**3GPP TSG-RAN WG4 Meeting #112 R4-2411611**

**Maastricht, Netherlands, 19th - 23rd August, 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **4701** | **rev** |  | **Current version:** | **17.14.0** |  |
|  | | | | | | | | |
| *For* ***[HE](http://www.3gpp.org/3G_Specs/CRs.htm" \l "_blank)******[LP](http://www.3gpp.org/3G_Specs/CRs.htm" \l "_blank)*** *on using this form: comprehensive instructions can be found at  <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:*** | CR on maintenance of RRM performance requirements in NR\_NTN\_solutions WI\_R17 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Xiaomi | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_NTN\_solutions-Perf | | | | |  | ***Date:*** | | | 2024-08-08 |
|  |  | | | |  | |  | | |  |
| ***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 can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In the latest version of TS 38.133, there are still some TBD in the test cases for L3 measurement. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Re-submit the draftCR(R4-2407837) endorsed in RAN4#111 meeting.   1. Replace the TBDs with numbers. 2. Correct some measurement reporting delay 3. Modify the test paramters table to keep the consistency of NTN test cases | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Some test cases will be incomplete | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | A.14.5.1, A.14.5.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

<Start of change# 1>

### A.14.5.1 Intra-frequency Measurements

A.14.5.1.1 SA event triggered reporting tests without gap under non-DRX

A.14.5.1.1.1 Test purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the intra-frequency cell search requirements in clauses 9.2C.5.1 and 9.2C.5.2.

A.14.5.1.1.2 Test parameters

Two cells are deployed in the test, which are FR1 PCell (Cell 1) and a FR1 neighbour cell (Cell 2) on the same frequency as the PCell. The test parameters for PCell and neighbour cell are given in Table A.14.5.1.1.2-1 and A.14.5.1.1.2-2 below. In the measurement control information, a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

The UE shall be provided with the valid information about the SAN serving the each cell in the test before the test.

UE is configured with 2 non-overlapping SMTCs for the intra-frequency measurement. The SMTC periodicity is 20ms, and SMTC1 is associated with Cell 1 with offset 0, and SMTC2 is associated with Cell 2 with offset 10ms.

**Table A.14.5.1.1.2-1: Supported test configurations**

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, NR FDD, SSB SCS 15 kHz, data SCS 15 kHz, BW 10 MHz |
| 2 | NGSO, NR FDD, SSB SCS 15 kHz, data SCS 15 kHz, BW 10 MHz |
| Note: The UE is only required to be tested in one of the supported test configurations | |

**Table A.14.5.1.1.2-2: General test parameters for SA intra-frequency event triggered reporting without gap for FR1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Value** | **Comment** |
| Active cell |  | 1, 2 | Cell 1 |  |
| Neighbour cell |  | 1, 2 | Cell 2 | Cell to be identified. |
| RF Channel Number |  | 1, 2 | 1: Cell 1 and Cell 2 |  |
| SMTC1 configuration |  | 1 | SMTC.1 | Period: 20ms, offset: 0 |
| SMTC2 configuration |  | 2 | SMTC.4 | Period: 20ms, offset: 10ms |
| A3-Offset | dB | 1, 2 | -4.5 |  |
| CP length |  | 1, 2 | Normal |  |
| Hysteresis | dB | 1, 2 | 0 |  |
| Time To Trigger | s | 1, 2 | 0 |  |
| Filter coefficient |  | 1, 2 | 0 | L3 filtering is not used |
| DRX |  | 1, 2 |  | OFF |
| Time offset between serving and neighbour cells |  | 1, 2 | 10 ms | Asynchronous cells.  The timing of Cell 2 is 10ms later than the timing of Cell 1. |
| T1 | s | 1, 2 | 5 |  |
| T2 | s | 1, 2 | 5 |  |

**Table A.14.5.1.1.2-3: NR Cell specific test parameters for SA intra-frequency event triggered reporting without gap for FR1**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | |
|  |  |  | **T1** | **T2** | **T1** | **T2** |
| Satellite information |  | 1 | SSC.1 | | NSC.1 | |
| 2 | SSC.2 | | NSC.2 | |
| SSB configuration |  | 1, 2 | SSB.1 FR1 | | SSB.1 FR1 | |
| PDSCH RMC configuration |  | 1, 2 | SR.1.1 FDD | | N/A | |
| RMSI CORESET RMC configuration |  | 1, 2 | CR.1.1 FDD | | N/A | |
| Dedicated CORESET RMC configuration |  | 1, 2 | CCR.1.1 FDD | | N/A | |
| OCNG Patterns |  | 1, 2 | OP.1 | | OP.1 | |
| TRS Configuration |  | 1, 2 | TRS.1.1 FDD | | N/A | |
| IInitial BWP configuration |  | 1, 2 | DLBWP.0.1 ULBWP.0.1 | | DLBWP.0.1 ULBWP.0.1 | |
| Active DL BWP configuration |  | 1, 2 | DLBWP.1.1 | | DLBWP.1.1 | |
| Active UL BWP configuration |  | 1, 2 | ULBWP.1.1 | | ULBWP.1.1 | |
| RLM-RS |  | 1, 2 | SSB | | SSB | |
| Note 2 | dBm/SCS | 1, 2 | -98 | | | |
| Note 2 | dBm/15 kHz | 1, 2 | -98 | | | |
|  | dB | 1, 2 | 4 | -1.46 | -Infinity | -1.46 |
|  | dB | 1, 2 | 4 | 4 | -Infinity | 4 |
| SS-RSRP Note 3 | dBm/SCS kHz | 1, 2 | -94 | -94 | -Infinity | -94 |
| Io | dBm/9.36 MHz | 1, 2 | -64.60 | -62.25 | --64.60 | -62.25 |
| Propagation Condition |  | 1, 2 | AWGN | | | |
| Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | |

A.14.5.1.1.3 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2. The UE is not required to read the neighbour cell SSB index in this test.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.14.5.1.2 SA event triggered reporting tests without gap under DRX

A.14.5.1.2.1 Test purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the intra-frequency cell search requirements in clauses 9.2C.5.1 and 9.2C.5.2.

A.14.5.1.2.2 Test parameters

Two cells are deployed in the test, which are FR1 PCell (Cell 1) and a FR1 neighbour cell (Cell 2) on the same frequency as the PCell. The test parameters for PCell are given in Table A.14.5.1.2.2-1, A.14.5.1.2.2-2 and A.14.5.1.2.2-3 below. In the measurement controlinformation, a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided with new Timing Advance Command MAC control element at least once during each time alignment timer period to maintain uplink time alignment. Furhtermore UE is allocated with PUSCH resource at every DRX cycle.

