**3GPP TSG-WG1 Meeting #105R1-2104123**

**Elbonia, May 10 – 27, 2021**

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| *CR-Form-v12.0* | | | | | | | | |
| **DRAFT CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.211** | **CR** | xxxx | **rev** | **-** | **Current version:** | **16.5.0** |  |
|  | | | | | | | | |
| *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 | **X** | Core Network |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Alignment of notation | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_unlic-Core, NR\_2step\_RACH-Core, NR\_IAB-Core, NR\_pos-Core, 5G\_V2X\_NRSL-Core | | | | |  | ***Date:*** | | | 2021-05-25 |
|  |  | | | |  | |  | | |  |
| ***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 can be 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:*** | | * At some places the system frame number is incorrectly denoted n\_SFN instead of the correct notation n\_f (the descriptive text was updated some meetings ago buthte table headings were not) * Minor typos in 6.4.1.1.3 (R1-2103495) * Incorrect index variable in the DMRS port mapping (R1-2103991) * Incorrectly named higher-layer parameter for MsgA PUSCH DMRS (R1-2104474) * Incorrect parameter names for *occ-Index* and *occ-Length* | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | * Change to consistent usage of n\_f * Correction of typos * Correcting to * Correcting the higher-layer parameter to *msgA-DMRS-Config* * Correcting the parameter names *occ-Index* and *occ-Length* and clarifying the value range. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | * Inconsistent notation * Typos remain in the specifications * Incorrect index notation in the DMRS port mapping * Inconsistent specifications * Incorrect parameter names | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.3.3.2, 6.4.1.1.1.1, 6.4.1.1.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | This is an update of R1-2104123 to include decisions from RAN1#105e | | | | | | | | |

##### 6.3.2.5.2A Spreading

Spreading shall be applied according to

resulting in a block of complex-valued symbols .

If the higher layer parameter *interlace1* is not configured, and the higher-layer parameter *occ-Length* is configured,

- is given by the higher-layer parameter *occ-Length*;

- is given by Tables 6.3.2.5A-1 and 6.3.2.5A-2 where , the quantity is the index of the orthogonal sequence to use given by the higher-layer parameter *occ-Index*, and is the interlaced resource block number as defined in clause 4.4.4.6 within the interlace given by the higher-layer parameter *Interlace0*.

otherwise and

Table 6.3.2.5A-1: Orthogonal sequences for PUCCH format 2 when .

|  |  |
| --- | --- |
|  |  |
| 0 |  |
| 1 |  |

Table 6.3.2.5A-2: Orthogonal sequences for PUCCH format 2 when .

|  |  |
| --- | --- |
|  |  |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |

##### 6.3.2.6.3 Block-wise spreading

For both PUCCH format 3 and 4, with representing the bandwidth of the PUCCH in terms of resource blocks according to clauses 9.2.3, 9.2.5.1 and 9.2.5.2 of [5, TS 38.213] and shall for non-interlaced mapping fulfil



where  is a set of non-negative integers and . For interlaced mapping, if a single interlace is configured and if two interlaces are configured.

For PUCCH format 3, if interlaced mapping is not configured, no block-wise spreading is applied and



where is given by clauses 9.2.3, 9.2.5.1 and 9.2.5.2 of [5, TS 38.213] and .

For PUCCH format 3 with interlaced mapping and PUCCH format 4, block-wise spreading shall be applied according to

where

- for PUCCH format 3 with interlaced mapping, if a single interlace is configured and , if two interlaces are configured;

- for PUCCH format 4, and is given by the higher-layer parameter occ-Length;

and  is given by Tables 6.3.2.6.3-1 and 6.3.2.6.3-2 for where is the index of the orthogonal sequence to use according to clause 9.2.1 of [5, TS 38.213]. The quantity is given by the higher-layer parameter *occ-Length* if provided, otherwise .

Table 6.3.2.6.3-1: Orthogonal sequences  for PUCCH format 3 with interlaced mapping and PUCCH format 4 when .

|  |  |
| --- | --- |
|  |  |
| 0 |  |
| 1 |  |

Table 6.3.2.6.3-2: Orthogonal sequences  for PUCCH format 3 with interlaced mapping and PUCCH format 4 when .

|  |  |
| --- | --- |
|  |  |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |

#### 6.3.3.2 Mapping to physical resources

The preamble sequence shall be mapped to physical resources according to



where  is an amplitude scaling factor in order to conform to the transmit power specified in [5, TS38.213], and  is the antenna port. Baseband signal generation shall be done according to clause 5.3 using the parameters in Table 6.3.3.1-1 or Table 6.3.3.1-2 with  given by Table 6.3.3.2-1.

Random access preambles can only be transmitted in the time resources obtained from Tables 6.3.3.2-2 to 6.3.3.2-4 and depends on FR1 or FR2 and the spectrum type as defined in [8, TS38.104]. The PRACH configuration index in Tables 6.3.3.2-2 to 6.3.3.2-4 is

- for Table 6.3.3.2-3 given by the higher-layer parameter *prach-ConfigurationIndex,* or by *msgA-PRACH-ConfigurationIndex* if configured; and

- for Tables 6.3.3.2-2 and 6.3.3.2-4 given by the higher-layer parameter *prach-ConfigurationIndex,* or by *msgA-PRACH-ConfigurationIndex* if configured.

For the IAB-MT part of an IAB-node, the following applies:

- if the higher-layer parameter *prach-ConfigurationPeriodScaling-IAB* is configured, the variable used in of Tables 6.3.3.2-2 to 6.3.3.2-4 shall be replaced by , where and is given by the higher-layer parameter *prach-ConfigurationPeriodScaling-IAB* and the IAB-node does not expect to be larger than 64;

- if the higher-layer parameter *prach-ConfigurationFrameOffset-IAB* is configured, the variable used in of Tables 6.3.3.2-2 to 6.3.3.2-4 shall be replaced by where is given by the higher-layer parameter *prach-ConfigurationFrameOffset-IAB*, and ;

- if the higher-layer parameter *prach-ConfigurationSOffset-IAB* is configured, the subframe number from Tables 6.3.3.2-2 to 6.3.3.2-3 and the slot number from Table 6.3.3.2-4 shall be replaced by where is given by the higher-layer parameter *prach-ConfigurationSOffset-IAB*, and is the number of subframes in a frame when using Tables 6.3.3.2-2 to 6.3.3.2-3 and the number of slots in a frame for 60 kHz subcarrier spacing when using in Table 6.3.3.2-4.

Random access preambles can only be transmitted in the frequency resources given by either the higher-layer parameter *msg1-FrequencyStart* or *msgA-RO-FrequencyStart* if configured as described in clause 8.1 of [5 TS 38.213]. The PRACH frequency resources , where equals the higher-layer parameter *msg1-FDM* or *msgA-RO-FDM* if configured, are numbered in increasing order within the initial uplink bandwidth part during initial access, starting from the lowest frequency. Otherwise, are numbered in increasing order within the active uplink bandwidth part, starting from the lowest frequency.

For operation with shared spectrum channel access, for , a UE expects to be provided with higher-layer parameter *msg1-FrequencyStart* or *msgA-RO-FrequencyStart* if configured, and higher-layer parameter *msg1-FDM* or *msgA-RO-FDM* if configured, such that a random access preamble is confined within a single RB set. The UE assumes that the RB set is defined as when the UE is not provided *intraCellGuardBandsPerSCS* for an UL carrier as described in Clause 7 of [6, TS 38.214].

For operation with shared spectrum channel access, for or and Type-2 random access, a UE expects to be provided with higher-layer parameter *msgA-RO-FDM* equals to one.

For the purpose of slot numbering in the tables, the following subcarrier spacing shall be assumed:

- 15 kHz for FR1

- 60 kHz for FR2.

For handover purposes to a target cell in paired or unpaired spectrum where the target cell uses , the UE may assume the absolute value of the time difference between radio frame in the current cell and radio frame in the target cell is less than if the association pattern period in clause 8.1 of [5, TS 38.213] is not equal to 10 ms.

For inter frequency handover purposes where the source cell is either in paired or unpaired spectrum and the target cell is in unpaired spectrum and uses , the UE may assume the absolute value of the time difference between radio frame in the current cell and radio frame in the target cell is less than

Table 6.3.3.2-1: Supported combinations of and , and the corresponding value of .

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | for PRACH | for PUSCH | , allocation expressed in number of RBs for PUSCH |  |
| 839 | 1.25 | 15 | 6 | 7 |
| 839 | 1.25 | 30 | 3 | 1 |
| 839 | 1.25 | 60 | 2 | 133 |
| 839 | 5 | 15 | 24 | 12 |
| 839 | 5 | 30 | 12 | 10 |
| 839 | 5 | 60 | 6 | 7 |
| 139 | 15 | 15 | 12 | 2 |
| 139 | 15 | 30 | 6 | 2 |
| 139 | 15 | 60 | 3 | 2 |
| 139 | 30 | 15 | 24 | 2 |
| 139 | 30 | 30 | 12 | 2 |
| 139 | 30 | 60 | 6 | 2 |
| 139 | 60 | 60 | 12 | 2 |
| 139 | 60 | 120 | 6 | 2 |
| 139 | 120 | 60 | 24 | 2 |
| 139 | 120 | 120 | 12 | 2 |
| 571 | 30 | 15 | 96 | 2 |
| 571 | 30 | 30 | 48 | 2 |
| 571 | 30 | 60 | 24 | 2 |
| 1151 | 15 | 15 | 96 | 1 |
| 1151 | 15 | 30 | 48 | 1 |
| 1151 | 15 | 60 | 24 | 1 |

