**3GPP TSG-RAN WG4 Meeting #97-e *R4-2017352***

**Electronic Meeting, 2nd – 13th November, 2020**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **DraftCR** | **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 |  | Core Network |  |

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| ***Title:*** | Draft Big CR38133 - Introduction of Rel-16 NR-U RRM performance requirements | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_unlic-Perf | | | | |  | ***Date:*** | | | 2020-10-23 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | No NR-U measurement accuracy requirements and no NR-U test cases are currently specified | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Change #1, #3:   * R4-2017091, Measurement accuracy requirements for NR-U, Ericsson   Change #2:   * R4-2017092, NR-U test cases structure, Ericsson | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | No NR-U measurement accuracy requirements and no NR-U test cases will be specified | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | New clauses:  10.1.27, 10.1.28, 10.1.29, 10.1.30, 10.1.31, 10.1.32, 10.1.33, 10.1.34, 10.1.35;  A.9, A.9.1, A.9.2, A.9.3;  A.10, A.10.1, A.10.2, A.10.3, A.10.4, A.10.5;  A.11, A.11.1, A.11.2, A.11.3, A.11.4, A.11.5, A.11.6;  A.12, A.12.1, A.12.2, A.12.3, A.12.4, A.12.5;  B.2.8, B.2.9, B.2.10, B.2.10.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS 38.533 | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**--- start of change 1 ---**

### 10.1.27 Intra-frequency RSRP accuracy requirements under CCA

#### 10.1.27.1 Intra-frequency SS-RSRP accuracy requirements in FR1

##### 10.1.27.1.1 Absolute SS-RSRP Accuracy

Unless otherwise specified, the requirements for absolute accuracy of SS-RSRP in this clause apply to a cell on the same frequency as that of the serving cell under CCA.

The accuracy requirements in Table 10.1.27.1.1-1 are valid under the following conditions:

- Conditions defined in clause TBD of TS 38.101-1 [18] for reference sensitivity are fulfilled.

- Conditions for intra-frequency measurements are fulfilled according to Annex B.2.8 for a corresponding Band for each relevant SSB.

Table 10.1.27.1.1-1: SS-RSRP intra-frequency absolute accuracy

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Accuracy | | Conditions | | | | | |
| Normal condition | Extreme condition | SSB Ês/Iot | Io Note 1 range | | | | |
|  |  |  | NR operating band groups Note 2 | Minimum Io | | | Maximum Io |
| dB | dB | dB |  | dBm / SCSSSB | | dBm/BWChannel | dBm/BWChannel |
|  |  |  |  | SCSSSB = 15 kHz | SCSSSB = 30 kHz |  |  |
| ±4.5 | ±9 | ≥-6 | NR\_TDD\_FR1\_I | TBD | TBD | N/A | -70 |
| ±8 | ±11 | ≥-6 | NR\_TDD\_FR1\_I | N/A | N/A | -70 | -50 |
| NOTE 1: Io is assumed to have constant EPRE across the bandwidth.  NOTE 2: NR operating band groups are as defined in clause 3.5.2. | | | | | | | |

##### 10.1.27.1.2 Relative SS-RSRP Accuracy

The relative accuracy of SS-RSRP is defined as the SS-RSRP measured from one cell compared to the SS-RSRP measured from another cell on the same frequency, or between any two SS-RSRP levels measured on the same cell under CCA.

The accuracy requirements in Table 10.1.27.1.2-1 are valid under the following conditions:

- Conditions defined in clause TBD of TS 38.101-1 [18] for reference sensitivity are fulfilled.

- Conditions for intra-frequency measurements are fulfilled according to Annex B.2.8 for a corresponding Band for each relevant SSB.

