**3GPP TSG-RAN WG2 Meeting #118-e *R2-2206441***

 **Online, 09 May – 20 May 2022**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **38.306** | **CR** | **0736** | **rev** | **1** | **Current version:** | **16.8.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:***  | Clarification on *configuredUL-GrantType1*-v1650 |
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| ***Source to WG:*** | Qualcomm Incorporated |
| ***Source to TSG:*** | RAN2 |
|  |  |
| ***Work item code:*** | NR\_newRAT-Core |  | ***Date:*** | 2022-05-09 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-16 |
|  | *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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | In RAN2#114e, a new capability was introduced (*configuredUL-GrantType1-v1650*) as an enhancement for the existing one (*configuredUL-GrantType1*) as it provides the flexibility for the UE to advertise the support of this feature at a higher granularity level (per band). There are multiple IEs (features), that can only be supported if the *configuredUL-GrantType1* is supported by the UE, e.g.:***activeConfiguredGrant-r16*** Indicates whether the UE supports up to 12 configured/active configured grant configurations in a BWP of a serving cell. This field includes the following parameters: - maxNumberConfigsPerBWP-r16 indicates the maximum number of configured/active configured grant configurations in a BWP of a serving cell. - maxNumberConfigsAllCC-r16 indicates the maximum number of configured/active configured grant configurations across all serving cells in a MAC entity, and across MCG and SCG in case of NR-DC. The UE can include this feature only if the UE indicates supports of either configuredUL-GrantType1 or configuredUL-GrantType2But since, *configuredUL-GrantType1-v1650* is an enhanced version of the *configuredUL-GrantType1*, only one of these IE can be included by the UE:***configuredUL-GrantType1-v1650*** Indicates whether the UE supports Type 1 PUSCH transmissions with configured grant as specified in TS 38.214 [12] with UL-TWG-repK value of one. This applies only to non-shared spectrum channel access. For shared spectrum channel access, configuredUL-GrantType1-r16 applies. UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively. The UE only includes configuredUL-GrantType1-v1650 if configuredUL-GrantType1 is absentTherefore, a clarification is needed to ensure all IEs that their support is dependent on *configuredUL-GrantType1* can still be supported by the UE if *configuredUL-GrantType1-v1650* is supported.  The same clarifiation is also needed for *configuredUL-GrantType2-v1650*.  |
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| ***Summary of change:*** | The description of the following IEs were modified, to allow UE to signal the capability for them if v1650 version capability of *configuredUL-GrantType1* and/or *configuredUL-GrantType2* are supported:* *activeConfiguredGrant-r16*
* *extCP-rangeCG-PUSCH-r16*
* *configuredGrantWithReTx-r16*
* *cg-resourceConfig-r16*
* *extendedCG-Periodicities-r16*
* *type2-CG-ReleaseDCI-0-1-r16*
* *type2-CG-ReleaseDCI-0-2-r16*

In addition, clarifying the table in section-6 to conditionally mandate Rel-15 only UL skipping feature if CG is supported. |
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| ***Consequences if not approved:*** | UE will not be able to signal some of the capabilities that it supports related to Configured Grants. |
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| ***Clauses affected:*** | 4.2.7.2, 4.2.7.2a, 4.2.7.10, 6 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **x** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

