**3GPP TSG-RAN WG2 Meeting #124  *R2-2313749***

**Chicago, IL, USA, 13 - 17 November 2023**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **38.306** | **CR** | **1013** | **rev** | **1** | **Current version:** | **17.6.0** |  |
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| *For* [***HELP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:***  | Simultaneous PUSCH and PUCCH transmissions of same priority on different inter-band cells [SimultaneousPUSCH-PUCCH] |
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| ***Source to WG:*** | Samsung, Ericsson, Verizon, Nokia |
| ***Source to TSG:*** | R2 |
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| ***Work item code:*** | TEI17, NR\_newRAT-Core |  | ***Date:*** | 2023-11-17 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | According to RAN1 LS (R1-2312456/R2-2313942), RAN1 agreed to support simultaneous PUSCH and PUCCH transmissions of same priority on different inter-band cells in case of TDD-FDD CA.

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| AgreementSimultaneous PUSCH and PUCCH transmissions of same priority on different inter-band cells is supported. Note 1: Above applies since Rel-17. Note 2: Above applies only for inter-band CANote 3: Above is subject to one new RRC parameter and one new UE capability (per BC). When the new RRC parameter is provided, simultaneous PUSCH and PUCCH transmission of same priority is always applied on different cells belonging to different bands.  |

In PhysicalCellGroupConfig IE, the RRC signaling to enable simultaneous PUCCH and PUSCH transmissions with different priorities for the primary PUCCH group and the secondary PUCCH group, respectively.

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| simultaneousPUCCH-PUSCH-r17 ENUMERATED {enabled} OPTIONAL, -- Need R simultaneousPUCCH-PUSCH-SecondaryPUCCHgroup-r17 ENUMERATED {enabled} OPTIONAL, -- Cond twoPUCCHgroup |

In addition, relevant UE capability (*parallelTxPUCCH-PUSCH-r17*) is configured in *CA-ParametersNR-v1700*.To extend these RRC signalings and UE capability for simultaneous PUSCH and PUCCH transmissions of same priority, the new RRC parameters and a new UE capability are required.  |
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| ***Summary of change:*** | Introduce a new Rel-17 UE capability in CA-ParametersNR-v17xy to indicate the UE support simultaneous PUSCH and PUCCH transmissions of same priority on different inter-band cells.* parallelTxPUCCH-PUSCH-SamePriority-r17

**Impact analysis****Impacted 5G architecture options:**EN-DC, SA, NE-DC, NR-DC**Impacted functionality:**Scheduling in TDD-FDD CA**Inter-operability:**If the UE is implemented according to the CR while the network is not, there is no inter-operability issue.If the network is implemented according to the CR while the UE is not, there is no inter-operability issue. |
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| ***Consequences if not approved:*** | Simultaneous PUSCH and PUCCH transmissions of same priority on different inter-band cells are not supported. |
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| ***Clauses affected:*** | 4.2.7.4 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 38.331 CR4506 |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
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| ***This CR's revision history:*** |  |

================================== CHANGE BEGIN=====================================

### 4.2.7 Physical layer parameters

4.2.7.4 *CA-ParametersNR*

| **Definitions for parameters** | **Per** | **M** | **FDD-TDD****DIFF** | **FR1-FR2****DIFF** |
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| ***ack-NACK-FeedbackForMulticast-r17***Indicates whether the UE supports ACK/NACK based HARQ-ACK feedback and RRC-based enabling/disabling ACK/NACK-based feedback for dynamic scheduling for multicast, comprised of the following functional components:- Supports ACK/NACK based HARQ-ACK feedback, and support of enabling/disabling ACK/NACK based HARQ-ACK feedback configured by RRC signalling;- Supports PTM retransmission for multicast;- Supports Type-1 and Type-2 HARQ-ACK CB for multicast feedback only;- Supports shared PUCCH resource configurations with unicast;- Supports Type-2 HARQ-ACK codebook for multicast on PUSCH/PUCCH with max number of G-RNTIs indicated in *maxNumberG-RNTI-HARQ-ACK-Codebook-r17*, which is not larger than max number of G-RNTIs indicated in *maxNumberG-RNTI-r17*.A UE supporting this feature shall also indicate support of *dynamicMulticastPCell-r17*. | BC | No | N/A | N/A |
| ***ack-NACK-FeedbackForSPS-Multicast-r17***Indicates whether the UE supports ACK/NACK based HARQ-ACK feedback and RRC-based enabling/disabling ACK/NACK-based feedback for SPS group-common PDSCH for multicast, comprised of the following functional components:- Support of ACK/NACK based HARQ-ACK feedback, enabling/disabling ACK/NACK based HARQ-ACK feedback configured by RRC signalling for SPS group-common PDSCH without PDCCH scheduling and first PDSCH after SPS activation;- Support of PTM retransmission for SPS multicast associated with G-CS-RNTI;- Support of Type-1 and Type-2 HARQ-ACK CB for SPS multicast feedback only;- Support of shared *SPS-PUCCH-AN-List* configuration from unicast SPS.A UE supporting this feature shall also indicate support of *sps-Multicast-r17*. | BC | No | N/A | N/A |
| ***beamManagementType-r16, beamManagementType-CBM-r17***Indicates the supported beam management type for inter-band CA within FR2. Beam management type can be independent beam management (IBM) or common beam management (CBM). The UE can support independent beam management (IBM) only or common beam management (CBM) only or both.NOTE: *beamManagementType-CBM-r17* is only applicable to the band combinations with 2 bands. | BC | Yes | TDD only | FR2 only |
| ***blindDetectFactor-r16***Defines the value of factor R for blind detection as specified in Clause 10.1 [11].The UE that indicates support of this feature shall support *multiDCI-MultiTRP-r16.* | BC | No | N/A | N/A |
| ***codebookComboParametersAdditionPerBC-r16***Indicates the list of supported CSI-RS resources across all bands in a band combination by referring to *codebookVariantsList* for the mixed codebook types. For mixed codebook types, UE reports support active CSI-RS resources and ports for up to 4 mixed codebook combinations in any slot. 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.For each band in a band combination, supported values for these three parameters are determined in conjunction with *codebookComboParametersAddition-r16* reported in *MIMO-ParametersPerBand*. | BC | No | N/A | N/A |
| ***codebookParametersAdditionPerBC-r16***Indicates the list of supported CSI-RS resources across all bands in a band combination by referring to *codebookVariantsList* for the additional 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.For each band in a band combination, supported values for these three parameters are determined in conjunction with *codebookParametersAddition-r16* reported in *MIMO-ParametersPerBand*. | BC | No | N/A | N/A |
| ***codebookParametersfetype2perBC-r17***Indicates the list of supported CSI-RS resources across all bands in a band combination by referring to *codebookVariantsList* for the additional 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.For each band in a band combination, supported values for these three parameters are determined in conjunction with *CodebookParametersfetyp2-r17* reported in *MIMO-ParametersPerBand*.For *codebookVariantsList* related to the FeType-II:- The minimum of *maxNumberTxPortsPerResource* is '*p4*';- The minimum value of *totalNumberTxPortsPerBand* is 4. | BC | No | N/A | N/A |
| ***codebookComboParameterMixedTypePerBC-r17***Indicates the support of active CSI-RS resources and ports for mixed codebook types in any slot. The UE reports supported active CSI-RS resources and ports for up to 4 mixed codebook combinations in any slot. The following are the possible mixed codebook combinations {Codebook1, Codebook2, Codebook3}:*- type1SP-feType2PS-null-r17 indicates* {Type 1 Single Panel, FeType II PS M=1, NULL}*- type1SP-feType2PS-M2R1-null-r17* indicates {Type 1 Single Panel, FeType II PS M=2 R=1, NULL}*- type1SP-feType2PS-M2R2-null-r17* indicates {Type 1 Single Panel, FeType II PS M=2 R=2, NULL}*- type1SP-Type2-feType2-PS-M1-r17* indicates {Type 1 Single Panel, Type II, FeType II PS M=1}*- type1SP-Type2-feType2-PS-M2R1-r17* indicates {Type 1 Single Panel, Type II, FeType II PS M=2 R=1}*- type1SP-eType2R1-feType2-PS-M1-r17* indicates {Type 1 Single Panel, eType II R=1, FeType II PS M=1}*- type1SP-eType2R1-feType2-PS-M2R1-r17* indicates {Type 1 Single Panel, eType II R=1, FeType II PS M=2 R=1}*- type1MP-feType2PS-null-r17* indicates {Type 1 Multi Panel*,* FeType II PS M=1, NULL}*- type1MP-feType2PS-M2R1-null-r17* indicates {Type 1 Multi Panel*,* FeType II PS M=2 R=1, NULL}*- type1MP-feType2PS-M2R2-null-r17* indicates {Type 1 Multi Panel*,* FeType II PS M=2 R=2, NULL}*- type1MP-Type2-feType2-PS-M1-r17* indicates {Type 1 Multi Panel*,* Type II, FeType II PS M=1}*- type1MP-Type2-feType2-PS-M2R1-r17* indicates {Type 1 Multi Panel*,* Type II, FeType II PS M=2 R=1}*- type1MP-eType2R1-feType2-PS-M1-r17* indicates {Type 1 Multi Panel, eType II R=1, FeType II PS M=1}*- type1MP-eType2R1-feType2-PS-M2R1-r17* indicates {Type 1 Multi Panel, eType II R=1, FeType II PS M=2 R=1}For each mixed codebook supported by the UE, *supportedCSI-RS-ResourceListAdd-r16* indicates the list of supported CSI-RS resources in a band by referring to *codebookVariantsList*. The following parameters are included in *codebookVariantsList*:*- maxNumberTxPortsPerResource* indicates the maximum number of Tx ports in a resource of a band combination with the minimum value of 'p4'.- *maxNumberResourcesPerBand* indicates the maximum number of resources across all CCs in a band combination with the minimum value of 4.- *totalNumberTxPortsPerBand* indicates the total number of Tx ports across all CCs in a band combination.The UE supporting this feature shall indicate the support of *fetype2basic-r17, etype2R1-r16, codebookParameters (type1-singlePanel, type1-multiPanel, type2), fetype2R1-r17, fetype2R2-r17.* | BC | No | N/A | N/A |
| ***codebookComboParameterMultiTRP-PerBC-r17***Indicates the support of active CSI-RS resources and ports in the presence of multi-TRP CSI.Indicates the support of active CSI-RS resources and ports for mixed codebook types in any slot. The UE reports supported active CSI-RS resources and ports for up to 4 mixed codebook combinations. The following are the possible mixed codebook combinations {Codebook1, Codebook2, Codebook3}:*- nCJT-null-null* indicates {NCJT, NULL, NULL}*- nCJT1SP-null-null* indicates {NCJT+Type 1 SP for sTRP, NULL, NULL}*- nCJT-Type2-null-r16* indicates{NCJT*, Type 2, Null}**- nCJT-Type2PS-null-r16* indicates{NCJT*, Type 2 with port selection, Null}**- nCJT-eType2R1-null-r16* indicates{NCJT*, eType 2 with R=1, Null}**- nCJT-eType2R2-null-r16* indicates{NCJT*, eType 2 with R=2, Null}**- nCJT-eType2R1PS-null-r16* indicates{NCJT*, eType 2 with R=1 and port selection, Null}**- nCJT-eType2R2PS-null-r16* indicates{NCJT*, eType 2 with R=2 and port selection, Null}**- nCJT-Type2-Type2PS-r16* indicates{NCJT*, Type 2, Type 2 with port selection}**- nCJT1SP-Type2-null-r16* indicates{NCJT+Type 1 SP for sTRP, Type 2, Null}*- nCJT1SP-Type2PS-null-r16* indicates{NCJT+Type 1 SP for sTRP, Type 2 with port selection, Null}*- nCJT1SP-eType2R1-null-r16* indicates{NCJT+Type 1 SP for sTRP, eType 2 with R=1, Null}*- nCJT1SP-eType2R2-null-r16* indicates{NCJT+Type 1 SP for sTRP, eType 2 with R=2, Null}*- nCJT1SP-eType2R1PS-null-r16* indicates{NCJT+Type 1 SP for sTRP, eType 2 with R=1 and port selection, Null}*- nCJT1SP-eType2R2PS-null-r16* indicates{NCJT+Type 1 SP for sTRP, eType 2 with R=2 and port selection, Null}*- nCJT1SP-Type2-Type2PS-r16* indicates{NCJT+Type 1 SP for sTRP, Type 2, Type 2 with port selection}*- nCJT-feType2PS-null-r17 indicates* {NCJT, FeType II PS M=1, NULL}*- nCJT-feType2PS-M2R1-null-r17* indicates {NCJT, FeType II PS M=2 R=1, NULL}*- nCJT-feType2PS-M2R2-null-r17* indicates {NCJT, FeType II PS M=2 R=2, NULL}*- nCJT-Type2-feType2-PS-M1-r17* indicates {NCJT, Type II, FeType II PS M=1}*- nCJT-Type2-feType2-PS-M2R1-r17* indicates {NCJT, Type II, FeType II PS M=2 R=1}*- nCJT-eType2R1-feType2-PS-M1-r17* indicates {NCJT, eType II R=1, FeType II PS M=1}*- nCJT-eType2R1-feType2-PS-M2R1-r17* indicates {NCJT, eType II R=1, FeType II PS M=2 R=1}*- nCJT1SP-feType2PS-null-r17 indicates* {NCJT+Type 1 SP for sTRP, FeType II PS M=1, NULL}*- nCJT1SP-feType2PS-M2R1-null-r17* indicates {NCJT+Type 1 SP for sTRP, FeType II PS M=2 R=1, NULL}*- nCJT1SP-feType2PS-M2R2-null-r17* indicates {NCJT+Type 1 SP for sTRP, FeType II PS M=2 R=2, NULL}*- nCJT1SP-Type2-feType2-PS-M1-r17* indicates {NCJT+Type 1 SP for sTRP, Type II, FeType II PS M=1}*- nCJT1SP-Type2-feType2-PS-M2R1-r17* indicates {NCJT+Type 1 SP for sTRP, Type II, FeType II PS M=2 R=1}*- nCJT1SP-eType2R1-feType2-PS-M1-r17* indicates {NCJT+Type 1 SP for sTRP, eType II R=1, FeType II PS M=1}*- nCJT1SP-eType2R1-feType2-PS-M2R1-r17* indicates {NCJT+Type 1 SP for sTRP, eType II R=1, FeType II PS M=2 R=1}For each mixed codebook supported by the UE, *supportedCSI-RS-ResourceListAdd-r16* indicates the list of supported CSI-RS resources in a band by referring to *codebookVariantsList*. The following parameters are included in *codebookVariantsList*:*- maxNumberTxPortsPerResource* indicates the maximum number of Tx ports in a resource of a band combination.- *maxNumberResourcesPerBand* indicates the maximum number of resources across all CCs in a band combination.- *totalNumberTxPortsPerBand* indicates the total number of Tx ports across all CCs in a band combination.NOTE 1:A CMR pair configured for NCJT will be counted as two activated resources, a CMR configured for sTRP will be counted as one activated resource for a triplet.NOTE2:his capability is relevant only when UE is configured with NCJT CSI in at least one CSI report setting in at least one CC in the band and/or band combination.The UE indicating support of this feature shall also indicate the support of *mTRP-CSI-EnhancementPerBand-r17*. | Band | No | N/A | N/A |