Table 6.3.3.2-2: Random access configurations for FR1 and paired spectrum/supplementary uplink.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PRACH Configuration  Index | Preamble format |  | | Subframe number | Starting symbol | Number of PRACH slots within a subframe | , number of time-domain PRACH occasions within a PRACH slot | , PRACH duration |
|  |  |
| 0 | 0 | 16 | 1 | 1 | 0 | - | - | 0 |
| 1 | 0 | 16 | 1 | 4 | 0 | - | - | 0 |
| 2 | 0 | 16 | 1 | 7 | 0 | - | - | 0 |
| 3 | 0 | 16 | 1 | 9 | 0 | - | - | 0 |
| 4 | 0 | 8 | 1 | 1 | 0 | - | - | 0 |
| 5 | 0 | 8 | 1 | 4 | 0 | - | - | 0 |
| 6 | 0 | 8 | 1 | 7 | 0 | - | - | 0 |
| 7 | 0 | 8 | 1 | 9 | 0 | - | - | 0 |
| 8 | 0 | 4 | 1 | 1 | 0 | - | - | 0 |
| 9 | 0 | 4 | 1 | 4 | 0 | - | - | 0 |
| 10 | 0 | 4 | 1 | 7 | 0 | - | - | 0 |
| 11 | 0 | 4 | 1 | 9 | 0 | - | - | 0 |
| 12 | 0 | 2 | 1 | 1 | 0 | - | - | 0 |
| 13 | 0 | 2 | 1 | 4 | 0 | - | - | 0 |
| 14 | 0 | 2 | 1 | 7 | 0 | - | - | 0 |
| 15 | 0 | 2 | 1 | 9 | 0 | - | - | 0 |
| 16 | 0 | 1 | 0 | 1 | 0 | - | - | 0 |
| 17 | 0 | 1 | 0 | 4 | 0 | - | - | 0 |
| 18 | 0 | 1 | 0 | 7 | 0 | - | - | 0 |
| 19 | 0 | 1 | 0 | 1,6 | 0 | - | - | 0 |
| 20 | 0 | 1 | 0 | 2,7 | 0 | - | - | 0 |
| 21 | 0 | 1 | 0 | 3,8 | 0 | - | - | 0 |
| 22 | 0 | 1 | 0 | 1,4,7 | 0 | - | - | 0 |
| 23 | 0 | 1 | 0 | 2,5,8 | 0 | - | - | 0 |
| 24 | 0 | 1 | 0 | 3, 6, 9 | 0 | - | - | 0 |
| 25 | 0 | 1 | 0 | 0,2,4,6,8 | 0 | - | - | 0 |
| 26 | 0 | 1 | 0 | 1,3,5,7,9 | 0 | - | - | 0 |
| 27 | 0 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 0 | - | - | 0 |
| 28 | 1 | 16 | 1 | 1 | 0 | - | - | 0 |
| 29 | 1 | 16 | 1 | 4 | 0 | - | - | 0 |
| 30 | 1 | 16 | 1 | 7 | 0 | - | - | 0 |
| 31 | 1 | 16 | 1 | 9 | 0 | - | - | 0 |
| 32 | 1 | 8 | 1 | 1 | 0 | - | - | 0 |
| 33 | 1 | 8 | 1 | 4 | 0 | - | - | 0 |
| 34 | 1 | 8 | 1 | 7 | 0 | - | - | 0 |
| 35 | 1 | 8 | 1 | 9 | 0 | - | - | 0 |
| 36 | 1 | 4 | 1 | 1 | 0 | - | - | 0 |
| 37 | 1 | 4 | 1 | 4 | 0 | - | - | 0 |
| 38 | 1 | 4 | 1 | 7 | 0 | - | - | 0 |
| 39 | 1 | 4 | 1 | 9 | 0 | - | - | 0 |
| 40 | 1 | 2 | 1 | 1 | 0 | - | - | 0 |
| 41 | 1 | 2 | 1 | 4 | 0 | - | - | 0 |
| 42 | 1 | 2 | 1 | 7 | 0 | - | - | 0 |
| 43 | 1 | 2 | 1 | 9 | 0 | - | - | 0 |
| 44 | 1 | 1 | 0 | 1 | 0 | - | - | 0 |
| 45 | 1 | 1 | 0 | 4 | 0 | - | - | 0 |
| 46 | 1 | 1 | 0 | 7 | 0 | - | - | 0 |
| 47 | 1 | 1 | 0 | 1,6 | 0 | - | - | 0 |
| 48 | 1 | 1 | 0 | 2,7 | 0 | - | - | 0 |
| 49 | 1 | 1 | 0 | 3,8 | 0 | - | - | 0 |
| 50 | 1 | 1 | 0 | 1,4,7 | 0 | - | - | 0 |
| 51 | 1 | 1 | 0 | 2,5,8 | 0 | - | - | 0 |
| 52 | 1 | 1 | 0 | 3,6,9 | 0 | - | - | 0 |
| 53 | 2 | 16 | 1 | 1 | 0 | - | - | 0 |
| 54 | 2 | 8 | 1 | 1 | 0 | - | - | 0 |
| 55 | 2 | 4 | 0 | 1 | 0 | - | - | 0 |
| 56 | 2 | 2 | 0 | 1 | 0 | - | - | 0 |
| 57 | 2 | 2 | 0 | 5 | 0 | - | - | 0 |
| 58 | 2 | 1 | 0 | 1 | 0 | - | - | 0 |
| 59 | 2 | 1 | 0 | 5 | 0 | - | - | 0 |
| 60 | 3 | 16 | 1 | 1 | 0 | - | - | 0 |
| 61 | 3 | 16 | 1 | 4 | 0 | - | - | 0 |
| 62 | 3 | 16 | 1 | 7 | 0 | - | - | 0 |
| 63 | 3 | 16 | 1 | 9 | 0 | - | - | 0 |
| 64 | 3 | 8 | 1 | 1 | 0 | - | - | 0 |
| 65 | 3 | 8 | 1 | 4 | 0 | - | - | 0 |
| 66 | 3 | 8 | 1 | 7 | 0 | - | - | 0 |
| 67 | 3 | 4 | 1 | 1 | 0 | - | - | 0 |
| 68 | 3 | 4 | 1 | 4 | 0 | - | - | 0 |
| 69 | 3 | 4 | 1 | 7 | 0 | - | - | 0 |
| 70 | 3 | 4 | 1 | 9 | 0 | - | - | 0 |
| 71 | 3 | 2 | 1 | 1 | 0 | - | - | 0 |
| 72 | 3 | 2 | 1 | 4 | 0 | - | - | 0 |
| 73 | 3 | 2 | 1 | 7 | 0 | - | - | 0 |
| 74 | 3 | 2 | 1 | 9 | 0 | - | - | 0 |
| 75 | 3 | 1 | 0 | 1 | 0 | - | - | 0 |
| 76 | 3 | 1 | 0 | 4 | 0 | - | - | 0 |
| 77 | 3 | 1 | 0 | 7 | 0 | - | - | 0 |
| 78 | 3 | 1 | 0 | 1,6 | 0 | - | - | 0 |
| 79 | 3 | 1 | 0 | 2,7 | 0 | - | - | 0 |
| 80 | 3 | 1 | 0 | 3,8 | 0 | - | - | 0 |
| 81 | 3 | 1 | 0 | 1,4,7 | 0 | - | - | 0 |
| 82 | 3 | 1 | 0 | 2,5,8 | 0 | - | - | 0 |
| 83 | 3 | 1 | 0 | 3, 6, 9 | 0 | - | - | 0 |
| 84 | 3 | 1 | 0 | 0,2,4,6,8 | 0 | - | - | 0 |
| 85 | 3 | 1 | 0 | 1,3,5,7,9 | 0 | - | - | 0 |
| 86 | 3 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 0 | - | - | 0 |
| 87 | A1 | 16 | 0 | 4,9 | 0 | 1 | 6 | 2 |
| 88 | A1 | 16 | 1 | 4 | 0 | 2 | 6 | 2 |
| 89 | A1 | 8 | 0 | 4,9 | 0 | 1 | 6 | 2 |
| 90 | A1 | 8 | 1 | 4 | 0 | 2 | 6 | 2 |
| 91 | A1 | 4 | 0 | 4,9 | 0 | 1 | 6 | 2 |
| 92 | A1 | 4 | 1 | 4,9 | 0 | 1 | 6 | 2 |
| 93 | A1 | 4 | 0 | 4 | 0 | 2 | 6 | 2 |
| 94 | A1 | 2 | 0 | 4,9 | 0 | 1 | 6 | 2 |
| 95 | A1 | 2 | 0 | 1 | 0 | 2 | 6 | 2 |
| 96 | A1 | 2 | 0 | 4 | 0 | 2 | 6 | 2 |
| 97 | A1 | 2 | 0 | 7 | 0 | 2 | 6 | 2 |
| 98 | A1 | 1 | 0 | 4 | 0 | 1 | 6 | 2 |
| 99 | A1 | 1 | 0 | 1,6 | 0 | 1 | 6 | 2 |
| 100 | A1 | 1 | 0 | 4,9 | 0 | 1 | 6 | 2 |
| 101 | A1 | 1 | 0 | 1 | 0 | 2 | 6 | 2 |
| 102 | A1 | 1 | 0 | 7 | 0 | 2 | 6 | 2 |
| 103 | A1 | 1 | 0 | 2,7 | 0 | 2 | 6 | 2 |
| 104 | A1 | 1 | 0 | 1,4,7 | 0 | 2 | 6 | 2 |
| 105 | A1 | 1 | 0 | 0,2,4,6,8 | 0 | 2 | 6 | 2 |
| 106 | A1 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 0 | 2 | 6 | 2 |
| 107 | A1 | 1 | 0 | 1,3,5,7,9 | 0 | 2 | 6 | 2 |
| 108 | A1/B1 | 2 | 0 | 4,9 | 0 | 1 | 7 | 2 |
| 109 | A1/B1 | 2 | 0 | 4 | 0 | 2 | 7 | 2 |
| 110 | A1/B1 | 1 | 0 | 4 | 0 | 1 | 7 | 2 |
| 111 | A1/B1 | 1 | 0 | 1,6 | 0 | 1 | 7 | 2 |
| 112 | A1/B1 | 1 | 0 | 4,9 | 0 | 1 | 7 | 2 |
| 113 | A1/B1 | 1 | 0 | 1 | 0 | 2 | 7 | 2 |
| 114 | A1/B1 | 1 | 0 | 7 | 0 | 2 | 7 | 2 |
| 115 | A1/B1 | 1 | 0 | 1,4,7 | 0 | 2 | 7 | 2 |
| 116 | A1/B1 | 1 | 0 | 0,2,4,6,8 | 0 | 2 | 7 | 2 |
| 117 | A2 | 16 | 1 | 2,6,9 | 0 | 1 | 3 | 4 |
| 118 | A2 | 16 | 1 | 4 | 0 | 2 | 3 | 4 |
| 119 | A2 | 8 | 1 | 2,6,9 | 0 | 1 | 3 | 4 |
| 120 | A2 | 8 | 1 | 4 | 0 | 2 | 3 | 4 |
| 121 | A2 | 4 | 0 | 2,6,9 | 0 | 1 | 3 | 4 |
| 122 | A2 | 4 | 0 | 4 | 0 | 2 | 3 | 4 |
| 123 | A2 | 2 | 1 | 2,6,9 | 0 | 1 | 3 | 4 |
| 124 | A2 | 2 | 0 | 1 | 0 | 2 | 3 | 4 |
| 125 | A2 | 2 | 0 | 4 | 0 | 2 | 3 | 4 |
| 126 | A2 | 2 | 0 | 7 | 0 | 2 | 3 | 4 |
| 127 | A2 | 1 | 0 | 4 | 0 | 1 | 3 | 4 |
| 128 | A2 | 1 | 0 | 1,6 | 0 | 1 | 3 | 4 |
| 129 | A2 | 1 | 0 | 4,9 | 0 | 1 | 3 | 4 |
| 130 | A2 | 1 | 0 | 1 | 0 | 2 | 3 | 4 |
| 131 | A2 | 1 | 0 | 7 | 0 | 2 | 3 | 4 |
| 132 | A2 | 1 | 0 | 2,7 | 0 | 2 | 3 | 4 |
| 133 | A2 | 1 | 0 | 1,4,7 | 0 | 2 | 3 | 4 |
| 134 | A2 | 1 | 0 | 0,2,4,6,8 | 0 | 2 | 3 | 4 |
| 135 | A2 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 0 | 2 | 3 | 4 |
| 136 | A2 | 1 | 0 | 1,3,5,7,9 | 0 | 2 | 3 | 4 |
| 137 | A2/B2 | 2 | 1 | 2,6,9 | 0 | 1 | 3 | 4 |
| 138 | A2/B2 | 2 | 0 | 4 | 0 | 2 | 3 | 4 |
| 139 | A2/B2 | 1 | 0 | 4 | 0 | 1 | 3 | 4 |
| 140 | A2/B2 | 1 | 0 | 1,6 | 0 | 1 | 3 | 4 |
| 141 | A2/B2 | 1 | 0 | 4,9 | 0 | 1 | 3 | 4 |
| 142 | A2/B2 | 1 | 0 | 1 | 0 | 2 | 3 | 4 |
| 143 | A2/B2 | 1 | 0 | 7 | 0 | 2 | 3 | 4 |
| 144 | A2/B2 | 1 | 0 | 1,4,7 | 0 | 2 | 3 | 4 |
| 145 | A2/B2 | 1 | 0 | 0,2,4,6,8 | 0 | 2 | 3 | 4 |
| 146 | A2/B2 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 0 | 2 | 3 | 4 |
| 147 | A3 | 16 | 1 | 4,9 | 0 | 1 | 2 | 6 |
| 148 | A3 | 16 | 1 | 4 | 0 | 2 | 2 | 6 |
| 149 | A3 | 8 | 1 | 4,9 | 0 | 1 | 2 | 6 |
| 150 | A3 | 8 | 1 | 4 | 0 | 2 | 2 | 6 |
| 151 | A3 | 4 | 0 | 4,9 | 0 | 1 | 2 | 6 |
| 152 | A3 | 4 | 0 | 4 | 0 | 2 | 2 | 6 |
| 153 | A3 | 2 | 1 | 2,6,9 | 0 | 2 | 2 | 6 |
| 154 | A3 | 2 | 0 | 1 | 0 | 2 | 2 | 6 |
| 155 | A3 | 2 | 0 | 4 | 0 | 2 | 2 | 6 |
| 156 | A3 | 2 | 0 | 7 | 0 | 2 | 2 | 6 |
| 157 | A3 | 1 | 0 | 4 | 0 | 1 | 2 | 6 |
| 158 | A3 | 1 | 0 | 1,6 | 0 | 1 | 2 | 6 |
| 159 | A3 | 1 | 0 | 4,9 | 0 | 1 | 2 | 6 |
| 160 | A3 | 1 | 0 | 1 | 0 | 2 | 2 | 6 |
| 161 | A3 | 1 | 0 | 7 | 0 | 2 | 2 | 6 |
| 162 | A3 | 1 | 0 | 2,7 | 0 | 2 | 2 | 6 |
| 163 | A3 | 1 | 0 | 1,4,7 | 0 | 2 | 2 | 6 |
| 164 | A3 | 1 | 0 | 0,2,4,6,8 | 0 | 2 | 2 | 6 |
| 165 | A3 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 0 | 2 | 2 | 6 |
| 166 | A3 | 1 | 0 | 1,3,5,7,9 | 0 | 2 | 2 | 6 |
| 167 | A3/B3 | 2 | 1 | 2,6,9 | 0 | 2 | 2 | 6 |
| 168 | A3/B3 | 2 | 0 | 4 | 0 | 2 | 2 | 6 |
| 169 | A3/B3 | 1 | 0 | 4 | 0 | 1 | 2 | 6 |
| 170 | A3/B3 | 1 | 0 | 1,6 | 0 | 1 | 2 | 6 |
| 171 | A3/B3 | 1 | 0 | 4,9 | 0 | 1 | 2 | 6 |
| 172 | A3/B3 | 1 | 0 | 1 | 0 | 2 | 2 | 6 |
| 173 | A3/B3 | 1 | 0 | 7 | 0 | 2 | 2 | 6 |
| 174 | A3/B3 | 1 | 0 | 1,4,7 | 0 | 2 | 2 | 6 |
| 175 | A3/B3 | 1 | 0 | 0,2,4,6,8 | 0 | 2 | 2 | 6 |
| 176 | A3/B3 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 0 | 2 | 2 | 6 |
| 177 | B1 | 16 | 0 | 4,9 | 0 | 1 | 7 | 2 |
| 178 | B1 | 16 | 1 | 4 | 0 | 2 | 7 | 2 |
| 179 | B1 | 8 | 0 | 4,9 | 0 | 1 | 7 | 2 |
| 180 | B1 | 8 | 1 | 4 | 0 | 2 | 7 | 2 |
| 181 | B1 | 4 | 0 | 4,9 | 0 | 1 | 7 | 2 |
| 182 | B1 | 4 | 1 | 4,9 | 0 | 1 | 7 | 2 |
| 183 | B1 | 4 | 0 | 4 | 0 | 2 | 7 | 2 |
| 184 | B1 | 2 | 0 | 4,9 | 0 | 1 | 7 | 2 |
| 185 | B1 | 2 | 0 | 1 | 0 | 2 | 7 | 2 |
| 186 | B1 | 2 | 0 | 4 | 0 | 2 | 7 | 2 |
| 187 | B1 | 2 | 0 | 7 | 0 | 2 | 7 | 2 |
| 188 | B1 | 1 | 0 | 4 | 0 | 1 | 7 | 2 |
| 189 | B1 | 1 | 0 | 1,6 | 0 | 1 | 7 | 2 |
| 190 | B1 | 1 | 0 | 4,9 | 0 | 1 | 7 | 2 |
| 191 | B1 | 1 | 0 | 1 | 0 | 2 | 7 | 2 |
| 192 | B1 | 1 | 0 | 7 | 0 | 2 | 7 | 2 |
| 193 | B1 | 1 | 0 | 2,7 | 0 | 2 | 7 | 2 |
| 194 | B1 | 1 | 0 | 1,4,7 | 0 | 2 | 7 | 2 |
| 195 | B1 | 1 | 0 | 0,2,4,6,8 | 0 | 2 | 7 | 2 |
| 196 | B1 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 0 | 2 | 7 | 2 |
| 197 | B1 | 1 | 0 | 1,3,5,7,9 | 0 | 2 | 7 | 2 |
| 198 | B4 | 16 | 0 | 4,9 | 0 | 2 | 1 | 12 |
| 199 | B4 | 16 | 1 | 4 | 0 | 2 | 1 | 12 |
| 200 | B4 | 8 | 0 | 4,9 | 0 | 2 | 1 | 12 |
| 201 | B4 | 8 | 1 | 4 | 0 | 2 | 1 | 12 |
| 202 | B4 | 4 | 0 | 4,9 | 0 | 2 | 1 | 12 |
| 203 | B4 | 4 | 0 | 4 | 0 | 2 | 1 | 12 |
| 204 | B4 | 4 | 1 | 4,9 | 0 | 2 | 1 | 12 |
| 205 | B4 | 2 | 0 | 4,9 | 0 | 2 | 1 | 12 |
| 206 | B4 | 2 | 0 | 1 | 0 | 2 | 1 | 12 |
| 207 | B4 | 2 | 0 | 4 | 0 | 2 | 1 | 12 |
| 208 | B4 | 2 | 0 | 7 | 0 | 2 | 1 | 12 |
| 209 | B4 | 1 | 0 | 1 | 0 | 2 | 1 | 12 |
| 210 | B4 | 1 | 0 | 4 | 0 | 2 | 1 | 12 |
| 211 | B4 | 1 | 0 | 7 | 0 | 2 | 1 | 12 |
| 212 | B4 | 1 | 0 | 1,6 | 0 | 2 | 1 | 12 |
| 213 | B4 | 1 | 0 | 2,7 | 0 | 2 | 1 | 12 |
| 214 | B4 | 1 | 0 | 4,9 | 0 | 2 | 1 | 12 |
| 215 | B4 | 1 | 0 | 1,4,7 | 0 | 2 | 1 | 12 |
| 216 | B4 | 1 | 0 | 0,2,4,6,8 | 0 | 2 | 1 | 12 |
| 217 | B4 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 0 | 2 | 1 | 12 |
| 218 | B4 | 1 | 0 | 1,3,5,7,9 | 0 | 2 | 1 | 12 |
| 219 | C0 | 8 | 1 | 4 | 0 | 2 | 7 | 2 |
| 220 | C0 | 4 | 1 | 4,9 | 0 | 1 | 7 | 2 |
| 221 | C0 | 4 | 0 | 4 | 0 | 2 | 7 | 2 |
| 222 | C0 | 2 | 0 | 4,9 | 0 | 1 | 7 | 2 |
| 223 | C0 | 2 | 0 | 1 | 0 | 2 | 7 | 2 |
| 224 | C0 | 2 | 0 | 4 | 0 | 2 | 7 | 2 |
| 225 | C0 | 2 | 0 | 7 | 0 | 2 | 7 | 2 |
| 226 | C0 | 1 | 0 | 4 | 0 | 1 | 7 | 2 |
| 227 | C0 | 1 | 0 | 1,6 | 0 | 1 | 7 | 2 |
| 228 | C0 | 1 | 0 | 4,9 | 0 | 1 | 7 | 2 |
| 229 | C0 | 1 | 0 | 1 | 0 | 2 | 7 | 2 |
| 230 | C0 | 1 | 0 | 7 | 0 | 2 | 7 | 2 |
| 231 | C0 | 1 | 0 | 2,7 | 0 | 2 | 7 | 2 |
| 232 | C0 | 1 | 0 | 1,4,7 | 0 | 2 | 7 | 2 |
| 233 | C0 | 1 | 0 | 0,2,4,6,8 | 0 | 2 | 7 | 2 |
| 234 | C0 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 0 | 2 | 7 | 2 |
| 235 | C0 | 1 | 0 | 1,3,5,7,9 | 0 | 2 | 7 | 2 |
| 236 | C2 | 16 | 1 | 4,9 | 0 | 1 | 2 | 6 |
| 237 | C2 | 16 | 1 | 4 | 0 | 2 | 2 | 6 |
| 238 | C2 | 8 | 1 | 4,9 | 0 | 1 | 2 | 6 |
| 239 | C2 | 8 | 1 | 4 | 0 | 2 | 2 | 6 |
| 240 | C2 | 4 | 0 | 4,9 | 0 | 1 | 2 | 6 |
| 241 | C2 | 4 | 0 | 4 | 0 | 2 | 2 | 6 |
| 242 | C2 | 2 | 1 | 2,6,9 | 0 | 2 | 2 | 6 |
| 243 | C2 | 2 | 0 | 1 | 0 | 2 | 2 | 6 |
| 244 | C2 | 2 | 0 | 4 | 0 | 2 | 2 | 6 |
| 245 | C2 | 2 | 0 | 7 | 0 | 2 | 2 | 6 |
| 246 | C2 | 1 | 0 | 4 | 0 | 1 | 2 | 6 |
| 247 | C2 | 1 | 0 | 1,6 | 0 | 1 | 2 | 6 |
| 248 | C2 | 1 | 0 | 4,9 | 0 | 1 | 2 | 6 |
| 249 | C2 | 1 | 0 | 1 | 0 | 2 | 2 | 6 |
| 250 | C2 | 1 | 0 | 7 | 0 | 2 | 2 | 6 |
| 251 | C2 | 1 | 0 | 2,7 | 0 | 2 | 2 | 6 |
| 252 | C2 | 1 | 0 | 1,4,7 | 0 | 2 | 2 | 6 |
| 253 | C2 | 1 | 0 | 0,2,4,6,8 | 0 | 2 | 2 | 6 |
| 254 | C2 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 0 | 2 | 2 | 6 |
| 255 | C2 | 1 | 0 | 1,3,5,7,9 | 0 | 2 | 2 | 6 |

