**3GPP TSG-RAN Meeting #109 electronic *R2-200xxxx***

**24 Feb – 6 Mar 2020**

|  |
| --- |
| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **36.331** | **CR** | **4219** | **rev** | **1** | **Current version:** | **15.8.0** |  |
|  |
| *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)*.* |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

|  |
| --- |
|  |
| ***Title:***  | Introduction of DL MIMO efficiency enhancement |
|  |  |
| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | LTE\_DL\_MIMO\_EE-Core |  | ***Date:*** | 2020-02-14 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***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-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
|  |  |
| ***Reason for change:*** | As per R2-2000023/R1-1913673, corresponding RRC configurations need to be added to support DL MIMO efficiency enhancement. |
|  |  |
| ***Summary of change:*** | The following changes are made:1. Configurations of DL MIMO efficiency enhancement are added to *PhysicalConfigDedicated* and *PhysicalConfigDedicatedSCell* |
|  |  |
| ***Consequences if not approved:*** | DL MIMO efficiency enhancement is not supported in Rel-16. |
|  |  |
| ***Clauses affected:*** | 6.3.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 36.306 CR 1740 |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** | **For RAN2#109 meeting, the following changes are made:*** Add new RRC parameter addSRS-GuardSymbolAS and addSRS-GuardSymbolFH
* The value of addSRS-P0-UE is added
 |

### 6.3.2 Radio resource control information elements

*/ Unchanged parts are omitted/*

#### – *PhysicalConfigDedicated*

The IE *PhysicalConfigDedicated* is used to specify the UE specific physical channel configuration.

*PhysicalConfigDedicated* information element

-- ASN1START

PhysicalConfigDedicated ::= SEQUENCE {

 pdsch-ConfigDedicated PDSCH-ConfigDedicated OPTIONAL, -- Need ON

 pucch-ConfigDedicated PUCCH-ConfigDedicated OPTIONAL, -- Need ON

 pusch-ConfigDedicated PUSCH-ConfigDedicated OPTIONAL, -- Need ON

 uplinkPowerControlDedicated UplinkPowerControlDedicated OPTIONAL, -- Need ON

 tpc-PDCCH-ConfigPUCCH TPC-PDCCH-Config OPTIONAL, -- Need ON

 tpc-PDCCH-ConfigPUSCH TPC-PDCCH-Config OPTIONAL, -- Need ON

 cqi-ReportConfig CQI-ReportConfig OPTIONAL, -- Cond CQI-r8

 soundingRS-UL-ConfigDedicated SoundingRS-UL-ConfigDedicated OPTIONAL, -- Need ON

 antennaInfo CHOICE {

 explicitValue AntennaInfoDedicated,

 defaultValue NULL

 } OPTIONAL, -- Cond AI-r8

 schedulingRequestConfig SchedulingRequestConfig OPTIONAL, -- Need ON

 ...,

 [[ cqi-ReportConfig-v920 CQI-ReportConfig-v920 OPTIONAL, -- Cond CQI-r8

 antennaInfo-v920 AntennaInfoDedicated-v920 OPTIONAL -- Cond AI-r8

 ]],

 [[ antennaInfo-r10 CHOICE {

 explicitValue-r10 AntennaInfoDedicated-r10,

 defaultValue NULL

 } OPTIONAL, -- Cond AI-r10

 antennaInfoUL-r10 AntennaInfoUL-r10 OPTIONAL, -- Need ON

 cif-Presence-r10 BOOLEAN OPTIONAL, -- Need ON

 cqi-ReportConfig-r10 CQI-ReportConfig-r10 OPTIONAL, -- Cond CQI-r10

 csi-RS-Config-r10 CSI-RS-Config-r10 OPTIONAL, -- Need ON

 pucch-ConfigDedicated-v1020 PUCCH-ConfigDedicated-v1020 OPTIONAL, -- Need ON

 pusch-ConfigDedicated-v1020 PUSCH-ConfigDedicated-v1020 OPTIONAL, -- Need ON

 schedulingRequestConfig-v1020 SchedulingRequestConfig-v1020 OPTIONAL, -- Need ON

 soundingRS-UL-ConfigDedicated-v1020

 SoundingRS-UL-ConfigDedicated-v1020 OPTIONAL, -- Need ON

 soundingRS-UL-ConfigDedicatedAperiodic-r10

 SoundingRS-UL-ConfigDedicatedAperiodic-r10 OPTIONAL, -- Need ON

 uplinkPowerControlDedicated-v1020

 UplinkPowerControlDedicated-v1020 OPTIONAL -- Need ON

 ]],

 [[ additionalSpectrumEmissionCA-r10 CHOICE {

 release NULL,

 setup SEQUENCE {

 additionalSpectrumEmissionPCell-r10 AdditionalSpectrumEmission

 }

 } OPTIONAL -- Need ON

 ]],

 [[ -- DL configuration as well as configuration applicable for DL and UL

 csi-RS-ConfigNZPToReleaseList-r11

 CSI-RS-ConfigNZPToReleaseList-r11 OPTIONAL, -- Need ON

 csi-RS-ConfigNZPToAddModList-r11

 CSI-RS-ConfigNZPToAddModList-r11 OPTIONAL, -- Need ON

 csi-RS-ConfigZPToReleaseList-r11

 CSI-RS-ConfigZPToReleaseList-r11 OPTIONAL, -- Need ON

 csi-RS-ConfigZPToAddModList-r11 CSI-RS-ConfigZPToAddModList-r11 OPTIONAL, -- Need ON

 epdcch-Config-r11 EPDCCH-Config-r11 OPTIONAL, -- Need ON

 pdsch-ConfigDedicated-v1130 PDSCH-ConfigDedicated-v1130 OPTIONAL, -- Need ON

 -- UL configuration

 cqi-ReportConfig-v1130 CQI-ReportConfig-v1130 OPTIONAL, -- Need ON

 pucch-ConfigDedicated-v1130 PUCCH-ConfigDedicated-v1130 OPTIONAL, -- Need ON

 pusch-ConfigDedicated-v1130 PUSCH-ConfigDedicated-v1130 OPTIONAL, -- Need ON

 uplinkPowerControlDedicated-v1130

 UplinkPowerControlDedicated-v1130 OPTIONAL -- Need ON

 ]],

 [[ antennaInfo-v1250 AntennaInfoDedicated-v1250 OPTIONAL, -- Cond AI-r10

 eimta-MainConfig-r12 EIMTA-MainConfig-r12 OPTIONAL, -- Need ON

 eimta-MainConfigPCell-r12 EIMTA-MainConfigServCell-r12 OPTIONAL, -- Need ON

 pucch-ConfigDedicated-v1250 PUCCH-ConfigDedicated-v1250 OPTIONAL, -- Need ON

 cqi-ReportConfigPCell-v1250 CQI-ReportConfig-v1250 OPTIONAL, -- Need ON

 uplinkPowerControlDedicated-v1250

 UplinkPowerControlDedicated-v1250 OPTIONAL, -- Need ON

 pusch-ConfigDedicated-v1250 PUSCH-ConfigDedicated-v1250 OPTIONAL, -- Need ON

 csi-RS-Config-v1250 CSI-RS-Config-v1250 OPTIONAL -- Need ON

 ]],

 [[ pdsch-ConfigDedicated-v1280 PDSCH-ConfigDedicated-v1280 OPTIONAL -- Need ON

 ]],

 [[ pdsch-ConfigDedicated-v1310 PDSCH-ConfigDedicated-v1310 OPTIONAL, -- Need ON

 pucch-ConfigDedicated-r13 PUCCH-ConfigDedicated-r13 OPTIONAL, -- Need ON

 pusch-ConfigDedicated-r13 PUSCH-ConfigDedicated-r13 OPTIONAL, -- Need ON

 pdcch-CandidateReductions-r13

 PDCCH-CandidateReductions-r13 OPTIONAL, -- Need ON

 cqi-ReportConfig-v1310 CQI-ReportConfig-v1310 OPTIONAL, -- Need ON

 soundingRS-UL-ConfigDedicated-v1310

 SoundingRS-UL-ConfigDedicated-v1310 OPTIONAL, -- Need ON

 soundingRS-UL-ConfigDedicatedUpPTsExt-r13

 SoundingRS-UL-ConfigDedicatedUpPTsExt-r13 OPTIONAL, -- Need ON

 soundingRS-UL-ConfigDedicatedAperiodic-v1310

 SoundingRS-UL-ConfigDedicatedAperiodic-v1310 OPTIONAL, -- Need ON

 soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13

 SoundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13 OPTIONAL, -- Need ON

 csi-RS-Config-v1310 CSI-RS-Config-v1310 OPTIONAL, -- Need ON

 ce-Mode-r13 CHOICE {

 release NULL,

 setup ENUMERATED {ce-ModeA,ce-ModeB}

 } OPTIONAL, -- Need ON

 csi-RS-ConfigNZPToAddModListExt-r13 CSI-RS-ConfigNZPToAddModListExt-r13 OPTIONAL, -- Need ON

 csi-RS-ConfigNZPToReleaseListExt-r13 CSI-RS-ConfigNZPToReleaseListExt-r13 OPTIONAL -- Need ON

 ]],

 [[ cqi-ReportConfig-v1320 CQI-ReportConfig-v1320 OPTIONAL -- Need ON

 ]],

 [[ typeA-SRS-TPC-PDCCH-Group-r14 CHOICE {

 release NULL,

 setup SEQUENCE (SIZE (1..32)) OF SRS-TPC-PDCCH-Config-r14

 } OPTIONAL, -- Need ON

 must-Config-r14 CHOICE{

 release NULL,

 setup SEQUENCE {

 k-max-r14 ENUMERATED {l1, l3},

 p-a-must-r14 ENUMERATED {

 dB-6, dB-4dot77, dB-3, dB-1dot77,

 dB0, dB1, dB2, dB3} OPTIONAL -- Need ON

 }

 } OPTIONAL, -- Need ON

 pusch-EnhancementsConfig-r14 PUSCH-EnhancementsConfig-r14 OPTIONAL, -- Need ON

 ce-pdsch-pusch-EnhancementConfig-r14 ENUMERATED {on} OPTIONAL, -- Need OR

 antennaInfo-v1430 AntennaInfoDedicated-v1430 OPTIONAL, -- Need ON

 pucch-ConfigDedicated-v1430 PUCCH-ConfigDedicated-v1430 OPTIONAL, -- Need ON

 pdsch-ConfigDedicated-v1430 PDSCH-ConfigDedicated-v1430 OPTIONAL, -- Need ON

 pusch-ConfigDedicated-v1430 PUSCH-ConfigDedicated-v1430 OPTIONAL, -- Need ON

 soundingRS-UL-PeriodicConfigDedicatedList-r14 SEQUENCE (SIZE (1..2)) OF SoundingRS-UL-ConfigDedicated OPTIONAL, -- Cond PeriodicSRSPCell

 soundingRS-UL-PeriodicConfigDedicatedUpPTsExtList-r14 SEQUENCE (SIZE (1..4)) OF SoundingRS-UL-ConfigDedicatedUpPTsExt-r13 OPTIONAL, -- Cond PeriodicSRSExt

 soundingRS-UL-AperiodicConfigDedicatedList-r14 SEQUENCE (SIZE (1..2)) OF SoundingRS-UL-ConfigDedicatedAperiodic-r10 OPTIONAL, -- Cond AperiodicSRS

 soundingRS-UL-ConfigDedicatedApUpPTsExtList-r14 SEQUENCE (SIZE (1..4)) OF SoundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13 OPTIONAL, -- Cond AperiodicSRSExt

 csi-RS-Config-v1430 CSI-RS-Config-v1430 OPTIONAL, -- Need ON

 csi-RS-ConfigZP-ApList-r14 CSI-RS-ConfigZP-ApList-r14 OPTIONAL, -- Need ON

 cqi-ReportConfig-v1430 CQI-ReportConfig-v1430 OPTIONAL, -- Need ON

 semiOpenLoop-r14 BOOLEAN OPTIONAL -- Need ON

 ]],

 [[ csi-RS-Config-v1480 CSI-RS-Config-v1480 OPTIONAL -- Need ON

 ]],

 [[ physicalConfigDedicatedSTTI-r15 PhysicalConfigDedicatedSTTI-r15 OPTIONAL,-- Need ON

 pdsch-ConfigDedicated-v1530 PDSCH-ConfigDedicated-v1530 OPTIONAL,-- Need ON

 pusch-ConfigDedicated-v1530 PUSCH-ConfigDedicated-v1530 OPTIONAL,-- Need ON

 cqi-ReportConfig-v1530 CQI-ReportConfig-v1530 OPTIONAL,-- Need ON

 antennaInfo-v1530 AntennaInfoDedicated-v1530 OPTIONAL,-- Need ON

 csi-RS-Config-v1530 CSI-RS-Config-v1530 OPTIONAL,-- Need ON

 uplinkPowerControlDedicated-v1530

 UplinkPowerControlDedicated-v1530 OPTIONAL, -- Need ON

 semiStaticCFI-Config-r15 CHOICE{

 release NULL,

 setup CHOICE{

 cfi-Config-r15 CFI-Config-r15,

 cfi-PatternConfig-r15 CFI-PatternConfig-r15

 }

 } OPTIONAL, -- Need ON

 blindPDSCH-Repetition-Config-r15 CHOICE{

 release NULL,

 setup SEQUENCE {

 blindSubframePDSCH-Repetitions-r15 BOOLEAN,

 blindSlotSubslotPDSCH-Repetitions-r15 BOOLEAN,

 maxNumber-SubframePDSCH-Repetitions-r15 ENUMERATED {n4,n6} OPTIONAL, -- Need ON

 maxNumber-SlotSubslotPDSCH-Repetitions-r15 ENUMERATED {n4,n6} OPTIONAL, -- Need ON

 rv-SubframePDSCH-Repetitions-r15 ENUMERATED {dlrvseq1, dlrvseq2} OPTIONAL, -- Need ON

 rv-SlotsublotPDSCH-Repetitions-r15 ENUMERATED {dlrvseq1, dlrvseq2} OPTIONAL, -- Need ON

 numberOfProcesses-SubframePDSCH-Repetitions-r15 INTEGER(1..16) OPTIONAL, -- Need ON

 numberOfProcesses-SlotSubslotPDSCH-Repetitions-r15 INTEGER(1..16) OPTIONAL, -- Need ON

 mcs-restrictionSubframePDSCH-Repetitions-r15 ENUMERATED {n0, n1} OPTIONAL, -- Need ON

 mcs-restrictionSlotSubslotPDSCH-Repetitions-r15 ENUMERATED {n0, n1} OPTIONAL -- Need ON

