**3GPP TSG-RAN WG4 Meeting #104-e *R4-221xxxx***

Electronic Meeting, Aug 15- Aug 26, 2022

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **38.133** | **CR** | **7174** | **rev** | **1** | **Current version:** | **17.6.0** |  |
|  |
| *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)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

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|  |
| ***Title:***  | Changes to Idle mode requirements for NR RedCap |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_redcap-Core |  | ***Date:*** | 2022-08-15 |
|  |  |  |  |  |
| ***Category:*** | F |  | ***Release:*** | Rel-17 |
|  | *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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | CR to capture the maintenance issues for the IDLE mode  |
|  |  |
| ***Summary of change:*** | Changes are:* Changed from Tdetect,EUTRAN\_ Relax to Tdetect,EUTRAN\_RedCap Relax in inter-RAT relaxation section.
* Clarified the applicability of relaxation when UE has not met S-criterion.
* Removal of [ ] in section 4.2B.2.6
* Removed the Editor’s note related to eDRX in 4.2B.2.9.4 since the section is refeerring to requirements in 4.2B.2.9.2 where the eDRX requirements are already captured.
* Removed the Editor’s note related to eDRX in 4.2B.2.9.7 since the section is refeerring to requirements in 4.2B.2.9.3 where the eDRX requirements are already captured.
* For similar reason, Editor’s note is removed in 4.2B.2.10.4, 4.2B.2.10.5, 4.2B.2.10.6, 4.2B.2.10.7, 4.2B.2.11.4, 4.2B.2.11.5, 4.2B.2.11.6, 4.2B.2.11.7
* References in clause 4.2B.2.10.2 is corrected.
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| ***Consequences if not approved:*** | Typos and ambiguity may exist in the IDLE mode sections.  |
|  |  |
| ***Clauses affected:*** | 4.2B |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** | **X** |  |  Test specifications | TS38.533  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

**----------------------NEXT CHANGE----------------------------**

## 4.2B Cell Re-selection for RedCap

### 4.2B.1 Introduction

The SSB and SMTC in this section applies for CD-SSB only if it is not additional specified.

The terms SSB and SMTC in this clause apply to CD-SSB only if not specified otherwise.

### 4.2B.2 Requirements

#### 4.2B.2.1 UE measurement capability for RedCap

##### 4.2B.2.1.1 UE measurement capability for 1 Rx RedCap

For idle mode cell re-selection purposes, and for UE supporting *IdleInactiveMeasurements-r16* or *idleInactiveEUTRA-MeasReport-r16*, the UE shall be capable of monitoring at least:

- Intra-frequency carrier, and

- Depending on UE capability, 6 NR inter-frequency carriers, and

- Depending on UE capability, 6 FDD E-UTRA inter-RAT carriers, and

- Depending on UE capability, 6 TDD E-UTRA inter-RAT carriers.

In addition to the requirements defined above, a UE supporting E-UTRA measurements in RRC\_IDLE state shall be capable of monitoring a total of at least 11 carrier frequency layers, which includes serving layer, comprising of any above defined combination of E-UTRA FDD, E-UTRA TDD and NR layers.

##### 4.2B.2.1.2 UE measurement capability for 2 Rx RedCap

The capability defined in section 4.2.2.1 apply for this section.

#### 4.2B.2.2 Measurement and evaluation of serving cell for RedCap UE

The UE shall measure the SS-RSRP and SS-RSRQ level of the serving cell and evaluate the cell selection criterion S defined in TS 38.304 [1] for the serving cell at least once every M1\*N1 DRX cycle; where:

- M1=2 if SMTC periodicity (TSMTC) > 20 ms and DRX cycle ≤ 0.64 second,

- otherwise M1=1.

The UE shall filter the SS-RSRP and SS-RSRQ measurements of the serving cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by, at least DRX cycle/2.

If the UE is not configured with eDRX\_IDLE cycle and the UE has evaluated according to Table 4.2B.2.2-1 for 1 Rx RedCap or Table 4.2.2.2-1 for 2 Rx RedCap in Nserv\_RedCap consecutive DRX cycles that the serving cell does not fulfil the cell selection criterion S, the UE shall initiate the measurements of all neighbour cells indicated by the serving cell, regardless of the measurement rules currently limiting UE measurement activities.

If the UE is configured with eDRX\_IDLE cycle and has evaluated according Nserv\_RedCap consecutive DRX cycles within a single PTW that the serving cell does not fulfil the cell selection criterion S, the UE shall initiate the measurements of all neighbour cells indicated by the serving cell, regardless of the measurement rules currently limiting UE measurement activities. For the UE configured with eDRX\_IDLE cycle, Nserv\_RedCap is specified in Table 4.2B.2.2-2 for 1 Rx RedCap and 2 Rx RedCap in FR1 and in Table 4.2B.2.2-3 for FR2 for 2 Rx RedCap.

If the UE in RRC\_IDLE has not found any new suitable cell based on searches and measurements using the intra-frequency, inter-frequency and inter-RAT information indicated in the system information during the time T, the UE shall initiate cell selection procedures for the selected PLMN as defined in TS 38.304 [1], where

- T= 10 s if the UE is not configured with eDRX\_IDLE cycle, or

- T= MAX (10 s, one eDRX\_IDLE cycle) if the UE is configured with eDRX\_IDLE cycle in FR1, or

- T= MAX (10 s, N1\* eDRX\_IDLE cycle) if the UE is configured with eDRX\_IDLE cycle less than 20.48s in FR2,

- Otherwise, T= MAX (10 s, one eDRX\_IDLE cycle) if the UE is configured with eDRX\_IDLE cycle no less than 20.48 s in FR2

Table 4.2B.2.2-1: Nserv\_RedCap

|  |  |  |
| --- | --- | --- |
| DRX cycle length [s] | Scaling Factor (N1) | Nserv\_RedCap [number of DRX cycles] |
|  | FR1 | FR2Note1 |  |
| 0.32 | 1 | 8 | M1\*N1\*4 |
| 0.64 |  | 5 | M1\*N1\*4 |
| 1.28 |  | 4 | N1\*2 |
| 2.56 |  | 3 | N1\*2 |
| Note 1: Applies for RedCap UE of all FR2 power class.  |

Table 4.2B.2.2-2: Nserv\_RedCap for UE configured with eDRX\_IDLE cycle (Frequency range FR1)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| eDRX\_IDLE cycle length [s] | DRX cycle length [s] | PTW length [s] (number of 1.28s periods) | Scaling Factor (N1) | Nserv\_RedCap [number of DRX or eDRX cycles Note 3] |
| 2.56 | N/A  | N/A | 1 | N1\*2 |
| 5.12 | N/A  | N/A | N1\*2 |
| 10.24 | N/A  | N/A | N1\*2 |
| 20.48 ≤ eDRX\_IDLE cycle length ≤10485.76 | 0.32 | ≥[1.28] (1) | N1\*M1\*2 |
| 0.64 | ≥ 1.28 (1) (M1=1) or ≥ 2.56 (2) (M1=2) | N1\*M1\*2 |
| 1.28 | ≥2.56 (2) | N1\*2 |
| 2.56 | ≥5.12 (4) | N1\*2 |
| NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs.NOTE 2: The eDRX\_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].NOTE 3: Number of eDRX cycles when eDRX\_IDLE cycle length equals 2.56s, 5.12s and 10.24s. Otherwise, number of DRX cycles.NOTE 4: The lower bound of PTW length is derived based on $\left⌈\frac{Nserv\\_RedCap \*DRX\\_cycle}{1.28}\right⌉\*1.28$. |

Table 4.2B.2.2-3: Nserv\_RedCap for UE configured with eDRX\_IDLE cycle (Frequency range FR2)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| eDRX\_IDLE cycle length [s] | DRX cycle length [s] | PTW length [s] (number of 1.28s periods) | Scaling Factor (N1) Note1 | Nserv\_RedCap [number of DRX or eDRX cycles Note 4] |
| 2.56 | N/A  | N/A | 3 | N1\*2 |
| 5.12 | N/A  | N/A | 3 | N1\*2 |
| 10.24 | N/A  | N/A | 3 | N1\*2 |
| 20.48 ≤ eDRX\_IDLE cycle length ≤10485.76 | 0.32 | ≥5.12 (4) | 8 | N1\*2 |
| 0.64 | ≥6.4 (5) | 5 | N1\*2 |
| 1.28 | ≥10.24 (8) | 4 | N1\*2 |
| 2.56 | ≥15.36 (12) | 3 | N1\*2 |
| NOTE 1: Applies for RedCap UE of all FR2 power class.NOTE 2: The number of DRX cycles in this table is given for the DRX cycles within PTWs.NOTE 3: The eDRX\_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].NOTE 4: Number of eDRX cycles when eDRX\_IDLE cycle length equals 2.56s, 5.12s and 10.24s. Otherwise, number of DRX cycles.NOTE 5: The lower bound of PTW length is derived based on $\left⌈\frac{Nserv\\_RedCap \*DRX\\_cycle}{1.28}\right⌉\*1.28$. |

*Editor Notes: The requirement of eDRX = 20.48s with DRX = 0.32s is FFS.*

For any requirement in this section, when the UE transitions between any two states when being configured with eDRX\_IDLE, being configured with eDRX\_IDLE cycle, changing eDRX\_IDLE cycle length, or changing PTW configuration, the UE shall meet the transition requirement, which is the less stringent requirement of the two requirements corresponding to the first state and the second state, during the transition time interval which is the time corresponding to the transition requirement. After the transition time interval, the UE shall meet the requirement corresponding to the second state.

#### 4.2B.2.3 Measurements of intra-frequency NR cells for RedCap UE

The UE shall be able to identify new intra-frequency cells and perform SS-RSRP and SS-RSRQ measurements of the identified intra-frequency cells without an explicit intra-frequency neighbour list containing physical layer cell identities.

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the reselection criteria defined in TS 38.304 [1] within Tdetect,NR\_Intra\_RedCapwhen that Treselection= 0. An intra frequency cell is considered to be detectable according to the conditions defined in Annex B.x.y for a corresponding Band.

The UE shall measure SS-RSRP and SS-RSRQ at least every Tmeasure,NR\_Intra\_RedCap for intra-frequency cells that are identified and measured according to the measurement rules.

The UE shall filter SS-RSRP and SS-RSRQ measurements of each measured intra-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least Tmeasure,NR\_Intra\_RedCap/2.

The UE shall not consider a NR neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an intra-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met reselection criterion defined in TS 38.304 [1] within Tevaluate,NR\_Intra\_RedCap when Treselection = 0 provided that:

when *rangeToBestCell* is not configured:

- the cell is at least 3dB better ranked in FR1 or 4.5dB better ranked in FR2 for 2 Rx RedCap.

- the cell is at least 3dB better ranked in FR1 for 1 Rx RedCap.

when *rangeToBestCell* is configured:

- the cell has the highest number of beams above the threshold *absThreshSS-BlocksConsolidation* among all detected cells whose cell-ranking criterion R value in TS 38.304 [1] is within *rangeToBestCell* of the cell-ranking criterion R value of the highest ranked cell.

- if there are multiple such cells, the cell has the highest rank among them.

- the cell is at least 3dB better ranked in FR1 or 4.5dB better ranked in FR2 if the current serving cell is among them for 2 Rx RedCap.

- the cell is at least [3dB] better ranked in FR1 if the current serving cell is among them for 1 Rx RedCap.