Table 6.3.3.2-3: Random access configurations for FR1 and unpaired spectrum.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PRACH Configuration  Index | Preamble format |  | | Subframe number | Starting symbol | Number of PRACH slots within a subframe | , number of time-domain PRACH occasions within a PRACH slot | , PRACH duration |
|  |  |
| 0 | 0 | 16 | 1 | 9 | 0 | - | - | 0 |
| 1 | 0 | 8 | 1 | 9 | 0 | - | - | 0 |
| 2 | 0 | 4 | 1 | 9 | 0 | - | - | 0 |
| 3 | 0 | 2 | 0 | 9 | 0 | - | - | 0 |
| 4 | 0 | 2 | 1 | 9 | 0 | - | - | 0 |
| 5 | 0 | 2 | 0 | 4 | 0 | - | - | 0 |
| 6 | 0 | 2 | 1 | 4 | 0 | - | - | 0 |
| 7 | 0 | 1 | 0 | 9 | 0 | - | - | 0 |
| 8 | 0 | 1 | 0 | 8 | 0 | - | - | 0 |
| 9 | 0 | 1 | 0 | 7 | 0 | - | - | 0 |
| 10 | 0 | 1 | 0 | 6 | 0 | - | - | 0 |
| 11 | 0 | 1 | 0 | 5 | 0 | - | - | 0 |
| 12 | 0 | 1 | 0 | 4 | 0 | - | - | 0 |
| 13 | 0 | 1 | 0 | 3 | 0 | - | - | 0 |
| 14 | 0 | 1 | 0 | 2 | 0 | - | - | 0 |
| 15 | 0 | 1 | 0 | 1,6 | 0 |  |  | 0 |
| 16 | 0 | 1 | 0 | 1,6 | 7 | - | - | 0 |
| 17 | 0 | 1 | 0 | 4,9 | 0 | - | - | 0 |
| 18 | 0 | 1 | 0 | 3,8 | 0 | - | - | 0 |
| 19 | 0 | 1 | 0 | 2,7 | 0 | - | - | 0 |
| 20 | 0 | 1 | 0 | 8,9 | 0 | - | - | 0 |
| 21 | 0 | 1 | 0 | 4,8,9 | 0 | - | - | 0 |
| 22 | 0 | 1 | 0 | 3,4,9 | 0 | - | - | 0 |
| 23 | 0 | 1 | 0 | 7,8,9 | 0 | - | - | 0 |
| 24 | 0 | 1 | 0 | 3,4,8,9 | 0 | - | - | 0 |
| 25 | 0 | 1 | 0 | 6,7,8,9 | 0 | - | - | 0 |
| 26 | 0 | 1 | 0 | 1,4,6,9 | 0 | - | - | 0 |
| 27 | 0 | 1 | 0 | 1,3,5,7,9 | 0 | - | - | 0 |
| 28 | 1 | 16 | 1 | 7 | 0 | - | - | 0 |
| 29 | 1 | 8 | 1 | 7 | 0 | - | - | 0 |
| 30 | 1 | 4 | 1 | 7 | 0 | - | - | 0 |
| 31 | 1 | 2 | 0 | 7 | 0 | - | - | 0 |
| 32 | 1 | 2 | 1 | 7 | 0 | - | - | 0 |
| 33 | 1 | 1 | 0 | 7 | 0 | - | - | 0 |
| 34 | 2 | 16 | 1 | 6 | 0 | - | - | 0 |
| 35 | 2 | 8 | 1 | 6 | 0 | - | - | 0 |
| 36 | 2 | 4 | 1 | 6 | 0 | - | - | 0 |
| 37 | 2 | 2 | 0 | 6 | 7 | - | - | 0 |
| 38 | 2 | 2 | 1 | 6 | 7 | - | - | 0 |
| 39 | 2 | 1 | 0 | 6 | 7 | - | - | 0 |
| 40 | 3 | 16 | 1 | 9 | 0 | - | - | 0 |
| 41 | 3 | 8 | 1 | 9 | 0 | - | - | 0 |
| 42 | 3 | 4 | 1 | 9 | 0 | - | - | 0 |
| 43 | 3 | 2 | 0 | 9 | 0 | - | - | 0 |
| 44 | 3 | 2 | 1 | 9 | 0 | - | - | 0 |
| 45 | 3 | 2 | 0 | 4 | 0 | - | - | 0 |
| 46 | 3 | 2 | 1 | 4 | 0 | - | - | 0 |
| 47 | 3 | 1 | 0 | 9 | 0 | - | - | 0 |
| 48 | 3 | 1 | 0 | 8 | 0 | - | - | 0 |
| 49 | 3 | 1 | 0 | 7 | 0 | - | - | 0 |
| 50 | 3 | 1 | 0 | 6 | 0 | - | - | 0 |
| 51 | 3 | 1 | 0 | 5 | 0 | - | - | 0 |
| 52 | 3 | 1 | 0 | 4 | 0 | - | - | 0 |
| 53 | 3 | 1 | 0 | 3 | 0 | - | - | 0 |
| 54 | 3 | 1 | 0 | 2 | 0 | - | - | 0 |
| 55 | 3 | 1 | 0 | 1,6 | 0 | - | - | 0 |
| 56 | 3 | 1 | 0 | 1,6 | 7 | - | - | 0 |
| 57 | 3 | 1 | 0 | 4,9 | 0 | - | - | 0 |
| 58 | 3 | 1 | 0 | 3,8 | 0 | - | - | 0 |
| 59 | 3 | 1 | 0 | 2,7 | 0 | - | - | 0 |
| 60 | 3 | 1 | 0 | 8,9 | 0 | - | - | 0 |
| 61 | 3 | 1 | 0 | 4,8,9 | 0 | - | - | 0 |
| 62 | 3 | 1 | 0 | 3,4,9 | 0 | - | - | 0 |
| 63 | 3 | 1 | 0 | 7,8,9 | 0 | - | - | 0 |
| 64 | 3 | 1 | 0 | 3,4,8,9 | 0 | - | - | 0 |
| 65 | 3 | 1 | 0 | 1,4,6,9 | 0 | - | - | 0 |
| 66 | 3 | 1 | 0 | 1,3,5,7,9 | 0 | - | - | 0 |
| 67 | A1 | 16 | 1 | 9 | 0 | 2 | 6 | 2 |
| 68 | A1 | 8 | 1 | 9 | 0 | 2 | 6 | 2 |
| 69 | A1 | 4 | 1 | 9 | 0 | 1 | 6 | 2 |
| 70 | A1 | 2 | 1 | 9 | 0 | 1 | 6 | 2 |
| 71 | A1 | 2 | 1 | 4,9 | 7 | 1 | 3 | 2 |
| 72 | A1 | 2 | 1 | 7,9 | 7 | 1 | 3 | 2 |
| 73 | A1 | 2 | 1 | 7,9 | 0 | 1 | 6 | 2 |
| 74 | A1 | 2 | 1 | 8,9 | 0 | 2 | 6 | 2 |
| 75 | A1 | 2 | 1 | 4,9 | 0 | 2 | 6 | 2 |
| 76 | A1 | 2 | 1 | 2,3,4,7,8,9 | 0 | 1 | 6 | 2 |
| 77 | A1 | 1 | 0 | 9 | 0 | 2 | 6 | 2 |
| 78 | A1 | 1 | 0 | 9 | 7 | 1 | 3 | 2 |
| 79 | A1 | 1 | 0 | 9 | 0 | 1 | 6 | 2 |
| 80 | A1 | 1 | 0 | 8,9 | 0 | 2 | 6 | 2 |
| 81 | A1 | 1 | 0 | 4,9 | 0 | 1 | 6 | 2 |
| 82 | A1 | 1 | 0 | 7,9 | 7 | 1 | 3 | 2 |
| 83 | A1 | 1 | 0 | 3,4,8,9 | 0 | 1 | 6 | 2 |
| 84 | A1 | 1 | 0 | 3,4,8,9 | 0 | 2 | 6 | 2 |
| 85 | A1 | 1 | 0 | 1,3,5,7,9 | 0 | 1 | 6 | 2 |
| 86 | A1 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 7 | 1 | 3 | 2 |
| 87 | A2 | 16 | 1 | 9 | 0 | 2 | 3 | 4 |
| 88 | A2 | 8 | 1 | 9 | 0 | 2 | 3 | 4 |
| 89 | A2 | 4 | 1 | 9 | 0 | 1 | 3 | 4 |
| 90 | A2 | 2 | 1 | 7,9 | 0 | 1 | 3 | 4 |
| 91 | A2 | 2 | 1 | 8,9 | 0 | 2 | 3 | 4 |
| 92 | A2 | 2 | 1 | 7,9 | 9 | 1 | 1 | 4 |
| 93 | A2 | 2 | 1 | 4,9 | 9 | 1 | 1 | 4 |
| 94 | A2 | 2 | 1 | 4,9 | 0 | 2 | 3 | 4 |
| 95 | A2 | 2 | 1 | 2,3,4,7,8,9 | 0 | 1 | 3 | 4 |
| 96 | A2 | 1 | 0 | 2 | 0 | 1 | 3 | 4 |
| 97 | A2 | 1 | 0 | 7 | 0 | 1 | 3 | 4 |
| 98 | A2 | 2 | 1 | 9 | 0 | 1 | 3 | 4 |
| 99 | A2 | 1 | 0 | 9 | 0 | 2 | 3 | 4 |
| 100 | A2 | 1 | 0 | 9 | 9 | 1 | 1 | 4 |
| 101 | A2 | 1 | 0 | 9 | 0 | 1 | 3 | 4 |
| 102 | A2 | 1 | 0 | 2,7 | 0 | 1 | 3 | 4 |
| 103 | A2 | 1 | 0 | 8,9 | 0 | 2 | 3 | 4 |
| 104 | A2 | 1 | 0 | 4,9 | 0 | 1 | 3 | 4 |
| 105 | A2 | 1 | 0 | 7,9 | 9 | 1 | 1 | 4 |
| 106 | A2 | 1 | 0 | 3,4,8,9 | 0 | 1 | 3 | 4 |
| 107 | A2 | 1 | 0 | 3,4,8,9 | 0 | 2 | 3 | 4 |
| 108 | A2 | 1 | 0 | 1,3,5,7,9 | 0 | 1 | 3 | 4 |
| 109 | A2 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 9 | 1 | 1 | 4 |
| 110 | A3 | 16 | 1 | 9 | 0 | 2 | 2 | 6 |
| 111 | A3 | 8 | 1 | 9 | 0 | 2 | 2 | 6 |
| 112 | A3 | 4 | 1 | 9 | 0 | 1 | 2 | 6 |
| 113 | A3 | 2 | 1 | 4,9 | 7 | 1 | 1 | 6 |
| 114 | A3 | 2 | 1 | 7,9 | 7 | 1 | 1 | 6 |
| 115 | A3 | 2 | 1 | 7,9 | 0 | 1 | 2 | 6 |
| 116 | A3 | 2 | 1 | 4,9 | 0 | 2 | 2 | 6 |
| 117 | A3 | 2 | 1 | 8,9 | 0 | 2 | 2 | 6 |
| 118 | A3 | 2 | 1 | 2,3,4,7,8,9 | 0 | 1 | 2 | 6 |
| 119 | A3 | 1 | 0 | 2 | 0 | 1 | 2 | 6 |
| 120 | A3 | 1 | 0 | 7 | 0 | 1 | 2 | 6 |
| 121 | A3 | 2 | 1 | 9 | 0 | 1 | 2 | 6 |
| 122 | A3 | 1 | 0 | 9 | 0 | 2 | 2 | 6 |
| 123 | A3 | 1 | 0 | 9 | 7 | 1 | 1 | 6 |
| 124 | A3 | 1 | 0 | 9 | 0 | 1 | 2 | 6 |
| 125 | A3 | 1 | 0 | 2,7 | 0 | 1 | 2 | 6 |
| 126 | A3 | 1 | 0 | 8,9 | 0 | 2 | 2 | 6 |
| 127 | A3 | 1 | 0 | 4,9 | 0 | 1 | 2 | 6 |
| 128 | A3 | 1 | 0 | 7,9 | 7 | 1 | 1 | 6 |
| 129 | A3 | 1 | 0 | 3,4,8,9 | 0 | 1 | 2 | 6 |
| 130 | A3 | 1 | 0 | 3,4,8,9 | 0 | 2 | 2 | 6 |
| 131 | A3 | 1 | 0 | 1,3,5,7,9 | 0 | 1 | 2 | 6 |
| 132 | A3 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 7 | 1 | 1 | 6 |
