**3GPP TSG- Meeting #112**

**Maastricht, Netherlands, August, 19 -**

|  |
| --- |
| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **38.133** | **CR** | **Draft** | **rev** | **-** | **Current version:** | **18.6.0** |  |
|  |
| *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 | **X** | Radio Access Network |  | Core Network |  |

|  |
| --- |
|  |
| ***Title:***  | Performance requirements for DL RSCPD and DL RSCP |
|  |  |
| ***Source to WG:*** | Nokia |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** | NR\_pos\_enh2-Perf |  | ***Date:*** | 2024-08-21 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** |  |
|  | *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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | Performance requirements for DL RSCPD are still missing in TS 38.133. |
|  |  |
| ***Summary of change:*** | 1. In subclause 10.1.43 performance requirements for the DL RSCPD measurement are introduced.
2. In subclause 10.1.44 performance requirements for the DL RSCP measurement are introduced
 |
|  |  |
| ***Consequences if not approved:*** | Missing performance requirements for NR CPP in TS 38.133.  |
|  |  |
| ***Clauses affected:*** | 10.1.43, 10.1.43.1, 10.1.43.2, 10.1.43.3, 10.1.44, 10.1.44.1, 10.1.44.2, 10.1.44.3  |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** | **X** |  |  Test specifications | TS 38.533 |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | None. |
|  |  |
| ***This CR's revision history:*** |  |

**--- Start of change 1 ---**

### 10.1.43 DL RSCPD Measurement

#### 10.1.43.1 Introduction

The requirements in Clause 10.1.43 shall apply, provided the UE has received *NR-DL-TDOA-RequestLocationInformation* message with *nr-DL-PRS-RSCPD-Request* from LMF via LPP [34] requesting the UE to measure and report DL RSCPD measurement together with DL RSTD measurements defined in TS 38.215 [4]. The requirements in Clause 10.1.43 shall apply:

- when UE is in RRC\_CONNECTED state and the measurement is performed with MG,

- when UE is in RRC\_IDLE or RRC\_INACTIVE state.

#### 10.1.43.2 Measurement Accuracy Requirements

The accuracy requirements for DL RSCPD measurement are based on single measurement sample in single PFL and shall be within ±(X+Y) degree.

The accuracy requirements for DL RSTD are contained in clause 10.1.23.2.

The requirements in this clause are derived based on AWGN channel and based on two-tap channel defined in 38.101-4 Annex B.2.4 (a = 1, τd=0.45 µs and fD=5 Hz).

X is defined in Tables 10.1.43.2-1 for AWGN channel for FR1, provided that the following conditions are met.

- Conditions defined in clause 7.3 of TS 38.101-1 [18] for reference sensitivity are fulfilled.

- Conditions for DL RSTD measurements are fulfilled according to Annex B.2.14 for a corresponding Band for each relevant PRS resource configured for measurement.

- UE does not perform DL RSTD measurement with reduced number of samples.

X is defined in Tables 10.1.43.2-2 for AWGN channel and Table 10.1.43.2-3 for two-tap channel for FR1, provided that the following conditions are met.

- Conditions defined in clause 7.3 of TS 38.101-1 [18] for reference sensitivity are fulfilled.

- Conditions for DL RSTD measurements are fulfilled according to Annex B.2.14 for a corresponding Band for each relevant PRS resource configured for measurement.

- UE performs DL RSTD measurement with reduced number of samples.

X is defined in Table 10.1.43.2-4 for AWGN channel for FR2, provided that the following conditions are met.

- Conditions defined in clause 7.3 of TS 38.101-2 [19] for reference sensitivity are fulfilled.

- Conditions for DL RSTD measurements are fulfilled according to Annex B.2.14 for a corresponding Band for each relevant PRS resource configured for measurement.

- UE does not perform DL RSTD measurement with reduced number of samples.

X is defined in Tables 10.1.43.2-5 for AWGN channel and Table 10.1.43.2-6 for two-tap channel for FR2, provided that the following conditions are met.

- Conditions defined in clause 7.3 of TS 38.101-2 [19] for reference sensitivity are fulfilled.

- Conditions for DL RSTD measurements are fulfilled according to Annex B.2.14 for a corresponding Band for each relevant PRS resource configured for measurement.

- UE performs DL RSTD measurement with reduced number of samples.

Y is defined in Table 10.1.43.2-7 for FR1 and Table 10.1.43.2-8 for FR2, respectively and specifies the margin caused by impairments.

