**3GPP TSG-RAN WG2 Meeting #112 Electronic *R2-200xxxx***

**Elbonia, 02 – 13 November 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** | **1787** | **rev** | **1** | **Current version:** |  |  |
|  |
| *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:***  | Capturing *ul-256QAM-r15* capability |
|  |  |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | LTE\_1024QAM\_DL-Core, TEI15 |  | ***Date:*** | 2020-11-12 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | 15 |
|  | *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-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
|  |  |
| ***Reason for change:*** | Based on TS 36.331 specification, the 256QAM in UL is defined in the Feature Set per CC in R15 but not captured in TS 36.306.  |
|  |  |
| ***Summary of change:*** | The capability is updated.**Impact analysis**Impacted functionality: UL 256 QAM capability.Impacted architectures: EN-DC, NGEN-DC, NE-DCInter-operability: There is no interoperability issue. |
|  |  |
| ***Consequences if not approved:*** | Capability description for *ul-256QAM-r15* cannot be found in the TS 36.306. |
|  |  |
| ***Clauses affected:*** | 4.3.4.xyz (new) |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 36.331 CR xxxx |
| ***affected:*** |  |  |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  |  |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

*First Modified Subclause*

### 4.3.4 Physical layer parameters

#### 4.3.4.1 *ue-TxAntennaSelectionSupported*

This field defines whether the UE supports transmit antenna selection.

#### 4.3.4.2 *ue-SpecificRefSigsSupported*

This field defines whether the UE supports PDSCH transmission mode 7 for FDD.

#### 4.3.4.3 Void

#### 4.3.4.4 *enhancedDualLayerFDD*

This field defines whether the UE supports enhanced dual layer (PDSCH transmission mode 8) for FDD.

#### 4.3.4.5 *enhancedDualLayerTDD*

This field defines whether the UE supports enhanced dual layer (PDSCH transmission mode 8) for TDD. Enhanced dual layer shall be supported by UEs of this version of the specification supporting TDD.

#### 4.3.4.6 *supportedMIMO-CapabilityUL-r10*

This field defines the maximum number of spatial multiplexing layers in the uplink direction for a certain band and bandwidth class in a supportedBandCombination supported by the UE.

#### 4.3.4.7 *supportedMIMO-CapabilityDL-r10*

This field defines the maximum number of spatial multiplexing layers in the downlink direction for a certain band and bandwidth class in a supportedBandCombination supported by the UE. For bandwidth classes that include multiple component carriers (i.e. bandwidth classes B, C, D and so on), the field defines the maximum number of spatial multiplexing layers supported by the UE on all component carriers in the corresponding bandwidth class.

The support for more layers in *supportedMIMO-CapabilityDL* than given by the "maximum number of supported layers for spatial multiplexing in DL" derived from the *ue-Category* (without suffix) in the *UE-EUTRA-Capability* IE is only applicable to transmission mode 9 and transmission mode 10.

#### 4.3.4.8 *two-AntennaPortsForPUCCH-r10*

This field defines whether the UE supports transmit diversity for PUCCH formats 1/1a/1b/2/2a/2b, and if the UE supports PUCCH format 3, transmit diversity for PUCCH format 3.

#### 4.3.4.9 *tm9-With-8Tx-FDD-r10*

This field defines whether the UE supports PDSCH transmission mode 9 with 8 CSI reference signal ports for FDD when not operating in CE mode.

#### 4.3.4.10 *pmi-Disabling-r10*

This field defines whether the UE supports PMI disabling.

#### 4.3.4.11 *crossCarrierScheduling-r10*

This field defines whether the UE supports cross carrier scheduling operation for carrier aggregation, including (if the UE supports carrier aggregation in UL) the use of PCell as the pathloss reference for an SCell when *pathlossReference-r10* within *UplinkPowerControlDedicatedSCell-r10* is configured as "pCell". The UE supports PDCCH DCI formats with CIF if the UE indicates support for cross carrier scheduling.

NOTE: Regardless of whether the UE supports cross carrier scheduling operation or not, it is mandatory for a UE supporting carrier aggregation in UL to support the configuration where *pathlossReference-r10* within *UplinkPowerControlDedicatedSCell-r10* is set to "sCell".

#### 4.3.4.12 *simultaneousPUCCH-PUSCH-r10*

This field defines whether the UE baseband supports simultaneous transmission of PUCCH and PUSCH, and is band agnostic. If the UE indicates support of baseband capability for simultaneous transmission of PUCCH and PUSCH using this field, and if the UE indicates support of RF capability for non-contiguous UL resource allocation within a component carrier for a particular E-UTRA radio frequency band, then the UE supports simultaneous transmission of PUCCH and PUSCH within each component carrier of the band. If the UE indicates support of baseband capability for simultaneous transmission of PUCCH and PUSCH using this field, and if the UE indicates support of carrier aggregation in UL, then the UE supports simultaneous transmission of PUCCH and PUSCH across any UL component carriers which the UE can aggregate. If the UE supports uplink LAA, this field is only applicable for non-LAA cells. For LAA SCells, see clause 7.7.4. If the UE supports DC, this field is applicable within a CG. If the UE supports PUCCH on SCell, this field is applicable within a PUCCH group as defined in TS 36.213 [22].

#### 4.3.4.13 *multiClusterPUSCH-WithinCC-r10*

This field defines whether the UE baseband supports multi-cluster PUSCH transmission within a component carrier (i.e. PUSCH resource allocation type 1), and is band agnostic. If the UE indicates support of baseband capability for multi-cluster PUSCH transmission within a component carrier using this field, and if the UE indicates support of RF capability for non-contiguous UL resource allocation within a component carrier for a particular E-UTRA radio frequency band, then the UE supports multi-cluster PUSCH transmission within each component carrier of the band.

NOTE: If the UE indicates support of carrier aggregation in UL, then the UE supports PUSCH transmissions over non-contiguous resource blocks across any UL component carriers which the UE can aggregate, regardless of whether or not the UE indicates support of baseband capability for multi-cluster PUSCH transmission within a component carrier using this field.

#### 4.3.4.14 *nonContiguousUL-RA-WithinCC-Info-r10*

This field defines whether the UE RF supports non-contiguous UL resource allocations within a component carrier, and is signalled per E-UTRA radio frequency band which the UE supports.

#### 4.3.4.15 *crs-InterfHandl-r11*

This field defines whether the UE supports CRS interference handling. It is mandatory for UEs of this release of the specification, except for Category 0, M1, 1bis and M2 UEs.

#### 4.3.4.16 Void

#### 4.3.4.17 Void

#### 4.3.4.18 *ePDCCH-r11*

This field defines whether the UE can receive DCI on UE specific search space on Enhanced PDCCH.

#### 4.3.4.19 *multiACK-CSI-Reporting-r11*

This field defines whether the UE supports multi-cell HARQ ACK and periodic CSI reporting and SR on PUCCH format 3 if the UE supports FDD carrier aggregation with more than two DL component carriers or TDD carrier aggregation.

#### 4.3.4.20 *ss-CCH-InterfHandl-r11*

This field defines whether the UE supports synchronisation signal and common channel interference handling if the UE supports *crs-InterfHandl-r11*. It is mandatory for UEs of this release of the specification to support this feature for TDD bands, except for Category 0, M1, 1bis and M2 UEs.

#### 4.3.4.21 *tdd-SpecialSubframe-r11*

This field defines whether the UE supports TDD special subframe as specified in TS 36.211 [17]. It is mandatory for UEs of this release of the specification.

#### 4.3.4.21A *tdd-SpecialSubframe-r14*

This field defines whether the UE supports TDD special subframe configuration 10 as specified in TS 36.211 [17]. A UE indicating support of *tdd-SpecialSubframe-r14* shall not indicate support of *ssp10-TDD-Only-r14*.