| 133 | B1 | 4 | 1 | 9 | 2 | 1 | 6 | 2 |
| 134 | B1 | 2 | 1 | 9 | 2 | 1 | 6 | 2 |
| 135 | B1 | 2 | 1 | 7,9 | 2 | 1 | 6 | 2 |
| 136 | B1 | 2 | 1 | 4,9 | 8 | 1 | 3 | 2 |
| 137 | B1 | 2 | 1 | 4,9 | 2 | 2 | 6 | 2 |
| 138 | B1 | 1 | 0 | 9 | 2 | 2 | 6 | 2 |
| 139 | B1 | 1 | 0 | 9 | 8 | 1 | 3 | 2 |
| 140 | B1 | 1 | 0 | 9 | 2 | 1 | 6 | 2 |
| 141 | B1 | 1 | 0 | 8,9 | 2 | 2 | 6 | 2 |
| 142 | B1 | 1 | 0 | 4,9 | 2 | 1 | 6 | 2 |
| 143 | B1 | 1 | 0 | 7,9 | 8 | 1 | 3 | 2 |
| 144 | B1 | 1 | 0 | 1,3,5,7,9 | 2 | 1 | 6 | 2 |
| 145 | B4 | 16 | 1 | 9 | 0 | 2 | 1 | 12 |
| 146 | B4 | 8 | 1 | 9 | 0 | 2 | 1 | 12 |
| 147 | B4 | 4 | 1 | 9 | 2 | 1 | 1 | 12 |
| 148 | B4 | 2 | 1 | 9 | 0 | 1 | 1 | 12 |
| 149 | B4 | 2 | 1 | 9 | 2 | 1 | 1 | 12 |
| 150 | B4 | 2 | 1 | 7,9 | 2 | 1 | 1 | 12 |
| 151 | B4 | 2 | 1 | 4,9 | 2 | 1 | 1 | 12 |
| 152 | B4 | 2 | 1 | 4,9 | 0 | 2 | 1 | 12 |
| 153 | B4 | 2 | 1 | 8,9 | 0 | 2 | 1 | 12 |
| 154 | B4 | 2 | 1 | 2,3,4,7,8,9 | 0 | 1 | 1 | 12 |
| 155 | B4 | 1 | 0 | 1 | 0 | 1 | 1 | 12 |
| 156 | B4 | 1 | 0 | 2 | 0 | 1 | 1 | 12 |
| 157 | B4 | 1 | 0 | 4 | 0 | 1 | 1 | 12 |
| 158 | B4 | 1 | 0 | 7 | 0 | 1 | 1 | 12 |
| 159 | B4 | 1 | 0 | 9 | 0 | 1 | 1 | 12 |
| 160 | B4 | 1 | 0 | 9 | 2 | 1 | 1 | 12 |
| 161 | B4 | 1 | 0 | 9 | 0 | 2 | 1 | 12 |
| 162 | B4 | 1 | 0 | 4,9 | 2 | 1 | 1 | 12 |
| 163 | B4 | 1 | 0 | 7,9 | 2 | 1 | 1 | 12 |
| 164 | B4 | 1 | 0 | 8,9 | 0 | 2 | 1 | 12 |
| 165 | B4 | 1 | 0 | 3,4,8,9 | 2 | 1 | 1 | 12 |
| 166 | B4 | 1 | 0 | 1,3,5,7,9 | 2 | 1 | 1 | 12 |
| 167 | B4 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 0 | 2 | 1 | 12 |
| 168 | B4 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 2 | 1 | 1 | 12 |
| 169 | C0 | 16 | 1 | 9 | 2 | 2 | 6 | 2 |
| 170 | C0 | 8 | 1 | 9 | 2 | 2 | 6 | 2 |
| 171 | C0 | 4 | 1 | 9 | 2 | 1 | 6 | 2 |
| 172 | C0 | 2 | 1 | 9 | 2 | 1 | 6 | 2 |
| 173 | C0 | 2 | 1 | 8,9 | 2 | 2 | 6 | 2 |
| 174 | C0 | 2 | 1 | 7,9 | 2 | 1 | 6 | 2 |
| 175 | C0 | 2 | 1 | 7,9 | 8 | 1 | 3 | 2 |
| 176 | C0 | 2 | 1 | 4,9 | 8 | 1 | 3 | 2 |
| 177 | C0 | 2 | 1 | 4,9 | 2 | 2 | 6 | 2 |
| 178 | C0 | 2 | 1 | 2,3,4,7,8,9 | 2 | 1 | 6 | 2 |
| 179 | C0 | 1 | 0 | 9 | 2 | 2 | 6 | 2 |
| 180 | C0 | 1 | 0 | 9 | 8 | 1 | 3 | 2 |
| 181 | C0 | 1 | 0 | 9 | 2 | 1 | 6 | 2 |
| 182 | C0 | 1 | 0 | 8,9 | 2 | 2 | 6 | 2 |
| 183 | C0 | 1 | 0 | 4,9 | 2 | 1 | 6 | 2 |
| 184 | C0 | 1 | 0 | 7,9 | 8 | 1 | 3 | 2 |
| 185 | C0 | 1 | 0 | 3,4,8,9 | 2 | 1 | 6 | 2 |
| 186 | C0 | 1 | 0 | 3,4,8,9 | 2 | 2 | 6 | 2 |
| 187 | C0 | 1 | 0 | 1,3,5,7,9 | 2 | 1 | 6 | 2 |
| 188 | C0 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 8 | 1 | 3 | 2 |
| 189 | C2 | 16 | 1 | 9 | 2 | 2 | 2 | 6 |
| 190 | C2 | 8 | 1 | 9 | 2 | 2 | 2 | 6 |
| 191 | C2 | 4 | 1 | 9 | 2 | 1 | 2 | 6 |
| 192 | C2 | 2 | 1 | 9 | 2 | 1 | 2 | 6 |
| 193 | C2 | 2 | 1 | 8,9 | 2 | 2 | 2 | 6 |
| 194 | C2 | 2 | 1 | 7,9 | 2 | 1 | 2 | 6 |
| 195 | C2 | 2 | 1 | 7,9 | 8 | 1 | 1 | 6 |
| 196 | C2 | 2 | 1 | 4,9 | 8 | 1 | 1 | 6 |
| 197 | C2 | 2 | 1 | 4,9 | 2 | 2 | 2 | 6 |
| 198 | C2 | 2 | 1 | 2,3,4,7,8,9 | 2 | 1 | 2 | 6 |
| 199 | C2 | 8 | 1 | 9 | 8 | 2 | 1 | 6 |
| 200 | C2 | 4 | 1 | 9 | 8 | 1 | 1 | 6 |
| 201 | C2 | 1 | 0 | 9 | 2 | 2 | 2 | 6 |
| 202 | C2 | 1 | 0 | 9 | 8 | 1 | 1 | 6 |
| 203 | C2 | 1 | 0 | 9 | 2 | 1 | 2 | 6 |
| 204 | C2 | 1 | 0 | 8,9 | 2 | 2 | 2 | 6 |
| 205 | C2 | 1 | 0 | 4,9 | 2 | 1 | 2 | 6 |
| 206 | C2 | 1 | 0 | 7,9 | 8 | 1 | 1 | 6 |
| 207 | C2 | 1 | 0 | 3,4,8,9 | 2 | 1 | 2 | 6 |
| 208 | C2 | 1 | 0 | 3,4,8,9 | 2 | 2 | 2 | 6 |
| 209 | C2 | 1 | 0 | 1,3,5,7,9 | 2 | 1 | 2 | 6 |
| 210 | C2 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 8 | 1 | 1 | 6 |
| 211 | A1/B1 | 2 | 1 | 9 | 2 | 1 | 6 | 2 |
| 212 | A1/B1 | 2 | 1 | 4,9 | 8 | 1 | 3 | 2 |
| 213 | A1/B1 | 2 | 1 | 7,9 | 8 | 1 | 3 | 2 |
| 214 | A1/B1 | 2 | 1 | 7,9 | 2 | 1 | 6 | 2 |
| 215 | A1/B1 | 2 | 1 | 4,9 | 2 | 2 | 6 | 2 |
| 216 | A1/B1 | 2 | 1 | 8,9 | 2 | 2 | 6 | 2 |
| 217 | A1/B1 | 1 | 0 | 9 | 2 | 2 | 6 | 2 |
| 218 | A1/B1 | 1 | 0 | 9 | 8 | 1 | 3 | 2 |
| 219 | A1/B1 | 1 | 0 | 9 | 2 | 1 | 6 | 2 |
| 220 | A1/B1 | 1 | 0 | 8,9 | 2 | 2 | 6 | 2 |
| 221 | A1/B1 | 1 | 0 | 4,9 | 2 | 1 | 6 | 2 |
| 222 | A1/B1 | 1 | 0 | 7,9 | 8 | 1 | 3 | 2 |
| 223 | A1/B1 | 1 | 0 | 3,4,8,9 | 2 | 2 | 6 | 2 |
| 224 | A1/B1 | 1 | 0 | 1,3,5,7,9 | 2 | 1 | 6 | 2 |
| 225 | A1/B1 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 8 | 1 | 3 | 2 |
| 226 | A2/B2 | 2 | 1 | 9 | 0 | 1 | 3 | 4 |
| 227 | A2/B2 | 2 | 1 | 4,9 | 6 | 1 | 2 | 4 |
| 228 | A2/B2 | 2 | 1 | 7,9 | 6 | 1 | 2 | 4 |
| 229 | A2/B2 | 2 | 1 | 4,9 | 0 | 2 | 3 | 4 |
| 230 | A2/B2 | 2 | 1 | 8,9 | 0 | 2 | 3 | 4 |
| 231 | A2/B2 | 1 | 0 | 9 | 0 | 2 | 3 | 4 |
| 232 | A2/B2 | 1 | 0 | 9 | 6 | 1 | 2 | 4 |
| 233 | A2/B2 | 1 | 0 | 9 | 0 | 1 | 3 | 4 |
| 234 | A2/B2 | 1 | 0 | 8,9 | 0 | 2 | 3 | 4 |
| 235 | A2/B2 | 1 | 0 | 4,9 | 0 | 1 | 3 | 4 |
| 236 | A2/B2 | 1 | 0 | 7,9 | 6 | 1 | 2 | 4 |
| 237 | A2/B2 | 1 | 0 | 3,4,8,9 | 0 | 1 | 3 | 4 |
| 238 | A2/B2 | 1 | 0 | 3,4,8,9 | 0 | 2 | 3 | 4 |
| 239 | A2/B2 | 1 | 0 | 1,3,5,7,9 | 0 | 1 | 3 | 4 |
| 240 | A2/B2 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 6 | 1 | 2 | 4 |
| 241 | A3/B3 | 2 | 1 | 9 | 0 | 1 | 2 | 6 |
| 242 | A3/B3 | 2 | 1 | 4,9 | 2 | 1 | 2 | 6 |
| 243 | A3/B3 | 2 | 1 | 7,9 | 0 | 1 | 2 | 6 |
| 244 | A3/B3 | 2 | 1 | 7,9 | 2 | 1 | 2 | 6 |
| 245 | A3/B3 | 2 | 1 | 4,9 | 0 | 2 | 2 | 6 |
| 246 | A3/B3 | 2 | 1 | 8,9 | 0 | 2 | 2 | 6 |
| 247 | A3/B3 | 1 | 0 | 9 | 0 | 2 | 2 | 6 |
| 248 | A3/B3 | 1 | 0 | 9 | 2 | 1 | 2 | 6 |
| 249 | A3/B3 | 1 | 0 | 9 | 0 | 1 | 2 | 6 |
| 250 | A3/B3 | 1 | 0 | 8,9 | 0 | 2 | 2 | 6 |
| 251 | A3/B3 | 1 | 0 | 4,9 | 0 | 1 | 2 | 6 |
| 252 | A3/B3 | 1 | 0 | 7,9 | 2 | 1 | 2 | 6 |
| 253 | A3/B3 | 1 | 0 | 3,4,8,9 | 0 | 2 | 2 | 6 |
| 254 | A3/B3 | 1 | 0 | 1,3,5,7,9 | 0 | 1 | 2 | 6 |
| 255 | A3/B3 | 1 | 0 | 0,1,2,3,4,5,6,7,8,9 | 2 | 1 | 2 | 6 |
| 256 | 0 | 16 | 1 | 7 | 0 | - | - | 0 |
| 257 | 0 | 8 | 1 | 7 | 0 | - | - | 0 |
| 258 | 0 | 4 | 1 | 7 | 0 | - | - | 0 |
| 259 | 0 | 2 | 0 | 7 | 0 | - | - | 0 |
| 260 | 0 | 2 | 1 | 7 | 0 | - | - | 0 |
| 261 | 0 | 2 | 0 | 2 | 0 | - | - | 0 |
| 262 | 0 | 2 | 1 | 2 | 0 | - | - | 0 |

