3GPP TSG-RAN WG4 Meeting # 99-e R4-2107744

Electronic Meeting, 19 – 27 May, 2021

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **38.101-1** | **CR** | **0820** | **rev** | **1** | **Current version:** | **16.7.0** |  |
|  |
| *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:***  | CR for 38.101-1 to correct AMPR value for NR V2X NS\_52 |
|  |  |
| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | 5G\_V2X\_NRSL-Core |  | ***Date:*** | 2021-05-24 |
|  |  |  |  |  |
| ***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)* |
|  |  |
| ***Reason for change:*** | 1) The AMPR values of some RB allocation cases are missing for NS\_33 PSSCH/PSCCH. As RAN1 update the RB allocation rules, the allowed RB allocation can be found as below. {10, 12, 15, 20, 24, 25, 30, 36, 40, 45, 48, 50, 60,70,72, 75,80,84, 90, 96, 100, 105, 108, 110, 120, 130, 132, 135, 140, 144, 150, 156, 160, 165,168,170,175,180,190,192,195,200,204,210, 216}2) The AMPR difference for worst case between NS\_52 and NS\_33 can be observed. It’s proposed to correct the AMPR requirements as 16dB for NS\_52 region 1.3) There is an editorial error in A.7.2. |
|  |  |
| ***Summary of change:*** | 1) The AMPR missing values of some RB allocation cases are added for NS\_33 PSSCH/PSCCH.2) To correct the AMPR requirements as 16dB for NS\_52 region 13) To correct the editorial error in A.7.2. |
|  |  |
| ***Consequences if not approved:*** | Some missing AMPR values are observed. AMPR requirements for NS\_52 region 1 are not enough. |
|  |  |
| ***Clauses affected:*** | 6.2E.3.2, 6.2E.3.3, A.7.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** | **X** |  |  Test specifications | TS 38.521-1  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

## **<<Start of Change1>>**

#### 6.2E.3.2 A-MPR for Power class 3 V2X UE by NS\_33

When NS\_33 is indicated by the network or pre-configured radio parameters for NR V2X UE, the additional maximum output power reduction specified as

 A-MPR = CEIL {MA, 0.5}

Where MA is defined as follows

 MA = A-MPRBase + Gpost connector\* A-MPRStep

CEIL{MA, 0.5} means rounding upwards to closest 0.5dB.

A-MPRBase and A-MPRStep are specified in Tables 6.2E.3-1, 6.2E.3-2 is allowed when network signalling value is provided*.* A-MPRBase is the default A-MPR value when no Gpost connector is declared. The supported post antenna connector gain Gpost connector is declared by the UE following the principle described in annex I in [11]. The A-MPRstep is the increase in A-MPR allowance to allow UE to meet tighter conducted A-SE and A-SEM requirements with higher value of declared Gpost connector.

For the contiguous PSSCH and PSCCH transmission when NS\_33 is indicated by the network or pre-configured radio parameters for NR V2X UE, the NR UE allow the follow A-MPR requirements.

Table 6.2E.3.2-1: A-MPR for PSSCH/PSCCH by NS\_33 (at Fc =5860MHz)

|  |  |  |  |
| --- | --- | --- | --- |
| Carrier frequency [MHz] | Resources Blocks (*L*CRB) | Start ResourceBlock | A-MPRBase (dB) |
|  |  |  | QPSK/16QAM | 64QAM | 256QAM |
| 5860 | ≥ 10 and ≤ 15 | 0 | ≤ 24 |
|  |  | ≥ 1 and ≤ 3 | ≤19 |
|  | ≥ 10 and ≤ 15 | ≥ 26 and ≤ 38 | ≤6 |
|  | ≥ 10 and ≤ 15 | ≥38 | ≤ 7 |
|  | ≥ 10 and ≤ 20 | ≥ 12 and ≤ 14 | ≤11 |
|  |  | ≥ 15 and ≤ 19 | ≤9.5 |
|  |  | ≥ 20 and ≤ 25 | ≤8.0 |
|  | > 15 and < 25 | ≥ 25 | ≤ 8 |
|  | ≥ 10 and < 40 | ≥ 4 and ≤7 | ≤ 16 |
|  |  | ≥ 8 and ≤ 11 | ≤ 13.5 |
|  | ≥ 20 and < 40  | ≥ 0 and ≤ 3 | ≤ 22 |
|  | ≥ 25 and < 40 | ≥ 16 and ≤ 21 | ≤ 9.5 |
|  |  | ≥ 22 and ≤ 27 | ≤ 8.0 |
|  | ≥ 25 and ≤ 40 | ≥ 12 and ≤ 15 | ≤ 12 |
|  | ≥ 40 and ≤ 45 | 0 and 1 | ≤ 19 |
|  |  | ≥ 2 and ≤ 5 | ≤ 16 |
|  |  | ≥ 6 and ≤ 11 | ≤ 13.5 |
|  | >45 | ≥ 0 | ≤ 16 |
| NOTE 1: A-MPRstep =1.2 dB is applied for RBstart 0 and 1 and A-MPRstep =0.7 dB is applied for all other RBstartNOTE 2: Applicable for Channel Bandwidth = 10 MHz |