 }

 } OPTIONAL -- Need ON

 ]],

 [[ spucch-Config-v1550 SPUCCH-Config-v1550 OPTIONAL -- Need ON

 ]],

 [[ soundingRS-UL-ConfigDedicatedAdd-r16 SoundingRS-UL-ConfigDedicatedAdd-r16 OPTIONAL, -- Need ON

 uplinkPowerControlAddSRS-r16 UplinkPowerControlAddSRS-r16 OPTIONAL, -- Need ON

 soundingRS-VirtualCellID-r16 SoundingRS-VirtualCellID-r16 OPTIONAL -- Need ON

 ]]

}

PhysicalConfigDedicated-v1370 ::= SEQUENCE {

 pucch-ConfigDedicated-v1370 PUCCH-ConfigDedicated-v1370 OPTIONAL -- Cond PUCCH-Format4or5

}

PhysicalConfigDedicated-v13c0 ::= SEQUENCE {

 pucch-ConfigDedicated-v13c0 PUCCH-ConfigDedicated-v13c0

}

PhysicalConfigDedicatedSCell-r10 ::= SEQUENCE {

 -- DL configuration as well as configuration applicable for DL and UL

 nonUL-Configuration-r10 SEQUENCE {

 antennaInfo-r10

 AntennaInfoDedicated-r10 OPTIONAL, -- Need ON

 crossCarrierSchedulingConfig-r10

 CrossCarrierSchedulingConfig-r10 OPTIONAL, -- Need ON

 csi-RS-Config-r10 CSI-RS-Config-r10 OPTIONAL, -- Need ON

 pdsch-ConfigDedicated-r10 PDSCH-ConfigDedicated OPTIONAL -- Need ON

 } OPTIONAL, -- Cond SCellAdd

 -- UL configuration

 ul-Configuration-r10 SEQUENCE {

 antennaInfoUL-r10 AntennaInfoUL-r10 OPTIONAL, -- Need ON

 pusch-ConfigDedicatedSCell-r10

 PUSCH-ConfigDedicatedSCell-r10 OPTIONAL, -- Cond PUSCH-SCell1

 uplinkPowerControlDedicatedSCell-r10

 UplinkPowerControlDedicatedSCell-r10 OPTIONAL, -- Need ON

 cqi-ReportConfigSCell-r10 CQI-ReportConfigSCell-r10 OPTIONAL, -- Need ON

 soundingRS-UL-ConfigDedicated-r10

 SoundingRS-UL-ConfigDedicated OPTIONAL, -- Need ON

 soundingRS-UL-ConfigDedicated-v1020

 SoundingRS-UL-ConfigDedicated-v1020 OPTIONAL, -- Need ON

 soundingRS-UL-ConfigDedicatedAperiodic-r10

 SoundingRS-UL-ConfigDedicatedAperiodic-r10 OPTIONAL -- Need ON

 } OPTIONAL, -- Cond CommonUL

 ...,

 [[ -- DL configuration as well as configuration applicable for DL and UL

 csi-RS-ConfigNZPToReleaseList-r11

 CSI-RS-ConfigNZPToReleaseList-r11 OPTIONAL, -- Need ON

 csi-RS-ConfigNZPToAddModList-r11

 CSI-RS-ConfigNZPToAddModList-r11 OPTIONAL, -- Need ON

 csi-RS-ConfigZPToReleaseList-r11

 CSI-RS-ConfigZPToReleaseList-r11 OPTIONAL, -- Need ON

 csi-RS-ConfigZPToAddModList-r11

 CSI-RS-ConfigZPToAddModList-r11 OPTIONAL, -- Need ON

 epdcch-Config-r11 EPDCCH-Config-r11 OPTIONAL, -- Need ON

 pdsch-ConfigDedicated-v1130 PDSCH-ConfigDedicated-v1130 OPTIONAL, -- Need ON

 -- UL configuration

 cqi-ReportConfig-v1130 CQI-ReportConfig-v1130 OPTIONAL, -- Need ON

 pusch-ConfigDedicated-v1130

 PUSCH-ConfigDedicated-v1130 OPTIONAL, -- Cond PUSCH-SCell1

 uplinkPowerControlDedicatedSCell-v1130

 UplinkPowerControlDedicated-v1130 OPTIONAL -- Need ON

 ]],

 [[ antennaInfo-v1250 AntennaInfoDedicated-v1250 OPTIONAL, -- Need ON

 eimta-MainConfigSCell-r12

 EIMTA-MainConfigServCell-r12 OPTIONAL, -- Need ON

 cqi-ReportConfigSCell-v1250 CQI-ReportConfig-v1250 OPTIONAL, -- Need ON

 uplinkPowerControlDedicatedSCell-v1250

 UplinkPowerControlDedicated-v1250 OPTIONAL, -- Need ON

 csi-RS-Config-v1250 CSI-RS-Config-v1250 OPTIONAL -- Need ON

 ]],

 [[ pdsch-ConfigDedicated-v1280 PDSCH-ConfigDedicated-v1280 OPTIONAL -- Need ON

 ]],

 [[ pucch-Cell-r13 ENUMERATED {true} OPTIONAL, -- Cond PUCCH-SCell1

 pucch-SCell CHOICE{

 release NULL,

 setup SEQUENCE {

 pucch-ConfigDedicated-r13

 PUCCH-ConfigDedicated-r13 OPTIONAL, -- Need ON

 schedulingRequestConfig-r13

 SchedulingRequestConfigSCell-r13 OPTIONAL, -- Need ON

 tpc-PDCCH-ConfigPUCCH-SCell-r13

 TPC-PDCCH-ConfigSCell-r13 OPTIONAL, -- Need ON

 pusch-ConfigDedicated-r13

 PUSCH-ConfigDedicated-r13 OPTIONAL, -- Cond PUSCH-SCell

 uplinkPowerControlDedicated-r13

 UplinkPowerControlDedicatedSCell-v1310 OPTIONAL -- Need ON

 }

 } OPTIONAL, -- Need ON

 crossCarrierSchedulingConfig-r13

 CrossCarrierSchedulingConfig-r13 OPTIONAL, -- Cond Cross-Carrier-Config

 pdcch-ConfigSCell-r13 PDCCH-ConfigSCell-r13 OPTIONAL, -- Need ON

 cqi-ReportConfig-v1310 CQI-ReportConfig-v1310 OPTIONAL, -- Need ON

 pdsch-ConfigDedicated-v1310 PDSCH-ConfigDedicated-v1310 OPTIONAL, -- Need ON

 soundingRS-UL-ConfigDedicated-v1310

 SoundingRS-UL-ConfigDedicated-v1310 OPTIONAL, -- Need ON

 soundingRS-UL-ConfigDedicatedUpPTsExt-r13

 SoundingRS-UL-ConfigDedicatedUpPTsExt-r13 OPTIONAL, -- Need ON

 soundingRS-UL-ConfigDedicatedAperiodic-v1310

 SoundingRS-UL-ConfigDedicatedAperiodic-v1310 OPTIONAL, -- Need ON

 soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13

 SoundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13 OPTIONAL, -- Need ON

 csi-RS-Config-v1310 CSI-RS-Config-v1310 OPTIONAL, -- Need ON

 laa-SCellConfiguration-r13 LAA-SCellConfiguration-r13 OPTIONAL, -- Need ON

 csi-RS-ConfigNZPToAddModListExt-r13 CSI-RS-ConfigNZPToAddModListExt-r13 OPTIONAL, -- Need ON

 csi-RS-ConfigNZPToReleaseListExt-r13 CSI-RS-ConfigNZPToReleaseListExt-r13 OPTIONAL -- Need ON

 ]],

 [[ cqi-ReportConfig-v1320 CQI-ReportConfig-v1320 OPTIONAL -- Need ON

 ]],

 [[ laa-SCellConfiguration-v1430 LAA-SCellConfiguration-v1430

 OPTIONAL, -- Need ON

 typeB-SRS-TPC-PDCCH-Config-r14 SRS-TPC-PDCCH-Config-r14 OPTIONAL, -- Need ON

 uplinkPUSCH-LessPowerControlDedicated-v1430 UplinkPUSCH-LessPowerControlDedicated-v1430 OPTIONAL, -- Need ON

 soundingRS-UL-PeriodicConfigDedicatedList-r14 SEQUENCE (SIZE (1..2)) OF SoundingRS-UL-ConfigDedicated OPTIONAL, -- Cond PeriodicSRS

 soundingRS-UL-PeriodicConfigDedicatedUpPTsExtList-r14 SEQUENCE (SIZE (1..4)) OF SoundingRS-UL-ConfigDedicatedUpPTsExt-r13 OPTIONAL, -- Cond PeriodicSRSExt

 soundingRS-UL-AperiodicConfigDedicatedList-r14 SEQUENCE (SIZE (1..2)) OF SoundingRS-AperiodicSet-r14 OPTIONAL, -- Cond AperiodicSRS

 soundingRS-UL-ConfigDedicatedApUpPTsExtList-r14 SEQUENCE (SIZE (1..4)) OF SoundingRS-AperiodicSetUpPTsExt-r14 OPTIONAL, -- Cond AperiodicSRSExt

 must-Config-r14 CHOICE{

 release NULL,

 setup SEQUENCE {

 k-max-r14 ENUMERATED {l1, l3},

 p-a-must-r14 ENUMERATED {

 dB-6, dB-4dot77, dB-3, dB-1dot77,

 dB0, dB1, dB2, dB3} OPTIONAL -- Need ON

 }

 } OPTIONAL, -- Need ON

 pusch-ConfigDedicated-v1430 PUSCH-ConfigDedicatedSCell-v1430 OPTIONAL, -- Need ON

 csi-RS-Config-v1430 CSI-RS-Config-v1430 OPTIONAL, -- Need ON

 csi-RS-ConfigZP-ApList-r14 CSI-RS-ConfigZP-ApList-r14 OPTIONAL, -- Need ON

 cqi-ReportConfig-v1430 CQI-ReportConfig-v1430 OPTIONAL, -- Need ON

 semiOpenLoop-r14 BOOLEAN OPTIONAL, -- Need ON

 pdsch-ConfigDedicatedSCell-v1430 PDSCH-ConfigDedicatedSCell-v1430 OPTIONAL -- Need ON

 ]],

 [[ csi-RS-Config-v1480 CSI-RS-Config-v1480 OPTIONAL -- Need ON

 ]],

 [[ physicalConfigDedicatedSTTI-r15 PhysicalConfigDedicatedSTTI-r15 OPTIONAL, -- Need ON

 pdsch-ConfigDedicated-v1530 PDSCH-ConfigDedicated-v1530 OPTIONAL, -- Need ON

 dummy CQI-ReportConfig-v1530 OPTIONAL, -- Need ON

 cqi-ReportConfigSCell-r15 CQI-ReportConfigSCell-r15 OPTIONAL, -- Need ON

 cqi-ShortConfigSCell-r15 CQI-ShortConfigSCell-r15 OPTIONAL, -- Need ON

 csi-RS-Config-v1530 CSI-RS-Config-v1530 OPTIONAL, -- Need ON

 uplinkPowerControlDedicatedSCell-v1530

 UplinkPowerControlDedicated-v1530 OPTIONAL, -- Need ON

 laa-SCellConfiguration-v1530 LAA-SCellConfiguration-v1530 OPTIONAL, -- Need ON

 pusch-ConfigDedicated-v1530 PUSCH-ConfigDedicatedScell-v1530 OPTIONAL, -- Cond AUL

 semiStaticCFI-Config-r15 CHOICE{

 release NULL,

 setup CHOICE{

 cfi-Config-r15 CFI-Config-r15,

 cfi-PatternConfig-r15 CFI-PatternConfig-r15

 }

 } OPTIONAL, -- Need ON

 blindPDSCH-Repetition-Config-r15 CHOICE{

 release NULL,

 setup SEQUENCE {

 blindSubframePDSCH-Repetitions-r15 BOOLEAN,

 blindSlotSubslotPDSCH-Repetitions-r15 BOOLEAN,

 maxNumber-SubframePDSCH-Repetitions-r15 ENUMERATED {n4,n6} OPTIONAL, -- Need ON

 maxNumber-SlotSubslotPDSCH-Repetitions-r15 ENUMERATED {n4,n6} OPTIONAL, -- Need ON

 rv-SubframePDSCH-Repetitions-r15 ENUMERATED {dlrvseq1, dlrvseq2} OPTIONAL, -- Need ON

 rv-SlotsublotPDSCH-Repetitions-r15 ENUMERATED {dlrvseq1, dlrvseq2} OPTIONAL, -- Need ON

 numberOfProcesses-SubframePDSCH-Repetitions-r15 INTEGER(1..16) OPTIONAL, -- Need ON

 numberOfProcesses-SlotSubslotPDSCH-Repetitions-r15 INTEGER(1..16) OPTIONAL, -- Need ON

 mcs-restrictionSubframePDSCH-Repetitions-r15 ENUMERATED {n0, n1} OPTIONAL, -- Need ON

 mcs-restrictionSlotSubslotPDSCH-Repetitions-r15 ENUMERATED {n0, n1} OPTIONAL -- Need ON

 }

 } OPTIONAL -- Need ON

 ]],

 [[ spucch-Config-v1550 SPUCCH-Config-v1550 OPTIONAL -- Need ON

 ]],

 [[ soundingRS-UL-ConfigDedicatedAdd-r16 SoundingRS-UL-ConfigDedicatedAdd-r16 OPTIONAL, -- Need ON

 uplinkPowerControlAddSRS-r16 UplinkPowerControlAddSRS-r16 OPTIONAL, -- Need ON

 soundingRS-VirtualCellID-r16 SoundingRS-VirtualCellID-r16 OPTIONAL -- Need ON

 ]]