Table 10.1.43.2-1: DL RSCPD absolute accuracy in FR1 for AWGN channel

|  |  |
| --- | --- |
| Accuracy | Conditions |
| PRS Ês/Iot | PRS SCS | PRS bandwidthNote 1 | PRS resource repetition ()Note 2 | Io Note 3 range |
| NR operating band groups Note 4 | Minimum Io  | Maximum Io |
| degree | dB | kHz | RB |  |  | dBm/SCS | dBm/BWChannel |
| [18] | (PRS Ês/Iot)ref ≥ -6dB (PRS Ês/Iot)*i* ≥ -13dB | 15 | ≥ 24 | ≥ 4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -127 | -50 |
| NR\_FDD\_FR1\_B | -126.5 | -50 |
| NR\_TDD\_FR1\_C | -126 | -50 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -125.5 | -50 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -125 | -50 |
| NR\_FDD\_FR1\_F | -124.5 | -50 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -124 | -50 |
| NR\_FDD\_FR1\_H | -123.5 | -50 |
|  |  |  | NR\_FDD\_FR1\_N | -120.5 | -50 |
| [11] | ≥ 52 | ≥ 1 | Note 5 | Note 5 | Note 5 |
| [9] | ≥ 104 | ≥ 1 | Note 5 | Note 5 | Note 5 |
| [17] | 30  | ≥ 24 | ≥ 4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -124 | -50 |
| NR\_FDD\_FR1\_B | -123.5 | -50 |
| NR\_TDD\_FR1\_C | -123 | -50 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -122.5 | -50 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -122 | -50 |
| NR\_FDD\_FR1\_F | -121.5 | -50 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -121 | -50 |
| NR\_FDD\_FR1\_H | -120.5 | -50 |
|  |  |  | NR\_FDD\_FR1\_N | -117.5 | -50 |
| [12] | ≥ 48 | ≥ 1 | Note 5 | Note 5 | Note 5 |
|  |  |  |  |  |  |
| [18] | 60 | ≥ 24 | ≥ 4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -121 | -50 |
| NR\_FDD\_FR1\_B | -120.5 | -50 |
| NR\_TDD\_FR1\_C | -120 | -50 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -119.5 | -50 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -119 | -50 |
| NR\_FDD\_FR1\_F | -118.5 | -50 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -118 | -50 |
| NR\_FDD\_FR1\_H | -117.5 | -50 |
|  |  |  | NR\_FDD\_FR1\_N | -114.5 | -50 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| NOTE 1: Minimum PRS bandwidth, which is minimum of the PRS bandwidths of the reference resource and the measured neighbour resource i.NOTE 2: Minimum number of PRS resource repetitions among the reference resource and the measured neighbour resource i. are configured by higher layer parameter *dl-PRS-ResourceRepetitionFactor, dl-PRS-NumSymbols and dl-PRS-CombSizeN*defined in TS 37.355 [34], respectively.NOTE 3: Io is assumed to have constant EPRE across the bandwidth.NOTE 4: NR operating band groups in FR1 are as defined in clause 3.5.2.NOTE 5: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding requirement with the PRS bandwidth of the smallest RB number for the corresponding SCS. |

Table 10.1.43.2-2: DL RSCPD absolute accuracy in FR1 for AWGN channel with reduced number of samples for DL RSTD

|  |  |
| --- | --- |
| Accuracy | Conditions |
| PRS Ês/Iot | PRS SCS | PRS bandwidthNote 1 | PRS resource repetition ()Note 2 | Io Note 3 range |
| NR operating band groups Note 4 | Minimum Io  | Maximum Io |
| degree | dB | kHz | RB |  |  | dBm/SCS | dBm/BWChannel |
| [5] | (PRS Ês/Iot)ref ≥ -3dB (PRS Ês/Iot)*i* ≥ -6dB | 15 | ≥ 24 | ≥ 4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -127 | -50 |
| NR\_FDD\_FR1\_B | -126.5 | -50 |
| NR\_TDD\_FR1\_C | -126 | -50 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -125.5 | -50 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -125 | -50 |
| NR\_FDD\_FR1\_F | -124.5 | -50 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -124 | -50 |
| NR\_FDD\_FR1\_H | -123.5 | -50 |
| NR\_FDD\_FR1\_N | -120.5 | -50 |
| [5] | ≥ 52 | ≥ 1 | Note 5 | Note 5 | Note 5 |
| [5] | ≥ 104 | ≥ 1 | Note 5 | Note 5 | Note 5 |
| [5] | 30  | ≥ 24 | ≥ 4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -124 | -50 |
| NR\_FDD\_FR1\_B | -123.5 | -50 |
| NR\_TDD\_FR1\_C | -123 | -50 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -122.5 | -50 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -122 | -50 |
| NR\_FDD\_FR1\_F | -121.5 | -50 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -121 | -50 |
| NR\_FDD\_FR1\_H | -120.5 | -50 |
|  |  |  | NR\_FDD\_FR1\_N | -117.5 | -50 |
| [6] | ≥ 48 | ≥ 1 | Note 5 | Note 5 | Note 5 |
|  |  |  |  |  |  |
| [5] | 60 | ≥ 24 | ≥ 4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -121 | -50 |
| NR\_FDD\_FR1\_B | -120.5 | -50 |
| NR\_TDD\_FR1\_C | -120 | -50 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -119.5 | -50 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -119 | -50 |
| NR\_FDD\_FR1\_F | -118.5 | -50 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -118 | -50 |
| NR\_FDD\_FR1\_H | -117.5 | -50 |
|  |  |  | NR\_FDD\_FR1\_N | -114.5 | -50 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| NOTE 1: Minimum PRS bandwidth, which is minimum of the PRS bandwidths of the reference resource and the measured neighbour resource i.NOTE 2: Minimum number of PRS resource repetitions among the reference resource and the measured neighbour resource i. are configured by higher layer parameter *dl-PRS-ResourceRepetitionFactor, dl-PRS-NumSymbols and dl-PRS-CombSizeN*defined in TS 37.355 [34], respectively.NOTE 3: Io is assumed to have constant EPRE across the bandwidth.NOTE 4: NR operating band groups in FR1 are as defined in clause 3.5.2.NOTE 5: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding requirement with the PRS bandwidth of the smallest RB number for the corresponding SCS. |