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| Start of first change |

4.2.7.2 *BandNR parameters*

| **Definitions for parameters** | **Per** | **M** | **FDD-TDD****DIFF** | **FR1-FR2****DIFF** |
| --- | --- | --- | --- | --- |
| ***activeConfiguredGrant-r16***Indicates whether the UE supports up to 12 configured/active configured grant configurations in a BWP of a serving cell. This field includes the following parameters:- *maxNumberConfigsPerBWP-r16* indicates the maximum number of configured/active configured grant configurations in a BWP of a serving cell.- *maxNumberConfigsAllCC-r16* indicates the maximum number of configured/active configured grant configurations across all serving cells in a MAC entity, and across MCG and SCG in case of NR-DC.The UE can include this feature only if the UE indicates supports of either *configuredUL-GrantType1* *or configuredUL-GrantType1-v1650* or *configuredUL-GrantType2 or configuredUL-GrantType2-v1650*.NOTE:- For all the reported bands in FR1, a same X1 value is reported for *maxNumberConfigsAllCC-r16*. For all the reported bands in FR2, a same X2 value is reported for *maxNumberConfigsAllCC-r16*.- The total number of configured/active configured grant configurations across all serving cells in FR1 is no greater than X1.- The total number of configured/active configured grant configurations across all serving cells in FR2 is no greater than X2.- If the CA have some serving cell(s) in FR1 and some serving cell(s) in FR2, the total number of configured/active configured grant configurations across all serving cells is no greater than max(X1, X2). | Band | No | N/A | N/A |
| ***additionalActiveTCI-StatePDCCH***Indicates whether the UE supports one additional active TCI-State for control in addition to the supported number of active TCI-States for PDSCH. The UE can include this field only if *maxNumberActiveTCI-PerBWP* in *tci-StatePDSCH* is set to *n1*. Otherwise, the UE does not include this field. | Band | No | N/A | N/A |
| ***aperiodicBeamReport***Indicates whether the UE supports aperiodic 'CRI/RSRP' or 'SSBRI/RSRP' reporting on PUSCH. The UE provides the capability for the band number for which the report is provided (where the measurement is performed). | Band | Yes | N/A | N/A |
| ***aperiodicTRS***Indicates whether the UE supports DCI triggering aperiodic TRS associated with periodic TRS. | Band | No | N/A | Yes |
| ***asymmetricBandwidthCombinationSet***Defines the supported asymmetric channel bandwidth combination for the band as defined in the TS 38.101-1 [2]. Field encoded as a bit map, where bit N is set to "1" if UE support asymmetric channel bandwidth combination set N for this band as defined in the TS 38.101-1 [2]. The leading / leftmost bit (bit 0) corresponds to the asymmetric channel bandwidth combination set 1, the next bit corresponds to the asymmetric channel bandwidth combination set 2 and so on. UE shall support asymmetric channel bandwidth combination set 0. If the field is absent, the UE supports asymmetric channel bandwidth combination set 0. | Band | No | N/A | N/A |
| ***bandNR***Defines supported NR frequency band by NR frequency band number, as specified in TS 38.101-1 [2] and TS 38.101-2 [3]. | Band | Yes | N/A | N/A |
| ***beamCorrespondenceCSI-RS-based-r16***Indicates whether the UE support for beam correspondence based on CSI-RS has the ability to select its uplink beam based on measurement of CSI-RS. If a UE supports beam correspondence based on CSI-RS, then the network can expect the UE to also fulfil Rel-15 beam correspondence requirements.If UE supports neither *beamCorrespondenceSSB-based-r16*nor *beamCorrespondenceCSI-RS-based-r16*, gNB can expect the UE to fulfill beam correspondence based on Rel-15 beam correspondence requirements. | Band | No | TDD only | FR2 only |
| ***beamCorrespondenceSSB-based-r16***Indicates whether the UE support for beam correspondence based on SSB has the ability to select its uplink beam based on measurement of SSB. If a UE supports beam correspondence based on SSB, then the network can expect the UE to also fulfil Rel-15 beam correspondence requirements.If UE supports neither *beamCorrespondenceSSB-based-r16*nor *beamCorrespondenceCSI-RS-based-r16*, gNB can expect the UE to fulfil beam correspondence based on Rel-15 beam correspondence requirements. | Band | No | TDD only | FR2 only |
| ***beamCorrespondenceWithoutUL-BeamSweeping***Indicates how UE supports FR2 beam correspondence as specified in TS 38.101-2 [3], clause 6.6. The UE that fulfils the beam correspondence requirement without the uplink beam sweeping (as specified in TS 38.101-2 [3], clause 6.6) shall set the field to *supported*. The UE that fulfils the beam correspondence requirement with the uplink beam sweeping (as specified in TS 38.101-2 [3], clause 6.6) shall not report this field. | Band | Yes | N/A | FR2 only |
| ***beamManagementSSB-CSI-RS***Defines support of SS/PBCH and CSI-RS based RSRP measurements. The capability comprises signalling of- *maxNumberSSB-CSI-RS-ResourceOneTx* indicates maximum total number of configured one port NZP CSI-RS resources and SS/PBCH blocks that are supported by the UE to measure L1-RSRP as specified in TS 38.215 [13] within a slot and across all serving cells (see NOTE). On FR2, it is mandatory to report >=8; On FR1, it is mandatory with capability signalling to report >=8.- *maxNumberCSI-RS-Resource* indicates maximum total number of configured NZP-CSI-RS resources that are supported by the UE to measure L1-RSRP as specified in TS 38.215 [13] across all serving cells (see NOTE). It is mandated to report at least n8 for FR1.- *maxNumberCSI-RS-ResourceTwoTx* indicates maximum total number of two ports NZP CSI-RS resources that are supported by the UE to measure L1-RSRP as specified in TS 38.215 [13] within a slot and across all serving cells (see NOTE).- *supportedCSI-RS-Density* indicates density of one RE per PRB for one port NZP CSI-RS resource for RSRP reporting, if supported. On FR2, it is mandatory to report either "three" or "oneAndThree"; On FR1, it is mandatory with capability signalling to report either "three" or "oneAndThree".- *maxNumberAperiodicCSI-RS-Resource* indicates maximum number of configured aperiodic CSI-RS resources across all serving cells (see NOTE). For FR1 and FR2, the UE is mandated to report at least n4.NOTE: If the UE sets a value other than *n0* in an FR1 band, it shall set that same value in all FR1 bands. If the UE sets a value other than *n0* in an FR2 band, it shall set that same value in all FR2 bands. The UE supports a total number of resources equal to the maximum of the FR1 and FR2 value, but no more than the FR1 value across all FR1 serving cells and no more than the FR2 value across all FR2 serving cells. | Band | Yes | N/A | FD |
| ***beamReportTiming***Indicates the number of OFDM symbols between the end of the last symbol of SSB/CSI-RS and the start of the first symbol of the transmission channel containing beam report. The UE provides the capability for the band number for which the report is provided (where the measurement is performed). The UE includes this field for each supported sub-carrier spacing. | Band | Yes | N/A | N/A |
| ***beamSwitchTiming***Indicates the minimum number of OFDM symbols between the DCI triggering of aperiodic CSI-RS and aperiodic CSI-RS transmission. The number of OFDM symbols is measured from the end of the last symbol containing the indication to the start of the first symbol of CSI-RS. The UE includes this field for each supported sub-carrier spacing.NOTE: *beamSwitchTiming* of value (*sym224* or *sym336*) will be used to determine UE expectation/behaviour for aperiodic CSI-RS for tracking and latency requirements for L1-RSRP reporting as described in clause 5.1.6.1.1 of TS 38.214 [12], while UE behaviour/assumption regarding before or after beam switch timing is unspecified for measuring AP CSI-RS for CSI acquisition (without *trs-Info* and without repetition) and for beam management (with repetition 'off'). | Band | No | N/A | FR2 only |
| ***beamSwitchTiming-r16***Indicates the minimum number of required OFDM symbols (sym224, sym336) between the DCI triggering aperiodic CSI-RS and the corresponding aperiodic CSI-RS transmission in a CSI-RS resource set configured with repetition 'ON' if *enableBeamSwitchTiming-r16* is configured.For CSI-RS configured with repetition "*off*", the UE applies beam switch time of sym48 if *beamSwitchTiming-r16* is reported and *enableBeamSwitchTiming-r16* is configured. For CSI-RS configured without repetition and without *trs-info*, the UE applies beam switch time of sym48 if *beamSwitchTiming-r16* is reported and *enableBeamSwitchTiming-r16* is configured. | Band | No | N/A | FR2 only |
| ***bwp-DiffNumerology***Indicates whether the UE supports BWP adaptation up to 4 BWPs with the different numerologies, via DCI and timer. Except for SUL, the UE only supports the same numerology for the active UL and DL BWP. For the UE capable of this feature, the bandwidth of a UE-specific RRC configured DL BWP includes the bandwidth of the CORESET#0 (if CORESET#0 is present) and SSB for PCell and PSCell (if configured). For SCell(s), the bandwidth of the UE-specific RRC configured DL BWP includes SSB, if there is SSB on SCell(s). | Band | No | N/A | N/A |
| ***bwp-SameNumerology***Indicates whether UE supports BWP adaptation (up to 2/4 BWPs) with the same numerology, via DCI and timer. Except for SUL, the UE only supports the same numerology for the active UL and DL BWP. For the UE capable of this feature, the bandwidth of a UE-specific RRC configured DL BWP includes the bandwidth of the CORESET#0 (if CORESET#0 is present) and SSB for PCell and PSCell (if configured). For SCell(s), the bandwidth of the UE-specific RRC configured DL BWP includes SSB, if there is SSB on SCell(s). | Band | No | N/A | N/A |
| ***bwp-WithoutRestriction***Indicates support of BWP operation without bandwidth restriction. The Bandwidth restriction in terms of DL BWP for PCell and PSCell means that the bandwidth of a UE-specific RRC configured DL BWP may not include the bandwidth of CORESET #0 (if configured) and SSB. For SCell(s), it means that the bandwidth of DL BWP may not include SSB. | Band | No | N/A | N/A |
| ***cancelOverlappingPUSCH-r16***Indicates whether UE supports the cancellation of the (repetition of the) PUSCHs transmission on all other intra-band serving cell(s). The cancellation of the (repetition of the) PUSCH transmission on a the set of intra-band serving cell(s) includes all symbols from the earliest symbol that is overlapping with the first cancelled symbol of the PUSCH on the serving cell for which the DCI format 2\_4 is applicable to. If the UE supports this feature, the UE needs to report *pa-PhaseDiscontinuityImpacts* and *ul-CancellationSelfCarrier-r16*. | Band | No | N/A | N/A |
| ***channelBWs-DL***Indicates for each subcarrier spacing the UE supported channel bandwidths.Absence of the *channelBWs-DL* (without suffix) for a band or absence of specific scs-XXkHz entry for a supported subcarrier spacing means that the UE supports the channel bandwidths among [5, 10, 15, 20, 25, 30, 40, 50, 60, 80, 100] and [50, 100, 200] that were defined in clause 5.3.5 of TS 38.101-1 version 15.7.0 [2] and TS 38.101-2 version 15.7.0 [3] for the given band or the specific SCS entry. For IAB-MT, to determine whether the IAB-MT supports a channel bandwidth of 100 MHz, the network checks c*hannelBW-DL-IAB-r16*.For FR1, the bits in *channelBWs-DL* (without suffix) starting from the leading / leftmost bit indicate 5, 10, 15, 20, 25, 30, 40, 50, 60 and 80MHz. For FR2, the bits in *channelBWs-DL* (without suffix) starting from the leading / leftmost bit indicate 50, 100 and 200MHz. The third / rightmost bit (for 200MHz) shall be set to 1. For IAB-MT the third / rightmost bit (for 200MHz) is ignored. To determine whether the IAB-MT supports a channel bandwidth of 200 MHz, the network checks *channelBW-DL-IAB-r16*.For FR1, the leading/leftmost bit in *channelBWs-DL-v1590* indicates 70MHz, the second leftmost bit indicates 45MHz, the third leftmost bit indicates 35MHz, the fourth leftmost bit indicates 100MHz and all the remaining bits in *channelBWs-DL-v1590* shall be set to 0. The fourth leftmost bit (for 100MHz) is not applicable for bands n41, n48, n77, n78, n79 and n90 as defined in TS 38.101-1 [2].NOTE: To determine whether the UE supports a specific SCS for a given band, the network validates the *supportedSubCarrierSpacingDL* and the *scs-60kHz*.To determine whether the UE supports a channel bandwidth of 90 MHz, the network may ignore this capability and validate instead the *channelBW-90mhz*, the *supportedBandwidthCombinationSet* and the *supportedBandwidthCombinationSetIntraENDC*. For serving cell(s) with other channel bandwidths the network validates the *channelBWs-DL*, the *supportedBandwidthCombinationSet*, the *supportedBandwidthCombinationSetIntraENDC*, the *asymmetricBandwidthCombinationSet* (for a band supporting asymmetric channel bandwidth as defined in clause 5.3.6 of TS 38.101-1 [2]) and *supportedBandwidthDL*. | Band | Yes | N/A | N/A |
| ***channelBWs-UL***Indicates for each subcarrier spacing the UE supported channel bandwidths.Absence of the *channelBWs-UL* (without suffix) for a band or absence of specific scs-XXkHz entry for a supported subcarrier spacing means that the UE supports the channel bandwidths among [5, 10, 15, 20, 25, 30, 40, 50, 60, 80, 100] and [50, 100, 200] that were defined in clause 5.3.5 of TS 38.101-1 version 15.7.0 [2] and TS 38.101-2 version 15.7.0 [3] for the given band or the specific SCS entry. For IAB-MT, to determine whether the IAB-MT supports a channel bandwidth of 100 MHz, the network checks *channelBW-UL-IAB-r16*.For FR1, the bits in *channelBWs-UL* (without suffix) starting from the leading / leftmost bit indicate 5, 10, 15, 20, 25, 30, 40, 50, 60 and 80MHz. For FR2, the bits in *channelBWs-UL* (without suffix) starting from the leading / leftmost bit indicate 50, 100 and 200MHz. The third / rightmost bit (for 200MHz) shall be set to 1. For IAB-MT the third / rightmost bit (for 200MHz) is ignored. To determine whether the IAB-MT supports a channel bandwidth of 200 MHz, the network checks *channelBW-UL-IAB-r16*.For FR1, the leading/leftmost bit in *channelBWs-UL-v1590* indicates 70 MHz, the second leftmost bit indicates 45MHz, the third leftmost bit indicates 35MHz, the fourth leftmost bit indicates 100MHz and all the remaining bits in *channelBWs-UL-v1590* shall be set to 0. The fourth leftmost bit (for 100MHz) is not applicable for bands n41, n48, n77, n78, n79 and n90 as defined in TS 38.101-1 [2].NOTE: To determine whether the UE supports a specific SCS for a given band, the network validates the *supportedSubCarrierSpacingUL* and the *scs-60kHz*.To determine whether the UE supports a channel bandwidth of 90 MHz the network may ignore this capability and validate instead the *channelBW-90mhz*, the *supportedBandwidthCombinationSet* and the *supportedBandwidthCombinationSetIntraENDC*. For serving cell(s) with other channel bandwidths the network validates the *channelBWs-UL*, the *supportedBandwidthCombinationSet*, the *supportedBandwidthCombinationSetIntraENDC*, the *asymmetricBandwidthCombinationSet* (for a band supporting asymmetric channel bandwidth as defined in clause 5.3.6 of TS 38.101-1 [2]) and *supportedBandwidthUL*. | Band | Yes | N/A | N/A |
| ***channelBW-DL-IAB-r16***Indicates whether the IAB-MT supports channel bandwidth of 100 MHz for a given SCS in FR1 for DL or whether the IAB-MT supports channel bandwidth of 200 MHz for a given SCS in FR2 for DL. | Band | No | N/A | N/A |
| ***channelBW-UL-IAB-r16***Indicates whether the IAB-MT supports channel bandwidth of 100 MHz for a given SCS in FR1 for UL or whether the IAB-MT supports channel bandwidth of 200 MHz for a given SCS in FR2 for UL. | Band | No | N/A | N/A |
| ***codebookComboParametersAddition-r16***Indicates the UE supports of the mixed codebook combinations and the corresponding parameters supported by the UE.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 is the possible mixed codebook combinations:- {Type 1 Single Panel, Type 2, Null}- {Type 1 Single Panel, Type 2 with port selection, Null}- {Type 1 Single Panel, eType 2 with R=1, Null}- {Type 1 Single Panel, eType 2 with R=2, Null}- {Type 1 Single Panel, eType 2 with R=1 and port selection, Null}- {Type 1 Single Panel, eType 2 with R=2 and port selection, Null}- {Type 1 Single Panel, Type 2, Type 2 with port selection}- {Type 1 Multi Panel, Type 2, Null}- {Type 1 Multi Panel, Type 2 with port selection, Null}- {Type 1 Multi Panel, eType 2 with R=1, Null}- {Type 1 Multi anel, eType 2 with R=2, Null}- {Type 1 Multi Panel, eType 2 with R=1 with port selection, Null}- {Type 1 Multi Panel, eType 2 with R=2 with port selection, Null}- {Type 1 Multi Panel, Type 2, Type 2 with port selection}Parameters 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*:For *supportedCSI-RS-ResourceListAdd-r16* related to the additional codebooks:- The minimum of *maxNumberTxPortsPerResource* is '*p4*';- The minimum value of *totalNumberTxPortsPerBand* is 4.If a UE reports one or more mixed codebook combinations, then usage of active CSI-RS resources and ports for multiple codebooks in any slot is allowed only within those combinations. For coexisting of mixed codebooks in any slot, gNB needs to consider the mixed codebook combination capability as well as per codebook capability of each codebook type in the mixed codebook combination.UE indicates support of a codebook type in the mixed codebook combination shall indicates support of the individual codebook type in the per band capability. | Band | No | N/A | N/A |