The UE shall be provided with the valid information about the SAN serving the each cell in the test before the test.

UE is configured with 1 SMTC for the intra-frequency measurement. Both Cell 1 and Cell 2 are associated with the configured SMTC.

**Table A.14.5.1.2.2-1: Supported test configurations**

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, NR FDD, SSB SCS 15 kHz, data SCS 15 kHz, BW 10 MHz |
| 2 | NGSO, NR FDD, SSB SCS 15 kHz, data SCS 15 kHz, BW 10 MHz |
| Note: The UE is only required to be tested in one of the supported test configurations | |

**Table A.14.5.1.2.2-2: General test parameters for SA intra-frequency event triggered reporting without gap for PCell in FR1 with DRX**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Value** | | **Comment** |
|  |  |  | **Test 1** | **Test 2** |  |
| Active cell |  | 1, 2 | Cell 1 | |  |
| Neighbour cell |  | 1, 2 | Cell 2 | | Cell to be identified. |
| RF Channel Number |  | 1, 2 | 1: Cell 1 and Cell 2 | |  |
| SMTC configuration |  | 1, 2 | SMTC.2 | |  |
| A3-Offset | dB | 1, 2 | -4.5 | |  |
| CP length |  | 1, 2 | Normal | |  |
| Hysteresis | dB | 1, 2 | 0 | |  |
| Time To Trigger | s | 1, 2 | 0 | |  |
| Filter coefficient |  | 1, 2 | 0 | | L3 filtering is not used |
| DRX |  | 1, 2 | DRX.1 | DRX. 7 |  |
| Time offset between serving and neighbour cells |  | 1, 2 | 3 μs | | Synchronous cells |
| T1 | s | 1, 2 | 5 | |  |
| T2 | s | 1, 2 | 5 | 10 |  |

**Table A.14.5.1.2.2-3: NR Cell specific test parameters for SA intra-frequency event triggered reporting without gap for PCell in FR1 with DRX**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | |
|  |  |  | **T1** | **T2** | **T1** | **T2** |
| Satellite information |  | 1 | SSC.1 | | NSC.1 | |
| 2 | SSC.2 | | NSC.2 | |
| SSB configuration |  | 1, 2 | SSB.1 FR1 | | SSB.1 FR1 | |
| PDSCH RMC configuration |  | 1, 2 | SR.1.1 FDD | | N/A | |
| RMSI CORESET RMC configuration |  | 1, 2 | CR.1.1 FDD | | N/A | |
| Dedicated CORESET RMC configuration |  | 1, 2 | CCR.1.1 FDD | | N/A | |
| OCNG Patterns |  | 1, 2 | OP.1 | | OP.1 | |
| TRS configuration |  | 1, 2 | TRS.1.1 FDD | | N/A | |
| IInitial BWP configuration |  | 1, 2 | DLBWP.0.1 ULBWP.0.1 | | DLBWP.0.1 ULBWP.0.1 | |
| Active DL BWP configuration |  | 1, 2 | DLBWP.1.1 | | DLBWP.1.1 | |
| Active UL BWP configuration |  | 1, 2 | ULBWP.1.1 | | ULBWP.1.1 | |
| RLM-RS |  | 1, 2 | SSB | | SSB | |
| Note 2 | dBm/SCS | 1, 2 | -98 | | | |
| Note 2 | dBm/15 kHz | 1, 2 | -98 | | | |
|  | dB | 1, 2 | 4 | -1.46 | -Infinity | -1.46 |
|  | dB | 1, 2 | 4 | 4 | -Infinity | 4 |
| SS-RSRP Note 3 | dBm/SCS kHz | 1, 2 | -94 | -94 | -Infinity | -94 |
| Io | dBm/9.36 MHz | 1, 2 | -64.60 | -62.25 | -64.60 | -62.25 |
| Propagation Condition |  | 1, 2 | AWGN | | | |
| Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | |

A.14.5.1.2.3 Test Requirements

In test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than X ms from the beginning of time period T2. The UE is not required to read the neighbour cell SSB index in this test. X=1280 for test configuration 2 and if UE indicates ‘n1’ for *maxNumber-NGSO-SatellitesWithinOneSMTC*, otherwise X=920.

In test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than Y ms from the beginning of time period T2. The UE is not required to read the neighbour cell SSB index in this test. Y=12800 for test configuration 2 and if UE indicates ‘n1’ for *maxNumber-NGSO-SatellitesWithinOneSMTC*, otherwise Y=6400.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.14.5.1.3 SA event triggered reporting tests without gap under non-DRX with SSB index reading

A.14.5.1.3.1 Test purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the FDD intra-frequency cell search requirements in clause 9.2C.5.1 and 9.2C.5.2.

A.14.5.1.3.2 Test parameters

Two cells are deployed in the test, which are FR1 PCell (Cell 1) and a FR1 neighbour cell (Cell 2) on the same frequency as the PCell. The test parameters for FDD PCell and neighbour cell are given in Table A.14.5.1.3.2-1 and A.14.5.1.3.2-2 below. In the measurement control information, a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

The UE shall be provided with the valid information about the SAN serving the each cell in the test before the test.

UE is configured with 2 overlapping SMTC for the intra-frequency measurement. The SMTC periodicity is 20ms, and SMTC1 is associated with Cell 1 with offset 0, and SMTC2 is associated with Cell 2 with offset 17ms.

**Table A.14.5.1.3.2-1: Supported test configurations**

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, NR FDD, SSB SCS 15 kHz, data SCS 15 kHz, BW 10 MHz |
| 2 | NGSO, NR FDD, SSB SCS 15 kHz, data SCS 15 kHz, BW 10 MHz |
| Note: The UE is only required to be tested in one of the supported test configurations | |

**Table A.14.5.1.3.2-2: General test parameters for SA intra-frequency event triggered reporting without gap for FDD PCell in FR1 with SSB index reading**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Value** | **Comment** |
| Active cell |  | 1, 2 | Cell 1 |  |
| Neighbour cell |  | 1, 2 | Cell 2 | Cell to be identified. |
| RF Channel Number |  | 1, 2 | 1: Cell 1 and Cell 2 |  |
| SSB configuration |  | 1, 2 | SSB.1 FR1 |  |
| SMTC1 configuration |  | 1, 2 | SMTC.2 |  |
| SMTC2 configuration |  | 1, 2 | SMTC.6 |  |
| A3-Offset | dB | 1, 2 | -4.5 |  |
| CP length |  | 1, 2 | Normal |  |
| Hysteresis | dB | 1, 2 | 0 |  |
| Time To Trigger | s | 1, 2 | 0 |  |
| Filter coefficient |  | 1, 2 | 0 | L3 filtering is not used |
| DRX | ms | 1, 2 |  | OFF |
| Time offset between serving and neighbour cells |  | 1, 2 | 3 ms | Asynchronous cells.  The timing of Cell 2 is 3ms earlier than the timing of Cell 1. |
| T1 | s | 1, 2 | 5 |  |
| T2 | s | 1, 2 | 5 |  |