Table 10.1.43.2-3: DL RSCPD absolute accuracy in FR1 for two-tap channel with reduced number of samples for DL RSTD

|  |  |
| --- | --- |
| Accuracy | Conditions |
| PRS Ês/Iot | PRS SCS | PRS bandwidthNote 1 | PRS resource repetition ()Note 2 | Io Note 3 range |
| NR operating band groups Note 4 | Minimum Io  | Maximum Io |
| degree | dB | kHz | RB |  |  | dBm/SCS | dBm/BWChannel |
| [8] | (PRS Ês/Iot)ref ≥ -3dB (PRS Ês/Iot)*i* ≥ -6dB | 15 | ≥ 24 | ≥ 4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -127 | -50 |
| NR\_FDD\_FR1\_B | -126.5 | -50 |
| NR\_TDD\_FR1\_C | -126 | -50 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -125.5 | -50 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -125 | -50 |
| NR\_FDD\_FR1\_F | -124.5 | -50 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -124 | -50 |
| NR\_FDD\_FR1\_H | -123.5 | -50 |
|  |  |  | NR\_FDD\_FR1\_N | -120.5 | -50 |
| [8] | ≥ 52 | ≥ 1 | Note 5 | Note 5 | Note 5 |
| [5] | ≥ 104 | ≥ 1 | Note 5 | Note 5 | Note 5 |
| [6] | 30  | ≥ 24 | ≥ 4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -124 | -50 |
| NR\_FDD\_FR1\_B | -123.5 | -50 |
| NR\_TDD\_FR1\_C | -123 | -50 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -122.5 | -50 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -122 | -50 |
| NR\_FDD\_FR1\_F | -121.5 | -50 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -121 | -50 |
| NR\_FDD\_FR1\_H | -120.5 | -50 |
|  |  |  | NR\_FDD\_FR1\_N | -117.5 | -50 |
| [8] | ≥ 48 | ≥ 1 | Note 5 | Note 5 | Note 5 |
|  |  |  |  |  |  |
| [6] | 60 | ≥ 24 | ≥ 4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -121 | -50 |
| NR\_FDD\_FR1\_B | -120.5 | -50 |
| NR\_TDD\_FR1\_C | -120 | -50 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -119.5 | -50 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -119 | -50 |
| NR\_FDD\_FR1\_F | -118.5 | -50 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -118 | -50 |
| NR\_FDD\_FR1\_H | -117.5 | -50 |
|  |  |  | NR\_FDD\_FR1\_N | -114.5 | -50 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| NOTE 1: Minimum PRS bandwidth, which is minimum of the PRS bandwidths of the reference resource and the measured neighbour resource i.NOTE 2: Minimum number of PRS resource repetitions among the reference resource and the measured neighbour resource i. are configured by higher layer parameter *dl-PRS-ResourceRepetitionFactor, dl-PRS-NumSymbols and dl-PRS-CombSizeN*defined in TS 37.355 [34], respectively.NOTE 3: Io is assumed to have constant EPRE across the bandwidth.NOTE 4: NR operating band groups in FR1 are as defined in clause 3.5.2.NOTE 5: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding requirement with the PRS bandwidth of the smallest RB number for the corresponding SCS. |

Table 10.1.43.2-4: DL RSCPD absolute accuracy in FR2 for AWGN channel

|  |  |
| --- | --- |
| Accuracy | Conditions |
| PRS Ês/Iot | PRS SCS | PRS bandwidthNote 1 | PRS resource repetition () Note 2 | Io Note 3 range |
| Minimum Io  | Maximum Io |
| degree  | dB | kHz | RB |  | dBm/SCS | dBm/BWChannel |
| [18] | (PRS Ês/Iot)ref ≥-6dB (PRS Ês/Iot)*i* ≥-13dB | 60 | ≥ 24 | ≥ 4 | Same value as PRS\_RP in Table B.2.14-2, according to UE Power class, operating band and angle of arrival | -50 |
| [11] | ≥ 64 | ≥ 1 | Note 4 | Note 4 |
| [9] | ≥ 132 | ≥ 1 | Note 4 | Note 4 |
| [19] | 120 | ≥ 32 | ≥ 4 | Same value as PRS\_RP in Table B.2.14-2, according to UE Power class, operating band and angle of arrival | -50 |
| [12] | ≥ 64 | ≥ 1 | Note 4 | Note 4 |
|  |  |  |  |  |
| NOTE 1: Minimum PRS bandwidth, which is minimum of the PRS bandwidths of the reference resource and the measured neighbour resource i.NOTE 2: Minimum number of PRS resource repetitions among the reference resource and the measured neighbour resource i. are configured by higher layer parameter *dl-PRS-ResourceRepetitionFactor, dl-PRS-NumSymbols and dl-PRS-CombSizeN*defined in TS 37.355 [34], respectively.NOTE 3: Io is assumed to have constant EPRE across the bandwidth.NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding requirement with the PRS bandwidth of the smallest RB number for the corresponding SCS. |

Table 10.1.43.2-5: DL RSCPD absolute accuracy in FR2 for AWGN channel with reduced number of samples for DL RSTD

