**3GPP TSG-RAN WG4 Meeting #94-e*R4-20xxxx***

Electronic Meeting, February 24-March 06, 2020

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** | **0106** | **rev** | **1** | **Current version:** | **15.3.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | CR to TS 38.141-1: Random data content for NR BS Test Models | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Perf | | | | |  | ***Date:*** | | | 2020-02-24 |
|  |  | | | |  | |  | | |  |
| ***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 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:*** | | Corresponding discussion paper describing the necessary change R4-2001722 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Update data content of ‘all zero data’ to random data | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Update NR Test Model data content of physical channels with “random” data in place of "all zero" data to resolve undesirable signal qualities for BS conformance testing. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.9.2.3.1, 4.9.2.3.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **x** |  | Test specifications | | | | TS/TR ... CR ... 38.141-2 | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Revision of R4-2001723 | | | | | | | | |

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications"

[2] 3GPP TS 38.104: "NR Base Station (BS) radio transmission and reception"

[3] 3GPP TS 38.141-2: "NR, Base Station (BS) conformance testing, Part 2: Radiated conformance testing"

[4] ITU-R Recommendation M.1545, "Measurement uncertainty as it applies to test limits for the terrestrial component of International Mobile Telecommunications-2000"

[5] ITU-R Recommendation SM.329: "Unwanted emissions in the spurious domain"

[6] IEC 60 721-3-3: "Classification of environmental conditions - Part 3-3: Classification of groups of environmental parameters and their severities - Stationary use at weather protected locations"

[7] IEC 60 721-3-4: "Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 4: Stationary use at non-weather protected locations"

[8] IEC 60 721: "Classification of environmental conditions"

[9] IEC 60 068-2-1 (2007): "Environmental testing - Part 2: Tests. Tests A: Cold"

[10] IEC 60 068-2-2: (2007): "Environmental testing - Part 2: Tests. Tests B: Dry heat"

[11] IEC 60 068-2-6: (2007): "Environmental testing - Part 2: Tests - Test Fc: Vibration (sinusoidal)"

[12] ITU-R Recommendation SM.328: "Spectra and bandwidth of emissions"

[13] Federal Communications Commission: "Title 47 of the Code of Federal Regulations (CFR) "

[14] ECC/DEC/(17)06: "The harmonised use of the frequency bands 1427-1452 MHz and 1492-1518 MHz for Mobile/Fixed Communications Networks Supplemental Downlink (MFCN SDL)"

[15] 3GPP TR 25.942: "RF system scenarios"

[16] 3GPP TS 38.212: "NR; Multiplexing and channel coding"

[17] 3GPP TS 38.211: "NR; Physical channels and modulation"

[18] 3GPP TS 38.214: "NR; Physical layer procedures for data"

[19] 3GPP TS 38.331: "NR; Radio Resource Control (RRC) protocol specification"

[20] 3GPP TR 38.901: "Study on channel model for frequencies from 0.5 to 100 GHz"

[21] 3GPP TS 38.101-1: "NR; User Equipment (UE) radio transmission and reception; Part 1: Range 1 Standalone"

[22] 3GPP TS 36.104: "Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception"

[23] ITU-T Recommendation O.150, “Equipment for the measurement of digital and analogue/digital parameters”

##### [Unchanged Sections]

##### 4.9.2.3 Data content of Physical channels and Signals for NR-FR1-TM

Randomisation of the data content is obtained by utilizing a PN sequence generator and the length-31 Gold sequence scrambling of TS 38.211 [17], subclause 5.2.1 which is invoked by all physical channels prior to modulation and mapping to the RE grid.

Initialization of the scrambler and RE-mappers as defined in TS 38.211 [17] use the following additional parameters:

- for the lowest configured carrier, for the 2nd lowest configured carrier,…, for the nth configured carrier

- Antenna ports starting with 1000 for PDSCH

- Antenna ports starting with 2000 for PDCCH

- *q* = 0 (single code word)

- Rank 1, single layer (except for TAE requirement of 2 layer MIMO transmission)

##### 4.9.2.3.1 PDCCH

-

- PDCCH modulation to be QPSK as described in TS 38.211 [17], subclause 5.1.3

- For each slot the required amount of bits for all PDCCHs is as follows: 1(# of PDCCH) \* 1(# of CCE per PDCCH) \* 6(REG per CCE) \* 9(data RE per REG) \* 2(bits per RE) with these parameters according to the NR-FR1-TM definitions in subclause 4.9.2.2

- Generate this amount of bits according to the output of the PN23 generator sequence starting seed of all ones [23]. The PN sequence is initialized once with a starting seed of “all ones”. The PN sequence is continuous over the slot boundaries and initialized only once in the first allocated slot.