#### 4.3.4.21B *ssp10-TDD-Only-r14*

This field defines whether the UE supports TDD special subframe configuration 10 when operating only in TDD carriers (i.e., not in TDD/FDD CA or TDD/FS3 CA) as specified in TS 36.211 [17]. A UE indicating support of *ssp10-TDD-Only-r14* shall not indicate support of *tdd-SpecialSubframe-r14*.

#### 4.3.4.22 *txDiv-PUCCH1b-ChSelect-r11*

This field defines whether the UE supports transmit diversity for PUCCH format 1b with channel selection if the UE supports carrier aggregation and *two-AntennaPortsForPUCCH-r10*. UE supporting *txDiv-PUCCH1b-ChSelect* shall support configuration of *PUCCH-ConfigDedicated-v13c0*.

#### 4.3.4.23 *ul-CoMP-r11*

This field defines whether the UE supports UL Coordinated Multi-Point operation. It is mandatory for UEs of this release of the specification.

#### 4.3.4.24 *tm5-FDD*

This field defines whether the UE supports PDSCH transmission mode 5 for FDD.

#### 4.3.4.25 *tm5-TDD*

This field defines whether the UE supports PDSCH transmission mode 5 for TDD.

#### 4.3.4.26 *interBandTDD-CA-WithDifferentConfig-r11*

This field defines whether the UE supports inter-band TDD carrier aggregation with different UL/DL configuration combinations. It is mandatory for UEs of this release of the specification if inter-band TDD carrier aggregation is supported.

#### 4.3.4.27 *e-HARQ-Pattern-FDD-r12*

This field defines whether the UE supports enhanced HARQ pattern for TTI bundling operation for FDD.

#### 4.3.4.28 *tdd-FDD-CA-PCellDuplex-r12*

The presence of this field indicates that the UE supports TDD/FDD CA in any supported band combination including at least one FDD band with *bandParametersUL* and at least one TDD band with *bandParametersUL*. The first bit is set to "1" if UE supports the TDD PCell. The second bit is set to "1" if UE supports FDD PCell. This field is included only if the UE supports band combination including at least one FDD band with *bandParametersUL* and at least one TDD band with *bandParametersUL*. If this field is included, the UE shall set at least one of the bits as "1". If this field is included with DC, then it is applicable within a CG, and the presence of this field indicates the capability of the UE to support TDD/FDD CA with at least one FDD band and at least one TDD band in the same CG, with the value indicating the support for TDD/FDD PCell (PSCell).

#### 4.3.4.29 *csi-SubframeSet-r12*

This field defines whether the UE supports Rel-12 DL CSI subframe set configuration, Rel-12 DL CSI subframe set dependent CSI measurement/feedback, configuration of up to 2 CSI-IM resources for a CSI process with no more than 4 CSI-IM resources for all CSI processes of one frequency if the UE supports tm10, configuration of two ZP-CSI-RS for tm1-tm9, PDSCH RE mapping with two ZP-CSI-RS configurations, and EPDCCH RE mapping with two ZP-CSI-RS configurations if the UE supports EPDCCH. This field is only applicable for UEs supporting TDD.

#### 4.3.4.30 *phy-TDD-ReConfig-FDD-PCell-r12*

This field defines whether the UE supports TDD UL/DL reconfiguration for TDD serving cell(s) via monitoring PDCCH with eIMTA-RNTI on a FDD PCell, and HARQ feedback according to UL and DL HARQ reference configurations.

#### 4.3.4.31 *phy-TDD-ReConfig-TDD-PCell-r12*

This field defines whether the UE supports TDD UL/DL reconfiguration for TDD serving cell(s) via monitoring PDCCH with eIMTA-RNTI on a TDD PCell, and HARQ feedback according to UL and DL HARQ reference configurations.

#### 4.3.4.32 *pusch-SRS-PowerControl-SubframeSet-r12*

This field defines whether the UE supports subframe set dependent UL power control for PUSCH and SRS. This field is only applicable for UEs supporting TDD.

#### 4.3.4.33 *enhanced-4TxCodebook-r12*

This field defines whether the UE supports enhanced 4Tx codebook as specified in TS 36.211 [17].

#### 4.3.4.34 *pusch-FeedbackMode-r12*

This field defines whether the UE supports PUSCH feedback mode 3-2 as specified in TS 36.213 [22].

#### 4.3.4.35 *naics-Capability-List-r12*

This field indicates that the UE supports NAICS, i.e. receiving assistance information from serving cell and using it to cancel or suppress interference of a neighbouring cell for at least one band combination. For each entry of the list, the NAICS capability for a band combination is indicated as a combination of *numberOfNAICSCapableCC* and *numberOfAggregatedPRB*.

#### 4.3.4.36 *noResourceRestrictionForTTIBundling-r12*

This field defines whether the UE supports TTI bundling operation without resource allocation restriction. It is mandatory for UEs of this release of the specification except for Category M1 and Category M2 UEs.

#### 4.3.4.37 Void

#### 4.3.4.38 *discoverySignalsInDeactSCell-r12*

This field defines whether the UE supports the behaviour on DL signals and physical channels when SCell is deactivated and discovery signals measurement is configured as specified in TS 36.211 [17]. A UE that supports this feature shall also support carrier aggregation and *crs-DiscoverySignalsMeas-r12*.

#### 4.3.4.39 *ul-64QAM-r12*

This field defines whether the UE supports UL 64QAM. A UE that supports 64QAM in UL shall support 64QAM in UL in all supported frequency bands.

#### 4.3.4.40 *supportedMIMO-CapabilityDL-r12*

This field defines the maximum number of spatial multiplexing layers in the downlink direction supported by the UE on a single component carrier for bandwidth classes that include multiple component carriers (i.e. bandwidth classes B, C, D and so on).

The support for more layers in *supportedMIMO-CapabilityDL-12* than given by the "maximum number of supported layers for spatial multiplexing in DL" derived from the *ue-Category* or *ue-CategoryDL* in the *UE-EUTRA-Capability* IE is only applicable to transmission mode 9 and transmission mode 10.

#### 4.3.4.41 *alternativeTBS-Indices-r12*

This field defines whether alternative TBS indices *I*TBS 26A and 33A as specified in TS 36.213 [22] are supported by the UE which is capable of transmission mode 9 or 10. Support of the alternative TBS index *I*TBS 33A is applied for the UE supporting 256QAM in DL.

#### 4.3.4.42 *codebook-HARQ-ACK-r13*

The first bit of this bitmap defines whether HARQ ACK codebook size determination based on the DAI-based solution as specified in TS 36.213 [22] is supported by the UE. If the UE supports carrier aggregation with more than 5 DL component carriers, it is mandatory to support HARQ ACK codebook size determination based on the DAI-based solution.

The second bit of this bitmap defines whether HARQ ACK codebook size determination based on the number of configured CCs as specified in TS 36.213 [22] is supported by the UE. If the UE supports carrier aggregation with more than 5 DL component carriers, it is mandatory to support HARQ ACK codebook size determination based on the number of configured CCs.

#### 4.3.4.43 *fdd-HARQ-TimingTDD-r13*

This field defines whether FDD HARQ timing for TDD SCell when configured with TDD PCell as specified in TS 36.213 [22] is supported by the UE.

#### 4.3.4.44 *maxNumberUpdatedCSI-Proc-r13*

This field defines the maximum number of CSI processes to be updated per UE for which aperiodic CSI is requested for CA with more than 5CCs as specified in TS 36.213 [22] which is supported by the UE.

#### 4.3.4.45 *pucch-Format4-r13*

This field defines whether PUCCH format 4 as specified in TS 36.213 [22] is supported by the UE. It is mandatory for UEs of this release of the specification if TDD carrier aggregation with more than 5 DL component carriers is supported. It is mandatory for UEs of this release of the specification if FDD carrier aggregation with more than [FFS] DL component carriers is supported.

