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

Electronic Meeting, February 24-March 06, 2020

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** |  **0133** | **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)*.* |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

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|  |
| ***Title:***  |  CR to TS 38.141-2: 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 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:*** | 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 ... 38.141-1 |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** | Revision of R4-2001725 |

# 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-FR2-TM

Randomisation of the data content is obtained by utilizing the length-31 Gold sequence scrambling of TS 38.211 [20], subclause 5.2.1 which is invoked by all physical channels prior to modulation and mapping to the RE grid. An appropriate number of '0' bits shall be generated prior to the scrambling.

Initialization of the scrambler and RE-mappers as defined in TS 38.211 [20] use the following additional parameters:

- $N\_{ID}^{cell}=1$ for the lowest configured carrier, $N\_{ID}^{cell}=2$ for the 2nd lowest configured carrier, … $N\_{ID}^{cell}=n$ 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

- $N\_{symb}^{CORESET}= 2$

- PDCCH modulation to be QPSK as described in TS 38.211 [20], 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-FR2-TM definitions in subclause 4.4.9.2.2.

- Generate this amount of bits according to the output of the PN23 [23] generator sequence starting seed of all ones.

- 1 CCE shall be according to TS 38.211 [20], subclause 7.3.2. PDCCH using non-interleaved CCE-to-REG mapping. PDCCH occupies the first two 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 [20], subclause 7.3.2.3.

- $N\_{ID}=N\_{ID}^{cell}$ in DM-RS sequence generation in TS 38.211 [20], subclause 7.4.1.3.

- $n\_{RNTI}=0$ in scrambling sequence generation in TS 38.211 [20], subclause 7.3.2.3.

- Perform mapping to REs according to TS 38.211 [20], subclause 7.3.2.5.

##### 4.9.2.3.2 PDSCH

- Generate this amount of bits according to the output of the PN23 [23] generator sequence starting seed of all ones.

- NR-FR2-TMs utilize 1 or 2 user PDSCH transmissions distinguished by $n\_{RNTI}$. For each NR-FR2-TM, PRBs are mapped to user ($n\_{RNTI}$) as follows:

Table 4.9.2.3.2-1: Mapping of PRBs to  for NR-FR2-TM

|  |  |  |
| --- | --- | --- |
| Test model |  | Number of users |
| NR-FR2-TM1.1 | 2 for PRBs located in PRB#0-20 for remaining PRBs | 2 |
| NR-FR2-TM2 | 2 for all PRBs | 1 |
| NR-FR2-TM3.1 | 2 for PRBs located in PRB#0-20 for remaining PRBs | 2 |

- Perform user specific scrambling according to TS 38.211 [20], subclause 7.3.1.1.

- $n\_{ID}=N\_{ID}^{cell}$

- Perform modulation of the scrambled bits with the modulation scheme defined for each user according to TS 38.211 [20], subclause7.3.1.2.

- Perform mapping of the complex-valued symbols to layer according to TS 38.211 [20], subclause 7.3.1.3.   Complex-valued modulation symbols  for codeword $q$ shall be mapped onto the layers ,  where $υ$ is equal to 1.

- Perform PDSCH mapping type A according to TS 38.211 [20].

- PDSCH resource allocation according to TS 38.214 [21] as following;

- NR-FR2-TM1.1, NR-FR2-TM3.1: type 1 for PDSCH with *n*RNTI = 0, *n*RNTI = 2

- NR-FR2-TM2: type 1 for PDSCH with *n*RNTI = 2

- DM-RS sequence generation according to TS 38.211 [20], subclause 7.4.1.1.1 where *l* is the OFDM symbol number within the slot with symbols indicated by table 4.9.2.2-3.

- $N\_{ID}^{n\_{SCID}}=N\_{ID}^{cell}$

- $n\_{SCID}=0$

- DM-RS mapping according to TS 38.211 [20], subclause 7.4.1.1.2 with parameters listed in table 4.9.2.2-3.

- For NR-FR2-TM PT-RS sequence generation according to TS 38.211 [20], subclause 7.4.1.2.1, with parameters listed in table 4.9.2.2-3.

- For NR-FR2-TM PT-RS mapping according to TS 38.211 [20], subclause 7.4.1.2.2, with parameters listed in table 4.9.2.2-3.

##### [End of changes]