|  |  |
| --- | --- |
| Accuracy | Conditions |
| PRS Ês/Iot | PRS SCS | PRS bandwidthNote 1 | PRS resource repetition () Note 2 | Io Note 3 range |
| Minimum Io  | Maximum Io |
| degree  | dB | kHz | RB |  | dBm/SCS | dBm/BWChannel |
| [5] | (PRS Ês/Iot)ref ≥-3dB (PRS Ês/Iot)*i* ≥-6dB | 60 | ≥ 24 | ≥ 4 | Same value as PRS\_RP in Table B.2.14-2, according to UE Power class, operating band and angle of arrival | -50 |
| [5] | ≥ 64 | ≥ 1 | Note 4 | Note 4 |
| [5] | ≥ 132 | ≥ 1 | Note 4 | Note 4 |
| [6] | 120 | ≥ 32 | ≥ 4 | Same value as PRS\_RP in Table B.2.14-2, according to UE Power class, operating band and angle of arrival | -50 |
| [6] | ≥ 64 | ≥ 1 | Note 4 | Note 4 |
|  |  |  |  |  |
| NOTE 1: Minimum PRS bandwidth, which is minimum of the PRS bandwidths of the reference resource and the measured neighbour resource i.NOTE 2: Minimum number of PRS resource repetitions among the reference resource and the measured neighbour resource i. are configured by higher layer parameter *dl-PRS-ResourceRepetitionFactor, dl-PRS-NumSymbols and dl-PRS-CombSizeN*defined in TS 37.355 [34], respectively.NOTE 3: Io is assumed to have constant EPRE across the bandwidth.NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding requirement with the PRS bandwidth of the smallest RB number for the corresponding SCS. |

Table 10.1.43.2-6: DL RSCPD absolute accuracy in FR2 for two-tap channel with reduced number of samples for DL RSTD

|  |  |
| --- | --- |
| Accuracy | Conditions |
| PRS Ês/Iot | PRS SCS | PRS bandwidthNote 1 | PRS resource repetition () Note 2 | Io Note 3 range |
| Minimum Io  | Maximum Io |
| degree  | dB | kHz | RB |  | dBm/SCS | dBm/BWChannel |
| [6] | (PRS Ês/Iot)ref ≥-3dB (PRS Ês/Iot)*i* ≥-6dB | 60 | ≥ 24 | ≥ 4 | Same value as PRS\_RP in Table B.2.14-2, according to UE Power class, operating band and angle of arrival | -50 |
| [6] | ≥ 64 | ≥ 1 | Note 4 | Note 4 |
| [4] | ≥ 132 | ≥ 1 | Note 4 | Note 4 |
| [5] | 120 | ≥ 32 | ≥ 4 | Same value as PRS\_RP in Table B.2.14-2, according to UE Power class, operating band and angle of arrival | -50 |
| [4] | ≥ 64 | ≥ 1 | Note 4 | Note 4 |
|  |  |  |  |  |
| NOTE 1: Minimum PRS bandwidth, which is minimum of the PRS bandwidths of the reference resource and the measured neighbour resource i.NOTE 2: Minimum number of PRS resource repetitions among the reference resource and the measured neighbour resource i. are configured by higher layer parameter *dl-PRS-ResourceRepetitionFactor, dl-PRS-NumSymbols and dl-PRS-CombSizeN*defined in TS 37.355 [34], respectively.NOTE 3: Io is assumed to have constant EPRE across the bandwidth.NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding requirement with the PRS bandwidth of the smallest RB number for the corresponding SCS. |

Table 10.1.43.2-7: Margin for DL RSCPD measurement accuracy in FR1

|  |  |
| --- | --- |
| PRS BW (RB number) | Margin (degree) |
| SCS=15kHz | SCS=30kHz | SCS=60kHz |
| ≥ 24 | N/A | N/A | [TBD] |
| ≥ 52 | ≥ 24 | N/A | [TBD] |
| ≥ 104 | ≥ 48 | ≥ 24 | [TBD] |
|  |  |  |  |
|  |  |  |  |

Table 10.1.43.2-8: Margin for DL RSCPD measurement accuracy in FR2

|  |  |
| --- | --- |
| PRS BW (RB number) | Margin (degree) |
| SCS=60kHz | SCS=120kHz |
| ≥ 24 | N/A | [TBD] |
| ≥ 64 | ≥ 32 | [TBD] |
| ≥ 132 | ≥ 64 | [TBD] |
|  |  |  |

#### 10.1.43.3 Report mapping

##### 10.1.43.3.1 Absolute DL RSCPD Measurement Reporting

The reporting range of DL RSCPD, as defined in Clause 5.1.43 of TS 38.215 [4], is defined from -180 degree to +180 degree. The reporting resolution is 0.1 degree.

The mapping of DL RSCPD measured quantity is defined in Table 10.1.43.3.1-1.

Table 10.1.43.3.1-1: DL RSCPD measurement report mapping

|  |  |  |
| --- | --- | --- |
| Reported value | Measured quantity value (DL RSCPD) | Unit |
| DL\_RSCPD\_0 | -180 ≤ DL RSCPD < -179.9 | degree |
| DL\_RSCPD\_1 | -179.9 ≤ DL RSCPD < -179.8 | degree |
| DL\_RSCPD\_2 | -179.8 ≤ DL RSCPD < -179.7 | degree |
| … | … | … |
| DL\_RSCPD\_1798 | -0.2 ≤ DL RSCPD < -0.1 | degree |
| DL\_RSCPD\_1799 | -0.1 ≤ DL RSCPD < 0 | degree |
| DL\_RSCPD\_1800 | 0 ≤ DL RSCPD < 0.1 | degree |
| DL\_RSCPD\_1801 | 0.1 ≤ DL RSCPD < 0.2 | degree |
| DL\_RSCPD\_1802 | 0.2 ≤ DL RSCPD < 0.3 | degree |
| … | … | … |
| DL\_RSCPD\_3598 | 179.8 ≤ DL RSCPD < 179.9 | degree |
| DL\_RSCPD\_3599 | 179.9 ≤ DL RSCPD < 180 | degree |

### 10.1.44 DL RSCP Measurement

#### 10.1.44.1 Introduction

The requirements in Clause 10.1.44 shall apply, provided the UE has received *NR-Multi-RTT-RequestLocationInformation* message with *nr-DL-PRS-RSCP-Request* from LMF via LPP [34] requesting the UE to measure and report DL RSCP measurement together with UE Rx-Tx time difference measurements defined in TS 38.215 [4]. The requirements in Clause 10.1.44 shall apply:

- when UE is in RRC\_CONNECTED state and the measurement is performed with MG,

- when UE is in RRC\_INACTIVE state.