#### 4.3.4.46 *pucch-Format5-r13*

This field defines whether PUCCH format 5 as specified in TS 36.213 [22] is supported by the UE.

#### 4.3.4.47 *pucch-SCell-r13*

This field defines whether PUCCH transmission on SCell in CA is supported by the UE.

#### 4.3.4.48 *supportedBlindDecoding-r13*

This field defines blind decoding capabilities supported by the UE as specified in TS 36.213 [22].

##### 4.3.4.48.1 *maxNumberDecoding-r13*

This field defines the maximum number of blind decodes in the UE specific search space per UE in one subframe for CA with more than 5CCs as specified in TS 36.213 [22] which is supported by the UE. The number of blind decodes supported by the UE is the field value \* 32. The UE indicating the maximum number of blind decodes in this field shall also support *pdcch-CandidateReduction-r13* and/or *skipMonitoringDCI-Format0-1A-r13*.

##### 4.3.4.48.2 *pdcch-CandidateReductions-r13*

This field defines whether the UE supports PDCCH candidate reduction on UE specific search space as specified in TS 36.213 [22], clause 9.1.1.

##### 4.3.4.48.3 *skipMonitoringDCI-Format0-1A-r13*

This field defines whether the UE supports blind decoding reduction on UE specific search space by not monitoring DCI Format 0 and 1A as specified in TS 36.213 [22], clause 9.1.1.

#### 4.3.4.49 *crs-InterfMitigationTM10-r13*

The field defines whether the UE supports CRS interference mitigation in transmission mode 10. The UE supporting the *crs-InterfMitigationTM10-r13* capability shall also support the *crs-InterfHandl-r11* capability.

#### 4.3.4.49a *crs-InterfMitigationTM1toTM9-r13*

The field defines whether the UE supports CRS interference mitigation (CRS-IM) while operating in the following transmission modes (TM): TM 1, TM 2, …, TM 8 and TM 9. The UE shall not include the field if it does not support CRS IM in TMs 1-9. If the field is present, the UE supports CRS-IM on at least one arbitrary downlink CC for up to *crs-InterfMitigationTM1toTM9-r13* downlink CC CA configuration. The UE signals *crs-InterfMitigationTM1toTM9-r13* value to indicate the maximum *crs-InterfMitigationTM1toTM9-r13* downlink CC CA configuration where UE may apply CRS IM. For example, the UE sets "*crs-InterfMitigationTM1toTM9-r13* = 3" to indicate that the UE supports CRS-IM on at least one DL CC for supported non-CA, 2DL CA and 3DL CA configurations. The UE supporting the *crs-InterfMitigationTM1toTM9-r13* capability shall also support the *crs-InterfHandl-r11* capability.

If this field is present, UE supports any of the following features:

1) CRS-IM with 2 CRS antenna ports for PDSCH for UEs with 2 receiver antenna ports (as specified in the TS 36.101 [6])

2) CRS-IM with 4 CRS antenna ports for PDSCH for UEs with 2 receiver antenna ports (as specified in the TS 36.101 [6])

3) CRS-IM with 2 CRS antenna ports for PDSCH for UEs with 4 receiver antenna ports (as specified in the TS 36.101 [6])

4) CRS-IM with 4 CRS antenna ports for PDSCH for UEs with 4 receiver antenna ports (as specified in the TS 36.101 [6])

#### 4.3.4.50 *pdsch-CollisionHandling-r13*

This field defines whether PDSCH collision handling as specified in TS 36.213 [22] is supported by the UE.

#### 4.3.4.51 *aperiodicCSI-Reporting-r13*

This field defines whether the UE supports aperiodic CSI reporting with 3 bits of the CSI request field size as specified in TS 36.213 [22], clause 7.2.1 and/or aperiodic CSI reporting mode 1-0 and mode 1-1 as specified in TS 36.213 [22], clause 7.2.1.

#### 4.3.4.52 *crossCarrierScheduling-B5C-r13*

This field defines whether the UE supports cross carrier scheduling beyond 5 DL component carriers. If supported, the UE shall also support *crossCarrierScheduling-r10*, i.e., cross carrier scheduling up to 5 DL component carriers.

#### 4.3.4.53 *spatialBundling-HARQ-ACK-r13*

This field defines whether the UE supports HARQ-ACK spatial bundling on PUCCH or PUSCH as specified in TS 36.213 [22], clauses 7.3.1 and 7.3.2.

#### 4.3.4.54 *uci-PUSCH-Ext-r13*

This field defines whether the UE supports an extension of UCI delivering more than 22 HARQ-ACK bits on PUSCH as specified in TS 36.212 [26], clause 5.2.2.6 and TS 36.213 [22], clause 8.6.3. It is mandatory for UEs of this release of the specification if TDD carrier aggregation with more than 5 DL component carriers is supported. It is mandatory for UEs of this release of the specification if FDD carrier aggregation with more than [FFS] DL component carriers is supported.

#### 4.3.4.55 *multiTone-r13*

This field defines whether the UE supports UL multi-tone transmissions on NPUSCH. This field is only applicable for UEs of any *ue-Category-NB*. It is mandatory for UEs of this release of the specification.

#### 4.3.4.56 *multiCarrier-r13*

This field defines whether the UE supports multi-carrier operation. This field is only applicable for UEs of any *ue-Category-NB*. It is mandatory for UEs of this release of the specification.

#### 4.3.4.57 *cch-InterfMitigation-RefRecTypeA-r13*

This field defines whether the UE supports Type A downlink control channel interference mitigation receiver "LMMSE-IRC + CRS-IC" for PDCCH/PCFICH/PHICH/EPDCCH receive processing (Enhanced downlink control channel performance requirements Type A in the TS 36.101 [6]).

If this field is present, the UE supports at least one the following features:

1) Enhanced downlink control channel interference mitigation Type A receiver for 2 CRS antenna ports for UEs with 2 receiver antenna ports (Enhanced downlink control channel performance requirements Type A in the TS 36.101 [6]).

2) Enhanced downlink control channel interference mitigation Type A receiver for 4 CRS antenna ports for UEs with 2 receiver antenna ports (Enhanced downlink control channel performance requirements Type A in the TS 36.101 [6]).

#### 4.3.4.58 *cch-InterfMitigation-RefRecTypeB-r13*

This field defines whether the UE supports Type B downlink control channel interference mitigation receiver "E-LMMSE-IRC + CRS-IC" for PDCCH/PCFICH/PHICH receive processing in synchronous networks (Enhanced downlink control channel performance requirements Type B in the TS 36.101 [6]). The UE supporting the capability defined by *cch-InterfMitigation-RefRecTypeB-r13* shall also support the capability defined by *cch-InterfMitigation-RefRecTypeA-r13*.

#### 4.3.4.59 *cch-InterfMitigation-MaxNumCCs-r13*

This field indicates that the UE supports downlink control channel interference mitigation on at least one arbitrary downlink CC for up to *cch-InterfMitigation-MaxNumCCs* downlink CC CA configuration.

#### 4.3.4.60 *tdd-TTI-Bundling-r14*

This field defines whether the UE supporting TDD special subframe configuration 10 also supports TTI bundling for TDD configuration 2 and 3 when *ssp10* is configured as specified in TS 36.331 [5].

#### 4.3.4.61 *dmrs-LessUpPTS-r14*

This field defines whether the UE supports not to transmit DMRS for PUSCH in UpPTS as specified in TS 36.211 [17].

#### 4.3.4.62 *twoHARQ-Processes-r14*

This field defines whether the UE supports 2 HARQ processes in DL and UL. This field is only applicable for UEs that support category NB2.