| ***codebookParameters***Indicates the codebooks and the corresponding parameters supported by the UE.Parameters for type I single panel codebook (type1 singlePanel) supported by the UE, which are mandatory to report:- *supportedCSI-RS-ResourceList*;- a UE shall support a *maxNumberTxPortsPerResource* minimum value of 4 for codebook type I single panel in FR1 in the case of a single active CSI-resource across all bands in a band combination, regardless of what it reports in *supportedCSI-RS-ResourceList* with *maxNumberTxPortsPerResource*;- a UE shall support a *maxNumberTxPortsPerResource* minimum value of 8 when configured with wideband CSI report for codebook type I single panel in FR1 in the case of a single active CSI-resource across all bands in a band combination, regardless of what it reports in *supportedCSI-RS-ResourceList* with *maxNumberTxPortsPerResource*;- a UE shall support a *maxNumberTxPortsPerResource* minimum value of 2 for codebook type I single panel in FR2 in the case of a single active CSI-resource across all bands in a band combination, regardless of what it reports in *supportedCSI-RS-ResourceList* with *maxNumberTxPortsPerResource*.- *modes* indicates supported codebook modes (mode 1, both mode 1 and mode 2);- *maxNumberCSI-RS-PerResourceSet* indicates the maximum number of CSI-RS resource in a resource set.Parameters for type I multi-panel codebook (type1 multiPanel) supported by the UE, which are optional:- *supportedCSI-RS-ResourceList*;- *modes* indicates supported codebook modes (mode 1, mode 2, or both mode 1 and mode 2);- *maxNumberCSI-RS-PerResourceSet* indicates the maximum number of CSI-RS resource in a resource set;- *nrofPanels* indicates supported number of panels.Parameters for type II codebook (type2) supported by the UE, which are optional:- *supportedCSI-RS-ResourceList*;- *parameterLx* indicates the parameter "Lx" in codebook generation where x is an index of Tx ports indicated by *maxNumberTxPortsPerResource*;- *amplitudeScalingType* indicates the amplitude scaling type supported by the UE (wideband or both wideband and sub-band);- *amplitudeSubsetRestriction* indicates whether amplitude subset restriction is supported for the UE.Parameters for type II codebook with port selection (type2-PortSelection) supported by the UE, which are optional:- *supportedCSI-RS-ResourceList*;- *parameterLx* indicates the parameter "Lx" in codebook generation where x is an index of Tx ports indicated by *maxNumberTxPortsPerResource*;- *amplitudeScalingType* indicates the amplitude scaling type supported by the UE (wideband or both wideband and sub-band).*supportedCSI-RS-ResourceList* includes list of the following parameters:- *maxNumberTxPortsPerResource* indicates the maximum number of Tx ports in a resource;- *maxNumberResourcesPerBand* indicates the maximum number of resources across all CCs within a band simultaneously;- *totalNumberTxPortsPerBand* indicates the total number of Tx ports across all CCs within a band simultaneously.For each codebook type, the UE may report another list of supported CSI-RS resources via *supportedCSI-RS-ResourceListAlt* in *codebookParametersPerBand*. For type I single panel codebook (type1 singlePanel) supportedCSI-RS-ResourceListAlt,- a UE shall report at least one triplet in supportedCSI-RS-ResourceListAlt with maxNumberTxPortsPerResource greater than or equal to 8 for FR1;- a UE shall report at least one triplet in supportedCSI-RS-ResourceListAlt with maxNumberTxPortsPerResource greater than or equal to 2 for FR2. | Band | FD | N/A | N/A |
| ***codebookParametersAddition-r16***Indicates the UE support of additional codebooks and the corresponding parameters supported by the UE.Codebook etype 2 R=1 support parameter combination 1 to 6 and rank 1 to 2. Parameters for etype 2 R=1 (*etype2R1-r16*) supported by the UE, which are optional:- *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;- *maxNumberResourcesPerBand* indicates the maximum number of resources across all CCs in a band, simultaneously;- *totalNumberTxPortsPerBand* indicates the total number of Tx ports across all CCs in a band, simultaneously.- *paramComb7-8-r16* indicates the support of parameter combinations 7-8 for etype 2 R=1- *rank3-4-r16* indicates the support of rank 3,4.- *amplitudeSubsetRestriction-r16* indicates the support of amplitude subset restriction.Parameters for etype 2 R=2 (*etype2R2-r16*) supported by the UE, which are optional:- *supportedCSI-RS-ResourceListAdd-r16*;UE supporting *etype2R2-r16*supports also indicates support of *etype2R1-r16*.Codebook etype 2 R=1 with port selection supports 6 parameter combinations and rank 1,2. Parameters for etype 2 R=1 with port selection (*etype2R1-PortSelection-r16*) supported by the UE, which are optional:- *supportedCSI-RS-ResourceListAdd-r16*;- *rank3-4-r16* indicates the support of rank 3,4Parameters for etype 2 R=2 with port selection (*etype2R2-PortSelection-r16*) supported by the UE, which are optional:- *supportedCSI-RS-ResourceListAdd-r16*;UE supporting *etype2R2-PortSelection-r16* also indicates support of *etype2R1-PortSelection-r16*.For *supportedCSI-RS-ResourceListAdd-r16* related to the additional codebooks:- The minimum of *maxNumberTxPortsPerResource* is '*p4*';- The minimum value of *totalNumberTxPortsPerBand* is 4. | Band | No | N/A | N/A |
| ***condHandover-r16***Indicates whether the UE supports conditional handover including execution condition, candidate cell configuration and maximum 8 candidate cells. UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively. | Band | No | N/A | N/A |
| ***condHandoverFailure-r16***Indicates whether the UE supports conditional handover during re-establishment procedure when the selected cell is configured as candidate cell for condition handover. UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively. | Band | No | N/A | N/A |
| ***condHandoverTwoTriggerEvents-r16***Indicates whether the UE supports 2 trigger events for same execution condition. This feature is mandatory supported if the UE supports *condHandover-r16*. UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively. | Band | CY | N/A | N/A |
| ***condPSCellChange-r16***Indicates whether the UE supports conditional PSCell change including execution condition, candidate cell configuration and maximum 8 candidate cells. UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively. | Band | No | N/A | N/A |
| ***condPSCellChangeTwoTriggerEvents-r16***Indicates whether the UE supports 2 trigger events for same execution condition. This feature is mandatory supported if the UE supports *condPSCellChange-r16*. UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively. | Band | CY | N/A | N/A |
| ***configuredUL-GrantType1-v1650***Indicates whether the UE supports Type 1 PUSCH transmissions with configured grant as specified in TS 38.214 [12] with UL-TWG-repK value of one. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *configuredUL-GrantType1-r16* applies. UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively.The UE only includes *configuredUL-GrantType1-v1650* if *configuredUL-GrantType1* is absent. | Band | No | N/A | N/A |
| ***configuredUL-GrantType2-v1650***Indicates whether the UE supports Type 2 PUSCH transmissions with configured grant as specified in TS 38.214 [12] with UL-TWG-repK value of one. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *configuredUL-GrantType2-r16* applies. UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively.The UE only includes *configuredUL-GrantType2*-v1650 if *configuredUL-GrantType2* is absent. | Band | No | N/A | N/A |
| ***crossCarrierScheduling-SameSCS***Indicates whether the UE supports cross carrier scheduling for the same numerology with carrier indicator field (CIF) in carrier aggregation where numerologies for the scheduling cell and scheduled cell are same. | Band | No | N/A | N/A |
| ***csi-ReportFramework***Indicates whether the UE supports CSI report framework. This capability signalling comprises the following parameters:- *maxNumberPeriodicCSI-PerBWP-ForCSI-Report* indicates the maximum number of periodic CSI report setting per BWP for CSI report;- *maxNumberPeriodicCSI-PerBWP-ForBeamReport* indicates the maximum number of periodic CSI report setting per BWP for beam report.- *maxNumberAperiodicCSI-PerBWP-ForCSI-Report* indicates the maximum number of aperiodic CSI report setting per BWP for CSI report;- *maxNumberAperiodicCSI-PerBWP-ForBeamReport* indicates the maximum number of aperiodic CSI report setting per BWP for beam report;- *maxNumberAperiodicCSI-triggeringStatePerCC* indicates the maximum number of aperiodic CSI triggering states in *CSI-AperiodicTriggerStateList* per CC;- *maxNumberSemiPersistentCSI-PerBWP-ForCSI-Report* indicates the maximum number of semi-persistent CSI report setting per BWP for CSI report;- *maxNumberSemiPersistentCSI-PerBWP-ForBeamReport* indicates the maximum number of semi-persistent CSI report setting per BWP for beam report;- *simultaneousCSI-ReportsPerCC* indicates the number of CSI report(s) for which the UE can measure and process reference signals simultaneously in a CC of the band for which this capability is provided. The CSI report comprises periodic, semi-persistent and aperiodic CSI and any latency classes and codebook types. The CSI report in simultaneousCSI-ReportsPerCC includes the beam report and CSI report.The UE is mandated to report *csi-ReportFramework*. | Band | Yes | N/A | N/A |
| ***csi-ReportFrameworkExt-r16***Indicates whether the UE supports the extension of the maximum number of configured aperiodic CSI report settings for all codebook types. The capability signalling comprises the following:*maxNumberAperiodicCSI-PerBWP-ForCSI-ReportExt-r16* indicates the extended maximum number of aperiodic CSI report setting per BWP for CSI report. If present, the value of *maxNumberAperiodicCSI-PerBWP-ForCSI-Report-r16* shall replace the corresponding value in *csi-ReportFramework*. | Band | No | N/A | N/A |
| ***csi-RS-ForTracking***Indicates support of CSI-RS for tracking (i.e. TRS). This capability signalling comprises the following parameters:- *maxBurstLength* indicates the TRS burst length. Value 1 indicates 1 slot and value 2 indicates both of 1 slot and 2 slots. In this release UE is mandated to report value 2;- *maxSimultaneousResourceSetsPerCC* indicates the maximum number of TRS resource sets per CC which the UE can track simultaneously;- *maxConfiguredResourceSetsPerCC* indicates the maximum number of TRS resource sets configured to UE per CC. It is mandated to report at least 8 for FR1 and 16 for FR2;- *maxConfiguredResourceSetsAllCC* indicates the maximum number of TRS resource sets configured to UE across CCs. If the UE includes the field in an FR1 band, it shall set the same value in all FR1 bands. If the UE includes the field in an FR2 band, it shall set the same value in all FR2 bands. The UE supports a total number of resources equal to the maximum of the FR1 and FR2 value, but no more than the FR1 value across all FR1 serving cells and no more than the FR2 value across all FR2 serving cells. The UE is mandated to report at least 16 for FR1 and 32 for FR2.The UE is mandated to report *csi-RS-ForTracking*. | Band | Yes | N/A | N/A |
| ***csi-RS-IM-ReceptionForFeedback***Indicates support of CSI-RS and CSI-IM reception for CSI feedback. This capability signalling comprises the following parameters:- *maxConfigNumberNZP-CSI-RS-PerCC* indicates the maximum number of configured NZP-CSI-RS resources per CC;- *maxConfigNumberPortsAcrossNZP-CSI-RS-PerCC* indicates the maximum number of ports across all configured NZP-CSI-RS resources per CC;- *maxConfigNumberCSI-IM-PerCC* indicates the maximum number of configured CSI-IM resources per CC;- *maxNumberSimultaneousNZP-CSI-RS-PerCC* indicates the maximum number of simultaneous CSI-RS-resources per CC;- *totalNumberPortsSimultaneousNZP-CSI-RS-PerCC* indicates the total number of CSI-RS ports in simultaneous CSI-RS resources per CC.The UE is mandated to report csi-RS-IM-ReceptionForFeedback. | Band | Yes | N/A | N/A |
| ***csi-RS-ProcFrameworkForSRS***Indicates support of CSI-RS processing framework for SRS. This capability signalling comprises the following parameters:- *maxNumberPeriodicSRS-AssocCSI-RS-PerBWP* indicates the maximum number of periodic SRS resources associated with CSI-RS per BWP;- *maxNumberAperiodicSRS-AssocCSI-RS-PerBWP* indicates the maximum number of aperiodic SRS resources associated with CSI-RS per BWP;- *maxNumberSP-SRS-AssocCSI-RS-PerBWP* indicates the maximum number of semi-persistent SRS resources associated with CSI-RS per BWP;- *simultaneousSRS-AssocCSI-RS-PerCC* indicates the number of SRS resources that the UE can process simultaneously in a CC, including periodic, aperiodic and semi-persistent SRS. | Band | No | N/A | N/A |
| ***defaultQCL-PerCORESETPoolIndex-r16***Indicates whether the UE supports default QCL assumption per CORESET pool index using multi-DCI based multi-TRP. The UE that indicates support of this feature shall support *multiDCI-MultiTRP-r16* and *simultaneousReceptionDiffTypeD-r16.* | Band | No | N/A | FR2 only |
| ***defaultQCL-TwoTCI-r16***Indicates whether the UE supports default QCL assumption with two TCI states using single-DCI based multi-TRP. The UE can include this field only if *simultaneousReceptionDiffTypeD-r16*is present. Otherwise, the UE does not include this field. | Band | No | N/A | FR2 only |
| ***enhancedSkipUplinkTxConfigured-v1660***Indicates whether the UE supports skipping UL transmission for a configured uplink grant only if no data is available for transmission and no UCI is multiplexed on the corresponding PUSCH of the uplink grant as specified in TS 38.321 [8]. UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively.The UE only includes *enhancedSkipUplinkTxConfigured-v1660* if *enhancedSkipUplinkTxConfigured-r16* is absent. | Band | No | N/A | N/A |
| ***enhancedSkipUplinkTxDynamic-v1660***Indicates whether the UE supports skipping UL transmission for an uplink grant addressed to a C-RNTI only if no data is available for transmission and no UCI is multiplexed on the corresponding PUSCH of the uplink grant as specified in TS 38.321 [8]. UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively.The UE only includes *enhancedSkipUplinkTxDynamic-v1660* if *enhancedSkipUplinkTxDynamic-r16* is absent. | Band | No | N/A | N/A |
| ***enhancedUL-TransientPeriod-r16***Indicates whether the UE supports enhanced UL performance for the transient period as specified in clause 6.3.3 of TS 38.101-1 [2]. If not reported, the UE supports transient period of 10us. | Band | No | N/A | FR1 only |
| ***extendedCP***Indicates whether the UE supports 60 kHz subcarrier spacing with extended CP length for reception of PDCCH, and PDSCH, and transmission of PUCCH, PUSCH, and SRS. | Band | No | N/A | N/A |
| ***groupBeamReporting***Indicates whether UE supports RSRP reporting for the group of two reference signals. | Band | No | N/A | N/A |
| ***groupSINR-reporting-r16***Indicates whether UE supports group based L1-SINR reporting. UE indicates support of this feature shall indicate support of *ssb-csirs-SINR-measurement-r16.* | Band | No | N/A | N/A |
| ***handoverUTRA-FDD-r16***Indicates whether the UE supports NR to UTRA-FDD CELL\_DCH CS handover for the PCell on the band. It is mandatory to support both UTRA-FDD measurement and event B triggered reporting, and periodic UTRA-FDD measurement and reporting if the UE supports HO to UTRA-FDD. If this field is included, then UE shall support IMS voice over NR. UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively. | Band | No | N/A | N/A |
| ***maxMIMO-LayersForMulti-DCI-mTRP-r16***Indicates the interpretation of *maxNumberMIMO-LayersPDSCH* for multi-DCI based mTRP. If this field is included, *maxNumberMIMO-LayersPDSCH* is interpreted as the maximum number of layers per PDSCH for multi-DCI multi-TRP operation.If this field is not included, *maxNumberMIMO-LayersPDSCH* is interpreted as the maximum number of layers across two PDSCHs if having at least one RE overlapped, for multi-DCI multi-TRP operation. The UE that indicates support of this feature shall support *overlapPDSCHsFullyFreqTime-r16*.NOTE 1: For data rate calculation in clause 4.1.2, if this feature is indicated, each multi-DCI based multi-TRP CC is counted two times toward J. | Band | No | N/A | N/A |