}

PhysicalConfigDedicatedSCell-v1370 ::= SEQUENCE {

 pucch-SCell-v1370 CHOICE{

 release NULL,

 setup SEQUENCE {

 pucch-ConfigDedicated-v1370 PUCCH-ConfigDedicated-v1370 OPTIONAL -- Cond PUCCH-Format4or5

 }

 }

}

PhysicalConfigDedicatedSCell-v13c0 ::= SEQUENCE {

 pucch-SCell-v13c0 CHOICE{

 release NULL,

 setup SEQUENCE {

 pucch-ConfigDedicated-v13c0 PUCCH-ConfigDedicated-v13c0

 }

 }

}

CFI-Config-r15 ::= SEQUENCE {

 cfi-SubframeNonMBSFN-r15 INTEGER (1..4) OPTIONAL, -- Need ON

 cfi-SlotSubslotNonMBSFN-r15 INTEGER (1..3) OPTIONAL, -- Need ON

 cfi-SubframeMBSFN-r15 INTEGER (1..2) OPTIONAL, -- Need ON

 cfi-SlotSubslotMBSFN-r15 INTEGER (1..2) OPTIONAL -- Need ON

}

CFI-PatternConfig-r15 ::= SEQUENCE {

 cfi-PatternSubframe-r15 SEQUENCE (SIZE(10)) OF INTEGER (1..4) OPTIONAL, -- Need ON

 cfi-PatternSlotSubslot-r15 SEQUENCE (SIZE(10)) OF INTEGER (1..3) OPTIONAL -- Need ON

}

LAA-SCellConfiguration-r13 ::= SEQUENCE {

 subframeStartPosition-r13 ENUMERATED {s0, s07},

 laa-SCellSubframeConfig-r13 BIT STRING (SIZE(8))

}

LAA-SCellConfiguration-v1430 ::= SEQUENCE {

 crossCarrierSchedulingConfig-UL-r14 CHOICE {

 release NULL,

 setup SEQUENCE {

 crossCarrierSchedulingConfigLAA-UL-r14 CrossCarrierSchedulingConfigLAA-UL-r14

 }

 } OPTIONAL, -- Cond Cross-Carrier-ConfigUL

 lbt-Config-r14 LBT-Config-r14 OPTIONAL, -- Need ON

 pdcch-ConfigLAA-r14 PDCCH-ConfigLAA-r14 OPTIONAL, -- Need ON

 absenceOfAnyOtherTechnology-r14 ENUMERATED {true} OPTIONAL, -- Need OR

 soundingRS-UL-ConfigDedicatedAperiodic-v1430

 SoundingRS-UL-ConfigDedicatedAperiodic-v1430 OPTIONAL -- Need ON

}

LAA-SCellConfiguration-v1530 ::= SEQUENCE {

 aul-Config-r15 AUL-Config-r15 OPTIONAL, -- Need ON

 pusch-ModeConfigLAA-r15 PUSCH-ModeConfigLAA-r15 OPTIONAL -- Need OR

}

PUSCH-ModeConfigLAA-r15 ::= SEQUENCE {

 laa-PUSCH-Mode1 BOOLEAN,

 laa-PUSCH-Mode2 BOOLEAN,

 laa-PUSCH-Mode3 BOOLEAN

}

LBT-Config-r14 ::= CHOICE{

 maxEnergyDetectionThreshold-r14 INTEGER(-85..-52),

 energyDetectionThresholdOffset-r14 INTEGER(-13..20)

}

CSI-RS-ConfigNZPToAddModList-r11 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-r11)) OF CSI-RS-ConfigNZP-r11

CSI-RS-ConfigNZPToAddModListExt-r13 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-v1310)) OF CSI-RS-ConfigNZP-r11

CSI-RS-ConfigNZPToAddModList-r15 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-r13)) OF CSI-RS-ConfigNZP-r11

CSI-RS-ConfigNZPToReleaseList-r11 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-r11)) OF CSI-RS-ConfigNZPId-r11

CSI-RS-ConfigNZPToReleaseListExt-r13 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-v1310)) OF CSI-RS-ConfigNZPId-v1310

CSI-RS-ConfigNZPToReleaseList-r15 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-r13)) OF CSI-RS-ConfigNZPId-r13

CSI-RS-ConfigZPToAddModList-r11 ::= SEQUENCE (SIZE (1..maxCSI-RS-ZP-r11)) OF CSI-RS-ConfigZP-r11

CSI-RS-ConfigZPToReleaseList-r11 ::= SEQUENCE (SIZE (1..maxCSI-RS-ZP-r11)) OF CSI-RS-ConfigZPId-r11

PhysicalConfigDedicatedSTTI-r15 ::= CHOICE {

 release NULL,

 setup SEQUENCE {

 antennaInfoDedicatedSTTI-r15 AntennaInfoDedicatedSTTI-r15 OPTIONAL, -- Need ON

 antennaInfoUL-STTI-r15 AntennaInfoUL-STTI-r15 OPTIONAL, -- Need ON

 pucch-ConfigDedicated-v1530 PUCCH-ConfigDedicated-v1530 OPTIONAL, -- Need ON

 schedulingRequestConfig-v1530 SchedulingRequestConfig-v1530 OPTIONAL, -- Need ON

 uplinkPowerControlDedicatedSTTI-r15 UplinkPowerControlDedicatedSTTI-r15 OPTIONAL, --Need ON

 cqi-ReportConfig-r15 CQI-ReportConfig-r15 OPTIONAL, -- Need ON

 csi-RS-Config-r15 CSI-RS-Config-r15 OPTIONAL, -- Need ON

 csi-RS-ConfigNZPToReleaseList-r15 CSI-RS-ConfigNZPToReleaseList-r15 OPTIONAL, -- Need ON

 csi-RS-ConfigNZPToAddModList-r15 CSI-RS-ConfigNZPToAddModList-r15 OPTIONAL, -- Need ON

 csi-RS-ConfigZPToReleaseList-r15 CSI-RS-ConfigZPToReleaseList-r11 OPTIONAL, -- Need ON

 csi-RS-ConfigZPToAddModList-r11 CSI-RS-ConfigZPToAddModList-r11 OPTIONAL, -- Need ON