#### 4.3.4.63 *ce-PUSCH-NB-MaxTBS-r14*

This field indicates whether the UE supports the maximum UL TBS size of 2984 bits in 1.4 MHz when operating in coverage enhancement mode A, as specified in TS 36.212 [26] and TS 36.213 [22]. A UE indicating support of *ce-PUSCH-NB-MaxTBS-r14* shall also indicate support of *ce-ModeA-r13*.

#### 4.3.4.64 *ce-PDSCH-PUSCH-MaxBandwidth-r14*

This field indicates support of a maximum PDSCH/PUSCH channel bandwidth larger than 1.4 MHz when the UE is operating in coverage enhancement mode A and B, as specified in TS 36.212 [26] and TS 36.213 [22]. The maximum supported PDSCH channel bandwidth in coverage enhancement mode A and B is indicated by *ce-PDSCH-PUSCH-MaxBandwidth-r14*. The maximum supported PUSCH channel bandwidth is 5 MHz in coverage enhancement mode A and 1.4 MHz in coverage enhancement mode B. This field is not applicable for UEs of Category M1. This field is mandatory for UEs of Category M2. A UE indicating support of *ce-PDSCH-PUSCH-MaxBandwidth-r14* shall also indicate support of *ce-ModeA-r13*.

#### 4.3.4.65 *ce-HARQ-AckBundling-r14*

This field indicates whether the UE supports HARQ-ACK bundling in FDD when operating in coverage enhancement mode A, as specified in TS 36.212 [26] and TS 36.213 [22]. A UE indicating support of *ce-HARQ-AckBundling-r14* shall also indicate support of *ce-ModeA-r13*.

#### 4.3.4.66 *ce-PDSCH-TenProcesses-r14*

This field indicates whether the UE supports 10 DL HARQ processes in FDD when operating in coverage enhancement mode A, as specified in TS 36.212 [26] and TS 36.213 [22]. A UE indicating support of *ce-PDSCH-TenProcesses-r14* shall also indicate support of *ce-ModeA-r13*.

#### 4.3.4.67 *ce-RetuningSymbols-r14*

This field indicates the number of retuning symbols used by the UE when operating in coverage enhancement mode A and B, as specified in TS 36.211 [17]. A UE indicating support of *ce-RetuningSymbols-r14* shall also indicate support of *ce-ModeA-r13*.

#### 4.3.4.68 *ce-PDSCH-PUSCH-Enhancement-r14*

This field indicates whether the UE supports new numbers of repetitions for PUSCH and modulation restriction for PDSCH and PUSCH in coverage enhancement mode A, as specified in TS 36.212 [26] and TS 36.213 [22]. A UE indicating support of *ce-PDSCH-PUSCH-Enhancement-r14* shall also indicate support of *ce-ModeA-r13*.

#### 4.3.4.69 *ce-SchedulingEnhancement-r14*

This field indicates whether the UE supports dynamic HARQ-ACK delay for HD-FDD in coverage enhancement mode A, as specified in TS 36.212 [26] and TS 36.213 [22]. A UE indicating support of *ce-SchedulingEnhancement-r14* shall also indicate support of *ce-ModeA-r13*.

#### 4.3.4.70 *ce-SRS-Enhancement-r14*

This field indicates whether the UE supports SRS coverage enhancement with support of SRS combs 2 and 4, as specified in TS 36.213 [22]. A UE indicating support of *ce-SRS-Enhancement-r14* shall also indicate support of *ce-ModeA-r13* and shall not indicate support of *ce-SRS-EnhancementWithoutComb4-r14*.

#### 4.3.4.70A *ce-SRS-EnhancementWithoutComb4-r14*

This field indicates whether the UE supports SRS coverage enhancement with support of SRS comb 2 but without support of SRS comb 4, as specified in TS 36.213 [22]. A UE indicating support of *ce-SRS-EnhancementWithoutComb4-r14* shall also indicate support of *ce-ModeA-r13* and shall not indicate support of *ce-SRS-Enhancement-r14*.

#### 4.3.4.71 *ce-PUCCH-Enhancement-r14*

This field indicates whether the UE supports repetition levels 64 and 128 for PUCCH in CE Mode B, as specified in TS 36.211 [17] and in TS 36.213 [22]. A UE indicating support of *ce-PUCCH-Enhancement-r14* shall also indicate support of *ce-ModeB-r13*.

#### 4.3.4.72 *ce-ClosedLoopTxAntennaSelection-r14*

This field indicates whether the UE supports UL closed-loop Tx antenna selection in coverage enhancement mode A, as specified in TS 36.212 [26]. A UE indicating support of *ce-ClosedLoopTxAntennaSelection-r14* shall also indicate support of *ce-ModeA-r13* and *ue-TxAntennaSelectionSupported*.

#### 4.3.4.73 *ul-256QAM-r14*

This field indicates UL 256QAM support by the UE on a single component carrier within a band combination (i.e. bandwith class A).

#### 4.3.4.74 *alternativeTBS-Index-r14*

This field defines whether alternative TBS index *I*TBS 33B as specified in TS 36.213 [22] is supported by the UE. Support of the alternative TBS index *I*TBS 33B is applied for the UE supporting 256QAM in DL.

#### 4.3.4.75 *multiCarrier-NPRACH-r14*

This field defines whether the UE supports NPRACH on non-anchor carrier, as specified in TS 36.321 [4] and TS 36.331 [5]. This field is only applicable for UEs of any *ue-Category-NB*. It is mandatory for UEs of this release of the specification.

#### 4.3.4.76 *multiCarrierPaging-r14*

This field defines whether the UE supports paging on non-anchor carriers for FDD, as specified in TS 36.331 [5] and TS 36.304 [14]. This field is only applicable for UEs of any *ue-Category-NB*. It is mandatory for UEs of this release of the specification.

#### 4.3.4.77 *ul-256QAM-perCC-InfoListr14*

This field indicates UL 256QAM support by the UE on a single component carrier within a band combination, which the corresponding bandwidth class includes multiple serving carriers (i.e. bandwidth class B, C, D and so on).

#### 4.3.4.78 *unicast-fembmsMixedSCell-r14*

This field defines whether unicast reception from FeMBMS/Unicast mixed cell is supported by the UE. This field is included only if UE supports carrier aggregation.

#### 4.3.4.79 *emptyUnicastRegion-r14*

This field defines whether the UE supports unicast reception in subframes with empty unicast control region as described in TS 36.213 [22], clause 12. This field is included only if UE supports unicast reception from FeMBMS/Unicast mixed cell.

#### 4.3.4.80 *interferenceRandomisation-r14*

This field indicates whether the UE supports interference randomisation in connected mode for FDD as specified in TS 36.211 [17]. This field is only applicable for UEs of any *ue-Category-NB*. It is mandatory for UEs of this release of the specification.

#### 4.3.4.81 *must-CapabilityPerBand-r14*

This field indicates that the UE supports multi-user superposition transmission operation for the corresponding frequency band as specified in 36.212 [26], clause 5.3.3.1. UE indicates the support of the different MUST features per band.

##### 4.3.4.81.1 *must-TM234-UpTo2Tx-r14*

This field indicates that the UE supports MUST operation for TM2/3/4 using up to 2Tx.

##### 4.3.4.81.2 *must-TM89-UpToOneInterferingLayer-r14*

This field indicates that the UE supports MUST operation for TM8/9 with assistance information for up to 1 interfering layer.

##### 4.3.4.81.3 *must-TM10-UpToOneInterferingLayer-r14*

This field indicates that the UE supports MUST operation for TM10 with assistance information for up to 1 interfering layer.

##### 4.3.4.81.4 *must-TM89-UpToThreeInterferingLayers-r14*

This field indicates that the UE supports MUST operation for TM8/9 with assistance information for up to 3 interfering layers.