- 1 CCE shall be according to TS 38.211 [17], subclause 7.3.2 using non-interleaved CCE-to-REG mapping. PDCCH occupies the first 2 symbols for 6 resource-element groups, where a resource element group equals one resource block during one OFDM symbol.

- Perform PDCCH scrambling according to TS 38.211 [17], subclause 7.3.2.3

- in DM-RS sequence generation in TS 38.211 [17], subclause 7.4.1.3

- in scrambling sequence generation in TS 38.211 [17], subclause 7.3.2.3

- Perform mapping to REs according to TS 38.211 [17], subclause 7.3.2.5.

##### 4.9.2.3.2 PDSCH

- Generate this amount of bits according to the output of the PN23 generator sequence starting seed of all ones [23]. The PN sequence is initialized once with a starting seed of “all ones”. The PN sequence is continuous over the slot boundaries and initialized only once in the first allocated slot.

- NR-FR1-TMs utilize 1, 2 or 3 user PDSCH transmissions distinguished by . For each NR-FR1-TM, PRBs are mapped to user () as follows:

Table 4.9.2.3.2-1: Mapping of PRBs to  for NR-FR1-TM

|  |  |  |
| --- | --- | --- |
| Test model |  | Number of users |
| NR-FR1-TM1.1 | 2 for PRBs located in PRB#0-2  0 for remaining PRBs | 2 |
| NR-FR1-TM1.2 | 0 for boosted PRBs  1 for de-boosted PRBs  2 for PRBs located in PRB#0-2 | 3 |
| NR-FR1-TM2 | 2 for all PRBs | 1 |
| NR-FR1-TM2a | 2 for all PRBs | 1 |
| NR-FR1-TM3.1 | 2 for PRBs located in PRB#0-2  0 for remaining PRBs | 2 |
| NR-FR1-TM3.1a | 2 for PRBs located in PRB#0-2  0 for remaining PRBs | 2 |
| NR-FR1-TM3.2 | 0 for QPSK PRBs  1 for 16QAM PRBs  2 for PRBs located in PRB#0-2 | 3 |
| NR-FR1-TM3.3 | 0 for 16QAM PRBs  1 for QPSK PRBs  2 for PRBs located in PRB#0-2 | 3 |

- Perform user specific scrambling according to TS 38.211 [17], subclause 7.3.1.1.

- Perform modulation of the scrambled bits with the modulation scheme defined for each user according to TS 38.211 [17], subclause 7.3.1.1

-

- Perform mapping of the complex-valued symbols to layer according to TS 38.211 [17], subclause 7.3.1.3.   Complex-valued modulation symbols  for codeword shall be mapped onto the layers ,  where is equal to number of layers.

- Perform PDSCH mapping according to TS 38.211 [17] using parameters listed in table 4.9.2.2-3.

- PDSCH resource allocation according to TS 38.214 [18] as following;

- NR-FR1-TM1.1, NR-FR1-TM3.1, NR-FR1-TM3.1a: type 1 for PDSCH with *n*RNTI = 0 and *n*RNTI = 2,

- NR-FR1-TM1.2, NR-FR1-TM3.2, NR-FR1-TM3.3: type 0 for PDSCH with *n*RNTI = 0 and *n*RNTI = 1, type 1 for PDSCH with *n*RNTI = 2,

- NR-FR1-TM2, NR-FR1-TM2a: type 1 for PDSCH with *n*RNTI = 2.

- DM-RS sequence generation according to TS 38.211 [17], subclause 7.4.1.1.1 where *l* is the OFDM symbol number within the slot with the symbols indicated by table 4.9.2.2-3.

-

-

- DM-RS mapping according to TS 38.211 [17], subclause 7.4.1.1.2 using parameters listed in table 4.9.2.2-3.

##### [End of changes]