**3GPP TSG-RAN WG1 Meeting #106-e *R1-210xxxx***

**e-Meeting, August 16th – 27th, 2021**

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| *CR-Form-v12.0* |
| **DRAFT CHANGE REQUEST** |
|  |
|  | **38.213** | **CR** | **xxxx** | **rev** | **-** | **Current version:** | **16.6.0** |  |
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| *For* [**HE****LP**](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* <http://www.3gpp.org/Change-Requests>*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:***  | Editorial corrections for TS 38.213 |
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| ***Source to WG:*** | Samsung |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** | 5G\_V2X\_NRSL-Core, NR\_L1enh\_URLLC-Core, NR\_eMIMO-Core |  | ***Date:*** | 2021-08-24 |
|  |  |  |  |  |
| ***Category:*** | F |  | ***Release:*** | Rel-16 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | 1. The ‘and’ in an ‘and/or’ statement is unnecessary as the ‘or’ is sufficient and the ‘and’ may not apply in clause 6.
2. Correct parameter names in statement “*ACKNackFeedbackMode* = *JointFeedback*” in clause 9.1.3.1.
3. In one occasion in clause 10, the name of a higher layer parameter *pdcch-BlindDetectionCA* is incorrect.
4. There is a leftover ‘-r16’ for the names of higher layer parameter names in clauses 16.1, 16.2.1, and 16.5.
5. In the first paragraph of clause 16.3, the “one or more sub-channels from” of the statement “in one or more sub-channels from a number of $N\_{subch }^{PSSCH}$ sub-channels” is incompatible with a later statement of clause 16.3 that “$N\_{subch }^{PSSCH}⋅M\_{subch, slot}^{PSFCH}$ PRBs are associated with one or more sub-channels from the $N\_{subch }^{PSSCH}$ sub-channels of the corresponding PSSCH”.
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| ***Summary of change:*** | 1. Change ‘and/or’ to ‘or’ in clause 6.
2. Change “*ACKNackFeedbackMode* = *JointFeedback*” to “*ackNackFeedbackMode* = *joint*” in clause 9.1.3.1.
3. Change *pdcch-BlindDetectionCA* to *pdcch-BlindDetectionCA1* in an occasion in clause 10.
4. Remove the ‘-r16’ from higher layer parameter names in clauses 16.1, 16.2.1, and 16.5 and remove an obsolete “higher layer parameter”.
5. Remove “in one or more sub-channels from a number of $N\_{subch }^{PSSCH}$ sub-channels” in the aforementioned first statement and remove “one or more sub-channels from” in the aforementioned later statement of clause 16.3.
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| ***Consequences if not approved:*** | Inconsistent specifications |
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| ***Clauses affected:*** | 6, 9.1.3.1, 10, 16.1, 16.2.1, 16.3, 16.5 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ... |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

# 6 Link recovery procedures

<omitted text>

For the PCell or the PSCell, upon request from higher layers, the UE provides to higher layers the periodic CSI-RS configuration indexes and/or SS/PBCH block indexes from the set  and the corresponding L1-RSRP measurements that are larger than or equal to the Qin,LR threshold.

For the SCell, upon request from higher layers, the UE indicates to higher layers whether there is at least one periodic CSI-RS configuration index or SS/PBCH block index from the set  with corresponding L1-RSRP measurements that are larger than or equal to the Qin,LR threshold, and provides the periodic CSI-RS configuration indexes or SS/PBCH block indexes from the set  and the corresponding L1-RSRP measurements that are larger than or equal to the Qin,LR threshold, if any.

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#### 9.1.3.1 Type-2 HARQ-ACK codebook in physical uplink control channel

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If the UE transmits HARQ-ACK information in a PUCCH in slot $n$ and for any PUCCH format, the UE determines the $\tilde{o}\_{0}^{ACK}, \tilde{o}\_{1}^{ACK},\cdots ,\tilde{o}\_{O\_{ACK}-1}^{ACK}$ , for a total number of $O\_{ACK}$ HARQ-ACK information bits, according to the following pseudo-code:

Set $m=0$ – PDCCH with DCI format scheduling PDSCH reception, SPS PDSCH release or SCell dormancy indication monitoring occasion index: lower index corresponds to earlier PDCCH monitoring occasion

Set $j=0$

Set $V\_{temp}=0$

Set $V\_{temp2}=0$

Set $V\_{s}=∅$

Set $N\_{cells}^{DL}$ to the number of serving cells configured by higher layers for the UE

- if, for an active DL BWP of a serving cell, the UE is not provided *coresetPoolIndex* or is provided *coresetPoolIndex* with value 0 for one or more first CORESETs and is provided *coresetPoolIndex* with value 1 for one or more second CORESETs, and is provided *ackNackFeedbackMode = joint,* the serving cell is counted two times where the first time corresponds to the first CORESETs and the second time corresponds to the second CORESETs