##### 4.3.4.81.5 *must-TM10-UpToThreeInterferingLayers-r14*

This field indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layers.

#### 4.3.4.82 *crs-LessDwPTS-r14*

This field defines whether the UE supports TDD special subframe configuration 10 without CRS transmission on the 5th symbol of DwPTS (i.e. *ssp10-CRS-LessDwPTS*) as specified in TS 36.211 [17] and TS 36.331 [5].

#### 4.3.4.83 *dl-1024QAM-Slot-r15*

This field indicates whether the UE supports 1024QAM in DL on the band for slot TTI operation.

#### 4.3.4.84 *dl-1024QAM-SubslotTA-1-r15*

This field indicates whether the UE supports 1024QAM in DL on the band for subslot TTI operation with TA set 1.

#### 4.3.4.85 *dl-1024QAM-SubslotTA-2-r15*

This field indicates whether the UE supports 1024QAM in DL on the band for subslot TTI operation with TA set 2.

#### 4.3.4.86 *dmrs-PositionPattern-r15*

This field indicates whether the UE supports uplink DMRS position pattern 'D D D' in subslot #5 with application of the 1/6 as the TBS scaling factor.

#### 4.3.4.87 *dmrs-RepetitionSubslotPDSCH-r15*

This field indicates whether the UE supports back-to-back 3/4-layer DMRS reception in two consecutive subslots across subframe boundary for subslot-PDSCH.

#### 4.3.4.88 *dmrs-SharingSubslotPDSCH-r15*

This field indicates whether the UE supports DMRS sharing in two consecutive subslots across subframe boundary for subslot-PDSCH.

#### 4.3.4.89 *epdcch-SPT-differentCells-r15*

This field indicates whether the UE supports EPDCCH and short processing time on different serving cells.

#### 4.3.4.90 *epdcch-STTI-differentCells-r15*

This field indicates whether the UE supports EPDCCH and sTTI on different serving cells.

#### 4.3.4.91 *maxLayersSlotOrSubslotPUSCH-r15*

This field indicates the maxiumum number of layers for slot-PUSCH or subslot-PUSCH transmission. If the UE reports maximum number of layers for UL in sTTI for a band combination using the IE *CA-MIMO-ParametersUL-r15*, the reported maximum number of layers shall not exceed the value indicated by this field.

#### 4.3.4.92 *maxNumberUpdatedCSI-Proc-SPT-r15*

This field defines, if short processing time is supported, the maximum number of CSI processes to be updated per UE which aperiodic CSI is requested for CA with more than 5CCs as specified in TS 36.213 [22] which is supported by the UE.

#### 4.3.4.93 Void

#### 4.3.4.94 *numberOfBlindDecodesUSS-r15*

This field defines the maximum number of blind decodes in UE specific search space in one subframe for CCs configured with sTTI operation, supported by the UE. The number of blind decodes supported by the UE is the field value X\*68.

#### 4.3.4.95 *pdsch-SlotSubslotPDSCH-Decoding-r15*

This field defines whether the UE supports decoding of PDSCH and slot-PDSCH/subslot-PDSCH assigned with C-RNTI/SPS C-RNTI in the same subframe for a given carrier.

#### 4.3.4.96 *simultaneousTx-differentTx-duration-r15*

This field defines whether the UE supports simultaneous transmission of different transmission durations over different carriers. The different transmission duration can be of subframe, slot or subslot duration. A common capability is used regardless of combination of different UL transmission duration over different carriers. The capability is reported per band/band combination.

#### 4.3.4.97 *slotPDSCH-TxDiv-TM8-r15*

This field indicates whether the UE supports TX diversity transmission using ports 7 and 8 for TM8 for slot PDSCH.

#### 4.3.4.98 *slotPDSCH-TxDiv-TM9and10-r15*

This field indicates whether the UE supports TX diversity transmission using ports 7 and 8 for TM9/10 for slot PDSCH.

#### 4.3.4.99 *spdcch-differentRS-types-r15*

This field indicates whether the UE supports monitoring of sPDCCH on RB sets with different RS types within a TTI.

#### 4.3.4.100 *spt-Parameters-r15*

This field indicates the maximum number of supported CCs and the corresponding supported frame structure for short processing time. The UE capability is reported per band combination. The reported number of carriers *maxNumberCCs-SPT-r15* applies to all the FS-type(s) *frameStructureType-SPT-r15* supported in a given band combination.

#### 4.3.4.101 *sps-CyclicShift-r15*

This field indicates whether the UE supports different cyclic shift for DMRS for UL SPS using 1ms TTI.

#### 4.3.4.102 *subslotPDSCH-TxDiv-TM9and10-r15*

This field indicates whether the UE supports TX diversity transmission using ports 7 and 8 for TM9/10 for subslot PDSCH.

#### 4.3.4.103 *sTTI-SupportedCombinations-r15*

This field indicates the different combinations of sTTI lengths (slot or subslot) that the UE supports in a single PUCCH group or in two PUCCH groups. A TTI length combination is reported for DL first followed by UL. In case of two PUCCH groups the support for the primary PUCCH group is indicated first. The capability is reported per band per band combination. This field is also used to report the sTTI capabilities for non-CA bands.

#### 4.3.4.104 Void

#### 4.3.4.105 *sTTI-SPT-BandParameters-r15*

This field indicates the different sTTI/sPT capabilities for each band of the reported band combinations using *supportedBandCombination*. The UE reports these capabilities in the same order in which the band combinations are reported. The UE is allowed to report the same band combination more than once, if the corresponding sTTI/sPT capabilities are different. If any of the fields *sTTI-CA-MIMO-ParametersDL-r15, sTTI-CA-MIMO-ParametersUL-r15, sTTI-SupportedCSI-Proc-r15* are not provided by the UE, the corresponding parameters of these fields reported from the band of the band combination for which the sTTI parameters are applied, are assumed to be supported for sTTI/sPT features as well. If any of the fields *sTTI-MIMO-CA-ParametersPerBoBCs-r15, sTTI-MIMO-CA-ParametersPerBoBCs-v1530* are not provided by the UE, the corresponding parameters from *mimo-UE-ParametersSTTI-r15, mimo-UE-ParametersSTTI-v1530* are applied, and if any of the fields *mimo-UE-ParametersSTTI-r15, mimo-UE-ParametersSTTI-v1530* are not provided by the UE, then the corresponding parameters of these fields reported from the band of the band combination for which the sTTI parameters are applied, are assumed to be supported for sTTI/sPT features.

#### 4.3.4.106 *sTTI-SupportedCSI-Proc-r15*

This field indicates, for short TTI, the maximum number of CSI processes supported on a component carrier within a band. Value n1 corresponds to 1 CSI process, value n3 corresponds to 3 CSI processes, and value n4 corresponds to 4 CSI processes. If this field is included, the UE shall include the same number of entries listed in the same order as in *bandParameterList-r11, bandParameterList-r13* if they are reported. If the UE supports at least 1 CSI process on any component carrier, then the UE shall include this field in all bands in all band combinations.

#### 4.3.4.107 *txDiv-SPUCCH-r15*

This field defines whether the UE supports Tx diversity on SPUCCH format 1, 1a, 1b and 3.

#### 4.3.4.108 *ul-256QAM-Slot-r15*

This field defines whether the UE supports 256QAM in UL for slot TTI operation on the band.

#### 4.3.4.109 *ul-256QAM-Subslot-r15*

This field defines whether the UE supports 256QAM in UL for subslot TTI operation on the band.

#### 4.3.4.110 *ue-TxAntennaSelection-SRS-1T4R-r15*

This field indicates whether the UE supports to select one antenna among four antennas to transmit SRS for the corresponding band of the band combination as described in TS 36.213 [22].