| ***jointReleaseConfiguredGrantType2-r16***Indicates whether the UE supports joint release in a DCI for two or more configured grant Type 2 configurations for a given BWP of a serving cell. The UE can include this feature only if the UE indicates supports of *activeConfiguredGrant-r16*. | Band | No | N/A | N/A |
| ***jointReleaseSPS-r16***Indicates whether the UE supports joint release in a DCI for two or more SPS configurations for a given BWP of a serving cell. The UE can include this feature only if the UE indicates supports of *sps-r16*. | Band | No | N/A | N/A |
| ***lowPAPR-DMRS-PDSCH-r16***Indicates whether the UE supports low PAPR DMRS for PDSCH. | Band | No | N/A | N/A |
| ***lowPAPR-DMRS-PUCCH-r16***Indicates whether the UE supports low PAPR DMRS for PUCCH format 3 and format 4 with transform precoding and with pi/2 BPSK modulation. UE indicates support of this feature shall indicate support of *pucch-F3-4-HalfPi-BPSK* and any combination of support of *pucch-F3-WithFH*, *pucch-F4-WithFH* and *pucch-F1-3-4WithoutFH*. | Band | No | N/A | N/A |
| ***lowPAPR-DMRS-PUSCHwithoutPrecoding-r16***Indicates whether the UE supports low PAPR DMRS for PUSCH without transform precoding. | Band | No | N/A | N/A |
| ***lowPAPR-DMRS-PUSCHwithPrecoding-r16***Indicates whether the UE supports low PAPR DMRS for PUSCH with transform precoding and with pi/2 BPSK modulation. UE indicates support of this feature shall indicate support of *pusch-HalfPi-BPSK*. | Band | No | N/A | N/A |
| ***maxNumberActivatedTCI-States-r16***Indicates maximum number of activated TCI states. This capability signalling includes the following:- *maxNumberPerCORESET-Pool-r16* indicates maximal number of activated TCI states per *CORESETPoolIndex* per BWP per CC including data and control- *maxTotalNumberAcrossCORESET-Pool-r16* indicates maximal total number of activated TCI states across *CORESETPoolIndex* per BWP per CC including data and controlThe UE that indicates support of this feature shall support *multiDCI-MultiTRP-r16*. | Band | No | N/A | N/A |
| ***maxNumberCSI-RS-BFD***Indicates maximal number of CSI-RS resources across all CCs, and across MCG and SCG in case of NR-DC, for UE to monitor PDCCH quality. In this release, the maximum value that can be signalled is 16. If the UE includes the field in an FR1 band, it shall set the same value in all FR1 bands. If the UE includes the field in an FR2 band, it shall set the same value in all FR2 bands. The UE supports a total number of resources equal to the maximum of the FR1 and FR2 value, but no more than the FR1 value across all FR1 serving cells and no more than the FR2 value across all FR2 serving cells. It is mandatory with capability signalling for FR2 and optional for FR1. | Band | CY | N/A | N/A |
| ***maxNumberCSI-RS-SSB-CBD***Defines maximal number of different CSI-RS [and/or SSB] resources across all CCs, and across MCG and SCG in case of NR-DC, for new beam identifications. In this release, the maximum value that can be signalled is 128. If the UE includes the field in an FR1 band, it shall set the same value in all FR1 bands. If the UE includes the field in an FR2 band, it shall set the same value in all FR2 bands. The UE supports a total number of resources equal to the maximum of the FR1 and FR2 value, but no more than the FR1 value across all FR1 serving cells and no more than the FR2 value across all FR2 serving cells. It is mandatory with capability signalling for FR2 and optional for FR1. The UE is mandated to report at least 32 for FR2. | Band | CY | N/A | N/A |
| ***maxNumberNonGroupBeamReporting***Defines support of non-group based RSRP reporting using N\_max RSRP values reported. | Band | Yes | N/A | N/A |
| ***maxNumberRxBeam***Defines whether UE supports receive beamforming switching using NZP CSI-RS resource. UE shall indicate a single value for the preferred number of NZP CSI-RS resource repetitions per CSI-RS resource set. Support of Rx beam switching is mandatory for FR2. | Band | CY | N/A | N/A |
| ***maxNumberRxTxBeamSwitchDL***Defines the number of Tx and Rx beam changes UE can perform on this band within a slot. UE shall report one value per each subcarrier spacing supported by the UE. In this release, the number of Tx and Rx beam changes for scs-15kHz and scs-30kHz are not included. | Band | No | N/A | FR2 only |
| ***maxNumberSCellBFR-r16***Defines the maximum number of SCells configured for SCell beam failure recovery simultaneously. The UE indicating support of this also indicates the capabilities of *maxNumberCSI-RS-BFD, maxNumberSSB-BFD* and *maxNumberCSI-RS-SSB-CBD.* | Band | No | N/A | N/A |
| ***maxNumberSSB-BFD***Defines maximal number of different SSBs across all CCs, and across MCG and SCG in case of NR-DC, for UE to monitor PDCCH quality. In this release, the maximum value that can be signalled is 16. If the UE includes the field in an FR1 band, it shall set the same value in all FR1 bands. If the UE includes the field in an FR2 band, it shall set the same value in all FR2 bands. The UE supports a total number of resources equal to the maximum of the FR1 and FR2 value, but no more than the FR1 value across all FR1 serving cells and no more than the FR2 value across all FR2 serving cells. It is mandatory with capability signalling for FR2 and optional for FR1. | Band | CY | N/A | N/A |
| ***maxUplinkDutyCycle-PC2-FR1***Indicates the maximum 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. This field is only applicable for FR1 power class 2 UE as specified in clause 6.2.1 of TS 38.101-1 [2]. If the field is absent, 50% shall be applied. Value n60 corresponds to 60%, value n70 corresponds to 70% and so on. This capability is not applicable to IAB-MT. | Band | No | N/A | FR1 only |
| ***maxUplinkDutyCycle-FR2***Indicates the maximum percentage of symbols during 1s that can be scheduled for uplink transmission at the UE maximum transmission power, so as to ensure compliance with applicable electromagnetic power density exposure requirements provided by regulatory bodies. This field is applicable for all power classes UE in FR2 as specified in TS 38.101-2 [3]. Value n15 corresponds to 15%, value n20 corresponds to 20% and so on. If the field is absent or the percentage of uplink symbols transmitted within any 1s evaluation period is larger than *maxUplinkDutyCycle-FR2*, the UE behaviour is specified in TS 38.101-2 [3]. This capability is not applicable to IAB-MT. | Band | No | N/A | FR2 only |
| ***maxUplinkDutyCycle-PC1dot5-MPE-FR1-r16***Indicates the maximum 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. This field is only applicable for FR1 power class 1.5 UE as specified in clause 6.2.1 of TS 38.101-1 [2]. If the field is absent, UE shall mitigate MPE autonomously by P-MPR or by other means and no restriction on scheduled uplink duty cycle is needed. | Band | No | N/A | FR1 only |
| ***modifiedMPR-Behaviour***Indicates whether UE supports modified MPR behaviour defined in TS 38.101-1 [2] and TS 38.101-2 [3]. | Band | No | N/A | N/A |
| ***mpr-PowerBoost-FR2-r16***Indicates whether UE supports uplink transmission power boost by suspension of in-band emission (IBE) requirements as specified in TS 38.101-2 [3]. | Band | No | TDD only | FR2 only |
| ***multipleRateMatchingEUTRA-CRS-r16***Indicates whether the UE supports multiple E-UTRA CRS rate matching patterns, which is supported only for FR1. The capability signalling comprises the following parameters:- *maxNumberPatterns-r16* indicates the maximum number of LTE-CRS rate matching patterns in total within a NR carrier using 15 kHz SCS. The UE can report the value larger than 2 only if UE reports the value of *maxNumberNon-OverlapPatterns-r16* is larger than 1.- *maxNumberNon-OverlapPatterns-r16* indicates the maximum number of LTE-CRS non-overlapping rate matching patterns within a NR carrier using 15 kHz SCS.The UE can include this feature only if the UE indicates support of *rateMatchingLTE-CRS*. | Band | No | N/A | FR1 only |
| ***multipleTCI***Indicates whether UE supports more than one TCI state configurations per CORESET. UE is only required to track one active TCI state per CORESET. UE is required to support minimum between 64 and number of configured TCI states indicated by *tci-StatePDSCH*. This field shall be set to *supported*. | Band | Yes | N/A | N/A |
| ***nonGroupSINR-reporting-r16***Indicates N\_max L1-SINR values reported when UE supports non-group based L1-SINR reporting. UE indicates support of this feature shall indicate support of *ssb-csirs-SINR-measurement-r16.* | Band | No | N/A | N/A |
| ***olpc-SRS-Pos-r16***Indicates whether the UE supports OLPC for SRS for positioning. The capability signalling comprises the following parameters.- *olpc-SRS-PosBasedOnPRS-Serving-r16* indicates whether the UE supports OLPC for SRS for positioning based on PRS from the serving cell in the same band. The UE can include this field only if the UE supports *NR-DL-PRS-ProcessingCapability-r16* defined in TS 37.355 [22], and *srs-PosResources-r16*. Otherwise, the UE does not include this field;- *olpc-SRS-PosBasedOnSSB-Neigh-r16* indicates whether the UE supports OLPC for SRS for positioning based on SSB from the neighbouring cell in the same band. The UE can include this field only if the UE supports *srs-PosResources-r16*. Otherwise, the UE does not include this field;- *olpc-SRS-PosBasedOnPRS-Neigh-r16* indicates whether the UE supports OLPC for SRS for positioning based on PRS from the neighbouring cell in the same band. The UE can include this field only if the UE supports *olpc-SRS-PosBasedOnPRS-Serving-r16*. Otherwise, the UE does not include this field;NOTE: A PRS from a PRS-only TP is treated as PRS from a non-serving cell.- *maxNumberPathLossEstimatePerServing-r16* indicates the maximum number of pathloss estimates that the UE can simultaneously maintain for all the SRS resource sets for positioning per serving cell in addition to the up to four pathloss estimates that the UE maintains per serving cell for the PUSCH/PUCCH/SRS transmissios. The UE shall include this field if the UE supports any of *olpc-SRS-PosBasedOnPRS-Serving-r16, olpc-SRS-PosBasedOnSSB-Neigh-r16* and *olpc-SRS-PosBasedOnPRS-Neigh-r16.* Otherwise, the UE does not include this field. | Band | No | N/A | N/A |
| ***oneSlotPeriodicTRS-r16***Indicates whether the UE supports one-slot periodic TRS configuration only when no two consecutive slots are indicated as downlink slots by *tdd-UL-DL-ConfigurationCommon* or *tdd-UL-DL-ConfigDedicated*. If the UE supports this feature, the UE needs to report *csi-RS-ForTracking*. | Band | No | TDD only | FR1 only |
| ***outOfOrderOperationDL-r16***Indicates whether the UE supports out of order operation for DL. The UE that indicates support of this feature shall support *multiDCI-MultiTRP-r16*. The capability signalling comprises the following parameters:*- supportPDCCH-ToPDSCH-r16* indicates support out-of-order operation for PDCCH to PDSCH;*- supportPDSCH-ToHARQ-ACK-r16* indicates support out-of-order operation for PDSCH to HARQ-ACK. | Band | No | N/A | N/A |
| ***outOfOrderOperationUL-r16***Indicates whether the UE supports out of order operation for UL. The UE that indicates support of this feature shall support *multiDCI-MultiTRP-r16.*Note: Same closed loop index for power control across PUSCHs associated with different *CORESETPoolIndex* values is not supported by a UE indicating the support of this feature when TPC accumulation is enabled. | Band | No | N/A | N/A |
| ***overlapPDSCHsFullyFreqTime-r16***Indicates the maximal number of PDSCH scrambling sequences per serving cell when the UE supports PDSCHs with fully overlapping Resource Elements. The UE that indicates support of this feature shall support *multiDCI-MultiTRP-r16.*Note: A UE may assume that its maximum receive timing difference between the DL transmissions from two TRPs is within a Cyclic Prefix | Band | No | N/A | N/A |
| ***overlapPDSCHsInTimePartiallyFreq-r16***Indicates whether the UE support PDSCHs with partially overlapping Resource Elements. The UE that indicates support of this feature shall support *multiDCI-MultiTRP-r16.* | Band | No | N/A | N/A |
| ***overlapRateMatchingEUTRA-CRS-r16***Indicates whether the UE supports two LTE-CRS overlapping rate matching patterns within a part of NR carrier using 15 kHz SCS overlapping with a LTE carrier. If the UE supports this feature, the UE needs to report *multipleRateMatchingEUTRA-CRS-r16*. | Band | No | N/A | FR1 only |
| ***pdsch-256QAM-FR2***Indicates whether the UE supports 256QAM modulation scheme for PDSCH for FR2 as defined in 7.3.1.2 of TS 38.211 [6]. | Band | No | N/A | FR2 only |
| ***pdsch-MappingTypeB-Alt-r16***Indicates whether the UE supports PDSCH Type B scheduling of length 9 and 10 OFDM symbols, and DMRS shift for length-10 symbols. If the UE supports this feature, the UE needs to report *pdsch-MappingTypeB*. | Band | No | N/A | FR1 only |
| ***periodicBeamReport***Indicates whether UE supports periodic 'CRI/RSRP' or 'SSBRI/RSRP' reporting using PUCCH formats 2, 3 and 4 in one slot. | Band | Yes | N/A | N/A |
| ***powerBoosting-pi2BPSK***Indicates whether UE supports power boosting for pi/2 BPSK, when applicable as defined in 6.2 of TS 38.101-1 [2]. This capability is not applicable to IAB-MT. | Band | No | TDD only | FR1 only |
| ***ptrs-DensityRecommendationSetDL***For each supported sub-carrier spacing, indicates preferred threshold sets for determining DL PTRS density. It is mandated for FR2. For each supported sub-carrier spacing, this field comprises:- two values of *frequencyDensity*;- three values of *timeDensity*. | Band | CY | N/A | N/A |
| ***ptrs-DensityRecommendationSetUL***For each supported sub-carrier spacing, indicates preferred threshold sets for determining UL PTRS density. For each supported sub-carrier spacing, this field comprises:- two values of *frequencyDensity*;- three values of *timeDensity*;- five values of *sampleDensity*. | Band | No | N/A | N/A |
| ***pucch-SpatialRelInfoMAC-CE***Indicates whether the UE supports indication of *PUCCH-spatialrelationinfo* by a MAC CE per PUCCH resource. It is mandatory for FR2 and optional for FR1. | Band | CY | N/A | N/A |
| ***pusch-256QAM***Indicates whether the UE supports 256QAM modulation scheme for PUSCH as defined in 6.3.1.2 of TS 38.211 [6]. | Band | No | N/A | N/A |
| ***pusch-RepetitionMultiSlots-v1650***Indicates whether the UE supports transmitting PUSCH scheduled by DCI format 0\_1 when configured with higher layer parameter *pusch-AggregationFactor* > 1, as defined in clause 6.1.2.1 of TS 38.214 [12]. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *pusch-RepetitionMultiSlots-r16* applies. UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively.The UE only includes *pusch-RepetitionMultiSlots-v1650* if *pusch-RepetitionMultiSlots* is absent. | Band | Yes | N/A | N/A |
| ***pusch-TransCoherence***Defines support of the uplink codebook subset by the UE for UL precoding for PUSCH transmission as described in clause 6.1.1.1 of TS 38.214 [12]. UE indicated support of partial coherent codebook subset shall also support non-coherent codebook subset. UE indicated support of full coherent codebook subset shall also support partial and non-coherent codebook subset. | Band | No | N/A | N/A |
| ***rateMatchingLTE-CRS***Indicates whether the UE supports receiving PDSCH with resource mapping that excludes the REs determined by the higher layer configuration LTE-carrier configuring common RS, as specified in TS 38.214 [12]. | Band | Yes | N/A | N/A |
| ***separateCRS-RateMatching-r16***Indicates whether the UE supports rate match around configured CRS patterns which is associated with *CORESETPoolIndex* (if configured) and are applied to the PDSCH scheduled with a DCI detected on a CORESET with the same value of *CORESETPoolIndex*. The UE that indicates support of this feature shall support *multiDCI-MultiTRP-r16* and *overlapRateMatchingEUTRA-CRS-r16.* This is only applicable for 15kHz SCS. | Band | No | N/A | FR1 only |
| ***semi-PersistentL1-SINR-Report-PUCCH-r16***Indicates whether the UE supports semi-persistent L1-SINR report on PUCCH. The UE indicating support of this feature shall include at least one of the following capabilities:- *supportReportFormat1-2OFDM-syms-r16* indicates support of report on PUCCH formats over 1 – 2 OFDM symbols once per slot (or piggybacked on a PUSCH)- *supportReportFormat4-14OFDM-syms-r16* indicates support of report on PUCCH formats over 4 – 14 OFDM symbols once per slot (or piggybacked on a PUSCH).The UE indicating support of this feature shall also indicate support of *ssb-csirs-SINR-measurement-r16.*  | Band | No | N/A | N/A |
| ***semi-PersistentL1-SINR-Report-PUSCH-r16***Indicates whether the UE supports semi-persistent L1-SINR report on PUSCH. The UE indicating support of this feature shall also indicate support of *ssb-csirs-SINR-measurement-r16.*  | Band | No | N/A | N/A |
| ***simul-SpatialRelationUpdatePUCCHResGroup-r16***Indicates whether the UE support PUCCH resource groups per BWP for simultaneous spatial relation update. The UE indicating support of this also indicates the capabilities of supported SRS resources and maximum supported spatial relations for the supported bands using *supportedSRS-Resources, maxNumberConfiguredSpatialRelations* and *pucch-SpatialRelInfoMAC-CE*. | Band | No | N/A | N/A |