| ***crossCarrierA-CSI-trigDiffSCS-r16***Indicates the UE support of handling cross-carrier aperiodic CSI report with aperiodic CSI-RS where triggering PDCCH and triggered CSI-RS resource are on different cells with different SCS. Value *higherA-CSI-SCS* indicates the UE support of PDCCH cell of lower SCS and CSI RS cell of higher SCS and value *lowerA-CSI-SCS* indicates the UE support of PDCCH cell of higher SCS and CSI RS cell of lower SCS, and value *both* indicates the support of both variations. A UE supporting this feature shall also indicate support of CSI-RS and CSI-IM reception for CSI feedback using *csi-RS-IM-ReceptionForFeedback* | BC | No | N/A | N/A |
| ***crossCarrierSchedulingDefaultQCL-r16***Indicates whether the UE can be configured with *enabledDefaultBeamForCCS* for default QCL assumption for cross-carrier scheduling for same/different numerologies. A UE supporting this feature shall either indicate support of *crossCarrierScheduling-SameSCS* or *crossCarrierSchedulingDL-DiffSCS-r16*.Value *diff-only* indicates UE supports this feature only for different SCS combination(s).Value *both* indicates UE supports this feature for same SCS and for different SCS combination(s). | BC | No | N/A | N/A |
| ***crossCarrierSchedulingDL-DiffSCS-r16***Indicates the UE supports cross carrier scheduling for the different numerologies with carrier indicator field (CIF) in DL carrier aggregation where numerologies for the scheduling CC and scheduled CC are different.Value *low-to-hig*h indicates UE supports scheduling CC of lower SCS to scheduled CC of higher SCS;Value *high-to-low* indicates UE supports scheduling CC of higher SCS to scheduled CC of lower SCS;Value *both* indicates UE supports both scheduling CC of lower SCS to scheduled CC of higher SCS and scheduling CC of higher SCS to scheduled CC of lower SCS.NOTE 1: Following components are applicable to cross carrier scheduling from lower SCS to higher SCS when the UE reports this feature:- Processing one unicast DCI scheduling DL per scheduling CC slot per scheduled CC for FDD scheduling CC- Processing one unicast DCI scheduling DL per scheduling CC slot per scheduled CC for TDD scheduling CCNOTE 2: Following components are applicable to cross carrier scheduling from higher SCS to lower SCS when the UE reports this feature:- Processing one unicast DCI scheduling DL per N consecutive scheduling CC slot per scheduled CC for FDD scheduling CC- Processing one unicast DCI scheduling DL per N consecutive scheduling CC slot per scheduled CC for TDD scheduling CC- 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 (60,5), (120,30), N = 8 for (120,15) | BC | No | N/A | N/A |
| ***crossCarrierSchedulingSCell-SpCellTypeB-r17***Indicates whether the UE supports cross-carrier scheduling from SCell configured with cross-carrier scheduling to PCell/PSCell (sSCell) to PCell/PSCell(Type B). This capability signalling comprises the following parameters:- *supportedSCS-Combinations-r17* indicates which {PCell/PSCell SCS in kHz, sSCell SCS in kHz} combinations are supported. For {PCell/PSCell SCS in kHz, sSCell SCS in kHz} combinations = {(30,30), (30, 60), (60,60)}, the capability also indicates the band pair(s) that are supported. The band-pair is encoded as a bitmap with size L \* (L – 1) / 2, and bit N (leftmost bit is indexed as bit 0) is set to "1" if the UE supports cross-carrier scheduling from SCell toPCell/PSCell for the band pair (x, y), where L is the number of band entries in the band combination, x and y are the indices of the band entry in the band combination (the first band entry is indexed as 0), x < y, and N = x\*(2\*L – x – 1)/2 + y – x – 1.- sSCell USS set(s) (for CCS from sSCell to PCell/PSCell) and search space sets on PCell/PSCell can be configured so that the UE monitors them in overlapping slot of PCell/PSCell and sSCell.- Configuration of scaling factor α for BD and CCE limit handling and PDCCH overbooking handling on P(S)Cell- The number of unicast DCI limits for PCell/PSCell scheduling- Processing K1 unicast DCI scheduling DL on PCell/PSCell per PCell/PSCell slot and its aligned N consecutive sSCell slot(s)- Processing K2 unicast DCI scheduling UL on PCell/PSCell per PCell/PSCell slot and its aligned N consecutive sSCell slot(s)- N is based on pair of (PCell/PSCell SCS, sSCell SCS): N=1 for (15,15), (30,30), (60,60) and N=2 for (15,30), (30,60) and N=4 for (15, 60)- (K1, K2) = {(1,1) for FDD P(S)Cell; (K1, K2) = (1,2) for TDD P(S)Cell}- Same numerology between sSCell and P(S)Cell or sSCell SCS is larger than P(S)Cell SCS.- USS set(s) for DCI format 0\_1,1\_1 configured on sSCell for CCS from sSCell to PCell/PSCell and USS set(s) for DCI format 0\_2,1\_2 configured on sSCell for CCS from sSCell to PCell/PSCell if UE supports *dci-Format1-2And0-2-r16*- *pdcch-MonitoringOccasion-r17* indicates the PDCCH monitoring occasion(s) on sSCell for cross-carrier scheduling to Pcell/PSCell. There are 2 values {val1, val2} where val1 = within the first 3 OFDM symbols of sSCell slot overlapping with the first 3 OFDM symbols of PCell/PSCell slot and val2 = within the first 3 OFDM symbols of any sSCell slot overlapping with a PCell/PSCell slot.- Frame boundary alignment between PCell/PSCell and sSCell.NOTE 1: A UE supporting this FG does not imply that the UE can be configured with sSCell in shared channel access spectrum.NOTE 2: The CCS from sSCell to PCell is applicable to FR1 only but there can be other SCells in FR2 configured for the UE.NOTE 3: Parameters in *CSI-MeasConfig* of P(S)Cell and sSCell are configured such that combination of P(S)Cell and sSCell configurations does not result in exceeding any of the UE's capabilities for A-/SP-CSI reporting on PUSCH on P(S)Cell. | BC | No | N/A | FR1 only |
| ***crossCarrierSchedulingSCell-SpCellTypeA-r17***Indicates whether the UE supports cross-carrier scheduling from SCell configured with cross-carrier scheduling to PCell/PSCell (sSCell) to PCell/PSCell with search space restrictions (Type A). This capability signalling comprises the following parameters:- *supportedSCS-Combinations-r17* indicates which {PCell/PSCell SCS in kHz, sSCell SCS in kHz} combinations are supported. For {PCell/PSCell SCS in kHz, sSCell SCS in kHz} combinations = {(30,30), (30, 60), (60,60)}, the capability also indicates the band pair(s) that are supported. The band-pair is encoded as a bitmap with size L \* (L – 1) / 2, and bit N (leftmost bit is indexed as bit 0) is set to "1" if the UE supports cross-carrier scheduling from SCell toPCell/PSCell for band pair (x, y), where L is the number of band entries in the band combination, x and y are the indices of the band entry in the band combination (the first band entry is indexed as 0), x < y, and N = x\*(2\*L – x – 1)/2 + y – x – 1.- Search space restrictions: sSCell USS set(s) (for CCS from sSCell to PCell/PSCell) and following search space sets on PCell/PSCell can only be configured such that UE does not monitor them in overlapping slot of PCell/PSCell and sSCell:- USS sets for DCI formats 0\_1,1\_1,0\_2,1\_2.- USS sets for DCI formats 0\_0,1\_0.- Type3-CSS set(s) for DCI formats 1\_0/0\_0 with C-RNTI/CS-RNTI/MCS-C-RNTI.- Configuration of scaling factor α for BD and CCE limit handling and PDCCH overbooking handling on P(S)Cell.- The number of unicast DCI limits for PCell/PSCell scheduling:- Processing K1 unicast DCI scheduling DL on PCell/PSCell per PCell/PSCell slot and its aligned N consecutive sSCell slot(s).- Processing K2 unicast DCI scheduling UL on PCell/PSCell per PCell/PSCell slot and its aligned N consecutive sSCell slot(s).- N is based on pair of (PCell/PSCell SCS, sSCell SCS): N=1 for (15,15), (30,30), (60,60) and N=2 for (15,30), (30,60) and N=4 for (15, 60).- (K1, K2) = {(1,1) for FDD P(S)Cell; (K1, K2) = (1,2) for TDD P(S)Cell}.- Same numerology between sSCell and P(S)Cell or sSCell SCS is larger than P(S)Cell SCS.- USS set(s) for DCI format 0\_1,1\_1 configured on sSCell for CCS from sSCell to PCell/PSCell and USS set(s) for DCI format 0\_2,1\_2 configured on sSCell for CCS from sSCell to PCell/PSCell if UE supports dci-Format1-2And0-2-r16.- sSCell USS set(s) (for CCS from sSCell to PCell/PSCell) and Type0/0A/1/2 CSS sets on PCell/PSCell can be configured so that the UE monitors them in overlapping slot of PCell/PSCell and sSCell- no simultaneous monitoring between 'USS sets (for P(S)Cell scheduling) on sSCell' and 'Type 0/0A/1/2 CSS sets on P(S)Cell for DCI formats with CRC scrambled by C-RNTI/MCS-C-RNTI/CS-RNTI'- simultaneous monitoring of 'USS sets (for P(S)Cell scheduling) on sSCell' and 'Type 0/0A/1/2 CSS sets on P(S)Cell for DCI formats with CRC not scrambled by C-RNTI/MCS-C-RNTI/CS-RNTI'.- *pdcch-MonitoringOccasion-r17* indicates the PDCCH monitoring occasion(s) on sSCell for cross-carrier scheduling to PCell/PSCell. There are 2 values {val1, val2} where val1 = within the first 3 OFDM symbols of sSCell slot overlapping with the first 3 OFDM symbols of PCell/PSCell slot and val2 = within the first 3 OFDM symbols of any sSCell slot overlapping with a PCell/PSCell slot.- Frame boundary alignment between PCell/PSCell and sSCell.NOTE 1: A UE supporting this FG does not imply that the UE can be configured with sSCell in shared channel access spectrum.NOTE 2: The CCS from sSCell to PCell is applicable to FR1 only but there can be other SCells in FR2 configured for the UE.NOTE 3: Parameters in *CSI-MeasConfig* of P(S)Cell and sSCell are configured such that combination of P(S)Cell and sSCell configurations does not result in exceeding any of the UE's capabilities for A-/SP-CSI reporting on PUSCH on P(S)Cell. | BC | No | N/A | FR1 only |
| ***crossCarrierSchedulingUL-DiffSCS-r16***Indicates the UE supports cross carrier scheduling for the different numerologies with carrier indicator field (CIF) in UL carrier aggregation where numerologies for the scheduling CC and scheduled CC are different.Value *low-to-high* indicates UE supports scheduling CC of lower SCS to scheduled CC of higher SCS;Value *high-to-low* indicates UE supports scheduling CC of higher SCS to scheduled CC of lower SCS;Value *both* indicates UE supports both scheduling CC of lower SCS to scheduled CC of higher SCS and scheduling CC of higher SCS to scheduled CC of lower SCS.NOTE 1: Following components are applicable to cross carrier scheduling from lower SCS to higher SCS when the UE reports this feature:- Processing one unicast DCI scheduling UL per scheduling CC slot per scheduled CC for FDD scheduling CC- Processing 2 unicast DCI scheduling UL per scheduling CC slot per scheduled CC for TDD scheduling CCNOTE 2: Following components are applicable to cross carrier scheduling from higher SCS to lower SCS when the UE reports this feature:- Processing one unicast DCI scheduling UL per N consecutive scheduling CC slot per scheduled CC for FDD scheduling CC- Processing 2 unicast DCI scheduling UL per N consecutive scheduling CC slot per scheduled CC for TDD scheduling CC- 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 (60,5), (120,30), N = 8 for (120,15) | BC | No | N/A | N/A |