10.1.44.2 Measurement Accuracy Requirements

The relative accuracy of DL RSCP measurement in this clause is defined as accuracy of the difference between two DL RSCP measurements, each based on single measurement sample in single PFL.

The accuracy requirements for UE Rx-Tx are contained in clause 10.1.25.2.

The requirements in this clause are derived based on AWGN channel and based on two-tap channel defined in 38.101-4 Annex B.2.4 (a = 1, τd=0.45 µs and fD=5 Hz).

The DL RSCP relative measurement accuracy requirements in this clause shall not apply, if:

* NTA\_offset defined in Table 7.1.2-2 changes during the DL RSCP with UE Rx-Tx measurement period or
* if the uplink transmission timing changes during the DL RSCP with UE Rx-Tx measurement period due to the network-configured Timing Advance.

The DL RSCP relative measurement accuracy requirements in this clause shall apply provided that:

- The UE transmits SRS within [-160, 160] msec of at least one DL PRS resource of each of the TRPs in the assistance data.

If the uplink transmission timing changes during the DL RSCP with UE Rx-Tx measurement period due to the autonomous timing adjustment defined in clause 7.1.2 then:

- DL RSCP and UE Rx-Tx measurement accuracy requirements shall apply for a cell, which is also the downlink reference cell (defined in section 7.1.1) for SRS transmission.

- UE Rx-Tx measurement accuracy requirements shall not apply for a cell, which is not the downlink reference cell (defined in section 7.1.1) for SRS transmission.

When a serving cell change occurs during the DL RSCP with UE Rx-Tx measurement period, UE Rx-Tx measurement accuracy requirements and DL RSCP measurement requirements do not apply.

The relative accuracy requirements in Table 10.1.44.2-1 for FR1 are valid under the following conditions:

* Conditions defined in clause 7.3 of TS 38.101-1 [18] for reference sensitivity are fulfilled.
* PRP|dBm according to Annex B.2.14 for a corresponding Band.
* UE does not perform UE Rx-Tx measurement with reduced number of samples.
* AWGN propagation condition.

The relative accuracy requirements in Table 10.1.44.2-2 for FR1 are valid under the following conditions:

* Conditions defined in clause 7.3 of TS 38.101-1 [18] for reference sensitivity are fulfilled.
* PRP|dBm according to Annex B.2.14 for a corresponding Band.
* UE performs UE Rx-Tx measurement with reduced number of samples.
* AWGN propagation condition.

The relative accuracy requirements in Table 10.1.44.2-3 for FR1 are valid under the following conditions:

* Conditions defined in clause 7.3 of TS 38.101-1 [18] for reference sensitivity are fulfilled.
* PRP|dBm according to Annex B.2.14 for a corresponding Band.
* UE performs UE Rx-Tx measurement with reduced number of samples.
* Two-tap channel propagation condition.

The relative accuracy requirements in Table 10.1.44.2-4 for FR2 are valid under the following conditions:

* Conditions defined in clause 7.3 of TS 38.101-2 [19] for reference sensitivity are fulfilled.
* PRP|dBm according to Annex B.2.14 for a corresponding Band.
* UE does not perform UE Rx-Tx measurement with reduced number of samples.
* AWGN propagation condition.

The relative accuracy requirements in Table 10.1.44.2-5 for FR2 are valid under the following conditions:

* Conditions defined in clause 7.3 of TS 38.101-2 [19] for reference sensitivity are fulfilled.
* PRP|dBm according to Annex B.2.14 for a corresponding Band.
* UE performs UE Rx-Tx measurement with reduced number of samples.
* AWGN propagation condition.

The relative accuracy requirements in Table 10.1.44.2-6 for FR2 are valid under the following conditions:

* Conditions defined in clause 7.3 of TS 38.101-2 [19] for reference sensitivity are fulfilled.
* PRP|dBm according to Annex B.2.14 for a corresponding Band.
* UE performs UE Rx-Tx measurement with reduced number of samples.
* Two-tap channel propagation condition.