 csi-RS-ConfigZP-ApList-r15 CSI-RS-ConfigZP-ApList-r14 OPTIONAL, -- Need ON

 eimta-MainConfig-r12 EIMTA-MainConfig-r12 OPTIONAL, -- Need ON

 eimta-MainConfigServCell-r15 EIMTA-MainConfigServCell-r12 OPTIONAL, -- Need ON

 semiOpenLoopSTTI-r15 BOOLEAN,

 slotOrSubslotPDSCH-Config-r15 SlotOrSubslotPDSCH-Config-r15 OPTIONAL, -- Need ON

 slotOrSubslotPUSCH-Config-r15 SlotOrSubslotPUSCH-Config-r15 OPTIONAL, -- Need ON

 spdcch-Config-r15 SPDCCH-Config-r15 OPTIONAL, -- Need ON

 spucch-Config-r15 SPUCCH-Config-r15 OPTIONAL, -- Need ON

 srs-DCI7-TriggeringConfig-r15 BOOLEAN,

 shortProcessingTime-r15 BOOLEAN,

 shortTTI-r15 ShortTTI-r15 OPTIONAL -- Need ON

 }

}

SoundingRS-AperiodicSet-r14 ::= SEQUENCE{

 srs-CC-SetIndexList-r14

 SEQUENCE (SIZE (1..4)) OF SRS-CC-SetIndex-r14

 OPTIONAL, -- Cond SRS-Trigger-TypeA

 soundingRS-UL-ConfigDedicatedAperiodic-r14

 SoundingRS-UL-ConfigDedicatedAperiodic-r10

}

SoundingRS-AperiodicSetUpPTsExt-r14 ::= SEQUENCE{

 srs-CC-SetIndexList-r14

 SEQUENCE (SIZE (1..4)) OF SRS-CC-SetIndex-r14

 OPTIONAL, -- Cond SRS-Trigger-TypeA

 soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r14

 SoundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13

}

ShortTTI-r15 ::= SEQUENCE {

 dl-STTI-Length-r15 ShortTTI-Length-r15 OPTIONAL, -- Need OR

 ul-STTI-Length-r15 ShortTTI-Length-r15 OPTIONAL -- Need OR

}

ShortTTI-Length-r15 ::= ENUMERATED {slot, subslot}

SoundingRS-VirtualCellID-r16 ::= SEQUENCE {

 srs-VirtualCellID-r16 INTEGER (0..503),

 srs-VirtualCellID-AllSRS-r16 BOOLEAN

}

-- ASN1STOP

| *PhysicalConfigDedicated* field descriptions |
| --- |
| ***absenceOfAnyOtherTechnology***Presence of this field indicates absence on a long term basis (e.g. by level of regulation) of any other technology sharing the carrier; absence of this field indicates the potential presence of any other technology sharing the carrier, as specified in TS 36.213 [23].  |
| ***additionalSpectrumEmissionPCell***E-UTRAN does not configure this field in this release of the specification. |
| ***antennaInfo***A choice is used to indicate whether the *antennaInfo* is signalled explicitly or set to the default antenna configuration as specified in clause 9.2.4. |
| ***blindSlotSubslotPDSCH-Repetitions***Enables HARQ-less/blind slot or subslot PDSCH repetitions for a UE in a given cell, i.e. back to back slot/subslot PDSCH transmissions for the same transport block. The number of slot/subslot PDSCH transmissions is indicated in the DCI. |
| ***blindSubframePDSCH-Repetitions***Enables HARQ-less/blind subframe PDSCH repetitions for a UE in a given cell, i.e. back to back PDSCH transmissions for the same transport block. The number of PDSCH transmissions is indicated in the DCI. |
| ***cqi-ShortConfigSCell***Indicates whether the CSI (CQI/PMI/RI/PTI/CRI) reporting resource configured by *cqi-ShortConfigSCell* is available upon receiving the SCell activation command for this SCell. E-UTRAN only configures this field when transmission mode 1-8 is configured for the serving cell on this carrier frequency. |
| ***ce-Mode***Indicates the CE mode as specified in TS 36.213 [23]. |
| ***ce-pdsch-pusch-Enhancement-Config***Activation of new numbers of repetitions for PUSCH and modulation restrictions for PDSCH/PUSCH in CE mode A, see TS 36.212 [22] and TS 36.213 [23]. |
| ***csi-RS-Config***For a serving frequency E-UTRAN does not configure *csi-RS-Config* (includes *zeroTxPowerCSI-RS*) when transmission mode 10 is configured for the serving cell on this carrier frequency. |
| ***csi-RS-ConfigNZPToAddModList***For a serving frequency E-UTRAN configures one or more *CSI-RS-ConfigNZP* only when transmission mode 9 or 10 is configured for the serving cell on this carrier frequency. For a serving frequency, EUTRAN configures a maximum number of *CSI-RS-ConfigNZP* in accordance with transmission mode (including CSI processes), eMIMO (including class) and associated UE capabilities (e.g. k-Max, n-MaxList). |
| ***csi-RS-ConfigZP-ApList***The aperiodic ZP CSI-RS for PDSCH rate matching. The field *subframeConfig* is applicable to semi-persistent CSI RS reporting. In other cases, the UE shall ignore field *subframeConfig*. |
| ***csi-RS-ConfigZPToAddModList***For a serving frequency E-UTRAN configures one or more *CSI-RS-ConfigZP* only when transmission mode 10 is configured for the serving cell on this carrier frequency. |
| ***dl-STTI-Length, ul-STTI-Length***Indicates the DL and UL short TTI lengths. Value slot corresponds to 7 OFDM symbols and value subslot corresponds to 2 or 3 OFDM symbols. E-UTRAN configures the same value for all serving cells sending PUCCH feedback on the same cell. If one SCell is configured with short TTI in the group of cells configured to send PUCCH on the same cell, the cell carrying PUCCH shall be configured with short TTI. E-UTRAN can configure different value of *dl-STTI-Length* and *ul-STTI-Length* for serving cells sending PUCCH feedback on different cells. E-UTRAN does not configure the combination {slot,subslot} for {DL,UL}.  |
| ***dummy***This field is not used in the specification. If received it shall be ignored by the UE. |
| ***eimta-MainConfigPCell, eimta-MainConfigSCell***If E-UTRAN configures *eimta-MainConfigPCell* or *eimta-MainConfigSCell* for one serving cell in a frequency band, E-UTRAN configures *eimta-MainConfigPCell* or *eimta-MainConfigSCell* for all serving cells residing on the frequency band. E-UTRAN configures *eimta-MainConfigPCell* or *eimta-MainConfigSCell* only if *eimta-MainConfig* is configured. |
| ***energyDetectionThresholdOffset***Indicates the offset to the default maximum energy detection threshold value. Unit in dB. Value -13 corresponds to -13dB, value -12 corresponds to -12dB, and so on (i.e. in steps of 1dB) as specified in TS 36.213 [23]. |
| ***epdcch-Config***indicates the *EPDCCH-Config* for the cell. E-UTRAN does not configure *EPDCCH-Config* for an SCell that is configured with value *other* for *schedulingCellInfo* in *CrossCarrierSchedulingConfig*. |
| ***k-max***Indicates the maximum number of interfering spatial layers signaled in the assistance information for MUST. Value l1 corresponds to 1 layer, Value l3 corresponds to 3 layers. |
| ***laa-PUSCH-Mode1, laa-PUSCH-Mode2, laa-PUSCH-Mode3***Indicates whether LAA PUSCH mode 1, 2 and/or 3 is configured as specified in TS 36.212 [22], clause 5.3.3.1. |
| ***laa-SCellSubframeConfig***A bit-map indicating LAA SCell subframe configuration, "1" denotes that the corresponding subframe is allocated as MBSFN subframe. The bitmap is interpreted as follows:Starting from the first/leftmost bit in the bitmap, the allocation applies to subframes #1, #2, #3, #4, #6, #7, #8, and #9. |
| ***maxEnergyDetectionThreshold***Indicates the absolute maximum energy detection threshold value. Unit in dBm. Value -85 corresponds to -85 dBm, value -84 corresponds to -84 dBm, and so on (i.e. in steps of 1dBm) as specified in TS 36.213 [23]. If the field is not configured, the UE shall use a default maximum energy detection threshold value as specified in TS 36.213 [23]. |
| ***maxNumber-SlotSubslotPDSCH-Repetitions***Indicates the maximum number of PDSCH transmissions for slot or subslot PDSCH repetitions.  |
| ***maxNumber-SubframePDSCH-Repetitions***Indicates the maximum number of PDSCH transmissions for subframe PDSCH repetitions.  |
| ***mcs-restrictionSlotSubslotPDSCH-Repetitions***Indicates the MCS restriction in terms of number of non-addressable MSB in the MCS bit-field for slot or subslot PDSCH repetition applicable when k > 1. |
| ***mcs-restrictionSubframePDSCH-Repetitions***Indicates MCS restriction in terms of number of non-addressable MSB in the MCS bit-field for subframe PDSCH repetition applicable when k > 1. |
| ***numberOfProcesses-SlotSubslotPDSCH-Repetitions***Indicates the number of HARQ processes for slot/subslot PDSCH repetition applicable when k > 1 configured per serving cell. |
| ***numberOfProcesses-SubframePDSCH-Repetitions***Indicates the number of HARQ processes for subframe PDSCH repetition applicable when k > 1 configured per serving cell. |
| ***p-a-must***Parameter: , see TS 36.213 [23], clause 5.2. Value dB-6 corresponds to -6 dB, dB-4dot77 corresponds to -4.77 dB etc. |
| ***pdsch-ConfigDedicated-v1130***For a serving frequency, E-UTRAN configures *pdsch-ConfigDedicated-v1130* only when transmission mode 10 is configured for the serving cell on this carrier frequency. |
| ***pdsch-ConfigDedicated-v1280***For a serving frequency, E-UTRAN configures *pdsch-ConfigDedicated-v1280* only when transmission mode 9 or 10 is configured for the serving cell on this carrier frequency. |
| ***pucch-Cell***If present, PUCCH feedback of this SCell is sent on the PUCCH SCell. If absent, PUCCH feedback of this SCell is sent on PCell or PSCell, or if the cell concerns the PUCCH SCell, on the concerned cell. If this field is not modified upon change of PUCCH SCell, the UE shall always send the PUCCH feedback of the concerned SCell using the configured PUCCH SCell. |
| ***pucch-ConfigDedicated***E-UTRAN configures *pucch-ConfigDedicated-r13* only if *pucch-ConfigDedicated* (i.e., without suffix) is not configured. UE shall ignore *pucch-ConfigDedicated-v1020* when *pucch-ConfigDedicated-r13* is configured. |
| ***pucch-SCell***If present, the concerned SCell is the PUCCH SCell. E-UTRAN only configures this field upon SCell addition i.e. this field is only released when the SCell is released. The field is not applicable for an LAA SCell in this release. |
| ***pusch-ConfigDedicated-r13***E-UTRAN configures *pusch-ConfigDedicated-r13* only if *pusch-ConfigDedicated* is not configured. |
| ***pusch-ConfigDedicated-v1250***E-UTRAN configures *pusch-ConfigDedicated-v1250* only if *tpc-SubframeSet* is configured. |
| ***pusch-EnhancementsConfig***Indicates that the UE shall transmit in the PUSCH enhancement mode if *pusch-EnhancementsConfig* is set to *setup*, see TS 36.211 [21] and TS 36.213 [23]. |
| ***rv-SlotsublotPDSCH-Repetitions***Indicates the RV cycling sequence for slot or subslot PDSCH repetition. Value dlrvseq1 = {0, 0, 0, 0} and value dlrvseq2 = {0, 2, 3, 1}. |
| ***rv-SubframePDSCH-Repetitions***Indicates the RV cycling sequence for subframe PDSCH repetition. Value dlrvseq1 = {0, 0, 0, 0} and value dlrvseq2 = {0, 2, 3, 1}. |
| ***semiOpenLoop, semiOpenLoopSTTI***Value TRUE indicates that semi-open-loop transmission is used for deriving CSI reporting and corresponding PDSCH transmission (DMRS). |
| ***semiStaticCFI-SlotSubslotNonMBSFN***Indicates the semi-static control format indicator for slot/subslot operation in non-MBSFN subframes. |
| ***semiStaticCFI-SlotSubslotMBSFN***Indicates the semi-static control format indicator for slot/subslot operation in MBSFN subframes. |
| ***semiStaticCFI-SubframeMBSFN***Indicates the semi-static control format indicator for subframe operation in MBSFN subframes. |
| ***semiStaticCFI-*** ***SubframeNonMBSFN***Indicates the semi-static control format indicator for subframe operation in non-MBSFN subframes. |
| ***shortProcessingTime***Indicates whether short processing time is configured as specific in TS 36.321 [6]. An SCell can only be configured with short processing if the cell carrying PUCCH for that SCell is configured with short processing time. |
| ***soundingRS-UL-PeriodicConfigDedicatedList***Indicates periodic soundingRS configuration except for the extension sounding symbols of the UpPTs subframe. E-UTRAN configures this field in *PhysicalConfigDedicated* only for the UE indicating support of *ce-SRS-Enhancement-r14* or *ce-SRS-EnhancementWithoutComb4-r14*. E-UTRAN configures this field in *PhysicalConfigDedicatedSCell-r10* only for the UE indicating support of *srs-UpPTS-6sym-r14*. |
| ***soundingRS-UL-PeriodicConfigDedicatedUpPTsExtList***Indicates periodic soundingRS configuration in extension sounding symbols of the UpPTs subframe. E-UTRAN configures this field in *PhysicalConfigDedicated* only for the UE indicating support of *ce-SRS-Enhancement-r14* or *ce-SRS-EnhancementWithoutComb4-r14*. E-UTRAN configures this field in *PhysicalConfigDedicatedSCell-r10* only for the UE indicating support of *srs-UpPTS-6sym-r14*. |
| ***soundingRS-UL-AperiodicConfigDedicatedList***Indicates aperiodic soundingRS configuration except for the extension sounding symbols of the UpPTs subframe. E-UTRAN configures this field in *PhysicalConfigDedicated* only for the UE indicating support of *ce-SRS-Enhancement-r14* or *ce-SRS-EnhancementWithoutComb4-r14*. E-UTRAN configures this field in *PhysicalConfigDedicatedSCell-r10* only for the UE indicating support of *srs-UpPTS-6sym-r14*. |
| ***soundingRS-UL-DedicatedApUpPTsExtList***Indicates aperiodic soundingRS configuration in extension sounding symbols of the UpPTs subframe. E-UTRAN configures this field in *PhysicalConfigDedicated* only for the UE indicating support of *ce-SRS-Enhancement-r14* or *ce-SRS-EnhancementWithoutComb4-r14*. E-UTRAN configures this field in *PhysicalConfigDedicatedSCell-r10* only for the UE indicating support of *srs-UpPTS-6sym-r14*. |
| ***srs-CC-SetIndexList***Indicates the *srs-CC-SetIndex* list which the *soundingRS-UL-ConfigDedicatedAperiodic* and*soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt* belongs to. |
| ***srs-DCI7-TriggeringConfig***Indicates whether SRS triggering via DCI7 is configured. |
| ***srs-VirtualCellID***Indicates the virtual cell ID for SRS. |
| ***srs-VirtualCellID-AllSRS***Value TRUE indicates the configured virtual cell ID is applied to all SRS symbols. Value FALSE indicates the configured virtual cell ID is applied only to additional SRS symbols. |
| ***subframeStartPosition***Indicates possible starting positions of transmission in the first subframe of the DL transmission burst, see TS 36.211 [21]. Value *s0* means the starting position is subframe boundary, *s07* means the starting position is either subframe boundary or slot boundary. |
| ***tpc-PDCCH-ConfigPUCCH***PDCCH configuration for power control of PUCCH using format 3/3A, see TS 36.212 [22]. |
| ***tpc-PDCCH-ConfigPUSCH***PDCCH configuration for power control of PUSCH using format 3/3A, see TS 36.212 [22]. |
| ***typeA-SRS-TPC-PDCCH-Group***Indicates Type A trigger configuration for SRS transmission on a PUSCH-less SCell. E-UTRAN configures the UE with either *typeA-SRS-TPC-PDCCH-Group* or *typeB-SRS-TPC-PDCCH-Group*, if any. |
| ***uplinkPowerControlDedicated***E-UTRAN configures *uplinkPowerControlDedicated-v1130* only if *uplinkPowerControlDedicated* (without suffix) is configured. |
| ***uplinkPowerControlDedicatedSCell***E-UTRAN configures *uplinkPowerControlDedicatedSCell-v1130* only if *uplinkPowerControlDedicatedSCell-r10* is configured for this serving cell. |

| Conditional presence | Explanation |
| --- | --- |
| *AI-r8* | The field is optionally present, need ON, if *antennaInfoDedicated-r10* is absent. Otherwise the field is not present |
| *AI-r10* | The field is optionally present, need ON, if *antennaInfoDedicated* is absent. Otherwise the field is not present |
| *AperiodicSRS* | If *soundingRS-UL-ConfigDedicatedAperiodic-r10* is absent, the field is optional, Need ON. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *AperiodicSRSExt* | If *soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13* is absent, the field is optional, Need ON. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *AUL* | The field is optionally present, need ON, if *aul-config-r15* is present. Otherwise the field is not present. |
| *CommonUL* | The field is mandatory present if *ul-Configuration* of *RadioResourceConfigCommonSCell-r10* is present; otherwise it is optional, need ON. |
| *CQI-r8* | The field is optionally present, need ON, if *cqi-ReportConfig-r10* is absent. Otherwise the field is not present |
| *CQI-r10* | The field is optionally present, need ON, if *cqi-ReportConfig* is absent. Otherwise the field is not present |
| *Cross-Carrier-Config* | The field is optionally present, need ON, if *crossCarrierSchedulingConfig-r10* is absent. Otherwise the field is not present |
| *Cross-Carrier-ConfigUL* | The field is optionally present, need ON, if *crossCarrierSchedulingConfig-r10* and *crossCarrierSchedulingConfig-r13* are absent or *schedulingCellInfo* is set to 'own'. Otherwise the field is not present. |
| *PeriodicSRS* | If *soundingRS-UL-ConfigDedicated-r10* is absent, the field is optional, Need ON. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *PeriodicSRSPCell* | If *soundingRS-UL-ConfigDedicated* is absent, the field is optional, Need ON. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *PeriodicSRSExt* | If *soundingRS-UL-ConfigDedicatedUpPTsExt-r13* is absent, the field is optional, Need ON. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *PUCCH-Format4or5* | The field is mandatory present with *pucch-Format-v1370* set to *setup* if *pucch-ConfigDedicated-r13* is configured and *pucch-ConfigDedicated-r13* indicates PUCCH format 4 or PUCCH format 5; otherwise it is not present and the UE shall delete any existing value for this field. |
| *PUCCH-SCell1* | The field is optionally present, need OR, for SCell not configured with *pucch-configDedicated-r13*. Otherwise it is not present. |
| *PUSCH-SCell* | The field is optionally present, need ON, if *pusch-ConfigDedicatedSCell-r10 and pusch-ConfigDedicated-v1130* are absent. Otherwise the field is not present |
| *PUSCH-SCell1* | The field is optionally present, need ON, for SCell not configured with *pucch-configDedicated-r13*. Otherwise it is not present. |
| *SCellAdd* | The field is mandatory present if *cellIdentification* is present; otherwise it is optional, need ON. |
| *SRS-Trigger-TypeA* | The field is mandatory present if *typeA-SRS-TPC-PDCCH-Group-r14* is present. Otherwise the field is not present and the UE shall delete any existing value for this field. |

NOTE 1: During handover, the UE performs a MAC reset, which involves reverting to the default CQI/ SRS/ SR configuration in accordance with clause 5.3.13 and TS 36.321 [6], clauses 5.9 and 5.2. Hence, for these parts of the dedicated radio resource configuration, the default configuration (rather than the configuration used in the source PCell) is used as the basis for the delta signalling that is included in the message used to perform handover.

NOTE 2: Since delta signalling is not supported for the common SCell configuration, E-UTRAN can only add or release the uplink of an SCell by releasing and adding the concerned SCell.

*/ Unchanged parts are omitted/*

#### – *RadioResourceConfigCommon*

The IE *RadioResourceConfigCommonSIB* and IE *RadioResourceConfigCommon* are used to specify common radio resource configurations in the system information and in the mobility control information, respectively, e.g., the random access parameters and the static physical layer parameters.