| ***csi-ReportingCrossPUCCH-Grp-r16***Indicates the support of CSI reporting cross PUCCH group, comprised of the following functional components:- Support reporting CSI of an SCell belonging to secondary PUCCH group by PUSCH or PUCCH of active serving cells belonging to primary PUCCH group, for both during and after SCell activation procedure;- Support reporting CSI of an SCell belonging to primary PUCCH group by PUSCH or PUCCH of active serving cells belonging to secondary PUCCH group, for both during and after SCell activation procedure;- Support for P-CSI and A-CSI for cross-PUCCH group CSI reporting;- *computationTimeForA-CSI-r16* indicates the CSI computation time for A-CSI; if '*relaxed*' is reported, the *additionalSymbols-r16* shall be reported to indicate for each supported SCS the required additional number of symbols in addition to existing Z and Z' for aperiodic CSI report for cross-PUCCH group CSI reporting (the same SCS set definition as in clause 5.4 of TS 38.214 [12]). The value *s14* indicates 14 symbols, and so on. For FR2-2 bands, the time relaxation values of the required additional number of symbols for SCS 480/960 kHz (µ=5 and µ=6) are the same amount of absolute time as UE reported for SCS 120kHz (µ=3).- *sp-CSI-ReportingOnPUCCH-r16* indicates whether the UE supports SP-CSI reporting on PUCCH for cross-PUCCH group CSI reporting;- *sp-CSI-ReportingOnPUSCH-r16* indicates whether the UE supports SP-CSI reporting on PUSCH for cross-PUCCH group CSI reporting;- *carrierTypePairList-r16* indicates one or multiple supported carrier type pairs(s). For each supported carrier type pair in *carrierTypePairList-r16*:- carrierForCSI-Measurement-r16 indicates the carrier type in a PUCCH group in which CSI measurement is performed;- carrierForCSI-Reporting-r16 indicates the carrier type in the other PUCCH group in which CSI report is performed,- where a carrier type is one of {*fr1-NonSharedTDD-r16, fr1-SharedTDD-r16, fr1-NonSharedFDD-r16, fr2-r16*}UE indicating support of this feature shall indicate *csi-ReportFramework* and indicate support of either *twoPUCCH-Group* or *twoPUCCH-Grp-ConfigurationsList-r16.*NOTE 1: For a band combination with SUL, the SUL band is counted as one of the bands.NOTE 2: For a band combination with SDL, the SDL band is counted as one of the bands. SDL is indicated as 'FR1-NonSharedFDD' carrier type. Per UE capabilities that are TDD only are not applicable to SDL.NOTE 3: When the carrier type of NUL is indicated for PUCCH/PUSCH transmission location for CSI measurement or CSI reporting, the SUL in the same cell as in the NUL can also be configured for PUCCH/PUSCH transmission. | BC | No | N/A | N/A |
| ***csi-RS-IM-ReceptionForFeedbackPerBandComb***Indicates support of CSI-RS and CSI-IM reception for CSI feedback. This capability signalling comprises the following parameters:- *maxNumberSimultaneousNZP-CSI-RS-ActBWP-AllCC* indicates the maximum number of simultaneous CSI-RS resources (irrespective of the associated codebook type) in active BWPs across all CCs, and across MCG and SCG in case of NR-DC. The network applies this limit in addition to the limits signalled in *MIMO-ParametersPerBand-> maxNumberSimultaneousNZP-CSI-RS-PerCC* and in *Phy-ParametersFRX-Diff-> maxNumberSimultaneousNZP-CSI-RS-PerCC*;- *totalNumberPortsSimultaneousNZP-CSI-RS-ActBWP-AllCC* indicates the total number of CSI-RS ports in simultaneous CSI-RS resources (irrespective of the associated codebook type) in active BWPs across all CCs, and across MCG and SCG in case of NR-DC. The network applies this limit in addition to the limits signalled in *MIMO-ParametersPerBand-> totalNumberPortsSimultaneousNZP-CSI-RS-PerCC* and in *Phy-ParametersFRX-Diff-> totalNumberPortsSimultaneousNZP-CSI-RS-PerCC*.The UE is mandated to report *csi-RS-IM-ReceptionForFeedbackPerBandComb*. | BC | Yes | N/A | N/A |
| ***dci-FormatsPCellPSCellUSS-Sets-r17***Indicates whether UE supports the monitoring DCI formats 0\_1,1\_1,0\_2 (if supported),1\_2 (if supported) on PCell/PSCell USS set(s).UE indicating support of this feature shall indicate support of *crossCarrierSchedulingSCell-SpCellTypeA-r17*. | BC | No | N/A | FR1 only |
| ***defaultQCL-CrossCarrierA-CSI-Trig-r16***Indicates whether the UE can be configured with *enabledDefaultBeamForCCS* for default QCL assumption for cross-carrier A-CSI-RS triggering for same/different numerologies as specified in TS 38.213 [11].Value *diffOnly* indicates the UE supports this feature for different SCS combination(s).Value *both* indicates the UE supports this feature for same SCS and for different SCS combination(s) (low-to-high, high-to-low or both) reported for *crossCarrierA-CSI-trigDiffSCS-r16.* | BC | No | N/A | N/A |
| ***demodulationEnhancementCA-r17***Indicates whether the UE supports the enhanced demodulation processing for carrier aggregation for HST-SFN joint transmission scheme with velocity up to 500km/h as specified in TS 38.101-4 [18].UE indicating support of this feature shall indicate support of *demodulationEnhancement-r16*. | BC | No | No | FR1 only |
| ***diffNumerologyAcrossPUCCH-Group***Indicates whether different numerology across two NR PUCCH groups for data and control channel at a given time in NR CA and (NG)EN-DC/NE-DC is supported by the UE. | BC | No | N/A | N/A |
| ***diffNumerologyAcrossPUCCH-Group-CarrierTypes-r16***Indicates whether different numerology across two NR PUCCH groups for data and control channel at a given time in NR CA for UE supporting two PUCCH groups with 3 or more bands with at least two carrier types. UE indicating support of this feature shall indicate support of *twoPUCCH-Grp-ConfigurationsList-r16.* | BC | No | N/A | N/A |
| ***diffNumerologyWithinPUCCH-GroupLargerSCS***Indicates whether UE supports different numerology across carriers within a PUCCH group and a same numerology between DL and UL per carrier for data/control channel at a given time in NR CA, (NG)EN-DC/NE-DC and NR-DC.In case of NR CA and (NG)EN-DC/NE-DC with one NR PUCCH group and in case of NR CA with two NR PUCCH groups, it also indicates whether the UE supports different numerologies across NR carriers within the same NR PUCCH group up to two different numerologies within the same NR PUCCH group, wherein NR PUCCH is sent on the carrier with larger SCS for data and control channel at a given time.In case of (NG)EN-DC/NE-DC with two NR PUCCH groups, it indicates whether the UE supports different numerologies across NR carriers up to two different numerologies within an NR PUCCH group in FR1, wherein NR PUCCH is sent on the carrier with larger SCS, and same numerology across NR carriers within another NR PUCCH group in FR2 for data and control channel at a given time.In case of NR-DC, it indicates whether the UE supports different numerologies across NR carriers within the same NR PUCCH group in MCG (in FR1) up to two different numerologies within the same NR PUCCH group wherein NR PUCCH is sent on the carrier with larger SCS for data/control channel at a given time; and same numerology across NR carriers in SCG (in FR2). | BC | No | N/A | N/A |
| ***diffNumerologyWithinPUCCH-GroupLargerSCS-CarrierTypes-r16***Indicates whether UE supports different numerology across carriers up to 2 different numerologies within the same PUCCH group wherein PUCCH is sent on the carrier with larger SCS for data/control channel at a given time in NR CA for UE supporting two PUCCH groups with 3 or more bands with at least two carrier types. UE indicating support of this feature shall indicate support of *twoPUCCH-Grp-ConfigurationsList-r16.*NOTE: PUCCH is sent on a carrier with SCS not smaller than SCS of any DL carriers corresponding to the PUCCH group. | BC | No | N/A | N/A |
| ***diffNumerologyWithinPUCCH-GroupSmallerSCS***Indicates whether UE supports different numerology across carriers within a PUCCH group and a same numerology between DL and UL per carrier for data/control channel at a given time in NR CA, (NG)EN-DC/NE-DC and NR-DC.In case of NR CA and (NG)EN-DC/NE-DC with one NR PUCCH group and in case of NR CA with two NR PUCCH groups, it also indicates whether the UE supports different numerologies across NR carriers within the same NR PUCCH group up to two different numerologies within the same NR PUCCH group, wherein NR PUCCH is sent on the carrier with smaller SCS for data and control channel at a given time.In case of (NG)EN-DC/NE-DC with two NR PUCCH groups, it indicates whether the UE supports different numerologies across NR carriers up to two different numerologies within an NR PUCCH group in FR1, wherein NR PUCCH is sent on the carrier with smaller SCS, and same numerology across NR carriers within another NR PUCCH group in FR2 for data and control channel at a given time.In case of NR-DC, it indicates whether the UE supports different numerologies across NR carriers within the same NR PUCCH group in MCG (in FR1) up to two different numerologies within the same NR PUCCH group wherein NR PUCCH is sent on the carrier with smaller SCS for data/control channel at a given time; and same numerology across NR carriers in SCG (in FR2). | BC | No | N/A | N/A |
| ***diffNumerologyWithinPUCCH-GroupSmallerSCS-CarrierTypes-r16***Indicates whether UE supports different numerology across carriers up to 2 different numerologies within the same PUCCH group wherein PUCCH is sent on the carrier with smaller SCS for data/control channel at a given time in NR CA for UE supporting two PUCCH groups with 3 or more bands with at least two carrier types. UE indicating support of this feature shall indicate support of *twoPUCCH-Grp-ConfigurationsList-r16.*NOTE: NR PUCCH is sent on a carrier with SCS not larger than SCS of any DL carriers corresponding to the NR PUCCH group. | BC | No | N/A | N/A |
| ***disablingScalingFactorDeactSCell-r17***Indicates whether UE supports disabling scaling factor α for Cross-carrier scheduling (CCS) from SCell configured with cross-carrier scheduling to PCell/PSCell (sSCell) to PCell/PSCell(Type A or Type B) when sSCell is deactivated (i.e. scaling factor α is not applied for PDCCH overbooking/BD/CCE limit computation when sSCell is deactivated).UE indicating support of this feature shall indicate support of *crossCarrierSchedulingSCell-SpCellTypeA-r17* and *crossCarrierSchedulingSCell-SpCellTypeB-r17*. | BC | No | N/A | FR1 only |
| ***disablingScalingFactorDormantSCell-r17***Indicates whether UE supports disabling scaling factor α for Cross-carrier scheduling (CCS) from SCell configured with cross-carrier scheduling to PCell/PSCell (sSCell) to PCell/PSCell(Type A or Type B) when sSCell is switched to dormant BWP (i.e. scaling factor α is not applied for PDCCH overbooking/BD/CCE limit computation when sSCell is switched to dormant BWP).UE indicating support of this feature shall indicate support of *crossCarrierSchedulingSCell-SpCellTypeA-r17* and *crossCarrierSchedulingSCell-SpCellTypeB-r17*. | BC | No | N/A | FR1 only |
| ***dmrs-BundlingNonBackToBackTX-PerBC-r17***Indicates whether the UE supports DM-RS bundling for non-back-to-back transmission for consecutive slots for PUSCH and PUCCH only for corresponding supported back-to-back transmission as reported in *dmrs-BundlingPUSCH-RepTypeAPerBC-r17*, *dmrs-BundlingPUSCH-RepTypeBPerBC-r17*, *dmrs-BundlingPUSCH-multiSlotPerBC-r17* or *dmrs-BundlingPUCCH-RepPerBC-r17*.UE indicating support of this feature shall also indicate support of at least one of *dmrs-BundlingPUSCH-RepTypeAPerBC-r17*, *dmrs-BundlingPUSCH-RepTypeBPerBC-r17*, *dmrs-BundlingPUSCH-multiSlotPerBC-r17* or *dmrs-BundlingPUCCH-RepPerBC-r17*.NOTE: This capability is only applicable when UE is configured with single uplink carrier within a frequency range. | BC | No | N/A | N/A |