**Table A.14.5.1.3.2-3: NR Cell specific test parameters for SA intra-frequency event triggered reporting without gap for FDD PCell in FR1 with SSB index reading**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | |
|  |  |  | **T1** | **T2** | **T1** | **T2** |
| Satellite information |  | 1 | SSC.1 | | NSC.1 | |
| 2 | SSC.2 | | NSC.2 | |
| SSB configuration |  | 1, 2 | SSB.1 FR1 | | SSB.1 FR1 | |
| PDSCH RMC configuration |  | 1, 2 | SR.1.1 FDD | | N/A | |
| RMSI CORESET RMC configuration |  | 1, 2 | CR.1.1 FDD | | N/A | |
| Dedicated CORESET RMC configuration |  | 1, 2 | CCR.1.1 FDD | | N/A | |
| OCNG Patterns |  | 1, 2 | OP.1 | | OP.1 | |
| TRS configuration |  | 1, 2 | TRS.1.1 FDD | | N/A | |
| IInitial BWP configuration |  | 1, 2 | DLBWP.0,1 ULBWP.0.1 | | DLBWP.0.1 ULBWP.0.1 | |
| Active DL BWP configuration |  | 1, 2 | DLBWP.1.1 | | DLBWP.1.1 | |
| Active UL BWP configuration |  | 1, 2 | ULBWP.1.1 | | ULBWP.1.1 | |
| RLM-RS |  | 1, 2 | SSB | | SSB | |
| Note 2 | dBm/SCS | 1, 2 | -98 | | | |
| Note 2 | dBm/15 kHz | 1, 2 | -98 | | | |
|  | dB | 1, 2 | 4 | -1.46 | -Infinity | -1.46 |
|  | dB | 1, 2 | 4 | 4 | -Infinity | 4 |
| SS-RSRP Note 3 | dBm/SCS kHz | 1, 2 | -94 | -94 | -Infinity | -94 |
| Io | dBm/9.36 MHz | 1, 2 | -64.60 | -62.25 | -64.60 | -62.25 |
| Propagation Condition |  | 1, 2 | AWGN | | | |
| Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | |

A.14.5.1.3.3 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than X ms from the beginning of time period T2. The UE is required to read the neighbour cell SSB index and report the acquired SSB index in this test. X=920 for test configuration 2 and if UE indicates ‘n1’ for *maxNumber-NGSO-SatellitesWithinOneSMTC*, otherwise X=800.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.14.5.1.4 SA event triggered reporting tests with single measurement gap under non-DRX for satellite access

A.14.5.1.4.1 Test purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the intra-frequency cell search requirements in clause 9.2C.6.1 and 9.2C.6.2.

A.14.5.1.4.2 Test parameters

Two cells are deployed in the test, which are FR1 PCell (Cell 1) and a FR1 neighbour cell (Cell 2) on the same frequency as the PCell. The test parameters are given in Table A.14.5.1.4.2-1 and A.14.5.1.4.2-2 below. In the measurement control information, a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

There are two BWPs configured in Cell 1, BWP1 which contains the cell defining SSB, and BWP2 which does not contain any SSB of Cell 1. During the whole test, BWP2 is always scheduled as the active BWP for the UE.

The UE shall be provided with the valid information about the SAN serving each cell before the test.

UE is configured with 1 SMTC for the intra-frequency measurement. Both Cell 1 and Cell 2 are associated with the configured SMTC.

**Table A.14.5.1.4.2-1: Supported test configurations**

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, NR FDD, SSB SCS 15 kHz, data SCS 15 kHz, BW 10 MHz |
| 2 | NGSO, NR FDD, SSB SCS 15 kHz, data SCS 15 kHz, BW 10 MHz |
| Note: The UE is only required to be tested in one of the supported test configurations. | |

**Table A.14.5.1.4.2-2: General test parameters for SA intra-frequency event triggered reporting with single measurement gap for PCell in FR1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Value** | **Comment** |
| Active cell |  | 1, 2 | Cell 1 |  |
| Neighbour cell |  | 1, 2 | Cell 2 | Cell to be identified. |
| RF Channel Number |  | 1, 2 | 1: Cell 1 and Cell 2 |  |
| Measurement gap type |  | 1, 2 | Per-UE gaps |  |
| Gap Pattern ID |  | 1, 2 | 0 | As specified in clause 9.1.2-1. |
| Measurement gap repetition periodicity | ms | 1, 2 | 40 |  |
| Measurement gap length | ms | 1, 2 | 6 |  |
| Measurement gap offset | ms | 1, 2 | 39 |  |
| A3-Offset | dB | 1, 2 | -4.5 |  |
| CP length |  | 1, 2 | Normal |  |
| Hysteresis | dB | 1, 2 | 0 |  |
| Time To Trigger | s | 1, 2 | 0 |  |
| Filter coefficient |  | 1, 2 | 0 | L3 filtering is not used |
| DRX | ms | 1, 2 |  | OFF |
| Time offset between serving and neighbour cells |  | 1,2 | 3 ms | Asynchronous cells.  The timing of Cell 2 is 3ms later than the timing of Cell 1. |
| T1 | s | 1, 2 | 5 |  |
| T2 | s | 1, 2 | 5 |  |