*RadioResourceConfigCommon* information element

-- ASN1START

RadioResourceConfigCommonSIB ::= SEQUENCE {

 rach-ConfigCommon RACH-ConfigCommon,

 bcch-Config BCCH-Config,

 pcch-Config PCCH-Config,

 prach-Config PRACH-ConfigSIB,

 pdsch-ConfigCommon PDSCH-ConfigCommon,

 pusch-ConfigCommon PUSCH-ConfigCommon,

 pucch-ConfigCommon PUCCH-ConfigCommon,

 soundingRS-UL-ConfigCommon SoundingRS-UL-ConfigCommon,

 uplinkPowerControlCommon UplinkPowerControlCommon,

 ul-CyclicPrefixLength UL-CyclicPrefixLength,

 ...,

 [[ uplinkPowerControlCommon-v1020 UplinkPowerControlCommon-v1020 OPTIONAL -- Need OR

 ]],

 [[ rach-ConfigCommon-v1250 RACH-ConfigCommon-v1250 OPTIONAL -- Need OR

 ]],

 [[ pusch-ConfigCommon-v1270 PUSCH-ConfigCommon-v1270 OPTIONAL -- Need OR

 ]],

 [[ bcch-Config-v1310 BCCH-Config-v1310 OPTIONAL, -- Need OR

 pcch-Config-v1310 PCCH-Config-v1310 OPTIONAL, -- Need OR

 freqHoppingParameters-r13 FreqHoppingParameters-r13 OPTIONAL, -- Need OR

 pdsch-ConfigCommon-v1310 PDSCH-ConfigCommon-v1310 OPTIONAL, -- Need OR

 pusch-ConfigCommon-v1310 PUSCH-ConfigCommon-v1310 OPTIONAL, -- Need OR

 prach-ConfigCommon-v1310 PRACH-ConfigSIB-v1310 OPTIONAL, -- Need OR

 pucch-ConfigCommon-v1310 PUCCH-ConfigCommon-v1310 OPTIONAL -- Need OR

 ]],

 [[ highSpeedConfig-r14 HighSpeedConfig-r14 OPTIONAL, -- Need OR

 prach-Config-v1430 PRACH-Config-v1430 OPTIONAL, -- Need OR

 pucch-ConfigCommon-v1430 PUCCH-ConfigCommon-v1430 OPTIONAL -- Need OR

 ]],

 [[ prach-Config-v1530 PRACH-ConfigSIB-v1530 OPTIONAL, -- Cond EDT

 ce-RSS-Config-r15 RSS-Config-r15 OPTIONAL, -- Need OR

 wus-Config-r15 WUS-Config-r15 OPTIONAL, -- Need OR

 highSpeedConfig-v1530 HighSpeedConfig-v1530 OPTIONAL -- Need OR

 ]],

 [[ uplinkPowerControlCommon-v1540 UplinkPowerControlCommon-v1530 OPTIONAL -- Need OR

 ]],

 [[ wus-Config-v1560 WUS-Config-v1560 OPTIONAL -- Need OR

 ]],

 [[ uplinkPowerControlCommon-v16xy UplinkPowerControlCommon-v16xy OPTIONAL -- Need OR

 ]]

}

RadioResourceConfigCommon ::= SEQUENCE {

 rach-ConfigCommon RACH-ConfigCommon OPTIONAL, -- Need ON

 prach-Config PRACH-Config,

 pdsch-ConfigCommon PDSCH-ConfigCommon OPTIONAL, -- Need ON

 pusch-ConfigCommon PUSCH-ConfigCommon,

 phich-Config PHICH-Config OPTIONAL, -- Need ON

 pucch-ConfigCommon PUCCH-ConfigCommon OPTIONAL, -- Need ON

 soundingRS-UL-ConfigCommon SoundingRS-UL-ConfigCommon OPTIONAL, -- Need ON

 uplinkPowerControlCommon UplinkPowerControlCommon OPTIONAL, -- Need ON

 antennaInfoCommon AntennaInfoCommon OPTIONAL, -- Need ON

 p-Max P-Max OPTIONAL, -- Need OP

 tdd-Config TDD-Config OPTIONAL, -- Cond TDD

 ul-CyclicPrefixLength UL-CyclicPrefixLength,

 ...,

 [[ uplinkPowerControlCommon-v1020 UplinkPowerControlCommon-v1020 OPTIONAL -- Need ON

 ]],

 [[ tdd-Config-v1130 TDD-Config-v1130 OPTIONAL -- Cond TDD3

 ]],

 [[ pusch-ConfigCommon-v1270 PUSCH-ConfigCommon-v1270 OPTIONAL -- Need OR

 ]],

 [[

 prach-Config-v1310 PRACH-Config-v1310 OPTIONAL, -- Need ON

 freqHoppingParameters-r13 FreqHoppingParameters-r13 OPTIONAL, -- Need ON

 pdsch-ConfigCommon-v1310 PDSCH-ConfigCommon-v1310 OPTIONAL, -- Need ON

 pucch-ConfigCommon-v1310 PUCCH-ConfigCommon-v1310 OPTIONAL, -- Need ON

 pusch-ConfigCommon-v1310 PUSCH-ConfigCommon-v1310 OPTIONAL, -- Need ON

 uplinkPowerControlCommon-v1310 UplinkPowerControlCommon-v1310 OPTIONAL -- Need ON

 ]],

 [[ highSpeedConfig-r14 HighSpeedConfig-r14 OPTIONAL, -- Need OR

 prach-Config-v1430 PRACH-Config-v1430 OPTIONAL, -- Need OR

 pucch-ConfigCommon-v1430 PUCCH-ConfigCommon-v1430 OPTIONAL, -- Need OR

 tdd-Config-v1430 TDD-Config-v1430 OPTIONAL -- Cond TDD3

 ]],

 [[

 tdd-Config-v1450 TDD-Config-v1450 OPTIONAL -- Cond TDD3

 ]],

 [[ uplinkPowerControlCommon-v1530 UplinkPowerControlCommon-v1530 OPTIONAL, -- Need ON

 highSpeedConfig-v1530 HighSpeedConfig-v1530 OPTIONAL -- Need OR

 ]],

 [[ uplinkPowerControlCommon-v16xy UplinkPowerControlCommon-v16xy OPTIONAL -- Need OR

 ]]

}

RadioResourceConfigCommonPSCell-r12 ::= SEQUENCE {

 basicFields-r12 RadioResourceConfigCommonSCell-r10,

 pucch-ConfigCommon-r12 PUCCH-ConfigCommon,

 rach-ConfigCommon-r12 RACH-ConfigCommon,

 uplinkPowerControlCommonPSCell-r12 UplinkPowerControlCommonPSCell-r12,

 ...,

 [[ uplinkPowerControlCommonPSCell-v1310

 UplinkPowerControlCommon-v1310 OPTIONAL -- Need ON

 ]],

 [[ uplinkPowerControlCommonPSCell-v1530

 UplinkPowerControlCommon-v1530 OPTIONAL -- Need ON

 ]]

}

RadioResourceConfigCommonPSCell-v12f0 ::= SEQUENCE {

 basicFields-v12f0 RadioResourceConfigCommonSCell-v10l0

}

RadioResourceConfigCommonPSCell-v1440 ::= SEQUENCE {

 basicFields-v1440 RadioResourceConfigCommonSCell-v1440

}

RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {

 -- DL configuration as well as configuration applicable for DL and UL

 nonUL-Configuration-r10 SEQUENCE {

 -- 1: Cell characteristics

 dl-Bandwidth-r10 ENUMERATED {n6, n15, n25, n50, n75, n100},

 -- 2: Physical configuration, general

 antennaInfoCommon-r10 AntennaInfoCommon,

 mbsfn-SubframeConfigList-r10 MBSFN-SubframeConfigList OPTIONAL, -- Need OR

 -- 3: Physical configuration, control

 phich-Config-r10 PHICH-Config,

 -- 4: Physical configuration, physical channels

 pdsch-ConfigCommon-r10 PDSCH-ConfigCommon,

 tdd-Config-r10 TDD-Config OPTIONAL -- Cond TDDSCell

 },

 -- UL configuration

 ul-Configuration-r10 SEQUENCE {

 ul-FreqInfo-r10 SEQUENCE {

 ul-CarrierFreq-r10 ARFCN-ValueEUTRA OPTIONAL, -- Need OP

 ul-Bandwidth-r10 ENUMERATED {n6, n15,

 n25, n50, n75, n100} OPTIONAL, -- Need OP

 additionalSpectrumEmissionSCell-r10 AdditionalSpectrumEmission

 },

 p-Max-r10 P-Max OPTIONAL, -- Need OP

 uplinkPowerControlCommonSCell-r10 UplinkPowerControlCommonSCell-r10,

 -- A special version of IE UplinkPowerControlCommon may be introduced

 -- 3: Physical configuration, control

 soundingRS-UL-ConfigCommon-r10 SoundingRS-UL-ConfigCommon,

 ul-CyclicPrefixLength-r10 UL-CyclicPrefixLength,

 -- 4: Physical configuration, physical channels

 prach-ConfigSCell-r10 PRACH-ConfigSCell-r10 OPTIONAL, -- Cond TDD-OR-NoR11

 pusch-ConfigCommon-r10 PUSCH-ConfigCommon

 } OPTIONAL, -- Need OR

 ...,

 [[ ul-CarrierFreq-v1090 ARFCN-ValueEUTRA-v9e0 OPTIONAL -- Need OP

 ]],

 [[ rach-ConfigCommonSCell-r11 RACH-ConfigCommonSCell-r11 OPTIONAL, -- Cond ULSCell

 prach-ConfigSCell-r11 PRACH-Config OPTIONAL, -- Cond UL

 tdd-Config-v1130 TDD-Config-v1130 OPTIONAL, -- Cond TDD2

 uplinkPowerControlCommonSCell-v1130

 UplinkPowerControlCommonSCell-v1130 OPTIONAL -- Cond UL

 ]],

 [[ pusch-ConfigCommon-v1270 PUSCH-ConfigCommon-v1270 OPTIONAL -- Need OR

 ]],

 [[ pucch-ConfigCommon-r13 PUCCH-ConfigCommon OPTIONAL, -- Cond UL

 uplinkPowerControlCommonSCell-v1310

 UplinkPowerControlCommonSCell-v1310 OPTIONAL -- Cond UL

 ]],

 [[ highSpeedConfigSCell-r14 HighSpeedConfigSCell-r14 OPTIONAL, -- Need OR

 prach-Config-v1430 PRACH-Config-v1430 OPTIONAL, -- Cond UL

 ul-Configuration-r14 SEQUENCE {

 ul-FreqInfo-r14 SEQUENCE {

 ul-CarrierFreq-r14 ARFCN-ValueEUTRA-r9 OPTIONAL, -- Need OP

 ul-Bandwidth-r14 ENUMERATED {n6, n15,

 n25, n50, n75, n100} OPTIONAL, -- Need OP

 additionalSpectrumEmissionSCell-r14 AdditionalSpectrumEmission

 },

 p-Max-r14 P-Max OPTIONAL, -- Need OP

 soundingRS-UL-ConfigCommon-r14 SoundingRS-UL-ConfigCommon,

 ul-CyclicPrefixLength-r14 UL-CyclicPrefixLength,

 prach-ConfigSCell-r14 PRACH-ConfigSCell-r10 OPTIONAL, -- Cond TDD-OR-NoR11

 uplinkPowerControlCommonPUSCH-LessCell-v1430

 UplinkPowerControlCommonPUSCH-LessCell-v1430 OPTIONAL -- Need OR

} OPTIONAL, -- Cond ULSRS

 harq-ReferenceConfig-r14 ENUMERATED {sa2,sa4,sa5} OPTIONAL, -- Need OR

 soundingRS-FlexibleTiming-r14 ENUMERATED {true} OPTIONAL -- Need OR

 ]],

 [[ mbsfn-SubframeConfigList-v1430 MBSFN-SubframeConfigList-v1430 OPTIONAL -- Need ON

 ]],

 [[ uplinkPowerControlCommonSCell-v1530 UplinkPowerControlCommon-v1530 OPTIONAL -- Need ON

 ]]

}

RadioResourceConfigCommonSCell-v10l0 ::= SEQUENCE {

 -- UL configuration

 ul-Configuration-v10l0 SEQUENCE {

 additionalSpectrumEmissionSCell-v10l0 AdditionalSpectrumEmission-v10l0

 }

}

RadioResourceConfigCommonSCell-v1440 ::= SEQUENCE {

 ul-Configuration-v1440 SEQUENCE {

 ul-FreqInfo-v1440 SEQUENCE {

 additionalSpectrumEmissionSCell-v1440 AdditionalSpectrumEmission-v10l0

 }

 }

}

BCCH-Config ::= SEQUENCE {

 modificationPeriodCoeff ENUMERATED {n2, n4, n8, n16}

}

BCCH-Config-v1310 ::= SEQUENCE {

 modificationPeriodCoeff-v1310 ENUMERATED {n64}

}

FreqHoppingParameters-r13 ::= SEQUENCE {

 dummy ENUMERATED {nb2, nb4} OPTIONAL,

 dummy2 CHOICE {

 interval-FDD-r13 ENUMERATED {int1, int2, int4, int8},

 interval-TDD-r13 ENUMERATED {int1, int5, int10, int20}

 } OPTIONAL,

 dummy3 CHOICE {

 interval-FDD-r13 ENUMERATED {int2, int4, int8, int16},

 interval-TDD-r13 ENUMERATED { int5, int10, int20, int40}

 } OPTIONAL,

 interval-ULHoppingConfigCommonModeA-r13 CHOICE {

 interval-FDD-r13 ENUMERATED {int1, int2, int4, int8},

 interval-TDD-r13 ENUMERATED {int1, int5, int10, int20}

 } OPTIONAL, -- Cond MP-A

 interval-ULHoppingConfigCommonModeB-r13 CHOICE {

 interval-FDD-r13 ENUMERATED {int2, int4, int8, int16},

 interval-TDD-r13 ENUMERATED { int5, int10, int20, int40}

 } OPTIONAL, -- Cond MP-B

 dummy4 INTEGER (1..maxAvailNarrowBands-r13) OPTIONAL

}

PCCH-Config ::= SEQUENCE {

 defaultPagingCycle ENUMERATED {

 rf32, rf64, rf128, rf256},

 nB ENUMERATED {

 fourT, twoT, oneT, halfT, quarterT, oneEighthT,

 oneSixteenthT, oneThirtySecondT}

}

PCCH-Config-v1310 ::= SEQUENCE {

 paging-narrowBands-r13 INTEGER (1..maxAvailNarrowBands-r13),

 mpdcch-NumRepetition-Paging-r13 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128, r256},