| ***dmrs-BundlingPUCCH-RepPerBC-r17***Indicates whether the UE supports DM-RS bundling for PUCCH repetitions for PUCCH formats 1/3/4 over consecutive symbols.UE indicating support of this feature shall also indicate support of *maxDurationDMRS-Bundling-r17* in at least one of the bands in the band combination and *pucch-Repetition-F1-3-4*.This feature is applicable to following multiple carrier scenarios in addition to single carrier scenarios:- FR1+FR2 UL CA, FR1+FR2 DC, and EN-DC with NR on FR2. DMRS bundling configuration is limited to one uplink NR carrier in total on all FRs at a time.- FR1 inter-band DL CA with a "single" uplink band configured, meaning no switching to transmit SRS on another carrier.- DL CA with "additional" UL carrier configured with SRS only (i.e. no PUCCH/PUSCH configured).- FR1 inter-band UL CA with DMRS bundling.- SUL with DMRS bundling.For the last three scenarios listed above, DMRS bundling can be applied with the following conditions:- Concurrent transmissions scheduled/configured over multiple carriers are not expected by UE.- Only configuration of a single TAG.- Only applicable for the back-to-back case (i.e., zero gap between two transmissions within an actual TDW).- Only one band can be configured with DMRS bundling at a time.NOTE 1: Under the above conditions, phase continuity and power consistency within any actual TDW on one carrier is not impacted by operations on a different carrier.NOTE 2: Under the above conditions, the events defined in clause 6.1.7 of TS 38.214 [12] for the carrier with DMRS bundling are not triggered by any transmission within any actual TDW on the other carrier.NOTE 3: If the modulation scheme higher than QPSK is scheduled for transmission on any carrier configured with DMRS bundling, DMRS bundling is not applicable (i.e., the error case and up to UE implementation). | BC | No | N/A | N/A |
| ***dmrs-BundlingPUSCH-multiSlotPerBC-r17***Indicates whether the UE supports DM-RS bundling for TB processing over multi-slot (TBoMS) PUSCH over consecutive symbols.UE indicating support of this feature shall also indicate support of *maxDurationDMRS-Bundling-r17* and *tb-ProcessingMultiSlotPUSCH-r17* in at least one of the bands in the band combination.This feature is applicable to following multiple carrier scenarios in addition to single carrier scenarios:- FR1+FR2 UL CA, FR1+FR2 DC, and EN-DC with NR on FR2. DMRS bundling configuration is limited to one uplink NR carrier in total on all FRs at a time.- FR1 inter-band DL CA with a "single" uplink band configured, meaning no switching to transmit SRS on another carrier.- DL CA with "additional" UL carrier configured with SRS only (i.e. no PUCCH/PUSCH configured).- FR1 inter-band UL CA with DMRS bundling.- SUL with DMRS bundling.For the last three scenarios listed above, DMRS bundling can be applied with the following conditions:- Concurrent transmissions scheduled/configured over multiple carriers are not expected by UE.- Only configuration of a single TAG.- Only applicable for the back-to-back case (i.e., zero gap between two transmissions within an actual TDW).- Only one band can be configured with DMRS bundling at a time.NOTE 1: Under the above conditions, phase continuity and power consistency within any actual TDW on one carrier is not impacted by operations on a different carrier.NOTE 2: Under the above conditions, the events defined in clause 6.1.7 of TS 38.214 [12] for the carrier with DMRS bundling are not triggered by any transmission within any actual TDW on the other carrier.NOTE 3: If the modulation scheme higher than QPSK is scheduled for transmission on any carrier configured with DMRS bundling, DMRS bundling is not applicable (i.e., the error case and up to UE implementation).NOTE 4: If a UE reports support of *tb-ProcessingRepMultiSlotPUSCH-r17* and *dmrs-BundlingPUSCH-multiSlot-r17* in a band in the band combination and *dmrs-BundlingPUSCH-multiSlotPerBC-r17* is supported for the band combination, the UE supports DMRS bundling for the repetitions of TBoMS for the band. | BC | No | N/A | N/A |
| ***dmrs-BundlingPUSCH-RepTypeAPerBC-r17***Indicates whether the UE supports DM-RS bundling for PUSCH repetition type A over consecutive symbols.UE indicating support of this feature shall also indicate support of *maxDurationDMRS-Bundling-r17* in at least one of the bands in the band combination and at least one of *type1-PUSCH-RepetitionMultiSlots*, *type2-PUSCH-RepetitionMultiSlots* or *pusch-RepetitionMultiSlots*.This feature is applicable to following multiple carrier scenarios in addition to single carrier scenarios:- FR1+FR2 UL CA, FR1+FR2 DC, and EN-DC with NR on FR2. DMRS bundling configuration is limited to one uplink NR carrier in total on all FRs at a time.- FR1 inter-band DL CA with a "single" uplink band configured, meaning no switching to transmit SRS on another carrier.- DL CA with "additional" UL carrier configured with SRS only (i.e. no PUCCH/PUSCH configured)- FR1 inter-band UL CA with DMRS bundling- SUL with DMRS bundlingFor the last three scenarios listed above, DMRS bundling can be applied with the following conditions:- Concurrent transmissions scheduled/configured over multiple carriers are not expected by UE- Only configuration of a single TAG- Only applicable for the back-to-back case (i.e., zero gap between two transmissions within an actual TDW)- Only one band can be configured with DMRS bundling at a timeNOTE 1: Under the above conditions, phase continuity and power consistency within any actual TDW on one carrier is not impacted by operations on a different carrier.NOTE 2: Under the above conditions, the events defined in clause 6.1.7 of TS 38.214 [12] for the carrier with DMRS bundling are not triggered by any transmission within any actual TDW on the other carrier.NOTE 3: If the modulation scheme higher than QPSK is scheduled for transmission on any carrier configured with DMRS bundling, DMRS bundling is not applicable (i.e., the error case and up to UE implementation). | BC | No | N/A | N/A |
| ***dmrs-BundlingPUSCH-RepTypeBPerBC-r17***Indicates whether the UE supports DM-RS bundling for PUSCH repetition type B over consecutive symbols.UE indicating support of this feature shall also indicate support of *maxDurationDMRS-Bundling-r17* in at least one of the bands in the band combination and *pusch-RepetitionTypeB-r16*.This feature is applicable to following multiple carrier scenarios in addition to single carrier scenarios:- FR1+FR2 UL CA, FR1+FR2 DC, and EN-DC with NR on FR2. DMRS bundling configuration is limited to one uplink NR carrier in total on all FRs at a time.- FR1 inter-band DL CA with a "single" uplink band configured, meaning no switching to transmit SRS on another carrier.- DL CA with "additional" UL carrier configured with SRS only (i.e. no PUCCH/PUSCH configured).- FR1 inter-band UL CA with DMRS bundling.- SUL with DMRS bundling.For the last three scenarios listed above, DMRS bundling can be applied with the following conditions:- Concurrent transmissions scheduled/configured over multiple carriers are not expected by UE.- Only configuration of a single TAG.- Only applicable for the back-to-back case (i.e., zero gap between two transmissions within an actual TDW).- Only one band can be configured with DMRS bundling at a time.NOTE 1: Under the above conditions, phase continuity and power consistency within any actual TDW on one carrier is not impacted by operations on a different carrier.NOTE 2: Under the above conditions, the events defined in clause 6.1.7 of TS 38.214 [12] for the carrier with DMRS bundling are not triggered by any transmission within any actual TDW on the other carrier.NOTE 3: If the modulation scheme higher than QPSK is scheduled for transmission on any carrier configured with DMRS bundling, DMRS bundling is not applicable (i.e., the error case and up to UE implementation). | BC | No | N/A | N/A |
| ***dmrs-BundlingRestartPerBC-r17***Indicates whether the UE supports restarting DM-RS bundling after the events triggered by DCI or MAC CE that violate power consistency and phase continuity.UE indicating support of this feature shall also indicate support of *maxDurationDMRS-Bundling-r17* in at least one of the bands in the band combination*.*NOTE: Events which are triggered by DCI or MAC CE, but do not require UE capability to resume maintaining power consistency and/or phase continuity as specified in clause 6.1.7 of TS 38.214 [12] are excluded from this feature. | BC | No | N/A | N/A |
| ***dualPA-Architecture***For band combinations with single-band with UL CA, this field indicates the support of dual PA and dual LO frequencies for FR1, or dual LO frequencies for FR2. If absent in such band combinations, the UE supports single PA and single LO frequency for all the ULs for FR1, or single LO frequency for all the ULs for FR2. For other band combinations, this field is not applicable. | BC | No | N/A | N/A |
| ***dynamicPUCCH-CellSwitchDiffLengthSingleGroup-r17***Indicates whether the UE supports PUCCH cell switching based on dynamic indication in the DCI scheduling the PUCCH for different length (in physical time) of overlapping PUCCH slots/sub-slots for a single PUCCH group only. The capability signalling comprises the following parameters:- *pucch-Group-r17* indicates for which PUCCH group the UE supports PUCCH cell switching based on dynamic indication. Value *primaryGroupOnly* indicates that only primary PUCCH group can support PUCCH cell switch, value *secondaryGroupOnly* indicates that only secondary PUCCH group can support PUCCH cell switch, and value *eitherPrimaryOrSecondaryGroup* indicates that either primary or secondary PUCCH group can support PUCCH cell switch.- *pucch-Group-Config-r17* indicates one or multiple of supported carrier type pairs that can support PUCCH cell switch, with *fr1-FR1-NonSharedTDD-r17* indicating the carrier type pair (FR1 licensed TDD, FR1 licensed TDD), *fr2-FR2-NonSharedTDD-r17* indicating the carrier type pair (FR2 licensed TDD, FR2 licensed TDD), and *fr1-FR2-NonSharedTDD-r17* indicating the carrier type pair (FR1 licensed TDD, FR2 licensed TDD).NOTE: This feature applies to cells in the same TAG only. If UE supporting this FG also supports both *diffNumerologyWithinPUCCH-GroupSmallerSCS* and *diffNumerologyWithinPUCCH-GroupLargerSCS* or both *diffNumerologyWithinPUCCH-GroupSmallerSCS-CarrierTypes-r16* and *diffNumerologyWithinPUCCH-GroupLargerSCS-CarrierTypes-r16* or *maxUpTo3Diff-NumerologiesConfigSinglePUCCH-grp-r16* or *maxUpTo4Diff-NumerologiesConfigSinglePUCCH-grp-r16* when UE is not configured with two NR PUCCH groups, the UE supports the cases of both same and different numerologies between switchable cells. Otherwise, the UE supports the case of same numerology between switchable cells. | BC | No | TDD only | N/A |
| ***dynamicPUCCH-CellSwitchSameLengthSingleGroup-r17***Indicates whether the UE supports PUCCH cell switching based on dynamic indication in the DCI scheduling the PUCCH for same length (in physical time) of overlapping PUCCH slots/sub-slots for a single PUCCH group only. The capability signalling comprises the following parameters:- *pucch-Group-r17* indicates for which PUCCH group the UE supports PUCCH cell switching based on dynamic indication. Value *primaryGroupOnly* indicates that only primary PUCCH group can support PUCCH cell switch, value *secondaryGroupOnly* indicates that only secondary PUCCH group can support PUCCH cell switch, and value *eitherPrimaryOrSecondaryGroup* indicates that either primary or secondary PUCCH group can support PUCCH cell switch.- *pucch-Group-Config-r17* indicates one or multiple of supported carrier type pairs that can support PUCCH cell switch, with *fr1-FR1-NonSharedTDD-r17* indicating the carrier type pair (FR1 licensed TDD, FR1 licensed TDD), *fr2-FR2-NonSharedTDD-r17* indicating the carrier type pair (FR2 licensed TDD, FR2 licensed TDD), and *fr1-FR2-NonSharedTDD-r17* indicating the carrier type pair (FR1 licensed TDD, FR2 licensed TDD).NOTE: This feature applies to cells in the same TAG only. If UE supporting this FG also supports both *diffNumerologyWithinPUCCH-GroupSmallerSCS* and *diffNumerologyWithinPUCCH-GroupLargerSCS* or both *diffNumerologyWithinPUCCH-GroupSmallerSCS-CarrierTypes-r16* and *diffNumerologyWithinPUCCH-GroupLargerSCS-CarrierTypes-r16* or *maxUpTo3Diff-NumerologiesConfigSinglePUCCH-grp-r16* or *maxUpTo4Diff-NumerologiesConfigSinglePUCCH-grp-r16* when UE is not configured with two NR PUCCH groups, the UE supports the cases of both same and different numerologies between switchable cells. Otherwise, the UE supports the case of same numerology between switchable cells. | BC | No | TDD only | N/A |
| ***dynamicPUCCH-CellSwitchDiffLengthTwoGroups-r17***Indicates whether the UE supports PUCCH cell switching based on dynamic indication in the DCI scheduling the PUCCH for different length (in physical time) of overlapping PUCCH slots/sub-slots for two PUCCH groups. The capability indicates one or multiple of supported configuration(s) of {primary PUCCH group config, secondary PUCCH group config}. The capability signalling of each primary or secondary PUCCH group configuration indicates one or multiple of carrier type pairs that can support PUCCH cell switch, with *fr1-FR1-NonSharedTDD-r17* indicating the carrier type pair (FR1 licensed TDD, FR1 licensed TDD), *fr2-FR2-NonSharedTDD-r17* indicating the carrier type pair (FR2 licensed TDD, FR2 licensed TDD), and *fr1-FR2-NonSharedTDD-r17* indicating the carrier type pair (FR1 licensed TDD, FR2 licensed TDD).NOTE: This feature applies to cells in the same TAG only. If UE supporting this FG also supports both *diffNumerologyWithinPUCCH-GroupSmallerSCS* and *diffNumerologyWithinPUCCH-GroupLargerSCS* or both *diffNumerologyWithinPUCCH-GroupSmallerSCS-CarrierTypes-r16* and *diffNumerologyWithinPUCCH-GroupLargerSCS-CarrierTypes-r16*, the UE supports the cases of both same and different numerologies between switchable cells. Otherwise, the UE supports the case of same numerology between switchable cells. | BC | No | TDD only | N/A |