When evaluating cells for reselection, the SSB side conditions apply to both serving and non-serving intra-frequency cells.

If Treselection timer has a non-zero value and the intra-frequency cell is satisfied with the reselection criteria which are defined in TS 38.304 [1], the UE shall evaluate this intra-frequency cell for the Treselection time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

For 1 Rx RedCap not configured with eDRX\_IDLE cycle, Tdetect,NR\_Intra\_RedCap, Tmeasure,NR\_Intra\_RedCap and Tevaluate,NR\_Intra\_RedCap are specified in Table 4.2B.2.3-1. For 2 Rx RedCap not configured with eDRX\_IDLE cycle, Tdetect,NR\_Intra\_RedCap, Tmeasure,NR\_Intra\_RedCap and Tevaluate,NR\_Intra\_RedCap are same as Tdetect,NR\_Intra, Tmeasure,NR\_Intra and Tevaluate,NR\_Intra specified in Table 4.2.2.3-1.

For 1 Rx RedCap and 2 Rx RedCap configured with eDRX\_IDLE cycle, Tdetect,NR\_Intra\_RedCap, Tmeasure,NR\_Intra\_RedCap and Tevaluate,NR\_Intra\_RedCap are specified in Table 4.2B.2.3-2 and Table 4.2B.2.3-3 for FR1 and FR2 respectively, where the requirements apply provided that the serving cell is configured with eDRX\_IDLE and is the same in all PTWs during any of Tdetect,NR\_Intra\_RedCap, Tmeasure,NR\_Intra\_RedCap and Tevaluate,NR\_Intra\_RedCap when multiple PTWs are used.

Table 4.2B.2.3-1: Tdetect,NR\_Intra\_RedCap, Tmeasure,NR\_Intra\_RedCap and Tevaluate,NR\_Intra\_RedCap

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DRX cycle length [s] | Scaling Factor (N1) | Tdetect,NR\_Intra\_RedCap [s] (number of DRX cycles) | Tmeasure,NR\_Intra\_RedCap [s] (number of DRX cycles) | Tevaluate,NR\_Intra\_RedCap[s] (number of DRX cycles) |
|  | FR1 | FR2Note1 |  |  |  |
| 0.32 | 1 | 8 | 11.52 x N1 x M2 (36 x N1 x M2) | 1.28 x N1 x M2 (4 x N1 x M2) | 5.12 x N1 x M2 (16 x N1 x M2) |
| 0.64 |  | 5 | 17.92 x N1 (28 x N1) | 1.28 x N1 (2 x N1) | 5.12 x N1 (8 x N1) |
| 1.28 |  | 4 | 32 x N1 (25 x N1) | 1.28 x N1 (1 x N1) | 6.4 x N1 (5 x N1) |
| 2.56 |  | 3 | 58.88 x N1 (23 x N1) | 2.56 x N1 (1 x N1) | 7.68 x N1 (3 x N1) |
| Note 1: Applies for RedCap UE of all FR2 power class.Note 2: M2 = 1.5 if SMTC periodicity of measured intra-frequency cell > 20 ms; otherwise M2=1. If different SMTC periodicities are configured for different cells, the SMTC periodicity in this note is the one used by the cell being identified. During PSS/SSS detection, the periodicity of the SMTC configured for the intra-frequency carrier is assumed, and if the actual SSB transmission periodicity is greater than the SMTC configured for the intra-frequency carrier, longer Tdetect, NR\_intra\_RedCap is expected. |

Table 4.2B.2.3-2: Tdetect,NR\_Intra\_RedCap, Tmeasure,NR\_Intra\_RedCap and Tevaluate,NR\_Intra\_RedCap for UE configured with eDRX\_IDLE cycle (Frequency range FR1)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **eDRX\_IDLE cycle length [s]** | **DRX cycle length [s]** | **PTW length [s] (number of 1.28s periods)** | **Tdetect,NR\_Intra\_RedCap [s] (number of DRX cycles or eDRX cycles Note 3)** | **Tmeasure,NR\_Intra\_RedCap [s] (number of DRX cycles or eDRX cycles Note 3)** | **Tevaluate,NR\_Intra\_RedCap [s] (number of DRX cycles or eDRX cycles Note 3)** |
| 2.56 | - | - | 58.88 (23) | 2.56 (1) | 7.68 (3) |
| 5.12 | - | - | 117.76 (23) | 5.12 (1) | 10.24 (2) |
| 10.24 | - | - | 235.52 (23) | 10.24 (1) | 20.48 (2) |
| 20.48 ≤ eDRX\_IDLE cycle length ≤10485.76 | 0.32 | ≥[1.28] ([1]) | $$eDRX\\_cycle\\_length×\left⌈\frac{23}{PTW/DRX\\_cycle\\_length}\right⌉$$(23) | 0.32 x M2 (1 x M2) | 0.64 x M2 (2 x M2) |
| 0.64 | ≥[1.28] ([1]) | 0.64 (1) | 1.28 (2) |
| 1.28 | ≥[2.56] ([2]) | 1.28 (1) | 2.56 (2) |
| 2.56 | ≥[5.12] ([4]) | 2.56 (1) | 5.12 (2) |
| Note 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs.Note 2: The eDRX\_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].Note 3: Number of eDRX cycles when eDRX\_IDLE cycle length equals 2.56s, 5.12s and 10.24s. Otherwise, number of DRX cycles.Note 4: The lower bound of PTW length is derived based on $\left⌈\frac{Tevaluate,NR\\_Intra\\_RedCap\*DRX\\_cycle}{1.28}\right⌉\*1.28$.Note 5: M2 = 1.5 if SMTC periodicity of measured intra-frequency cell > 20 ms; otherwise M2=1. |

Table 4.2B.2.3-3: Tdetect,NR\_Intra\_RedCap, Tmeasure,NR\_Intra\_RedCap and Tevaluate,NR\_Intra\_RedCap for UE configured with eDRX\_IDLE cycle (Frequency range FR2)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **eDRX\_IDLE cycle length [s]** | **DRX cycle length [s]** | **PTW length [s] (number of 1.28s periods)** | **Scaling Factor (N1)** Note1 | **Tdetect,NR\_Intra\_RedCap [s] (number of DRX cycles or eDRX cycles Note 4)** | **Tmeasure,NR\_Intra\_RedCap [s] (number of DRX cycles or eDRX cycles Note 4)** | **Tevaluate,NR\_Intra\_RedCap [s] (number of DRX cycles or eDRX cycles Note 4)** |
| 2.56 | - | - | 3 | 58.88 x N1 (23 x N1) | 2.56 x N1 (1 x N1) | 7.68 x N1 (3 x N1) |
| 5.12 | - | - | 3 | 117.76 x N1 (23 x N1) | 5.12 x N1 (1 x N1) | 10.24 x N1 (2 x N1) |
| 10.24 | - | - | 3 | 235.52 x N1 (23 x N1) | 10.24 x N1 (1 x N1) | 20.48 x N1 (2 x N1) |
| 20.48 ≤ eDRX\_IDLE cycle length ≤10485.76 | 0.32 | ≥5.12 (4) | 8 | $$eDRX\\_cycle\\_length×\left⌈\frac{23×N1}{PTW/DRX\\_cycle\\_length}\right⌉$$(23 x N1) | 0.32 x N1 (1 x N1) | 0.64 x N1 (2 x N1) |
| 0.64 | ≥6.4 (5) | 5 | 0.64 x N1 (1 x N1) | 1.28 x N1 (2 x N1) |
| 1.28 | ≥10.24 (8) | 4 | 1.28 x N1 (1 x N1) | 2.56 x N1 (2 x N1) |
| 2.56 | ≥15.36 (12) | 3 | 2.56 x N1 (1 x N1) | 5.12 x N1 (2 x N1) |
| NOTE 1: Applies for RedCap UE of all power class.NOTE 2: The number of DRX cycles in this table is given for the DRX cycles within PTWs.NOTE 3: The eDRX\_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].NOTE 4: Number of eDRX cycles when eDRX\_IDLE cycle length equals 2.56s, 5.12s and 10.24s. Otherwise, number of DRX cycles.NOTE 5: The lower bound of PTW length is derived based on $\left⌈\frac{Tevaluate,NR\\_Intra\\_RedCap\*DRX\\_cycle}{1.28}\right⌉\*1.28$. |

For any requirement in this section, when the UE transitions between any two states when being configured with eDRX\_IDLE, being configured with eDRX\_IDLE cycle, changing eDRX\_IDLE cycle length, or changing PTW configuration, the UE shall meet the transition requirement, which is the less stringent requirement of the two requirements corresponding to the first state and the second state, during the transition time interval which is the time corresponding to the transition requirement. After the transition time interval, the UE shall meet the requirement corresponding to the second state.

#### 4.2B.2.4 Measurements of inter-frequency NR cells for RedCap UE

The UE shall be able to identify new inter-frequency cells and perform SS-RSRP or SS-RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the serving cell, even if no explicit neighbour list with physical layer cell identities is provided.

If Srxlev > SnonIntraSearchP and Squal > SnonIntraSearchQ then the UE shall search for inter-frequency layers of higher priority at least every Thigher\_priority\_search where Thigher\_priority\_search is described in clause 4.2.2.7.

If Srxlev ≤ SnonIntraSearchP or Squal ≤ SnonIntraSearchQ then the UE shall search for and measure inter-frequency layers of higher, equal or lower priority in preparation for possible reselection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority layers shall be the same as that defined below in this clause.

The UE shall be able to evaluate whether a newly detectable inter-frequency cell meets the reselection criteria defined in TS 38.304 [1] within Kcarrier\_RedCap \* Tdetect,NR\_Inter\_RedCap if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when Treselection = 0 provided that the reselection criteria is met

 For 2 Rx RedCap by a margin of at least

 5 dB in FR1 or 6.5 dB in FR2 for reselections based on ranking or

 6 dB in FR1 or 7.5 dB in FR2 for SS-RSRP reselections based on absolute priorities or

 4 dB in FR1 and 4 dB in FR2 for SS-RSRQ reselections based on absolute priorities

 For 1 Rx RedCap by a margin of at least

 [5 dB] in FR1 or for reselections based on ranking or

 [6 dB] in FR1 for SS-RSRP reselections based on absolute priorities or

 [4 dB] in FR1 for SS-RSRQ reselections based on absolute priorities.

The parameter Kcarrier\_RedCap is the number of NR inter-frequency carriers indicated by the serving cell. An inter-frequency cell is considered to be detectable according to the conditions defined in Annex B.x.y for a corresponding Band. When higher priority cells are found by the higher priority search, they shall be measured at least every Tmeasure,NR\_Inter\_RedCap. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this clause shall still be met by the UE before it makes any determination that it may stop measuring the cell. If the UE detects on a NR carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall measure SS-RSRP or SS-RSRQ at least every Kcarrier\_RedCap \* Tmeasure,NR\_Inter\_RedCap for identified lower or equal priority inter-frequency cells. If the UE detects on a NR carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall filter SS-RSRP or SS-RSRQ measurements of each measured higher, lower and equal priority inter-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least Tmeasure,NR\_Inter/2.

The UE shall not consider a NR neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an inter-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell has met reselection criterion defined TS 38.304 [1] within Kcarrier \* Tevaluate,NR\_Inter\_RedCap when Treselection = 0provided that the reselection criteria is met by

- the condition when performing equal priority reselection and

- when *rangeToBestCell* is not configured:

- the cell is at least 5dB better ranked in FR1 or 6.5dB better ranked in FR2 for 2 Rx RedCap.