Table 10.1.27.1.2-1: SS-RSRP intra-frequency relative accuracy under CCA

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Accuracy | | Conditions | | | | | |
| Normal condition | Extreme condition | SSB Ês/Iot Note 2 | Io Note 1 range | | | | |
|  |  |  | NR operating band groups Note 4 | Minimum Io | | | Maximum Io |
| dB | dB | dB |  | dBm / SCSSSB | | dBm/BWChannel | dBm/BWChannel |
|  |  |  |  | SCSSSB = 15 kHz | SCSSSB = 30 kHz |  |  |
| ±2 | ±3 | ≥-3 | NR\_TDD\_FR1\_I | TBD | TBD | N/A | -50 |
| ±3 | ±3 | ≥-6 | Note 3 | Note 3 | Note 3 | N/A | Note 3 |
| NOTE 1: Io is assumed to have constant EPRE across the bandwidth.  NOTE 2: The parameter SSB Ês/Iot is the minimum SSB Ês/Iot of the pair of cells to which the requirement applies.  NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.  NOTE 4: NR operating band groups are as defined in clause 3.5.2. | | | | | | | |

### 10.1.28 Inter-frequency RSRP accuracy requirements under CCA

#### 10.1.28.1 Inter-frequency SS-RSRP accuracy requirements in FR1

##### 10.1.28.1.1 Absolute Accuracy of SS-RSRP

The requirements for absolute accuracy of SS-RSRP in this clause apply to a cell on a frequency under CCA that has different carrier frequency from the serving cell.

The accuracy requirements in Table 10.1.28.1.1-1 are valid under the following conditions:

- Conditions defined in clause TBD of TS 38.101-1 [18] for reference sensitivity are fulfilled.

- Conditions for inter-frequency measurements are fulfilled according to Annex B.2.9 for a corresponding Band for each relevant SSB.

Table 10.1.28.1.1-1: SS-RSRP inter-frequency absolute accuracy under CCA

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Accuracy | | Conditions | | | | | |
| Normal condition | Extreme condition | SSB Ês/Iot | Io Note 1 range | | | | |
|  |  |  | NR operating band groups Note 2 | Minimum Io | | | Maximum Io |
| dB | dB | dB |  | dBm / SCSSSB | | dBm/BWChannel | dBm/BWChannel |
|  |  |  |  | SCSSSB = 15 kHz | SCSSSB = 30 kHz |  |  |
| ±4.5 | ±9 | ≥-6 | NR\_TDD\_FR1\_I | TBD | TBD | N/A | -70 |
| ±8 | ±11 | ≥-6 | NR\_TDD\_FR1\_I | N/A | N/A | -70 | -50 |
| NOTE 1: Io is assumed to have constant EPRE across the bandwidth.  NOTE 2: NR operating band groups are as defined in clause 3.5.2. | | | | | | | |

##### 10.1.28.1.2 Relative Accuracy of SS-RSRP

The relative accuracy of SS-RSRP in inter frequency case is defined as the RSRP measured from one cell on a frequency compared to the RSRP measured from another cell on a different frequency, with at least one of the two frequencies being under CCA.

The accuracy requirements in Table 10.1.28.1.2-1 are valid under the following conditions:

- Conditions defined in clause TBD of TS 38.101-1 [18] for reference sensitivity are fulfilled.

- Conditions for inter-frequency measurements are fulfilled according to Annex B.2.9 for a corresponding Band for each relevant SSB.

- |SSB\_RP1dBm - SSB\_RP2dBm| ≤ 27 dB

- | Channel 1\_Io ‑Channel 2\_Io | ≤ 20 dB

Table 10.1.28.1.2-1: SS-RSRP inter-frequency relative accuracy under CCA

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Accuracy | | Conditions | | | | | |
| Normal condition | Extreme condition | SSB Ês/Iot Note 2 | Io Note 1 range | | | | |
|  |  |  | NR operating band groups Note 3 | Minimum Io | | | Maximum Io |
| dB | dB | dB |  | dBm / SCSSSB | | dBm/BWChannel | dBm/BWChannel |
|  |  |  |  | SCSSSB = 15 kHz | SCSSSB = 30 kHz |  |  |
| ±4.5 | ±6 | ≥-6 | NR\_TDD\_FR1\_I | TBD | TBD | N/A | -50 |
| NOTE 1: Io is assumed to have constant EPRE across the bandwidth.  NOTE 2: The parameter SSB Ês/Iot is the minimum SSB Ês/Iot of the pair of cells to which the requirement applies.  NOTE 3: NR operating band groups are as defined in clause 3.5.2. | | | | | | | |

### 10.1.29 Intra-frequency RSRQ accuracy requirements under CCA

#### 10.1.29.1 Intra-frequency SS-RSRQ accuracy requirements in FR1

##### 10.1.29.1.1 Absolute SS-RSRQ Accuracy

Unless otherwise specified, the requirements for absolute accuracy of SS-RSRQ in this clause apply to a cell on the same frequency as that of the serving cell under CCA.