Table 6.3.3.2-4: Random access configurations for FR2 and unpaired spectrum.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PRACH Config.  Index | Preamble format |  | | Slot number | Starting symbol | Number of PRACH slots within a 60 kHz slot | , number of time-domain PRACH occasions within a PRACH slot | , PRACH duration |
|  |  |
| 0 | A1 | 16 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 6 | 2 |
| 1 | A1 | 16 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 6 | 2 |
| 2 | A1 | 8 | 1,2 | 9,19,29,39 | 0 | 2 | 6 | 2 |
| 3 | A1 | 8 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 6 | 2 |
| 4 | A1 | 8 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 6 | 2 |
| 5 | A1 | 4 | 1 | 4,9,14,19,24,29,34,39 | 0 | 1 | 6 | 2 |
| 6 | A1 | 4 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 6 | 2 |
| 7 | A1 | 4 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 6 | 2 |
| 8 | A1 | 2 | 1 | 7,15,23,31,39 | 0 | 2 | 6 | 2 |
| 9 | A1 | 2 | 1 | 4,9,14,19,24,29,34,39 | 0 | 1 | 6 | 2 |
| 10 | A1 | 2 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 6 | 2 |
| 11 | A1 | 2 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 6 | 2 |
| 12 | A1 | 1 | 0 | 19,39 | 7 | 1 | 3 | 2 |
| 13 | A1 | 1 | 0 | 3,5,7 | 0 | 1 | 6 | 2 |
| 14 | A1 | 1 | 0 | 24,29,34,39 | 7 | 1 | 3 | 2 |
| 15 | A1 | 1 | 0 | 9,19,29,39 | 7 | 2 | 3 | 2 |
| 16 | A1 | 1 | 0 | 17,19,37,39 | 0 | 1 | 6 | 2 |
| 17 | A1 | 1 | 0 | 9,19,29,39 | 0 | 2 | 6 | 2 |
| 18 | A1 | 1 | 0 | 4,9,14,19,24,29,34,39 | 0 | 1 | 6 | 2 |
| 19 | A1 | 1 | 0 | 4,9,14,19,24,29,34,39 | 7 | 1 | 3 | 2 |
| 20 | A1 | 1 | 0 | 3,5,7,9,11,13 | 7 | 1 | 3 | 2 |
| 21 | A1 | 1 | 0 | 23,27,31,35,39 | 7 | 1 | 3 | 2 |
| 22 | A1 | 1 | 0 | 7,15,23,31,39 | 0 | 1 | 6 | 2 |
| 23 | A1 | 1 | 0 | 23,27,31,35,39 | 0 | 1 | 6 | 2 |
| 24 | A1 | 1 | 0 | 13,14,15, 29,30,31,37,38,39 | 7 | 2 | 3 | 2 |
| 25 | A1 | 1 | 0 | 3,7,11,15,19,23,27,31,35,39 | 7 | 1 | 3 | 2 |
| 26 | A1 | 1 | 0 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 6 | 2 |
| 27 | A1 | 1 | 0 | 1,3,5,7,…,37,39 | 0 | 1 | 6 | 2 |
| 28 | A1 | 1 | 0 | 0,1,2,…,39 | 7 | 1 | 3 | 2 |
| 29 | A2 | 16 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 3 | 4 |
| 30 | A2 | 16 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 3 | 4 |
| 31 | A2 | 8 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 3 | 4 |
| 32 | A2 | 8 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 3 | 4 |
| 33 | A2 | 8 | 1,2 | 9,19,29,39 | 0 | 2 | 3 | 4 |
| 34 | A2 | 4 | 1 | 4,9,14,19,24,29,34,39 | 0 | 1 | 3 | 4 |
| 35 | A2 | 4 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 3 | 4 |
| 36 | A2 | 4 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 3 | 4 |
| 37 | A2 | 2 | 1 | 7,15,23,31,39 | 0 | 2 | 3 | 4 |
| 38 | A2 | 2 | 1 | 4,9,14,19,24,29,34,39 | 0 | 1 | 3 | 4 |
| 39 | A2 | 2 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 3 | 4 |
| 40 | A2 | 2 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 3 | 4 |
| 41 | A2 | 1 | 0 | 19,39 | 5 | 1 | 2 | 4 |
| 42 | A2 | 1 | 0 | 3,5,7 | 0 | 1 | 3 | 4 |
| 43 | A2 | 1 | 0 | 24,29,34,39 | 5 | 1 | 2 | 4 |
| 44 | A2 | 1 | 0 | 9,19,29,39 | 5 | 2 | 2 | 4 |
| 45 | A2 | 1 | 0 | 17,19,37,39 | 0 | 1 | 3 | 4 |
| 46 | A2 | 1 | 0 | 9, 19, 29, 39 | 0 | 2 | 3 | 4 |
| 47 | A2 | 1 | 0 | 7,15,23,31,39 | 0 | 1 | 3 | 4 |
| 48 | A2 | 1 | 0 | 23,27,31,35,39 | 5 | 1 | 2 | 4 |
| 49 | A2 | 1 | 0 | 23,27,31,35,39 | 0 | 1 | 3 | 4 |
| 50 | A2 | 1 | 0 | 3,5,7,9,11,13 | 5 | 1 | 2 | 4 |
| 51 | A2 | 1 | 0 | 3,5,7,9,11,13 | 0 | 1 | 3 | 4 |
| 52 | A2 | 1 | 0 | 4,9,14,19,24,29,34,39 | 5 | 1 | 2 | 4 |
| 53 | A2 | 1 | 0 | 4,9,14,19,24,29,34,39 | 0 | 1 | 3 | 4 |
| 54 | A2 | 1 | 0 | 13,14,15, 29,30,31,37,38,39 | 5 | 2 | 2 | 4 |
| 55 | A2 | 1 | 0 | 3,7,11,15,19,23,27,31,35,39 | 5 | 1 | 2 | 4 |
| 56 | A2 | 1 | 0 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 3 | 4 |
| 57 | A2 | 1 | 0 | 1,3,5,7,…,37,39 | 0 | 1 | 3 | 4 |
| 58 | A2 | 1 | 0 | 0,1,2,…,39 | 5 | 1 | 2 | 4 |
| 59 | A3 | 16 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 2 | 6 |
| 60 | A3 | 16 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 2 | 6 |
| 61 | A3 | 8 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 2 | 6 |
| 62 | A3 | 8 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 2 | 6 |
| 63 | A3 | 8 | 1,2 | 9,19,29,39 | 0 | 2 | 2 | 6 |
| 64 | A3 | 4 | 1 | 4,9,14,19,24,29,34,39 | 0 | 1 | 2 | 6 |
| 65 | A3 | 4 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 2 | 6 |
| 66 | A3 | 4 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 2 | 6 |
| 67 | A3 | 2 | 1 | 4,9,14,19,24,29,34,39 | 0 | 1 | 2 | 6 |
| 68 | A3 | 2 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 2 | 6 |
| 69 | A3 | 2 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 2 | 6 |
| 70 | A3 | 1 | 0 | 19,39 | 7 | 1 | 1 | 6 |
| 71 | A3 | 1 | 0 | 3,5,7 | 0 | 1 | 2 | 6 |
| 72 | A3 | 1 | 0 | 9,11,13 | 2 | 1 | 2 | 6 |
| 73 | A3 | 1 | 0 | 24,29,34,39 | 7 | 1 | 1 | 6 |
| 74 | A3 | 1 | 0 | 9,19,29,39 | 7 | 2 | 1 | 6 |
| 75 | A3 | 1 | 0 | 17,19,37,39 | 0 | 1 | 2 | 6 |
| 76 | A3 | 1 | 0 | 9,19,29,39 | 0 | 2 | 2 | 6 |
| 77 | A3 | 1 | 0 | 7,15,23,31,39 | 0 | 1 | 2 | 6 |
| 78 | A3 | 1 | 0 | 23,27,31,35,39 | 7 | 1 | 1 | 6 |
| 79 | A3 | 1 | 0 | 23,27,31,35,39 | 0 | 1 | 2 | 6 |
| 80 | A3 | 1 | 0 | 3,5,7,9,11,13 | 0 | 1 | 2 | 6 |
| 81 | A3 | 1 | 0 | 3,5,7,9,11,13 | 7 | 1 | 1 | 6 |
| 82 | A3 | 1 | 0 | 4,9,14,19,24,29,34,39 | 0 | 1 | 2 | 6 |
| 83 | A3 | 1 | 0 | 4,9,14,19,24,29,34,39 | 7 | 1 | 1 | 6 |
| 84 | A3 | 1 | 0 | 13,14,15, 29,30,31,37,38,39 | 7 | 2 | 1 | 6 |
| 85 | A3 | 1 | 0 | 3,7,11,15,19,23,27,31,35,39 | 7 | 1 | 1 | 6 |
| 86 | A3 | 1 | 0 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 2 | 6 |
| 87 | A3 | 1 | 0 | 1,3,5,7,…,37,39 | 0 | 1 | 2 | 6 |
| 88 | A3 | 1 | 0 | 0,1,2,…,39 | 7 | 1 | 1 | 6 |
| 89 | B1 | 16 | 1 | 4,9,14,19,24,29,34,39 | 2 | 2 | 6 | 2 |
| 90 | B1 | 8 | 1 | 4,9,14,19,24,29,34,39 | 2 | 2 | 6 | 2 |
| 91 | B1 | 8 | 1,2 | 9,19,29,39 | 2 | 2 | 6 | 2 |
| 92 | B1 | 4 | 1 | 4,9,14,19,24,29,34,39 | 2 | 2 | 6 | 2 |
| 93 | B1 | 2 | 1 | 4,9,14,19,24,29,34,39 | 2 | 2 | 6 | 2 |
| 94 | B1 | 2 | 1 | 3,7,11,15,19,23,27,31,35,39 | 2 | 1 | 6 | 2 |
| 95 | B1 | 1 | 0 | 19,39 | 8 | 1 | 3 | 2 |
| 96 | B1 | 1 | 0 | 3,5,7 | 2 | 1 | 6 | 2 |
| 97 | B1 | 1 | 0 | 24,29,34,39 | 8 | 1 | 3 | 2 |
| 98 | B1 | 1 | 0 | 9,19,29,39 | 8 | 2 | 3 | 2 |
| 99 | B1 | 1 | 0 | 17,19,37,39 | 2 | 1 | 6 | 2 |
| 100 | B1 | 1 | 0 | 9,19,29,39 | 2 | 2 | 6 | 2 |
| 101 | B1 | 1 | 0 | 7,15,23,31,39 | 2 | 1 | 6 | 2 |
| 102 | B1 | 1 | 0 | 23,27,31,35,39 | 8 | 1 | 3 | 2 |
| 103 | B1 | 1 | 0 | 23,27,31,35,39 | 2 | 1 | 6 | 2 |
| 104 | B1 | 1 | 0 | 3,5,7,9,11,13 | 8 | 1 | 3 | 2 |
| 105 | B1 | 1 | 0 | 4,9,14,19,24,29,34,39 | 8 | 1 | 3 | 2 |
| 106 | B1 | 1 | 0 | 4,9,14,19,24,29,34,39 | 2 | 1 | 6 | 2 |
| 107 | B1 | 1 | 0 | 3,7,11,15,19,23,27,31,35,39 | 8 | 1 | 3 | 2 |
| 108 | B1 | 1 | 0 | 13,14,15, 29,30,31,37,38,39 | 8 | 2 | 3 | 2 |
| 109 | B1 | 1 | 0 | 3,7,11,15,19,23,27,31,35,39 | 2 | 1 | 6 | 2 |
| 110 | B1 | 1 | 0 | 1,3,5,7,…,37,39 | 2 | 1 | 6 | 2 |
| 111 | B1 | 1 | 0 | 0,1,2,…,39 | 8 | 1 | 3 | 2 |
| 112 | B4 | 16 | 1,2 | 4,9,14,19,24,29,34,39 | 0 | 2 | 1 | 12 |
| 113 | B4 | 16 | 1,2 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 1 | 12 |
| 114 | B4 | 8 | 1,2 | 4,9,14,19,24,29,34,39 | 0 | 2 | 1 | 12 |
| 115 | B4 | 8 | 1,2 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 1 | 12 |
| 116 | B4 | 8 | 1,2 | 9,19,29,39 | 0 | 2 | 1 | 12 |
| 117 | B4 | 4 | 1 | 4,9,14,19,24,29,34,39 | 0 | 1 | 1 | 12 |
| 118 | B4 | 4 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 1 | 12 |
| 119 | B4 | 4 | 1,2 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 1 | 12 |
| 120 | B4 | 2 | 1 | 7,15,23,31,39 | 2 | 2 | 1 | 12 |
| 121 | B4 | 2 | 1 | 4,9,14,19,24,29,34,39 | 0 | 1 | 1 | 12 |
| 122 | B4 | 2 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 1 | 12 |
| 123 | B4 | 2 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 1 | 12 |
| 124 | B4 | 1 | 0 | 19, 39 | 2 | 2 | 1 | 12 |