#### 4.3.4.111 *ue-TxAntennaSelection-SRS-2T4R-2Pairs-r15*

This field indicates whether the UE supports to select one antenna pair between two antenna pairs to transmit SRS simultaneously for the corresponding band of the band combination as described in TS 36.213 [22].

#### 4.3.4.112 *ue-TxAntennaSelection-SRS-2T4R-3Pairs-r15*

This field indicates whether the UE supports to select one antenna pair among three antenna pairs to transmit SRS simultaneously for the corresponding band of the band combination as described in TS 36.213 [22].

#### 4.3.4.113 *wakeUpSignal-r15*

This field indicates whether the UE supports WUS for FDD as specified in TS 36.211 [17], TS 36.213 [22] and TS 36.304 [14]. This feature is only applicable if the UE supports *ce-ModeA-r13* or if the UE supports any *ue-Category-NB*.

#### 4.3.4.114 *wakeUpSignalMinGap-eDRX-r15*

This field indicates the minimum gap required between end of WUS and start of PO by a UE indicating support of extended idle mode DRX for FDD, as specified in TS 24.301 [28]. A UE indicating support of *wakeUpSignalMinGap-eDRX-r15* shall also indicate support of w*akeUpSignal-r15*. This feature is only applicable if the UE supports *ce-ModeA-r13* or if the UE supports any *ue-Category-NB*.

#### 4.3.4.115 *mixedOperationMode-r15*

This field defines whether the UE supports multi-carrier operation where the anchor carrier is in standalone mode while the non-anchor carrier is in inband or guardand mode, and vice versa, for unicast, paging, and random access for FDD as specified in TS 36.300 [30]. This field is only applicable for UEs of any *ue-Category-NB*.

#### 4.3.4.116 void

#### 4.3.4.117 *sr-WithHARQ-ACK-r15*

This field defines whether the UE supports physical layer SR with HARQ ACK for FDD as specified in TS 36.213 [22]. This field is only applicable for UEs of any *ue-Category-NB*.

#### 4.3.4.118 *sr-WithoutHARQ-ACK-r15*

This field defines whether the UE supports physical layer SR without HARQ ACK for FDD as specified in TS 36.211 [17] and TS 36.213 [22]. This field is only applicable for UEs of any *ue-Category-NB*.

#### 4.3.4.119 *nprach-Format2-r15*

This field defines whether the UE supports NPRACH resources using preamble format 2 for FDD. This field is only applicable for UEs of any *ue-Category-NB*.

#### 4.3.4.120 *ce-UL-HARQ-ACK-Feedback-r15*

This field indicates whether the UE supports uplink HARQ ACK Feedback in RRC\_CONNECTED when operating in coverage enhancement, as specified in TS 36.213 [22]. A UE indicating support of *ce-UL-HARQ-ACK-Feedback-r15* shall also indicate support of *ce-ModeA-r13*.

#### 4.3.4.121 *ce-PDSCH-FlexibleStartPRB-CE-ModeA-r15*

This field indicates whether the UE supports flexible starting PRB for PDSCH in RRC\_CONNECTED when operating in coverage enhancement mode A, as specified in TS 36.211 [17] and TS 36.213 [22]. A UE indicating support of *ce-PDSCH-FlexibleStartPRB-CE-ModeA-r15* shall also indicate support of *ce-ModeA-r13*.

#### 4.3.4.122 *ce-PDSCH-FlexibleStartPRB-CE-ModeB-r15*

This field indicates whether the UE supports flexible starting PRB for PDSCH in RRC\_CONNECTED when operating in coverage enhancement mode B, as specified in TS 36.211 [17] and TS 36.213 [22]. A UE indicating support of *ce-PDSCH-FlexibleStartPRB-CE-ModeB-r15* shall also indicate support of *ce-ModeB-r13*.

#### 4.3.4.123 *ce-PUSCH-FlexibleStartPRB-CE-ModeA-r15*

This field indicates whether the UE supports flexible starting PRB for PUSCH in RRC\_CONNECTED when operating in coverage enhancement mode A, as specified in TS 36.211 [17] and TS 36.213 [22]. A UE indicating support of *ce-PUSCH-FlexibleStartPRB-CE-ModeA-r15* shall also indicate support of *ce-ModeA-r13*.

#### 4.3.4.124 *ce-PUSCH-FlexibleStartPRB-CE-ModeB-r15*

This field indicates whether the UE supports flexible starting PRB for PUSCH in RRC\_CONNECTED when operating in coverage enhancement mode B, as specified in TS 36.211 [17] and TS 36.213 [22]. A UE indicating support of *ce-PUSCH-FlexibleStartPRB-CE-ModeB-r15* shall also indicate support of *ce-ModeB-r13*.

#### 4.3.4.125 *ce-CRS-IntfMitig-r15*

This field indicates whether the UE supports CRS interference mitigation, i.e., value *supported* indicates UE does not rely on the CRS outside certain PRBs and subframes as defined in TS 36.133 [16], clauses 3.6.1.2 and 3.6.1.3 and TS 36.213 [23] when operating in coverage enhancement mode. A UE indicating support of *ce-CRS-IntfMitig-r15* shall also indicate support of *ce-ModeA-r13*.

#### 4.3.4.126 *ce-PDSCH-64QAM-r15*

This field indicates whether the UE supports 64QAM for non-repeated unicast PDSCH in RRC\_CONNECTED when operating in coverage enhancement mode A. A UE indicating support of *ce-PDSCH-64QAM-r15* shall also indicate support of *ce-ModeA-r13*.

#### 4.3.4.127 *ce-CQI-AlternativeTable-r15*

This field indicates whether the UE supports alternative CQI table in RRC\_CONNECTED when operating in coverage enhancement mode A, as specified in TS 36.213 [22]. A UE indicating support of *ce-CQI-AlternativeTable-r15* shall also indicate support of *ce-ModeA-r13*.

#### 4.3.4.128 *ce-PUSCH-SubPRB-Allocation-r15*

This field indicates whether the UE supports sub-PRB resource allocation for PUSCH when operating in coverage enhancement mode A or B, as specified in TS 36.211 [17] and TS 36.213 [22]. A UE indicating support of *ce-PUSCH-SubPRB-Allocation-r15* shall also indicate support of *ce-ModeA-r13.*

#### 4.3.4.129 *wakeUpSignal-TDD-r15*

This field indicates whether the UE supports WUS for TDD as specified in TS 36.211 [17], TS 36.213 [22] and TS 36.304 [14]. This feature is only applicable if the UE supports *ce-ModeA-r13*.

#### 4.3.4.130 *wakeUpSignalMinGap-eDRX-TDD-r15*

This field indicates the minimum gap required between end of WUS and start of PO by a UE indicating support of extended idle mode DRX for TDD, as specified in TS 24.301 [28]. A UE indicating support of *wakeUpSignalMinGap-eDRX-TDD-r15* shall also indicate support of *wakeUpSignal-TDD-r15*. This feature is only applicable if the UE supports *ce-ModeA-r13*.

#### 4.3.4.131 *shortCqi-ForSCellActivation-r15*

This field defines whether the UE supports temporary CQI reporting periodicity after SCell activation as defined in TS 36.321 [4] and TS 36.331 [5].

#### 4.3.4.132 *crs-IntfMitig-r15*

This field defines whether the UE supports CRS interference mitigation as specified in TS 36.133 [16], clause 3.6.1.1.

#### 4.3.4.133 *srs-UpPTS-6sym-r14*

This field indicates whether the UE supports up to 6-symbol SRS in UpPTS.

#### 4.3.4.134 *multiCarrierPagingTDD-r15*

This field defines whether the UE supports paging on non-anchor carriers for TDD, as specified in TS 36.331 [5] and TS 36.304 [14]. This field is only applicable for UEs of any *ue-Category-NB*. It is mandatory for UEs of this release of the specification.