 nB-v1310 ENUMERATED {one64thT, one128thT, one256thT}

 OPTIONAL -- Need OR

}

UL-CyclicPrefixLength ::= ENUMERATED {len1, len2}

HighSpeedConfig-r14 ::= SEQUENCE {

 highSpeedEnhancedMeasFlag-r14 ENUMERATED {true} OPTIONAL, -- Need OR

 highSpeedEnhancedDemodulationFlag-r14 ENUMERATED {true} OPTIONAL -- Need OR

}

HighSpeedConfig-v1530 ::= SEQUENCE {

 highSpeedMeasGapCE-ModeA-r15 ENUMERATED {true}

}

HighSpeedConfigSCell-r14 ::= SEQUENCE {

 highSpeedEnhancedDemodulationFlag-r14 ENUMERATED {true} OPTIONAL -- Need OR

}

-- ASN1STOP

| *RadioResourceConfigCommon* field descriptions |
| --- |
| ***additionalSpectrumEmissionSCell***The UE requirements related to *additionalSpectrumEmissionSCell* are defined in TS 36.101 [42]. E-UTRAN configures the same value in *additionalSpectrumEmissionSCell* for all SCell(s) of the same band with UL configured. The *additionalSpectrumEmissionSCell* is applicable for all serving cells (including PCell) of the same band with UL configured. |
| ***defaultPagingCycle***Default paging cycle, used to derive 'T' in TS 36.304 [4]. Value rf32 corresponds to 32 radio frames, rf64 corresponds to 64 radio frames and so on. |
| ***dummy***This field is not used in the specification. If received it shall be ignored by the UE. |
| ***harq-ReferenceConfig***Indicates UL/ DL configuration used as the DL HARQ reference configuration for this serving cell. Value sa2 corresponds to Configuration2, sa4 to Configuration4 etc, as specified in TS 36.211 [21], table 4.2-2. E-UTRAN configures the same value for all serving cells residing on same frequency band. |
| ***highSpeedEnhancedMeasFlag***If the field is present, the UE shall apply the high speed measurement enhancements as specified in TS 36.133 [16]. |
| ***highSpeedEnhancedDemodulationFlag***If the field is present, the UE shall apply the advanced receiver in SFN scenario as specified in TS 36.101 [6]. |
| ***highSpeedMeasGapCE-ModeA***If the field is present, the UE in CE mode A shall apply the measurement gap sharing table associated with high-velocity scenario for measurements, as specified in TS 36.133 [16]. |
| ***interval-DLHoppingConfigCommonModeX***Number of consecutive absolute subframes over which MPDCCH or PDSCH for CE mode X stays at the same narrowband before hopping to another narrowband. For interval-FDD, int1 corresponds to 1 subframe, int2 corresponds to 2 subframes, and so on. For interval-TDD, int1 corresponds to 1 subframe, int5 corresponds to 5 subframes, and so on. |
| ***interval-ULHoppingConfigCommonModeX***Number of consecutive absolute subframes over which PUCCH or PUSCH for CE mode X stays at the same narrowband before hopping to another narrowband. For interval-FDD, int1 corresponds to 1 subframe, int2 corresponds to 2 subframes, and so on. For interval-TDD, int1 corresponds to 1 subframe, int5 corresponds to 5 subframes, and so on. |
| ***modificationPeriodCoeff***Actual modification period, expressed in number of radio frames= *modificationPeriodCoeff* \* *defaultPagingCycle*. n2 corresponds to value 2, n4 corresponds to value 4, n8 corresponds to value 8, n16 corresponds to value 16, and n64 corresponds to value 64. |
| ***mpdcch-NumRepetition-Paging***Maximum number of repetitions for MPDCCH common search space (CSS) for paging, see TS 36.211 [21]. |
| ***mpdcch-pdsch-HoppingOffset***Parameter: cid:image020.png@01D1F4C1.16D3F4B0, see TS 36.211 [21], clause 6.4.1. |
| ***mpdcch-pdsch-HoppingNB***The number of narrowbands for MPDCCH/PDSCH frequency hopping. Value nb2 corresponds to 2 narrowbands and value nb4 corresponds to 4 narrowbands. |
| ***nB***Parameter: nB is used as one of parameters to derive the Paging Frame and Paging Occasion according to TS 36.304 [4]. Value in multiples of 'T' as defined in TS 36.304 [4]. A value of fourT corresponds to 4 \* T, a value of twoT corresponds to 2 \* T and so on. In case *nB-v1310* is signalled, the UE shall ignore *nB* (i.e. without suffix). EUTRAN configures *nB-v1310* only in the BR version of SI message. |
| ***paging-narrowBands***Number of narrowbands used for paging, see TS 36.304 [4], TS 36.212 [22] and TS 36.213 [23]. |
| ***p-Max***Pmax to be used in the target cell. If absent, for the band used in the target cell, the UE applies the maximum power according to its capability as specified in 36.101 [42], clause 6.2.2. In case the UE is configured with uplink intra-band contiguous CA and the UE indicates *ue-CA-PowerClass-N* in that band combination, then the *p-Max* in *RadioResourceConfigCommonSCell* for that SCell, if present, also applies for that band combination whenever that SCell is activated. |
| ***prach-ConfigSCell***Indicates a PRACH configuration for an SCell. The field is not applicable for an LAA SCell in this release. |
| ***rach-ConfigCommonSCell***Indicates a RACH configuration for an SCell. The field is not applicable for an LAA SCell in this release. |
| ***soundingRS-FlexibleTiming***Indicates the SRS flexible timing (if configured) for aperiodic SRS triggered by DL grant. If the SRS transmission is collided with ACK/NACK, postpone once to the next configured SRS transmission opportunity. |
| ***ul-Bandwidth***Parameter: transmission bandwidth configuration, NRB, in uplink, see TS 36.101 [42], table 5.6-1. Value n6 corresponds to 6 resource blocks, n15 to 15 resource blocks and so on. If for FDD this parameter is absent, the uplink bandwidth is equal to the downlink bandwidth. For TDD this parameter is absent and it is equal to the downlink bandwidth. |
| ***ul-CarrierFreq***For FDD: If absent, the (default) value determined from the default TX-RX frequency separation defined in TS 36.101 [42], table 5.7.3-1, applies.For TDD: This parameter is absent and it is equal to the downlink frequency. |
| ***ul-CyclicPrefixLength***Parameter: Uplink cyclic prefix length see TS 36.211 [21], clause 5.2.1, where len1 corresponds to normal cyclic prefix and len2 corresponds to extended cyclic prefix. |

| **Conditional presence** | **Explanation** |
| --- | --- |
| *EDT* | The field is optionally present, Need OR, if *edt-Parameters* is present; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *MP-A* | The field is mandatory present for CE mode A. Otherwise the field is optional, Need OR. |
| *MP-B* | The field is mandatory present for CE mode B. Otherwise the field is optional, Need OR. |
| *TDD* | The field is optional for TDD, Need ON; it is not present for FDD and the UE shall delete any existing value for this field. |
| *TDD2* | If *tdd-Config-r10* is present, the field is optional, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *TDD3* | If *tdd-Config* is present, the field is optional, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *TDD-OR-NoR11* | If *prach-ConfigSCell-r11* is absent, the field is optional for TDD, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *TDDSCell* | This field is mandatory present for TDD; it is not present for FDD and LAA SCell, and the UE shall delete any existing value for this field. |
| *UL* | If the SCell is part of the STAG or concerns the PSCell or PUCCH SCell and if *ul-Configuration* is included, the field is optional, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *ULSCell* | For the PSCell (IE is included in *RadioResourceConfigCommonPSCell*) the field is absent. Otherwise, if the SCell is part of the STAG and if *ul-Configuration* is included, the field is optional, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *ULSRS* | If *ul-Configuration-r10* is absent, the field is optional, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field. |

*/ Unchanged parts are omitted/*

#### – *SoundingRS-UL-Config*

The IE *SoundingRS-UL-Config* is used to specify the uplink Sounding RS configuration for periodic and aperiodic sounding.

*SoundingRS-UL-Config* information element

-- ASN1START

SoundingRS-UL-ConfigCommon ::= CHOICE {

 release NULL,

 setup SEQUENCE {

 srs-BandwidthConfig ENUMERATED {bw0, bw1, bw2, bw3, bw4, bw5, bw6, bw7},

 srs-SubframeConfig ENUMERATED {

 sc0, sc1, sc2, sc3, sc4, sc5, sc6, sc7,

 sc8, sc9, sc10, sc11, sc12, sc13, sc14, sc15},

 ackNackSRS-SimultaneousTransmission BOOLEAN,

 srs-MaxUpPts ENUMERATED {true} OPTIONAL -- Cond TDD

 }

}

SoundingRS-UL-ConfigDedicated ::= CHOICE{

 release NULL,

 setup SEQUENCE {

 srs-Bandwidth ENUMERATED {bw0, bw1, bw2, bw3},

 srs-HoppingBandwidth ENUMERATED {hbw0, hbw1, hbw2, hbw3},

 freqDomainPosition INTEGER (0..23),

 duration BOOLEAN,

 srs-ConfigIndex INTEGER (0..1023),

 transmissionComb INTEGER (0..1),

 cyclicShift ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7}

 }

}

SoundingRS-UL-ConfigDedicated-v1020 ::= SEQUENCE {

 srs-AntennaPort-r10 SRS-AntennaPort

}

SoundingRS-UL-ConfigDedicated-v1310 ::= CHOICE{

 release NULL,

 setup SEQUENCE {

 transmissionComb-v1310 INTEGER (2..3) OPTIONAL, -- Need OR

 cyclicShift-v1310 ENUMERATED {cs8, cs9, cs10, cs11} OPTIONAL, -- Need OR

 transmissionCombNum-r13 ENUMERATED {n2, n4} OPTIONAL -- Need OR

 }

}

SoundingRS-UL-ConfigDedicatedUpPTsExt-r13 ::= CHOICE{

 release NULL,

 setup SEQUENCE {

 srs-UpPtsAdd-r13 ENUMERATED {sym2, sym4},

 srs-Bandwidth-r13 ENUMERATED {bw0, bw1, bw2, bw3},

 srs-HoppingBandwidth-r13 ENUMERATED {hbw0, hbw1, hbw2, hbw3},

 freqDomainPosition-r13 INTEGER (0..23),

 duration-r13 BOOLEAN,

 srs-ConfigIndex-r13 INTEGER (0..1023),

 transmissionComb-r13 INTEGER (0..3),

 cyclicShift-r13 ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7,

 cs8, cs9, cs10, cs11},

 srs-AntennaPort-r13 SRS-AntennaPort,

 transmissionCombNum-r13 ENUMERATED {n2, n4}

 }

}

SoundingRS-UL-ConfigDedicatedAperiodic-r10 ::= CHOICE{

 release NULL,

 setup SEQUENCE {

 srs-ConfigIndexAp-r10 INTEGER (0..31),

 srs-ConfigApDCI-Format4-r10 SEQUENCE (SIZE (1..3)) OF SRS-ConfigAp-r10 OPTIONAL,--Need ON

 srs-ActivateAp-r10 CHOICE {

 release NULL,

 setup SEQUENCE {

 srs-ConfigApDCI-Format0-r10 SRS-ConfigAp-r10,

 srs-ConfigApDCI-Format1a2b2c-r10 SRS-ConfigAp-r10,

 ...

 }

 } OPTIONAL -- Need ON

 }

}

SoundingRS-UL-ConfigDedicatedAperiodic-v1310 ::= CHOICE{

 release NULL,

 setup SEQUENCE {

 srs-ConfigApDCI-Format4-v1310 SEQUENCE (SIZE (1..3)) OF SRS-ConfigAp-v1310 OPTIONAL,--Need ON

 srs-ActivateAp-v1310 CHOICE {

 release NULL,

 setup SEQUENCE {

 srs-ConfigApDCI-Format0-v1310 SRS-ConfigAp-v1310 OPTIONAL, -- Need ON

 srs-ConfigApDCI-Format1a2b2c-v1310 SRS-ConfigAp-v1310 OPTIONAL -- Need ON

 }

 } OPTIONAL -- Need ON

 }

}

SoundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13 ::= CHOICE{

 release NULL,

 setup SEQUENCE {

 srs-UpPtsAdd-r13 ENUMERATED {sym2, sym4},

 srs-ConfigIndexAp-r13 INTEGER (0..31),

 srs-ConfigApDCI-Format4-r13 SEQUENCE (SIZE (1..3)) OF SRS-ConfigAp-r13 OPTIONAL,--Need ON