The accuracy requirements in Table 10.1.29.1.1-1 are valid under the following conditions:

- Conditions defined in clause TBD of TS 38.101-1 [18] for reference sensitivity are fulfilled.

- Conditions for intra-frequency measurements are fulfilled according to Annex B.2.8 for a corresponding Band for each relevant SSB.

Table 10.1.29.1.1-1: SS-RSRQ intra-frequency absolute accuracy under CCA

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Accuracy | | Conditions | | | | | |
| Normal condition | Extreme condition | SSB Ês/Iot | Io Note 1 range | | | | |
|  |  |  | NR operating band groups Note 3 | Minimum Io | | | Maximum Io |
| dB | dB | dB |  | dBm / SCSSSB | | dBm/BWChannel | dBm/BWChannel |
|  |  |  |  | SCSSSB = 15 kHz | SCSSSB = 30 kHz |  |  |
| ±2.5 | ±4 | ≥-3 | NR\_TDD\_FR1\_I | TBD | TBD | N/A | -50 |
| ±3.5 | ±4 | ≥-6 | Note 2 | Note 2 | Note 2 | Note 2 | Note 2 |
| NOTE 1: Io is assumed to have constant EPRE across the bandwidth.  NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.  NOTE 3: NR operating band groups are as defined in clause 3.5.2. | | | | | | | |

### 10.1.30 Inter-frequency RSRQ accuracy requirements under CCA

#### 10.1.30.1 Inter-frequency SS-RSRQ accuracy requirements in FR1

##### 10.1.30.1.1 Aboslute Accuracy of SS-RSRQ

The requirements for absolute accuracy of SS-RSRQ in this clause apply to a cell on a frequency under CCA that has different carrier frequency from the serving cell.

The accuracy requirements in Table 10.1.30.1.1-1 are valid under the following conditions:

- Conditions defined in clause TBD of TS 38.101-1 [18] for reference sensitivity are fulfilled.

- Conditions for inter-frequency measurements are fulfilled according to Annex B.2.9 for a corresponding Band for each relevant SSB.

Table 10.1.30.1.1-1: SS-RSRQ inter-frequency absolute accuracy under CCA

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Accuracy | | Conditions | | | | | |
| Normal condition | Extreme condition | SSB Ês/Iot | Io Note 1 range | | | | |
|  |  |  | NR operating band groups Note 3 | Minimum Io | | | Maximum Io |
| dB | dB | dB |  | dBm / SCSSSB | | dBm/BWChannel | dBm/BWChannel |
|  |  |  |  | SCSSSB = 15 kHz | SCSSSB = 30 kHz |  |  |
| ±2.5 | ±4 | ≥-3 | NR\_TDD\_FR1\_I | TBD | TBD | N/A | -50 |
| ±3.5 | ±4 | ≥-6 | Note 2 | Note 2 | Note 2 | Note 2 | Note 2 |
| NOTE 1: Io is assumed to have constant EPRE across the bandwidth.  NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.  NOTE 3: NR operating band groups are as defined in clause 3.5.2. | | | | | | | |

##### 10.1.30.1.2 Relative Accuracy of SS-RSRQ

The relative accuracy of SS-RSRQ in inter-frequency case is defined as the RSRQ measured from one cell on a frequency compared to the RSRP measured from another cell on a different frequency, with at least one of the two frequencies being under CCA.

The accuracy requirements in Table 10.1.30.1.2-1 are valid under the following conditions:

- Conditions defined in clause TBD of TS 38.101-1 [18] for reference sensitivity are fulfilled.

- Conditions for inter-frequency measurements are fulfilled according to Annex B.2.9 for a corresponding Band for each relevant SSB.