- if the UE indicates *type2-HARQ-ACK-Codebook*, a serving cell is counted $N\_{PDSCH}^{MO}$ times where $N\_{PDSCH}^{MO}$ is the number of PDSCH receptions that can be scheduled for the serving cell by DCI formats in PDCCH receptions at a same PDCCH monitoring occasion based on the reported value of *type2-HARQ-ACK-Codebook*

Set $M$ to the number of PDCCH monitoring occasion(s)

<omitted text>

# 10 UE procedure for receiving control information

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When a UE is configured for NR-DC operation with a total of $N\_{NR-DC}^{DL,cells}$ downlink cells on both the MCG and the SCG and the UE is provided *monitoringCapabilityConfig* = *r15monitoringcapability* for$N\_{NR-DC,r15}^{DL,cells}$ downlink cells and *monitoringCapabilityConfig* = *r16monitoringcapability* for $N\_{NR-DC,r16}^{DL,cells}$ downlink cells where the UE monitors PDCCH, the UE expects to be provided *pdcch-BlindDetection3* and *pdcch-BlindDetection2* for the MCG, and *pdcch-BlindDetection3* and *pdcch-BlindDetection2* for the SCG with values that satisfy

- *pdcch-BlindDetection3* for the MCG + *pdcch-BlindDetection3* for the SCG <= *pdcch-BlindDetectionCA1*, if the UE reports *pdcch-BlindDetectionCA1*, or

- *pdcch-BlindDetection3* for the MCG + *pdcch-BlindDetection3* for the SCG <= $N\_{NR-DC,r15}^{DL,cells}$, if the UE does not report *pdcch-BlindDetectionCA1*

and

- *pdcch-BlindDetection2* for the MCG + *pdcch-BlindDetection2* for the SCG <= *pdcch-BlindDetectionCA2*, if the UE reports *pdcch-BlindDetectionCA2*, or

- *pdcch-BlindDetection2* for the MCG + *pdcch-BlindDetection2* for the SCG <= $N\_{NR-DC,r16}^{DL,cells}$, if the UE does not report *pdcch-BlindDetectionCA2*

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## 16.1 Synchronization procedures

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A UE is provided, by *sl-NumSSB-WithinPeriod*, a number $N\_{period}^{S-SSB}$ of S-SS/PSBCH blocks in a period of 16 frames. The UE assumes that a transmission of the S-SS/PSBCH blocks in the period is with a periodicity of 16 frames. The UE determines indexes of slots that include S-SS/PSBCH block as $N\_{offset}^{S-SSB}$+$\left(N\_{interval}^{S-SSB}+1\right)⋅i\_{S-SSB}$, where

- index 0 corresponds to a first slot in a frame with SFN satisfying $(SFN mod 16)=0$

- $i\_{S-SSB}$ is a S-SS/PSBCH block index within the number of S-SS/PSBCH blocks in the period, with $0\leq i\_{S-SSB}\leq N\_{period}^{S-SSB}-1$

- $N\_{offset}^{S-SSB}$ is a slot offset from a start of the period to the first slot including S-SS/PSBCH block, provided by *sl-TimeOffsetSSB*

- $N\_{interval}^{S-SSB}$ is a slot interval between S-SS/PSBCH blocks, provided by *sl-TimeInterval*

For paired spectrum, an S-SS/PSBCH block can be transmitted/received only in a slot of an UL carrier. For unpaired spectrum, an S-SS/PSBCH block can be transmitted/received only in a slot of which all OFDM symbols are configured as UL by *tdd-UL-DL-ConfigurationCommon* of the serving cell if providedor *sl-TDD-Configuration* if provided or *sl-TDD-Config* of the received PSBCH if provided. Or if *tdd-UL-DL-ConfigurationCommon* and *sl-TDD-Configuration* are not provided for a spectrum indicated with only PC5 interface in Table 5.2E.1-1 in [TS 38.101-1], an S-SS/PSBCH block can be transmitted/received in any slot of the spectrum.

For transmission of an S-SS/PSBCH block, a UE includes a bit sequence $a\_{0}, a\_{1}, a\_{2}, a\_{3}, …, a\_{11}$ in the PSBCH payload to indicate *sl-TDD-Config* and provide a slot format over a number of slots.