**Table A.14.5.1.4.2-3: NR Cell specific test parameters for SA intra-frequency event triggered reporting with single measurement gap for PCell in FR1**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | |
|  |  |  | **T1** | **T2** | **T1** | **T2** |
| Satellite information |  | 1 | SSC.1 | | NSC.1 | |
| 2 | SSC.2 | | NSC.2 | |
| SSB configuration |  | 1, 2 | SSB.1 FR1 | | SSB.1 FR1 | |
| SMTC configuration |  | 1, 2 | SMTC.2 | | SMTC.2 | |
| CSI-RS parameters |  | 1, 2 | CSI-RS.1.2 FDD resource #0 | | N/A | |
| PDSCH RMC configuration |  | 1, 2 | SR.1.1 FDD | | N/A | |
| RMSI CORESET RMC configuration |  | 1, 2 | CR.1.1 FDD | | N/A | |
| Dedicated CORESET RMC configuration |  | 1, 2 | CCR.1.2 FDD | | N/A | |
| OCNG Patterns |  | 1, 2 | OP.1 | | OP.1 | |
| TRS configuration |  | 1, 2 | TRS.1.1 FDD | | N/A | |
| Initial BWP configuration |  | 1, 2 | DLBWP.0.1 ULBWP.0.1 | | DLBWP.0.1 ULBWP.0.1 | |
| Active DL BWP configuration |  | 1, 2 | DLBWP.1.2 | | DLBWP.1.1 | |
| Active UL BWP configuration |  | 1, 2 | ULBWP.1.2 | | ULBWP.1.1 | |
| RLM-RS |  | 1, 2 | CSI-RS | | SSB | |
| Note 2 | dBm/SCS | 1, 2 | -98 | | | |
| Note 2 | dBm/15 kHz | 1, 2 | -98 | | | |
|  | dB | 1, 2 | 4 | -1.46 | -Infinity | -1.46 |
|  | dB | 1, 2 | 4 | 4 | -Infinity | 4 |
| SS-RSRP Note 3 | dBm/SCS kHz | 1, 2 | -94 | -94 | -Infinity | -94 |
| Io | dBm/9.36 MHz | 1, 2 | -64.60 | -62.25 | -64.60 | -62.25 |
| Propagation Condition |  | 1, 2 | AWGN | | | |
| Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | |

A.14.5.1.4.3 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than X ms from the beginning of time period T2. The UE is not required to read the neighbour cell SSB index in this test. X=1600 for test configuration 2 and if UE indicates ‘n1’ for *maxNumber-NGSO-SatellitesWithinOneSMTC*, otherwise X=1000.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.14.5.1.5 SA event triggered reporting tests with FNO concurrent gaps under DRX for satellite access

A.14.5.1.5.1 Test purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the intra-frequency cell search requirements in clause 9.2C.6.1 and 9.2C.6.2.

A.14.5.1.5.2 Test parameters

Two cells are deployed in the test, which are FR1 PCell (Cell 1) and a FR1 neighbour cell (Cell 2) on the same frequency as the PCell. The test parameters are given in Table A.14.5.1.5.2-1, A. 14.5.1.5.2-2 and A. 14.5.1.5.2-3 below. In the measurement control information, a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2 and Cell 3.

There are two BWPs configured in Cell 1, BWP1 which contains the cell defining SSB, and BWP2 which does not contain any SSB of Cell 1. During the whole test, BWP2 is always scheduled as the active BWP for the UE.

UE needs to be provided with new Timing Advance Command MAC control element at least once during each time alignment timer period to maintain uplink time alignment. Furhtermore UE is allocated with PUSCH resource at every DRX cycle.

The UE shall be provided with the valid information about the SAN serving each cell before the test.

The UE is configured with 2 FNO concurrent measurement gaps for the intra-frequency measurement. Serving Cell 1 is expected to be measured within MeasGapId #0 and Neighbour Cell 2 is expected to be measured within MeasGapId #1.

**Table A.14.5.1.5.2-1: Supported test configurations**

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, NR FDD, SSB SCS 15 kHz, data SCS 15 kHz, BW 10 MHz |
| 2 | NGSO, NR FDD, SSB SCS 15 kHz, data SCS 15 kHz, BW 10 MHz |
| Note: The UE is only required to be tested in one of the supported test configurations. | |

**Table A.14.5.1.1.2-2: General test parameters for SA intra-frequency event triggered reporting with FNO concurrent gaps for PCell in FR1 with DRX**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Value** | | **Comment** |
|  |  |  | **Test 1** | **Test 2** |  |
| Active cell |  | 1, 2 | Cell 1 | |  |
| Neighbour cell |  | 1, 2 | Cell 2 | | Cell to be identified. |
| RF Channel Number |  | 1, 2 | 1: Cell 1 and Cell 2 | |  |
| Measurement gap type |  | 1, 2 | Per-UE gap | |  |
| Gap Pattern ID |  | 1 | 1 | | As specified in clause 9.1.2-1. |
| Measurement gap repetition periodicity | ms | 1, 2 | 40 | |  |
| Measurement gap length | ms | 1, 2 | 6 | |  |
| Measurement gap offset | ms | 1, 2 | 19 for MeasGapId #0  4 for MeasGapId #1 | |  |
| A3-Offset | dB | 1, 2 | -4.5 | |  |
| CP length |  | 1, 2 | Normal | |  |
| Hysteresis | dB | 1, 2 | 0 | |  |
| Time To Trigger | s | 1, 2 | 0 | |  |
| Filter coefficient |  | 1, 2 | 0 | | L3 filtering is not used |
| DRX |  | 1, 2 | DRX.1 | DRX. 7 |  |
| Time offset between serving and neighbour cells |  | 1, 2 | 3 ms | | Asynchronous cells.  The timing of Cell 2 is 3ms later than the timing of Cell 1. |
| T1 | s | 1, 2 | 5 | |  |
| T2 | s | 1, 2 | 5 | 10 |  |

**Table A.14.5.1.5.2 -3: NR Cell specific test parameters for SA intra-frequency event triggered reporting with FNO concurrent gaps for PCell in FR1 with DRX**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | |
|  |  |  | **T1** | **T2** | **T1** | **T2** |
| Satellite information |  | 1 | SSC.1 | | NSC.1 | |
| 2 | SSC.2 | | NSC.2 | |
| SSB configuration |  | 1, 2 | SSB.1 FR1 | | SSB.7 FR1 | |
| SMTC configuration |  | 1, 2 | SMTC.2 | | SMTC.Y | |
| CSI-RS parameters |  | 1, 2 | CSI-RS.1.2 FDD resource #0 | | N/A | |
| PDSCH RMC configuration |  | 1, 2 | SR.1.1 FDD | | N/A | |
| RMSI CORESET RMC configuration |  | 1, 2 | CR.1.1 FDD | | N/A | |
| Dedicated CORESET RMC configuration |  | 1, 2 | CCR.1.2 FDD | | N/A | |
| OCNG Patterns |  | 1, 2 | OP.1 | | OP.1 | |
| TRS configuration |  | 1, 2 | TRS.1.1 FDD | | N/A | |
| Initial BWP configuration |  | 1, 2 | DLBWP.0.1 ULBWP.0.1 | | DLBWP.0.1 ULBWP.0.1 | |
| Active DL BWP configuration |  | 1, 2 | DLBWP.1.2 | | DLBWP.1.1 | |
| Active UL BWP configuration |  | 1, 2 | ULBWP.1.2 | | ULBWP.1.1 | |
| RLM-RS |  | 1, 2 | CSI-RS | | SSB | |
| Note 2 | dBm/SCS | 1, 2 | -98 | | | |
| Note 2 | dBm/15 kHz | 1, 2 | -98 | | | |
|  | dB | 1, 2 | 4 | -1.46 | -Infinity | -1.46 |
|  | dB | 1, 2 | 4 | 4 | -Infinity | 4 |
| SS-RSRP Note 3 | dBm/SCS kHz | 1, 2 | -94 | -94 | -Infinity | -94 |
| Io | dBm/9.36 MHz | 1, 2 | -64.60 | -62.25 | -64.60 | -62.25 |
| Propagation Condition |  | 1, 2 | AWGN | | | |
| Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | |

**Table A.14.5.1.5.2-4: Void**

**Table A.14.5.1.5.2-5: Void**

A.15.5.1.5.3 Test Requirements

In test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 920 ms from the beginning of time period T2. The UE is not required to read the neighbour cell SSB index in this test.

In test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 6400 ms from the beginning of time period T2. The UE is not required to read the neighbour cell SSB index in this test.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.14.5.1.6 SA event triggered reporting tests with PPO concurrent gaps under non-DRX with SSB index reading for satellite access

A.14.5.1.6.1 Test purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the FDD intra-frequency cell search requirements in clause 9.2C.6.1 and 9.2C.6.2.

A.14.5.1.6.2 Test parameters

Two cells are deployed in the test, which are FR1 PCell (Cell 1) and a FR1 neighbour cell (Cell 2) on the same frequency as the PCell. The test parameters for FDD PCell and neighbour cells are given in Table A.14.5.1.6.2-1 and A.14.5.1.6.2-2 below. In the measurement control information, a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

There are two BWPs configured in Cell 1, BWP1 which contains the cell defining SSB, and BWP2 which does not contain any SSB of Cell 1. During the whole test, BWP2 is always scheduled as the active BWP for the UE.

The UE shall be provided with the valid information about the SAN serving each cell before the test.

The UE is configured with 2 PPO concurrent measurement gaps for the intra-frequency measurement. Serving Cell 1 is expected to be measured within MeasGapId #0 and Neighbour Cell 2 is expected to be measured within MeasGapId #1. And the priority for MeasGapId #1 is higher than the priority for MeasGapId #0.

**Table A.14.5.1.6.2-1: Supported test configurations**

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, NR FDD, SSB SCS 15 kHz, data SCS 15 kHz, BW 10 MHz |
| 2 | NGSO, NR FDD, SSB SCS 15 kHz, data SCS 15 kHz, BW 10 MHz |
| Note: The UE is only required to be tested in one of the supported test configurations. | |

**Table A.14.5.1.6.2-2: General test parameters for SA intra-frequency event triggered reporting with PPO concurrent gaps for FDD PCell in FR1 with SSB index reading**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Value** | **Comment** |
| Active cell |  | 1, 2 | Cell 1 |  |
| Neighbour cell |  | 1, 2 | Cell 2 | Cell to be identified. |
| RF Channel Number |  | 1, 2 | 1: Cell 1 and Cell 2 |  |
| Measurement gap type |  | 1, 2 | Per-UE gap |  |
| Gap Pattern ID |  | 1, 2 | 0 for MeasGapId #0  1 for MeasGapId #1 | As specified in clause 9.1.2-1. |
| Measurement gap repetition periodicity | ms | 1, 2 | 40ms for MeasGapId #0  80ms for MeasGapId #1 |  |
| Measurement gap length | ms | 1, 2 | 6 |  |
| Measurement gap offset | ms | 1, 2 | 39 for MeasGapId #0  4 for MeasGapId #1 |  |
| A3-Offset | dB | 1, 2 | -4.5 |  |
| CP length |  | 1, 2 | Normal |  |
| Hysteresis | dB | 1, 2 | 0 |  |
| Time To Trigger | s | 1, 2 | 0 |  |
| Filter coefficient |  | 1, 2 | 0 | L3 filtering is not used |
| DRX | ms | 1, 2 |  | OFF |
| Time offset between serving and neighbour cells |  | 1, 2 | 5 ms | Asynchronous cells.  The timing of Cell 2 is 5ms later than the timing of serving Cell 1. |
| T1 | s | 1, 2 | 5 |  |
| T2 | s | 1, 2 | 5 |  |

**Table A.14.5.1.6.2-3: NR Cell specific test parameters for SA intra-frequency event triggered reporting with PPO concurrent gaps for FDD PCell in FR1 with SSB index reading**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | |
|  |  |  | **T1** | **T2** | **T1** | **T2** |
| Satellite information |  | 1 | SSC.1 | | NSC.1 | |
| 2 | SSC.2 | | NSC.2 | |
| SSB configuration |  | 1, 2 | SSB.1 FR1 | | SSB.1 FR1 | |
| SMTC configuration |  | 1, 2 | SMTC.2 | | SMTC.Y | |
| CSI-RS parameters |  | 1, 2 | CSI-RS.1.2 FDD resource #0 | | N/A | |
| PDSCH RMC configuration |  | 1, 2 | SR.1.1 FDD | | N/A | |
| RMSI CORESET RMC configuration |  | 1, 2 | CR.1.1 FDD | | N/A | |
| Dedicated CORESET RMC configuration |  | 1, 2 | CCR.1.2 FDD | | N/A | |
| OCNG Patterns |  | 1, 2 | OP.1 | | OP.1 | |
| TRS configuration |  | 1, 2 | TRS.1.1 FDD | | N/A | |
| Initial BWP configuration |  | 1, 2 | DLBWP.0.1 ULBWP.0.1 | | DLBWP.0.1 ULBWP.0.1 | |
| Active DL BWP configuration |  | 1, 2 | DLBWP.1.2 | | DLBWP.1.1 | |
| Active UL BWP configuration |  | 1, 2 | ULBWP.1.2 | | ULBWP.1.1 | |
| RLM-RS |  | 1, 2 | CSI-RS | | SSB | |
| Note 2 | dBm/SCS | 1, 2 | -98 | | | |
| Note 2 | dBm/15 kHz | 1, 2 | -98 | | | |
|  | dB | 1, 2 | 4 | -1.46 | -Infinity | -1.46 |
|  | dB | 1, 2 | 4 | 4 | -Infinity | 4 |
| SS-RSRP Note 3 | dBm/SCS kHz | 1, 2 | -94 | -94 | -Infinity | -94 |
| Io | dBm/9.36 MHz | 1, 2 | -64.60 | -62.25 | -64.60 | -62.25 |
| Propagation Condition |  | 1, 2 | AWGN | | | |
| Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | |

A.14.5.1.6.3 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1240 ms from the beginning of time period T2. The UE is required to read the neighbour cell SSB index and report the acquired SSB index in this test.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

< End of change# >

<Start of change# 2>

### A.14.5.2 Inter-frequency Measurements

A.14.5.2.1 SA event triggered reporting tests for FR1 without SSB time index detection when DRX is not used with single gap for satellite access

A.14.5.2.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the SA inter-frequency NR cell search requirements in clause 9.3C.4.