| ***dynamicPUCCH-CellSwitchSameLengthTwoGroups-r17***Indicates whether the UE supports PUCCH cell switching based on dynamic indication in the DCI scheduling the PUCCH for same length (in physical time) of overlapping PUCCH slots/sub-slots for two PUCCH groups. The capability indicates one or multiple of supported configuration(s) of {primary PUCCH group config, secondary PUCCH group config}. The capability signalling of each primary or secondary PUCCH group configuration indicates one or multiple of carrier type pairs that can support PUCCH cell switch, with *fr1-FR1-NonSharedTDD-r17* indicating the carrier type pair (FR1 licensed TDD, FR1 licensed TDD), *fr2-FR2-NonSharedTDD-r17* indicating the carrier type pair (FR2 licensed TDD, FR2 licensed TDD), and *fr1-FR2-NonSharedTDD-r17* indicating the carrier type pair (FR1 licensed TDD, FR2 licensed TDD).NOTE: This feature applies to cells in the same TAG only. If UE supporting this FG also supports both *diffNumerologyWithinPUCCH-GroupSmallerSCS* and *diffNumerologyWithinPUCCH-GroupLargerSCS* or both *diffNumerologyWithinPUCCH-GroupSmallerSCS-CarrierTypes-r16* and *diffNumerologyWithinPUCCH-GroupLargerSCS-CarrierTypes-r16*, the UE supports the cases of both same and different numerologies between switchable cells. Otherwise, the UE supports the case of same numerology between switchable cells. | BC | No | TDD only | N/A |
| ***fdm-CodebookForMux-UnicastMulticastHARQ-ACK-r17***Indicates whether the UE supports FDM-ed Type-1 and Type-2 HARQ-ACK codebooks for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast, comprised of the following functional components:- Support of FDM-ed Type-1 HARQ-ACK codebooks for multiplexing HARQ-ACK for unicast and ACK/NACK-based HARQ-ACK for multicast on PUCCH or PUSCH;- Support of Type-2 HARQ-ACK codebooks for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast on PUCCH or PUSCH with max number of G-RNTIs indicated in *maxNumberG-RNTI-HARQ-ACK-Codebook-r17*, which is not larger than max number of G-RNTIs indicated in *maxNumberG-RNTI-r17* or G-CS-RNTIs indicated in *maxNumberG-CS-RNTI-r17.*A UE supporting this feature shall also indicate support of *fdm-MulticastUnicast-r17*, and at least one of {*ack-NACK-FeedbackForMulticast-r17*, *nack-OnlyFeedbackForMulticast-r17*, *ack-NACK-FeedbackForSPS-Multicast-r17, nack-OnlyFeedbackForSPS-Multicast-r17*}.NOTE 1: FDM-ed Type-1 HARQ-ACK codebook is generated by concatenating the Type-1 sub-codebook for unicast and the Type-1 sub-codebook for multicast.NOTE 2: The Type-2 HARQ-ACK codebook is generated by concatenating the Type-2 sub-codebook for unicast and the Type-2 sub-codebook for multicast. | BC | No | N/A | N/A |
| ***half-DuplexTDD-CA-SameSCS-r16***Indicates whether the UE supports directional collision handling between reference and other cell(s) for half-duplex operation in TDD CA with same SCS. The UE can include this field for band combinations including only intra-band TDD CA or if *simultaneousRxTxInterBandCA* is not present for band combinations involving mix of intra-band TDD CA and inter-band TDD CA.If this field is included in *ca-ParametersNR-forDC-v1610* for IAB-MT, it indicates IAB-MT supports directional collision handling between reference and other cells for half-duplex operation in TDD NR-DC with same SCS across MCG and SCG. | BC | No | TDD only | N/A |
| ***higherPowerLimit-r17***Indicates whether UE supports increase in maximum output power above the power class indication. | BC | No | N/A | FR1 only |
| ***interCA-NonAlignedFrame-r16***Indicates whether the UE supports inter-band carrier aggregation operation where, within the same cell group, the frame boundaries of the SpCell and the SCell(s) are not aligned, the slot boundaries are aligned and the lowest subcarrier spacing of the subcarrier spacings given in *scs-SpecificCarrierList* for SpCell is smaller than or equal to the lowest subcarrier spacing of the subcarrier spacings given in *scs-SpecificCarrierList* for each of the non-aligned SCells. | BC | No | N/A | N/A |
| ***interCA-NonAlignedFrame-B-r16***Indicates whether the UE supports inter-band carrier aggregation operation where, within the same cell group, the frame boundaries of the SpCell and the SCell(s) are not aligned, the slot boundaries are aligned and the lowest subcarrier spacing of the subcarrier spacings given in *scs-SpecificCarrierList* for SpCell is larger than the lowest subcarrier spacing of the subcarrier spacings given in *scs-SpecificCarrierList* for at least one of the non-aligned SCells.A UE indicating support of *interCA-NonAlignedFrame-B-r16* shall also indicate support of *interCA-NonAlignedFrame-r16*. | BC | No | N/A | N/A |
| ***interFreqDAPS-r16***Indicates whether the UE supports inter-frequency handover, e.g. support of simultaneous DL reception of PDCCH and PDSCH from source and target cell. A UE indicating this capability shall also support inter-frequency synchronous DAPS handover, and single UL transmission for inter-frequency DAPS handover. The capability signalling comprises of the following parameters:- *interFreqAsyncDAPS-r16* indicates whether the UE supports asynchronous DAPS handover.- *interFreqDiffSCS-DAPS-r16* indicates whether the UE supports different SCSs in source PCell and inter-frequency target PCell in DAPS handover. The UE only includes this field if different SCSs can be supported in both UL and DL. If absent, the UE does not support either UL or DL SCS being different in DAPS handover.- *interFreqMultiUL-TransmissionDAPS-r16* indicates whether the UE supports simultaneous UL transmission in source PCell and target PCell during a DAPS handover. The UE can include this field only if any of *semiStaticPowerSharingDAPS-Mode1-r16*, *semiStaticPowerSharingDAPS-Mode2-r16* or *dynamicPowersharingDAPS-r16* are included. Otherwise, the UE does not include this field.- *interFreqSemiStaticPowerSharingDAPS-Mode1-r16* indicates whether the UE supports semi-static UL power sharing mode 1 during DAPS handover between source and target cells of same FR.- *interFreqSemiStaticPowerSharingDAPS-Mode2-r16* indicates whether the UE supports semi-static UL power sharing mode 2 during DAPS handover between source and target cells of same FR. It is only applicable to DAPS Handover in synchronous scenarios. The UE only includes this field if *semiStaticPowerSharingDAPS-Mode1-r16* is included. Otherwise, the UE does not include this field.- *interFreqDynamicPowersharingDAPS-r16* indicates the value of T offset (short or long) that the UE supports for dynamic UL power sharing during DAPS handover between source and target cells of same FR. The UE only include this field if *semiStaticPowerSharingDAPS-Mode1-r16* is included. Otherwise, the UE does not include this field.- *interFreqUL-TransCancellationDAPS-r16* indicates support of cancelling UL transmission to the source PCell for inter-frequency DAPS handover. | BC | No | N/A | N/A |
| ***intraBandFreqSeparationUL-AggBW-GapBW-r16***Indicates the UL frequency separation class between lower edge of lowest CC and upper edge of highest CC of Intra-band UL non-contiguous CA, i.e. including both the aggregated bandwidth and the gap bandwidth. 3 frequency separation classes are introduced and the values are defined in Table 5.3A.5-2 of TS 38.101-1 [2]. | BC | No | N/A | FR1 only |
| ***jointSearchSpaceSwitchAcrossCells-r16***Indicates whether the UE supports being configured with a group of cells and switching search space set group jointly over these cells. If the UE supports this feature, the UE needs to report *searchSpaceSwitchWithDCI-r16* or *searchSpaceSwitchWithoutDCI-r16*. | BC | No | N/A | N/A |
| ***maxCC-32-DL-HARQ-ProcessFR2-2-r17***Indicates the maximum number of component carriers that can be configured with 32 DL HARQ processes. Value n1 means 1 DL HARQ process, value n2 means 2 DL HARQ processes, and so on.UE supporting this feature shall indicate support of *support32-DL-HARQ-ProcessPerSCS-r17*. | BC | No | NA | NA |
| ***maxCC-32-UL-HARQ-ProcessFR2-2-r17***Indicates the maximum number of component carriers that can be configured with 32 UL HARQ processes. Value n1 means 1 UL HARQ process, value n2 means 2 UL HARQ processes, and so on.UE supporting this feature shall indicate support of *support32-UL-HARQ-ProcessPerSCS-r17*. | BC | No | NA | NA |
| ***maxUplinkDutyCycle-interBandCA-PC2-r17***Indicates the maximum average percentage of symbols during a certain evaluation period that can be scheduled for uplink transmission so as to ensure compliance with applicable electromagnetic energy absorption requirements provided by regulatory bodies. The average percentage of uplink symbols is specified in 6.2A.1.3 in TS 38101-1[2] and the capability applies to the CA combinations listed in table 6.2A.1.3-1 in TS 38101-1[2]. If the field is absent, UE shall work on power class 2 regardless of UL duty cycle and may use P-MPRc as defined in 6.2.4 in TS 38101-1[2] if necessary.Value n50 corresponds to 50%, value n60 corresponds to 60% and so on.NOTE: Specific targeted UL duty cycle percentage is not assumed if the field is absent. | BC | No | N/A | FR1 only |
| ***maxUplinkDutyCycle-SULcombination-PC2-r17***Indicates the maximum average percentage of symbols during a certain evaluation period that can be scheduled for uplink transmission so as to ensure compliance with applicable electromagnetic energy absorption requirements provided by regulatory bodies. The average percentage of uplink symbols is specified in 6.2C.1 in TS 38101-1[2] and the capability applies to all the SUL configurations with 1 SUL band + 1 TDD band.If the field is absent, UE shall work on power class 2 regardless of UL duty cycle and may use P-MPRc as defined in 6.2.4 in TS 38101-1[2] if necessary.Value n50 corresponds to 50%, value n60 corresponds to 60% and so on.NOTE: Specific targeted UL duty cycle percentage is not assumed if the field is absent. | BC | No | N/A | FR1 only |
| ***maxUpTo3Diff-NumerologiesConfigSinglePUCCH-grp-r16***Indicates the UE support of up to 3 different numerologies in the same PUCCH group where UE is not configured with two NR PUCCH groups by indicating one or multiple NR carrier types {FR1 licensed TDD (*fr1-NonSharedTDD-r16*), FR1 unlicensed TDD (*fr1-SharedTDD-r16*), FR1 licensed FDD (*fr1-NonSharedFDD-r16*), FR2(*fr2-r16*)} that can transmit the PUCCH for NR part of (NG)EN-DC, NE-DC and NR-CA.NOTE: When the carrier type of NUL is indicated for PUCCH transmission location, the SUL in the same cell as in the NUL can also be configured for PUCCH transmission. | BC | No | N/A | N/A |
| ***maxUpTo4Diff-NumerologiesConfigSinglePUCCH-grp-r16***Indicates the UE support of up to 4 different numerologies in the same PUCCH group where UE is not configured with two NR PUCCH groups by indicating one or multiple the NR carrier types {FR1 licensed TDD (*fr1-NonSharedTDD-r16*), FR1 unlicensed TDD (*fr1-SharedTDD-r16*), FR1 licensed FDD (*fr1-NonSharedFDD-r16*), FR2(*fr2-r16*)} that can transmit the PUCCH for NR part of (NG)EN-DC, NE-DC and NR-CA.NOTE: When the carrier type of NUL is indicated for PUCCH transmission location, the SUL in the same cell as in the NUL can also be configured for PUCCH transmission. | BC | No | N/A | N/A |
| ***mode1-ForType1-CodebookGeneration-r17***Indicates whether the UE supports type1-Codebook-Generation-Mode configured as mode 1, for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast on PUCCH or PUSCH.A UE supporting this feature shall also indicate support of *mode2-TDM-CodebookForMux-UnicastMulticastHARQ-ACK-r17*. | BC | No | N/A | N/A |