Table 6.2E.3.2-2: A-MPR for PSSCH/PSCCH by NS\_33 (at other carrier frequency)

|  |  |  |  |
| --- | --- | --- | --- |
| Carrier frequency [MHz] | RB allocations | A-MPRBase (dB) | A-MPRstep (dB) |
|  |  | QPSK | 16QAM | 64QAM | 256QAM |
| 5870, 5880, 5890, 5900, 5910, 5920 | Inner | ≤ 3.0 | ≤ 5.0 | ≤ 6.0 | 0.5 |
|  | Outer | ≤ 4.5 |  |  |  |
| NOTE 1: Inner and Outer RB allocations are defined in clause 6.2E.2.1NOTE 2: Applicable for Channel Bandwidth = 10 MHz |

For the simultaneous PSFCH transmission when NS\_33 is indicated by the network or pre-configured radio parameters for NR V2X UE, the NR UE allow the follow A-MPR requirements

Table 6.2E.3.2-3: A-MPR for simultaneous PSFCH by NS\_33

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Channel Bandwidth[MHz] | Center Frequency[MHz] | RB allocation | A-MPRBase (dB) | A-MPRstep (dB) |
|  |  |  | 0 ≤ NGap / NRB < 0.15 | 0.15≤ NGap / NRB < 0.3 | 0.3≤ NGap / NRB ≤ 1 |  |
| 10 | 5860 | NRB =1 | 19.0 | 1.0 |
|  | NRB > 1 | 22.0 |  |
|  | 5870, 5880, 5890, 5900, 5910, 5920 | NRB =1 | 5 | 0.8 |
| NRB > 1 | 14 | 7 | 18.5 |  |
| Note 1: NGap is the gap RB amount between RBstart and RBend for contiguous and non-contiguous allocation simultaneous PSFCH transmission. (NGap = RBend - RBstart) |

For the S-SSB transmission when NS\_33 is indicated by the network or pre-configured radio parameters for NR V2X UE, the NR UE allow the follow A-MPR requirements.

Table 6.2E.3.2-4: A-MPR for S-SSB transmission by NS\_33

|  |  |  |  |
| --- | --- | --- | --- |
| Carrier Frequency (MHz) | RBStart \* 12\*SCS[MHz] | A-MPRBase (dB) | AMPRStep (dB) |
| 5860 | ≤1.0 | ≤ 25 | 0.6 |
|  | >1.0 and ≤2.0 | ≤ 19 |  |
|  | >2.0 and ≤3.24 | ≤ 12 |  |
|  | >3.24 and ≤3.6 | ≤ 10 |  |
|  | >3.6 | ≤ 9 |  |
| 5870, 5880, 5890, 5900, 5910, 5920 | ≤1.0 | ≤ 7.0 | 0.85 |
|  | >1.0 and ≤1.6 | ≤ 6.5 |  |
|  | >1.6 and ≤2.6 | ≤ 5.8 |  |
|  | >2.6 and ≤3.24 | ≤ 4.5 |  |
|  | >3.24 and ≤4.32 | ≤ 5.5 |  |
|  | >4.32 | ≤ 6.5 |  |

## **<<End of Change1>>**

## **<<Start of Change2>>**

#### 6.2E.3.3 A-MPR for Power class 3 V2X UE by NS\_52

When NS\_52 is indicated by the network or pre-configured radio parameters for NR V2X UE, the additional maximum output power reduction specified as

A-MPR = CEIL {MA, 0.5}

Where MA is defined as follows

 MA = A-MPR

CEIL{MA, 0.5} means rounding upwards to closest 0.5dB.