| 125 | B4 | 1 | 0 | 17, 19, 37, 39 | 0 | 1 | 1 | 12 |
| 126 | B4 | 1 | 0 | 24,29,34,39 | 2 | 1 | 1 | 12 |
| 127 | B4 | 1 | 0 | 9,19,29,39 | 2 | 2 | 1 | 12 |
| 128 | B4 | 1 | 0 | 9,19,29,39 | 0 | 2 | 1 | 12 |
| 129 | B4 | 1 | 0 | 7,15,23,31,39 | 0 | 1 | 1 | 12 |
| 130 | B4 | 1 | 0 | 7,15,23,31,39 | 0 | 2 | 1 | 12 |
| 131 | B4 | 1 | 0 | 23,27,31,35,39 | 0 | 1 | 1 | 12 |
| 132 | B4 | 1 | 0 | 23,27,31,35,39 | 2 | 2 | 1 | 12 |
| 133 | B4 | 1 | 0 | 9,11,13,15,17,19 | 0 | 1 | 1 | 12 |
| 134 | B4 | 1 | 0 | 3,5,7,9,11,13 | 2 | 1 | 1 | 12 |
| 135 | B4 | 1 | 0 | 4,9,14,19,24,29,34,39 | 0 | 1 | 1 | 12 |
| 136 | B4 | 1 | 0 | 4,9,14,19,24,29,34,39 | 2 | 2 | 1 | 12 |
| 137 | B4 | 1 | 0 | 13,14,15, 29,30,31,37,38,39 | 2 | 2 | 1 | 12 |
| 138 | B4 | 1 | 0 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 1 | 12 |
| 139 | B4 | 1 | 0 | 3,7,11,15,19,23,27,31,35,39 | 2 | 1 | 1 | 12 |
| 140 | B4 | 1 | 0 | 3, 5, 7, …, 23,25 | 2 | 1 | 1 | 12 |
| 141 | B4 | 1 | 0 | 3, 5, 7, …, 23,25 | 0 | 2 | 1 | 12 |
| 142 | B4 | 1 | 0 | 1,3,5,7,…,37,39 | 0 | 1 | 1 | 12 |
| 143 | B4 | 1 | 0 | 0, 1, 2,…, 39 | 2 | 1 | 1 | 12 |
| 144 | C0 | 16 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 7 | 2 |
| 145 | C0 | 16 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 7 | 2 |
| 146 | C0 | 8 | 1 | 4,9,14,19,24,29,34,39 | 0 | 1 | 7 | 2 |
| 147 | C0 | 8 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 7 | 2 |
| 148 | C0 | 8 | 1,2 | 9,19,29,39 | 0 | 2 | 7 | 2 |
| 149 | C0 | 4 | 1 | 4,9,14,19,24,29,34,39 | 0 | 1 | 7 | 2 |
| 150 | C0 | 4 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 7 | 2 |
| 151 | C0 | 4 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 7 | 2 |
| 152 | C0 | 2 | 1 | 7,15,23,31,39 | 0 | 2 | 7 | 2 |
| 153 | C0 | 2 | 1 | 4,9,14,19,24,29,34,39 | 0 | 1 | 7 | 2 |
| 154 | C0 | 2 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 7 | 2 |
| 155 | C0 | 2 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 7 | 2 |
| 156 | C0 | 1 | 0 | 19,39 | 8 | 1 | 3 | 2 |
| 157 | C0 | 1 | 0 | 3,5,7 | 0 | 1 | 7 | 2 |
| 158 | C0 | 1 | 0 | 24,29,34,39 | 8 | 1 | 3 | 2 |
| 159 | C0 | 1 | 0 | 9,19,29,39 | 8 | 2 | 3 | 2 |
| 160 | C0 | 1 | 0 | 17,19,37,39 | 0 | 1 | 7 | 2 |
| 161 | C0 | 1 | 0 | 9,19,29,39 | 0 | 2 | 7 | 2 |
| 162 | C0 | 1 | 0 | 23,27,31,35,39 | 8 | 1 | 3 | 2 |
| 163 | C0 | 1 | 0 | 7,15,23,31,39 | 0 | 1 | 7 | 2 |
| 164 | C0 | 1 | 0 | 23,27,31,35,39 | 0 | 1 | 7 | 2 |
| 165 | C0 | 1 | 0 | 3,5,7,9,11,13 | 8 | 1 | 3 | 2 |
| 166 | C0 | 1 | 0 | 4,9,14,19,24,29,34,39 | 8 | 1 | 3 | 2 |
| 167 | C0 | 1 | 0 | 4,9,14,19,24,29,34,39 | 0 | 1 | 7 | 2 |
| 168 | C0 | 1 | 0 | 13,14,15, 29,30,31,37,38,39 | 8 | 2 | 3 | 2 |
| 169 | C0 | 1 | 0 | 3,7,11,15,19,23,27,31,35,39 | 8 | 1 | 3 | 2 |
| 170 | C0 | 1 | 0 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 7 | 2 |
| 171 | C0 | 1 | 0 | 1,3,5,7,…,37,39 | 0 | 1 | 7 | 2 |
| 172 | C0 | 1 | 0 | 0,1,2,…,39 | 8 | 1 | 3 | 2 |
| 173 | C2 | 16 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 2 | 6 |
| 174 | C2 | 16 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 2 | 6 |
| 175 | C2 | 8 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 2 | 6 |
| 176 | C2 | 8 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 2 | 6 |
| 177 | C2 | 8 | 1,2 | 9,19,29,39 | 0 | 2 | 2 | 6 |
| 178 | C2 | 4 | 1 | 4,9,14,19,24,29,34,39 | 0 | 1 | 2 | 6 |
| 179 | C2 | 4 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 2 | 6 |
| 180 | C2 | 4 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 2 | 6 |
| 181 | C2 | 2 | 1 | 7,15,23,31,39 | 2 | 2 | 2 | 6 |
| 182 | C2 | 2 | 1 | 4,9,14,19,24,29,34,39 | 0 | 1 | 2 | 6 |
| 183 | C2 | 2 | 1 | 4,9,14,19,24,29,34,39 | 0 | 2 | 2 | 6 |
| 184 | C2 | 2 | 1 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 2 | 6 |
| 185 | C2 | 1 | 0 | 19,39 | 2 | 1 | 2 | 6 |
| 186 | C2 | 1 | 0 | 3,5,7 | 0 | 1 | 2 | 6 |
| 187 | C2 | 1 | 0 | 24,29,34,39 | 7 | 1 | 1 | 6 |
| 188 | C2 | 1 | 0 | 9,19,29,39 | 7 | 2 | 1 | 6 |
| 189 | C2 | 1 | 0 | 17,19,37,39 | 0 | 1 | 2 | 6 |
| 190 | C2 | 1 | 0 | 9,19,29,39 | 2 | 2 | 2 | 6 |
| 191 | C2 | 1 | 0 | 7,15,23,31,39 | 2 | 1 | 2 | 6 |
| 192 | C2 | 1 | 0 | 3,5,7,9,11,13 | 7 | 1 | 1 | 6 |
| 193 | C2 | 1 | 0 | 23,27,31,35,39 | 7 | 2 | 1 | 6 |
| 194 | C2 | 1 | 0 | 23,27,31,35,39 | 0 | 1 | 2 | 6 |
| 195 | C2 | 1 | 0 | 4,9,14,19,24,29,34,39 | 7 | 2 | 1 | 6 |
| 196 | C2 | 1 | 0 | 4,9,14,19,24,29,34,39 | 2 | 1 | 2 | 6 |
| 197 | C2 | 1 | 0 | 13,14,15, 29,30,31,37,38,39 | 7 | 2 | 1 | 6 |
| 198 | C2 | 1 | 0 | 3,7,11,15,19,23,27,31,35,39 | 7 | 1 | 1 | 6 |
| 199 | C2 | 1 | 0 | 3,7,11,15,19,23,27,31,35,39 | 0 | 1 | 2 | 6 |
| 200 | C2 | 1 | 0 | 1,3,5,7,…,37,39 | 0 | 1 | 2 | 6 |
| 201 | C2 | 1 | 0 | 0,1,2,…,39 | 7 | 1 | 1 | 6 |
| 202 | A1/B1 | 16 | 1 | 4,9,14,19,24,29,34,39 | 2 | 1 | 6 | 2 |
| 203 | A1/B1 | 16 | 1 | 3,7,11,15,19,23,27,31,35,39 | 2 | 1 | 6 | 2 |
| 204 | A1/B1 | 8 | 1 | 4,9,14,19,24,29,34,39 | 2 | 1 | 6 | 2 |
| 205 | A1/B1 | 8 | 1 | 3,7,11,15,19,23,27,31,35,39 | 2 | 1 | 6 | 2 |
| 206 | A1/B1 | 4 | 1 | 4,9,14,19,24,29,34,39 | 2 | 1 | 6 | 2 |
| 207 | A1/B1 | 4 | 1 | 3,7,11,15,19,23,27,31,35,39 | 2 | 1 | 6 | 2 |
| 208 | A1/B1 | 2 | 1 | 4,9,14,19,24,29,34,39 | 2 | 1 | 6 | 2 |
| 209 | A1/B1 | 1 | 0 | 19,39 | 8 | 1 | 3 | 2 |
| 210 | A1/B1 | 1 | 0 | 9,19,29,39 | 8 | 1 | 3 | 2 |
| 211 | A1/B1 | 1 | 0 | 17,19,37,39 | 2 | 1 | 6 | 2 |
| 212 | A1/B1 | 1 | 0 | 9,19,29,39 | 2 | 2 | 6 | 2 |
| 213 | A1/B1 | 1 | 0 | 23,27,31,35,39 | 8 | 1 | 3 | 2 |
| 214 | A1/B1 | 1 | 0 | 7,15,23,31,39 | 2 | 1 | 6 | 2 |
| 215 | A1/B1 | 1 | 0 | 23,27,31,35,39 | 2 | 1 | 6 | 2 |
| 216 | A1/B1 | 1 | 0 | 4,9,14,19,24,29,34,39 | 8 | 1 | 3 | 2 |
| 217 | A1/B1 | 1 | 0 | 4,9,14,19,24,29,34,39 | 2 | 1 | 6 | 2 |
| 218 | A1/B1 | 1 | 0 | 3,7,11,15,19,23,27,31,35,39 | 2 | 1 | 6 | 2 |
| 219 | A1/B1 | 1 | 0 | 1,3,5,7,…,37,39 | 2 | 1 | 6 | 2 |
| 220 | A2/B2 | 16 | 1 | 4,9,14,19,24,29,34,39 | 2 | 1 | 3 | 4 |
| 221 | A2/B2 | 16 | 1 | 3,7,11,15,19,23,27,31,35,39 | 2 | 1 | 3 | 4 |
| 222 | A2/B2 | 8 | 1 | 4,9,14,19,24,29,34,39 | 2 | 1 | 3 | 4 |
| 223 | A2/B2 | 8 | 1 | 3,7,11,15,19,23,27,31,35,39 | 2 | 1 | 3 | 4 |
| 224 | A2/B2 | 4 | 1 | 4,9,14,19,24,29,34,39 | 2 | 1 | 3 | 4 |
| 225 | A2/B2 | 4 | 1 | 3,7,11,15,19,23,27,31,35,39 | 2 | 1 | 3 | 4 |
| 226 | A2/B2 | 2 | 1 | 4,9,14,19,24,29,34,39 | 2 | 1 | 3 | 4 |
| 227 | A2/B2 | 1 | 0 | 19,39 | 6 | 1 | 2 | 4 |
| 228 | A2/B2 | 1 | 0 | 9,19,29,39 | 6 | 1 | 2 | 4 |
| 229 | A2/B2 | 1 | 0 | 17,19,37,39 | 2 | 1 | 3 | 4 |
| 230 | A2/B2 | 1 | 0 | 9,19,29,39 | 2 | 2 | 3 | 4 |
| 231 | A2/B2 | 1 | 0 | 23,27,31,35,39 | 6 | 1 | 2 | 4 |
| 232 | A2/B2 | 1 | 0 | 7,15,23,31,39 | 2 | 1 | 3 | 4 |
| 233 | A2/B2 | 1 | 0 | 23,27,31,35,39 | 2 | 1 | 3 | 4 |
| 234 | A2/B2 | 1 | 0 | 4,9,14,19,24,29,34,39 | 6 | 1 | 2 | 4 |
| 235 | A2/B2 | 1 | 0 | 4,9,14,19,24,29,34,39 | 2 | 1 | 3 | 4 |
| 236 | A2/B2 | 1 | 0 | 3,7,11,15,19,23,27,31,35,39 | 2 | 1 | 3 | 4 |
| 237 | A2/B2 | 1 | 0 | 1,3,5,7,…,37,39 | 2 | 1 | 3 | 4 |
| 238 | A3/B3 | 16 | 1 | 4,9,14,19,24,29,34,39 | 2 | 1 | 2 | 6 |
| 239 | A3/B3 | 16 | 1 | 3,7,11,15,19,23,27,31,35,39 | 2 | 1 | 2 | 6 |
| 240 | A3/B3 | 8 | 1 | 4,9,14,19,24,29,34,39 | 2 | 1 | 2 | 6 |
| 241 | A3/B3 | 8 | 1 | 3,7,11,15,19,23,27,31,35,39 | 2 | 1 | 2 | 6 |
| 242 | A3/B3 | 4 | 1 | 4,9,14,19,24,29,34,39 | 2 | 1 | 2 | 6 |
| 243 | A3/B3 | 4 | 1 | 3,7,11,15,19,23,27,31,35,39 | 2 | 1 | 2 | 6 |
| 244 | A3/B3 | 2 | 1 | 4,9,14,19,24,29,34,39 | 2 | 1 | 2 | 6 |
| 245 | A3/B3 | 1 | 0 | 19,39 | 2 | 1 | 2 | 6 |
| 246 | A3/B3 | 1 | 0 | 9,19,29,39 | 2 | 1 | 2 | 6 |
| 247 | A3/B3 | 1 | 0 | 17,19,37,39 | 2 | 1 | 2 | 6 |
| 248 | A3/B3 | 1 | 0 | 9,19,29,39 | 2 | 2 | 2 | 6 |
| 249 | A3/B3 | 1 | 0 | 7,15,23,31,39 | 2 | 1 | 2 | 6 |
| 250 | A3/B3 | 1 | 0 | 23,27,31,35,39 | 2 | 1 | 2 | 6 |
| 251 | A3/B3 | 1 | 0 | 23,27,31,35,39 | 2 | 2 | 2 | 6 |
| 252 | A3/B3 | 1 | 0 | 4,9,14,19,24,29,34,39 | 2 | 1 | 2 | 6 |
| 253 | A3/B3 | 1 | 0 | 4,9,14,19,24,29,34,39 | 2 | 2 | 2 | 6 |
| 254 | A3/B3 | 1 | 0 | 3,7,11,15,19,23,27,31,35,39 | 2 | 1 | 2 | 6 |
| 255 | A3/B3 | 1 | 0 | 1,3,5,7,…,37,39 | 2 | 1 | 2 | 6 |