| ***mode2-TDM-CodebookForMux-UnicastMulticastHARQ-ACK-r17***Indicates whether the UE supports Mode 2 TDM-ed Type-1 and Type-2 HARQ-ACK codebook for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast, comprised of the following functional components:- Support of Mode 2 TDM-ed Type-1 HARQ-ACK codebook for multiplexing HARQ-ACK for unicast and ACK/NACK-based HARQ-ACK for multicast on PUCCH or PUSCH;- Support of Type-2 HARQ-ACK codebooks for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast on PUCCH or PUSCH with max number of G-RNTIs indicated in *maxNumberG-RNTI-HARQ-ACK-Codebook-r17*, which is not larger than max number of G-RNTIs indicated in *maxNumberG-RNTI-r17* or G-CS-RNTIs indicated in *maxNumberG-CS-RNTI-r17.*A UE supporting this feature shall also indicate support of *ack-NACK-FeedbackForMulticast-r17* or *nack-OnlyFeedbackForMulticast-r17* or *ack-NACK-FeedbackForSPS-Multicast-r17* or *nack-OnlyFeedbackForSPS-Multicast-r17*.NOTE 1: Mode 2 TDM-ed Type-1 HARQ-ACK codebook is generated based on the union TDRA tables from unicast and multicast and the union of k1 sets from unicast and multicast.NOTE 2: The Type-2 HARQ-ACK codebook is generated by concatenating the Type-2 sub-codebook for unicast and the Type-2 sub-codebook for multicast. | BC | No | N/A | N/A |
| ***msgA-SUL-r16***Indicates whether the UE supports MSGA transmission in a band combination including SUL. A UE supporting this feature shall also indicate support of *twoStepRACH-r16*. | BC | No | N/A | N/A |
| ***mTRP-CSI-EnhancementPerBC-r17***Indicates support of CSI enhancements for multi-TRP including support of NZP CSI-RS resource pairs used as CMR (channel measurement resource) pairs for NCJT measurement hypothesis with N=1.This feature also includes following parameters:- *maxNumNZP-CSI-RS-r17* indicates the maximum number of NZP CSI-RS resources in one CSI-RS resource set: Ks,max- *cSI-Report-mode-r17* indicates the CSI report mode selection. Mode indicates mode 1 with X=0, mode2 indicates mode 2, both indicate the support of both mode 1 with X=0 and mode 2.- A list of supported combinations, up to 16, across all CCs simultaneously, where each combination is- *maxNumTx-Ports-r17* indicates the maximum number of Tx ports in one NZP CSI-RS resource associated with an NCJT measurement hypothesis- *maxTotalNumCMR-r17* indicates the maximum total number of CMRs for NCJT measurement- *maxTotalNumTx-PortsNZP-CSI-RS-r17*: indicates the maximum total number of Tx ports of NZP CSI-RS resources associated with NCJT measurement hypotheses- *codebookMode-NCJT-r17* indicates the supported codebook modes for NCJT CSI. | BC | No | N/A | N/A |
| ***multiPUCCH-ConfigForMulticast-r17***Indicates whether the UE supports *PUCCH-ConfigurationList* for multicast HARQ-ACK feedback, separate from that of unicast configurations.A UE supporting this feature shall also indicate support of *singlePUCCH-ConfigForMulticast-r17* and *priorityIndicatorInDCI-Multicast-r17*. | BC | No | N/A | N/A |
| ***mux-HARQ-ACK-UnicastMulticast-r17***Indicates whether the UE supports multiplexing HARQ-ACK for unicast and for multicast with the same priority and different HARQ-ACK codebook types in a PUCCH or in a PUSCH.A UE supporting this feature shall also indicate support of *ack-NACK-FeedbackForMulticast-r17* or *nack-OnlyFeedbackForMulticast-r17* or *ack-NACK-FeedbackForSPS-Multicast-r17* or *nack-OnlyFeedbackForSPS-Multicast-r17*. | BC | No | N/A | N/A |
| ***nack-OnlyFeedbackForMulticast-r17***Indicates whether the UE supports NACK-only based HARQ-ACK feedback for multicast RRC-based enabling/disabling with ACK/NACK transforming, comprised of the following functional components:- Supports NACK-only based HARQ-ACK feedback and enabling/disabling NACK-only based HARQ-ACK feedback configured by RRC signalling for dynamic scheduling for multicast, including:- A single TB with NACK-only feedback transmitted in PUCCH- Multiple TB with NACK-only feedback transmitted in PUCCH by transforming into ACK/NACK bits- Supports shared PUCCH resource configurations with unicast;- Supports one or multiple TB with NACK-only feedback transmitted in PUSCH by transforming into ACK/NACK bits;- Supports One or multiple TB with NACK-only feedback transmitted in PUCCH by transforming into ACK/NACK bits when multiplexing with other UCI.A UE supporting this feature shall also indicate support of *ack-NACK-FeedbackForMulticast-r17*. | BC | No | N/A | N/A |
| ***nack-OnlyFeedbackForSPS-Multicast-r17***Indicates whether the UE supports RRC-based enabling/disabling NACK-only based feedback for SPS group-common PDSCH for multicast, comprised of the following functional components:- Support NACK-only based HARQ-ACK feedback, and support of enabling/disabling NACK-only based HARQ-ACK feedback configured by RRC signalling for SPS group-common PDSCH without PDCCH scheduling, including:- A single TB with NACK-only feedback transmitted in PUCCH- Multiple TBs with NACK-only feedback transmitted in PUCCH by transforming into ACK/NACK bits- Support of shared PUCCH resource configurations with unicast- One or multiple TB with NACK-only feedback transmitted in PUSCH by transforming into ACK/NACK bits- One or multiple TB with NACK-only feedback transmitted in PUCCH by transforming into ACK/NACK bits when multiplexing with other UCIA UE supporting this feature shall also indicate support of *ack-NACK-FeedbackForSPS-Multicast-r17*. | BC | No | N/A | N/A |
| ***nack-OnlyFeedbackSpecificResourceForMulticast-r17***Indicates whether the UE supports NACK-only based HARQ-ACK feedback for multicast corresponding to a specific sequence or a PUCCH transmission, comprised of the following functional components:- Supports NACK-only based HARQ-ACK feedback for dynamic scheduling for multicast, including:- Up to 4 TBs with NACK-only feedback transmitted in PUCCH by select one PUCCH resource- Supports separate PUCCH resource configurations from unicast;- Supports single TB with NACK-only feedback transmitted in PUCCH;- Supports up to 4TBs with NACK-only feedback transmitted in PUSCH by transforming into ACK/NACK bits.A UE supporting this feature shall also indicate support of *nack-OnlyFeedbackForMulticast-r17*. | BC | No | N/A | N/A |
| ***nack-OnlyFeedbackSpecificResourceForSPS-Multicast-r17***Indicates whether the UE supports NACK-only based HARQ-ACK feedback for multicast corresponding to a specific sequence or a PUCCH transmission for SPS group-common PDSCH for multicast, comprised of the following functional components:- Supports NACK-only based HARQ-ACK feedback for SPS PDSCH for multicast, including:- Up to 2TBs with NACK-only feedback transmitted in PUCCH by select one PUCCH resource- Supports separate *SPS-PUCCH-AN-List* from unicast;- Single TB with NACK-only feedback transmitted in PUCCH;- Up to 2TBs with NACK-only feedback transmitted in PUSCH by transforming into ACK/NACK bits.UE supporting this feature shall also indicate support of *nack-OnlyFeedbackForSPS-Multicast-r17*. | BC | No | N/A | N/A |
| ***non-AlignedFrameBoundaries-r17***Indicates whether UE supports carrier aggregation with non-aligned frame boundaries for PCell/PSCell and SCell configured with cross-carrier scheduling to PCell/PSCell (sSCell) in inter-band CA. The capability indicates the band pairs of the {PCell/PSCell SCS in kHz, sSCell SCS in kHz} combination which supports non-aligned frame boundary PCell/PSCell and SCell. The band-pair is encoded as a bitmap with size L \* (L – 1) / 2, and bit N (leftmost bit is indexed as bit 0) is set to "1" if the UE supports non-frame boundary for PCell/PSCell and SCell for the band pair (x, y), where L is the number of band entries in the band combination, x and y are the indices of the band entry in the band combination (the first band entry is indexed as 0), x < y, and N = x\*(2\*L – x – 1)/2 + y – x – 1.UE indicating support of this feature shall indicate support of *crossCarrierSchedulingSCell-SpCellTypeA-r17* and *crossCarrierSchedulingSCell-SpCellTypeB-r17*. | BC | No | N/A | FR1 only |
| ***parallelTxMsgA-SRS-PUCCH-PUSCH-r16***Indicates whether the UE supports parallel transmission of MsgA and SRS/ PUCCH/ PUSCH across CCs in an inter-band CA band combination. A UE supporting this feature shall also indicate support of *parallelTxPRACH-SRS-PUCCH-PUSCH*. | BC | No | N/A | N/A |
| ***parallelTxMsgA-SRS-PUCCH-PUSCH-intraBand-r17***Indicates whether the UE supports parallel transmission of MsgA and SRS/ PUCCH/ PUSCH across CCs in an intra-band non-contiguous CA band combination. The UE indicating support of this field shall also indicate support of *parallelTxMsgA-SRS-PUCCH-PUSCH-r16* and *parallelTxPRACH-SRS-PUCCH-PUSCH-intraBand-r17*. | BC | No | N/A | N/A |
| ***parallelTxSRS-PUCCH-PUSCH***Indicates whether the UE supports parallel transmission of SRS and PUCCH/ PUSCH across CCs in an inter-band CA band combination. | BC | No | N/A | N/A |
| ***parallelTxSRS-PUCCH-PUSCH-intraBand-r17***Indicates whether the UE supports parallel transmission of SRS and PUCCH/ PUSCH across CCs in an intra-band non-contiguous CA band combination. | BC | No | N/A | N/A |
| ***parallelTxPRACH-SRS-PUCCH-PUSCH***Indicates whether the UE supports parallel transmission of PRACH and SRS/PUCCH/PUSCH across CCs in an inter-band CA band combination. | BC | No | N/A | N/A |
| ***parallelTxPRACH-SRS-PUCCH-PUSCH-intraBand-r17***Indicates whether the UE supports parallel transmission of PRACH and SRS/PUCCH/PUSCH across CCs in an intra-band non-contiguous CA band combination. | BC | No | N/A | N/A |
| ***parallelTxPUCCH-PUSCH-r17***Indicates whether the UE supports simultaneous PUCCH and PUSCH transmissions of different priority on different cells for inter-band CA. | BC | No | N/A | N/A |
| ***parallelTxPUCCH-PUSCH-SamePriority-r17***Indicates whether the UE supports simultaneous PUCCH and PUSCH transmissions of same priority on different cells in different bands for inter-band CA as specified in section 9 of TS 38.213 [11]. | BC | No | N/A | N/A |
| ***pdcch-BlindDetectionCA-Mixed-r16, pdcch-BlindDetectionCA-Mixed-v16a0***This field indicates mixed operation of two variants of the number of blind detections in case of CA. UE indicating support of this feature shall also indicate support of *pdcch-MonitoringMixed-r16*. UE indicating support of *pdcch-BlindDetectionCA-Mixed-v16a0* shall also indicate support of *pdcch-MonitoringMixed-r16*.Only one between *pdcch-BlindDetectionCA-Mixed-r16* and *pdcch-BlindDetectionCA-Mixed-NonAlignedSpan-r16* can be reported by UE. | BC | No | N/A | N/A |
| ***pdcch-BlindDetectionCA-Mixed-NonAlignedSpan-r16, pdcch-BlindDetectionCA-Mixed-NonAlignedSpan-v16a0***This field indicates mixed operation of two variants of the number of blind detections in case of CA when the UE supports aligned span and non-aligned span. In the case of non-aligned span, when the configured number of CCs 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. UE indicating support of this feature shall also indicate support of *pdcch-MonitoringMixed-r16*. 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.UE indicating support of *pdcch-BlindDetectionCA-Mixed-NonAlignedSpan-v16a0* shall also indicate support of *pdcch-BlindDetectionCA-Mixed-NonAlignedSpan-r16*. Only one between *pdcch-BlindDetectionCA-Mixed-r16* and *pdcch-BlindDetectionCA-Mixed-NonAlignedSpan-r16* can be reported by UE. | BC | No | N/A | N/A |
| ***pdcch-BlindDetectionMCG-UE-r16, pdcch-BlindDetectionSCG-UE-r16***This field indicates the number of blind detections supported for MCG and SCG, respectively as specified in clause 10 in TS 38.213 [11] for the NR-DC. UE shall report the fields for MCG and for SCG together if supported.If a UE supports *pdcch-MonitoringCA-r16* or *pdcch-MonitoringCA-NonAlighedSpan-r16*, then the capability defined by *pdcch-MonitoringCA-r16* or *pdcch-MonitoringCA-NonAlighedSpan-r16* is applied to the feature as defined in clause 10 in TS 38.213 [11]. | BC | No | N/A | N/A |
| ***pdcch-BlindDetectionMCG-SCG-List-r17***Indicates the supported combinations of the capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs for MCG and for SCG (i.e. *pdcch-BlindDetectionMCG-UE-r17* and *pdcch-BlindDetectionSCG-UE-r17*) when configured for NR-DC operation with Rel-17 PDCCH monitoring capability on all the serving cells.UE indicating support of this feature shall also indicate support of *dl-FR2-2-SCS-480kHz-r17* or *dl-FR2-2-SCS-960kHz-r17.*NOTE: If the UE reports *pdcch-MonitoringCA-r17*,- Candidate values for pdcch-BlindDetectionMCG-UE-r17 is 1 to *pdcch-MonitoringCA-r17*-1- Candidate values for pdcch-BlindDetectionSCG-UE-r17 is 1 *pdcch-MonitoringCA-r17*-1- *pdcch-BlindDetectionMCG-UE-r17* + *pdcch-BlindDetectionSCG-UE-r17* >= *pdcch-MonitoringCA-r17*Otherwise, the value of *pdcch-BlindDetectionMCG-UE-r17* or of*pdcchBlindDetectionSCG-UE-r17* is {1, 2, 3} | BC | No | N/A | N/A |