- |SSB\_RP1dBm - SSB\_RP2dBm| ≤ 27 dB

- | Channel 1\_Io ‑Channel 2\_Io | ≤ 20 dB

Table 10.1.30.1.2-1: SS-RSRQ inter-frequency relative accuracy under CCA

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Accuracy | | Conditions | | | | | |
| Normal condition | Extreme condition | SSB Ês/Iot | Io Note 1 range | | | | |
|  |  | Note 2 | NR operating band groups Note 4 | Minimum Io | | | Maximum Io |
| **dB** | **dB** | **dB** |  | **dBm / SCSSSB** | | **dBm/BWChannel** | **dBm/BWChannel** |
|  |  |  |  | **SCSSSB = 15 kHz** | **SCSSSB = 30 kHz** |  |  |
| ±3 | ±4 | ≥-3 | NR\_TDD\_FR1\_I | TBD | TBD | N/A | -50 |
| ±4 | ±4 | ≥-6 | Note 3 | Note 3 | Note 3 | Note 3 | Note 3 |
| NOTE 1: Io is assumed to have constant EPRE across the bandwidth.  NOTE 2: The parameter SSB Ês/Iot is the minimum SSB Ês/Iot of the pair of cells to which the requirement applies.  NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.  NOTE 4: NR operating band groups are as defined in clause 3.5.2. | | | | | | | |

### 10.1.31 Intra-frequency SINR accuracy requirements under CCA

10.1.31.1 Intra-frequency SS-SINR accuracy requirements in FR1

10.1.31.1.1 Absolute SS-SINR Accuracy

Unless otherwise specified, the requirements for absolute accuracy of SS-SINR in this clause apply to a cell on the same frequency as that of the serving cell under CCA.

The accuracy requirements in Table 10.1.31.1.1-1 are valid under the following conditions:

- Conditions defined in clause TBD of TS 38.101-1 [18] for reference sensitivity are fulfilled.

- Conditions for intra-frequency measurements are fulfilled according to Annex B.2.8 for a corresponding Band.

Table 10.1.31.1.1-1: SS-SINR intra-frequency absolute accuracy under CCA

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Accuracy | | Conditions | | | | | |
| Normal condition | Extreme condition | SSB Ês/Iot | Io Note 1 range | | | | |
|  |  | Note 3 | NR operating band groups Note 4 | Minimum Io | | | Maximum Io |
| dB | dB | dB |  | dBm / SCSSSB | | dBm/BWChannel | dBm/BWChannel |
|  |  |  |  | SCSSSB = 15 kHz | SCSSSB = 30 kHz |  |  |
| ±3.0 | ±4 | ≥-3 | NR\_TDD\_FR1\_I | TBD | TBD | N/A | -50 |
| ±3.5 | ±4 | ≥-6 | Note 2 | Note 2 | Note 2 | Note 2 | Note 2 |
| NOTE 1: Io is assumed to have constant EPRE across the bandwidth.  NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.  NOTE 3: The requirements apply for SSB Ês/Iot ≤ 25 dB.  NOTE 4: NR operating band groups are as defined in clause 3.5.2. | | | | | | | |

### 10.1.32 Inter-frequency SINR accuracy requirements under CCA

10.1.32.1 Inter-frequency SS-SINR accuracy requirements in FR1

10.1.32.1.1 Aboslute Accuracy of SS-SINR

The requirements for absolute accuracy of SS-SINR in this clause apply to a cell on a frequency under CCA that has different carrier frequency from the serving cell.

The accuracy requirements in Table 10.1.32.1.1-1 are valid under the following conditions:

- Conditions defined in clause TBD of TS 38.101-1 [18] for reference sensitivity are fulfilled.

- Conditions for inter-frequency measurements are fulfilled according to Annex B.2.9 for a corresponding Band.

Table 10.1.32.1.1-1: SS-SINR inter-frequency absolute accuracy under CCA

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Accuracy | | Conditions | | | | | |
| Normal condition | Extreme condition | SSB Ês/Iot Note 3 | Io Note 1 range | | | | |
|  |  | NR operating band groups Note 4 | Minimum Io | | | Maximum Io |
| dB | dB | dB |  | dBm / SCSSSB | | dBm/BWChannel | dBm/BWChannel |
|  |  |  |  | SCSSSB = 15 kHz | SCSSSB = 30 kHz |  |  |
| ±3.0 | ±4 | ≥-3 | NR\_TDD\_FR1\_I | TBD | TBD | N/A | -50 |
| ±3.5 | ±4 | ≥-6 | Note 2 | Note 2 | Note 2 | Note 2 | Note 2 |
| NOTE 1: Io is assumed to have constant EPRE across the bandwidth.  NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.  NOTE 3: The requirements apply for SSB Ês/Iot ≤ 25 dB.  NOTE 4: NR operating band groups are as defined in clause 3.5.2. | | | | | | | |

10.1.32.1.2 Relative Accuracy of SS-SINR

The relative accuracy of SS-SINR in inter frequency case is defined as the SS-SINR measured from one cell on a frequency compared to the SS-SINR measured from another cell on a different frequency, with at least one of the two frequencies being under CCA.