6.4.1.1.1.1 Sequence generation when transform precoding is disabled

If transform precoding for PUSCH is not enabled, the sequence  shall be generated according to

.

where the pseudo-random sequence  is defined in clause 5.2.1. The pseudo-random sequence generator shall be initialized with

where  is the OFDM symbol number within the slot, is the slot number within a frame, and

- are given by the higher-layer parameters *scramblingID0* and *scramblingID1*, respectively, in the *DMRS-UplinkConfig* IE if provided and the PUSCH is scheduled by DCI format 0\_1 or 0\_2, or by a PUSCH transmission with a configured grant;

- is given by the higher-layer parameter *scramblingID0* in the *DMRS-UplinkConfig* IE if provided and the PUSCH is scheduled by DCI format 0\_0 with the CRC scrambled by C-RNTI, MCS-C-RNTI, or CS-RNTI;

- are, for each msgA PUSCH configuration, given by the higher-layer parameters *msgA-ScramblingID0* and *msgA-ScramblingID1*, respectively, in the *msgA-DMRS-Config* IE if provided and the PUSCH transmission is triggered by a Type-2 random access procedure as described in clause 8.1A of [5, TS 38.213];

- otherwise;

- and are given by

- if the higher-layer parameter *dmrs-Uplink* in the *DMRS-UplinkConfig* IE is provided

where is the CDM group defined in clause 6.4.1.1.3.