In this test, there are two cells: NR cell 1 as PCell in FR1 on NR RF channel 1 and NR cell 2 as neighbour cell in FR1 on NR RF channel 2. The test parameters are given in Tables A.14.5.2.1.1-1, A.14.5.2.1.1-2 and A.14.5.2.1.1-3.

In test 1 measurement gap pattern configuration # 0 as defined in Table A.14.5.2.1.1-2 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR cell 2.

**Table A.14.5.2.1.1-1: SA event triggered reporting tests without SSB index reading for FR1-FR1**

|  |  |
| --- | --- |
| **Config** | **Description** |
| 1 | GSO, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | NGSO, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2.  Note 2: target NR cell has the same SCS, BW and duplex mode as NR serving cell | |

**Table A.14.5.2.1.1-2: General test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Value** | **Comment** |
|  |  |  | **Test 1** |  |
| NR RF Channel Number |  | Config 1,2 | 1, 2 | Two FR1 NR carrier frequencies is used. |
| Active cell |  | Config 1,2 | NR cell 1 (Pcell) | NR Cell 1 is on NR RF channel number 1. |
| Neighbour cell |  | Config 1,2 | NR cell2 | NR cell 2 is on NR RF channel number 2. |
| Gap Pattern Id |  | Config 1,2 | 0 | As specified in clause 9.1.2-1. |
| Measurement gap offset |  | Config 1,2 | 9 |  |
| A3-Offset | dB | Config 1,2 | -6 |  |
| Hysteresis | dB | Config 1,2 | 0 |  |
| CP length |  | Config 1,2 | Normal |  |
| TimeToTrigger | s | Config 1,2 | 0 |  |
| Filter coefficient |  | Config 1,2 | 0 | L3 filtering is not used |
| DRX |  | Config 1,2 | OFF | DRX is not used |
| Time offset between serving and neighbour cells |  | Config 1,2 | 3ms | Asynchronous cells.  The timing of Cell 2 is 3ms later than the timing of Cell 1. |
| T1 | s | Config 1,2 | 5 |  |
| T2 | s | Config 1,2 | 1 |  |

**Table A.14.5.2.1.1-3: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Test configuration** | **Cell 1** | | | **Cell 2** | |
|  | |  |  | **T1** | **T2** | | **T1** | **T2** |
| NR RF Channel Number | |  | Config 1,2 | 1 | | | 2 | |
| Satellite information | |  | Config 1 | SSC.1 | | | NSC.1 | |
|  | |  | Config 2 | SSC.2 | | | NSC.2 | |
| Duplex mode | |  | Config 1,2 | FDD | | | | |
| BWchannel | | MHz | Config 1,2 | 10: NRB,c = 52 | | | | |
| BWP BW | | MHz | Config 1,2 | 10: NRB,c = 52 | | | | |
| BWP configuration | Initial DL BWP | Config 1 | Config 1,2 | DLBWP.0.1 | | | NA | |
|  | Initial UL BWP |  |  | ULBWP.0.1 | | | NA | |
|  | Dedicated DL BWP |  |  | DLBWP.1.1 | | | NA | |
|  | Dedicated UL BWP |  |  | ULBWP.1.1 | | | NA | |
| TRS configuration | |  | Config 1,2 | TRS.1.1 FDD | | | NA | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1) | |  | Config 1,2 | OP.1 | | | OP.1 | |
| PDSCH Reference measurement channel | |  | Config 1,2 | SR.1.1 FDD | | |  | |
| RMSI CORESET Reference Channel | |  | Config 1,2 | CR.1.1 FDD | | |  | |
| Dedicated CORESET Reference Channel | |  | Config 1,2 | CCR.1.1 FDD | | |  | |
| SSB parameters | |  | Config 1,2 | SSB.1 FR1 | | | SSB.5 FR1 | |
| SMTC configuration defined in A.3.11 | |  | Config 1,2 | SMTC.2 | | | SMTC.5 | |
| PDSCH/PDCCH subcarrier spacing | | kHz | Config 1,2 | 15 | | | | |
| EPRE ratio of PSS to SSS | |  | Config 1,2 | 0 | | | 0 | |
| EPRE ratio of PBCH DMRS to SSS | |  |  |  | | |  | |
| EPRE ratio of PBCH to PBCH DMRS | |  |  |  | | |  | |
| EPRE ratio of PDCCH DMRS to SSS | |  |  |  | | |  | |
| EPRE ratio of PDCCH to PDCCH DMRS | |  |  |  | | |  | |
| EPRE ratio of PDSCH DMRS to SSS | |  |  |  | | |  | |
| EPRE ratio of PDSCH to PDSCH | |  |  |  | | |  | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | |  |  |  | | |  | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |  |  |  | | |  | |
| Note2 | | dBm/15kHz | Config 1,2 | -98 | | -98 | | |
| Note2 | | dBm/SCS | Config 1,2 | -98 | | -98 | | |
| SS-RSRP Note 3 | | dBm/SCS | Config 1,2 | -94 | -94 | | -Infinity | -91 |
|  | | dB | Config 1,2 | 4 | 4 | | -Infinity | 7 |
|  | | dB | Config 1,2 | 4 | 4 | | -Infinity | 7 |
| IoNote3 | | dBm/9.36MHz | Config 1,2 | -64.59 | -64.59 | | -70.05 | -62.26 |
| Propagation Condition | |  | Config 1,2 | AWGN | | AWGN | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | | | | | |

A.14.5.2.1.2 Test Requirements

In test 1 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 920 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90%.

In test 1 UE is not required to report SSB time index.

