**3GPP TSG-RAN WG2 Meeting #109bis-eR2-200xxxx**

**Electronic meeting, Apr 20th – 30th, 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **36.302** | **CR** | **1208** | **rev** | **1** | **Current version:** | **15.2.0** |  |
|  |
| *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)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network |  |

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|  |
| ***Title:***  | Adding Reception Type for uplink HARQ ACK feedback for Rel-15 eMTC |
|  |  |
| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | LTE\_eMTC4-Core |  |  | 2020-04-27 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-15 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
|  |  |
| ***Reason for change:*** | In Rel-15 eMTC, uplink HARQ ACK feedback is introduced for power saving e.g. early termination of MPDCCH monitoring and/or ealry termination of ongoing PUSCH transmission. In RAN1#92bis meeting, DCI format 6-0A/B for CE mode A/B were agreed to be used to explicitly indicate the uplink HARQ ACK feedback. In current TS 36.212, it is specified that* *If the Resource block assignment in format 6-0A is set to all ones, format 6-0A is used for the indication of ACK feedback, and all the remaining bits except Flag format 6-0A/format 6-1A differentiation and DCI subframe repetition number are set zero.*
* *If the Modulation and coding scheme in format 6-0B is 4 bits and set to all ones, format 6-0B is used for the indication of ACK feedback, and all the remaining bits except Flag for format 6-0B/format 6-1B differentiation and DCI subframe repetition number are set to zero.*

That means the MPDCCH is only used for uplink HARQ ACK feedback and there is no subsequent PUSCH or PDSCH transmission. However, in current TS 36.302, the Reception Type “I” and “J” with MPDCCH for C-RNTI/SPS C-RNTI are all associated with shared channel, i.e. UL-SCH and DL-SCH, which is incorrect for uplink HARQ ACK feedback. |
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| ***Summary of change:*** | In section 8.2, add a new Reception Type “B1” with MPDCCH for C-RNTI unassociated with any shared channel.**Impact analysis**Impacted functionality:Uplink HARQ ACK feedbackInter-operability: If the network implements this CR but the UE does not, then the UE supporting uplink HARQ ACK feedback may expect a shared channel e.g. UL-SCH or DL-SCH when receiving a MPDCCH for C-RNTI..If the UE implements this CR but the network does not, then there is no interoperability issue. |
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| ***Consequences if not approved:*** | The UE supporting uplink HARQ ACK feedback may expect a shared channel e.g. UL-SCH or DL-SCH when receiving a MPDCCH for C-RNTI. |
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| ***Clauses affected:*** | 8.2 |
|  |  |
|  | **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:*** |  |

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| ***This CR's revision history:*** |  |

First Change

8.2 Downlink

The tables describe the possible combinations of physical channels that can be received in parallel in the downlink in the same subframe by one UE. In one subframe, the UE shall be able to receive all TBs according to the indication on PDCCH. Tables 8.2-1, 8.2-1a, 8.2-2 and 8.2-2a are applicable to LTE; Tables 8.2-1b and 8.2-2b are applicable to NB-IoT.

<Omitted>

**Table 8.2-1a: Downlink "Reception Types" for BL UEs and UEs in enhanced coverage**

|  |  |  |  |
| --- | --- | --- | --- |
| **"Reception Type"** | **Physical Channel(s)** | **MonitoredRNTI** | **AssociatedTransport Channel** |
| A | PBCH | N/A | BCH |
| B | MPDCCH (Note 1) | C-RNTI | N/A |
| B1 | MPDCCH (Note y) | C-RNTI | N/A |
| C | MPDCCH | TPC-PUCCH-RNTI | N/A |
| D | MPDCCH | TPC-PUSCH-RNTI | N/A |
| D1 | MPDCCH (Note 7) | SC-RNTI | DL-SCH |
| G-RNTI | DL-SCH |
| E | MPDCCH | Semi-Persistent Scheduling C-RNTI (Note 2) | N/A |
| F | MPDCCH | Semi-Persistent Scheduling C-RNTI (Note 3) | N/A |
| G | MPDCCH (Note 4) | RA-RNTI | DL-SCH |
| Temporary C-RNTI  | UL-SCH |
| Temporary C-RNTI  | DL-SCH |
| P-RNTI | PCH |
| H | PDSCH (Note 5) | SI-RNTI | DL-SCH |
| P-RNTI | PCH  |
| Temporary C-RNTI  | DL-SCH |
| RA-RNTI | DL-SCH |
| H1 | PDSCH (Note 7) | SC-RNTI | DL-SCH |
| G-RNTI | DL-SCH |
| I | MPDCCH | Temporary C-RNTI (Note 6) | UL-SCH |
| C-RNTI and Semi-Persistent Scheduling C-RNTI | UL-SCH |
| J | MPDCCH | C-RNTI and Semi-Persistent Scheduling C-RNTI | DL-SCH |
| K | PDSCH (Note 5) | C-RNTI and Semi-Persistent Scheduling C-RNTI | DL-SCH |
| L | MWUS | N/A | N/A |
| Note 1: MPDCCH is used to convey PDCCH order for Random Access.Note 2: Semi-Persistent Scheduling C-RNTI is used for DL Semi-Persistent Scheduling release.Note 3: Semi-Persistent Scheduling C-RNTI is used for UL Semi-Persistent Scheduling release.Note 4: RA-RNTI, P-RNTI, and Temporary C-RNTI are not required to be simultaneously monitored.Note 5: All RNTIs listed in the reception type are mutually exclusive.Note 6: Temporary C-RNTI is only applicable during contention-based Random Access procedure.Note 7: SC-RNTI and G-RNTI are not required to be simultaneously monitored.Note y: MPDCCH is used to convey uplink HARQ ACK feedback. |

<Omitted>

**Table 8.2-2a: Downlink "Reception Type" Combinations for BL UEs and UEs in enhanced coverage**

The "Reception Type" used in this table refers to the "Reception Type" in Table 8.2-1a.

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| --- | --- |
|  | **PCell** |
| 1. RRC\_IDLE |
| 1.1 All UEs  | A or G or H |
| 1.2 UEs supporting SC-PTM | A or G or H or (D1 + H1) |
| 1.3 UEs supporting MWUS | A or G or H or L |
| 2. RRC\_CONNECTED |
| 2.1 All UEs | A or ((J or C or E or B) + (I or D or F or B1) + K) or G or H |
| Remarks: The combination for Random Access procedure is only required, related to G and H.Remarks: B1 is only applicable for UEs supporting uplink HARQ ACK feedback. |
| 2.2 UEs supporting FS2 |  A or ((J or C or E or B) + (I or D or F or B1) + I + K) or G or H |
| Remarks: For TDD UL/DL configuration 0, two MPDCCHs can be received in the same subframe for UL-SCH in two different uplink subframes, which is only applicable for UEs configured with CE mode A with no repetitions.Remarks: The combination for Random Access procedure is only required, related to G and H.Remarks: B1 is only applicable for UEs supporting uplink HARQ ACK feedback. |

NOTE: Any subset of the combinations specified in table 8.2-2 and 8.2-2a are also supported.

End of changes