- the cell is at least [5dB] better ranked in FR1 for 1 Rx RedCap.

- when *rangeToBestCell* is configured:

- the cell has the highest number of beams above the threshold *absThreshSS-BlocksConsolidation* among all detected cells whose cell-ranking criterion R value defined in TS38.304 [1] is within *rangeToBestCell* of the cell-ranking criterion R value of the highest ranked cell.

- if there are multiple such cells, the cell has the highest rank among them

- the cell is at least 5dB better ranked in FR1 or 6.5dB better ranked in FR2 if the current serving cell is among them, or 6dB in FR1 or 7.5dB in FR2 for SS-RSRP reselections based on absolute priorities for 2 Rx RedCap or 4dB in FR1 or 4dB in FR2 for SS-RSRQ reselections based on absolute priorities for 2 Rx RedCap.

- the cell is at least [5dB] better ranked in FR1 if the current serving cell is among them, or [6dB] in FR1 for SS-RSRP reselections based on absolute priorities or [4dB] in FR1 for SS-RSRQ reselections based on absolute priorities for 1 Rx RedCap.

When evaluating cells for reselection, the SSB side conditions apply to both serving and inter-frequency cells.

If Treselection timer has a non-zero value and the inter-frequency cell is satisfied with the reselection criteria, the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

The UE is not expected to meet the measurement requirements for an inter-frequency carrier under DRX cycle=320 ms defined in Table 4.2B.2.4-1 or Table 4.2.2.4-1 for 1 Rx RedCap and 2 Rx RedCap respectively, under the following conditions:

- TSMTC\_intra = TSMTC\_inter = 160 ms; where TSMTC\_intra and TSMTC\_inter are periodicities of the SMTC occasions configured for the intra-frequency carrier and the inter-frequency carrier respectively, and

- SMTC occasions configured for the inter-frequency carrier occur up to 1 ms before the start or up to 1 ms after the end of the SMTC occasions configured for the intra-frequency carrier, and

- SMTC occasions configured for the intra-frequency carrier and for the inter-frequency carrier occur up to 1 ms before the start or up to 1 ms after the end of the paging occasion defined in TS38.304 [1].

For UE not configured with eDRX\_IDLE cycle, Tdetect,NR\_Inter\_RedCap, Tmeasure,NR\_ Inter \_RedCap and Tevaluate,NR\_ Inter \_RedCap are specified in Table 4.2B.2.4.1-1.

For 1 Rx RedCap configured with eDRX\_IDLE cycle, Tdetect,NR\_ Inter \_RedCap, Tmeasure,NR\_ Inter \_RedCap and Tevaluate,NR\_ Inter \_RedCap are specified in Table 4.2B.2.4-2 for FR1. For 1 Rx RedCap and 2 Rx RedCap configured with eDRX\_IDLE cycle, Tdetect,NR\_ Inter \_RedCap, Tmeasure,NR\_ Inter \_RedCap and Tevaluate,NR\_ Inter \_RedCap are specified in Table 4.2B.2.4-2 and Table 4.2B.2.4-3 for FR1 and FR2 respectively. The requirements apply provided that the serving cell is configured with eDRX\_IDLE and is the same in all PTWs during any of Tdetect,NR\_ Inter \_RedCap, Tmeasure,NR\_ Inter \_RedCap and Tevaluate,NR\_ Inter \_RedCap when multiple PTWs are used.

Table 4.2B.2.4-1: Tdetect,NR\_Inter\_RedCap, Tmeasure,NR\_Inter\_RedCap and Tevaluate,NR\_Inter\_RedCap

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DRX cycle length [s] | Scaling Factor (N1) | Tdetect,NR\_Inter\_RedCap [s] (number of DRX cycles) | Tmeasure,NR\_Inter\_RedCap [s] (number of DRX cycles) | Tevaluate,NR\_Inter\_RedCap [s] (number of DRX cycles) |
| FR1 | FR2Note1 |
| 0.32 | 1 | 8 | 11.52 x N1 x 1.5 (36 x N1 x 1.5) | 1.28 x N1 x 1.5 (4 x N1 x 1.5) | 5.12 x N1 x 1.5 (16 x N1 x 1.5) |
| 0.64 | 5 | 17.92x N1 (28 x N1) | 1.28 x N1 (2 x N1) | 5.12 x N1 (8 x N1) |
| 1.28 | 4 | 32 x N1 (25 x N1) | 1.28 x N1 (1 x N1) | 6.4 x N1 (5 x N1) |
| 2.56 | 3 | 58.88 x N1 (23 x N1) | 2.56 x N1 (1 x N1) | 7.68 x N1 (3 x N1) |
| Note 1: Applies for RedCap UE of all FR2 power class. |

Table 4.2B.2.4-2: Tdetect,NR\_Inter\_RedCap, Tmeasure,NR\_Inter\_RedCap and Tevaluate,NR\_Inter\_RedCap for UE configured with eDRX\_IDLE cycle (Frequency range FR1)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **eDRX\_IDLE cycle length [s]** | **DRX cycle length [s]** | **PTW length [s] (number of 1.28s periods)** | **Tdetect,NR\_Inter\_RedCap [s] (number of DRX cycles or eDRX cycles Note 3)** | **Tmeasure,NR\_Inter\_RedCap** **[s] (number of DRX cycles or eDRX cycles Note 3)** | **Tevaluate,NR\_Inter\_RedCap****[s] (number of DRX cycles or eDRX cycles Note 3)** |
|
| 2.56 | - | - | 58.88 (23) | 2.56 (1) | 7.68 (3) |
| 5.12 | - | - | 117.76 (23) | 5.12 (1) | 10.24 (2) |
| 10.24 | - | - | 235.52 (23) | 10.24 (1) | 20.48 (2) |
| 20.48 ≤ eDRX\_IDLE cycle length ≤10485.76 | 0.32 | ≥1.28 (1) | $$eDRX\\_cycle\\_length×\left⌈\frac{23}{PTW/DRX\\_cycle\\_length}\right⌉$$(23) | 0.32 x 1.5 (1 x 1.5) | 0.64 x 1.5 (2 x 1.5) |
| 0.64 | ≥1.28 (1) | 0.64 (1) | 1.28 (2) |
| 1.28 | ≥2.56 (2) | 1.28 (1) | 2.56 (2) |
| 2.56 | ≥5.12 (4) | 2.56 (1) | 5.12 (2) |
| NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs.NOTE 2: The eDRX\_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].NOTE 3: Number of eDRX cycles when eDRX\_IDLE cycle length equals 2.56s, 5.12s and 10.24s. Otherwise, number of DRX cycles.NOTE 4: The lower bound of PTW length is derived based on $\left⌈\frac{Tevaluate,NR\\_Inter\\_RedCap\*DRX\\_cycle}{1.28}\right⌉\*1.28$. |

Table 4.2B.2.4-3: Tdetect,NR\_Inter\_RedCap, Tmeasure,NR\_Inter\_RedCap and Tevaluate,NR\_Inter\_RedCap for UE configured with eDRX\_IDLE cycle (Frequency range FR2)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **eDRX\_IDLE cycle length [s]** | **DRX cycle length [s]** | **PTW length [s] (number of 1.28s periods)** | **Scaling Factor (N1)** Note1 | **Tdetect,NR\_Inter\_RedCap [s] (number of DRX cycles or eDRX cycles Note 3)** | **Tmeasure,NR\_Inter\_RedCap** **[s] (number of DRX cycles or eDRX cycles Note 3)** | **Tevaluate,NR\_Inter\_RedCap****[s] (number of DRX cycles or eDRX cycles Note 3)** |
| 2.56 | - | - | 3 | 58.88 x N1 (23 x N1) | 2.56 x N1 (1 x N1) | 7.68 x N1 (3 x N1) |
| 5.12 | - | - | 3 | 117.76 x N1 (23 x N1) | 5.12 x N1 (1 x N1) | 10.24 x N1 (2 x N1) |
| 10.24 | - | - | 3 | 235.52 x N1 (23 x N1) | 10.24 x N1 (1 x N1) | 20.48 x N1 (2 x N1) |
| 20.48 ≤ eDRX\_IDLE cycle length ≤10485.76 | 0.32 | ≥5.12 (4) | 8 | $$eDRX\\_cycle\\_length×\left⌈\frac{23×N1}{PTW/DRX\\_cycle\\_length}\right⌉$$(23 x N1) | 0.32 x N1 (1 x N1) | 0.64 x N1 (2 x N1) |
| 0.64 | ≥6.4 (5) | 5 | 0.64 x N1 (1 x N1) | 1.28 x N1 (2 x N1) |
| 1.28 | ≥10.24 (8) | 4 | 1.28 x N1 (1 x N1) | 2.56 x N1 (2 x N1) |
| 2.56 | ≥15.36 (12) | 3 | 2.56 x N1 (1 x N1) | 5.12 x N1 (2 x N1) |
| NOTE 1: Applies for RedCap UE of all power class.NOTE 2: The number of DRX cycles in this table is given for the DRX cycles within PTWs.NOTE 3: The eDRX\_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].NOTE 4: Number of eDRX cycles when eDRX\_IDLE cycle length equals 2.56s, 5.12s and 10.24s. Otherwise, number of DRX cycles.NOTE 5: The lower bound of PTW length is derived based on $\left⌈\frac{Tevaluate,NR\\_Inter\\_RedCap\*DRX\\_cycle}{1.28}\right⌉\*1.28$. |

For any requirement in this section, when the UE transitions between any two states when being configured with eDRX\_IDLE, being configured with eDRX\_IDLE cycle, changing eDRX\_IDLE cycle length, or changing PTW configuration, the UE shall meet the transition requirement, which is the less stringent requirement of the two requirements corresponding to the first state and the second state, during the transition time interval which is the time corresponding to the transition requirement. After the transition time interval, the UE shall meet the requirement corresponding to the second state.

#### 4.2B.2.5 Measurements of inter-RAT E-UTRAN cells for RedCap UE

If Srxlev > SnonIntraSearchP and Squal > SnonIntraSearchQ then the UE shall search for inter-RAT E-UTRAN layers of higher priority at least every Thigher\_priority\_search where Thigher\_priority\_search is described in clause 4.2B.2.7.

If Srxlev ≤ SnonIntraSearchP or Squal ≤ SnonIntraSearchQ then the UE shall search for and measure inter-RAT E-UTRAN layers of higher, lower priority in preparation for possible reselection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority inter-RAT E-UTRAN layers shall be the same as that defined below for lower priority RATs.

The requirements in this clause apply for inter-RAT E-UTRAN FDD measurements and E-UTRA TDD measurements. When the measurement rules indicate that inter-RAT E-UTRAN cells are to be measured, the UE shall measure RSRP and RSRQ of detected E-UTRA cells in the neighbour frequency list at the minimum measurement rate specified in this clause.

The parameter NEUTRA\_carrier\_RedCap is the total number of configured E-UTRA carriers in the neighbour frequency list. The UE shall filter RSRP and RSRQ measurements of each measured E-UTRA cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least Tmeasure,EUTRAN\_RedCap/2.

An inter-RAT E-UTRA cell is considered to be detectable provided the following conditions are fulfilled:

- the same conditions as for inter-frequency RSRP measurements specified in TS 36.133 [15, Annex B.x.y] are fulfilled for a corresponding Band, and

- the same conditions as for inter-frequency RSRQ measurements specified in TS 36.133 [15, Annex B.x.y] are fulfilled for a corresponding Band.