| ***simulTX-SRS-AntSwitchingIntraBandUL-CA-r16***Indicates whether the UE support simultaneous transmission of SRS on different CCs for intra-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 intra-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 intra-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 intra-band UL CA.NOTE: For simultaneously antenna switching and antenna switching SRS in intra-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. | Band | No | N/A | N/A |
| ***simulSRS-MIMO-TransWithinBand-r16***Indicates the number of SRS resources for positioning and SRS resource for MIMO on a symbol within a band across multiple CCs. The UE can include this field only if the UE supports *srs-PosResources-r16*. Otherwise, the UE does not include this field. | Band | No | N/A | N/A |
| ***simulSRS-TransWithinBand-r16***Indicates the number of SRS resources for positioning on a symbol within a band across multiple CCs. The UE can include this field only if the UE supports *srs-PosResources-r16*. Otherwise, the UE does not include this field. | Band | No | N/A | N/A |
| ***simultaneousReceptionDiffTypeD-r16***Indicates whether the UE supports simultaneous reception with different QCL Type D reference signal as specified in TS38.213 [11]. | Band | No | N/A | FR2 only |
| ***spatialRelations, spatialRelations-v1640***Indicates whether the UE supports spatial relations. The capability signalling comprises the following parameters.- *maxNumberConfiguredSpatialRelations* indicates the maximum number of configured spatial relations per CC for PUCCH and SRS. It is not applicable to FR1 and applicable to FR2 only. The UE is mandated to report 16 or higher values. *maxNumberConfiguredSpatialRelations-v1640* indicates the maximum number of configured spatial relations per CC for PUCCH and SRS with UE supporting the configuration of maximum 64 PUCCH spatial relations per BWP per CC;- *maxNumberActiveSpatialRelations* indicates the maximum number of active spatial relations with regarding to PUCCH and SRS for PUSCH, per BWP per CC. It is not applicable to FR1 and applicable and mandatory to report one or higher value for FR2 only;- *additionalActiveSpatialRelationPUCCH* indicates support of one additional active spatial relation for PUCCH. It is mandatory with capability signalling if *maxNumberActiveSpatialRelations* is set to n1;- *maxNumberDL-RS-QCL-TypeD* indicates the maximum number of downlink RS resources used for QCL type D in the active TCI states and active spatial relation information, which is optional.The UE is mandated to report *spatialRelations* for FR2. if *maxNumberConfiguredSpatialRelations-v1640* is reported, UE shall report value *n96* in *maxNumberConfiguredSpatialRelations*. | Band | FD | N/A | FD |
| ***spatialRelationsSRS-Pos-r16***Indicates whether the UE supports spatial relations for SRS for positioning. The capability signalling comprises the following parameters.- *spatialRelation-SRS-PosBasedOnSSB-Serving-r16* indicates whether the UE supports spatial relation for SRS for positioning based on SSB from the serving cell in the same band. The UE can include this field only if the UE supports *srs-PosResources-r16*. Otherwise, the UE does not include this field;- *spatialRelation-SRS-PosBasedOnCSI-RS-Serving-r16* indicates whether the UE supports spatial relation for SRS for positioning based on CSI-RS from the serving cell in the same band. The UE can include this field only if the UE supports *spatialRelation-SRS-PosBasedOnSSB-Serving-r16*. Otherwise, the UE does not include this field;- *spatialRelation-SRS-PosBasedOnPRS-Serving-r16* indicates whether the UE supports spatial relation for SRS for positioning based on PRS from the serving cell in the same band. The UE can include this field only if the UE supports any of DL PRS Resources for DL AoD, DL PRS Resources for DL-TDOA or DL PRS Resources for Multi-RTT defined in TS37.355 [22], or *srs-PosResources-r16*. Otherwise, the UE does not include this field;- *spatialRelation-SRS-PosBasedOnSRS-r16* indicates whether the UE supports spatial relation for SRS for positioning based on SRS in the same band. The UE can include this field only if the UE supports *srs-PosResources-r16*. Otherwise, the UE does not include this field;- *spatialRelation-SRS-PosBasedOnSSB-Neigh-r16* indicates whether the UE supports spatial relation for SRS for positioning based on SSB from the neighbouring cell in the same band. The UE can include this field only if the UE supports *spatialRelation-SRS-PosBasedOnSSB-Serving-r16*. Otherwise, the UE does not include this field;- *spatialRelation-SRS-PosBasedOnPRS-Neigh-r16* indicates whether the UE supports spatial relation for SRS for positioning based on PRS from the neighbouring cell in the same band. The UE can include this field only if the UE supports *spatialRelation-SRS-PosBasedOnPRS-Serving-r16*. Otherwise, the UE does not include this field;NOTE: A PRS from a PRS-only TP is treated as PRS from a non-serving cell. | Band | No | N/A | FR2 only |
| ***sp-BeamReportPUCCH***Indicates support of semi-persistent 'CRI/RSRP' or 'SSBRI/RSRP' reporting using PUCCH formats 2, 3 and 4 in one slot. | Band | No | N/A | N/A |
| ***sp-BeamReportPUSCH***Indicates support of semi-persistent 'CRI/RSRP' or 'SSBRI/RSRP' reporting on PUSCH. | Band | No | N/A | N/A |
| ***sps-r16***Indicates whether the UE support of up to 8 configured SPS configurations in a BWP of a serving cell and up to 32 configured SPS configurations in a cell group. This field includes the following parameters:- *maxNumberConfigsPerBWP-r16* indicates the maximum number of active SPS configurations in a BWP of a serving cell.- *maxNumberConfigsAllCC-r16* indicates the maximum number of active SPS configurations across all serving cells in a MAC entity, and across MCG and SCG in case of NR-DC.The UE can include this feature only if the UE indicates supports of *downlinkSPS*.NOTE:- For all the reported bands in FR1, a same X1 value is reported for *maxNumberConfigsAllCC-r16*. For all the reported bands in FR2, a same X2 value is reported for *maxNumberConfigsAllCC-r16*.- The total number of active SPS configurations across all serving cells in FR1 is no greater than X1.- The total number of active SPS configurations across all serving cells in FR2 is no greater than X2.- If the CA have some serving cell(s) in FR1 and some serving cell(s) in FR2, the total number of active SPS configurations across all serving cells is no greater than max(X1, X2). | Band | No | N/A | N/A |
| ***srs-AssocCSI-RS***Parameters for the calculation of the precoder for SRS transmission based on channel measurements using associated NZP CSI-RS resource (srs-AssocCSI-RS) as described in clause 6.1.1.2 of TS 38.214 [12]. UE supporting this feature shall also indicate support of non-codebook based PUSCH transmission.This capability signalling includes list of the following parameters:- *maxNumberTxPortsPerResource* indicates the maximum number of Tx ports in a resource;- *maxNumberResourcesPerBand* indicates the maximum number of resources across all CCs within a band simultaneously;*-* *totalNumberTxPortsPerBand* indicates the total number of Tx ports across all CCs within a band simultaneously. | Band | No | N/A | N/A |
| ***ssb-csirs-SINR-measurement-r16***Indicates the limitations of the UE support of SSB/CSI-RS for L1-SINR measurement.This capability signalling includes list of the following parameters:Per slot limitations:- *maxNumberSSB-CSIRS-OneTx-CMR-r16* indicates the maximum number of SSB/CSI-RS (1TX) across all CCs within a band for Channel Measurement Report- *maxNumberCSI-IM-NZP-IMR-res-r16* indicates the maximum number of CSI-IM/NZP-IMR resources across all CCs within a band- maxNumberCSIRS-2Tx-res-r16 indicates the maximum number of CSI-RS (2TX) resources across all CCs within a band for Channel Measurement ReportMemory limitations:- *maxNumberSSB-CSIRS-res-r16* indicates the max number of SSB/CSI-RS resources across all CCs within a band as Channel Measurement Report- *maxNumberCSI-IM-NZP-IMR-res-mem-r16* indicates the maximum number of CSI-IM/NZP-IMR resources across all CCs within a bandOther limitations:- *supportedCSI-RS-Density-CMR-r16* indicates supported density of CSI-RS for Channel Measurement Report.- *maxNumberAperiodicCSI-RS-Res-r16* indicates the maximum number of aperiodic CSI-RS resources across all CCs within a band configured to measure L1-SINR (including CMR and IMR)- *supportedSINR-meas* indicates the supported SINR measurements.- *supportedSINR-meas-r16* contains values {*ssbWithCSI-IM*, *ssbWithNZP-IMR*, *csirsWithNZP-IMR*, *csi-RSWithoutIMR*} representing {SSB as CMR with dedicated CSI-IM, SSB as CMR with dedicated NZP IMR, CSI-RS as CMR with dedicated NZP IMR configured, CSI-RS as CMR without dedicated IMR configured}.- *supportedSINR-meas-v1670* indicates a 4-bit bitmap {ssbWithCSI-IM, ssbWithNZP-IMR, csirsWithNZP-IMR, csi-RSWithoutIMR}, where the leftmost bit corresponds to ssbWithCSI-IM, the next bit corresponds to ssbWithNZP-IMR and so on. UE indicating *supportedSINR-meas-v1670* shall always indicate *supportedSINR-meas-r16.*UE supporting this feature shall also indicate support of CSI-RS as CMR with dedicated CSI-IM. UE indicating support of this feature shall also indicate support of *periodicBeamReport* and *aperiodicBeamReport* or *sp-BeamReportPUCCH* and *sp-BeamReportPUSCH.* UE indicating support of *ssb-csirs-SINR-measurement-r16* shall support periodic and aperiodic L1-SINR report.NOTE 1: The reference slot duration is the shortest slot duration defined for the frequency range where the reported band belongs.NOTE 2: For *maxNumberSSB-CSIRS-res-r16* and *maxNumberCSI-IM-NZP-IMR-res-mem-r16* the configured CSI-RS resources for both active and inactive BWPs are counted.NOTE 3: For *maxNumberSSB-CSIRS-OneTx-CMR-r16, maxNumberCSI-IM-NZP-IMR-res-r16* and *maxNumberCSIRS-2Tx-res-r16*, CSI-RS resources configured as CMR without dedicated IMR are counted both as CMR and IMR.NOTE 4: For *maxNumberSSB-CSIRS-OneTx-CMR-r16*, *maxNumberCSI-IM-NZP-IMR-res-r16*, *maxNumberCSIRS-2Tx-res-r16*, *maxNumberAperiodicCSI-RS-Res-r16*, a SSB/CSI-RS resource is counted within the duration of a reference slot in which the corresponding reference signals are transmitted.NOTE 5: For *maxNumberSSB-CSIRS-OneTx-CMR-r16*, *maxNumberCSI-IM-NZP-IMR-res-r16*, *maxNumberCSIRS-2Tx-res-r16*, *maxNumberAperiodicCSI-RS-Res-r16*, if one resource used for L1-SINR measurement is referred N times by one or more CSI reporting settings with *reportQuantity-r16* = *ssb-Index-SINR-r16* or *cri-SINR-r16*, it is counted N times.NOTE 6: If more than one type of SINR measurement is indicated in *supportedSINR-meas-v1670*, it is left to UE implementation which SINR measurement to indicate in *supportedSINR-meas-r16*. | Band | No | N/A | N/A |
| ***support64CandidateBeamRS-BFR-r16***Indicates UE support of configuring maximum 64 candidate beam RSs per BWP per CC. UE indicating support of this feature shall also indicate support of *maxNumberCSI-RS-BFD, maxNumberSSB-BFD* and *maxNumberCSI-RS-SSB-CBD.* | Band | No | N/A | N/A |
| ***supportCodeWordSoftCombining-r16***Indicates whether UE supports codeword soft combining for FDMSchemeB. UE indicates support of this feature depends on whether the *supportFDM-SchemeB-r16* is also supported. | Band | No | N/A | N/A |
| ***supportFDM-SchemeA-r16***Indicates whether UE supports single DCI based FDMSchemeA. | Band | No | N/A | N/A |
| ***supportInter-slotTDM-r16***Indicates whether UE supports single-DCI based inter-slot TDM. This capability signalling includes the following:- *supportRepNumPDSCH-TDRA-r16* indicates support of RepNumR16 in PDSCH-TimeDomainResourceAllocation and the maximum value of RepNumR16- *maxTBS-Size-r16* indicates maximum TBS size.- *maxNumberTCI-states-r16* indicates the maximum number of TCI states. | Band | No | N/A | N/A |
| ***supportNewDMRS-Port-r16***Indicates whether UE supports of new DMRS port entry {0,2,3}. UE supports this feature should indicate support *singleDCI-SDM-scheme-r16* for the band. | Band | No | N/A | N/A |
| ***supportTDM-SchemeA-r16***Indicates whether UE supports single DCI based TDMSchemeA. The capability signalling includes the maximum TBS size. | Band | No | N/A | N/A |
| ***supportTwoPortDL-PTRS-r16***Indicates whether UE supports 2-port DL PT-RS. UE supports this feature should indicate support *singleDCI-SDM-scheme-r16* for the band. | Band | No | N/A | n/A |
| ***tci-StatePDSCH***Defines support of TCI-States for PDSCH. The capability signalling comprises the following parameters:- *maxNumberConfiguredTCIstatesPerCC* indicates the maximum number of configured TCI-states per CC for PDSCH. For FR2, the UE is mandated to set the value at least to 64 (i.e. value 128 is an optional value). For FR1, the UE is mandated to set these values at least to the maximum number of allowed SSBs in the supported band;- *maxNumberActiveTCI-PerBWP* indicates the maximum number of activated TCI-states per BWP per CC, including control and data. If a UE reports X active TCI state(s), it is not expected that more than X active QCL type D assumption(s) for any PDSCH and any CORESETs for a given BWP of a serving cell become active for the UE. The UE shall include this field.Note the UE is required to track only the active TCI states.The UE is mandated to report *tci-StatePDSCH*. | Band | Yes | N/A | N/A |
| ***trs-AdditionalBandwidth-r16***Indicates the UE supported TRS bandwidths, in addition to 52 RBs, for a 10MHz UE channel bandwidth. This field only applies for the BWPs configured with 52 RBs size and 15kHz SCS, in FDD bands.Value *trs-AddBW-Set1* indicates 28, 32, 36, 40, 44, 48 RBs.Value *trs-AddBW-Set2* indicates 32, 36, 40, 44, 48 RBs. | Band | No | FDD only | FR1 only |
| ***twoPortsPTRS-UL***Defines whether UE supports PT-RS with 2 antenna ports for UL transmission. | Band | No | N/A | N/A |
| ***type1-PUSCH-RepetitionMultiSlots-v1650***Indicates whether the UE supports Type 1 PUSCH transmissions with configured grant as specified in TS 38.214 [12] with UL-TWG-repK value equal to 2, 4, or 8 with a single repetition of the transport block within each slot, and redundancy version pattern as indicated by UL-TWG-RV-rep. A UE supporting this feature shall also support Type 1 PUSCH transmissions with configured grant as specified in TS 38.214 [12] with UL-TWG-repK value of one. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *type1-PUSCH-RepetitionMultiSlots-r16* applies. UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively.The UE only includes *type1-PUSCH-RepetitionMultiSlots-v1650* if *type1-PUSCH-RepetitionMultiSlots* is absent | Band | No | N/A | N/A |
| ***type2-PUSCH-RepetitionMultiSlots-v1650***Indicates whether the UE supports Type 2 PUSCH transmissions with configured grant as specified in TS 38.214 [12] with UL-TWG-repK value equal to 2, 4, or 8 with a single repetition of the transport block within each slot, and redundancy version pattern as indicated by UL-TWG-RV-rep. A UE supporting this feature shall also support Type 2 PUSCH transmissions with configured grant as specified in TS 38.214 [12] with UL-TWG-repK value of one. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *type2-PUSCH-RepetitionMultiSlots-r16* applies. UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands respectively.The UE only includes *type2-PUSCH-RepetitionMultiSlots-v1650* if *type2-PUSCH-RepetitionMultiSlots* is absent | Band | No | N/A | N/A |
| ***txDiversity-r16***Indicates whether the UE supports transparent Tx diversity requirements as specified in the suffix G clauses of TS 38.101-1 [2] (see also clauses 4.2 and 4.3 of TS38.101-1 [2]). | Band | No | N/A | FR1 only |
| ***ue-PowerClass, ue-PowerClass-v1610***For FR1, if the UE supports the different UE power class than the default UE power class as defined in clause 6.2 of TS 38.101-1 [2], the UE shall report the supported UE power class in this field. For FR2, UE shall report the supported UE power class as defined in clause 6 and 7 of TS 38.101-2 [3] in this field. This capability is not applicable to IAB-MT. | Band | Yes | N/A | N/A |
| ***uplinkBeamManagement***Defines support of beam management for UL. This capability signalling comprises the following parameters:- *maxNumberSRS-ResourcePerSet-BM* indicates the maximum number of SRS resources per SRS resource set configurable for beam management, supported by the UE.- *maxNumberSRS-ResourceSet* indicates the maximum number of SRS resource sets configurable for beam management, supported by the UE.If the UE does not set *beamCorrespondenceWithoutUL-BeamSweeping* to *supported*, the UE shall report this capability. This feature is optional for the UE that supports beam correspondence without uplink beam sweeping as defined in clause 6.6, TS 38.101-2 [3].NOTE: The network uses *maxNumberSRS-ResourceSet* to determine the maximum number of SRS resource sets that can be configured to the UE for periodic/semi-persistent/aperiodic configurations as below:

|  |  |
| --- | --- |
| **Maximum number of SRS resource sets across all time domain behaviour (periodic/semi-persistent/aperiodic) reported in *maxNumberSRS-ResourceSet*** | **Additional constraint on the maximum number of SRS resource sets configured to the UE for each supported time domain behaviour (periodic/semi-persistent/aperiodic)** |
| 1 | 1 |
| 2 | 1 |
| 3 | 1 |
| 4 | 2 |
| 5 | 2 |
| 6 | 2 |
| 7 | 4 |
| 8 | 4 |

 | Band | No | N/A | FR2 only |

|  |
| --- |
| Next Change |

4.2.7.2a *SharedSpectrumChAccessParamsPerBand*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Definitions for parameters** | **Per** | **M** | **FDD-TDD DIFF** | **FR1-FR2 DIFF** |
| ***ul-DynamicChAccess-r16***Indicates whether the UE supports UL channel access for dynamic channel access mode.Support of this feature is mandatory if UE supports any of the deployment scenarios A.2, B, C, D and E in Annex B.3 of TS 38.300 [28] with dynamic channel access mode. | Band  | CY | N/A | N/A |
| ***ul-Semi-StaticChAccess-r16***Indicates whether the UE supports UL channel access for semi-static channel access mode.Support of this feature is mandatory if UE supports any of the deployment scenarios A.2, B, C, D and E in Annex B.3 of TS 38.300 [28] with semi-static channel access mode. | Band  | CY | N/A | N/A |
| ***ssb-RRM-DynamicChAccess-r16***Indicates whether the UE supports SSB-based RRM for dynamic channel access mode.Support of this feature is mandatory if UE supports any of the deployment scenarios A.1, A.2, B, C, D and E in Annex B.3 of TS 38.300 [28] with dynamic channel access mode. | Band  | CY | N/A | N/A |
| ***ssb-RRM-Semi-StaticChAccess-r16***Indicates whether the UE supports SSB-based RRM for semi-static channel access mode, when SMTC window is no longer than the fixed frame period.Support of this feature is mandatory if UE supports any of the deployment scenarios A.1, A.2, B, C, D and E in Annex B.3 of TS 38.300 [28] with semi-static channel access mode. | Band  | CY | N/A | N/A |
| ***mib-Acquisition-r16***Indicates whether the UE supports acquiring MIB on an unlicensed cell for SpCell.Support of this feature is mandatory if UE supports any of the deployment scenarios B, C, D and E in Annex B.3 of TS 38.300 [28]. | Band  | CY | N/A | N/A |
| ***ssb-RLM-DynamicChAccess-r16***Indicates whether the UE supports SSB-based RLM for dynamic channel access mode.Support of this feature is mandatory if UE supports any of the deployment scenarios B, C, D and E in Annex B.3 of TS 38.300 [28] with dynamic channel access mode. | Band  | CY | N/A | N/A |
| ***ssb-RLM-Semi-StaticChAccess-r16***Indicates whether the UE supports SSB-based RLM for semi-static channel access mode, when discovery burst transmission window is no longer than the fixed frame period.Support of this feature is mandatory if UE supports any of the deployment scenarios B, C, D and E in Annex B.3 of TS 38.300 [28] with semi-static channel access mode. | Band  | CY | N/A | N/A |
| ***sib1-Acquisition-r16***Indicates whether the UE supports acquiring SIB1 on an unlicensed cell for PCell.Support of this feature is mandatory if UE supports any of the deployment scenarios C and D in Annex B.3 of TS 38.300 [28]. | Band  | CY | N/A | N/A |
| ***extRA-ResponseWindow-r16***Indicates whether the UE supports the configuration of maximum length of RAR window with a value larger than 10ms and up to 40ms by decoding of the 2 LSBs of SFN in the DCI format 1\_0 for 4-step RA type. Support of this feature is mandatory if the UE supports any of the deployment scenarios B, C, D and E in Annex B.3 of TS 38.300 [28]. | Band  | CY | N/A | N/A |
| ***ssb-BFD-CBD-dynamicChannelAccess-r16***Indicates whether the UE supports SSB based Beam Failure Detection and Candidate Beam Detection with NSSBQCL for dynamic channel access mode. | Band | No | N/A | N/A |
| ***ssb-BFD-CBD-semi-staticChannelAccess-r16***Indicates whether the UE supports SSB based Beam Failure Detection and Candidate Beam Detection with NSSBQCL for semi-static channel access mode. | Band | No | N/A | N/A |
| ***csi-RS-BFD-CBD-r16***Indicates whether the UE supports CSI-RS based Beam Failure Detection and Candidate Beam Detection for shared spectrum operation. | Band | No | N/A | N/A |
| ***ul-ChannelBW-SCell-10mhz-r16***Indicates whether the UE supports 10 MHz of LBT bandwidth for an SCell. A UE that supports this feature shall also support *ul-DynamicChAccess-r16* or *ul-Semi-StaticChAccess-r16*. | Band  | No | N/A | N/A |
| ***rssi-ChannelOccupancyReporting-r16***Indicates whether the UE supports RSSI measurements and channel occupancy reporting. | Band | No | N/A | N/A |
| ***srs-StartAnyOFDM-Symbol-r16***Indicates whether the UE supports transmitting SRS starting in all symbols (0 to 13) of a slot. This capability is also applicable to a frequency band that does not require shared spectrum access. | Band | No | N/A | N/A |
| ***searchSpaceFreqMonitorLocation-r16***Indicates the maximum number of frequency domain locations supported by the UE, for a search space set configuration with *freqMonitorLocations-r16*. | Band | No | N/A | N/A |
| ***coreset-RB-Offset-r16***Indicates whether the UE supports CORESET configuration with *rb-Offset-r16*. This capability is also applicable to a frequency band that does not require shared spectrum access. | Band | No | N/A | N/A |
| ***cgi-Acquisition-r16***Indicates whether the UE supports acquisition of CGI information from a neighbouring NR unlicensed cell in an unlicensed carrier by reading SIB1 of the neighbouring unlicensed cell and reporting the acquired information to the network. | Band | No | N/A | N/A |
| ***configuredUL-Tx-r16***Indicates whether the UE supports configuration of enableConfiguredUL-r16 and enable transmission of higher-layer configured UL (SRS, PUCCH, CG-PUSCH, etc) when SFI field in DCI 2\_0 is configured but DCI 2\_0 is not detected. | Band | No | N/A | N/A |
| ***prach-Wideband-r16***Indicates whether the UE supports enhanced PRACH design for operation with shared spectrum channel access by adopting a single long ZC sequence, with ZC sequence = 1151 for 15 kHz and ZC sequence = 571 for 30 kHz. | Band  | No | N/A | N/A |
| ***dci-AvailableRB-Set-r16***Indicates whether the UE supports monitoring DCI 2\_0 to read available RB set indicator. | Band  | No | N/A | N/A |
| ***dci-ChOccupancyDuration-r16***Indicates whether the UE supports monitoring DCI 2\_0 to read COT duration. | Band  | No | N/A | N/A |
| ***typeB-PDSCH-length-r16***Indicates whether the UE supports 1. Type B PDSCH length {3, 5, 6, 8, 9, 10, 11, 12, 13} without DMRS shift due to CRS collision. This capability is also applicable to a frequency band that does not require shared spectrum access. | Band | No | N/A | N/A |
| ***searchSpaceSwitchWithDCI-r16***Indicates whether the UE supports switching between two groups of search space sets with DCI 2\_0 monitoring that comprises of the following functional components:- Monitor DCI 2\_0 with a search space set switching field;- Support switching the search space set group with PDCCH decoding in group 1;- Support a timer to switch back to original search space set group;- Monitor DCI 2\_0 for channel occupancy time and use the end of channel occupancy time to switch back to the original search space set group.The UE can switch search space set groups for different cells independently, unless the UE supports *jointSearchSpaceSwitchAcrossCells-r16*. The UE supports search space set group switching capability-1: P=25/25/25 symbols for µ=0/1/2, unless the UE supports *searchSpaceSwitchCapability2-r16*. The UE supports search space switching triggers to be configured for up to 4 cells or 4 cell groups. | Band | No | N/A | N/A |
| ***extendedSearchSpaceSwitchWithDCI-r16***Indicates whether the UE supports search space switching triggers to be individually configured for up to 16 cells. UE indicating support of this feature shall indicate support of *searchSpaceSwitchWithDCI-r16*. | Band | No | N/A | N/A |
| ***searchSpaceSwitchWithoutDCI-r16***Indicates whether the UE supports switching between two groups of search space sets without DCI 2\_0 monitoring (i.e. implicit PDCCH decoding) that comprises of the following functional components:- Support switching the search space set group with PDCCH decoding in group 1;- Support a timer to switch back to original search space set group.The UE can switch search space set groups for different cells independently, unless the UE supports *jointSearchSpaceSwitchAcrossCells-r16*. The UE supports search space set group switching capability-1: P=25/25/25 symbols for µ=0/1/2, unless the UE supports *searchSpaceSwitchCapability2-r16*. | Band | No | N/A | N/A |
| ***searchSpaceSwitchCapability2-r16***Indicates whether the UE supports search space set group switching Capability-2: P=10/12/22 symbols for µ = 0/1/2 SCS. If the UE supports this feature, the UE needs to report *searchSpaceSwitchWithDCI-r16* or *searchSpaceSwitchWithoutDCI-r16*. | Band | No | N/A | N/A |
| ***non-numericalPDSCH-HARQ-timing-r16***Indicates whether the UE supports configuration of a value for *dl-DataToUL-ACK-r16* indicating an inapplicable time to report HARQ ACK. | Band | No | N/A | N/A |
| ***enhancedDynamicHARQ-codebook-r16***Indicates whether the UE supports enhanced dynamic HARQ codebook supporting grouping of HARQ ACK and triggering the retransmission of HARQ ACK in each group. The enhanced dynamic HARQ codebook comprises of the following functional components:- Support of bit fields signalling PDSCH HARQ group index and NFI in DCI 1\_1 (configuration of nfi-TotalDAI-Included);- Support of bit field in DCI 0\_1 for other group total DAI if configured. (configuration of ul-TotalDAI-Included);- Support the retransmission of HARQ ACK (pdsch-HARQ-ACK-Codebook = enhancedDynamic-r16).This capability is also applicable to a frequency band that does not require shared spectrum access. | Band | No | N/A | N/A |
| ***oneShotHARQ-feedback-r16***Indicates whether the UE supports one shot HARQ ACK feedback comprised of the following functional components:- Support feedback of type 3 HARQ-ACK codebook, triggered by a DCI 1\_1 scheduling a PDSCH;- Support feedback of type 3 HARQ-ACK codebook, triggered by a DCI 1\_1 without scheduling a PDSCH using a reserved FDRA value.This capability is also applicable to a frequency band that does not require shared spectrum access. | Band | No | N/A | N/A |
| ***multiPUSCH-UL-grant-r16***Indicates whether the UE supports scheduling up to 8 PUSCH with a single DCI 0\_1. This capability is also applicable to a frequency band that does not require shared spectrum access. | Band | No | N/A | N/A |
| ***csi-RS-RLM-r16***Indicates whether the UE supports CSI-RS based RLM for NR-Unlicensed. | Band | No | N/A | N/A |
| ***csi-RSRP-AndRSRQ-MeasWithSSB-r16***Indicates whether the UE can perform CSI-RSRP and CSI-RSRQ measurement as specified in TS 38.215 [13], where CSI-RS resource is configured with an associated SS/PBCH in shared spectrum channel access. | Band | No | N/A | N/A |
| ***csi-RSRP-AndRSRQ-MeasWithoutSSB-r16***Indicates whether the UE can perform CSI-RSRP and CSI-RSRQ measurement as specified in TS 38.215 [13], where CSI-RS resource is configured for a cell that transmits SS/PBCH block and without an associated SS/PBCH block in shared spectrum channel access. | Band | No | N/A | N/A |
| ***csi-SINR-Meas-r16***Indicates whether the UE can perform CSI-SINR measurements based on configured CSI-RS resources as specified in TS 38.215 [13] in shared spectrum channel access. If the UE supports this feature, the UE needs to report *maxNumberCSI-RS-RRM-RS-SINR*. UE indicating support of this feature shall indicate support of *csi-RSRP-AndRSRQ-MeasWithSSB-r16.* | Band | No | N/A | N/A |
| ***ssb-AndCSI-RS-RLM-r16***Indicates whether the UE can perform radio link monitoring procedure based on measurement of SS/PBCH block and CSI-RS as specified in TS 38.213 [11] and TS 38.133 [5] in shared spectrum channel access. If the UE supports this feature, the UE needs to report *maxNumberResource-CSI-RS-RLM*.UE indicating support of this feature shall indicate support of*csi-RS-RLM-r16* and either *ssb-RLM-DynamicChAccess-r16* or *ssb-RLM-Semi-StaticChAccess-r16*. | Band | No | N/A | N/A |
| ***csi-RS-CFRA-ForHO-r16***Indicates whether the UE can perform reconfiguration with sync using a contention free random access with 4-step RA type on PRACH resources that are associated with CSI-RS resources of the target cell in shared spectrum channel access.UE indicating support of this feature shall indicate support of either *csi-RSRP-AndRSRQ-MeasWithSSB-r16* or *csi-RSRP-AndRSRQ-MeasWithoutSSB-r16.* | Band | No | N/A | N/A |
| ***periodicAndSemi-PersistentCSI-RS-r16***indicates whether the UE supports validating P/SP-CSI-RS reception when receiving a DCI granting a PDSCH over the same set of symbols, and when receiving a DCI triggering an A-CSI-RS over the same set of symbols. | Band | No | N/A | N/A |
| ***pusch-PRB-interlace-r16***Indicates whether the UE supports PRB interlace frequency domain resource allocation for PUSCH. | Band | No | N/A | N/A |
| ***pucch-F0-F1-PRB-Interlace-r16***Indicates whether the UE supports PRB interlace frequency domain resource allocation for PUCCH format 0, 1, 2 and 3. | Band | No | N/A | N/A |
| ***occ-PRB-PF2-PF3-r16***Indicates whether the UE supports OCC for PRB interface mapping for PUCCH format 2 and 3. If the UE supports this feature, the UE needs to report *pucch-F0-F1-PRB-Interlace-r16*. | Band | No | N/A | N/A |
| ***extCP-rangeCG-PUSCH-r16***Indicates whether the UE supports generating a CP extension of length longer than 1 symbol for Configured Grant PUSCH transmission. If the UE supports this feature, the UE needs to report *configuredUL-GrantType1* or *configuredUL-GrantType1-v1650* and/or *configuredUL-GrantType2 or configuredUL-GrantType2-v1650*. | Band | No | N/A | N/A |
| ***configuredGrantWithReTx-r16***Indicates whether the UE supports configured grant with retransmission in configured grant resource, comprised of retransmission timer, DFI monitoring and CG-UCI in CG-PUSCH. If the UE supports this feature, the UE needs to report *configuredUL-GrantType1* *or configuredUL-GrantType1-v1650* and/or *configuredUL-GrantType2 or configuredUL-GrantType2-v1650*. | Band | No | N/A | N/A |
| ***ed-Threshold-r16***Indicates whether the UE supports using ED threshold given by gNB for UL to DL COT sharing. A UE that supports this feature shall also support *ul-DynamicChAccess-r16*. | Band | No | N/A | N/A |
| ***ul-DL-COT-Sharing-r16***Indicates whether the UE supports UL to DL COT sharing. A UE that supports this feature shall also support *ul-DynamicChAccess-r16*. | Band | No | N/A | N/A |
| ***mux-CG-UCI-HARQ-ACK-r16***Indicates whether the UE supports multiplexing CG-UCI with HARQ ACK. If the UE supports this feature, the UE needs to report *configuredGrantWithReTx-r16*. | Band | No | N/A | N/A |
| ***cg-resourceConfig-r16***Indicates whether the UE supports configuration of resources with *cg-nrofSlots-r16* and *cg-nrofPUSCH-InSlot-r16*. If the UE supports this feature, the UE needs to report *configuredUL-GrantType1* *or configuredUL-GrantType1-v1650* and/or *configuredUL-GrantType2 or configuredUL-GrantType2-v1650*. | Band | No | N/A | N/A |
| ***dl-ReceptionLBT-subsetRB-r16***Indicates whether the UE supports reception in a wideband carrier when LBT is successful in a subset of the configured RB sets, which are either contiguous or non-contiguous, of the carrier. | Band | No | N/A | N/A |
| ***dl-ReceptionIntraCellGuardband-r16***Indicates whether the UE supports reception in the non-zero intra-cell guardband between contiguous RB sets in DL wideband carrier operation wider than 20MHz when LBT is successful only in a subset of RB sets. The UE indicates support of this capability shall also indicates support of*dl-ReceptionLBT-subsetRB-r16****.*** | Band | No | N/A | N/A |