 srs-ActivateAp-r13 CHOICE {

 release NULL,

 setup SEQUENCE {

 srs-ConfigApDCI-Format0-r13 SRS-ConfigAp-r13,

 srs-ConfigApDCI-Format1a2b2c-r13 SRS-ConfigAp-r13

 }

 } OPTIONAL -- Need ON

 }

}

SoundingRS-UL-ConfigDedicatedAperiodic-v1430 ::= CHOICE{

 release NULL,

 setup SEQUENCE {

 srs-SubframeIndication-r14 INTEGER (1..4) OPTIONAL -- Need ON

 }

}

SoundingRS-UL-ConfigDedicatedAdd-r16 ::= CHOICE {

 release NULL,

 setup SEQUENCE {

 srs-ConfigApDCI-Format0-r16 SRS-ConfigAdd-r16 OPTIONAL, --Need ON

 srs-ConfigApDCI-Format1a2b2c-r16 SRS-ConfigAdd-r16 OPTIONAL, --Need ON

 srs-ConfigApDCI-Format4-r16 SRS-ConfigAdd-r16 OPTIONAL --Need ON

 }

}

SRS-ConfigAdd-r16 ::= SEQUENCE {

 srs-ConfigAp-v16xy SRS-ConfigAp-r13 OPTIONAL, --Need ON

 srs-ConfigAdd-r16 SRS-ConfigAdd-r16 OPTIONAL --Need ON

}

SRS-ConfigAp-r10 ::= SEQUENCE {

 srs-AntennaPortAp-r10 SRS-AntennaPort,

 srs-BandwidthAp-r10 ENUMERATED {bw0, bw1, bw2, bw3},

 freqDomainPositionAp-r10 INTEGER (0..23),

 transmissionCombAp-r10 INTEGER (0..1),

 cyclicShiftAp-r10 ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7}

}

SRS-ConfigAp-v1310 ::= SEQUENCE {

 transmissionCombAp-v1310 INTEGER (2..3) OPTIONAL, -- Need OR

 cyclicShiftAp-v1310 ENUMERATED {cs8, cs9, cs10, cs11} OPTIONAL, -- Need OR

 transmissionCombNum-r13 ENUMERATED {n2, n4} OPTIONAL -- Need OR

}

SRS-ConfigAp-r13 ::= SEQUENCE {

 srs-AntennaPortAp-r13 SRS-AntennaPort,

 srs-BandwidthAp-r13 ENUMERATED {bw0, bw1, bw2, bw3},

 freqDomainPositionAp-r13 INTEGER (0..23),

 transmissionCombAp-r13 INTEGER (0..3),

 cyclicShiftAp-r13 ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7,

 cs8, cs9, cs10, cs11},

 transmissionCombNum-r13 ENUMERATED {n2, n4}

}

SRS-AntennaPort ::= ENUMERATED {an1, an2, an4, spare1}

SRS-ConfigAdd-r16 ::= SEQUENCE {

 srs-RepNumAdd-r16 ENUMERATED {n1,n2,n3,n4,n6,n7,n8,n9,n12,n13},

 srs-BandwidthAdd-r16 ENUMERATED {bw0, bw1, bw2, bw3},

 srs-HoppingBandwidthAdd-r16 ENUMERATED {hbw0, hbw1, hbw2, hbw3},

 srs-FreqDomainPosAdd-r16 INTEGER (0..23),

 srs-AntennaPortAdd-r16 SRS-AntennaPort,

 srs-CyclicShiftAdd-r16 ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7,

 cs8, cs9, cs10, cs11},

 srs-TransmissionCombNumAdd-r16 ENUMERATED {n2, n4},

 srs-TransmissionCombAdd-r16 INTEGER (0..3),

 srs-StartPosAdd-r16 INTEGER (1..13),

 srs-DurationAdd-r16 INTEGER (1..13),

 srs-GuardSymbolAS-Add-r16 ENUMERATED {enabled} OPTIONAL, -- Need ON

 srs-GuardSymbolFH-Add-r16 ENUMERATED {enabled} OPTIONAL -- Need ON

}

-- ASN1STOP

| *SoundingRS-UL-Config* field descriptions |
| --- |
| ***ackNackSRS-SimultaneousTransmission***Parameter: *Simultaneous-AN-and-SRS*, see TS 36.213 [23], clause 8.2. For SCells without PUCCH configured, this field is not applicable and the UE shall ignore the value. |
| ***cyclicShift, cyclicShiftAp, srs-CyclicShiftAdd***Parameter: n\_SRS for periodic, aperiodic and additional sounding reference signal transmission respectively except for an LAA SCell. See TS 36.211 [21], clause 5.5.3.1, where cs0 corresponds to 0 etc. |
| ***duration***Parameter: Duration for periodic sounding reference signal transmission except for an LAA SCell. See TS 36.213 [21], clause 8.2. FALSE corresponds to "single" and value TRUE to "indefinite". |
| ***freqDomainPosition, freqDomainPositionAp, srs-FreqDomainPosAdd***Parameter:  for periodic, aperiodic and additional sounding reference signal transmission respectively, see TS 36.211 [21], clause 5.5.3.2. |
| ***srs-AntennaPort, srs-AntennaPortAp, srs-AntennaPortAdd***Indicates the number of antenna ports used for periodic, aperiodic and additional sounding reference signal transmission respectively, see TS 36.211 [21], clause 5.5.3. UE shall release *srs-AntennaPort* if *SoundingRS-UL-ConfigDedicated* is released. |
| ***srs-Bandwidth, srs-BandwidthAp, srs-BandwidthAdd***Parameter:  for periodic, aperiodic and additional sounding reference signal transmission respectively, see TS 36.211 [21], tables 5.5.3.2-1, 5.5.3.2-2, 5.5.3.2-3 and 5.5.3.2-4. For LAA SCell only bw0 is applied. |
| ***srs-BandwidthConfig***Parameter: SRS Bandwidth Configuration. See TS 36.211, [21], tables 5.5.3.2-1, 5.5.3.2-2, 5.5.3.2-3 and 5.5.3.2-4. Actual configuration depends on UL bandwidth. bw0 corresponds to value 0, bw1 to value 1 and so on. |
| ***srs-ConfigApDCI-Format0 / srs-ConfigApDCI-Format1a2b2c / srs-ConfigApDCI-Format4***Parameters indicate the resource configurations for aperiodic sounding reference signal transmissions triggered by DCI formats 0, 1A, 2B, 2C, 4. See TS 36.213 [23], clause 8.2. |
| ***srs-ConfigIndex, srs-ConfigIndexAp***Parameter: ISRS for periodic and aperiodic sounding reference signal transmission respectively except for an LAA SCell. See TS 36.213 [23], tables 8.2-1 and 8.2-2, for periodic and TS 36.213 [23], tables 8.2-4 an8.2-5, for aperiodic SRS transmission. |
| ***srs-DurationAdd***Indicates the duration of the additional SRS including guard symbols within a UL subframe, see TS 36.211 [21], clause 5.5.3. E-UTRAN configures *addSRS-StartPos* and this field such that all the configured additional SRS occur within the same subframe. |
| ***srs-GuardSymbolAS-Add***If enabled, there is a guard period of one symbol after antenna switching, see TS 36.211 [21], clause 5.5.3 and TS 36.213 [23] clause 8.2. |
| ***srs-GuardSymbolFH-Add***If enabled, there is a guard period of one symbol after frequency hopping, see TS 36.211 [21], clause 5.5.3 and TS 36.213 [23] clause 8.2. |
| ***srs-HoppingBandwidth, srs-HoppingBandwidthAdd***Parameter: SRS hopping bandwidth  for periodic and additional sounding reference signal transmission respectively except for an LAA SCell, see TS 36.211 [21], clause 5.5.3.2, where hbw0 corresponds to value 0, hbw1 to value 1 and so on. |
| ***srs-MaxUpPts***Parameter: srsMaxUpPts, see TS 36.211 [21], clause 5.5.3.2. If this field is present, reconfiguration of  applies for UpPts, otherwise reconfiguration does not apply. |
| ***srs-RepNumAdd***Parameter: R which indicates the number of the additional SRS repetitions, see TS 36.211 [21], clause 5.5.3.2 and TS 36.213 [23] clause 8.3. |
| ***srs-StartPosAdd***Indicates the starting position of the additional SRS within a UL subframe excluding UpPTS, see TS 36.211 [21], clause 5.5.3. |
| ***srs-SubframeConfig***Parameter: SRS SubframeConfiguration except for an LAA SCell. See TS 36.211, [21], table 5.5.3.3-1, applies for FDD whereas TS 36.211 [21], table 5.5.3.3-2, applies for TDD. sc0 corresponds to value 0, sc1 corresponds to value 1 and so on. |
| ***srs-SubframeIndication***Parameter: SRS subframe indication in SRS parameter set configuration for aperiodic sounding reference signal transmission on an LAA SCell configured with uplink, see TS 36.213 [23].  |
| ***srs-UpPtsAdd***The field only applies for TDD and frame structure type 3, see TS 36.211 [21]. If E-UTRAN configures both *soundingRS-UL-ConfigDedicatedUpPTsExt* and *soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt*, *srs-UpPtsAdd* in both fields is set to the same value. If E-UTRAN configures *soundingRS-UL-PeriodicConfigDedicatedUpPTsExtList-r14* with a number of *soundingRS-UL-ConfigDedicatedUpPTsExt* and/or *soundingRS-UL-AperiodicConfigDedicatedList-r14* with a number of *soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt*, *srs-UpPtsAdd* in all fields are set to the same value. |
| ***transmissionComb, transmissionCombAp, srs-TransmissionCombAdd***Parameter:  for periodic, aperiodic and additional sounding reference signal transmission respectively, see TS 36.211 [21], clause 5.5.3.2. |

| Conditional presence | Explanation |
| --- | --- |
| *TDD* | This field is optional present for TDD, need OR; it is not present for FDD and the UE shall delete any existing value for this field. |

*/ Unchanged parts are omitted/*

#### – *UplinkPowerControl*

The IE *UplinkPowerControlCommon* and IE *UplinkPowerControlDedicated* are used to specify parameters for uplink power control in the system information and in the dedicated signalling, respectively.

*UplinkPowerControl* information elements

-- ASN1START

UplinkPowerControlCommon ::= SEQUENCE {

 p0-NominalPUSCH INTEGER (-126..24),

 alpha Alpha-r12,

 p0-NominalPUCCH INTEGER (-127..-96),

 deltaFList-PUCCH DeltaFList-PUCCH,

 deltaPreambleMsg3 INTEGER (-1..6)

}

UplinkPowerControlCommon-v1020 ::= SEQUENCE {

 deltaF-PUCCH-Format3-r10 ENUMERATED {deltaF-1, deltaF0, deltaF1, deltaF2,

 deltaF3, deltaF4, deltaF5, deltaF6},

 deltaF-PUCCH-Format1bCS-r10 ENUMERATED {deltaF1, deltaF2, spare2, spare1}

}

UplinkPowerControlCommon-v1310 ::= SEQUENCE {

 deltaF-PUCCH-Format4-r13 ENUMERATED {deltaF16, deltaF15, deltaF14,deltaF13, deltaF12,

 deltaF11, deltaF10, spare1} OPTIONAL, -- Need OR

 deltaF-PUCCH-Format5-13 ENUMERATED { deltaF13, deltaF12, deltaF11, deltaF10, deltaF9,

 deltaF8, deltaF7, spare1} OPTIONAL -- Need OR

}

UplinkPowerControlCommon-v1530 ::= SEQUENCE {

 deltaFList-SPUCCH-r15 DeltaFList-SPUCCH-r15

}

UplinkPowerControlCommon-v16xy ::= SEQUENCE {

 alphaSRS-Add-r16 Alpha-r12

}

UplinkPowerControlCommonPSCell-r12 ::= SEQUENCE {

-- For uplink power control the additional/ missing fields are signalled (compared to SCell)

 deltaF-PUCCH-Format3-r12 ENUMERATED {deltaF-1, deltaF0, deltaF1, deltaF2,

 deltaF3, deltaF4, deltaF5, deltaF6},

 deltaF-PUCCH-Format1bCS-r12 ENUMERATED {deltaF1, deltaF2, spare2, spare1},

 p0-NominalPUCCH-r12 INTEGER (-127..-96),

 deltaFList-PUCCH-r12 DeltaFList-PUCCH

}

UplinkPowerControlCommonSCell-r10 ::= SEQUENCE {

 p0-NominalPUSCH-r10 INTEGER (-126..24),

 alpha-r10 Alpha-r12

}

UplinkPowerControlCommonSCell-v1130 ::= SEQUENCE {

 deltaPreambleMsg3-r11 INTEGER (-1..6)

}

UplinkPowerControlCommonSCell-v1310 ::= SEQUENCE {

-- For uplink power control the additional/ missing fields are signalled (compared to SCell)

 p0-NominalPUCCH INTEGER (-127..-96),

 deltaFList-PUCCH DeltaFList-PUCCH,

 deltaF-PUCCH-Format3-r12 ENUMERATED {deltaF-1, deltaF0, deltaF1,

 deltaF2, deltaF3, deltaF4, deltaF5,

 deltaF6} OPTIONAL, -- Need OR

 deltaF-PUCCH-Format1bCS-r12 ENUMERATED {deltaF1, deltaF2,

 spare2, spare1} OPTIONAL, -- Need OR

 deltaF-PUCCH-Format4-r13 ENUMERATED {deltaF16, deltaF15, deltaF14,

 deltaF13, deltaF12, deltaF11, deltaF10,

 spare1} OPTIONAL, -- Need OR

 deltaF-PUCCH-Format5-13 ENUMERATED { deltaF13, deltaF12, deltaF11,

 deltaF10, deltaF9, deltaF8, deltaF7,

 spare1} OPTIONAL -- Need OR

}

UplinkPowerControlCommonPUSCH-LessCell-v1430 ::= SEQUENCE {

 p0-Nominal-PeriodicSRS-r14 INTEGER (-126..24) OPTIONAL, -- Need OR

 p0-Nominal-AperiodicSRS-r14 INTEGER (-126..24) OPTIONAL, -- Need OR

 alpha-SRS-r14 Alpha-r12 OPTIONAL -- Need OR

}

UplinkPowerControlDedicated ::= SEQUENCE {

 p0-UE-PUSCH INTEGER (-8..7),

 deltaMCS-Enabled ENUMERATED {en0, en1},

 accumulationEnabled BOOLEAN,

 p0-UE-PUCCH INTEGER (-8..7),

 pSRS-Offset INTEGER (0..15),

 filterCoefficient FilterCoefficient DEFAULT fc4

}

UplinkPowerControlDedicated-v1020 ::= SEQUENCE {

 deltaTxD-OffsetListPUCCH-r10 DeltaTxD-OffsetListPUCCH-r10 OPTIONAL, -- Need OR

 pSRS-OffsetAp-r10 INTEGER (0..15) OPTIONAL -- Need OR

}

UplinkPowerControlDedicated-v1130 ::= SEQUENCE {

 pSRS-Offset-v1130 INTEGER (16..31) OPTIONAL, -- Need OR

 pSRS-OffsetAp-v1130 INTEGER (16..31) OPTIONAL, -- Need OR

 deltaTxD-OffsetListPUCCH-v1130 DeltaTxD-OffsetListPUCCH-v1130 OPTIONAL -- Need OR

}

UplinkPowerControlDedicated-v1250 ::= SEQUENCE {

 set2PowerControlParameter CHOICE {

 release NULL,

 setup SEQUENCE {

 tpc-SubframeSet-r12 BIT STRING (SIZE(10)),

 p0-NominalPUSCH-SubframeSet2-r12 INTEGER (-126..24),

 alpha-SubframeSet2-r12 Alpha-r12,

 p0-UE-PUSCH-SubframeSet2-r12 INTEGER (-8..7)