- SCH conditions specified in TS 36.133 [15, Annex B.x.y] are fulfilled for a corresponding Band

The UE shall be able to evaluate whether a newly detectable inter-RAT E-UTRAN cell meets the reselection criteria defined in TS38.304 [1] within (NEUTRA\_carrier\_RedCap) \* Tdetect,EUTRAN\_RedCap when Srxlev ≤ SnonIntraSearchP or Squal ≤ SnonIntraSearchQ when Treselection = 0 provided that the reselection criteria are met by a margin of at least 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities for 2 Rx RedCap and at least [6dB] for RSRP reselections based on absolute priorities or [4dB] for RSRQ reselections based on absolute priorities for 1 Rx RedCap.

Cells which have been detected shall be measured at least every (NEUTRA\_carrier\_RedCap) \* Tmeasure,EUTRAN\_RedCap when Srxlev ≤ SnonIntraSearchP or Squal ≤ SnonIntraSearchQ.

When higher priority cells are found by the higher priority search, they shall be measured at least every Tmeasure,EUTRAN\_RedCap. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this clause shall still be met by the UE before it makes any determination that it may stop measuring the cell.

If the UE detects on an inter-RAT E-UTRAN carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall not consider an inter-RAT E-UTRA cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For a cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified inter-RAT E-UTRA cell has met reselection criterion defined in TS 38.304 [1] within (NEUTRA\_carrier\_RedCap) \* Tevaluate,EUTRAN\_RedCap when Treselection = 0provided that the reselection criteria are met by a margin of at least 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities for 2 Rx RedCap and at least [6dB] for RSRP reselections based on absolute priorities or [4dB] for RSRQ reselections based on absolute priorities for 1 Rx RedCap.

If Treselection timer has a non-zero value and the inter-RAT E-UTRA cell is satisfied with the reselection criteria which are defined in TS 38.304 [1], the UE shall evaluate this E-UTRA cell for the Treselection time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

For 1 Rx RedCap and 2 Rx RedCap not configured with eDRX\_IDLE cycle, Tdetect,EUTRAN\_RedCap, Tmeasure,EUTRAN\_RedCap and Tevaluate, E-UTRAN\_RedCap are specified in Table 4.2B.2.5-1 and Table 4.2.2.5-1 respectively.

For 1 Rx RedCap and 2 Rx RedCap configured with eDRX\_IDLE cycle, Tdetect,EUTRAN\_RedCap, Tmeasure,EUTRAN\_RedCap and Tevaluate, E-UTRAN\_RedCap are specified in Table 4.2B.2.5-2, where the requirements apply provided that the serving cell is configured with eDRX\_IDLE and is the same in all PTWs during any of Tdetect,EUTRAN\_RedCap, Tmeasure,EUTRAN\_RedCap and Tevaluate, E-UTRAN\_RedCap when multiple PTWs are used.

Table 4.2B.2.5-1: Tdetect,EUTRAN\_RedCap, Tmeasure,EUTRAN\_RedCap, and Tevaluate,EUTRAN\_RedCap for 1 Rx RedCap

|  |  |  |  |
| --- | --- | --- | --- |
| DRX cycle length [s] | Tdetect,EUTRAN [s] (number of DRX cycles) | Tmeasure,EUTRAN [s] (number of DRX cycles) | Tevaluate,EUTRAN[s] (number of DRX cycles) |
| 0.32 | 11.52 (36) | 1.28 (4) | 5.12 (16) |
| 0.64 | 17.92 (28) | 1.28 (2) | 5.12 (8) |
| 1.28 | 32(25) | 1.28 (1) | 6.4 (5) |
| 2.56 | 58.88 (23) | 2.56 (1) | 7.68 (3) |

Table 4.2B.2.5-2: Tdetect,EUTRAN\_RedCap, Tmeasure,EUTRAN\_RedCap, and Tevaluate,EUTRAN\_RedCap for UE configured with eDRX\_IDLE cycle

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| eDRX\_IDLE cycle length [s] | DRX cycle length [s] | PTW length [s] (number of 1.28s periods) | Tdetect,EUTRAN\_RedCap [s] (number of DRX or eDRX cycles Note 3) | Tmeasure,EUTRAN\_RedCap [s] (number of DRX or eDRX cycles Note 3) | Tevaluate,E-UTRAN\_RedCap[s] (number of DRX or eDRX cycles Note 3) |
| 5.12 | N/A | N/A | 117.76 (23) | 5.12 (1) | 10.24 (2) |
| 10.24 ≤ eDRX\_IDLE cycle length ≤ 2621.444 | 0.32 | ≥1.28 (1) |  (23) | 0.32 (1) | 0.64 (2) |
| 0.64 | ≥1.28 (1) | 0.64 (1) | 1.28 (2) |
| 1.28 | ≥2.56 (2) | 1.28 (1) | 2.56 (2) |
| 2.56 | ≥5.12 (4) | 2.56 (1) | 5.12 (2) |
| NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs.NOTE 2: The eDRX\_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].NOTE 3: Number of eDRX cycles when eDRX\_IDLE cycle length equals 5.12s, number of DRX cycles otherwise.NOTE 4: The lower bound of PTW length is derived based on $\left⌈\frac{Tevaluate,E-UTRAN\\_RedCap\*DRX\\_cycle}{1.28}\right⌉\*1.28$. |

For any requirement in this section, when the UE transitions between any two states when being configured with eDRX\_IDLE, being configured with eDRX\_IDLE cycle, changing eDRX\_IDLE cycle length, or changing PTW configuration, the UE shall meet the transition requirement, which is the less stringent requirement of the two requirements corresponding to the first state and the second state, during the transition time interval which is the time corresponding to the transition requirement. After the transition time interval, the UE shall meet the requirement corresponding to the second state.

#### 4.2B.2.6 Maximum interruption in paging reception for RedCap

The FDD, HD-FDD and TDD RedCap UE shall meet all applicable requirements specified in clause 4.2.2.6. In addition, when the UE is configured with eDRX\_IDLE cycle, the UE shall not miss any paging in a PTW provided the paging is sent in at least 2 DRX cycles before the end of that PTW.

The 1 Rx RedCap in HD-FDD shall meet all applicable requirements specified in clause 4.2.2.6 under the following conditions

- at least 1 SSB is available at the UE in the serving cell during the last 160 ms duration.

#### 4.2B.2.7 General requirements for RedCap

The requirements defined in section 4.2.2.7 apply for this section.

#### 4.2B.2.8 Minimum requirement at transitions

When switching from:

 low mobility scenario to stationary scenario, or

 from low mobility scenario to stationary and not-at-cell-edge scenario,

the UE shall fulfill the requirements corresponding to low mobility scenario over measurement period (Trelaxed) and thereafter switch to requirements corresponding to stationary scenario, or stationary and not-at-cell-edge scenario. The measurement period, Trelaxed, is any of:

- Tmeasure,NR\_Intra\_RedCap\_Relax and Tevaluate,NR\_Intra\_RedCap\_Relax, defined in section 4.2B.2.9 for intra-frequency measurements on NR cells,

- Tmeasure,NR\_Inter\_RedCap\_Relax and Tevaluate,NR\_Inter\_RedCap\_Relax defined in section 4.2B.2.10 for inter-frequency measurements on NR cells and

- Tmeasure,EUTRAN\_RedCap\_Relax and Tevaluate,EUTRAN\_RedCap\_Relax defined in sections 4.2B.2.11 for inter-RAT E-UTRAN measurements.

When switching from:

 stationary scenario to low mobility scenario, or

 stationary and not-at-cell-edge scenario to low mobility scenario,

the UE shall fulfill the requirements corresponding to low mobility scenario upon fulfilling the switching criteria.

When switching from normal mode to low mobility scenario, stationary scenario or stationary and not-at-cell edge scenario during cell-reselection period, the UE shall fulfill the requirements corresponding to normal mode over measurement period (Tnormal) and thereafter switch to requirements corresponding to low mobility scenario, stationary scenario or stationary and not-at-cell edge scenario. The measurement period, Tnormal, is any of:

- Tmeasure,NR\_Intra\_RedCap and Tevaluate,NR\_Intra\_RedCap, defined in section 4.2B.2.3 for intra-frequency measurements on NR cells,

- Tmeasure,NR\_Inter\_RedCap and Tevaluate,NR\_Inter\_RedCap defined in section 4.2B.2.4 for inter-frequency measurements on NR cells and

- Tmeasure,EUTRAN\_RedCap and Tevaluate,EUTRAN\_RedCap defined in sections 4.2B.2.5 for inter-RAT E-UTRAN measurements.

When switching from:

 low mobility scenario to normal mode, or

 stationary scenario to normal mode, or

 stationary and not-at-cell-edge scenario to normal mode

the UE shall fulfill the requirements corresponding to normal mode upon fulfilling the switching criteria.

No requirement is defined for multiple transitions of scenarios within one measurement period.

#### 4.2B.2.9 Measurements of intra-frequency NR cells for UE configured with relaxed measurement criterion for RedCap

##### 4.2B.2.9.1 Introduction

This clause contains the requirements for measurements on intra-frequency NR cells when Srxlev ≤ SIntraSearchP or Squal ≤ SIntraSearchQ and when the UE is configured any of the following relaxed measurement critera:

- Relaxed measurement criterion for a stationary UE defined in clause 5.2.4.9.3 in [1],

- Relaxed measurement criterion for a stationary UE not at cell edge defined in clause 5.2.4.9.4 in [1],

- Both low mobility criterion and stationary criterion as defined in clause 5.2.4.9.1 and 5.2.4.9.3 or 5.2.4.9.4 in [1] respectively.

##### 4.2B.2.9.2 Measurements for UE fulfilling stationary criterion

This clause contains requirements for measurements on intra-frequency NR cells provided that:

- UE is configured with *stationaryMobilityEvaluation* [2] criterion and UE has fulfilled that criterion, or

- UE is configured with both *stationaryMobilityEvaluation* [2] criterion and *cellEdgeEvaluationWhileStationary* [2] criterion and *combineRelaxedMeasCondition2* [2] not configured, and UE has fulfilled only the *stationaryMobilityEvaluation* [2] criterion

The requirements defined in clause 4.2B.2.3 apply for this clause except that:

- Tdetect,NR\_Intra\_RedCap\_Relaxas specified in Table 4.2B.2.9.2-1 and Table 4.2B.2.9.2-2 for 1 Rx RedCap and 2 Rx RedCap respectively.

- Tmeasure,NR\_Intra\_RedCap\_Relax as specified in Table 4.2B.2.9.2-1 and Table 4.2B.2.9.2-2 for 1 Rx RedCap and 2 Rx RedCap respectively.

- Tevaluate,NR\_Intra\_RedCap\_Relax as specified in Table 4.2B.2.9.2-1 and Table 4.2B.2.9.2-2 for 1 Rx RedCap and 2 Rx RedCap respectively.

If the UE is configured with eDRX\_IDLE cycle then the requirements in Table 4.2B.2.9.2-3 and Table 4.2B.2.9.2-4 are applicable for eDRX cycle up to 10.24 s in FR1 and FR2 respectively.

If the UE is configured with eDRX\_IDLE cycle greater than 10.24 s in FR1 and FR2, then the requirements in Table Table 4.2B.2.9.2-5 and Table 4.2B.2.9.2-6 respectively apply provided eDRX cycle is ≤ [163.84] sec and evaluation/measurement time with relaxation on one carrier is not greater than single PTW window length.