#### 4.3.4.135 *altMCS-Table-r15*

This field defines whether the UE supports 6-bit MCS table, see TS 36.212 [26] and TS 36.213 [22].

#### 4.3.4.136 *ul-PowerControlEnhancements-r15*

This field defines whether the UE supports UE specific UL power control.

#### 4.3.4.137 *additionalTransmissionSIB1-r15*

This field defines whether the UE supports additional SIB1 transmission in subframe #3 for FDD, as defined in TS 36.213 [22]. This field is only applicable for UEs of any *ue-Category-NB*.

#### 4.3.4.138 *aperiodicCsi-ReportingSTTI-r15*

This field defines whether the UE supports aperiodic CSI reporting for STTI.If the UE indicates the support of aperiodic CSI reporting for short TTI using this field, the UE also supports the legacy aperiodic CSI capabilities for short TTI.

#### 4.3.4.139 *dmrs-BasedSPDCCH-MBSFN-r15*

This field defines whether the UE supports sDCI monitoring in DMRS based SPDCCH for MBSFN subframe. If UE supports this, it also provides the corresponding DMRS based SPDCCH capability in *min-Proc-TimelineSubslot.*

#### 4.3.4.140 *dmrs-BasedSPDCCH-nonMBSFN -r15*

This field defines whether the UE supports sDCI monitoring in DMRS based SPDCCH for non-MBSFN subframe. If UE supports this, it also provides the corresponding DMRS based SPDCCH capability in *min-Proc-TimelineSubslot*

#### 4.3.4.141 *maxNumberUpdatedCSI-Proc-STTI-Comb77-r15*

This field defines, for {slot, slot}, if short TTI specific A-CSI reporting is supported, the maximum number of CSI processes to be updated per UE which aperiodic CSI is requested for CA with more than 2CCs as specified in TS 36.213 [22] which is supported by the UE.

#### 4.3.4.142 *maxNumberUpdatedCSI-Proc-STTI-Comb27-r15*

This field defines, for {subslot, slot}, if short TTI specific A-CSI reporting is supported, the maximum number of CSI processes to be updated per UE which aperiodic CSI is requested for CA with more than 2CCs as specified in TS 36.213 [22] which is supported by the UE.

#### 4.3.4.143 *maxNumberUpdatedCSI-Proc-STTI-Comb22-Set1-r15*

This field defines, for {subslot, subslot} set 1, if short TTI specific A-CSI reporting is supported, the maximum number of CSI processes to be updated per UE which aperiodic CSI is requested for CA with more than 2CCs as specified in TS 36.213 [22] which is supported by the UE.

#### 4.3.4.144 *maxNumberUpdatedCSI-Proc-STTI-Comb22-Set2-r15*

This field defines, for {subslot, subslot} set 2, if short TTI specific A-CSI reporting is supported, the maximum number of CSI processes to be updated per UE which aperiodic CSI is requested for CA with more than 2CCs as specified in TS 36.213 [22] which is supported by the UE.

#### 4.3.4.145 *powerUCI-SlotPUSCH-r15*

This field Indicates whether the UE supports BPRE derivation based on the actual derived O\_CQI. The parameter uplinkPower-CSIPayload configures the UE to derive BPRE based on either the actual value of O\_CQI or the largest value of O\_CQI across all RI values. If the UE does not support the capability, the UE will derive BPRE based on the largest value of O\_CQI across all RI values.

#### 4.3.4.146 *powerUCI-SubslotPUSCH-r15*

This field indicates whether the UE supports BPRE derivation based on the actual derived O\_CQI. The parameter uplinkPower-CSIPayload configures the UE to derive BPRE based on either the actual value of O\_CQI or the largest value of O\_CQI across all RI values. If the UE does not support the capability, the UE will derive BPRE based on the largest value of O\_CQI across all RI values.

#### 4.3.4.147 *spdcch-Reuse-r15*

This field indicates whether the UE supports L1 based SPDCCH reuse.

#### 4.3.4.148 *sps-STTI-r15*

This field indicates whether the UE supports SPS in DL and/or UL for slot or subslot based PDSCH and PUSCH, respectively.

#### 4.3.4.149 *sTTI-FD-MIMO-Coexistence-r15*

This field indicates whether the UE supports CSI feedback for more than 8 NZP CSI-RS ports on subframe based PUSCH in any serving cell and supporting sTTI in any serving cell.

#### 4.3.4.150 *sTTI-SPT-Supported-r15*

This field indicates whether the UE supports short TTI and/or short processing time features.

#### 4.3.4.151 *tm8-slotPDSCH-r15*

This field indicates whether the UE supports configuration and decoding of TM8 for slot PDSCH in TDD.

#### 4.3.4.152 *tm9-slotSubslot-r15*

This field indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot PDSCH for non-MBSFN.

#### 4.3.4.153 *tm9-slotSubslotMBSFN-r15*

This field indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot PDSCH for MBSFN.

#### 4.3.4.154 *tm10-slotSubslot-r15*

This field indicates whether the UE supports configuration and decoding of TM10 for slot and/or subslot PDSCH for non-MBSFN.

#### 4.3.4.155 *tm10-slotSubslotMBSFN-r15*

This field indicates whether the UE supports configuration and decoding of TM10 for slot and/or subslot PDSCH for MBSFN.

#### 4.3.4.156 *ul-AsyncHarqSharingDiff-TTI-Lengths-r15*

This field indicates whether the UE supports UL asynchronous HARQ sharing between different TTI lengths for an UL serving cell.

#### 4.3.4.157 *semiStaticCFI-r15*

This field indicates whether the UE supports the semi-static configuration of CFI for subframe/slot/sub-slot operation.

#### 4.3.4.158 *semiStaticCFI-Pattern-r15*

This field indicates whether the UE supports the semi-static configuration of CFI pattern for subframe/slot/sub-slot operation. This field is only applicable for UEs supporting TDD.

#### 4.3.4.159 *pdsch-RepSubframe-r15*

This field indicates whether the UE supports subframe PDSCH repetition. A UE indicating support of *pdsch-RepSubframe-r15* shall also indicate support of *semiStaticCFI-r15* or *semiStaticCFI-Pattern*-*r15*.

#### 4.3.4.160 *pdsch-RepSlot-r15*

This field indicates whether the UE supports slot PDSCH repetition. A UE indicating support of *pdsch-RepSlot-r15* shall also indicate support of *semiStaticCFI-r15* or *semiStaticCFI-Pattern-r15.* A UE indicating support of *pdsch-RepSlot-r15* shall also indicate support of rel-15 slot PDSCH.

#### 4.3.4.161 *pdsch-RepSubslot-r15*

This field indicates whether the UE supports subslot PDSCH repetition. This field is only applicable for UEs supporting FDD. A UE indicating support of *pdsch-RepSubslot-r15* shall also indicate support of *semiStaticCFI-r15*. A UE indicating support of *pdsch-RepSlot-r15* shall also indicate support of rel-15 subslot PDSCH.

#### 4.3.4.162 *pusch-SPS-SubframeRepPCell-r15*

This field indicates whether the UE supports SPS repetition for subframe PUSCH for PCell. A UE indicating support of *pusch-SPS-SubFrameRepPCell-r15* shall also indicate support of *semiStaticCFI-r15* or *semiStaticCFI-Pattern*-*r15*.

#### 4.3.4.163 *pusch-SPS-SubframeRepPSCell-r15*

This field indicates whether the UE supports SPS repetition for subframe PUSCH for PSCell. A UE indicating support of *pusch-SPS-SubframeRepPSCell-r15* shall also indicate support of *semiStaticCFI-r15* or *semiStaticCFI-Pattern*-*r15*.