| ***pdcch-BlindDetectionMCG-UE-Mixed-r16, pdcch-BlindDetectionSCG-UE-Mixed-r16, pdcch-BlindDetectionMCG-UE-Mixed-v16a0, pdcch-BlindDetectionSCG-UE-Mixed-v16a0***This field indicates mixed operation of two variants of the number of blind detections supported for MCG and SCG, respectively. UE shall report the fields for MCG and for SCG together if supported. UE indicating support of *pdcch-BlindDetectionMCG-UE-Mixed-v16a0* and *pdcch-BlindDetectionSCG-UE-Mixed-v16a0* shall also indicate support of *pdcch-BlindDetectionMCG-UE-Mixed-r16* and *pdcch-BlindDetectionSCG-UE-Mixed-r16*.If a UE supports *pdcch-BlindDetectionCA-Mixed*or *pdcch-BlindDetectionCA-Mixed-NonAlignedSpan*, then the capability defined by *pdcch-BlindDetectionCA-Mixed*or *pdcch-BlindDetectionCA-Mixed-NonAlignedSpan* is applied to the combination of *pdcch-BlindDetectionMCG-UE-Mixed and pdcch-BlindDetectionSCG-UE-Mixed* correspondingly as defined in clause 10 in TS 38.213 [11]. | BC | No | N/A | N/A |
| ***pdcch-BlindDetectionMixedList1-r17***Indicates the supported combinations of the number of carriers for CCE/BD scaling for MCG and for SCG when configured for NR-DC operation and/or with DL CA with mix of Rel. 15 and Rel. 17 PDCCH monitoring capabilities on different carriers.UE indicating support of this feature shall also indicate support of *dl-FR2-2-SCS-480kHz-r17* or *dl-FR2-2-SCS-960kHz-r17*.NOTE 1: For DL CA combinations, the range of *pdcch-BlindDetectionCA1-r17* (for Rel-15) + *pdcch-BlindDetectionCA2-r17* (for Rel-17) is {4, …,16}.NOTE 2: For NR-DC operation:If the UE reports *pdcch-BlindDetectionCA1-r17* (for Rel-15),- Candidate values for *pdcch-BlindDetectionMCG-UE1* (for Rel-15) are 0 to *pdcch-BlindDetectionCA1-r17* (for Rel-15)- Candidate values for *pdcch-BlindDetectionSCG-UE1* (for Rel-15) are 0 to *pdcch-BlindDetectionCA1-r17* (for Rel-15)- *pdcch-BlindDetectionMCG-UE1* (for Rel-15) + *pdcch-BlindDetectionSCG-UE1* (for Rel-15) >= *pdcch-BlindDetectionCA1-r17* (for Rel-15),Otherwise,- Candidate values for *pdcch-BlindDetectionMCG-UE1* (for Rel-15) are {0, 1, 2, 3}- Candidate values for *pdcch-BlindDetectionSCG-UE1* (for Rel-15) are {0, 1, 2, 3}If the UE reports *pdcch-BlindDetectionCA2-r17* (for Rel-17),- Candidate values for *pdcch-BlindDetectionMCG-UE2* (for Rel-17) are 0 to *pdcch-BlindDetectionCA2-r17* (for Rel-17)- Candidate values for *pdcch-BlindDetectionSCG-UE2* (for Rel-17) are 0 to *pdcch-BlindDetectionCA2-r17* (for Rel-17)- *pdcch-BlindDetectionMCG-UE2* (for Rel-17) + *pdcch-BlindDetectionSCG-UE2* (for Rel-17) >= *pdcch-BlindDetectionCA2-r17* (for Rel-17),Otherwise,- Candidate values for *pdcch-BlindDetectionMCG-UE2* (for Rel-17) are {0, 1, 2, 3}- Candidate values for *pdcch-BlindDetectionSCG-UE2* (for Rel-17) are {0, 1, 2, 3} | BC | No | N/A | N/A |
| ***pdcch-BlindDetectionMixedList2-r17***Indicates the supported combinations of the number of carriers for CCE/BD scaling for MCG and for SCG when configured for NR-DC operation and/or with DL CA with mix of Rel. 16 and Rel. 17 PDCCH monitoring capabilities on different carriers.UE indicating support of this feature shall also indicate support of *dl-FR2-2-SCS-480kHz-r17* or *dl-FR2-2-SCS-960kHz-r17*NOTE 1: For DL CA combinations, the range of *pdcch-BlindDetectionCA1-r17* (for Rel-16) + *pdcch-BlindDetectionCA2-r17* (for Rel-17) is {3, …,16}NOTE 2: For NR-DC operation:If the UE reports *pdcch-BlindDetectionCA1-r17* (for Rel-16),- Candidate values for *pdcch-BlindDetectionMCG-UE1* (for Rel-16) are 0 to *pdcch-BlindDetectionCA1-r17* (for Rel-16)- Candidate values for *pdcch-BlindDetectionSCG-UE1* (for Rel-16) are 0 to *pdcch-BlindDetectionCA1-r17* (for Rel-16)- *pdcch-BlindDetectionMCG-UE1* (for Rel-16) + *pdcch-BlindDetectionSCG-UE1* (for Rel-16) >= *pdcch-BlindDetectionCA1-r17* (for Rel-16),Otherwise,- Candidate values for *pdcch-BlindDetectionMCG-UE1* (for Rel-16) are {0, 1}- Candidate values for *pdcch-BlindDetectionSCG-UE1* (for Rel-16) are {0, 1}If the UE reports *pdcch-BlindDetectionCA2-r17* (for Rel-17),- Candidate values for *pdcch-BlindDetectionMCG-UE2* (for Rel-17) are 0 to *pdcch-BlindDetectionCA2-r17* (for Rel-17)- Candidate values for *pdcch-BlindDetectionSCG-UE2* (for Rel-17) are 0 to *pdcch-BlindDetectionCA2-r17* (for Rel-17)- *pdcch-BlindDetectionMCG-UE2* (for Rel-17) + *pdcch-BlindDetectionSCG-UE2* (for Rel-17) >= *pdcch-BlindDetectionCA2-r17* (for Rel-17),Otherwise,- Candidate values for *pdcch-BlindDetectionMCG-UE2* (for Rel-17) are {0, 1, 2}- Candidate values for *pdcch-BlindDetectionSCG-UE2* (for Rel-17) are {0, 1, 2} | BC | No | N/A | N/A |
| ***pdcch-BlindDetectionMixedList3-r17***Indicates the supported combinations of the number of carriers for CCE/BD scaling for MCG and for SCG when configured for NR-DC operation and/or with DL CA with mix of Rel. 15, Rel. 16 and Rel. 17 PDCCH monitoring capabilities on different carriers.UE indicating support of this feature shall also indicate support of *dl-FR2-2-SCS-480kHz-r17* or *dl-FR2-2-SCS-960kHz-r17*NOTE 1: For DL CA combinations, the range of *pdcch-BlindDetectionCA1-r17* (for Rel-15) plus *pdcch-BlindDetectionCA2-r17* (for Rel-16) + *pdcch-BlindDetectionCA3-r17* (for Rel-17) is {3, …,16}.NOTE 2: For NR-DC operation:If the UE reports *pdcch-BlindDetectionCA1-r17* (for Rel-15),- Candidate values for *pdcch-BlindDetectionMCG-UE1* (for Rel-15) are 0 to *pdcch-BlindDetectionCA1-r17* (for Rel-15)- Candidate values for *pdcch-BlindDetectionSCG-UE1* (for Rel-15) are 0 to *pdcch-BlindDetectionCA1-r17* (for Rel-15)- *pdcch-BlindDetectionMCG-UE1* (for Rel-15) + *pdcch-BlindDetectionSCG-UE1* (for Rel-15) >= *pdcch-BlindDetectionCA1-r17* (for Rel-15),Otherwise,- Candidate values for *pdcch-BlindDetectionMCG-UE1* (for Rel-15) are {0, 1}- Candidate values for *pdcch-BlindDetectionSCG-UE1* (for Rel-15) are {0, 1}If the UE reports *pdcch-BlindDetectionCA2-r17* (for Rel-16),- Candidate values for *pdcch-BlindDetectionMCG-UE2* (for Rel-16) are 0 to *pdcch-BlindDetectionCA2-r17* (for Rel-16)- Candidate values for *pdcch-BlindDetectionSCG-UE2* (for Rel-16) are 0 to *pdcch-BlindDetectionCA2-r17* (for Rel-16)- *pdcch-BlindDetectionMCG-UE2* (for Rel-16) + *pdcch-BlindDetectionSCG-UE2* (for Rel-16) >= *pdcch-BlindDetectionCA2-r17* (for Rel-16),Otherwise,- Candidate values for *pdcch-BlindDetectionMCG-UE2* (for Rel-16) are {0, 1}- Candidate values for *pdcch-BlindDetectionSCG-UE2* (for Rel-16) are {0, 1}If the UE reports *pdcch-BlindDetectionCA3-r17* (for Rel-17),- Candidate values for *pdcch-BlindDetectionMCG-UE3* (for Rel-17) are 0 to *pdcch-BlindDetectionCA3-r17* (for Rel-17)- Candidate values for *pdcch-BlindDetectionSCG-UE2* (for Rel-17) are 0 to *pdcch-BlindDetectionCA3-r17* (for Rel-17)- *pdcch-BlindDetectionMCG-UE3* (for Rel-17) + *pdcch-BlindDetectionSCG-UE3* (for Rel-17) >= *pdcch-BlindDetectionCA3-r17* (for Rel-17),Otherwise,- Candidate values for *pdcch-BlindDetectionMCG-UE3* (for Rel-17) are {0, 1}- Candidate values for *pdcch-BlindDetectionSCG-UE3* (for Rel-17) are {0, 1} | BC | No | N/A | N/A |
| ***pdcch-MonitoringCA-r16***Indicates the number of CCs for monitoring a maximum number of blind detections and non-overlapped CCEs per span when configured with DL CA with Rel-16 PDCCH monitoring capability on all the serving cells. This field also indicates supported span arrangement for CA. UE indicating support of this feature shall also indicate support of *pdcch-Monitoring-r16.* Only one between *pdcch-MonitoringCA-r16* and *pdcch-MonitoringCA-NonAlignedSpan-r16* can be reported by UE. | BC | No | N/A | N/A |
| ***pdcch-MonitoringCA-r17***Indicates the number of CCs for monitoring a maximum number of blind detections and non-overlapped CCEs per span when configured with DL CA with Rel-17 PDCCH monitoring capability on all the serving cells.UE indicating support of this feature shall also indicate support of *dl-FR2-2-SCS-480kHz-r17* or *dl-FR2-2-SCS-960kHz-r17.* | BC | No | N/A | N/A |
| ***pdcch-MonitoringCA-NonAlignedSpan-r16***Indicates the number of CCs for monitoring a maximum number of blind detections and non-overlapped CCEs per span when configured with DL CA with Rel-16 PDCCH monitoring capability on all the serving cells in the case UE supports aligned span and non-aligned span. In the case of non-aligned span, when the configured number of CCs with Rel-16 PDCCH monitoring is larger than the UE reported value and PDCCH monitoring occasion(s) should be configured only on same symbol(s) every slot. UE indicating support of this feature shall also indicate support of *pdcch-Monitoring-r16*. Only one between *pdcch-MonitoringCA-r16* and *pdcch-MonitoringCA-NonAlignedSpan-r16* can be reported by UE. | BC | No | N/A | N/A |
| ***prioSCellPRACH-OverSP-PeriodicSRS-Support-r17***Indicates whether the UE supports RRC configuration *prioSCellPRACH-OverSP-PeriodicSRS* as specified in TS 38.331 [9]. | BC | No | N/A | N/A |
| ***ptp-Retx-Multicast-r17***Indicates whether the UE supports PTP retransmission for multicast on the same cell as multicast initial transmission.A UE supporting this feature shall also indicate support of *ack-NACK-FeedbackForMulticast-r17*. | BC | No | N/A | N/A |
| ***ptp-Retx-SPS-Multicast-r17***Indicates whether the UE supports PTP retransmission associated with CS-RNTI for SPS multicast on the cell same as multicast initial transmission.A UE supporting this feature shall also indicate support of *ack-NACK-FeedbackForSPS-Multicast-r17*. | BC | No | N/A | N/A |
| ***pucch-ConfigForSPS-Multicast-r17***Indicates whether the UE supports *SPS-PUCCH-AN-List* for multicast HARQ-ACK feedback of all multicast SPS configuration(s), separate from that of SPS unicast configurations.A UE supporting this feature shall also indicate support of *ack-NACK-FeedbackForSPS-Multicast-r17*. | BC | No | N/A | N/A |
| ***scellDormancyWithinActiveTime-r16***Indicates whether the UE supports SCell dormancy indication received on SPCell with DCI format 0\_1/1\_1 sent within the active time as defined in clause 10.3 of TS 38.213 [11]. If the UE indicates the support of this, the UE supports one dormant BWP and at least one non-dormant BWP per carrier. To support more than one non-dormant BWP in a carrier, the UE indicates support of *upto4* in *bwp-SameNumerology* or *upto4* in *bwp-DiffNumerology*. One dormant BWP and one non-dormant BWP are UE specific BWPs even for UEs not supporting *bwp-SameNumerology.* | BC | No | N/A | N/A |
| ***scellDormancyOutsideActiveTime-r16***Indicates whether the UE supports SCell dormancy indication received on SPCell using DCI format 2\_6 sent outside the active time as defined in clause 10.3 of TS 38.213 [11]. A UE supporting this feature shall also indicate support of power saving DRX adaptation using *drx-Adaptation-r16* and shall also support one dormant BWP and at least one non-dormant BWP per carrier. To support more than one non-dormant BWP in a carrier, the UE indicates support of *upto4* in *bwp-SameNumerology* or *upto4* in *bwp-DiffNumerology*. One dormant BWP and one non-dormant BWP are UE specific BWPs even for UEs not supporting *bwp-SameNumerology.* | BC | No | N/A | N/A |
| ***semiStaticPUCCH-CellSwitchSingleGroup-r17***Indicates whether the UE supports semi-static PUCCH cell switching for a single PUCCH group only. The capability signalling comprises the following parameters:- *pucch-Group-r17* indicates for which PUCCH group the UE supports semi-static PUCCH cell switching using configured time-domain domain pattern of applicable PUCCH cell / carrier. Value *primaryGroupOnly* indicates that only primary PUCCH group can support PUCCH cell switch, value *secondaryGroupOnly* indicates that only secondary PUCCH group can support PUCCH cell switch, and value *eitherPrimaryOrSecondaryGroup* indicates that either primary or secondary PUCCH group can support PUCCH cell switch.- *pucch-Group-Config-r17* indicates one or multiple of supported carrier type pairs that can support PUCCH cell switch, with *fr1-FR1-NonSharedTDD-r17* indicating the carrier type pair (FR1 licensed TDD, FR1 licensed TDD), *fr2-FR2-NonSharedTDD-r17* indicating the carrier type pair (FR2 licensed TDD, FR2 licensed TDD), and *fr1-FR2-NonSharedTDD-r17* indicating the carrier type pair (FR1 licensed TDD, FR2 licensed TDD).NOTE: This feature applies to cells in the same TAG only. If UE supporting this FG also supports both *diffNumerologyWithinPUCCH-GroupSmallerSCS* and *diffNumerologyWithinPUCCH-GroupLargerSCS* or both *diffNumerologyWithinPUCCH-GroupSmallerSCS-CarrierTypes-r16* and *diffNumerologyWithinPUCCH-GroupLargerSCS-CarrierTypes-r16* or *maxUpTo3Diff-NumerologiesConfigSinglePUCCH-grp-r16* or *maxUpTo4Diff-NumerologiesConfigSinglePUCCH-grp-r16* when UE is not configured with two NR PUCCH groups, the UE supports the cases of both same and different numerologies between switchable cells. Otherwise, the UE supports the case of same numerology between switchable cells. | BC | No | TDD only | N/A |