The accuracy requirements in Table 10.1.32.1.2-1 are valid under the following conditions:

- Conditions defined in clause TBD of TS 38.101-1 [18] for reference sensitivity are fulfilled.

- Conditions for inter-frequency measurements are fulfilled according to Annex B.2.9 for a corresponding Band.

- |SSB\_RP1dBm - SSB\_RP2dBm| ≤ 27 dB

- | Channel 1\_Io ‑Channel 2\_Io | ≤ 20 dB

Table 10.1.32.1.2-1: SS-SINR inter-frequency relative accuracy under CCA

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Accuracy | | Conditions | | | | | |
| Normal condition | Extreme condition | SSB Ês/Iot | Io Note 1 range | | | | |
|  |  | Note 2,4 | NR operating band groups Note 5 | Minimum Io | | | Maximum Io |
| dB | dB | dB |  | dBm / SCSSSB | | dBm/BWChannel | dBm/BWChannel |
|  |  |  |  | SCSSSB = 120 kHz | SCSSSB = 240 kHz |  |  |
| ±3.5 | ±4 | ≥-3 | NR\_TDD\_FR1\_I | TBD | TBD | N/A | -50 |
| ±4 | ±4 | ≥-6 | Note 3 | Note 3 | Note 3 | Note 3 | Note 3 |
| NOTE 1: Io is assumed to have constant EPRE across the bandwidth.  NOTE 2: The parameter SSB Ês/Iot is the minimum SSB Ês/Iot of the pair of cells to which the requirement applies.  NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.  NOTE 4: The requirements apply for SSB Ês/Iot ≤ 25 dB.  NOTE 5: NR operating band groups are as defined in clause 3.5.2. | | | | | | | |

### 10.1.33 L1-RSRP accuracy requirements under CCA

10.1.33.1 SSB based L1-RSRP accuracy requirements in FR1

10.1.33.1.1 Absolute Accuracy

Unless otherwise specified, the requirements for absolute accuracy of SSB based L1-RSRP in this clause apply to all SSBs of the serving cell configured for L1-RSRP measurement under CCA.

The accuracy requirements in Table 10.1.33.1.1-1 are valid under the following conditions:

- Conditions defined in clause TBD of TS 38.101-1 [18] for reference sensitivity are fulfilled.

- Conditions for L1-RSRP measurements are fulfilled according to Annex B.2.10.1 for a corresponding Band for each relevant SSB.

Table 10.1.33.1.1-1: SSB based L1-RSRP absolute accuracy under CCA

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Accuracy | | Conditions | | | | | |
| Normal condition | Extreme condition | SSB Ês/Iot | Io Note 1 range | | | | |
|  |  |  | NR operating band groups Note 2 | Minimum Io | | | Maximum Io |
| dB | dB | dB |  | dBm / SCSSSB | | dBm/BWChannel | dBm/BWChannel |
|  |  |  |  | SCSSSB = 15 kHz | SCSSSB = 30 kHz |  |  |
| ±5.0 | ±9.5 | ≥-3 | NR\_TDD\_FR1\_I | TBD | TBD | N/A | -70 |
| ±8.5 | ±11.5 | ≥-3 | NR\_TDD\_FR1\_I | N/A | N/A | -70 | -50 |
| NOTE 1: Io is assumed to have constant EPRE across the bandwidth.  NOTE 2: NR operating band groups are as defined in clause 3.5.2. | | | | | | | |

10.1.33.1.2 Relative Accuracy

The relative accuracy of SSB based L1-RSRP is defined as the L1-RSRP measured from one SSB compared to the largest measured value of L1-RSRP among all SSBs of the serving cell under CCA.

The accuracy requirements in Table 10.1.33.1.2-1 are valid under the following conditions:

- Conditions defined in clause TBD of TS 38.101-1 [18] for reference sensitivity are fulfilled.

- Conditions for L1-RSRP measurements are fulfilled according to Annex B.2.10.1 for a corresponding Band for each relevant SSB.