Table 4.2B.2.9.2-1: Tdetect,NR\_Intra\_RedCap\_Relax, Tmeasure,NR\_Intra\_RedCap\_Relax and Tevaluate,NR\_Intra\_RedCap\_Relax for UEs fulfilling stationary criterion for 1 Rx RedCap UE

|  |  |  |  |
| --- | --- | --- | --- |
| DRX cycle length [s] | Tdetect,NR\_Intra\_RedCap\_Relax [s] (number of DRX cycles) | Tmeasure,NR\_Intra\_RedCap\_Relax [s] (number of DRX cycles) | Tevaluate,NR\_Intra\_RedCap\_Relax[s] (number of DRX cycles) |
|  |  |  |  |
| 0.32 | 11.52 x M2 x K3 (36 x M2 x K3) | 1.28 x M2 x K3 (4 x M2 x K3) | 5.12 x M2 x K3 (16 x M2 x K3) |
| 0.64 | 17.92 x K3 (28 x K3) | 1.28 x K3 (2 x K3) | 5.12 x K3 (8 x K3) |
| 1.28 | 32 x K3 (25 x K3) | 1.28x K3 (1 x K3) | 6.4 x K3 (5 x K3) |
| 2.56 | 58.88 x K3 (23 x K3) | 2.56 x K3 (1 x K3) | 7.68 x K3 (3 x K3) |
| Note 1: M2 = 1.5 if SMTC periodicity of measured intra-frequency cell > 20 ms; otherwise M2=1. If different SMTC periodicities are configured for different cells, the SMTC periodicity in this note is the one used by the cell being identified. During PSS/SSS detection, the periodicity of the SMTC configured for the intra-frequency carrier is assumed, and if the actual SSB transmission periodicity is greater than the SMTC configured for the intra-frequency carrier, longer Tdetect, NR\_intra is expected.Note 2: K3 = 6 is the measurement relaxation factor applicable for UE fulfilling the *stationaryMobilityEvaluation* [2] criterion. |

Table 4.2B.2.9.2-2: Tdetect,NR\_Intra\_RedCap\_Relax, Tmeasure,NR\_Intra\_RedCap\_Relax and Tevaluate,NR\_Intra\_RedCap\_Relax for UEs fulfilling stationary criterion for 2 Rx RedCap UE

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DRX cycle length [s] | Scaling Factor (N1) | Tdetect,NR\_Intra\_RedCap\_Relax [s] (number of DRX cycles) | Tmeasure,NR\_Intra\_RedCap\_Relax [s] (number of DRX cycles) | Tevaluate,NR\_Intra\_RedCap\_Relax[s] (number of DRX cycles) |
|  | FR1 | FR2Note1 |  |  |  |
| 0.32 | 1 | 8 | 11.52 x N1 x M2 x K3 (36 x N1 x M2 x K3) | 1.28 x N1 x M2 x K3 (4 x N1 x M2 x K3) | 5.12 x N1 x M2 x K3 (16 x N1 x M2 x K3) |
| 0.64 |  | 5 | 17.92 x N1 x K3 (28 x N1 x K3) | 1.28 x N1 x K3 (2 x N1 x K3) | 5.12 x N1 x K3 (8 x N1 x K3) |
| 1.28 |  | 4 | 32 x N1 x K3 (25 x N1 x K3) | 1.28 x N1 x K3 (1 x N1 x K3) | 6.4 x N1 x K3 (5 x N1 x K3) |
| 2.56 |  | 3 | 58.88 x N1 x K3 (23 x N1 x K3) | 2.56 x N1 x K3 (1 x N1 x K3) | 7.68 x N1 x K3 (3 x N1 x K3) |
| Note 1: Applies for RedCap UE of all supporting FR2 power classes.Note 2: M2 = 1.5 if SMTC periodicity of measured intra-frequency cell > 20 ms; otherwise M2=1. If different SMTC periodicities are configured for different cells, the SMTC periodicity in this note is the one used by the cell being identified. During PSS/SSS detection, the periodicity of the SMTC configured for the intra-frequency carrier is assumed, and if the actual SSB transmission periodicity is greater than the SMTC configured for the intra-frequency carrier, longer Tdetect, NR\_intra is expected.Note 3: K3 = 6 is the measurement relaxation factor applicable for UE fulfilling the *stationaryMobilityEvaluation* [2] criterion. |

Table 4.2B.2.9.2-3: Tdetect,NR\_Intra\_RedCap\_Relax, Tmeasure,NR\_Intra\_RedCap\_Relax and Tevaluate,NR\_Intra\_RedCap\_Relax for UE configured with eDRX\_IDLE cycle (Frequency range FR1) for eDRX\_IDLE cycle upto 10.24 s

|  |  |  |  |
| --- | --- | --- | --- |
| **eDRX\_IDLE cycle length [s]** | **Tdetect,NR\_Intra\_RedCap\_Relax [s] (number of eDRX IDLE cycles)** | **Tmeasure,NR\_Intra\_RedCap\_Relax [s] (number of eDRX IDLE cycles)** | **Tevaluate,NR\_Intra\_RedCap\_Relax [s] (number of eDRX IDLE cycles)** |
|
| 2.56 | 58.88 x K3 (23 x K3) | 2.56 x K3 (1 x K3) | 7.68 x K3 (3 x K3) |
| 5.12 | 117.76 x K3 (23 x K3) | 5.12 x K3 (1 x K3) | 10.24 x K3 (2 x K3) |
| 10.24 | 235.52 x K3 (23 x K3) | 10.24 x K3 (1 x K3) | 20.48 x K3 (2 x K3) |
| Note 1: K3 = 6 is the measurement relaxation factor applicable for UE fulfilling the stationaryMobilityEvaluation [2] criterion. |

Table 4.2B.2.9.2-4: Tdetect,NR\_Intra\_RedCap\_Relax, Tmeasure,NR\_Intra\_RedCap\_Relax and Tevaluate,NR\_Intra\_RedCap\_Relax for UE configured with eDRX\_IDLE cycle (Frequency range FR2) for eDRX\_IDLE cycle upto 10.24 s

|  |  |  |  |
| --- | --- | --- | --- |
| **eDRX\_IDLE cycle length [s]** | **Tdetect,NR\_Intra\_RedCap\_Relax [s] (number of eDRX IDLE cycles)** | **Tmeasure,NR\_Intra\_RedCap\_Relax [s] (number of eDRX IDLE cycles)** | **Tevaluate,NR\_Intra\_RedCap\_Relax [s] (number of eDRX IDLE cycles)** |
|
| 2.56 | 58.88 x N1 x K3 (23 x N1 x K3) | 2.56 x N1 x K3 (1 x K3) | 7.68 x N1 x K3 (3 x N1 x K3) |
| 5.12 | 117.76 x N1 x K3 (23 x N1 x K3) | 5.12 x N1 x K3 (1 x N1 x K3) | 10.24 x N1 x K3 (2 x N1 x K3) |
| 10.24 | 235.52 x N1 x K3 (23 x N1 x K3) | 10.24 x N1 x K3 (1 x N1 x K3) | 20.48 x N1 x K3 (2 x N1 x K3) |
| Note 1: K3 = 6 is the measurement relaxation factor applicable for UE fulfilling the stationaryMobilityEvaluation [2] criterion. |

Table 4.2B.2.9.2-5: Tdetect,NR\_Intra\_RedCap\_Relax, Tmeasure,NR\_Intra\_RedCap\_Relax and Tevaluate,NR\_Intra\_RedCap\_Relax for UE configured with eDRX\_IDLE cycle (Frequency range FR1)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **eDRX\_IDLE cycle length [s]** | **DRX cycle length [s]** | **PTW length [s] (number of 1.28s periods)** | **Tdetect,NR\_Intra\_RedCap\_Relax [s] (number of DRX cycles or eDRX cycles Note 3)** | **Tmeasure,NR\_Intra\_RedCap\_Relax [s] (number of DRX cycles or eDRX cycles Note 3)** | **Tevaluate,NR\_Intra\_RedCap\_Relax [s] (number of DRX cycles or eDRX cycles Note 3)** |
| 20.48 ≤ eDRX\_IDLE cycle length ≤10485.76 | 0.32 | ≥[1.28] ([1]) | $$eDRX\\_cycle\\_length×\left⌈\frac{23}{PTW/DRX\\_cycle\\_length}\right⌉x K3$$(23 x K3) | 0.32 x M2 x K3 (1 x M2 x K3) | 0.64 x M2 x K3 (2 x M2 x K3) |
| 0.64 | ≥[1.28] ([1]) | 0.64 x K3 (1 x K3) | 1.28 x K3 (2 x K3) |
| 1.28 | ≥[2.56] ([2]) | 1.28 x K3 (1 x K3) | 2.56 x K3 (2 x K3) |
| 2.56 | ≥[5.12] ([4]) | 2.56 x K3 (1 x K3) | 5.12 x K3 (2 x K3) |
| Note 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs.Note 2: The eDRX\_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].Note 3: The lower bound of PTW length is derived based on $\left⌈\frac{Tevaluate,NR\\_Intra\\_RedCap\*DRX\\_cycle}{1.28}\right⌉\*1.28$.Note 4: M2 = 1.5 if SMTC periodicity of measured intra-frequency cell > 20 ms; otherwise M2=1. If different SMTC periodicities are configured for different cells, the SMTC periodicity in this note is the one used by the cell being identified. During PSS/SSS detection, the periodicity of the SMTC configured for the intra-frequency carrier is assumed, and if the actual SSB transmission periodicity is greater than the SMTC configured for the intra-frequency carrier, longer Tdetect, NR\_intra\_RedCap is expected.Note 5: K3 = 6 is the measurement relaxation factor applicable for UE fulfilling the stationaryMobilityEvaluation [2] criterion. |

Table 4.2B.2.9.2-6: Tdetect,NR\_Intra\_RedCap\_Relax, Tmeasure,NR\_Intra\_RedCap\_Relax and Tevaluate,NR\_Intra\_RedCap\_Relax for UE configured with eDRX\_IDLE cycle (Frequency range FR2)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **eDRX\_IDLE cycle length [s]** | **DRX cycle length [s]** | **PTW length [s] (number of 1.28s periods)** | **Scaling Factor (N1)** Note1 | **Tdetect,NR\_Intra\_RedCap\_Relax [s] (number of DRX cycles or eDRX cycles Note 3)** | **Tmeasure,NR\_Intra\_RedCap\_Relax** **[s] (number of DRX cycles or eDRX cycles Note 3)** | **Tevaluate,NR\_Intra\_RedCap\_Relax****[s] (number of DRX cycles or eDRX cycles Note 3)** |
| 20.48 ≤ eDRX\_IDLE cycle length ≤10485.76 | 0.32 | ≥5.12 (4) | 8 | K3 x $eDRX\\_cycle\\_length×\left⌈\frac{23×N1}{PTW/DRX\\_cycle\\_length}\right⌉$(23 x N1 x K3) | 0.32 x N1 x K3 (1 x N1 x K3) | 0.64 x N1 x K3 (2 x N1 x K3) |
| 0.64 | ≥6.4 (5) | 5 | 0.64 x N1 x K3 (1 x N1 x K3) | 1.28 x N1 x K3 (2 x N1 x K3) |
| 1.28 | ≥10.24 (8) | 4 | 1.28 x N1 x K3 (1 x N1 x K3) | 2.56 x N1 x K3 (2 x N1 x K3) |
| 2.56 | ≥15.36 (12) | 3 | 2.56 x N1 x K3 (1 x N1 x K3) | 5.12 x N1 x K3 (2 x N1 x K3) |
| Note 1: Applies for RedCap UE of all supporting FR2 power classes.Note 2: The number of DRX cycles in this table is given for the DRX cycles within PTWs.Note 3: The eDRX\_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].Note 4: The lower bound of PTW length is derived based on $\left⌈\frac{Tevaluate,NR\\_Intra\\_RedCap\*DRX\\_cycle}{1.28}\right⌉\*1.28$.Note 5: The measurement shall not be performed across PTW’s. In this case the measurement is performed in the next available PTW.Note 6: The evaluation shall not be performed across PTW’s. In this case the evaluation is performed in the next available PTW.Note 7: K3 = 6 is the measurement relaxation factor applicable for UE fulfilling the stationaryMobilityEvaluation [2] criterion. |

##### 4.2B.2.9.3 Measurements for a UE fulfilling stationary not at cell edge criteria

This clause contains requirements for measurements on intra-frequency NR cells provided that:

- UE is configured with both *stationaryMobilityEvaluation* [2] criterion and *cellEdgeEvaluationWhileStationary* [2] criterion, and

- has also fulfilled both criteria, and,

- less than 4 hours have passed since measurements for cell reselection were last performed

In this case the UE is not required to meet Tdetect,NR\_Intra\_RedCap, Tmeasure,NR\_Intra\_RedCap and Tevaluate,NR\_Intra\_RedCap as defined in clause 4.2B.2.3X.