| ***semiStaticPUCCH-CellSwitchTwoGroups-r17***Indicates whether the UE supports semi-static PUCCH cell switching for two PUCCH groups using configured time-domain domain pattern of applicable PUCCH cell / carrier. The capability indicates one or multiple of supported configuration(s) of {primary PUCCH group config, secondary PUCCH group config}. The capability signalling of each primary or secondary PUCCH group configuration indicates one or multiple of carrier type pairs that can support PUCCH cell switch, with *fr1-FR1-NonSharedTDD-r17* indicating the carrier type pair (FR1 licensed TDD, FR1 licensed TDD), *fr2-FR2-NonSharedTDD-r17* indicating the carrier type pair (FR2 licensed TDD, FR2 licensed TDD), and *fr1-FR2-NonSharedTDD-r17* indicating the carrier type pair (FR1 licensed TDD, FR2 licensed TDD).NOTE: This feature applies to cells in the same TAG only. If UE supporting this FG also supports both *diffNumerologyWithinPUCCH-GroupSmallerSCS* and *diffNumerologyWithinPUCCH-GroupLargerSCS* or both *diffNumerologyWithinPUCCH-GroupSmallerSCS-CarrierTypes-r16* and *diffNumerologyWithinPUCCH-GroupLargerSCS-CarrierTypes-r16*, the UE supports the cases of both same and different numerologies between switchable cells. Otherwise, the UE supports the case of same numerology between switchable cells. | BC | No | TDD only | N/A |
| ***simultaneousCSI-ReportsAllCC***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-ReportsAllCC* includes the beam report and CSI report. This parameter may further limit *simultaneousCSI-ReportsPerCC* in *MIMO-ParametersPerBand* and *Phy-ParametersFRX-Diff* for each band in a given band combination. | BC | Yes | N/A | N/A |
| ***simul-SRS-Trans-BC-r16***Indicates the number of SRS resources for positioning on a symbol for a given band combination. The UE can include this field only if the UE supports *srs-PosResources-r16*. Otherwise, the UE does not include this field;NOTE 1: For single-band band combinations, it defines the capability for intra-band CA, and for band combinations with at least two bands, it defines the capability for inter-band carrier aggregation.NOTE 2: if the UE does not indicate this capability for a band combination, the UE does not support the feature in this band combination. | BC | No | N/A | N/A |
| ***simul-SRS-MIMO-Trans-BC-r16***Indicates the number of SRS resources for positioning and SRS resource for MIMO on a symbol for a given BC. The UE can include this field only if the UE supports *srs-PosResources-r16*. Otherwise, the UE does not include this field.NOTE 1: If UE reports 2 for the candidate value, it means both the number of SRS resource for positioning and SRS resource for MIMO equals to 1.NOTE 2: For single-band band combinations, it defines the capability for intra-band carrier aggregation, and for band combinations with at least two bands, it defines the capability for inter-band carrier aggregation.NOTE 3: if the UE does not indicate this capability for a band combination, the UE does not support the feature in this band combination. | BC | No | N/A | N/A |
| ***simulTX-SRS-AntSwitchingInterBandUL-CA-r16***Indicates whether the UE support simultaneous transmission of SRS on different CCs for inter-band UL CA. The UE indicating support of this feature shall include at least one of the following capabilities:- *supportSRS-xTyR-xLessThanY-r16* indicates support transmission of SRS for xTyR (x<y) based antenna switching and SRS for CB/NCB/BM on different CCs in overlapped symbol(s) for inter-band UL CA.- *supportSRS-xTyR-xEqualToY-r16* indicates support transmission of SRS for xTyR (x=y) based antenna switching and SRS for CB/NCB/BM on different CCs in overlapped symbol(s) for inter-band UL CA.- *supportSRS-AntennaSwitching-r16* Indicates whether the UE support simultaneous transmission of SRS for antenna switching on different CCs in overlapped symbol(s) for inter-band UL CA.NOTE: For simultaneously antenna switching and antenna switching SRS in inter-band CAs with bands whose UL are switched together according to the reported *supportSRS-AntennaSwitching-r16*, the UE expects the same configuration of xTyR across the different CCs and the SRS resources overlapped in time domain from UE perspective are from the same UE antenna ports. | BC | No | N/A | N/A |
| ***simultaneousRxTxInterBandCA***Indicates whether the UE supports simultaneous transmission and reception in TDD-TDD and TDD-FDD inter-band NR CA. If this field is included in *ca-ParametersNR-ForDC*, it indicates the UE supports simultaneous transmission and reception between any UL/DL band pair within a cell group and across MCG and SCG in TDD-TDD and TDD-FDD inter-band NR-DC. It is mandatory for certain TDD-FDD and TDD-TDD band combinations defined in TS 38.101-1 [2], TS 38.101-2 [3] and TS 38.101-3 [4]. | BC | CY | N/A | N/A |
| ***simultaneousRxTxInterBandCAPerBandPair***Indicates whether the UE supports simultaneous transmission and reception in TDD-TDD and TDD-FDD inter-band NR CA for each band pair in the band combination.Encoded as a bitmap with size L \* (L – 1) / 2, and bit N (leftmost bit is indexed as bit 0) is set to "1" if the UE supports simultaneous transmission and reception for band pair (x, y), where L is the number of band entries in the band combination, x and y are the indices of the band entry in the band combination (the first band entry is indexed as 0), x < y, and N = x\*(2\*L – x – 1)/2 + y – x – 1.If this field is included in *ca-ParametersNR-ForDC*, each bit of this field indicates whether the UE supports simultaneous transmission and reception between each band pair, within a cell group and across MCG and SCG in TDD-TDD and TDD-FDD inter-band NR-DC.The UE does not include this field if the UE supports simultaneous transmission and reception for all applicable band pairs in the band combination (in which case *simultaneousRxTxInterBandCA* is included) or does not support for any band pair in the band combination. It is mandatory for certain band pairs as specified in TS 38.101-1 [2], TS 38.101-2 [3] and TS 38.101-3 [4]. The UE shall consistently set the bits which correspond to the same band pair. | BC | CY | N/A | N/A |
| ***simultaneousRxTxSUL***Indicates whether the UE supports simultaneous reception and transmission for a NR band combination including SUL. Mandatory/Optional support depends on band combination and captured in TS 38.101-1 [2]. | BC | CY | N/A | N/A |
| ***simultaneousRxTxSULPerBandPair***Indicates whether the UE supports simultaneous reception and transmission for a NR band combination including SUL for each band pair in the band combination.Encoded in the same manner as *simultaneousRxTxInterBandCAPerBandPair*.The UE does not include this field if the UE supports simultaneous transmission and reception for all applicable band pairs in the band combination (in which case *simultaneousRxTxSUL* is included) or does not support for any band pair in the band combination. It is mandatory for certain band pairs as specified in TS 38.101-1 [2]. The UE shall consistently set the bits which correspond to the same band pair. | BC | CY | N/A | N/A |
| ***simultaneousSRS-AssocCSI-RS-AllCC***Indicates support of CSI-RS processing framework for SRS and the number of SRS resources that the UE can process simultaneously across all CCs, and across MCG and SCG in case of NR-DC, including periodic, aperiodic and semi-persistent SRS. This parameter may further limit *simultaneousSRS-AssocCSI-RS-PerCC* in *MIMO-ParametersPerBand* and *Phy-ParametersFRX-Diff* for each band in a given band combination. | BC | No | N/A | N/A |
| ***singlePUCCH-ConfigForMulticast-r17***Indicates whether the UE supports a *PUCCH-Config* for multicast HARQ-ACK feedback, separate from that of unicast configurations.A UE supporting this feature shall also indicate support of *ack-NACK-FeedbackForMulticast-r17* or *nack-OnlyFeedbackForMulticast-r17*.NOTE: With *ack-NACK-FeedbackForMulticast-r17* or *nack-OnlyFeedbackForMulticast-r17* as prerequisite, this feature includes the case of ACK/NACK for multicast or NACK-only mode1 for multicast. | BC | No | N/A | N/A |
| ***stayOnTargetCC-SRS-CarrierSwitch-r17***Indicates whether the UE supports staying on the target CC when remaining SRS resource set(s) for SRS carrier switching exists. UE indicating support of this feature shall indicate support of *srs-CarrierSwitch*.NOTE 1: When UE supports this capability, if the time period between the SRS resource sets is smaller than the total required RF switching time to the source CC and back to the target CC and a higher priority UL transmission and/or DL reception is not scheduled on the source CC in the time period between the two SRS resources sets, the UE stays in the target CC in the period between the SRS resource sets; otherwise, the UE switches back to the source CC after transmitting each SRS resource set.NOTE 2: If the UE does not indicate this capability, the UE switches back to source CC between the SRS resource sets. | BC | No | N/A | N/A |
| ***supportedCSI-RS-ResourceListAlt-r16***Indicates the list of supported CSI-RS resources across all bands in a band combination by referring to *codebookVariantsList*. 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.For each band in a band combination, supported values for these three parameters are determined in conjunction with *supportedCSI-RS-ResourceListAlt* reported in *MIMO-ParametersPerBand*. | BC | No | N/A | N/A |
| ***supportedNumberTAG***Defines the number of timing advance groups supported by the UE. It is applied to NR CA, NR-DC, (NG)EN-DC/NE-DC and DAPS handover. For (NG)EN-DC/NE-DC, it indicates number of TAGs only for NR CG. The number of TAGs for the LTE MCG is signalled by existing LTE TAG capability signalling. For NR CA/NR-DC band combination, if the band combination comprised of more than one band entry (i.e., inter-band or intra-band non-contiguous band combination), it indicates that different timing advances on different band entries are supported. If absent, the UE supports only one TAG for the NR part. It is mandatory for the UE to support more than one TAG for NR-DC and it is mandatory for the UE to support 2 TAGs for inter-frequency DAPS. For the mixed inter-band and intra-band NR CA/NR-DC band combination, if the network configures more non-contiguous UL serving cells than the number of supported TAG, the UE only supports the configuration where all UL CCs of the same frequency band are configured with the same Timing Advance Group ID. | BC | CY | N/A | N/A |
| ***twoPUCCH-Grp-ConfigurationsList-r16***Indicates one or multiple of supported configuration(s) of {primary PUCCH group config, secondary PUCCH group config} for the band combination where for each of the supported configuration the carrier type(s) (FR1-NonSharedTDD, FR1-SharedTDD, FR1-NonSharedFDD, FR2) that can be mapped to a PUCCH group and also the carrier types that can be configured with PUCCH transmission for primary PUCCH group and secondary PUCCH group for NR-CA band combination with 3 or more bands. The capability signalling of each primary or secondary PUCCH group configuration comprises of the following parameters:- *pucch-GroupMapping-r16* indicates the PUCCH group(s) that a carrier type can be mapped to.- pucch-TX-r16 indicates the PUCCH group(s) that a carrier type can be configured for PUCCH transmissionNOTE 1: For a band combination with SUL, the SUL band is counted as one of the bands.NOTE 2: For a band combination with SDL, the SDL band is counted as one of the bands. SDL is indicated as 'FR1-NonSharedFDD' carrier type. Per UE capabilities that are TDD only are not applicable to SDL.NOTE 3: When the carrier type of NUL is indicated for PUCCH transmission location, the SUL in the same cell as in the NUL can also be configured for PUCCH transmission.NOTE 4: When the carrier type of NUL is indicated for one PUCCH group config, the SUL in the same cell as in the NUL can also be configured for the PUCCH group.NOTE 5: If UE indicating this field does not support *diffNumerologyAcrossPUCCH-Group-CarrierTypes-r16*, the UE can only be configured with the same SCS across NR PUCCH groups. | BC | No | N/A | N/A |
| ***uplinkTxDC-TwoCarrierReport-r16***Indicates whether the UE supports the uplink Tx Direct Current subcarrier location(s) reporting when configured with uplink CA with two carriers.It is applicable only for (NG)EN-DC/NE-DC and NR CA where the NR has intra-band uplink CA with two uplink carriers. | BC | No | N/A | N/A |