- otherwise

The quantity is

- indicated by the DM-RS initialization field, if present, either in the DCI associated with the PUSCH transmission if DCI format 0\_1 or 0\_2, in [4, TS 38.212] is used;

- indicated by the higher layer parameter *dmrs-SeqInitialization*, if present, for a Type 1 PUSCH transmission with a configured grant;

- determined by the mapping between preamble(s) and a PUSCH occasion and the associated DMRS resource for a PUSCH transmission of Type-2 random access process in [5, TS 38.213];

- otherwise .

##### 6.4.1.1.3 Precoding and mapping to physical resources

The sequence  shall be mapped to the intermediate quantity according to

- if transform precoding is not enabled,



- if transform precoding is enabled



where , , and are given by Tables 6.4.1.1.3-1 and 6.4.1.1.3-2 and the configuration type is given by the higher-layer parameter *DMRS-UplinkConfig*, and both and correspond to . The intermediate quantity if Δ corresponds to any other antenna ports than*.*

The intermediate quantity shall be precoded, multiplied with the amplitude scaling factor  in order to conform to the transmit power specified in [6, TS 38.214], and mapped to physical resources according to

where

- the precoding matrix is given by clause 6.3.1.5,

- the set of antenna ports  is given by clause 6.3.1.5, and

- the set of antenna ports  is given by [6, TS 38.214];

and the following conditions are fulfilled:

- the resource elements are within the common resource blocks allocated for PUSCH transmission.

The reference point for is

- subcarrier 0 in common resource block 0 if transform precoding is not enabled, and

- subcarrier 0 of the lowest-numbered resource block of the scheduled PUSCH allocation if transform precoding is enabled.

The reference point for and the position  of the first DM-RS symbol depends on the mapping type:

- for PUSCH mapping type A:

-  is defined relative to the start of the slot if frequency hopping is disabled and relative to the start of each hop in case frequency hopping is enabled

-  is given by the higher-layer parameter *dmrs-TypeA-Position*

- for PUSCH mapping type B:

-  is defined relative to the start of the scheduled PUSCH resources if frequency hopping is disabled and relative to the start of each hop in case frequency hopping is enabled

- 

The position(s) of the DM-RS symbols is given by  and duration where

- is the duration between the first OFDM symbol of the slot and the last OFDM symbol of the scheduled PUSCH resources in the slot for PUSCH mapping type A according to Tables 6.4.1.1.3-3 and 6.4.1.1.3-4 if intra-slot frequency hopping is not used, or

- is the duration of scheduled PUSCH resources for PUSCH mapping type B according to Tables 6.4.1.1.3-3 and 6.4.1.1.3-4 if intra-slot frequency hopping is not used, or

- is the duration per hop according to Table 6.4.1.1.3-6 if intra-slot frequency hopping is used.

- if the higher-layer parameter *maxLength* in *DMRS-UplinkConfig* is not configured, or for a msgA transmission *msgA-MaxLength* in *msgA-DMRS-Config* is not configured, the tables shall be used according to single-symbol DM-RS

- if the higher-layer parameter *maxLength* in *DMRS-UplinkConfig* is equal to 'len2', the associated DCI or configured grant configuration determines whether single-symbol or double-symbol DM-RS shall be used

- if the higher-layer parameter *msgA-MaxLength* in *msgA-DMRS-Config* is equal to 'len2', double-symbol DM-RS shall be used

- if the higher-layer parameter *dmrs-AdditionalPosition* is not set to 'pos0' and intra-slot frequency hopping is enabled according to clause 7.3.1.1.2 in [4, TS 38.212] and by higher layer, Tables 6.4.1.1.3-6 shall be used assuming *dmrs-AdditionalPosition* is equal to 'pos1' for each hop.

For PUSCH mapping type A,

- the case *dmrs-AdditionalPosition* is equal to 'pos3' is only supported when *dmrs-TypeA-Position* is equal to 'pos2';

- symbols in Table 6.4.1.1.3-4 is only applicable when *dmrs-TypeA-Position* is equal to 'pos2'.

For msgA transmitted using PUSCH mapping type A,

- the case *msgA-DMRS-AdditionalPosition* is equal to 'pos3' is only supported when *dmrs-TypeA-Position* is equal to 'pos2';

- *'dmrs-AdditionalPosition*' in Tables 6.4.1.1.3-3 to 6.4.1.1.3-6 shall be replaced by *msgA-DMRS-AdditionalPosition;*

- only PUSCH DM-RS configuration type 1 is supported.

For msgA transmitted using PUSCH mapping type B,

- '*dmrs-AdditionalPosition*' in Tables 6.4.1.1.3-3 to 6.4.1.1.3-6 shall be replaced by *msgA-DMRS-AdditionalPosition*;

- only PUSCH DM-RS configuration type 1 is supported.

The time-domain index  and the supported antenna ports  are given by Table 6.4.1.1.3-5.

Table 6.4.1.1.3-1: Parameters for PUSCH DM-RS configuration type 1.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | CDM group |  |  | |  | |
|  |  |  |  |
| 0 | 0 | 0 | +1 | +1 | +1 | +1 |
| 1 | 0 | 0 | +1 | -1 | +1 | +1 |
| 2 | 1 | 1 | +1 | +1 | +1 | +1 |
| 3 | 1 | 1 | +1 | -1 | +1 | +1 |
| 4 | 0 | 0 | +1 | +1 | +1 | -1 |
| 5 | 0 | 0 | +1 | -1 | +1 | -1 |
| 6 | 1 | 1 | +1 | +1 | +1 | -1 |
| 7 | 1 | 1 | +1 | -1 | +1 | -1 |

Table 6.4.1.1.3-2: Parameters for PUSCH DM-RS configuration type 2.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | CDM group |  |  | |  | |
|  |  |  |  |
| 0 | 0 | 0 | +1 | +1 | +1 | +1 |
| 1 | 0 | 0 | +1 | -1 | +1 | +1 |
| 2 | 1 | 2 | +1 | +1 | +1 | +1 |
| 3 | 1 | 2 | +1 | -1 | +1 | +1 |
| 4 | 2 | 4 | +1 | +1 | +1 | +1 |
| 5 | 2 | 4 | +1 | -1 | +1 | +1 |
| 6 | 0 | 0 | +1 | +1 | +1 | -1 |
| 7 | 0 | 0 | +1 | -1 | +1 | -1 |
| 8 | 1 | 2 | +1 | +1 | +1 | -1 |
| 9 | 1 | 2 | +1 | -1 | +1 | -1 |
| 10 | 2 | 4 | +1 | +1 | +1 | -1 |
| 11 | 2 | 4 | +1 | -1 | +1 | -1 |

Table 6.4.1.1.3-3: PUSCH DM-RS positions  within a slot for single-symbol DM-RS and intra-slot frequency hopping disabled.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| in symbols | DM-RS positions | | | | | | | |
| PUSCH mapping type A | | | | PUSCH mapping type B | | | |
| *dmrs-AdditionalPosition* | | | | *dmrs-AdditionalPosition* | | | |
| *pos0* | *pos1* | *pos2* | *pos3* | *pos0* | *pos1* | *pos2* | *pos3* |
| <4 | - | - | - | - |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  | , 4 | , 4 | , 4 |
| 6 |  |  |  |  |  | , 4 | , 4 | , 4 |
| 7 |  |  |  |  |  | , 4 | , 4 | , 4 |
| 8 |  | , 7 | , 7 | , 7 |  | , 6 | , 3, 6 | , 3, 6 |
| 9 |  | , 7 | , 7 | , 7 |  | , 6 | , 3, 6 | , 3, 6 |
| 10 |  | , 9 | , 6, 9 | , 6, 9 |  | , 8 | , 4, 8 | , 3, 6, 9 |
| 11 |  | , 9 | , 6, 9 | , 6, 9 |  | , 8 | , 4, 8 | , 3, 6, 9 |
| 12 |  | , 9 | , 6, 9 | , 5, 8, 11 |  | , 10 | , 5, 10 | , 3, 6, 9 |
| 13 |  | , 11 | , 7, 11 | , 5, 8, 11 |  | , 10 | , 5, 10 | , 3, 6, 9 |
| 14 |  | , 11 | , 7, 11 | , 5, 8, 11 |  | , 10 | , 5, 10 | , 3, 6, 9 |

Table 6.4.1.1.3-4: PUSCH DM-RS positions  within a slot for double-symbol DM-RS and intra-slot frequency hopping disabled.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **in symbols** | **DM-RS positions** | | | | | | | |
| **PUSCH mapping type A** | | | | **PUSCH mapping type B** | | | |
| ***dmrs-AdditionalPosition*** | | | | ***dmrs-AdditionalPosition*** | | | |
| ***pos0*** | ***pos1*** | ***pos2*** | ***pos3*** | ***pos0*** | ***pos1*** | ***pos2*** | ***pos3*** |
| <4 | - | - |  |  | - | - |  |  |
| 4 |  |  |  |  | - | - |  |  |
| 5 |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  | , 5 |  |  |
| 9 |  |  |  |  |  | , 5 |  |  |
| 10 |  | , 8 |  |  |  | , 7 |  |  |
| 11 |  | , 8 |  |  |  | , 7 |  |  |
| 12 |  | , 8 |  |  |  | , 9 |  |  |
| 13 |  | , 10 |  |  |  | , 9 |  |  |
| 14 |  | , 10 |  |  |  | , 9 |  |  |

Table 6.4.1.1.3-5: PUSCH DM-RS time index .

|  |  |  |  |
| --- | --- | --- | --- |
| DM-RS duration |  | *Supported antenna ports* | |
| *Configuration type 1* | *Configuration type 2* |
| single-symbol DM-RS | 0 | 0 – 3 | 0 – 5 |
| double-symbol DM-RS | 0, 1 | 0 – 7 | 0 – 11 |

Table 6.4.1.1.3-6: PUSCH DM-RS positions  within a slot for single-symbol DM-RS and intra-slot frequency hopping enabled.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **in symbols** | **DM-RS positions** | | | | | | | | | | | |
| **PUSCH mapping type A** | | | | | | | | **PUSCH mapping type B** | | | |
|  | | | |  | | | |
| ***dmrs-AdditionalPosition*** | | | | ***dmrs-AdditionalPosition*** | | | | ***dmrs-AdditionalPosition*** | | | |
| ***pos0*** | | ***pos1*** | | ***pos0*** | | ***pos1*** | | ***pos0*** | | ***pos1*** | |
| **1st hop** | **2nd hop** | **1st hop** | **2nd hop** | **1st hop** | **2nd hop** | **1st hop** | **2nd hop** | **1st hop** | **2nd hop** | **1st hop** | **2nd hop** |
| ≤3 | - | - | - | - | - | - | - | - | 0 | 0 |  | 0 |
| 4 | 2 | 0 | 2 | 0 | 3 | 0 | 3 | 0 | 0 | 0 |  | 0 |
| 5, 6 | 2 | 0 | 2 | 0, 4 | 3 | 0 | 3 | 0, 4 | 0 | 0 |  | 0, 4 |
| 7 | 2 | 0 | 2, 6 | 0, 4 | 3 | 0 | 3 | 0, 4 | 0 | 0 |  | 0, 4 |