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| Next Change |

4.2.7.10 *Phy-Parameters*

| **Definitions for parameters** | **Per** | **M** | **FDD-TDD****DIFF** | **FR1-FR2****DIFF** |
| --- | --- | --- | --- | --- |
| ***absoluteTPC-Command***Indicates whether the UE supports absolute TPC command mode. | UE | No | No | Yes |
| ***aggregationFactorSPS-DL-r16***Indicates whether the UE supports configurable PDSCH aggregation factor ({1, 2, 4, 8}) per DL SPS configuration. The UE can include this feature only if the UE indicates supports of *downlinkSPS*. | UE | No | No | Yes |
| ***almostContiguousCP-OFDM-UL***Indicates whether the UE supports almost contiguous UL CP-OFDM transmissions as defined in clause 6.2 of TS 38.101-1 [2]. | UE | No | No | Yes |
| ***bwp-SwitchingDelay***Defines whether the UE supports DCI and timer based active BWP switching delay type1 or type2 specified in clause 8.6.2 of TS 38.133 [5]. It is mandatory to report type 1 or type 2. This capability is not applicable to IAB-MT. | UE | Yes | No | No |
| ***bwp-SwitchingMultiCCs-r16***Indicates whether the UE supports incremental delay for DCI and timer based active BWP switching on multiple CCs simultaneously as specified in TS 38.133 [5]. The capability signalling comprises of the following:- *type1-r16* indicates the delay value for type 1 BWP switching delay and has values of {100us, 200us}- *type2-r16* indicates the delay value for type 2 BWP switching delay and has values of {200us, 400us, 800us, 1000us}The UE indicating support of this feature shall also support *bwp-SwitchingDelay*, *bwp-SameNumerology* and/or *bwp-DiffNumerology*. It is mandatory to report either *type1-r16* or *type2-r16* for a UE which supports CA. | UE | CY | No | No |
| ***bwp-SwitchingMultiDormancyCCs-r16***Indicates whether the UE supports incremental delay for BWP switch processing on additional SCells in DCI based simultaneous dormant BWP switching on multiple SCells as specified in TS 38.133 [5]. The capability signalling comprises of the following:- *type1-r16* indicates the delay value for type 1 BWP switching delay and has values of {100us, 200us}- *type2-r16* indicates the delay value for type 2 BWP switching delay and has values of {200us, 400us, 800us, 1000us}The UE indicating support of this feature shall also support *scellDormancyWithinActiveTime-r16* or *scellDormancyOutsideActiveTime-r16*. | UE | No | No | No |
| ***cbg-FlushIndication-DL***Indicates whether the UE supports CBG-based (re)transmission for DL using CBG flushing out information (CBGFI) as specified in TS 38.214 [12]. | UE | No | No | No |
| ***cbg-TransIndication-DL***Indicates whether the UE supports CBG-based (re)transmission for DL using CBG transmission information (CBGTI) as specified in TS 38.214 [12]. | UE | No | No | No |
| ***cbg-TransIndication-UL***Indicates whether the UE supports both in-order and out-of-order CBG-based (re)transmission for UL using CBG transmission information (CBGTI) as specified in TS 38.214 [12]. | UE | No | No | No |
| ***cbg-TransInOrderPUSCH-UL-r16***Indicates whether the UE supports CBG-based re-transmission(s) of a TB using CBG transmission information (CBGTI) as specified in TS 38.214 [12] in the following two cases (both are considered as in-order CBG-based retransmission(s)):1. if the initial PUSCH transmission was not cancelled due to gNB scheduling/indication/configuration; and2. if the initial PUSCH transmission was cancelled due to gNB scheduling/indication/configuration and the following condition is satisfied: the UE is scheduled for a re-transmission of a CBG #N in a given TB when CBG #N-1 has been transmitted before or is scheduled in the same UL grant that includes CBG#N. | UE | No | No | No |
| ***cli-RSSI-FDM-DL-r16***Indicates whether serving cell DL signal/channel (e.g. PDSCH/PDCCH) and CLI-RSSI FDMed reception is supported as specified in TS 38.215 [13]. | UE | No | TDD only | Yes |
| ***cli-SRS-RSRP-FDM-DL-r16***Indicates whether serving cell DL signal/channel (e.g. PDSCH/PDCCH) and SRS-RSRP FDMed reception is supported as specified in TS 38.215 [13]. | UE | No | TDD only | Yes |
| ***codebookVariantsList-r16***Indicates the list of *SupportedCSI-RS-Resource* applicable to the codebook types supported by the UE. | UE | No | No | No |
| ***configuredUL-GrantType1***Indicates whether the UE supports Type 1 PUSCH transmissions with configured grant as specified in TS 38.214 [12] with UL-TWG-repK value of one. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *configuredUL-GrantType1-r16* applies. | UE | No | No | No |
| ***configuredUL-GrantType2***Indicates whether the UE supports Type 2 PUSCH transmissions with configured grant as specified in TS 38.214 [12] with UL-TWG-repK value of one. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *configuredUL-GrantType2-r16* applies. | UE | No | No | No |
| ***cqi-TableAlt***Indicates whether UE supports the CQI table with target BLER of 10^-5. | UE | No | No | Yes |
| ***cri-RI-CQI-WithoutNon-PMI-PortInd-r16***Indicates whether UE supports *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to '*cri-RI-CQ*' and the higher layer parameter *non-PMI-PortIndication* is not configured.UE indicating support of this feature shall also indicate support of *csi-ReportFramework*. | UE | No | No | Yes |
| ***crossSlotScheduling-r16***Indicates whether UE supports dynamic indication of applicable minimum scheduling restriction by DCI format 0\_1 and 1\_1, and the minimum scheduling offset for PDSCH and aperiodic CSI-RS triggering offset (K0), and PUSCH (K2), and the extended value range for aperiodic CSI-RS triggering offset. Support of this feature is reported for licensed and unlicensed bands, respectively. When this field is reported, either of *non-SharedSpectrumChAccess-r16* or *sharedSpectrumChAccess-r16* shall be reported, at least. | UE | No | No | No |
| ***csi-ReportFramework***See *csi-ReportFramework* in 4.2.7.2. For a band combination comprised of FR1 and FR2 bands, this parameter, if present, limits the corresponding parameter in *MIMO-ParametersPerBand*. | UE | Yes | No | N/A |
| ***csi-ReportFrameworkExt-r16***See *csi-ReportFramework* in 4.2.7.2. For a band combination comprised of FR1 and FR2 bands, this parameter, if present, limits the corresponding parameter in *MIMO-ParametersPerBand*. | UE | No | No | N/A |
| ***csi-ReportWithoutCQI***Indicates whether UE supports CSI reporting with report quantity set to 'CRI/RI/i1' as defined in clause 5.2.1.4 of TS 38.214 [12]. | UE | No | No | Yes |
| ***csi-ReportWithoutPMI***Indicates whether UE supports CSI reporting with report quantity set to 'CRI/RI/CQI' as defined in clause 5.2.1.4 of TS 38.214 [12]. | UE | No | No | Yes |
| ***csi-RS-CFRA-ForHO***Indicates whether the UE can perform reconfiguration with sync using a contention free random access with 4-step RA type on PRACH resources that are associated with CSI-RS resources of the target cell. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *csi-RS-CFRA-ForHO-r16* applies. | UE | No | No | No |
| ***csi-RS-IM-ReceptionForFeedback***See *csi-RS-IM-ReceptionForFeedback* in 4.2.7.2. For a band combination comprised of FR1 and FR2 bands, this parameter, if present, limits the corresponding parameter in *MIMO-ParametersPerBand*. | UE | Yes | No | N/A |
| ***csi-RS-ProcFrameworkForSRS***See *csi-RS-ProcFrameworkForSRS* in 4.2.7.2. For a band combination comprised of FR1 and FR2 bands, this parameter, if present, limits the corresponding parameter in *MIMO-ParametersPerBand*. | UE | No | No | N/A |
| ***csi-TriggerStateNon-ActiveBWP-r16***Indicates whether the UE supports CSI trigger states containing non-active BWP. | UE | No | No | No |
| ***dci-DL-PriorityIndicator-r16***Indicates whether the UE supports the priority indicator field configured in DCI formats 1\_1 and 1\_2 in a BWP when configured to monitor both DCI formats 1\_1 and 1\_2 in the BWP. | UE | No | No | No |
| ***dci-Format1-2And0-2-r16***Indicates whether the UE supports monitoring DCI format 1\_2 for DL scheduling and monitoring DCI format 0\_2 for UL scheduling. | UE | No | No | No |
| ***dci-UL-PriorityIndicator-r16***Indicates whether the UE supports the priority indicator field configured in DCI formats 0\_1 and 0\_2 in a BWP when configured to monitor both DCI formats 0\_1 and 0\_2 in the BWP. A UE supporting this feature shall also support *ul-IntraUE-Mux-r16* and *dci-Format1-2And0-2-r16*. | UE | No | No | No |
| ***defaultSpatialRelationPathlossRS-r16***Indicates the UE support of default spatial relation and pathloss reference RS for dedicated PUCCH/SRS and PUSCH. The UE indicating support of this also indicates the capabilities of supported SRS resources and maximum supported spatial relations for the supported FR2 bands using *supportedSRS-Resources* and *maxNumberConfiguredSpatialRelations.* | UE | No | No | FR2 only |
| ***dl-64QAM-MCS-TableAlt***Indicates whether the UE supports the alternative 64QAM MCS table for PDSCH. | UE | No | No | Yes |
| ***dl-SchedulingOffset-PDSCH-TypeA***Indicates whether the UE supports DL scheduling slot offset (K0) greater than 0 for PDSCH mapping type A. | UE | Yes | Yes | Yes |
| ***dl-SchedulingOffset-PDSCH-TypeB***Indicates whether the UE supports DL scheduling slot offset (K0) greater than 0 for PDSCH mapping type B. | UE | Yes | Yes | Yes |
| ***downlinkSPS***Indicates whether the UE supports PDSCH reception based on semi-persistent scheduling. One SPS configuration is supported per cell group. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *downlinkSPS-r16* applies. | UE | No | No | No |
| ***dynamicBetaOffsetInd-HARQ-ACK-CSI***Indicates whether the UE supports indicating beta-offset (UCI repetition factor onto PUSCH) for HARQ-ACK and/or CSI via DCI among the RRC configured beta-offsets. | UE | No | No | No |
| ***dynamicHARQ-ACK-Codebook***Indicates whether the UE supports HARQ-ACK codebook dynamically constructed by DCI(s). This field shall be set to *supported*. | UE | Yes | No | No |
| ***dynamicHARQ-ACK-CodeB-CBG-Retx-DL***Indicates whether the UE supports HARQ-ACK codebook size for CBG-based (re)transmission based on the DAI-based solution as specified in TS 38.213 [11]. | UE | No | No | No |
| ***dynamicPRB-BundlingDL***Indicates whether UE supports DCI-based indication of the PRG size for PDSCH reception. | UE | No | No | No |
| ***dynamicSFI***Indicates whether the UE supports monitoring for DCI format 2\_0 and determination of slot formats via DCI format 2\_0. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *dynamicSFI-r16* applies. | UE | No | Yes | Yes |
| ***dynamicSwitchRA-Type0-1-PDSCH***Indicates whether the UE supports dynamic switching between resource allocation Types 0 and 1 for PDSCH as specified in TS 38.212 [10]. | UE | No | No | No |
| ***dynamicSwitchRA-Type0-1-PUSCH***Indicates whether the UE supports dynamic switching between resource allocation Types 0 and 1 for PUSCH as specified in TS 38.212 [10]. | UE | No | No | No |
| ***enhancedPowerControl-r16***For DG-PUSCH, one bit (separately from SRI) in UL grant is used to indicate the P0 value if SRI is present in the UL grant, and 1 or 2 bits is used to indicate the P0 value if SRI is not present in the UL grant. | UE | No | No | Yes |
| ***extendedCG-Periodicities-r16***Indicates that the UE supports extended periodicities for CG Type 1 (if the UE indicates *configuredUL-GrantType1* or *configuredUL-GrantType1-v1650* capability) or CG Type 2 (if the UE indicates *configuredUL-GrantType2* or *configuredUL-GrantType2-v1650* capability) as specified by *periodicityExt-r16* field of IE *ConfiguredGrantConfig* in TS 38.331 [9]. | UE | No | No | No |
| ***extendedSPS-Periodicities-r16***Indicates that the UE supports extended periodicities for downlink SPS as specified by *periodicityExt-r16* field of IE *SPS-Config* in TS 38.331 [9]. | UE | No | No | No |
| ***fdd-PCellUL-TX-AllUL-Subframe-r16***Indicates whether the UE configured with *tdm-patternConfig-r16* can be semi-statically configured with LTE UL transmissions in all UL subframes not limited to the reference tdm-pattern (only for type 1 UE) in case of LTE FDD PCell. UE indicating support can configure its LTE FDD PCell with this feature on the band combination which indicates support of either *tdm-restrictionFDD-endc-r16*or *tdm-restrictionDualTX-FDD-endc-r16*. | UE | No | FDD only | FR1 only |
| ***harqACK-CB-SpatialBundlingPUCCH-Group-r16***Indicates whether the UE supports HARQ-ACK codebook type and HARQ-ACK spatial bundling configuration per PUCCH group as specified in TS 38.213 [11]. If the UE indicates support of this, it also supports two NR PUCCH groups with same numerology by setting *twoPUCCH-Group* to *supported.* | UE | No | No | No |
| ***harqACK-separateMultiDCI-MultiTRP-r16***Indicates whether the UE support of separate HARQ-ACK. The capability signalling of this feature includes the following:- *maxNumberLongPUCCHs-r16* indicates maximum number of long PUCCHs within a slot for separate HARQ-AckThe UE that indicates support of this feature shall support *multiDCI-MultiTRP-r16.* | UE | No | No | No |
| ***harqACK-jointMultiDCI-MultiTRP-r16***Indicates whether the UE support of joint HARQ-ACK. The UE that indicates support of this feature shall support *multiDCI-MultiTRP-r16.* | UE | No | No | No |
| ***pucch-F0-2WithoutFH***Indicates whether the UE supports transmission of a PUCCH format 0 or 2 without frequency hopping. When included, the UE does not support PUCCH formats 0 and 2 without frequency hopping. When not included, the UE supports the PUCCH formats 0 and 2 without frequency hopping. | UE | Yes | No | Yes |
| ***pucch-F1-3-4WithoutFH***Indicates whether the UE supports transmission of a PUCCH format 1, 3 or 4 without frequency hopping. When included, the UE does not support PUCCH formats 1, 3 and 4 without frequency hopping. When not included, the UE supports the PUCCH formats 1, 3 and 4 without frequency hopping. | UE | Yes | No | Yes |
| ***interleavingVRB-ToPRB-PDSCH***Indicates whether the UE supports receiving PDSCH with interleaved VRB-to-PRB mapping as specified in TS 38.211 [6]. | UE | Yes | No | No |
| ***interSlotFreqHopping-PUSCH***Indicates whether the UE supports inter-slot frequency hopping for PUSCH transmissions. | UE | No | No | No |
| ***intraSlotFreqHopping-PUSCH***Indicates whether the UE supports intra-slot frequency hopping for PUSCH transmission, except for PUSCH scheduled by PDCCH in the Type1-PDCCH common search space before RRC connection establishment. | UE | Yes | No | Yes |
| ***maxLayersMIMO-Adaptation-r16***Indicates whether the UE supports the network configuration of *maxMIMO-Layers* per DL BWP. If the UE supports this feature, the UE needs to report *maxLayersMIMO-Indication*. | UE | No | No | Yes |
| ***maxLayersMIMO-Indication***Indicates whether the UE supports the network configuration of *maxMIMO-Layers* as specified in TS 38.331 [9]. | UE | Yes | No | No |
| ***maxNumberPathlossRS-update-r16***Indicates the maximum number of configured pathloss reference RSs for PUSCH/PUCCH/SRS by RRC that the UE can support for MAC-CE based pathloss reference RS update. | UE | No | No | No |
| ***maxNumberSearchSpaces***Indicates whether the UE supports up to 10 search spaces in an SCell per BWP. | UE | No | No | No |
| ***maxNumberSRS-PosPathLossEstimateAllServingCells-r16***Indicates the maximum number of pathloss estimates that the UE can simultaneously maintain for all the SRS resource sets for positioning across all cells in addition to the up to four pathloss estimates that the UE maintains per serving cell for the PUSCH/PUCCH/SRS transmissions. The UE shall include this field if the UE supports any of *olpc-SRS-PosBasedOnPRS-Serving-r16, olpc-SRS-PosBasedOnSSB-Neigh-r16* and *olpc-SRS-PosBasedOnPRS-Neigh-r16.* Otherwise, the UE does not include this field; | UE | No | No | No |
| ***maxNumberSRS-PosSpatialRelationsAllServingCells-r16***Indicates the maximum number of maintained spatial relations for all the SRS resource sets for positioning across all serving cells in addition to the spatial relations maintained spatial relations per serving cell for the PUSCH/PUCCH/SRS transmissions. It is only applied for FR2. The UE can include this field only if the UE supports any of *spatialRelation-SRS-PosBasedOnSSB-Serving-r16*, *spatialRelation-SRS-PosBasedOnCSI-RS-Serving-r16*, *spatialRelation-SRS-PosBasedOnPRS-Serving-r16*, *spatialRelation-SRS-PosBasedOnSSB-Neigh-r16* or *spatialRelation-SRS-PosBasedOnPRS-Neigh-r16*. Otherwise, the UE does not include this field; | UE | No | No | FR2 only |
| ***maxTotalResourcesForAcrossFreqRanges-r16***Indicates the maximum total number of SSB/CSI-RS/CSI-IM resources for beam management, pathloss measurement, BFD, RLM and new beam identification across frequency ranges (both FR1 and FR2) that the UE supports.The capability signalling includes the following:- *maxNumberResWithinSlotAcrossCC-AcrossFR-r16* indicates maximum total number of SSB/CSI-RS/CSI-IM resources configured to measure within a slot across all CCs across all frequency ranges for any of L1-RSRP measurement, L1-SINR measurement, pathloss measurement, BFD, RLM and new beam identification.- *maxNumberResAcrossCC-AcrossFR-r16* indicates maximum total number of SSB/CSI-RS/CSI-IM resources configured across all CCs across all frequency ranges for any of L1-RSRP measurement, L1-SINR measurement, pathloss measurement, BFD, RLM and new beam identification.gNB takes into conjunction of this feature and the features *maxTotalResourcesForOneFreqRange-r16****,*** *beamManagementSSB-CSI-RS, maxNumberCSI-RS-BFD, maxNumberSSB-BFD* and *maxNumberCSI-RS-SSB-CBD* when configuring SSB/CSI-RS/CSI-IM resources for beam management, pathloss measurement, BFD, RLM and new beam identification across frequency ranges. The signalled values apply to the shortest slot duration defined in any FR(s) that are supported by the UE.NOTE 1: The "configured to measure" RS is counted within the duration of a reference slot in which the corresponding reference signals are transmitted.NOTE 2: Regarding the "configured to measure" RS counting- (basic usage 1): If one resource is used for one or multiple of BFD/RLM, it is counted as one.- (basic usage 2): If one resource is used for one or multiple of New Beam Identification/PL-RS/L1-RSRP, add 1.- L1-RSRP measurement includes cases associated with reports with *reportQuantity* set to '*ssb-Index-RSRP*', '*cri-RSRP*' or with *reportQuantity* set to '*none*' and *CSI-RS-ResourceSet* with higher layer parameter *trs-Info* is not configured.- If one resource is used for L1-SINR in addition to basic usage 1 & 2, add N if referred N times by one or more CSI Reporting settings with *reportQuantity-r16* = '*ssb-Index-SINR-r16*' or '*cri-SINR-r16*'. | UE | No | No | No |
| ***maxTotalResourcesForOneFreqRange-r16***Indicates the maximum total number of SSB/CSI-RS/CSI-IM resources for beam management, pathloss measurement, BFD, RLM and new beam identification for one frequency range that the UE supports.The capability signalling includes the following:*- maxNumberResWithinSlotAcrossCC-OneFR-r16* indicates maximum total number of SSB/CSI-RS/CSI-IM resources configured to measure within a slot across all CCs in one frequency range for any of L1-RSRP measurement, L1-SINR measurement, pathloss measurement, BFD, RLM and new beam identification*- maxNumberResAcrossCC-OneFR-r16* indicates maximum total number of SSB/CSI-RS/CSI-IM resources configured across all CCs in one frequency range for any of L1-RSRP measurement, L1-SINR measurement, pathloss measurement, BFD, RLM and new beam identification.gNB takes into conjunction of this feature and the features *beamManagementSSB-CSI-RS, maxNumberCSI-RS-BFD, maxNumberSSB-BFD* and *maxNumberCSI-RS-SSB-CBD* when configuring SSB/CSI-RS/CSI-IM resources for beam management, pathloss measurement, BFD, RLM and new beam identification across one frequency range.NOTE 1: The reference slot duration is the shortest slot duration defined for the reported FR supported by the UE.NOTE 2: For RS configured for new beam identification, they are always counted regardless of beam failure event.NOTE 3: The *maxNumberResWithinSlotAcrossCC-AcrossFR-r16* only counts those in active BWP but the *maxNumberResAcrossCC-AcrossFR-r16* counts all configured including both active and inactive BWP.NOTE 4: The "configured to measure" RS is counted within the duration of a reference slot in which the corresponding reference signals are transmitted.NOTE 5: Regarding the "configured to measure" RS counting- (basic usage 1): If one resource is used for one or multiple of BFD/RLM, it is counted as one.- (basic usage 2): If one resource is used for one or multiple of New Beam Identification/PL-RS/L1-RSRP, add 1.- L1-RSRP measurement includes cases associated with reports with *reportQuantity* set to '*ssb-Index-RSRP*', '*cri-RSRP*' or with *reportQuantity* set to '*none*' and *CSI-RS-ResourceSet* with higher layer parameter *trs-Info* is not configured.- If one resource is used for L1-SINR in addition to basic usage 1 & 2, add N if referred N times by one or more CSI Reporting settings with *reportQuantity-r16* = '*ssb-Index-SINR-r16*' or '*cri-SINR-r16*'. | UE | No | No | Yes |
| ***monitoringDCI-SameSearchSpace-r16***Indicates whether the UE supports monitoring both DCI format 0\_1/1\_1 and DCI format 0\_2/1\_2 in the same search space. If the UE supports this feature, the UE needs to report *dci-Format1-2And0-2-r16*. | UE | No | No | No |
| ***multipleCORESET***Indicates whether the UE supports configuration of up to two PDCCH CORESETs per BWP in addition to the CORESET with CORESET-ID 0 in the BWP. If this is not supported, the UE supports one PDCCH CORESET per BWP in addition to the CORESET with CORESET-ID 0 in the BWP. It is mandatory with capability signaling for FR2 and optional for FR1. | UE | CY | No | Yes |
| ***mux-HARQ-ACK-PUSCH-DiffSymbol***Indicates whether the UE supports HARQ-ACK piggyback on a PUSCH with/without aperiodic CSI once per slot when the starting OFDM symbol of the PUSCH is different from the starting OFDM symbols of the PUCCH resource that HARQ-ACK would have been transmitted on. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *mux-HARQ-ACK-PUSCH-DiffSymbol-r16* applies. | UE | Yes | No | Yes |
| ***mux-MultipleGroupCtrlCH-Overlap***Indicates whether the UE supports more than one group of overlapping PUCCHs and PUSCHs per slot per PUCCH cell group for control multiplexing. | UE | No | No | Yes |
| ***mux-SR-HARQ-ACK-CSI-PUCCH-MultiPerSlot***Indicates whether the UE supports multiplexing SR, HARQ-ACK and CSI on a PUCCH or piggybacking on a PUSCH more than once per slot when SR, HARQ-ACK and CSI are supposed to be sent with the same or different starting symbol in a slot. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *mux-SR-HARQ-ACK-CSI-PUCCH-MultiPerSlot-r16* applies. | UE | No | No | Yes |
| ***mux-SR-HARQ-ACK-CSI-PUCCH-OncePerSlot****sameSymbol* indicates the UE supports multiplexing SR, HARQ-ACK and CSI on a PUCCH or piggybacking on a PUSCH once per slot, when SR, HARQ-ACK and CSI are supposed to be sent with the same starting symbols on the PUCCH resources in a slot. *diffSymbol* indicates the UE supports multiplexing SR, HARQ-ACK and CSI on a PUCCH or piggybacking on a PUSCH once per slot, when SR, HARQ-ACK and CSI are supposed to be sent with the different starting symbols in a slot. The UE is mandated to support the multiplexing and piggybacking features indicated by *sameSymbol* while the UE is optional to support the multiplexing and piggybacking features indicated by *diffSymbol*.If the UE indicates *sameSymbol* in this field and does not support *mux-HARQ-ACK-PUSCH-DiffSymbol*, the UE supports HARQ-ACK/CSI piggyback on PUSCH once per slot, when the starting OFDM symbol of the PUSCH is the same as the starting OFDM symbols of the PUCCH resource(s) that would have been transmitted on.If the UE indicates *sameSymbol* in this field and supports *mux-HARQ-ACK-PUSCH-DiffSymbol*, the UE supports HARQ-ACK/CSI piggyback on PUSCH once per slot for which case the starting OFDM symbol of the PUSCH is the different from the starting OFDM symbols of the PUCCH resource(s) that would have been transmitted on. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *mux-SR-HARQ-ACK-CSI-PUCCH-OncePerSlot-r16* applies. | UE | FD | No | Yes |