In addition the the conditions listed above, if the UE is configured with eDRX\_IDLE cycle ≤ [163.84] sec then the UE is not required to meet Tdetect,NR\_Intra\_RedCap, Tmeasure,NR\_Intra\_RedCap and Tevaluate,NR\_Intra\_RedCap as defined in clause 4.2B.2.3X and evaluation/measurement time with relaxation on one carrier is not greater than single PTW window length.

##### 4.2B.2.9.4 Measurements for a UE fulfilling low mobility and stationary criteria

This clause contains requirements for measurements on intra-frequency NR cells provided that:

- UE is configured with *lowMobilityEvaluation* [2] criterion and *stationaryMobilityEvaluation* [2] criterion, and has also fulfilled both criteria, or,

- UE is configured with *lowMobilityEvaluation* [2] criterion and with both *stationaryMobilityEvaluation* [2] criterion and *cellEdgeEvaluationWhileStationary* [2] criterion and *combineRelaxedMeasCondition2* [2] not configured, and UE has fulfilled *lowMobilityEvaluation* and *stationaryMobilityEvaluation* [2] criteria

The requirements defined in clause 4.2B.2.9.2 apply for this clause.

##### 4.2B.2.9.5 Measurements for a UE fulfilling low mobility and stationary not at cell edge criteria

This clause contains requirements for measurements on intra-frequency NR cells provided that:

- UE is configured with *lowMobilityEvaluation* [2] criterion and UE has fulfilled this criterion, and

- UE is configured with *stationaryMobilityEvaluation* [2] and *cellEdgeEvaluationWhileStationary* [2] criterion, and UE has also fulfilled both criteria

The requirements defined in clause 4.2B.2.9.3 apply for this clause.

##### 4.2B.2.9.6 Measurements for a UE fulfilling not-at-cell edge criterion and stationary not at cell edge criteria

This clause contains requirements for measurements on intra-frequency NR cells provided that:

* UE is configured with cellEdgeEvaluation [2] criterion and UE has fulfilled that criterion, and
* UE is configured with *stationaryMobilityEvaluation* [2] criterion and *cellEdgeEvaluationWhileStationary* [2] criterion, and has also fulfilled both criteria

The requirements defined in clause 4.2B.2.9.3 apply for this clause.

##### 4.2B.2.9.7 Measurements for a UE fulfilling low mobility not-at-cell edge criterion and stationary not at cell edge criteria

This clause contains requirements for measurements on intra-frequency NR cells provided that:

* UE is configured with both *lowMobilityEvaluation* [2] criterion and *cellEdgeEvaluation* [2] criterion, and has fulfilled both criteria, and
* UE is configured with *stationaryMobilityEvaluation* [2] criterion and *cellEdgeEvaluationWhileStationary* [2] criterion, and has also fulfilled both criteria

The requirements defined in clause 4.2B.2.9.3 apply for this clause.

##### 4.2B.2.9.8 Measurements for a UE fulfilling low mobility not-at-cell edge criterion and stationary criteria

This clause contains requirements for measurements on intra-frequency NR cells provided that:

* UE is configured with both *lowMobilityEvaluation* [2] criterion and *cellEdgeEvaluation* [2] criterion, and has fulfilled both criteria, and
* UE is configured with *stationaryMobilityEvaluation* [2] criterion and has also fulfilled both criteria

The requirements defined in clause 4.2.2.9.4 apply for this clause.

#### 4.2B.2.10 Measurements of inter-frequency NR cells for UE configured with relaxed measurement criterion

##### 4.2B.2.10.1 Introduction

This clause contains the requirements for measurements on inter-frequency NR cells when Srxlev ≤ SIntraSearchP or Squal ≤ SIntraSearchQ and when the UE is configured any of the following relaxed measurement critera:

- Relaxed measurement criterion for a stationary UE defined in clause 5.2.4.9.3 in [1],

- Relaxed measurement criterion for a stationary UE not at cell edge defined in clause 5.2.4.9.4 in [1],

- Both low mobility criterion and stationary criterion as defined in clause 5.2.4.9.1 and 5.2.4.9.3 or 5.2.4.9.4 in [1] respectively.

##### 4.2B.2.10.2 Measurements for UE fulfilling stationary criterion

This clause contains requirements for measurements on inter-frequency NR cells provided that:

- UE is configured with *stationaryMobilityEvaluation* [2] criterion and UE has fulfilled that criterion, or

- UE is configured with both *stationaryMobilityEvaluation* [2] criterion and *cellEdgeEvaluationWhileStationary* [2] criterion and *combineRelaxedMeasCondition2* [2] not configured, and UE has fulfilled only the *stationaryMobilityEvaluation* [2] criterion, and

The requirements defined in clause 4.2B.2.4 apply for this clause except that:

- Tdetect,NR\_Inter\_RedCap\_Relaxas specified in Table 4.2B.2.10.2-1 and Table 4.2B.2.10.2-2 for 1 Rx RedCap and 2 Rx RedCap respectively.

- Tmeasure,NR\_Inter\_RedCap\_Relax as specified in Table 4.2B.2.10.2-1 and Table 4.2B.2.10.2-2 for 1 Rx RedCap and 2 Rx RedCap respectively.

- Tevaluate,NR\_Inter\_RedCap\_Relax as specified in Table 4.2B.2.10.2-1 and Table 4.2B.2.10.2-2 for 1 Rx RedCap and 2 Rx RedCap respectively.

If the UE is configured with eDRX\_IDLE cycle then the requirements in Table 4.2B.2.10.2-3 and Table 4.2B.2.10.2-4 are applicable for eDRX cycle up to 10.24 s in FR1 and FR2 respectively.

If the UE is configured with eDRX\_IDLE cycle greater than 10.24 s in FR1 and FR2, then the requirements in Table Table 4.2B.2.10.2-5 and Table 4.2B.2.10.2-6 respectively apply provided that eDRX cycle is ≤ [163.84] sec and evaluation/measurement time with relaxation on one carrier is not greater than single PTW window length.

Table 4.2B.2.10.2-1: Tdetect,NR\_Inter\_RedCap\_Relax, Tmeasure,NR\_Inter\_RedCap\_Relax and Tevaluate,NR\_Inter\_RedCap\_Relax for 1 Rx RedCap UE

|  |  |  |  |
| --- | --- | --- | --- |
| DRX cycle length [s] | Tdetect,NR\_Inter\_RedCap\_Relax [s] (number of DRX cycles) | Tmeasure,NR\_Inter\_RedCap\_Relax [s] (number of DRX cycles) | Tevaluate,NR\_Inter\_RedCap\_Relax [s] (number of DRX cycles) |
| 0.32 | 11.52 x 1.5 x K4(36 x 1.5 x K4) | 1.28 x 1.5 x K4 (4 x 1.5 x K4) | 5.12 x 1.5 x K4 (16 x 1.5 x K4) |
| 0.64 | 17.92 x K4 (28 x K4) | 1.28x K4 (2 x K4) | 5.12 x K4 (8 x K4) |
| 1.28 | 32 x K4 (25 x K4) | 1.28x K4 (1 x K4) | 6.4 x K4 (5 x K4) |
| 2.56 | 58.88 x K4 (23 x K4) | 2.56 x K4 (1 x K4) | 7.68 x K4 (3 x K4) |
| Note 1: K4 = 6 is the measurement relaxation factor applicable for UE fulfilling the *stationaryMobilityEvaluation* [2] criterion. |

Table 4.2B.2.10.2-2: Tdetect,NR\_Inter\_RedCap\_Relax, Tmeasure,NR\_Inter\_RedCap\_Relax and Tevaluate,NR\_Inter\_RedCap\_Relax for 2 Rx RedCap UE

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DRX cycle length [s] | Scaling Factor (N1) | Tdetect,NR\_Inter\_Relax [s] (number of DRX cycles) | Tmeasure,NR\_Inter\_Relax [s] (number of DRX cycles) | Tevaluate,NR\_Inter\_Relax [s] (number of DRX cycles) |
| FR1 | FR2Note1 |
| 0.32 | 1 | 8 | 11.52 x N1 x 1.5 x K4 (36 x N1 x 1.5 x K4) | 1.28 x N1 x 1.5 x K4 (4 x N1 x 1.5 x K4) | 5.12 x N1 x 1.5 x K4 (16 x N1 x 1.5 x K4) |
| 0.64 |  | 5 | 17.92x N1 x K4 (28 x N1 x K4) | 1.28 x N1 x K4 (2 x N1 x K4) | 5.12 x N1 x K4 (8 x N1 x K4) |
| 1.28 |  | 4 | 32 x N1 x K4 (25 x N1 x K4) | 1.28 x N1 x K4 (1 x N1 x K4) | 6.4 x N1 x K4 (5 x N1 x K4) |
| 2.56 |  | 3 | 58.88 x N1 x K4 (23 x N1 x K4) | 2.56 x N1 x K4 (1 x N1 x K4) | 7.68 x N1 x K4 (3 x N1 x K4) |
| Note 1: Applies for RedCap UE of all supporting power class.Note 2: K4 = 6 is the measurement relaxation factor applicable for UE fulfilling the *stationaryMobilityEvaluation* [2] criterion. |

Table 4.2B.2.10.2-3: Tdetect,NR\_Inter\_RedCap\_Relax, Tmeasure,NR\_Inter\_RedCap\_Relax and Tevaluate,NR\_Inter\_RedCap\_Relax for UE configured with eDRX\_IDLE cycle (Frequency range FR1) for eDRX\_IDLE cycle upto 10.24 s

|  |  |  |  |
| --- | --- | --- | --- |
| **eDRX\_IDLE cycle length [s]** | **Tdetect,NR\_Inter\_RedCap\_Relaxx [s] (number of DRX cycles)** | **Tmeasure,NR\_Inter\_RedCap\_Relax [s] (number of DRX cycles)** | **Tevaluate,NR\_Inter\_RedCap\_Relax [s] (number of DRX cycles)** |
|
| 2.56 | 58.88 x K4 (23 x K4) | 2.56 x K4 (1 x K4) | 7.68 x K4 (3 x K4) |
| 5.12 | 117.76 x K4 (23 x K4) | 5.12 x K4 (1 x K4) | 10.24 x K4 (2 x K4) |
| 10.24 | 235.52 x K4 (23 x K4) | 10.24 x K4 (1 x K4) | 20.48 x K4 (2 x K4) |
| Note 1: K4 = 6 is the measurement relaxation factor applicable for UE fulfilling the *stationaryMobilityEvaluation* [2] criterion. |