**Table 10.1.44.2-1: DL RSCP relative measurement accuracy in FR1 in AWGN**

|  |  |
| --- | --- |
| **Accuracy** | **Conditions** |
| **PRS Ês/Iot** | **Minimum PRS bandwidth** | **PRS SCS** | **PRS resource repetition Note 3** | **NR operating band groupsNote 2** | **IoNote 4 range** |
| **MinimumIoNote 1** | **MaximumIo** |
| **degree** | **dB** | **RB** | **kHz** |  |  | **dBm / SCSPRS** | **dBm/BW** |
| [15]+δ | (PRS Ês/Iot)ref ≥ -3dB (PRS Ês/Iot)*i* ≥ -13dB | ≥24 | 15 | ≥4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -127 | -50 |
| NR\_FDD\_FR1\_B | -126.5 |
| NR\_TDD\_FR1\_C | -126 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -125.5 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -125 |
| NR\_FDD\_FR1\_F | -124.5 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -124 |
| NR\_FDD\_FR1\_H | -123.5 |
|  |  | NR\_FDD\_FR1\_N | -120.5 |  |
| [9]+δ | ≥52 | ≥1 | Note 5 | Note 5 | Note 5 |
| [7]+δ | >104 | ≥1 | Note 5 | Note 5 | Note 5 |
| [15]+δ | ≥24 | 30 | ≥4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -124 | -50 |
| NR\_FDD\_FR1\_B | -123.5 |
| NR\_TDD\_FR1\_C | -123 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -122.5 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -122 |
| NR\_FDD\_FR1\_F | -121.5 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -121 |
| NR\_FDD\_FR1\_H | -120.5 |
| NR\_FDD\_FR1\_N | -117.5 |
| [10]+δ | ≥48 | ≥1 | Note 5 | Note 5 | Note 5 |
|  |  |  |  |  |  |
| [18]+δ | ≥24 | 60 | ≥4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -121 | -50 |
| NR\_FDD\_FR1\_B | -120.5 |
| NR\_TDD\_FR1\_C | -120 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -119.5 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -119 |
| NR\_FDD\_FR1\_F | -118.5 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -118 |
| NR\_FDD\_FR1\_H | -117.5 |
| NR\_FDD\_FR1\_N | -114.5 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in an OFDM symbol.NOTE 2: NR operating band groups are as defined in Section 3.5.NOTE 3: are configured by higher layer parameter *dl-PRS-ResourceRepetitionFactor, dl-PRS-NumSymbols and dl-PRS-CombSizeN*defined in TS 37.355 [34].NOTE 4: The Io is defined in PRS slots. The same Io range applies to PRS and non-PRS symbols. Io levels are different in PRS and non-PRS symbols within the same slot.NOTE 5: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding requirement with the PRS bandwidth of the smallest RB number for the corresponding SCS.NOTE 6: δ is the margin determined from Table 10.1.44.2-7. |

Table 10.1.44.2-2: DL RSCP relative measurement accuracy in FR1 in AWGN with reduced number of samples for UE Rx-Tx time difference

|  |  |
| --- | --- |
| **Accuracy** | **Conditions** |
| **PRS Ês/Iot** | **Minimum PRS bandwidth** | **PRS SCS** | **PRS resource repetition Note 3** | **NR operating band groupsNote 2** | **IoNote 4 range** |
| **MinimumIoNote 1** | **MaximumIo** |
| **degree** | **dB** | **RB** | **kHz** |  |  | **dBm / SCSPRS** | **dBm/BW** |
| [4]+δ | (PRS Ês/Iot)ref ≥ 0dB (PRS Ês/Iot)*i* ≥ -6dB | ≥24 | 15 | ≥4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -127 | -50 |
| NR\_FDD\_FR1\_B | -126.5 |
| NR\_TDD\_FR1\_C | -126 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -125.5 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -125 |
| NR\_FDD\_FR1\_F | -124.5 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -124 |
| NR\_FDD\_FR1\_H | -123.5 |
|  |  | NR\_FDD\_FR1\_N | -120.5 |  |
| [4]+δ | ≥52 | ≥1 | Note 5 | Note 5 | Note 5 |
| [3]+δ | >104 | ≥1 | Note 5 | Note 5 | Note 5 |
| [5]+δ | ≥24 | 30 | ≥4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -124 | -50 |
| NR\_FDD\_FR1\_B | -123.5 |
| NR\_TDD\_FR1\_C | -123 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -122.5 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -122 |
| NR\_FDD\_FR1\_F | -121.5 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -121 |
| NR\_FDD\_FR1\_H | -120.5 |
| NR\_FDD\_FR1\_N | -117.5 |
| [3]+δ | ≥48 | ≥1 | Note 5 | Note 5 | Note 5 |
| [5]+δ | ≥24 | 60 | ≥4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -121 | -50 |
| NR\_FDD\_FR1\_B | -120.5 |
| NR\_TDD\_FR1\_C | -120 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -119.5 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -119 |
| NR\_FDD\_FR1\_F | -118.5 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -118 |
| NR\_FDD\_FR1\_H | -117.5 |
| NR\_FDD\_FR1\_N | -114.5 |
| NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in an OFDM symbol.NOTE 2: NR operating band groups are as defined in Section 3.5.NOTE 3: are configured by higher layer parameter *dl-PRS-ResourceRepetitionFactor, dl-PRS-NumSymbols and dl-PRS-CombSizeN*defined in TS 37.355 [34].NOTE 4: The Io is defined in PRS slots. The same Io range applies to PRS and non-PRS symbols. Io levels are different in PRS and non-PRS symbols within the same slot.NOTE 5: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding requirement with the PRS bandwidth of the smallest RB number for the corresponding SCS.NOTE 6: δ is the margin determined from Table 10.1.44.2-7. |

|  |  |
| --- | --- |
|  |  |
|  |  |  |  |  |  |
|  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |

44Table 10.1.44.2-3: DL RSCP relative measurement accuracy in FR1 in two-tap channel with reduced number of samples for UE Rx-Tx time difference