For paired spectrum, or if *tdd-UL-DL-ConfigurationCommon* and *sl-TDD-Configuration* are not provided for a spectrum indicated with only PC5 interface in Table 5.2E.1-1 in [TS 38.101-1],

- $a\_{0}, a\_{1}, a\_{2}, a\_{3},a\_{4}, a\_{5}, a\_{6}, a\_{7},a\_{8}, a\_{9}, a\_{10}, a\_{11}$ are set to '1';

else

- $a\_{0}=0$ if *pattern1* is provided by *sl-TDD-Configuration* or *tdd-UL-DL-ConfigurationCommon*; $a\_{0}=1$ if both *pattern1* and *pattern2* are provided by *sl-TDD-Configuration* or *tdd-UL-DL-ConfigurationCommon* as described in clause 11.1

- $a\_{1}, a\_{2}, a\_{3},a\_{4}$ are determined based on

- $P$ in *pattern1* as described in Table 16.1-1 for $a\_{0}=0$

- $P$ in *pattern1* and$P\_{2}$ *in pattern2* as described in Table 16.1-2 for $a\_{0}=1$

where $P$ and $P\_{2}$ are as described in clause 11.1

- $a\_{5}, a\_{6}, a\_{7},a\_{8}, a\_{9}, a\_{10}, a\_{11}$ are the 7th to 1st LSBs of $u\_{slots}^{SL}$, respectively

- for $a\_{0}=0$, $u\_{slots}^{SL}=u\_{slots}\*2^{μ-μ\_{ref}}+\left⌊\frac{u\_{sym}\*2^{μ-μ\_{ref}}}{L}\right⌋+I\_{1}$

- for $a\_{0}=1$, $u\_{slots}^{SL}=\left⌊\frac{u\_{slots,2}\*2^{μ-μ\_{ref}}+\left⌊\frac{u\_{sym,2}\*2^{μ-μ\_{ref}}}{L}\right⌋+I\_{2}}{w}\right⌋\*\left⌈\frac{P\*2^{μ}+1}{w}\right⌉+\left⌊\frac{u\_{slots}\*2^{μ-μ\_{ref}}+\left⌊\frac{u\_{sym}\*2^{μ-μ\_{ref}}}{L}\right⌋+I\_{1}}{w}\right⌋$

where

- $L$ is the number of symbols in a slot: $L=12$ if *cyclicPrefix* = "ECP"; else,$L=14$

- $I\_{1}$ is 1 if $u\_{sym}\*2^{μ-μ\_{ref}} mod L\geq L-Y$, else $I\_{1}$ is 0

- $I\_{2}$ is 1 if $u\_{sym,2}\*2^{μ-μ\_{ref}} mod L\geq L-Y$, else $I\_{2}$ is 0

- $Y$ is the sidelink starting symbol index provided by *sl-StartSymbol*

- $w$ is the granularity of slots indication as described in Table 16.1-2

- $μ\_{ref}$, $u\_{slots}$, $u\_{sym}$, $u\_{slots,2}$, $u\_{sym,2}$ are the parameters of *TDD-UL-ConfigurationCommon* as described in clause 11.1, or the parameters of *sl-TDD-Configuration* as defined in [9.3, TS 38.331]

- $μ=0, 1, 2, 3$ corresponds to SL SCS as defined in [4, TS 38.211]

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### 16.2.1 PSSCH

A UE determines a power $P\_{PSSCH,b,c}(i)$ for a PSSCH transmission on a resource pool in symbols where a corresponding PSCCH is not transmitted in PSCCH-PSSCH transmission occasion $i$ on active SL BWP $b$ of carrier $f$of serving cell $c$ as:

 $P\_{PSSCH}(i)=min\left(P\_{CMAX},P\_{MAX,CBR},min\left(P\_{PSSCH,D}\left(i\right),P\_{PSSCH,SL}(i)\right)\right)$ [dBm]

where

- $P\_{CMAX}$ is defined in [8-1, TS 38.101-1]

- $P\_{MAX,CBR}$ is determined by a value of *sl-MaxTransPower* based on a priority level of the PSSCH transmission and a CBR range that includes a CBR measured in slot $i-N$ [6, TS 38.214]; if *sl-MaxTransPower* is not provided, then $P\_{MAX,CBR}=P\_{CMAX}$;

<omitted text>

## 16.3 UE procedure for reporting HARQ-ACK on sidelink

A UE can be indicated by an SCI format scheduling a PSSCH reception to transmit a PSFCH with HARQ-ACK information in response to the PSSCH reception. The UE provides HARQ-ACK information that includes ACK or NACK, or only NACK.