Table 4.2B.2.10.2-4: Tdetect,NR\_Inter\_RedCap\_Relax, Tmeasure,NR\_Inter\_RedCap\_Relax and Tevaluate,NR\_Inter\_RedCap\_Relax for UE configured with eDRX\_IDLE cycle (Frequency range FR2) for eDRX\_IDLE cycle upto 10.24 s

|  |  |  |  |
| --- | --- | --- | --- |
| **eDRX\_IDLE cycle length [s]** | **Tdetect,NR\_Inter\_RedCap\_Relax [s] (number of DRX cycles)** | **Tmeasure,NR\_Inter\_RedCap\_Relax [s] (number of DRX cycles)** | **Tevaluate,NR\_Inter\_RedCap\_Relax [s] (number of DRX cycles)** |
|
| 2.56 | 58.88 x N1 x K3 (23 x N1 x K3) | 2.56 x N1 x K3 (1 x K3) | 7.68 x N1 x K3 (3 x N1 x K3) |
| 5.12 | 117.76 x N1 x K3 (23 x N1 x K3) | 5.12 x N1 x K3 (1 x N1 x K3) | 10.24 x N1 x K3 (2 x N1 x K3) |
| 10.24 | 235.52 x N1 x K3 (23 x N1 x K3) | 10.24 x N1 x K3 (1 x N1 x K3) | 20.48 x N1 x K3 (2 x N1 x K3) |
| Note 1: K3 = 6 is the measurement relaxation factor applicable for UE fulfilling the stationaryMobilityEvaluation [2] criterion. |

Table 4.2B.2.10.2-5: Tdetect,NR\_Inter\_RedCap\_Relax, Tmeasure,NR\_ Inter \_RedCap\_Relax and Tevaluate,NR\_ Inter \_RedCap\_Relax for UE configured with eDRX\_IDLE cycle (Frequency range FR1) for eDRX\_IDLE cycle larger than 10.24 s

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **eDRX\_IDLE cycle length [s]** | **DRX cycle length [s]** | **PTW length [s] (number of 1.28s periods)** | **Tdetect,NR\_Inter\_RedCap\_Relax [s] (number of DRX cycles or eDRX cycles Note 3)** | **Tmeasure,NR\_Inter\_RedCap\_Relax [s] (number of DRX cycles or eDRX cycles Note 3)** | **Tevaluate,NR\_Inter\_RedCap\_Relax [s] (number of DRX cycles or eDRX cycles Note 3)** |
| 20.48 ≤ eDRX\_IDLE cycle length ≤10485.76 | 0.32 | ≥[1.28] ([1]) | $$eDRX\\_cycle\\_length×\left⌈\frac{23}{PTW/DRX\\_cycle\\_length}\right⌉x K3$$(23 x K3) | 0.32 x M2 x K3 (1 x M2 x K3) | 0.64 x M2 x K3 (2 x M2 x K3) |
| 0.64 | ≥[1.28] ([1]) | 0.64 x K3 (1 x K3) | 1.28 x K3 (2 x K3) |
| 1.28 | ≥[2.56] ([2]) | 1.28 x K3 (1 x K3) | 2.56 x K3 (2 x K3) |
| 2.56 | ≥[5.12] ([4]) | 2.56 x K3 (1 x K3) | 5.12 x K3 (2 x K3) |
| Note 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs.Note 2: The eDRX\_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].Note 3: The lower bound of PTW length is derived based on $\left⌈\frac{Tevaluate,NR\\_Inter\\_RedCap\*DRX\\_cycle}{1.28}\right⌉\*1.28$.Note 4: K4 = 6 is the measurement relaxation factor applicable for UE fulfilling the stationaryMobilityEvaluation [2] criterion. |

Table 4.2B.2.10.2-6: Tdetect,NR\_Inter\_RedCap\_Relax, Tmeasure,NR\_Inter\_RedCap\_Relax and Tevaluate,NR\_Inter\_RedCap\_Relax for UE configured with eDRX\_IDLE cycle (Frequency range FR2) for eDRX\_IDLE cycle larger than 10.24 s

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **eDRX\_IDLE cycle length [s]** | **DRX cycle length [s]** | **PTW length [s] (number of 1.28s periods)** | **Scaling Factor (N1)** Note1 | **Tdetect,NR\_Inter\_RedCap\_Relax [s] (number of DRX cycles or eDRX cycles Note 3)** | **Tmeasure,NR\_Inter\_RedCap\_Relax** **[s] (number of DRX cycles or eDRX cycles Note 3)** | **Tevaluate,NR\_Inter\_RedCap\_Relax****[s] (number of DRX cycles or eDRX cycles Note 3)** |
| 20.48 ≤ eDRX\_IDLE cycle length ≤10485.76 | 0.32 | ≥5.12 (4) | 8 | K3 x $eDRX\\_cycle\\_length×\left⌈\frac{23×N1}{PTW/DRX\\_cycle\\_length}\right⌉$(23 x N1 x K3) | 0.32 x N1 x K3 (1 x N1 x K3) | 0.64 x N1 x K3 (2 x N1 x K3) |
| 0.64 | ≥6.4 (5) | 5 | 0.64 x N1 x K3 (1 x N1 x K3) | 1.28 x N1 x K3 (2 x N1 x K3) |
| 1.28 | ≥10.24 (8) | 4 | 1.28 x N1 x K3 (1 x N1 x K3) | 2.56 x N1 x K3 (2 x N1 x K3) |
| 2.56 | ≥15.36 (12) | 3 | 2.56 x N1 x K3 (1 x N1 x K3) | 5.12 x N1 x K3 (2 x N1 x K3) |
| Note 1: Applies for RedCap UE of all supporting FR2 power classes.Note 2: The number of DRX cycles in this table is given for the DRX cycles within PTWs.Note 3: The eDRX\_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].Note 4: The lower bound of PTW length is derived based on $\left⌈\frac{Tevaluate,NR\\_Inter\\_RedCap\*DRX\\_cycle}{1.28}\right⌉\*1.28$.Note 5: K4 = 6 is the measurement relaxation factor applicable for UE fulfilling the stationaryMobilityEvaluation [2] criterion. |

##### 4.2B.2.10.3 Measurements for a UE fulfilling stationary not at cell edge criterion

This clause contains requirements for measurements on inter-frequency NR cells provided that:

- UE is configured with both *stationaryMobilityEvaluation* [2] criterion and *cellEdgeEvaluationWhileStationary* [2] criterion, and

- has also fulfilled both criteria, and

- less than 4 hours have passed since measurements for cell reselection were last performed, and

In this case the UE is not required to meet Tdetect,NR\_Inter\_RedCap, Tmeasure,NR\_Inter\_RedCap and Tevaluate,NR\_Inter\_RedCap as defined in clause 4.2B.2.4.

In addition the the conditions listed above, if the UE is configured with eDRX\_IDLE cycle ≤ [163.84] sec then the UE is not required to meet Tdetect,NR\_Intra\_RedCap, Tmeasure,NR\_Intra\_RedCap and Tevaluate,NR\_Intra\_RedCap as defined in clause 4.2B.2.4 and evaluation/measurement time with relaxation on one carrier is not greater than single PTW window length.

##### 4.2B.2.10.4 Measurements for a UE fulfilling low mobility and stationary criteria

This clause contains requirements for measurements on inter-frequency NR cells provided that:

- UE is configured with *lowMobilityEvaluation* [2] criterion and *stationaryMobilityEvaluation* [2] criterion, and has also fulfilled both criteria, or,

- UE is configured with *lowMobilityEvaluation* [2] criterion and with both *stationaryMobilityEvaluation* [2] criterion and *cellEdgeEvaluationWhileStationary* [2] criterion and *combineRelaxedMeasCondition2* [2] not configured, and UE has fulfilled *lowMobilityEvaluation* and *stationaryMobilityEvaluation* [2] criteria

The requirements defined in clause 4.2B.2.10.2 apply for this clause.

##### 4.2B.2.10.5 Measurements for a UE fulfilling low mobility and stationary not at cell edge criteria

This clause contains requirements for measurements on intra-frequency NR cells provided that:

- UE is configured with *lowMobilityEvaluation* [2] criterion and UE has fulfilled this criterion, and

- UE is configured with *stationaryMobilityEvaluation* [2] and *cellEdgeEvaluationWhileStationary* [2] criterion, and UE has also fulfilled both criteria

The requirements defined in clause 4.2B.2.10.3 apply for this clause.

##### 4.2B.2.10.6 Measurements for a UE fulfilling not-at-cell edge criterion and stationary not at cell edge criteria

This clause contains requirements for measurements on inter-frequency NR cells provided that:

* UE is configured with cellEdgeEvaluation [2] criterion and UE has fulfilled that criterion, and
* UE is configured with *stationaryMobilityEvaluation* [2] criterion and *cellEdgeEvaluationWhileStationary* [2] criterion, and has also fulfilled both criteria

The requirements defined in clause 4.2B.2.10.3 apply for this clause.

##### 4.2B.2.10.7 Measurements for a UE fulfilling low mobility not-at-cell edge criterion and stationary not at cell edge criteria

This clause contains requirements for measurements on intra-frequency NR cells provided that:

* UE is configured with both *lowMobilityEvaluation* [2] criterion and *cellEdgeEvaluation* [2] criterion, and has fulfilled both criteria, and
* UE is configured with *stationaryMobilityEvaluation* [2] criterion and *cellEdgeEvaluationWhileStationary* [2] criterion, and has also fulfilled both criteria

The requirements defined in clause 4.2B.2.10.3 apply for this clause.

##### 4.2B.2.10.8 Measurements for a UE fulfilling low mobility not-at-cell edge criterion and stationary criteria

This clause contains requirements for measurements on inter-frequency NR cells provided that:

* UE is configured with both *lowMobilityEvaluation* [2] criterion and *cellEdgeEvaluation* [2] criterion, and has fulfilled both criteria, and
* UE is configured with *stationaryMobilityEvaluation* [2] criterion and has also fulfilled that criterion

The requirements defined in clause 4.2.2.10.4 apply for this clause.

#### 4.2B.2.11 Measurements of inter-RAT E-UTRAN cells for UE configured with relaxed measurement criterion

##### 4.2B.2.11.1 Introduction

This clause contains the requirements for measurements on inter-RAT E-UTRAN cells when Srxlev ≤ SIntraSearchP or Squal ≤ SIntraSearchQ and when the UE is configured any of the following relaxed measurement critera:

- Relaxed measurement criterion for a stationary UE defined in clause 5.2.4.9.X in [1],

- Relaxed measurement criterion for a stationary UE not at cell edge defined in clause 5.2.4.9.Y in [1],

- Both low mobility criterion and stationary criterion as defined in clause 5.2.4.9.1 and 5.2.4.9.X in [1] respectively.

