# Draft TPs for E-rated issues

# Aligning RRC parameter names with TS38.331

Reason for change:

RRC parameter names in TS 38.213 v16.3.0 are not aligned with TS 38.331 v16.2.0.

Text proposal [1][2]:

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| **Text proposal for TS 38.213 v16.3.0**  10.1 UE procedure for determining physical downlink control channel assignment  < Unchanged parts are omitted >  - if the UE is provided by *simultaneousTCI-UpdateList1-r16* or *simultaneousTCI-UpdateList2-r16* up to two lists of cells for simultaneous TCI state activation, the UE applies the antenna port quasi co-location provided by *TCI-States* with same activated *tci-StateID* value to CORESETs with index in all configured DL BWPs of all configured cells in a list determined from a serving cell index provided by a MAC CE command  < Unchanged parts are omitted >  4.1 Cell search  For operation with shared spectrum channel access, a UE assumes that SS/PBCH blocks in a serving cell that are within a same discovery burst transmission window or across discovery burst transmission windows are quasi co-located with respect to average gain, quasi co-location ’typeA’, and ’typeD’ properties, when applicable [6, TS 38.214], if a value of is same among the SS/PBCH blocks. is an index of a DM-RS sequence transmitted in a PBCH of a corresponding SS/PBCH block, and is either provided by *ssb-PositionQCL-r16* or, if *ssb-PositionQCL-r16* is not provided,obtained from a *MIB* provided by a SS/PBCH block according to Table 4.1-1 with [4, TS 38.211]. *subCarrierSpacingCommon* indicates SCS of RMSI only for the case of operation without shared spectrum channel access. The UE can determine an SS/PBCH block index according to , or according to where is the candidate SS/PBCH block index. The UE assumes that within a discovery burst transmission window, a number of transmitted SS/PBCH blocks on a serving cell is not larger than and a number of transmitted SS/PBCH blocks with a same SS/PBCH block index is not larger than one.  < Unchanged parts are omitted >  5 Radio link monitoring  The downlink radio link quality of the primary cell is monitored by a UE for the purpose of indicating out-of-sync/in-sync status to higher layers. The UE is not required to monitor the downlink radio link quality in DL BWPs other than the active DL BWP, as described in Clause 12, on the primary cell. If the active DL BWP is the initial DL BWP and for SS/PBCH block and CORESET multiplexing pattern 2 or 3, as described in Clause 13, the UE is expected to perform RLM using the associated SS/PBCH block when the associated SS/PBCH block index is provided by *RadioLinkMonitoringRS*.  If the UE is configured with a SCG, as described in [12, TS 38.331], and the parameter *rlf-TimersAndConstants* is provided by higher layers and is not set to release, the downlink radio link quality of the PSCell of the SCG is monitored by the UE for the purpose of indicating out-of-sync/in-sync status to higher layers. The UE is not required to monitor the downlink radio link quality in DL BWPs other than the active DL BWP on the PSCell.  A UE can be configured for each DL BWP of a SpCell [11, TS 38.321] with a set of resource indexes, through a corresponding set of *RadioLinkMonitoringRS*, for radio link monitoring by *failureDetectionResources*. The UE is provided either a CSI-RS resource configuration index, by *csi-RS-Index*, or a SS/PBCH block index, by *ssb-Index*. The UE can be configured with up to  *RadioLinkMonitoringRS* for link recovery procedures, as described in Clause 6, and for radio link monitoring. From the  *RadioLinkMonitoringRS*, up to  *RadioLinkMonitoringRS* can be used for radio link monitoring depending on as described in Table 5-1, wherein is as defined in Clause 4.1, and up to two *RadioLinkMonitoringRS* can be used for link recovery procedures.  For operation with shared spectrum channel access, when a UE is provided a SS/PBCH block index by *ssb-Index*, the UE is expected to perform radio link monitoring using SS/PBCH block(s) in the discovery burst transmission window as described in Clause 4.1, where the SS/PBCH block(s) have candidate SS/PBCH block index(es) corresponding to SS/PBCH block index provided by *ssb-Index*.  If the UE is not provided *RadioLinkMonitoringRS* and the UE is provided for PDCCH receptions TCI states that include one or more of a CSI-RS  - the UE uses for radio link monitoring the RS provided for the active TCI state for PDCCH reception if the active TCI state for PDCCH reception includes only one RS  - if the active TCI state for PDCCH reception includes two RS, the UE expects that one RS is configured with *qcl-Type* set to ’typeD’ [6, TS 38.214] and the UE uses the RS configured with *qcl-Type* set to ’typeD’ for radio link monitoring; the UE does not expect both RS to be configured with *qcl-Type* set to ’typeD’.  - the UE is not required to use for radio link monitoring an aperiodic or semi-persistent RS  - For , the UE selects the  RS provided for active TCI states for PDCCH receptions in CORESETs associated with the search space sets in an order from the shortest monitoring periodicity. If more than one CORESETs are associated with search space sets having same monitoring periodicity, the UE determines the order of the CORESET from the highest CORESET index as described in Clause 10.1.  < Unchanged parts are omitted >  6 Link recovery procedures  A UE can be provided, for each BWP of a serving cell, a set  of periodic CSI-RS resource configuration indexes by *failureDetectionResources* and a set  of periodic CSI-RS resource configuration indexes and/or SS/PBCH block indexes by *candidateBeamRSList* or *candidateBeamRSListExt-r16* or *candidateBeamRSSCellList-r16* for radio link quality measurements on the BWP of the serving cell. If the UE is not provided  by *failureDetectionResources* for a BWP of the serving cell, the UE determines the set  to include periodic CSI-RS resource configuration indexes with same values as the RS indexes in the RS sets indicated by *TCI-State* for respective CORESETs that the UE uses for monitoring PDCCH and, if there are two RS indexes in a TCI state, the set  includes RS indexes configured with *qcl-Type* set to ’typeD’ for the corresponding TCI states. The UE expects the set  to include up to two RS indexes. The UE expects single port RS in the set . The UE expects single-port or two-port CSI-RS with frequency density equal to 1 or 3 REs per RB in the set .  The thresholds Qout,LR and Qin,LR correspond to the default value of *rlmInSyncOutOfSyncThreshold*, as described in [10, TS 38.133] for Qout, and to the value provided by *rsrp-ThresholdSSB* or *rsrp-ThresholdBFR-r16*, respectively.  < Unchanged parts are omitted >  7.1.1 UE behaviour  < Unchanged parts are omitted >  - If  - the PUSCH transmission is scheduled by DCI format 0\_0 and the UE is not provided a spatial setting for a PUCCH transmission, or  - the PUSCH transmission is not scheduled by DCI format 0\_0 that does not include an SRI field, or  - *SRI-PUSCH-PowerControl* is not provided to the UE,  the UE determines a RS resource index with a respective *PUSCH-PathlossReferenceRS-Id* value being equal to zero where the RS resource is either on serving cell or, if provided, on a serving cell indicated by a value of *pathlossReferenceLinking*  - If  - the PUSCH transmission is scheduled by DCI format 0\_0 on serving cell ,  - the UE is not provided PUCCH resources for the active UL BWP of serving cell , and  - the UE is provided *enableDefaultBeamPL-ForPUSCH0-r16*  the UE determines a RS resource index providing a periodic RS resource configured with *qcl-Type* set to ’typeD’ in the TCI state or the QCL assumption of a CORESET with the lowest index in the active DL BWP of the serving cell  - If  - the PUSCH transmission is scheduled by DCI format 0\_0 on serving cell ,  - the UE is not provided a spatial setting for PUCCH resources on the active UL BWP of the primary cell [11, TS 38.321], and  - the UE is provided *enableDefaultBeamPL-ForPUSCH0-r16*  the UE determines a RS resource index providing a periodic RS resource configured with *qcl-Type* set to ’typeD’ in the TCI state or the QCL assumption of a CORESET with the lowest index in the active DL BWP of serving cell  < Unchanged parts are omitted >  7.3.1 UE behaviour  < Unchanged parts are omitted >  - If the UE  - is not provided *pathlossReferenceRS* or *SRS-PathlossReferenceRS*,  - is not provided *spatialRelationInfo*, and  - is provided *enableDefaultBeamPL-ForSRS-r16*, and  - is not provided *CORESETPoolIndex* value of 1 for any CORESET, or is provided *CORESETPoolIndex* value of 1 for all CORESETs, in *ControlResourceSet* and no codepoint of a TCI field, if any, in a DCI format of any search space set maps to two TCI states [5, TS 38.212]  the UE determines a RS resource index  providing a periodic RS resource configured with *qcl-Type* set to ’typeD’ in  - the TCI state or the QCL assumption of a CORESET with the lowest index in the active DL BWP, if CORESETs are provided in the active DL BWP of serving cell  - the active PDSCH TCI state with lowest