Table 10.1.33.1.2-1: SSB based L1-RSRP relative accuracy under CCA

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Accuracy | | Conditions | | | | | |
| Normal condition | Extreme condition | SSB Ês/Iot Note 2 | Io Note 1 range | | | | |
|  |  |  | NR operating band groups Note 3 | Minimum Io | | | Maximum Io |
| dB | dB | dB |  | dBm / SCSSSB | | dBm/BWChannel | dBm/BWChannel |
|  |  |  |  | SCSSSB = 15 kHz | SCSSSB = 30 kHz |  |  |
| ±3 | ±4 | ≥-3 | NR\_TDD\_FR1\_I | TBD | TBD | N/A | -50 |
| NOTE 1: Io is assumed to have constant EPRE across the bandwidth.  NOTE 2: The parameter SSB Ês/Iot is the minimum SSB Ês/Iot of the pair of SSBs to which the requirement applies.  NOTE 3: NR operating band groups are as defined in clause 3.5.2. | | | | | | | |

### 10.1.34 RSSI measurements under CCA

#### 10.1.34.1 Intra-frequency absolute RSSI measurement accuracy requirements in FR1

The accuracy requirements for intra-frequency RSSI measurements on a carrier frequency under CCA are specified in Table 10.1.34.1-1. The requirements apply for any configured RSSI *measDuration* [2], provided that:

- All symbols duing each RSSI measurement duration are available for RSSI sampling within the same reporting interval.

Table 10.1.34.1-1: Intra-frequency RSSI accuracy under CCA

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Accuracy | | Conditions | | | | |
| Normal condition | Extreme condition | Io Note 1 range | | | | |
|  |  | NR operating band groups Note 2 | Minimum Io | | | Maximum Io |
| dB | dB |  | dBm / SCSSSB | | dBm/BWChannel | dBm/BWChannel |
|  |  |  | SCSSSB = 15 kHz | SCSSSB = 30 kHz |  |  |
| [±3.5] | [±6.5] | NR\_TDD\_FR1\_I | TBD | TBD | N/A | -70 |
| [±5.5] | [±8.5] | NR\_TDD\_FR1\_I | N/A | N/A | -70 | -50 |
| NOTE 1: Io is assumed to have constant EPRE across the bandwidth.  NOTE 2: NR operating band groups are as defined in clause 3.5.2. | | | | | | |

#### 10.1.34.2 Inter-frequency absolute RSSI measurement accuracy requirements in FR1

The accuracy requirements for inter-frequency RSSI measurements on a carrier frequency under CCA are the same as specified in clause 10.1.34.1.

#### 10.1.34.3 RSSI measurement report mapping

The reporting range of RSSI measurement is defined from -100 dBm to -25 dBm with 1 dBm resolution.

The mapping of the measured quantity is defined in Table 10.1.34.3-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 10.1.34.3-1: RSSI measurement report mapping

|  |  |  |
| --- | --- | --- |
| Reported value | Measured quantity value | Unit |
| RSSI\_00 | RSSI < ‑100 | dBm |
| RSSI\_01 | -100 ≤ RSSI < ‑99 | dBm |
| RSSI\_02 | -99 ≤ RSSI < ‑98 | dBm |
| … | … | … |
| RSSI\_74 | -27 ≤ RSSI < -26 | dBm |
| RSSI\_75 | -26 ≤ RSSI < -25 | dBm |
| RSSI\_76 | -25 ≤ RSSI | dBm |

### 10.1.35 Channel occupancy measurements under CCA

#### 10.1.35.1 Intra-frequency channel occupancy measurement accuracy requirements in FR1

The UE shall be able to correctly evaluate the intra-frequency channel occupancy configured according to 38.331 [2], provided that the following conditions are met:

- All symbols during each RSSI measurement duration are available for RSSI sampling within the same reporting interval,

- RSSI at the UE receiver meets the following condition with respect to the configured *channelOccupancyThreshold* [2]:

RSSI at the UE receiver is below *channelOccupancyThreshold*-, or

RSSI at the UE receiver is above *channelOccupancyThreshold*+,

where  is the applicable RSSI measurement accuracy value from the RSSI measurement accuracy requirements specified in clause 10.1.34.1.