##### 4.2B.2.11.2 Measurements for UE fulfilling stationary criterion

This clause contains requirements for measurements on inter-RAT E-UTRAN cells provided that:

- UE is configured with *stationaryMobilityEvaluation* [2] criterion and UE has fulfilled that criterion, or

- UE is configured with both *stationaryMobilityEvaluation* [2] criterion and *cellEdgeEvaluationWhileStationary* [2] criterion and *combineRelaxedMeasCondition2* [2] not configured, and UE has fulfilled only the *stationaryMobilityEvaluation* [2] criterion, and

The requirements defined in clause 4.2B.2.5 apply for this clause except that:

- Tdetect,EUTRAN\_RedCap Relax as specified in Table 4.2B.2.11.2-1 and Table 4.2B.2.11.2-2 for 1 Rx RedCap and 2 Rx RedCap respectively.

- Tmeasure,EUTRAN RedCap Relax as specified in Table 4.2B.2.11.2-1 and Table 4.2B.2.11.2-2 for 1 Rx RedCap and 2 Rx RedCap respectively.

- Tevaluate,EUTRAN RedCap Relax as specified in Table 4.2B.2.11.2-1 and Table 4.2B.2.11.2-2 for 1 Rx RedCap and 2 Rx RedCap respectively.

If the UE is configured with eDRX\_IDLE cycle then the requirements in Table 4.2B.2.11.2-3 are applicable for eDRX cycle < 10.24 s.

If the UE is configured with eDRX\_IDLE cycle ≥ 10.24 s, then the requirements in Table 4.2B.2.11.2-4 apply provided that filtering of a measurement is done within a single PTW and provided that the eDRX cycle is ≤ [163.84] sec and evaluation/measurement time with relaxation on one carrier is not greater than single PTW window length.

Table 4.2B.2.11.2-1: Tdetect,EUTRAN\_RedCap\_Relax, Tmeasure,EUTRAN\_RedCap\_Relax, and Tevaluate,EUTRAN\_RedCap\_Relax for 1 Rx RedCap

|  |  |  |  |
| --- | --- | --- | --- |
| DRX cycle length [s] | Tdetect,EUTRAN\_Relax [s] (number of DRX cycles) | Tmeasure,EUTRAN\_Relax [s] (number of DRX cycles) | Tevaluate,EUTRAN\_Relax[s] (number of DRX cycles) |
| 0.32 | 11.52 x K5 (36 x K5) | 1.28 x K5 (4 x K5) | 5.12 x K5 (16 x K5) |
| 0.64 | 17.92 x K5 (28 x K5) | 1.28 x K5 (2 x K5) | 5.12 x K5 (8 x K5) |
| 1.28 | 32 x K5 (25 x K5) | 1.28 x K5 (1 x K5) | 6.4 x K5 (5 x K5) |
| 2.56 | 58.88 x K5 (23 x K5) | 2.56 x K5 (1 x K5) | 7.68 x K5 (3 x K5) |
| Note 1: K5 = 6 is the measurement relaxation factor applicable for UE fulfilling the *stationaryMobilityEvaluation* [2] criterion. |

Table 4.2B.2.11.2-2: Tdetect,EUTRAN\_Relax, Tmeasure,EUTRAN\_Relax, and Tevaluate,EUTRAN\_Relax for 2 Rx RedCap

|  |  |  |  |
| --- | --- | --- | --- |
| DRX cycle length [s] | Tdetect,EUTRAN\_Relax [s] (number of DRX cycles) | Tmeasure,EUTRAN\_Relax [s] (number of DRX cycles) | Tevaluate,EUTRAN\_Relax[s] (number of DRX cycles) |
| 0.32 | 11.52 x K5 (36 x K5) | 1.28 x K5 (4 x K5) | 5.12 x K5 (16 x K5) |
| 0.64 | 17.92 x K5 (28 x K5) | 1.28 x K5 (2 x K5) | 5.12 x K5 (8 x K5) |
| 1.28 | 32 x K5 (25 x K5) | 1.28 x K5 (1 x K5) | 6.4 x K5 (5 x K5) |
| 2.56 | 58.88 x K5 (23 x K5) | 2.56 x K5 (1 x K5) | 7.68 x K5 (3 x K5) |

Table 4.2B.2.10.2-3: Tdetect,E-UTRAN \_RedCap\_Relax, Tmeasure,NR\_,E-UTRAN \_RedCap\_Relax and Tevaluate,NR\_,E-UTRAN \_RedCap\_Relax for UE configured with eDRX\_IDLE cycle

|  |  |  |  |
| --- | --- | --- | --- |
| **eDRX\_IDLE cycle length [s]** | **Tdetect,NR\_E-UTRAN\_RedCap\_Relax [s] (number of DRX cycles)** | **Tmeasure,NR\_E-UTRAN\_RedCap\_Relax [s] (number of DRX cycles)** | **Tevaluate,NR\_E-UTRAN\_RedCap\_Relax [s] (number of DRX cycles)** |
|
| 5.12 | 117.76 x K3 (23 x K3) | 5.12 x K3 (1 x K3) | 10.24 x K3 (2 x K3) |
| Note 1: M2 = 1.5 if SMTC periodicity of measured intra-frequency cell > 20 ms; otherwise M2=1. If different SMTC periodicities are configured for different cells, the SMTC periodicity in this note is the one used by the cell being identified. During PSS/SSS detection, the periodicity of the SMTC configured for the intra-frequency carrier is assumed, and if the actual SSB transmission periodicity is greater than the SMTC configured for the intra-frequency carrier, longer Tdetect, NR\_intra is expected.Note 2: K3 = 6 is the measurement relaxation factor applicable for UE fulfilling the *stationaryMobilityEvaluation* [2] criterion. |

Table 4.2B.2.10.2-4: Tdetect,E-UTRAN \_RedCap\_Relax, Tmeasure,NR\_,E-UTRAN \_RedCap\_Relax and Tevaluate,NR\_,E-UTRAN \_RedCap\_Relax for UE configured with eDRX\_IDLE cycle

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| eDRX\_IDLE cycle length [s] | DRX cycle length [s] | PTW length [s] (number of 1.28s periods) | Tdetect,EUTRAN\_RedCap\_Relax [s] (number of DRX or eDRX cycles Note 3) | Tmeasure,EUTRAN\_RedCap\_Relax [s] (number of DRX or eDRX cycles Note 3) | Tevaluate,E-UTRAN\_RedCap\_Relax[s] (number of DRX or eDRX cycles Note 3) |
| 10.24 ≤ eDRX\_IDLE cycle length ≤ 2621.444 | 0.32 | ≥1.28 (1) | K3 x  (23 x K3) | 0.32 x K3 (1 x K3) | 0.64 x K3 (2 x K3) |
| 0.64 | ≥1.28 (1) | 0.64 x K3 (1 x K3) | 1.28 x K3 (2 x K3) |
| 1.28 | ≥2.56 (2) | 1.28 x K3 (1 x K3) | 2.56 x K3 (2 x K3) |
| 2.56 | ≥5.12 (4) | 2.56 x K3 (1 x K3) | 5.12 x K3 (2 x K3) |
| NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs.NOTE 2: The eDRX\_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].NOTE 3: Number of eDRX cycles when eDRX\_IDLE cycle length equals 5.12s, number of DRX cycles otherwise.NOTE 4: The lower bound of PTW length is derived based on $\left⌈\frac{Tevaluate,E-UTRAN\\_RedCap\*DRX\\_cycle}{1.28}\right⌉\*1.28$. |

##### 4.2B.2.11.3 Measurements for a UE fulfilling stationary not at cell edge criterion

This clause contains requirements for measurements on inter-RAT E-UTRAN cells provided that:

- UE is configured with both *stationaryMobilityEvaluation* [2] criterion and *cellEdgeEvaluationWhileStationary* [2] criterion, and

- has also fulfilled both criteria, and

- less than 4 hours have passed since measurements for cell reselection were last performed, and

In this case the UE is not required to meet Tdetect,EUTRAN, Tmeasure,EUTRAN and Tevaluate,EUTRAN as defined in clause 4.2B.2.5.

In addition the the conditions listed above, if the UE is configured with eDRX\_IDLE cycle ≤ [163.84] sec then the UE is not required to meet Tdetect,NR\_Intra\_RedCap, Tmeasure,NR\_Intra\_RedCap and Tevaluate,NR\_Intra\_RedCap as defined in clause 4.2B.2.5 and evaluation/measurement time with relaxation on one carrier is not greater than single PTW window length.

##### 4.2B.2.11.4 Measurements for a UE fulfilling low mobility and stationary criteria

This clause contains requirements for measurements on inter-RAT E-UTRAN cells provided that:

- UE is configured with *lowMobilityEvaluation* [2] criterion and *stationaryMobilityEvaluation* [2] criterion, and has also fulfilled both criteria, or,

- UE is configured with *lowMobilityEvaluation* [2] criterion and with both *stationaryMobilityEvaluation* [2] criterion and *cellEdgeEvaluationWhileStationary* [2] criterion and *combineRelaxedMeasCondition2* [2] not configured, and UE has fulfilled *lowMobilityEvaluation* and *stationaryMobilityEvaluation* [2] criteria

The requirements defined in clause 4.2B.2.11.2 apply for this clause.

##### 4.2B.2.11.5 Measurements for a UE fulfilling low mobility and stationary not at cell edge criteria

This clause contains requirements for measurements on inter-RAT E-UTRAN cells provided that:

- UE is configured with *lowMobilityEvaluation* [2] criterion and UE has fulfilled this criterion, and

- UE is configured with *stationaryMobilityEvaluation* [2] and *cellEdgeEvaluationWhileStationary* [2] criterion, and UE has also fulfilled both criteria

The requirements defined in clause 4.2B.2.11.3 apply for this clause.

##### 4.2B.2.11.6 Measurements for a UE fulfilling not-at-cell edge criterion and stationary not at cell edge criteria

This clause contains requirements for measurements on inter-RAT E-UTRAN cells provided that:

* UE is configured with cellEdgeEvaluation [2] criterion and UE has fulfilled that criterion, and
* UE is configured with *stationaryMobilityEvaluation* [2] criterion and *cellEdgeEvaluationWhileStationary* [2] criterion, and has also fulfilled both criteria

The requirements defined in clause 4.2B.2.11.3 apply for this clause.

##### 4.2B.2.11.7 Measurements for a UE fulfilling low mobility not-at-cell edge criterion and stationary not at cell edge criteria

This clause contains requirements for measurements on inter-RAT E-UTRAN cells provided that:

* UE is configured with both *lowMobilityEvaluation* [2] criterion and *cellEdgeEvaluation* [2] criterion, and has fulfilled both criteria, and
* UE is configured with *stationaryMobilityEvaluation* [2] criterion and *cellEdgeEvaluationWhileStationary* [2] criterion, and has also fulfilled both criteria

The requirements defined in clause 4.2B.2.11.3 apply for this clause.

##### 4.2B.2.11.8 Measurements for a UE fulfilling low mobility not-at-cell edge criterion and stationary criteria

This clause contains requirements for measurements on inter-RAT E-UTRAN cells provided that:

* UE is configured with both *lowMobilityEvaluation* [2] criterion and *cellEdgeEvaluation* [2] criterion, and has fulfilled both criteria, and
* UE is configured with *stationaryMobilityEvaluation* [2] criterion and has also fulfilled both criteria

The requirements defined in clause 4.2.2.11.4 apply for this clause.

**----------------------END OF CHANGES----------------------------**