**3GPP TSG-RAN WG4 #98-e R4-21xxxxx**

Electronic Meeting, Jan. 25h – Feb. 5th, 2021

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| *CR-Form-v11.2* |
| **Draft CHANGE REQUEST** |
|  |
|  | **TS38.101-1** | **CR** | **0602** | **rev** | **1** | **Current version:** | **15.12.0** |  |
|  |
| *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:***  | IBE requirement for almost contiguous allocations |
|  |  |
| ***Source to WG:*** | Qualcomm Incorporated |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_newRAT-Core |  | ***Date:*** | 2021-01-13 |
|  |  |  |  |  |
| ***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)* |
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| ***Reason for change:*** | Missing IBE mask for almost contiguous allocations. There are no in-gap IBE requirements |
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| ***Summary of change:*** | Apply IBE mask to each of the contiguously allocated RB groups and use the sum of the masks of the contiguously allocated RB groups in any unallocated region. The general term is then approximated as a constant. There is no change to the flooring term or the term that is a function of the transmission BW. The IBE requirement outside of the gaps use the same definition of contigyuous RB allocations with a modified transmission BW to include the gaps. |
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| ***Consequences if not approved:*** | There is no limitation of In band emissions in the gaps of PUSCH allocations within a CC. Other UE could experience degradation due to unwanted emissions in the gap locations. |
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| ***Clauses affected:*** | 6.4.2.3  |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  |  |
| ***affected:*** | **x** |  |  Test specifications | 38.521-1 |
| ***(show related CRs)*** |  | **X** |  O&M Specifications |   |
|  |  |
| ***Other comments:*** |  |

< start of changes >

#### 6.4.2.3 In-band emissions

The in-band emission is defined as the average emission across 12 sub-carriers and as a function of the RB offset from the edge of the allocated UL transmission bandwidth. The in-band emission is measured as the ratio of the UE output power in a non–allocated RB to the UE output power in an allocated RB.

The basic in-band emissions measurement interval is defined over one slot in the time domain; however, the minimum requirement applies when the in-band emission measurement is averaged over 10 sub-frames. When the PUSCH or PUCCH transmission slot is shortened due to multiplexing with SRS, the in-band emissions measurement interval is reduced by one or more symbols, accordingly.

The average of the basic in-band emission measurement over 10 sub-frames shall not exceed the values specified in Table 6.4.2.3-1.

Table 6.4.2.3-1: Requirements for in-band emissions

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| --- | --- | --- | --- |
| Parameter description | Unit | Limit (NOTE 1) | Applicable Frequencies |
| General | dB |  | Any non-allocated,excluding gaps (NOTES 2, 11) |
|  | In allocation gaps (NOTES 2, 12) |
| IQ Image | dB | -28 | Image frequencies when output power > 10 dBm | Image frequencies (NOTES 2, 3) |
| -25 | Image frequencies when output power ≤ 10 dBm |
| Carrier leakage | dBc | -28 | Output power > 10 dBm  | Carrier leakage frequency (NOTES 4, 5) |
| -25 | 0 dBm ≤ Output power ≤ 10 dBm |
| -20 | -30 dBm ≤ Output power < 0 dBm |
| -10 | -40 dBm ≤ Output power < -30 dBm |
| NOTE 1: An in-band emissions combined limit is evaluated in each non-allocated RB. For each such RB, the minimum requirement is calculated as the higher of - 30 dB and the power sum of all limit values (General, IQ Image or Carrier leakage) that apply. is defined in NOTE 10.NOTE 2: The measurement bandwidth is 1 RB and the limit is expressed as a ratio of measured power in one non-allocated RB to the measured average power per allocated RB, where the averaging is done across all allocated RBs. For pi/2 BPSK with Spectrum Shaping, the limit is expressed as a ratio of measured power in one non-allocated RB to the measured power in the allocated RB with highest PSD.NOTE 3: The applicable frequencies for this limit are those that are enclosed in the reflection of the allocated bandwidth, based on symmetry with respect to the carrier leakage frequency, but excluding any allocated RBs.NOTE 4: The measurement bandwidth is 1 RB and the limit is expressed as a ratio of measured power in one non-allocated RB to the measured total power in all allocated RBs.NOTE 5: The applicable frequencies for this limit depend on the parameter *txDirectCurrentLocation* in *UplinkTxDirectCurrent* IE, and are those that are enclosed either in the RB containing the carrier leakage frequency, or in the two RBs immediately adjacent to the carrier leakage frequency but excluding any allocated RB.NOTE 6: For contiguous allocations, *LCRB* is the Transmission Bandwidth (see clause 5.3). For almost contiguous allocations defined in sub-clause 6.2.2, *LCRB* is the transmission bandwidth including the gaps: *LCRB =* NRB\_alloc + NRB\_gap.NOTE 7: *NRB* is the Transmission Bandwidth Configuration (see clause 5.3).NOTE 8: *EVM* is the limit specified in Table 6.4.2.1-1 for the modulation format used in the allocated RBs.NOTE 9:  is the starting frequency offset between the allocated RB and the measured non-allocated RB (e.g. *∆RB*= 1 or *∆RB*= -1 for the first adjacent RB outside of the allocated bandwidth.NOTE 10:  is an average of the transmitted power over 10 sub-frames normalized by the number of allocated RBs, measured in dBm.NOTE 11: For contiguous allocations, applies to all unallocated RBs. For almost contiguous allocations, applies to unallocated RBs excluding gap RBs.NOTE 12: Applies to gaps of almost contiguous allocations. |

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