**3GPP TSG-RAN WG1 Meeting # 110bis-eR1-22xxxxx**

**e-Meeting, October 10th – 19th , 2022**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **38.214** | **CR** | **DRAFT** | **rev** | **-** | **Current version:** | **17.3.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network | **x** | Core Network |  |

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| ***Title:***  | Corrections on available slot determination for PUSCH repetition type A and TBoMS for HD-UE |
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| ***Source to WG:*** | Moderator (Ericsson), [Sharp, vivo, Nokia, Nokia Shanghai Bell, Intel, …] |
| ***Source to TSG:*** |  |
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| ***Work item code:*** | NR\_redcap-Core |  | ***Date:*** | 2022-10-17 |
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| ***Category:*** | **F** |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | 1. The case of not transmititng a PUSCH according to the clause 17.2 of TS 38.213 is missing in the slots counting in the number of slots.
2. The following agreement regarding the back-to-back non-overlapping without sufficient gap case between SSB and PUSCH repetition Type A has not been captured in the available slot counting procedure for HD-UE.

AgreementFL1 High Priority Proposal 2-3 in R1-2205442 is agreed.**FL1 High Priority Proposal 2-3:*** For a HD-UE in paired spectrum and for PUSCH repetition Type A scheduled by DCI format 0\_1 or 0\_2 or with a configured grant
	+ When *AvailableSlotCounting* is enabled
		- For K>1, a slot is not counted in the number of K slots if a PUSCH transmission in the slot does not start or end at least or , respectively, from the last or first symbol in the set of symbols with SSB transmission
		- For K=1, the HD-UE does not transmit PUSCH if PUSCH transmission in the slot does not start or end at least or , respectively, from the last or first symbol in the set of symbols with SSB transmission
	+ When the UE is not configured with *AvailableSlotCounting* or when *AvailableSlotCounting* is disabled, the HD-UE does not transmit PUSCH in a slot if a PUSCH transmission in the slot does not start or end at least or , respectively, from the last or first symbol in the set of symbols with SSB transmission
1. The case of back-to-back non-overlapping without sufficient gap between SSB and PUSCH was agreed in RAN1#109 for the available slot counting procedure for the PUSCH repetition Type A. The same solution can be also applied to TBoMS.

The email discussion about this CR is captured as Issue #4 in R1-2210247. |
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| ***Summary of change:*** | 1. Add ‘and clause 17.2’ in clause 6.1.2.1 to clarify that a slot where a PUSCH is not transmitted according to clause 17.2 of TS 38.213 is counted in the number of slots.
2. Change ‘overlap with a’ to ‘would not start or end at least or , respectively, from the last or first’ in clause 6.1.2.1 and clause 6.1.2.3.1 to clarify that a slot where a PUSCH transmission overlaps with the switch gap before or after SSB transmission is not counted in the slots for PUSCH repetition Type A transmission when *AvailableSlotCounting* is enabled and *K*>1.
3. Change ‘overlap with a’ to ‘would not start or end at least or , respectively, from the last or first’ in clause 6.1.2.1 and clause 6.1.2.3.3 to clarify that a slot where a PUSCH transmission overlaps with the switch gap before or after SSB transmission is not counted in the slots for TBoMS.
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| ***Consequences if not approved:*** | 1. Incomplete support of PUSCH dropping in slots counting in the number of slots.
2. The above agreement is not supported in the specification.
3. Different available slot counting procedures are specified for PUSCH repetition Type A and TBoMS in the case of back-to-back non-overlapping without sufficient gap case between PUSCH transmission and SSB transmission.
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| ***Clauses affected:*** | 6.1.2.1, 6.1.2.3.1, 6.1.2.3.3 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **x** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

6.1.2.1 Resource allocation in time domain

**<Unchanged text is omitted>**

For paired spectrum and SUL band:

- The UE determines consecutive slots for a PUSCH transmission of a PUSCH repetition type A scheduled by DCI format 0\_1 or 0\_2, or for a PUSCH transmission of TB processing over multiple slots scheduled by DCI format 0\_1 or 0\_2, based on the TDRA information field value in the DCI format 0\_1 or 0\_2.

- For the case of a reduced capability half-duplex UE, the UE determines slots for a PUSCH transmission of a PUSCH repetition type A scheduled by DCI format 0\_1 or 0\_2 when *AvailableSlotCounting* is enabled and K>1, or for a PUSCH transmission of TB processing over multiple slots scheduled by DCI format 0\_1 or 0\_2, based on the TDRA information field value in the DCI format 0\_1 or 0\_2. A slot is not counted in the number of slots if at least one of the symbols indicated by the indexed row of the used resource allocation table in the slot does not start or end at least or , respectively, from the last or first symbol of an SS/PBCH block with index provided by *ssb-PositionsInBurst*.