#### 4.3.4.164 *pusch-SPS-SubframeRepSCell-r15*

This field indicates whether the UE supports SPS repetition for subframe PUSCH for serving cells other than SpCell. A UE indicating support of *pusch-SPS-SubframeRepSCell-r15* shall also indicate support of *semiStaticCFI-r15* or *semiStaticCFI-Pattern*-*r15*.

#### 4.3.4.165 *pusch-SPS-SlotRepPCell-r15*

This field indicates whether the UE supports SPS repetition for slot PUSCH for PCell. A UE indicating support of *pusch-SPS-SlotRepPCell-r15* shall also indicate support of *semiStaticCFI-r15* or *semiStaticCFI-Pattern*-*r15*. A UE indicating support of *pusch-SPS-SlotRepPCell-r15* shall also indicate support of slot PUSCH and SPS for slot PUSCH.

#### 4.3.4.166 *pusch-SPS-SlotRepPSCell-r15*

This field indicates whether the UE supports SPS repetition for slot PUSCH for PSCell. A UE indicating support of *pusch-SPS-SlotRepPSCell-r15* shall also indicate support of *semiStaticCFI-r15* or *semiStaticCFI-Pattern*-*r15*. A UE indicating support of *pusch-SPS-SlotRepPSCell-r15* shall also indicate support of slot PUSCH and SPS for slot PUSCH.

#### 4.3.4.167 *pusch-SPS-SlotRepSCell-r15*

This field indicates whether the UE supports SPS repetition for slot PUSCH for serving cells other than SpCell. A UE indicating support of *pusch-SPS-SlotRepSCell-r15* shall also indicate support of *semiStaticCFI-r15* or *semiStaticCFI-Pattern*-*r15*. A UE indicating support of *pusch-SPS-SlotRepSCell-r15* shall also indicate support of slot PUSCH and SPS for slot PUSCH.

#### 4.3.4.168 *pusch-SPS-SubslotRepPCell-r15*

This field indicates whether the UE supports SPS repetition for subslot PUSCH for PCell. This field is only applicable for UEs supporting FDD. A UE indicating support of *pusch-SPS-SubslotRepPCell-r15* shall also indicate support of *semiStaticCFI-r15*. A UE indicating support of *pusch-SPS-SubslotRepPCell-r15* shall also indicate support of subslot PUSCH and SPS for subslot PUSCH.

#### 4.3.4.169 *pusch-SPS-SubslotRepPSCell-r15*

This field indicates whether the UE supports SPS repetition for subslot PUSCH for PSCell. This field is only applicable for UEs supporting FDD. A UE indicating support of *pusch-SPS-SubslotRepPSCell-r15* shall also indicate support of *semiStaticCFI-r15*. A UE indicating support of *pusch-SPS-SubslotRepPSCell-r15* shall also indicate support of subslot PUSCH and SPS for subslot PUSCH.

#### 4.3.4.170 *pusch-SPS-SubslotRepSCell-r15*

This field indicates whether the UE supports SPS repetition for subslot PUSCH for serving cells other than SpCell. This field is only applicable for UEs supporting FDD. A UE indicating support of *pusch-SPS-SubSlotRepSCell-r15* shall also indicate support of *semiStaticCFI-r15*. A UE indicating support of *pusch-SPS-SubslotRepSCell-r15* shall also indicate support of subslot PUSCH and SPS for subslot PUSCH.

#### 4.3.4.171 *pusch-SPS-MaxConfigSubframe-r15*

This field indicates the maximum number of multiple SPS configurations of subframe PUSCH across all cells.

#### 4.3.4.172 *pusch-SPS-MultiConfigSubframe-r15*

This field indicates the number of multiple SPS configurations of slot PUSCH for each serving cell. A UE indicating support of *pusch-SPS-MultiConfigSubframe-r15* shall also indicate support of *pusch-SPS-SubframeRepPCell-r15, pusch-SPS-SubframeRepPSCell-r15* or *pusch-SPS-SubframeRepSCell-r15*.

#### 4.3.4.173 *pusch-SPS-MaxConfigSlot-r15*

This field indicates the maximum number of multiple SPS configurations of slot PUSCH across all cells.

#### 4.3.4.174 *pusch-SPS-MultiConfigSlot-r15*

This field indicates the number of multiple SPS configurations of subframe PUSCH for each serving cell. A UE indicating support of *pusch-SPS-MultiConfigSlot-r15* shall also indicate support of *pusch-SPS-SlotRepPCell-r15, pusch-SPS-SlotRepPSCell-r15* or *pusch-SPS-SlotRepSCell-r15*.

#### 4.3.4.175 *pusch-SPS-MaxConfigSubslot-r15*

This field indicates the maximum number of multiple SPS configurations of subslot PUSCH across all cells.

#### 4.3.4.176 *pusch-SPS-MultiConfigSubslot-r15*

This field indicates the number of multiple SPS configurations of subslot PUSCH for each serving cell. This field is only applicable for UEs supporting FDD. A UE indicating support of *pusch-SPS-MultiConfigSubslot-r15* shall also indicate support of *pusch-SPS-SubslotRepPCell-r15, pusch-SPS-SubslotRepPSCell-r15* or *pusch-SPS-SubslotRepSCell-r15*.

#### 4.3.4.177 *npusch-3dot75kHz-SCS-TDD-r15*

This field defines whether the UE supports NPUSCH with 3.75kHz SCS for TDD as specified in TS 36.211 [17]. This field is only applicable for UEs of any *ue-Category-NB*. It is mandatory for UEs of this release of the specification.

#### 4.3.4.178 *crs-IM-TM1-toTM9-OneRX-Port*

1) The field defines whether the DL Category 1bis UE or the DL Category M2 UE supports any of the below CRS interference mitigation (CRS-IM) features while operating in the following transmission modes (TM): TM 1, TM 2, …, TM 8 and TM 9. CRS-IM with 2 CRS antenna ports for PDSCH with 1 receiver antenna port (as specified in TS 36.101 [6]).

2) CRS-IM with 4 CRS antenna ports for PDSCH with 1 receiver antenna port (as specified in TS 36.101 [6]).

The UE shall not include the field if it does not support CRS IM in TMs 1-9.

#### 4.3.4.179 *cch-IM-RefRecTypeA-OneRX-Port*

The field defines whether the DL Category 1bis UE or DL Category M2 UE supports Type A downlink control channel interference mitigation receiver "LMMSE-IRC + CRS-IC" for PDCCH/PCFICH/PHICH/EPDCCH receive processing (Enhanced downlink control channel performance requirements Type A in TS 36.101 [6]).

For DL Category 1bis UE, if this field is present, the UE supports any of the following features:

1) Enhanced downlink control channel interference mitigation Type A receiver for 2 CRS antenna ports with 1 receiver antenna port (as specified in TS 36.101 [6]).

2) Enhanced downlink control channel interference mitigation Type A receiver for 4 CRS antenna ports with 1 receiver antenna port (as specified in TS 36.101 [6]).

For DL Category M2 UE, if this field is present, the UE supports the following feature:

1) Enhanced downlink control channel interference mitigation Type A receiver for 2 CRS antenna ports with 1 receiver antenna port (as specified in TS 36.101 [6]).

#### 4.3.4.180 *dmrs-OverheadReduction-r15*

This field defines whether the UE supports OCC4 for rank 3 and 4 transmission as specified in clause 5.3.3.1.5C of TS 36.212 [26].

#### 4.3.4.181 *srs-DCI7-TriggeringFS2-r15*

This field indicates whether the UE supports SRS triggerring via DCI format 7 for FS2.

#### 4.3.4.xyz *ul-256QAM-r15*

This field indicates whether the UE supports UL 256QAM for MR-DC within the indicated feature set. This field is reported per component carrier in a bandwidth class (A,B, C, D and so on) for a band in a given band combination.

*End of changes*