|  |  |
| --- | --- |
| **Accuracy** | **Conditions** |
| **PRS Ês/Iot** | **Minimum PRS bandwidth** | **PRS SCS** | **PRS resource repetition Note 3** | **NR operating band groupsNote 2** | **IoNote 4 range** |
| **MinimumIoNote 1** | **MaximumIo** |
| **degree** | **dB** | **RB** | **kHz** |  |  | **dBm / SCSPRS** | **dBm/BW** |
| [9]+δ | (PRS Ês/Iot)ref ≥ 0dB (PRS Ês/Iot)*i* ≥ -6dB | ≥24 | 15 | ≥4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -127 | -50 |
| NR\_FDD\_FR1\_B | -126.5 |
| NR\_TDD\_FR1\_C | -126 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -125.5 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -125 |
| NR\_FDD\_FR1\_F | -124.5 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -124 |
| NR\_FDD\_FR1\_H | -123.5 |
|  |  | NR\_FDD\_FR1\_N | -120.5 |  |
| [7]+δ | ≥52 | ≥1 | Note 5 | Note 5 | Note 5 |
| [5]+δ | >104 | ≥1 | Note 5 | Note 5 | Note 5 |
| [7]+δ | ≥24 | 30 | ≥4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -124 | -50 |
| NR\_FDD\_FR1\_B | -123.5 |
| NR\_TDD\_FR1\_C | -123 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -122.5 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -122 |
| NR\_FDD\_FR1\_F | -121.5 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -121 |
| NR\_FDD\_FR1\_H | -120.5 |
| NR\_FDD\_FR1\_N | -117.5 |
| [7]+δ | ≥48 | ≥1 | Note 5 | Note 5 | Note 5 |
| [7]+δ | ≥24 | 60 | ≥4 | NR\_FDD\_FR1\_A, NR\_TDD\_FR1\_A,NR\_SDL\_FR1\_A | -121 | -50 |
| NR\_FDD\_FR1\_B | -120.5 |
| NR\_TDD\_FR1\_C | -120 |
| NR\_FDD\_FR1\_D, NR\_TDD\_FR1\_D | -119.5 |
| NR\_FDD\_FR1\_E, NR\_TDD\_FR1\_E | -119 |
| NR\_FDD\_FR1\_F | -118.5 |
| NR\_FDD\_FR1\_G, NR\_TDD\_FR1\_G | -118 |
| NR\_FDD\_FR1\_H | -117.5 |
| NR\_FDD\_FR1\_N | -114.5 |
| NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in an OFDM symbol.NOTE 2: NR operating band groups are as defined in Section 3.5.NOTE 3: are configured by higher layer parameter *dl-PRS-ResourceRepetitionFactor, dl-PRS-NumSymbols and dl-PRS-CombSizeN*defined in TS 37.355 [34].NOTE 4: The Io is defined in PRS slots. The same Io range applies to PRS and non-PRS symbols. Io levels are different in PRS and non-PRS symbols within the same slot.NOTE 5: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding requirement with the PRS bandwidth of the smallest RB number for the corresponding SCS.NOTE 6: δ is the margin determined from Table 10.1.44.2-7. |

|  |  |
| --- | --- |
|  |  |
|  |  |  |  |  |  |
|  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| 44 |

**Table 10.1.44.2-4: DL RSCP relative measurement accuracy in FR2 in AWGN**

|  |  |
| --- | --- |
| **Accuracy** | **Conditions** |
| **PRS Ês/Iot** | **Minimum PRS bandwidth** | **PRS SCS** | **PRS resource repetitionNote 3** | **IoNote 4 range** |
| **MinimumIoNote 1** | **MaximumIo** |
| **degree** | **dB** | **RB** | **kHz** |  | **dBm / SCSPRS** | **dBm/BWChannel** |
| [16]+δ | (PRS Ês/Iot)ref ≥ -3dB (PRS Ês/Iot)*i* ≥ -13dB | ≥24 | 60 | ≥4 | Same value as PRP in Table B.2.14-2, according to UE Power class, operating band and angle of arrival | -50 |
| [8]+δ |  | ≥64 |  | ≥1 | Note 5 | Note 5 |
| [6]+δ |  | ≥132 |  | ≥1 | Note 5 | Note 5 |
| [18]+δ | ≥32 | 120 | ≥4 | Same value as PRP in Table B.2.14-2, according to UE Power class, operating band and angle of arrival | -50 |
| [10]+δ |  | ≥64 |  | ≥1 | Note 5 | Note 5 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in an OFDM symbol.NOTE 2: NR operating band groups are as defined in Section 3.5.NOTE 3: are configured by higher layer parameter *dl-PRS-ResourceRepetitionFactor, dl-PRS-NumSymbols and dl-PRS-CombSizeN*defined in TS 37.355 [34].NOTE 4: The Io is defined in PRS slots. The same Io range applies to PRS and non-PRS symbols. Io levels are different in PRS and non-PRS symbols within the same slot.NOTE 5: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding requirement with the PRS bandwidth of the smallest RB number for the corresponding SCS.NOTE 6: δ is the margin determined from Table 10.1.44.2-8. |

Table 10.1.44.2-5: DL RSCP relative measurement accuracy in FR2 in AWGN with reduced number of samples for UE Rx-Tx time difference

|  |  |
| --- | --- |
| **Accuracy** | **Conditions** |
| **PRS Ês/Iot** | **Minimum PRS bandwidth** | **PRS SCS** | **PRS resource repetitionNote 3** | **IoNote 4 range** |
| **MinimumIoNote 1** | **MaximumIo** |
| **degree** | **dB** | **RB** | **kHz** |  | **dBm / SCSPRS** | **dBm/BWChannel** |
| [5]+δ | (PRS Ês/Iot)ref ≥ 0dB (PRS Ês/Iot)*i* ≥ -6dB | ≥24 | 60 | ≥4 | Same value as PRP in Table B.2.14-2, according to UE Power class, operating band and angle of arrival | Note 5 |
| [4]+δ |  | ≥64 | ≥1 | Note 5 | Note 5 |
| [3]+δ |  | ≥132 | ≥1 | Note 5 | Note 5 |
| [6]+δ |  | ≥32 | 120 | ≥4 | Same value as PRP in Table B.2.14-2, according to UE Power class, operating band and angle of arrival | Note 5 |
| [5]+δ |  | ≥64 |  | ≥1 | Note 5 | Note 5 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in an OFDM symbol.NOTE 2: NR operating band groups are as defined in Section 3.5.NOTE 3: are configured by higher layer parameter dl-PRS-ResourceRepetitionFactor, dl-PRS-NumSymbols and dl-PRS-CombSizeNdefined in TS 37.355 [34].NOTE 4: The Io is defined in PRS slots. The same Io range applies to PRS and non-PRS symbols. Io levels are different in PRS and non-PRS symbols within the same slot.NOTE 5: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding requirement with the PRS bandwidth of the smallest RB number for the corresponding SCS.NOTE 6: δ is the margin determined from Table 10.1.44.2-8. |