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.14.5.2.2 SA event triggered reporting tests for FR1 without SSB time index detection when DRX is used with single gap for satellite access

A.14.5.2.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the SA inter-frequency NR cell search requirements in clause 9.3C.4.

In this test, there are two cells: NR cell 1 as PCell in FR1 on NR RF channel 1 and NR cell 2 as neighbour cell in FR1 on NR RF channel 2. The test parameters are given in Tables A.14.5.2.2.1-1, A.14.5.2.2.1-2 and A.14.5.2.2.1-3.

In test 1&2 measurement gap pattern configuration # 0 as defined in Table A.14.5.2.2.1-2 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR cell 2.

UE needs to be provided with new Timing Advance Command MAC control element at least once during each time alignment timer period to maintain uplink time alignment. Furthermore, UE is allocated with PUSCH resource at every DRX cycle.

**Table A.14.5.2.2.1-1: SA event triggered reporting tests without SSB index reading for FR1-FR1**

|  |  |
| --- | --- |
| **Config** | **Description** |
| 1 | GSO, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | NGSO, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2.  Note 2: target NR cell has the same SCS, BW and duplex mode as NR serving cell | |

**Table A.14.5.2.2.1-2: General test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Value** | | **Comment** |
|  |  |  | **Test 1** | **Test 2** |  |
| NR RF Channel Number |  | Config 1,2 | 1, 2 | | Two FR1 NR carrier frequencies is used. |
| Active cell |  | Config 1,2 | NR cell 1 (Pcell) | | NR Cell 1 is on NR RF channel number 1. |
| Neighbour cell |  | Config 1,2 | NR cell2 | | NR cell 2 is on NR RF channel number 2. |
| Gap Pattern Id |  | Config 1,2 | 0 | | As specified in clause 9.1.2-1. |
| Measurement gap offset |  | Config 1,2 | 9 | |  |
| A3-Offset | dB | Config 1,2 | -6 | |  |
| Hysteresis | dB | Config 1,2 | 0 | |  |
| CP length |  | Config 1,2 | Normal | |  |
| TimeToTrigger | s | Config 1,2 | 0 | |  |
| Filter coefficient |  | Config 1,2 | 0 | | L3 filtering is not used |
| DRX |  | Config 1,2 | DRX.1 | DRX. 7 | As specified in clause A.3.3 |
| Time offset between serving and neighbour cells |  | Config 1,2 | 3ms | | Asynchronous cells.  The timing of Cell 2 is 3ms later than the timing of Cell 1. |
| T1 | s | Config 1,2 | 5 | |  |
| T2 | s | Config 1,2 | [1.1] | [11] |  |

**Table A.14.5.2.2.1-3: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | |
|  | |  |  | **T1** | **T2** | **T1** | **T2** |
| NR RF Channel Number | |  | Config 1,2 | 1 | | 2 | |
| Satellite information | |  | Config 1 | SSC.1 | | NSC.1 | |
|  | |  | Config 2 | SSC.2 | | NSC.2 | |
| Duplex mode | |  | Config 1,2 | FDD | | | |
| BWchannel | | MHz | Config 1,2 | 10: NRB,c = 52 | | | |
| BWP BW | | MHz | Config 1,2 | 10: NRB,c = 52 | | | |
| BWP configuration | Initial DL BWP |  | Config 1,2 | DLBWP.0.1 | | NA | |
|  | Initial UL BWP |  |  | ULBWP.0.1 | | NA | |
|  | Dedicated DL BWP |  |  | DLBWP.1.1 | | NA | |
|  | Dedicated UL BWP |  |  | ULBWP.1.1 | | NA | |
| TRS configuration | |  | Config 1,2 | TRS.1.1 FDD | | NA | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1) | |  | Config 1,2 | OP.1 | | OP.1 | |
| PDSCH Reference measurement channel | |  | Config 1,2 | SR.1.1 FDD | |  | |
| RMSI CORESET Reference Channel | |  | Config 1,2 | CR.1.1 FDD | |  | |
| Dedicated CORESET Reference Channel | |  | Config 1,2 | CCR.1.1 FDD | |  | |
| SSB parameters | |  | Config 1,2 | SSB.1 FR1 | | SSB.5 FR1 | |
| SMTC configuration defined in A.3.11 | |  | Config 1,2 | SMTC.2 | | SMTC.5 | |
| PDSCH/PDCCH subcarrier spacing | | kHz | Config 1,2 | 15 | | | |
| EPRE ratio of PSS to SSS | |  | Config 1,2 | 0 | | 0 | |
| EPRE ratio of PBCH DMRS to SSS | |  |  |  | |  | |
| EPRE ratio of PBCH to PBCH DMRS | |  |  |  | |  | |
| EPRE ratio of PDCCH DMRS to SSS | |  |  |  | |  | |
| EPRE ratio of PDCCH to PDCCH DMRS | |  |  |  | |  | |
| EPRE ratio of PDSCH DMRS to SSS | |  |  |  | |  | |
| EPRE ratio of PDSCH to PDSCH | |  |  |  | |  | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | |  |  |  | |  | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |  |  |  | |  | |
| Note2 | | dBm/15kHz | Config 1,2 | -98 | | -98 | |
| Note2 | | dBm/SCS | Config 1,2 | -98 | | -98 | |
| SS-RSRP Note 3 | | dBm/SCS | Config 1,2 | -94 | -94 | -Infinity | -91 |
|  | | dB | Config 1,2 | 4 | 4 | -Infinity | 7 |
|  | | dB | Config 1,2 | 4 | 4 | -Infinity | 7 |
| IoNote3 | | dBm/9.36MHz | Config 1,2 | -64.59 | -64.59 | -70.05 | -62.2 |
| Propagation Condition | |  | Config 1,2 | AWGN | | AWGN | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | | | | |

**Table A.14.5.2.2.1-4: DRX-Configuration for SA inter-frequency event triggered reporting without SSB time index detection**

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Test1** | **Test2** | **Comment** |
|  | **Value** | **Value** |  |
| drx-onDurationTimer | ms1 | ms1 | As specified in clause 6.3.2 in TS 38.331 [2] |
| drx-InactivityTimer | ms1 | ms1 |  |
| drx-RetransmissionTimerDL | sl1 | sl1 |  |
| drx-RetransmissionTimerUL | sl1 | sl1 |  |
| drx-LongCycleStartOffset | ms40 | Ms640 |  |
| shortDRX | disable | disable |  |

**Table A.14.5.2.2.1-5: *TimeAlignmentTimer* -Configuration SA inter-frequency event triggered reporting without SSB time index detection**

|  |  |  |
| --- | --- | --- |
| **Field** | **Value** | **Comment** |
| TimeAlignmentTimer | ms500 | As specified in clause 6.3.2 in TS 38.331 [2] |

A.14.5.2.2.2 Test Requirements

In test 1 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than [1080] ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90%.