For the contiguous PSSCH and PSCCH transmission when NS\_52 is indicated by the network or pre-configured radio parameters for NR V2X UE, the NR UE allow the follow A-MPR requirements.

Table 6.2E.3.3-1: A-MPR for PSSCH/PSCCH by NS\_52

|  |  |  |
| --- | --- | --- |
| Carrier frequency(MHz) | Modulation | A-MPR(dB) |
|  |  | Region 1 | Region 2 | Region 3 |
| 5885 | QPSK | ≤ 15 | ≤ 8.0 | ≤ 5.5 |
|  | 16QAM |  | ≤ 8.0 | ≤ 5.5 |
|  | 64QAM |  | ≤ 8.5 | ≤ 5.5 |
|  | 256QAM |  | ≤ 8.5 | ≤ 6.0 |
| Note1: Void. |

Where the following parameters are defined to specify valid RB allocation ranges for Region1, Region2 and Region3 according to RB allocations:

Table 6.2E.3.3-1a: A-MPR Region definitions for PSSCH/PSCCH by NS\_52

|  |  |  |  |
| --- | --- | --- | --- |
| Channel Bandwidth, MHz | Carrier frequency (MHz) | A-MPR parameters for region definitions | A-MPR |
|  |  | RBstart or RBend | LCRB |  |
| 40 | 5885 | **RBstart** ≤ floor(NRB\*0.2) or **RBend** ≥ NRB - floor(NRB\*0.2) | **LCRB** ≤floor(NRB\*0.2) | Region 1 |
|  |  | The RB allocation is in Region 2 allocation for all other allocations which are not a Region1 or Region3 allocation. | Region 2 |
|  |  | floor(NRB /3.5) ≤ **RBstart** ≤ NRB –floor(NRB /3.5) – LCRB | **LCRB** ≤ceil(NRB/3.5) | Region 3 |

NRB is the maximum number of RBs for a given Channel bandwidth and sub-carrier spacing defined in Table 5.3.2-1 [3].

For the simultaneous PSFCH transmission when NS\_52 is indicated by the network or pre-configured radio parameters for NR V2X UE, the NR UE allow the follow A-MPR requirements

Table 6.2E.3.3-2: A-MPR for simultaneous PSFCH by NS\_52

|  |  |  |
| --- | --- | --- |
| Channel Bandwidth [MHz] | Carrier frequency [MHz] | A-MPR (dB) |
| 40 MHz | 5885 | 23.5 |

For the S-SSB transmission when NS\_52 is indicated by the network or pre-configured radio parameters for NR V2X UE, the NR UE allow the follow A-MPR requirements

Table 6.2E.3.2-3: A-MPR for S-SSB transmission by NS\_52

|  |  |  |
| --- | --- | --- |
| Carrier Frequency [MHz] | RBStart \* 12\*SCS[MHz] | A-MPR (dB) |
| 5885 | ≤ 7 | ≤ 16 |
|  | > 7 and ≤ 12 | ≤ 10.5 |
|  | > 12 and ≤ 19 | ≤ 4.0 |
|  | > 19 and ≤ 25 | ≤ 10.5 |
|  | > 25 | ≤ 16 |

## **<<End of Change2>>**

## **<<Start of Change3>>**

## A.7.2 FRC for V2X receiver requirements for QPSK

For V2X transmission over PC5, Table A.7.2-1, Table A.7.2-2 and Table A.7.2-3 are applicable for measurements on the Receiver Characteristics with the exception of Maximum input level.