Table 10.1.44.2-6: DL RSCP relative measurement accuracy in FR2 in two-tap channel with reduced number of samples for UE Rx-Tx time difference

|  |  |
| --- | --- |
| **Accuracy** | **Conditions** |
| **PRS Ês/Iot** | **Minimum PRS bandwidth** | **PRS SCS** | **PRS resource repetitionNote 3** | **IoNote 4 range** |
| **MinimumIoNote 1** | **MaximumIo** |
| **degree** | **dB** | **RB** | **kHz** |  | **dBm / SCSPRS** | **dBm/BWChannel** |
| [7]+δ | (PRS Ês/Iot)ref ≥ 0dB (PRS Ês/Iot)*i* ≥ -6dB | ≥24 | 60 | ≥4 | Same value as PRP in Table B.2.14-2, according to UE Power class, operating band and angle of arrival | Note 5 |
| [6]+δ |  | ≥64 |  | ≥1 | Note 5 | Note 5 |
| [4]+δ |  | ≥132 |  | ≥1 | Note 5 | Note 5 |
| [8]+δ |  | ≥32 | 120 | ≥4 | Same value as PRP in Table B.2.14-2, according to UE Power class, operating band and angle of arrival | Note 5 |
| [5]+δ |  | ≥64 |  | ≥1 | Note 5 | Note 5 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in an OFDM symbol.NOTE 2: NR operating band groups are as defined in Section 3.5.NOTE 3: are configured by higher layer parameter dl-PRS-ResourceRepetitionFactor, dl-PRS-NumSymbols and dl-PRS-CombSizeNdefined in TS 37.355 [34].NOTE 4: The Io is defined in PRS slots. The same Io range applies to PRS and non-PRS symbols. Io levels are different in PRS and non-PRS symbols within the same slot.NOTE 5: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding requirement with the PRS bandwidth of the smallest RB number for the corresponding SCS.NOTE 6: δ is the margin determined from Table 10.1.44.2-8. |

Table 10.1.44.2-7: Margin for relative DL RSCP measurement accuracy in FR1

|  |  |
| --- | --- |
| PRS BW (RB number) | Margin (degree) |
| SCS=15kHz | SCS=30kHz | SCS=60kHz |
| ≥ 24 | N/A | N/A | [TBD] |
| ≥ 52 | ≥ 24 | N/A | [TBD] |
| ≥ 104 | ≥ 48 | ≥ 24 | [TBD] |
|  |  |  |  |
|  |  |  |  |

Table 10.1.44.2-8: Margin for relative DL RSCP measurement accuracy in FR2

|  |  |
| --- | --- |
| PRS BW (RB number) | Margin (degree) |
| SCS=60kHz | SCS=120kHz |
| ≥ 24 | N/A | [TBD] |
| ≥ 64 | ≥ 32 | [TBD] |
| ≥ 132 | ≥ 64 | [TBD] |
|  |  |  |

#### 10.1.44.3 Report Mapping

Relative DL RSCP measurement reporting in clause 10.1.44.3.1 applies, regardless of samples used to measure PRS, to report:

- gap-based DL RSCP measurement,

- DL RSCP in RRC\_INACTIVE state.

##### 10.1.44.3.1 Relative DL RSCP Measurement Reporting

The reporting range of relative DL RSCP, as defined in Clause 5.1.42 of TS 38.215 [4], is defined from 0 degree to 360 degree. The reporting resolution is 0.1 degree.

The mapping of DL RSCP measured quantity is defined in Table 10.1.44.3.1-1.

Table 10.1.44.3.1-1: DL RSCP measurement report mapping

|  |  |  |
| --- | --- | --- |
| Reported value | Measured quantity value (DL RSCP) | Unit |
| DL\_RSCP\_0 | 0 ≤ DL RSCP < 0.1 | degree |
| DL\_RSCP\_1 | 0.1 ≤ DL RSCP < 0.2 | degree |
| DL\_RSCP\_2 | 0.2 ≤ DL RSCP < 0.3 | degree |
| … | … | … |
| DL\_RSCP\_1798 | 179.8 ≤ DL RSCP < 179.9 | degree |
| DL\_RSCP\_1799 | 179.9 ≤ DL RSCP < 180 | degree |
| DL\_RSCP\_1800 | 180 ≤ DL RSCP < 180.1 | degree |
| DL\_RSCP\_1801 | 180.1 ≤ DL RSCP < 180.2 | degree |
| DL\_RSCP\_1802 | 180.2 ≤ DL RSCP < 180.3 | degree |
| … | … | … |
| DL\_RSCP\_3598 | 359.8 ≤ DL RSCP < 359.9 | degree |
| DL\_RSCP\_3599 | 359.9 ≤ DL RSCP < 360 | degree |

**--- End of change 1 ---**