ID [6, TS 38.214] in the active DL BWP, if CORESETs are not provided in the active DL BWP of serving cell  < Unchanged parts are omitted >  7.4 Physical random access channel  A UE determines a transmission power for a physical random access channel (PRACH), , on active UL BWP  of carrier  of serving cell  based on DL RS for serving cell  in transmission occasion  as  [dBm],  where  is the UE configured maximum output power defined in [8-1, TS 38.101-1], [8-2, TS 38.101-2] and [8-3, TS 38.101-3] for carrier  of serving cell  within transmission occasion ,  is the PRACH target reception power *PREAMBLE\_RECEIVED\_TARGET\_POWER* provided by higher layers [11, TS 38.321] for the active UL BWP  of carrier  of serving cell , and  is a pathloss for the active UL BWP  of carrier  based on the DL RS associated with the PRACH transmission on the active DL BWP of serving cell  and calculated by the UE in dB as *referenceSignalPower* – higher layer filtered RSRP in dBm, where RSRP is defined in [7, TS 38.215] and the higher layer filter configuration is defined in [12, TS 38.331]. If the active DL BWP is the initial DL BWP and for SS/PBCH block and CORESET multiplexing pattern 2 or 3, as described in Clause 13, the UE determines  based on the SS/PBCH block associated with the PRACH transmission.  If a PRACH transmission from a UE is not in response to a detection of a PDCCH order by the UE, or is in response to a detection of a PDCCH order by the UE that triggers a contention based random access procedure, or is associated with a link recovery procedure where a corresponding index  is associated with a SS/PBCH block, as described in Clause 6, *referenceSignalPower* is provided by *ss-PBCH-BlockPower*.  If a PRACH transmission from a UE is in response to a detection of a PDCCH order by the UE that triggers a contention-free random access procedure and depending on the DL RS that the DM-RS of the PDCCH order is quasi-collocated with as described in Clause 10.1, *referenceSignalPower* is provided by *ss-PBCH-BlockPower* or, if the UE is configured resources for a periodic CSI-RS reception or the PRACH transmission is associated with a link recovery procedure where a corresponding index  is associated with a periodic CSI-RS configuration as described in Clause 6, *referenceSignalPower* is obtained by *ss-PBCH-BlockPower* and *powerControlOffsetSS* where *powerControlOffsetSS* provides an offset of CSI-RS transmission power relative to SS/PBCH block transmission power [6, TS 38.214]. If *powerControlOffsetSS* is not provided to the UE, the UE assumes an offset of 0 dB. If the active TCI state for the PDCCH that provides the PDCCH order includes two RS, the UE expects that one RS is configured with *qcl-Type* set to ’typeD’ and the UE uses the one RS when applying a value provided by *powerControlOffsetSS*.  < Unchanged parts are omitted >  10.1 UE procedure for determining physical downlink control channel assignment  < Unchanged parts are omitted >  If a UE monitors PDCCH candidates for DCI formats with CRC scrambled by a C-RNTI and the UE is provided a non-zero value for *searchSpaceID* in *PDCCH-ConfigCommon* for a Type0/0A/2-PDCCH CSS set, the UE determines monitoring occasions for PDCCH candidates of the Type0/0A/2-PDCCH CSS set based on the search space set associated with the value of *searchSpaceID*.  The UE may assume that the DM-RS antenna port associated with PDCCH receptions in the CORESET configured by *pdcch-ConfigSIB1* in *MIB*, the DM-RS antenna port associated with corresponding PDSCH receptions, and the corresponding SS/PBCH block are quasi co-located with respect to average gain, quasi co-location ’typeA’, and ’typeD’ properties, when applicable [6, TS 38.214], if the UE is not provided a TCI state indicating quasi co-location information of the DM-RS antenna port for PDCCH reception in the CORESET. The value for the DM-RS scrambling sequence initialization is the cell ID. A SCS is provided by *subCarrierSpacingCommon* in *MIB*.  For single cell operation or for operation with carrier aggregation in a same frequency band, a UE does not expect to monitor a PDCCH in a Type0/0A/2/3-PDCCH CSS set or in a USS set if a DM-RS for monitoring a PDCCH in a Type1-PDCCH CSS set is not configured with the same *qcl-Type* set to ’typeD’ properties [6, TS 38.214] with a DM-RS for monitoring the PDCCH in the Type0/0A/2/3-PDCCH CSS set or in the USS set, and if the PDCCH or an associated PDSCH overlaps in at least one symbol with a PDCCH the UE monitors in a Type1-PDCCH CSS set or with an associated PDSCH.  < Unchanged parts are omitted >  For a CORESET other than a CORESET with index 0, if a UE is provided a single TCI state for a CORESET, or if the UE receives a MAC CE activation command for one of the provided TCI states for a CORESET, the UE assumes that the DM-RS antenna port associated with PDCCH receptions in the CORESET is quasi co-located with the one or more DL RS configured by the TCI state. For a CORESET with index 0, the UE expects that a CSI-RS configured with *qcl-Type* set to ‘typeD’ in a TCI state indicated by a MAC CE activation command for the CORESET is provided by a SS/PBCH block  - if the UE receives a MAC CE activation command for one of the TCI states, the UE applies the activation command in the first slot that is after slot where is the slot where the UE would transmit a PUCCH with HARQ-ACK information for the PDSCH providing the activation command and is the SCS configuration for the PUCCH. The active BWP is defined as the active BWP in the slot when the activation command is applied.  < Unchanged parts are omitted >  If a UE  - is configured for single cell operation or for operation with carrier aggregation in a same frequency band, and  - monitors PDCCH candidates in overlapping PDCCH monitoring occasions in multiple CORESETs that have been configured with the same or different *qcl-Type* set to ’typeD’ properties on active DL BWP(s) of one or more cells  the UE monitors PDCCHs only in a CORESET, and in any other CORESET from the multiple CORESETs having being configured with *qcl-Type* set to same ’typeD’ properties as the CORESET, on the active DL BWP of a cell from the one or more cells  - the CORESET corresponds to the CSS set with the lowest index in the cell with the lowest index containing CSS, if any; otherwise, to the USS set with the lowest index in the cell with lowest index  - the lowest USS set index is determined over all USS sets with at least one PDCCH candidate in overlapping PDCCH monitoring occasions  - for the purpose of determining the CORESET, a SS/PBCH block is considered to have different QCL ’typeD’ properties than a CSI-RS  - for the purpose of determining the CORESET, a first CSI-RS associated with a SS/PBCH block in a first cell and a second CSI-RS in a second cell that is also associated with the SS/PBCH block are assumed to have same QCL ’typeD’ properties  - the allocation of non-overlapping CCEs and of PDCCH candidates for PDCCH monitoring is according to all search space sets associated with the multiple CORESETs on the active DL BWP(s) of the one or more cells  - the number of active TCI states is determined from the multiple CORESETs  If a UE  - is configured for single cell operation or for operation with carrier aggregation in a same frequency band, and  - monitors PDCCH candidates in overlapping PDCCH monitoring occasions in multiple CORESETs where none of the CORESETs has TCI-states configured with *qcl-Type* set to’typeD’,  the UE is required to monitor PDCCH candidates in overlapping PDCCH monitoring occasions for search space sets associated with different CORESETs.  <omitted text>  13 UE procedure for monitoring Type0-PDCCH CSS sets  < Unchanged parts are omitted >  For operation with shared spectrum channel access and for the SS/PBCH block and CORESET multiplexing pattern 1, a UE monitors PDCCH in the Type0-PDCCH CSS set over slots that include Type0-PDCCH monitoring occasions associated with SS/PBCH blocks that are quasi co-located with the SS/PBCH block that provides a CORESET for Type0-PDCCH CSS set with respect to average gain, quasi co-location ’typeA’, and ’typeD’ properties, when applicable [6, TS 38.214]. For a candidate SS/PBCH block index , where , two consecutive slots starting from slot include the associated Type0-PDCCH monitoring occasions. The UE determines an index of slot as that is in a frame with system frame number (SFN) satisfying if , or in a frame with SFN satisfying if . and are provided by Table 13-11, and based on the SCS for PDCCH receptions in the CORESET [4, TS 38.211]. The index for the first symbol of the CORESET in slots and is the first symbol index provided by Table 13-11. The UE does not expect to be configured with , or with , when .  < Unchanged parts are omitted > |

# References

[1] [R1-2008640](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_103-e/Docs/R1-2008640.zip), Draft CR on QCL terminology alignment, Nokia, Nokia Shanghai Bell

[2] [R1-2008514](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_103-e/Docs/R1-2008514.zip), Remaining issues on multi-beam operation, MediaTek Inc.