Table A.7.2-1: Fixed reference channel for V2X receiver requirements (SCS 15 kHz, QPSK)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Channel bandwidth | MHz | 10 | 20 | 30 | 40 |
| Subcarrier spacing | kHz | 15 | 15 | 15 | 15 |
| Subchannel size |  | 10 | 15 | 10 | 12 |
| Allocated resource blocks |  | 50 | 105 | 160 | 216 |
| MCS Index |  | 4 | 4 | 4 | 4 |
| MCS Table for TBS determination | 64QAM |
| Modulation |  | QPSK | QPSK | QPSK | QPSK |
| Transport Block Size |  | 3624 | 7936 | 12296 | 16896 |
| Transport block CRC | Bits | 16 | 24 | 24 | 24 |
| LDPC base graph |  | 2 | 1 | 1 | 1 |
| Number of Code Blocks per Slot |  | 1 | 1 | 2 | 3 |
| Beta offset for 2nd stage SCI |  | 2.25 | 2.25 | 2.25 | 2.25 |
| $γ$ value when 2nd stage SCI rate match |  | 1 | 1 | 1 | 1 |
| Binary Channel Bits per Slot |  | 12036 | 26556 | 41076 | 55860 |
| Max. Throughput averaged over 100ms | Mbps | 0.3624 | 0.7936 | 1.2296 | 1.6896 |
| NOTE 1: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit).NOTE 2: $γ$ is the number of vacant resource elements in the resource block to which the last coded symbol of the 2nd-stage SCI belongs. |

Table A.7.2-2: Fixed reference channel for V2X receiver requirements (SCS 30 kHz, QPSK)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Channel bandwidth | MHz | 10 | 20 | 30 | 40 |
| Subcarrier spacing | kHz | 30 | 30 | 30 | 30 |
| Subchannel size |  | 12 | 10 | 15 | 15 |
| Allocated resource blocks |  | 24 | 50 | 75 | 105 |
| MCS Index |  | 4 | 4 | 4 | 4 |
| MCS Table for TBS determination | 64QAM |
| Modulation |  | QPSK | QPSK | QPSK | QPSK |
| Transport Block Size |  | 1608 | 3624 | 5632 | 7936 |
| Transport block CRC | Bits | 16 | 16 | 24 | 24 |
| LDPC base graph |  | 2 | 2 | 1 | 1 |
| Number of Code Blocks per Slot |  | 1 | 1 | 1 | 1 |
| Beta offset for 2nd stage SCI |  | 2.25 | 2.25 | 2.25 | 2.25 |
| $γ$ value when 2nd stage SCI rate match |  | 7 | 1 | 1 | 1 |
| Binary Channel Bits per Slot |  | 5160 | 12036 | 18636 | 26556 |
| Max. Throughput averaged over 100ms | Mbps | 0.3216 | 0.7248 | 1.1264 | 1.5872 |
| NOTE 1: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit).NOTE 2: $γ$ is the number of vacant resource elements in the resource block to which the last coded symbol of the 2nd-stage SCI belongs. |

Table A.7.2-3: Fixed reference channel for V2X receiver requirements (SCS 60 kHz, QPSK)

|  |  |  |
| --- | --- | --- |
| Parameter | Unit | Value |
| Channel bandwidth | MHz | 10 | 20 | 30 | 40 |
| Subcarrier spacing | kHz | 60 | 60 | 60 | 60 |
| Subchannel size |  | 10 | 12 | 12 | 10 |
| Allocated resource blocks |  | 10 | 24 | 36 | 50 |
| MCS Index |  | 4 | 4 | 4 | 4 |
| MCS Table for TBS determination | 64QAM |
| Modulation |  | QPSK | QPSK | QPSK | QPSK |
| Transport Block Size |  | 456 | 1608 | 2536 | 3624 |
| Transport block CRC | Bits | 16 | 16 | 16 | 16 |
| LDPC base graph |  | 2 | 2 | 2 | 2 |
| Number of Code Blocks per Slot |  | 1 | 1 | 1 | 1 |
| Beta offset for 2nd stage SCI |  | 2.25 | 2.25 | 2.25 | 2.25 |
| $γ$ value when 2nd stage SCI rate match |  | 7 | 7 | 7 | 1 |
| Binary Channel Bits per Slot |  | 1464 | 5160 | 8328 | 12036 |
| Max. Throughput averaged over 100ms | Mbps | 0.1824 | 0.6432 | 1.0144 | 1.4496 |
| NOTE 1: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit).NOTE 2: $γ$ is the number of vacant resource elements in the resource block to which the last coded symbol of the 2nd-stage SCI belongs. |

## **<<End of Change3>>**