#### 10.1.35.2 Inter-frequency channel occupancy measurement accuracy requirements in FR1

The UE shall be able to correctly evaluate the inter-frequency channel occupancy configured according to 38.331 [2], provided that the following conditions are met:

- All symbols during each RSSI measurement duration are available for RSSI sampling within the same reporting interval,

- RSSI at the UE receiver meets the following condition with respect to the configured *channelOccupancyThreshold* [2]:

RSSI at the UE receiver is below *channelOccupancyThreshold*-, or

RSSI at the UE receiver is above *channelOccupancyThreshold*+,

where  is the applicable RSSI measurement accuracy value from the RSSI measurement accuracy requirements specified in clause 10.1.34.2.

**--- end of change 1 ---**

**--- start of change 2 ---**

# A.9 NR Standalone Tests with SCell under CCA and PCell in FR1

## A.9.1 Signalling characteristics

## A.9.2 Measurement procedure

## A.9.3 Measurement performance

# A.10 EN-DC Tests with NR PSCell under CCA

## A.10.1 RRC\_CONNECTED state mobility

## A.10.2 Timing

## A.10.3 Signalling characteristics

## A.10.4 Measurement procedure

## A.10.5 Measurement performance

# A.11 NR-U Standalone Tests with NR PCell under CCA

## A.11.1 RRC\_IDLE state mobility

## A.11.2 RRC\_CONNECTED state mobility

## A.11.3 Timing

## A.11.4 Signalling caharacteristics

## A.11.5 Measurement procedure

## A.11.6 Measurement performance

# A.12 E-UTRA Standalone Tests with NR-U cells

## A.12.1 RRC\_IDLE state mobility

## A.12.2 RRC\_CONNECTED state mobility

## A.12.3 Signalling caharacteristics

## A.12.4 Measurement procedure

## A.12.5 Measurement performance

**--- end of change 2 ---**

**--- start of change 3 ---**

## B.2.8 Conditions for NR intra-frequency measurements under CCA

This clause defines the following conditions for NR intra-frequency measurements unde CCA and corresponding procedures performed based on SSBs: SSB\_RP and SSB Ês/Iot, applicable for a corresponding operating band.

The conditions are defined in Table B.2.8-1 for NR cells under CCA.

Table B.2.8-1: Conditions for intra-frequency measurements under CCA

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | NR operating band groups Note1 | Minimum SSB\_RP | | SSB Ês/Iot |
| dBm / SCSSSB | | dB |
| SCSSSB = 15 kHz | SCSSSB = 30 kHz |
| Conditions | NR\_TDD\_FR1\_I | TBD | TBD | ≥ -6 |
| NOTE 1: NR operating band groups are as defined in clause 3.5.2. | | | | |

## B.2.9 Conditions for NR inter-frequency measurements under CCA

This clause defines the following conditions for NR inter-frequency measurements and corresponding procedures performed based on SSBs: SSB\_RP and SSB Ês/Iot, applicable for a corresponding operating band.

The conditions are defined in Table B.2.9-1 for NR cells under CCA.

Table B.2.9-1: Conditions for inter-frequency measurements under CCA

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | NR operating band groups Note1 | Minimum SSB\_RP | | SSB Ês/Iot |
| dBm / SCSSSB | | dB |
| SCSSSB = 15 kHz | SCSSSB = 30 kHz |
| Conditions | NR\_TDD\_FR1\_I | TBD | TBD | ≥ -4 |
| NOTE 1: NR operating band groups are as defined in clause 3.5.2. | | | | |

## B.2.10 Conditions for NR L1-RSRP reporting under CCA

### B.2.10.1 Conditions for SSB based L1-RSRP reporting

This clause defines the following conditions for NR L1-RSRP measurement reporting and corresponding procedures performed based on SSBs under CCA: SSB\_RP and SSB Ês/Iot, applicable for a corresponding operating band.

The conditions are defined in Table B.2.10.1-1 for NR cells under CCA.

Table B.2.10.1-1: Conditions for SSB based L1-RSRP measurements under CCA

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | NR operating band groups Note1 | Minimum SSB\_RP | | SSB Ês/Iot |
| dBm / SCSSSB | | dB |
| SCSSSB = 15 kHz | SCSSSB = 30 kHz |
| Conditions | NR\_TDD\_FR1\_I | TBD | TBD | ≥ -3 |
| NOTE 1: NR operating band groups are defined in clause 3.5.2. | | | | |

**--- end of change 3 ---**