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A UE determines a number of PSFCH resources available for multiplexing HARQ-ACK information in a PSFCH transmission as $R\_{PRB, CS}^{PSFCH}=N\_{type }^{PSFCH}⋅M\_{subch, slot}^{PSFCH}⋅N\_{CS}^{PSFCH}$ where $N\_{CS}^{PSFCH}$ is a number of cyclic shift pairs for the resource pool provided by *sl-NumMuxCS-Pair* and, based on an indication by *sl-PSFCH-CandidateResourceType*,

- if *sl-PSFCH-CandidateResourceType* is configured as *startSubCH*, $N\_{type }^{PSFCH}=1$ and the $M\_{subch, slot}^{PSFCH}$ PRBs are associated with the starting sub-channel of the corresponding PSSCH;

- if *sl-PSFCH-CandidateResourceType* is configured as *allocSubCH*, $N\_{type }^{PSFCH}=N\_{subch }^{PSSCH}$ and the $N\_{subch }^{PSSCH}⋅M\_{subch, slot}^{PSFCH}$ PRBs are associated with the $N\_{subch }^{PSSCH}$ sub-channels of the corresponding PSSCH.

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## 16.5 UE procedure for reporting HARQ-ACK on uplink

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For DCI format 3\_0, if present, the PSFCH-to-HARQ\_feedback timing indicator field values map to values for a set of number of slots provided by *sl-PSFCH-ToPUCCH* as defined in Table 16.5-2.

Table 16.5-2: Mapping of PSFCH-to-HARQ\_feedback timing indicator field values to numbers of slots

|  |  |
| --- | --- |
| PSFCH-to-HARQ\_feedback timing indicator  | Number of slots  |
| 1 bit | 2 bits | 3 bits |  |
| '0' | '00' | '000' | 1st value provided by *sl-PSFCH-ToPUCCH*  |
| '1' | '01' | '001' | 2nd value provided by *sl-PSFCH-ToPUCCH* |
|  | '10' | '010' | 3rd value provided by *sl-PSFCH-ToPUCCH* |
|  | '11' | '011' | 4th value provided by *sl-PSFCH-ToPUCCH* |
|  |  | '100' | 5th value provided by *sl-PSFCH-ToPUCCH* |
|  |  | '101' | 6th value provided by *sl-PSFCH-ToPUCCH* |
|  |  | '110' | 7th value provided by *sl-PSFCH-ToPUCCH* |
|  |  | '111' | 8th value provided by *sl-PSFCH-ToPUCCH* |

With reference to slots for PUCCH transmissions and for a number of PSFCH reception occasions ending in slot $n$, the UE provides the generated HARQ-ACK information in a PUCCH transmission within slot $n+k$, subject to the overlapping conditions in clause 9.2.5, where $k$ is a number of slots indicated by a PSFCH-to-HARQ\_feedback timing indicator field, if present, in a DCI format indicating a slot for PUCCH transmission to report the HARQ-ACK information, or $k$ is provided by *sl-PSFCH-ToPUCCH* for a transmission scheduled by a DCI format or for a SL configured grant type 2, or by *sl-PSFCH-ToPUCCH-CG-Type1* for a SL configured grant type 1. $k=0$ corresponds to a last slot for a PUCCH transmission that would overlap with the last PSFCH reception occasion assuming that the start of the sidelink frame is same as the start of the downlink frame [4, TS 38.211].

For a PSSCH transmission by a UE that is scheduled by a DCI format, or for a SL configured grant Type 2 PSSCH transmission activated by a DCI format, the DCI format indicates to the UE that a PUCCH resource is not provided when a value of the PUCCH resource indicator field is zero and a value of PSFCH-to-HARQ feedback timing indicator field, if present, is zero. For a SL configured grant Type 2 PSSCH transmission without a corresponding PDCCH, the DCI format activating the SL configured grant Type 2 indicates to the UE that a PUCCH resource is not provided when a value of the PUCCH resource indicator field is zero and a value of PSFCH-to-HARQ feedback timing indicator field, if present, is zero. For a SL configured grant Type 1 PSSCH transmission, a PUCCH resource can be provided by *sl-N1PUCCH-AN* and *sl-PSFCH-ToPUCCH-CG-Type1*. For transmission of HARQ-ACK information corresponding only to a SL configured grant Type 2 PSSCH transmission without a corresponding PDCCH, a UE can be provided a PUCCH resource by *sl-N1PUCCH-AN-Type2*. If a PUCCH resource is not provided, the UE does not transmit a PUCCH with generated HARQ-ACK information from PSFCH reception occasions.

For a PUCCH transmission with HARQ-ACK information, a UE determines a PUCCH resource after determining a set of PUCCH resources from up to four PUCCH resource sets provided by *sl-PUCCH-Config*, for $O\_{UCI}$ HARQ-ACK information bits, as described in clause 9.2.1. The PUCCH resource determination is based on a PUCCH resource indicator field [5, TS 38.212] in a last DCI format 3\_0, among the DCI formats 3\_0 that have a value of a PSFCH-to-HARQ\_feedback timing indicator field indicating a same slot for the PUCCH transmission, that the UE detects and for which the UE transmits corresponding HARQ-ACK information in the PUCCH where, for PUCCH resource determination, detected DCI formats are indexed in an ascending order across PDCCH monitoring occasion indexes.

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