| ***mux-SR-HARQ-ACK-PUCCH***Indicates whether the UE supports multiplexing SR and HARQ-ACK on a PUCCH or piggybacking on a PUSCH once per slot, when SR and HARQ-ACK are supposed to be sent with the different starting symbols in a slot. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *mux-SR-HARQ-ACK-PUCCH-r16* applies. | UE | No | No | Yes |
| ***newBeamIdentifications2PortCSI-RS-r16***Indicates whether the UE supports 2 port CSI-RS for new beam identification with the same resource counting as in *maxTotalResourcesForOneFreqRange-r16* and *maxTotalResourcesForAcrossFreqRanges-r16*. | UE | No | No | No |
| ***nzp-CSI-RS-IntefMgmt***Indicates whether the UE supports interference measurements using NZP CSI-RS. | UE | No | No | No |
| ***oneFL-DMRS-ThreeAdditionalDMRS-UL***Defines whether the UE supports DM-RS pattern for UL transmission with 1 symbol front-loaded DM-RS with three additional DM-RS symbols. | UE | No | No | Yes |
| ***oneFL-DMRS-TwoAdditionalDMRS-UL***Defines support of DM-RS pattern for UL transmission with 1 symbol front-loaded DM-RS with 2 additional DM-RS symbols and more than 1 antenna ports. | UE | Yes | No | Yes |
| ***onePortsPTRS***Defines whether UE supports PT-RS with 1 antenna port in DL reception and/or UL transmission. It is mandatory with UE capability signalling for FR2 and optional for FR1. The left most in the bitmap corresponds to DL reception and the right most bit in the bitmap corresponds to UL transmission. | UE | CY | No | Yes |
| ***onePUCCH-LongAndShortFormat***Indicates whether the UE supports transmission of one long PUCCH format and one short PUCCH format in TDM in the same slot. | UE | No | No | Yes |
| ***pathlossEstimation2PortCSI-RS-r16***Indicates whether the UE supports 2 port CSI-RS for pathloss estimation with the same resource counting as in *maxTotalResourcesForOneFreqRange-r16* and *maxTotalResourcesForAcrossFreqRanges-r16*. | UE | No | No | No |
| ***pCell-FR2***Indicates whether the UE supports PCell operation on FR2. | UE | Yes | No | FR2 only |
| ***pdcch-MonitoringSingleOccasion***Indicates whether the UE supports receiving PDCCH in a search space configured to be monitored within a single span of any three contiguous OFDM symbols in a slot with the capability of supporting at least 44 blind decodes in a slot for 15 kHz subcarrier spacing. | UE | No | No | FR1 only |
| ***pdcch-BlindDetectionCA***Indicates PDCCH blind decoding capabilities supported by the UE for CA with more than 4 CCs as specified in TS 38.213 [11]. The field value is from 4 to 16.NOTE: FR1-FR2 differentiation is not allowed in this release, although the capability signalling is supported for FR1-FR2 differentiation. | UE | No | No | No |
| ***pdcch-BlindDetectionMCG-UE***Indicates PDCCH blind decoding capabilities supported for MCG when in NR DC. The field value is from 1 to 15. The UE sets the value in accordance with the constraints specified in TS 38.213 [11].Additionally, if the UE does not report *pdcch-BlindDetectionCA*, and if X is the maximum number of CCs supported by the UE across all NR-DC band combinations then there is at least one parameter pair (X1, X2) such that X1 + X2 = X and the UE supports at least one NR-DC band combination with X1 CCs in MCG and X2 CCs in SCG and for which X1 <= *pdcch-BlindDetectionMCG-UE* and X2 <= *pdcch-BlindDetectionSCG-UE*. | UE | No | No | Yes |
| ***pdcch-BlindDetectionSCG-UE***Indicates PDCCH blind decoding capabilities supported for SCG when in NR DC. The field value is from 1 to 15. The UE sets the value in accordance with the constraints specified in TS 38.213 [11].Additionally, if the UE does not report *pdcch-BlindDetectionCA*, and if X is the maximum number of CCs supported by the UE across all NR-DC band combinations then there is at least one parameter pair (X1, X2) such that X1 + X2 = X and the UE supports at least one NR-DC band combination with X1 CCs in MCG and X2 CCs in SCG and for which X1 <= *pdcch-BlindDetectionMCG-UE* and X2 <= *pdcch-BlindDetectionSCG-UE*. | UE | No | No | Yes |
| ***pdcch-MonitoringAnyOccasionsWithSpanGapCrossCarrierSch-r16***Indicates how the UE supports *pdcch-MonitoringAnyOccasionsWithSpanGap* in case of cross-carrier scheduling with different SCSs in the scheduling cell and the scheduled cell.Value 'mode2' indicates *pdcch-MonitoringAnyOccasionsWithSpanGap* is supported for the band of the scheduling/triggering/indicating cell.Value 'mode3' indicates *pdcch-MonitoringAnyOccasionsWithSpanGap* is supported in both the band of the scheduled/triggered/indicated cell and the band of the scheduling/triggering/indicating cell.UE indicating support of these feature indicates support of *pdcch-MonitoringAnyOccasionsWithSpanGap* and *crossCarrierSchedulingDL-DiffSCS-r16*.NOTE: For *pdcch-MonitoringAnyOccasionsWithSpanGap*, the supported set (set1, set2 or set 3) for cross-carrier scheduling with the different SCSs in the scheduling cell and the scheduled cell is still based on the indicated value for the band of the scheduling cell. | UE | No | No | No |
| ***pdsch-256QAM-FR1***Indicates whether the UE supports 256QAM modulation scheme for PDSCH for FR1 as defined in 7.3.1.2 of TS 38.211 [6]. | UE | Yes | No | FR1 only |
| ***pdsch-MappingTypeA***Indicates whether the UE supports receiving PDSCH using PDSCH mapping type A with less than seven symbols. This field shall be set to *supported*. | UE | Yes | No | No |
| ***pdsch-MappingTypeB***Indicates whether the UE supports receiving PDSCH using PDSCH mapping type B. | UE | Yes | No | No |
| ***pdsch-RepetitionMultiSlots***Indicates whether the UE supports receiving PDSCH scheduled by DCI format 1\_1 when configured with higher layer parameter *pdsch-AggregationFactor* > 1, as defined in 5.1.2.1 of TS 38.214 [12]. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *pdsch-RepetitionMultiSlots-r16* applies. | UE | No | No | No |
| ***pdsch-RE-MappingFR1-PerSymbol/pdsch-RE-MappingFR1-PerSlot***Indicates the maximum number of supported PDSCH Resource Element (RE) mapping patterns for FR1, each described as a resource (including NZP/ZP CSI-RS, CRS, CORESET and SSB) or bitmap. The number of patterns coinciding in a symbol in a CC and in a slot in a CC are limited by the respective capability parameters. Value n10 means 10 RE mapping patterns and n16 means 16 RE mapping patterns, and so on. The UE shall set the fields *pdsch-RE-MappingFR1-PerSymbol* and *pdsch-RE-MappingFR1-PerSlo*t to at least n10 and n16, respectively. In the exceptional case that the UE does not include the fields, the network may anyway assume that the UE supports the required minimum values. | UE | Yes | No | FR1 only |
| ***pdsch-RE-MappingFR2-PerSymbol/pdsch-RE-MappingFR2-PerSlot***Indicates the maximum number of supported PDSCH Resource Element (RE) mapping patterns for FR2, each described as a resource (including NZP/ZP CSI-RS, CORESET and SSB) or bitmap. The number of patterns coinciding in a symbol in a CC and in a slot in a CC are limited by the respective capability parameters. Value n6 means 6 RE mapping patterns and n16 means 16 RE mapping patterns, and so on. The UE shall set the fields *pdsch-RE-MappingFR2-PerSymbol* and *pdsch-RE-MappingFR2-PerSlo*t to at least n6 and n16, respectively. In the exceptional case that the UE does not include the fields, the network may anyway assume that the UE supports the required minimum values. | UE | Yes | No | FR2 only |
| ***precoderGranularityCORESET***Indicates whether the UE supports receiving PDCCH in CORESETs configured with CORESET-precoder-granularity equal to the size of the CORESET in the frequency domain as specified in TS 38.211 [6]. | UE | No | No | No |
| ***pre-EmptIndication-DL***Indicates whether the UE supports interrupted transmission indication for PDSCH reception based on reception of DCI format 2\_1 as defined in TS 38.213 [11]. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *pre-EmptIndication-DL-r16* applies. | UE | No | No | No |
| ***pucch-F2-WithFH***Indicates whether the UE supports transmission of a PUCCH format 2 (2 OFDM symbols in total) with frequency hopping in a slot. This field shall be set to *supported*. | UE | Yes | No | Yes |
| ***pucch-F3-WithFH***Indicates whether the UE supports transmission of a PUCCH format 3 (4~14 OFDM symbols in total) with frequency hopping in a slot. This field shall be set to *supported*. | UE | Yes | No | Yes |
| ***pucch-F3-4-HalfPi-BPSK***Indicates whether the UE supports pi/2-BPSK for PUCCH format 3/4 as defined in 6.3.2.6 of TS 38.211 [6]. It is optional for FR1 and mandatory with capability signalling for FR2. This capability is not applicable to IAB-MT. | UE | CY | No | Yes |
| ***pucch-F4-WithFH***Indicates whether the UE supports transmission of a PUCCH format 4 (4~14 OFDM symbols in total) with frequency hopping in a slot. | UE | Yes | No | Yes |
| ***pusch-RepetitionMultiSlots***Indicates whether the UE supports transmitting PUSCH scheduled by DCI format 0\_1 when configured with higher layer parameter *pusch-AggregationFactor* > 1, as defined in clause 6.1.2.1 of TS 38.214 [12]. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *pusch-RepetitionMultiSlots-r16* applies. | UE | Yes | No | No |
| ***pucch-Repetition-F1-3-4***Indicates whether the UE supports transmission of a PUCCH format 1 or 3 or 4 over multiple slots with the repetition factor 2, 4 or 8. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *pucch-Repetition-F1-3-4-r16* applies. | UE | Yes | No | No |
| ***pusch-HalfPi-BPSK***Indicates whether the UE supports pi/2-BPSK modulation scheme for PUSCH as defined in 6.3.1.2 of TS 38.211 [6]. It is optional for FR1 and mandatory with capability signalling for FR2. This capability is not applicable to IAB-MT. | UE | CY | No | Yes |
| ***pusch-LBRM***Indicates whether the UE supports limited buffer rate matching in UL as specified in TS 38.212 [10]. | UE | No | No | Yes |
| ***pusch-RepetitionTypeA-r16***Indicates whether the UE supports PUSCH transmission with or without slot aggregation. Support of this field is reported for shared spectrum channel access and non-shared spectrum channel access, respectively. | UE | No | No | No |
| ***ra-Type0-PUSCH***Indicates whether the UE supports resource allocation Type 0 for PUSCH as specified in TS 38.214 [12]. | UE | No | No | No |
| ***rateMatchingCtrlResrcSetDynamic***Indicates whether the UE supports dynamic rate matching for DL control resource set. | UE | Yes | No | No |
| ***rateMatchingResrcSetDynamic***Indicates whether the UE supports receiving PDSCH with resource mapping that excludes the REs corresponding to resource sets configured with RB-symbol level granularity indicated by *bitmaps* (see *patternType* in *RateMatchPattern* in TS 38.331[9]) based on dynamic indication in the scheduling DCI as specified in TS 38.214 [12]. | UE | No | No | No |
| ***rateMatchingResrcSetSemi-Static***Indicates whether the UE supports receiving PDSCH with resource mapping that excludes the REs corresponding to resource sets configured with RB-symbol level granularity indicated by *bitmaps* and *controlResourceSet* (see *patternType* in *RateMatchPattern* in TS 38.331[9]) following the semi-static configuration as specified in TS 38.214 [12]. | UE | Yes | No | No |
| ***scs-60kHz***Indicates whether the UE supports 60kHz subcarrier spacing for data channel in FR1 as defined in clause 4.2-1 of TS 38.211 [6]. | UE | No | No | FR1 only |
| ***semiOpenLoopCSI***Indicates whether UE supports CSI reporting with report quantity set to 'CRI/RI/i1/CQI ' as defined in clause 5.2.1.4 of TS 38.214 [12]. | UE | No | No | Yes |
| ***semiStaticHARQ-ACK-Codebook***Indicates whether the UE supports HARQ-ACK codebook constructed by semi-static configuration. | UE | Yes | No | No |
| ***simultaneousTCI-ActMultipleCC-r16***Indicates the UE support of simultaneous TCI state activation across multiple CCs. If the UE indicates support of this for a FR, the UE shall support this on the supported bands of the indicated FR where the UE reports the support of TCI-states for PDSCH using *tci-StatePDSCH.* | UE | No | No | Yes |
| ***simultaneousSpatialRelationMultipleCC-r16***Indicates the UE support of simultaneous spatial relation across multiple CCs for aperiodic and semi-persistent SRS. The UE indicating support of this also indicates the capabilities of maximum and active supported spatial relations for the supported FR2 bands using *maxNumberConfiguredSpatialRelations* and *maxNumberActiveSpatialRelations.* | UE | No | No | FR2 only |
| ***spatialBundlingHARQ-ACK***Indicates whether the UE supports spatial bundling of HARQ-ACK bits carried on PUCCH or PUSCH per PUCCH group. With spatial bundling, two HARQ-ACK bits for a DL MIMO data is bundled into a single bit by logical "AND" operation. | UE | Yes | No | No |
| ***spatialRelationUpdateAP-SRS-r16***Indicates the UE support of spatial relation update for AP-SRS using MAC CE. The UE indicating support of this also indicates the capabilities of supported SRS resources and maximum supported spatial relations for the supported FR2 bands using *supportedSRS-Resources* and *maxNumberConfiguredSpatialRelations.* | UE | No | No | FR2 only |
| ***spCellPlacement***Indicates whether the UE supports a SpCell on FR1-FDD, FR1-TDD and/or FR2-TDD depending on which additional SCells of other frequency range(s) / duplex mode(s) are configured. It is applicable to NR SA and NR-DC (both MCG and SCG), where UL is configured on more than one of FR1-FDD, FR1-TDD and FR2-TDD in a cell group. If not included, the UE supports SpCell on any serving cell with UL in supported band combinations. | UE | No | No | No |
| ***sp-CSI-IM***Indicates whether the UE supports semi-persistent CSI-IM. | UE | No | No | Yes |
| ***sp-CSI-ReportPUCCH***Indicates whether UE supports semi-persistent CSI reporting using PUCCH formats 2, 3 and 4. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *sp-CSI-ReportPUCCH-r16* applies. | UE | No | No | No |
| ***sp-CSI-ReportPUSCH***Indicates whether UE supports semi-persistent CSI reporting using PUSCH. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *sp-CSI-ReportPUSCH-r16* applies. | UE | No | No | No |
| ***sp-CSI-RS***Indicates whether the UE supports semi-persistent CSI-RS. | UE | Yes | No | Yes |
| ***sps-ReleaseDCI-1-1-r16***Indicates whether the UE supports SPS release by DCI format 1\_1. If the UE supports this feature, the UE needs to report *downlinkSPS*. | UE | No | No | No |
| ***sps-ReleaseDCI-1-2-r16***Indicates whether the UE supports SPS release by DCI format 1\_2. If the UE supports this feature, the UE needs to report *downlinkSPS* and *dci-Format1-2And0-2-r16*. | UE | No | No | No |
| ***supportedDMRS-TypeDL***Defines supported DM-RS configuration types at the UE for DL reception. Type 1 is mandatory with capability signaling. Type 2 is optional. If this field is not included, Type 1 is supported. | UE | FD | No | Yes |
| ***supportedDMRS-TypeUL***Defines supported DM-RS configuration types at the UE for UL transmission. Support of both type 1 and type 2 is mandatory with capability signalling. If this field is not included, Type 1 is supported. | UE | FD | No | Yes |
| ***supportRepetitionZeroOffsetRV-r16***Indicates whether UE supports the value 0 for the parameter *sequenceOffsetforRV*.The UE indicating support of this capability shall also indicate support of *supportInter-slotTDM-r16* with *maxNumberTCI-states-r16* set to 2 for at least one band. | UE | No | No | No |
| ***supportRetx-Diff-CoresetPool-Multi-DCI-TRP-r16***Indicates that retransmission scheduled by a different *CORESETPoolIndex* for multi-DCI multi-TRP is not supported.For multi-DCI multi-TRP operation, if this feature is reported, UE does not support retransmission scheduled by PDCCH received in a different *CORESETPoolIndex* compared to the *CORESETPoolIndex* of the initial transmission, i.e., the UE is not expected to receive, for the same HARQ process ID, DCI from a different *CORESETPoolIndex* that schedules the retransmission, i.e., NDI not flipped. This applies to both PDSCH and PUSCH retransmissions.UE indicating support of this feature shall indicate support of *multiDCI-MultiTRP-r16.* | UE | No | No | No |
| ***targetSMTC-SCG-r16***Indicates the support of configuration of SMTC of target SCG cell with field *targetCellSMTC-SCG*. | UE | No | No | No |
| ***tdd-MultiDL-UL-SwitchPerSlot***Indicates whether the UE supports more than one switch points in a slot for actual DL/UL transmission(s). | UE | No | TDD only | Yes |
| ***tdd-PCellUL-TX-AllUL-Subframe-r16***Indicates whether the UE configured with *tdm-patternConfig-r16* can be semi-statically configured with LTE UL transmissions in all UL subframes not limited to the reference tdm-pattern (only for type 1 UE) in case of TDD PCell. UE indicating support can configure LTE TDD PCell with this feature on the band combination which indicates support of *tdm-restrictionTDD-endc-r16*. | UE | No | TDD only | FR1 only |
| ***tpc-PUCCH-RNTI***Indicates whether the UE supports group DCI message based on TPC-PUCCH-RNTI for TPC commands for PUCCH. | UE | No | No | Yes |
| ***tpc-PUSCH-RNTI***Indicates whether the UE supports group DCI message based on TPC-PUSCH-RNTI for TPC commands for PUSCH. | UE | No | No | Yes |
| ***tpc-SRS-RNTI***Indicates whether the UE supports group DCI message based on TPC-SRS-RNTI for TPC commands for SRS. | UE | No | No | Yes |
| ***twoDifferentTPC-Loop-PUCCH***Indicates whether the UE supports two different TPC loops for PUCCH closed loop power control. | UE | Yes | Yes | Yes |
| ***twoDifferentTPC-Loop-PUSCH***Indicates whether the UE supports two different TPC loops for PUSCH closed loop power control. | UE | Yes | Yes | Yes |
| ***twoFL-DMRS***Defines whether the UE supports DM-RS pattern for DL reception and/or UL transmission with 2 symbols front-loaded DM-RS without additional DM-RS symbols.The left most in the bitmap corresponds to DL reception and the right most bit in the bitmap corresponds to UL transmission. | UE | Yes | No | Yes |
| ***twoFL-DMRS-TwoAdditionalDMRS-UL***Defines whether the UE supports DM-RS pattern for UL transmission with 2 symbols front-loaded DM-RS with one additional 2 symbols DM-RS. | UE | Yes | No | Yes |
| ***twoPUCCH-AnyOthersInSlot***Indicates whether the UE supports transmission of two PUCCH formats in TDM in the same slot, which are not covered by *twoPUCCH-F0-2-ConsecSymbols* and *onePUCCH-LongAndShortFormat*. | UE | No | No | Yes |
| ***twoPUCCH-F0-2-ConsecSymbols***Indicates whether the UE supports transmission of two PUCCHs of format 0 or 2 in consecutive symbols in a slot. | UE | No | Yes | Yes |
| ***twoStepRACH-r16***Indicates whether the UE supports the following basic structure and procedure of 2-step RACH:- Fallback procedures from 2-step RA type to 4-step RA type;- MSGA PRACH resource and format determination;- MSGA PUSCH configuration;- Validation and transmission of MSGA PRACH and PUSCH;- Mapping between preamble of MSGA PRACH and PUSCH occasion with DMRS resource of MSGA PUSCH;- MSGB monitoring and decoding;- PUCCH transmission for HARQ-ACK feedback to a MSGB;- Power control for MSGA PRACH, MSGA PUSCH and PUCCH carrying HARQ-ACK feedback to MSGB.- Reconfiguration with sync using a contention free random access with 2-step RA type on MSGA PRACH and PUSCH resources that are associated with SSB resources of the target cell. | UE | No | No | No |
| ***twoTCI-Act-servingCellInCC-List-r16***Indicates whether the UE supports receiving the Enhanced TCI States Activation/Deactivation for UE-specific PDSCH MAC CE (as specified in TS 38.321 [8] clause 6.1.3.24) indicating a serving cell configured as part of *simultaneousTCI-UpdateList1* or *simultaneousTCI-UpdateList2* as specified in TS 38.331 [9].If the UE indicates support of *simultaneousTCI-ActMultipleCC-r16* for a FR and support of at least one of *singleDCI-SDM-scheme-r16*, *supportFDM-SchemeA-r16*, *supportFDM-SchemeB-r16*, *supportTDM-SchemeA-r16* or *supportInter-slotTDM-r16* for at least one band or component carrier of this FR, the UE shall indicate support of *twoTCI-Act-servingCellInCC-List-r16* for this FR. | UE | CY | No | Yes |
| ***type1-HARQ-ACK-Codebook-r16***Indicates whether the UE supports Type 1 HARQ-ACK codebook for TDRA using the starting symbol of the PDCCH monitoring occasion in which the DL assignment is detected as the reference of the SLIV. If the UE supports this feature, the UE needs to report *dci-Format1-2And0-2-r16*. Support for FR1/FR2 is differentiated from the viewpoint of the scheduled carrier. | UE | No | No | Yes |
| ***type1-PUSCH-RepetitionMultiSlots***Indicates whether the UE supports Type 1 PUSCH transmissions with configured grant as specified in TS 38.214 [12] with UL-TWG-repK value equal to 2, 4, or 8 with a single repetition of the transport block within each slot, and redundancy version pattern as indicated by UL-TWG-RV-rep. A UE supporting this feature shall also support Type 1 PUSCH transmissions with configured grant as specified in TS 38.214 [12] with UL-TWG-repK value of one. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *type1-PUSCH-RepetitionMultiSlots-r16* applies. | UE | No | No | No |
| ***type2-CG-ReleaseDCI-0-1-r16***Indicates whether the UE supports type 2 configured grant release by DCI format 0\_1. If the UE supports this feature, the UE needs to report *configuredUL-GrantType2* or *configuredUL-GrantType2-v1650*. | UE | No | No | No |
| ***type2-CG-ReleaseDCI-0-2-r16***Indicates whether the UE supports type 2 configured grant release by DCI format 0\_2. If the UE supports this feature, the UE needs to report *configuredUL-GrantType2* or *configuredUL-GrantType2-v1650* and *dci-Format1-2And0-2-r16*. | UE | No | No | No |
| ***type2-HARQ-ACK-Codebook-r16***Indicates whether the UE supports Type 2 HARQ-ACK codebook when HARQ-ACK feedback in a codebook corresponds to more than one unicast DL DCI for same scheduled cell in a monitoring occasion of a scheduling cell using the PDSCH starting time in addition to the existing monitoring occasion and Cell index to order the HARQ-ACK feedback. | UE | No | No | No |
| ***type2-PUSCH-RepetitionMultiSlots***Indicates whether the UE supports Type 2 PUSCH transmissions with configured grant as specified in TS 38.214 [12] with UL-TWG-repK value equal to 2, 4, or 8 with a single repetition of the transport block within each slot, and redundancy version pattern as indicated by UL-TWG-RV-rep. A UE supporting this feature shall also support Type 2 PUSCH transmissions with configured grant as specified in TS 38.214 [12] with UL-TWG-repK value of one. This applies only to non-shared spectrum channel access. For shared spectrum channel access, *type2-PUSCH-RepetitionMultiSlots-r16* applies. | UE | No | No | No |
| ***type2-SP-CSI-Feedback-LongPUCCH***Indicates whether UE supports Type II CSI semi-persistent CSI reporting over PUCCH Formats 3 and 4 as defined in clause 5.2.4 of TS 38.214 [12]. | UE | No | No | No |
| ***uci-CodeBlockSegmentation***Indicates whether the UE supports segmenting UCI into multiple code blocks depending on the payload size. | UE | Yes | No | Yes |
| ***ul-64QAM-MCS-TableAlt***Indicates whether the UE supports the alternative 64QAM MCS table for PUSCH with and without transform precoding respectively. | UE | No | No | Yes |
| ***ul-SchedulingOffset***Indicates whether the UE supports UL scheduling slot offset (K2) greater than 12. | UE | Yes | Yes | Yes |

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| Next Change |

6 Conditionally mandatory features without UE radio access capability parameters

| **Features** | **Condition** |
| --- | --- |
| Skipping UL configured grant if no data to transmit, as specified in release-15 version of TS38.321 [3]. | Either *configuredUL-GrantType1* or *configuredUL-GrantType1*-v1650 or *configuredUL-GrantType2* or *configuredUL-GrantType2-v1650*is supported. |
| Downlink SDAP header | Either NAS reflective QoS or *as-ReflectiveQoS* is supported. |
| IMS emergency call | It is mandatory to support IMS emergency call for UEs which are IMS voice capable in NR. |
| MAC subheaders with one-octet eLCID field | It is mandatory to support MAC subheaders with one-octet eLCID field for UEs/IAB-MTs supporting MAC CEs using extended LCID values as specified in TS 38.321 [8]. |

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| End of changes |