- The UE determines consecutive slots for a PUSCH transmission of a PUSCH repetition Type A scheduled by RAR UL grant, based on the TDRA information field value in the RAR UL grant.

- The UE determines consecutive slots for a PUSCH transmission of a PUSCH repetition Type A scheduled by DCI format 0\_0 with CRC scrambled by TC-RNTI, based on the TDRA information field value in the DCI scheduling the PUSCH.

If a UE would transmit a PUSCH of PUSCH repetition Type A when *AvailableSlotCounting* is enabled and K>1 or a TB processing over multiple slots over slots, and the UE does not transmit the PUSCH of a TB processing over multiple slots or the PUSCH repetition Type A in a slot from the slots, according to clause 9, clause 11.1, clause 11.2A and clause 17.2 of [6, TS 38.213], the UE counts the slots in the number of slots.

**<Unchanged text is omitted>**

6.1.2.3.1 Transport Block repetition for uplink transmissions of PUSCH repetition Type A with a configured grant

**<Unchanged text is omitted>**

For both Type 1 and Type 2 PUSCH transmissions with a configured grant, when *K >* 1*,*

- For unpaired spectrum:

- If *AvailableSlotCounting* is enabled, the UE shall repeat the TB across the slots determined for the PUSCH transmission applying the same symbol allocation in each slot.

- A slot is not counted in the number of slots if at least one of the symbols indicated by the indexed row of the used resource allocation table in the slot overlaps with a DL symbol indicated by *tdd-UL-DL-ConfigurationCommon* or *tdd-UL-DL-ConfigurationDedicated* if provided, or a symbol of an SS/PBCH block with index provided by *ssb-PositionsInBurst*.

- Otherwise, the UE shall repeat the TB across the consecutive slots applying the same symbol allocation in each slot, except if the UE is provided with higher layer parameters *cg-nrofSlots* and *cg-nrofPUSCH-InSlot*, in which case the UE repeats the TB in the *repK* earliest consecutive transmission occasion candidates within the same configuration.

- For paired spectrum and SUL band:

- The UE shall repeat the TB across the consecutive slots applying the same symbol allocation in each slot, except if the UE is provided with higher layer parameters *cg-nrofSlots* and *cg-nrofPUSCH-InSlot*, in which case the UE repeats the TB in the *repK* earliest consecutive transmission occasion candidates within the same configuration.

- If *AvailableSlotCounting* is enabled, and in case of reduced capability half-duplex UE, the UE shall repeat the TB across the slots applying the same symbol allocation in each slot. A slot is not counted in the number of slots if at least one of the symbols indicated by the indexed row of the used resource allocation table in the slot does not start or end at least or , respectively, from the last or first symbol of an SS/PBCH block with index provided by *ssb-PositionsInBurst*.

A Type 1 or Type 2 PUSCH transmission with a configured grant in a slot is omitted according to the conditions in Clause 9, Clause 11.1, Clause 11.2A and Clause 17.2 of [6, TS 38.213].

6.1.2.3.3 Transport Block repetition for uplink transmissions of TB processing over multiple slots with a configured grant

**<Unchanged text is omitted>**

For paired spectrum and SUL band:

- The UE determines consecutive slots for a PUSCH transmission of TB processing over multiple slots with a Type 2 configured grant activated by DCI format 0\_1 or 0\_2, based on the TDRA information field value in the DCI format 0\_1 or 0\_2.

- For the case of a reduced capability half-duplex UE, the UE determines slots for a PUSCH transmission of TB processing over multiple slots with a Type 2 configured grant activated by DCI format 0\_1 or 0\_2, based on the TDRA information field value in the DCI format 0\_1 or 0\_2. A slot is not counted in the number of slots if at least one of the symbols indicated by the indexed row of the used resource allocation table in the slot does not start or end at least or , respectively, from the last or first symbol of an SS/PBCH block with index provided by *ssb-PositionsInBurst*.

For Type 2 PUSCH transmission with a configured grant of TB processing over multiple slots*,* the UE shall transmit the TB across the slots determined for the PUSCH transmission applying the same symbol allocation in each slot. A Type 2 PUSCH transmission with a configured grant of TB processing over multiple slots is omitted in a slot according to the conditions in clause 9, clause 11.1, clause 11.2A, and clause 17.2 of [6, TS 38.213].