 }

 }

}

UplinkPowerControlDedicated-v1530 ::= SEQUENCE {

 alpha-UE-r15 Alpha-r12 OPTIONAL, -- Need OR

 p0-UE-PUSCH-r15 INTEGER (-16..15) OPTIONAL -- Need OR

}

UplinkPowerControlDedicatedSTTI-r15 ::= SEQUENCE {

 accumulationEnabledSTTI-r15 BOOLEAN,

 deltaTxD-OffsetListSPUCCH-r15 DeltaTxD-OffsetListSPUCCH-r15 OPTIONAL, -- Need OR

 uplinkPower-CSIPayload BOOLEAN

}

UplinkPUSCH-LessPowerControlDedicated-v1430 ::= SEQUENCE {

 p0-UE-PeriodicSRS-r14 INTEGER (-8..7) OPTIONAL, -- Need OR

 p0-UE-AperiodicSRS-r14 INTEGER (-8..7) OPTIONAL, -- Need OR

 accumulationEnabled-r14 BOOLEAN

}

UplinkPowerControlAddSRS-r16 ::= SEQUENCE {

 tpc-IndexSRS-Add-r16 TPC-Index OPTIONAL, -- Need ON

 startingBitOfFormat3B-SRS-Add-r16 INTEGER (0..31) OPTIONAL, -- Need ON

 fieldTypeFormat3B-SRS-Add-r16 INTEGER (1..2) OPTIONAL, -- Need ON

 p0-NominalSRS-Add-r16 INTEGER (-126..24) OPTIONAL, -- Need ON

 p0-UE-SRS-Add-r16 INTEGER (-16..15) OPTIONAL, -- Need ON

 accumulationEnabledSRS-Add-r16 BOOLEAN

}

UplinkPowerControlDedicatedSCell-r10 ::= SEQUENCE {

 p0-UE-PUSCH-r10 INTEGER (-8..7),

 deltaMCS-Enabled-r10 ENUMERATED {en0, en1},

 accumulationEnabled-r10 BOOLEAN,

 pSRS-Offset-r10 INTEGER (0..15),

 pSRS-OffsetAp-r10 INTEGER (0..15) OPTIONAL, -- Need OR

 filterCoefficient-r10 FilterCoefficient DEFAULT fc4,

 pathlossReferenceLinking-r10 ENUMERATED {pCell, sCell}

}

UplinkPowerControlDedicatedSCell-v1310 ::= SEQUENCE {

--Release 8

 p0-UE-PUCCH INTEGER (-8..7),

--Release 10

 deltaTxD-OffsetListPUCCH-r10 DeltaTxD-OffsetListPUCCH-r10 OPTIONAL -- Need OR

}

Alpha-r12 ::= ENUMERATED {al0, al04, al05, al06, al07, al08, al09, al1}

DeltaFList-PUCCH ::= SEQUENCE {

 deltaF-PUCCH-Format1 ENUMERATED {deltaF-2, deltaF0, deltaF2},

 deltaF-PUCCH-Format1b ENUMERATED {deltaF1, deltaF3, deltaF5},

 deltaF-PUCCH-Format2 ENUMERATED {deltaF-2, deltaF0, deltaF1, deltaF2},

 deltaF-PUCCH-Format2a ENUMERATED {deltaF-2, deltaF0, deltaF2},

 deltaF-PUCCH-Format2b ENUMERATED {deltaF-2, deltaF0, deltaF2}

}

DeltaFList-SPUCCH-r15 ::= CHOICE {

 release NULL,

 setup SEQUENCE {

 deltaF-slotSPUCCH-Format1-r15 ENUMERATED {deltaF-1, deltaF0, deltaF1, deltaF2,

 deltaF3, deltaF4, deltaF5, deltaF6} OPTIONAL, --Need OR

 deltaF-slotSPUCCH-Format1a-r15 ENUMERATED {deltaF1, deltaF2, deltaF3, deltaF4,

 deltaF5, deltaF6, deltaF7, deltaF8} OPTIONAL, --Need OR

 deltaF-slotSPUCCH-Format1b-r15 ENUMERATED {deltaF3, deltaF4, deltaF5, deltaF6,

 deltaF7, deltaF8, deltaF9, deltaF10} OPTIONAL,--Need OR

 deltaF-slotSPUCCH-Format3-r15 ENUMERATED {deltaF4, deltaF5, deltaF6, deltaF7,

 deltaF8, deltaF9, deltaF10, deltaF11} OPTIONAL,--Need OR

 deltaF-slotSPUCCH-RM-Format4-r15 ENUMERATED {deltaF13, deltaF14, deltaF15, deltaF16,

 deltaF17, deltaF18, deltaF19, deltaF20} OPTIONAL,

--Need OR

 deltaF-slotSPUCCH-TBCC-Format4-r15 ENUMERATED {deltaF10, deltaF11, deltaF12, deltaF13,

 deltaF14, deltaF15, deltaF16, deltaF17} OPTIONAL,

--Need OR

 deltaF-subslotSPUCCH-Format1and1a-r15 ENUMERATED {deltaF5, deltaF6, deltaF7, deltaF8,

 deltaF9, deltaF10, deltaF11, deltaF12} OPTIONAL,

--Need OR

 deltaF-subslotSPUCCH-Format1b-r15 ENUMERATED {deltaF6, deltaF7, deltaF8, deltaF9,

 deltaF10, deltaF11, deltaF12, deltaF13} OPTIONAL,

--Need OR

 deltaF-subslotSPUCCH-RM-Format4-r15 ENUMERATED {deltaF15, deltaF16, deltaF17, deltaF18,

 deltaF19, deltaF20, deltaF21, deltaF22} OPTIONAL,

--Need OR

 deltaF-subslotSPUCCH-TBCC-Format4-r15 ENUMERATED {deltaF10, deltaF11, deltaF12, deltaF13,

 deltaF14, deltaF15, deltaF16, deltaF17} OPTIONAL,

--Need OR

 ...

 }

}

DeltaTxD-OffsetListPUCCH-r10 ::= SEQUENCE {

 deltaTxD-OffsetPUCCH-Format1-r10 ENUMERATED {dB0, dB-2},

 deltaTxD-OffsetPUCCH-Format1a1b-r10 ENUMERATED {dB0, dB-2},

 deltaTxD-OffsetPUCCH-Format22a2b-r10 ENUMERATED {dB0, dB-2},

 deltaTxD-OffsetPUCCH-Format3-r10 ENUMERATED {dB0, dB-2},

 ...

}

DeltaTxD-OffsetListPUCCH-v1130 ::= SEQUENCE {

 deltaTxD-OffsetPUCCH-Format1bCS-r11 ENUMERATED {dB0, dB-1}

}

DeltaTxD-OffsetListSPUCCH-r15 ::= SEQUENCE {

 deltaTxD-OffsetSPUCCH-Format1-r15 ENUMERATED {dB0, dB-2},

 deltaTxD-OffsetSPUCCH-Format1a-r15 ENUMERATED {dB0, dB-2},

 deltaTxD-OffsetSPUCCH-Format1b-r15 ENUMERATED {dB0, dB-2},

 deltaTxD-OffsetSPUCCH-Format3-r15 ENUMERATED {dB0, dB-2},

 ...

}

-- ASN1STOP

| *UplinkPowerControl* field descriptions |
| --- |
| ***accumulationEnabled, accumulationEnabledTTI***Parameter: Accumulation-enabled, see TS 36.213 [23], clauses 5.1.1.1 and 5.1.3.1. TRUE corresponds to "enabled" whereas FALSE corresponds to "disabled". |
| ***accumulationEnabledSRS-Add***Parameter: accumulationEnabled-additionalSRS, see TS 36.213 [23], clauses 5.1.3.1. TRUE corresponds to "enabled" whereas FALSE corresponds to "disabled". |
| ***alpha***Parameter: *α* See TS 36.213 [23], clause 5.1.1.1, where al0 corresponds to 0, al04 corresponds to value 0.4, al05 to 0.5, al06 to 0.6, al07 to 0.7, al08 to 0.8, al09 to 0.9 and al1 corresponds to 1. This field applies for uplink power control subframe set 1 if uplink power control subframe sets are configured by *tpc-SubframeSet*. |
| ***alpha-SRS, alphaSRS-Add***Parameter: *αSRS*. See TS 36.213 [23], clause 5.1.3.1, where al0 corresponds to 0, al04 corresponds to value 0.4, al05 to 0.5, al06 to 0.6, al07 to 0.7, al08 to 0.8, al09 to 0.9 and al1 corresponds to 1. *alpha-SRS* applies for SRS power control on a PUSCH-less SCell, *alphaSRS-Add* applies for SRS power control on the additional SRS symbols. |
| ***alpha-SubframeSet2***Parameter: *α*. See TS 36.213 [23], clause 5.1.1.1, where al0 corresponds to 0, al04 corresponds to value 0.4, al05 to 0.5, al06 to 0.6, al07 to 0.7, al08 to 0.8, al09 to 0.9 and al1 corresponds to 1. This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by *tpc-SubframeSet*. |
| ***alpha-UE***Parameter: *αUE* See TS 36.213 [23], clause 5.1.1.1, where al0 corresponds to 0, al04 corresponds to value 0.4, al05 to 0.5, al06 to 0.6, al07 to 0.7, al08 to 0.8, al09 to 0.9 and al1 corresponds to 1. |
| ***deltaF-PUCCH-FormatX***Parameter:  for the PUCCH formats 1, 1b, 2, 2a, 2b, 3, 4, 5 and 1b with channel selection. See TS 36.213 [23], clause 5.1.2, where deltaF-2 corresponds to -2 dB, deltaF0 corresponds to 0 dB and so on. |
| ***deltaF-PUCCH-FormatX, deltaF-slotSPUCCH-FormatX, deltaF-subslotSPUCCH-FormatX***Parameter:  for the SPUCCH formats 1, 1a, 1b, 3 and 4. See TS 36.213 [23], clause 5.1.2 where deltaF-2 corresponds to -2 dB, deltaF0 corresponds to 0 dB and so on. In case both an A and a B configuration exist, configuration A is used in case SPUCCH carries ≤ 22 HARQ-ACK bits, and B otherwise. |
| ***deltaMCS-Enabled***Parameter: *Ks* See TS 36.213 [23], clause 5.1.1.1. en0 corresponds to value 0 corresponding to state "disabled". en1 corresponds to value 1.25 corresponding to "enabled". |
| ***deltaPreambleMsg3***Parameter:  *see* TS 36.213 [23], clause 5.1.1.1. Actual value = field value \* 2 [dB]. |
| ***deltaTxD-OffsetPUCCH-FormatX***Parameter:  for the PUCCH formats 1, 1a/1b, 1b with channel selection, 2/2a/2b and 3 when two antenna ports are configured for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. EUTRAN configures the field *deltaTxD-OffsetPUCCH-Format1bCS-r11* for the PCell and/or the PSCell only. |
| ***deltaTxD-OffsetSPUCCH-FormatX***Parameter:  for the SPUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are configured for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. |
| ***fieldTypeFormat3B-SRS-Add***Indicates the field width of power control field in DCI format 3B for additional SRS. See TS 36.212 [22], clause 5.3.3.1.7A. |
| ***filterCoefficient***Specifies the filtering coefficient for RSRP measurements used to calculate path loss, as specified in TS 36.213 [23], clause 5.1.1.1. The same filtering mechanism applies as for *quantityConfig* described in 5.5.3.2. |
| ***p0-NominalSRS-Add***Parameter:  where *m*=2. See TS 36.213 [23], clause 5.1.3.1, unit dBm. |
| ***p0-Nominal-AperiodicSRS***Parameter:  where *m*=1. See TS 36.213 [23], clause 5.1.3.1, unit dBm. |
| ***p0-Nominal-PeriodicSRS***Parameter:  where *m*=0. See TS 36.213 [23], clause5.1.3.1, unit dBm. |
| ***p0-NominalPUCCH***Parameter:  See TS 36.213 [23], clause 5.1.2.1, unit dBm. |
| ***p0-NominalPUSCH***Parameter:  See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non-persistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe sets are configured by *tpc-SubframeSet*. |
| ***p0-NominalPUSCH-SubframeSet2***Parameter: . See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non-persistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by *tpc-SubframeSet*. |
| ***p0-UE-SRS-Add***Parameter:  where *m*=2. See TS 36.213 [23], clause 5.1.3.1, unit dB. |
| ***p0-UE-AperiodicSRS***Parameter:  where *m*=1. See TS 36.213 [23], clause 5.1.3.1, unit dB. |
| ***p0-UE-PeriodicSRS***Parameter:  where *m*=0. See TS 36.213 [23], clause 5.1.3.1, unit dB. |
| ***p0-UE-PUCCH***Parameter:  See TS 36.213 [23], clause 5.1.2.1. Unit dB |
| ***p0-UE-PUSCH***Parameter:  See TS 36.213 [23], clause 5.1.1.1, unit dB. This field is applicable for non-persistent scheduling, only. This field applies for uplink power control subframe set 1 if uplink power control subframe sets are configured by *tpc-SubframeSet*. If *p0-UE-PUSCH-r15* is included, the UE ignores *p0-UE-PUSCH* (i.e., without suffix). |
| ***p0-UE-PUSCH-SubframeSet2***Parameter:  See TS 36.213 [23], clause 5.1.1.1, unit dB. This field is applicable for non-persistent scheduling, only. This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by *tpc-SubframeSet*. |
| ***pathlossReferenceLinking***Indicates whether the UE shall apply as pathloss reference either the downlink of the PCell or of the SCell that corresponds with this uplink (i.e. according to the *cellIdentification* within the field *sCellToAddMod*). For SCells part of an STAG E-UTRAN sets the value to sCell. |
| ***pSRS-Offset, pSRS-OffsetAp***Parameter: *PSRS\_OFFSET* for periodic and aperiodic sounding reference signal transmission repectively. See TS 36.213 [23], clause 5.1.3.1. For *Ks*=1.25, the actual parameter value is *pSRS-Offset* value – 3. For *Ks*=0, the actual parameter value is -10.5 + 1.5\**pSRS-Offset* value.If *pSRS-Offset-v1130* is included, the UE ignores *pSRS-Offset* (i.e., without suffix). Likewise, if *pSRS-OffsetAp-v1130* is included, the UE ignores *pSRS-OffsetAp-r10*. For *Ks*=0, E-UTRAN does not set values larger than 26. |
| ***startingBitOfFormat3B-SRS-Add***Indicates the starting position of a block to trigger and TPC commands for the additional SRS symbols. See TS 36.212 [22], clause 5.3.3.1.7A. |
| ***tpc-IndexSRS-Add***Indicates the index to the TPC command for the SRS in additional symbols. See TS 36.212 [22], clause 5.3.3.1.6 and 5.3.3.1.7. |
| ***tpc-SubframeSet***Indicates the uplink subframes (including UpPTS in special subframes) of the uplink power control subframe sets. Value 0 means the subframe belongs to uplink power control subframe set 1, and value 1 means the subframe belongs to uplink power control subframe set 2. |
| ***uplinkPower-CSIPayload***Indicates whether the UE shall derive BPRE based on the actual value of O\_CQI for slot/subslot-PUSCH. If not present, the largest value of O\_CQI across all RI values shall be used for the derivation of BPRE for slot/subslot-PUSCH. |