In test 2 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than [10240] ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90%.

In test 1 and 2 UE is not required to report SSB time index.

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.14.5.2.3 SA event triggered reporting tests for FR1 with SSB time index detection when DRX is not used with single gap for satellite access

A.14.5.2.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the SA inter-frequency NR cell search requirements in clause 9.3C.4.

In this test, there are two cells: NR cell 1 as PCell in FR1 on NR RF channel 1 and NR cell 2 as neighbour cell in FR1 on NR RF channel 2. The test parameters are given in Tables A.14.5.2.3.1-1, A.14.5.2.3.1-2 and A.14.5.2.3.1-3.

In test 1 measurement gap pattern configuration # 0 as defined in Table A.14.5.2.3.1-2 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR cell 2.

**Table A.14.5.2.3.1-1: SA event triggered reporting tests with SSB index reading for FR1-FR1**

|  |  |
| --- | --- |
| **Config** | **Description** |
| 1 | GSO, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | NGSO, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2.  Note 2: target NR cell has the same SCS, BW and duplex mode as NR serving cell | |

**Table A.14.5.2.3.1-2: General test parameters for SA inter-frequency event triggered reporting for FR1 with SSB time index detection**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Value** | **Comment** |
|  |  |  | **Test 1** |  |
| **Parameter** | **Unit** | **Test configuration** | **Value** | **Comment** |
| NR RF Channel Number |  | Config 1,2 | 1, 2 | Two FR1 NR carrier frequencies is used. |
| Active cell |  | Config 1,2 | NR cell 1 (Pcell) | NR Cell 1 is on NR RF channel number 1. |
| Neighbour cell |  | Config 1,2 | NR cell2 | NR cell 2 is on NR RF channel number 2. |
| Gap Pattern Id |  | Config 1,2 | 0 | As specified in clause 9.1.2-1. |
| Measurement gap offset |  | Config 1,2 | 9 |  |
| A3-Offset | dB | Config 1,2 | -6 |  |
| Hysteresis | dB | Config 1,2 | 0 |  |
| CP length |  | Config 1,2 | Normal |  |
| TimeToTrigger | s | Config 1,2 | 0 |  |
| Filter coefficient |  | Config 1,2 | 0 | L3 filtering is not used |
| DRX |  | Config 1,2 | OFF | DRX is not used |
| Time offset between serving and neighbour cells |  | Config 1,2 | 3ms | Asynchronous cells.  The timing of Cell 2 is 3ms later than the timing of Cell 1. |
| T1 | s | Config 1,2 | 5 |  |
| T2 | s | Config 1,2 | [1.1] |  |

**Table A.14.5.2.3.1-3: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 with SSB time index detection**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Test configuration** | **Cell 1** | | | **Cell 2** | |
|  | |  |  | **T1** | **T2** | | **T1** | **T2** |
| NR RF Channel Number | |  | Config 1,2 | 1 | | | 2 | |
| Duplex mode | |  | Config 1,2 | FDD | | | | |
| BWchannel | | MHz | Config 1,2 | 10: NRB,c = 52 | | | | |
| BWP BW | | MHz | Config 1,2 | 10: NRB,c = 52 | | | | |
| BWP configuration | Initial DL BWP | Config 1 | Config 1,2 | DLBWP.0.1 | | | NA | |
|  | Initial UL BWP |  |  | ULBWP.0.1 | | | NA | |
|  | Dedicated DL BWP |  |  | DLBWP.1.1 | | | NA | |
|  | Dedicated UL BWP |  |  | ULBWP.1.1 | | | NA | |
| TRS configuration | |  | Config 1,2 | TRS.1.1 FDD | | | NA | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1) | |  | Config 1,2 | OP.1 | | | OP.1 | |
| PDSCH Reference measurement channel | |  | Config 1,2 | SR.1.1 FDD | | |  | |
| RMSI CORESET Reference Channel | |  | Config 1,2 | CR.1.1 FDD | | |  | |
| Dedicated CORESET Reference Channel | |  | Config 1,2 | CCR.1.1 FDD | | |  | |
| SSB parameters | |  | Config 1,2 | SSB.1 FR1 | | | SSB.5 FR1 | |
| SMTC configuration defined in A.3.11 | |  | Config 1,2 | SMTC.2 | | | SMTC.5 | |
| PDSCH/PDCCH subcarrier spacing | | kHz | Config 1,2 | 15 | | | | |
| EPRE ratio of PSS to SSS | |  | Config 1,2 | 0 | | | 0 | |
| EPRE ratio of PBCH DMRS to SSS | |  |  |  | | |  | |
| EPRE ratio of PBCH to PBCH DMRS | |  |  |  | | |  | |
| EPRE ratio of PDCCH DMRS to SSS | |  |  |  | | |  | |
| EPRE ratio of PDCCH to PDCCH DMRS | |  |  |  | | |  | |
| EPRE ratio of PDSCH DMRS to SSS | |  |  |  | | |  | |
| EPRE ratio of PDSCH to PDSCH | |  |  |  | | |  | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | |  |  |  | | |  | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |  |  |  | | |  | |
| Note2 | | dBm/15kHz | Config 1,2 | -98 | | -98 | | |
| Note2 | | dBm/SCS | Config 1,2 | -98 | | -98 | | |
| SS-RSRP Note 3 | | dBm/SCS | Config 1,2 | -94 | -94 | | -Infinity | -91 |
|  | | dB | Config 1,2 | 4 | 4 | | -Infinity | 7 |
|  | | dB | Config 1,2 | 4 | 4 | | -Infinity | 7 |
| IoNote3 | | dBm/9.36MHz | Config 1,2 | -64.59 | -64.59 | | -70.05 | -62.2 |
| Propagation Condition | |  | Config 1,2 | AWGN | | AWGN | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | | | | | |

A.14.5.2.3.2 Test Requirements

In test 1 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than [1040] ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90%.

In test 1 UE is required to report SSB time index.

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.14.5.2.4 SA event triggered reporting tests for FR1 without SSB time index detection when DRX is not used with two gaps in fully non-overlapped for satellite access

A.14.5.2.4.1 Test Purpose and Environment

The purpose of this test is to verify that the multiple gaps capable UE makes correct reporting of events. This test will partly verify the SA inter-frequency NR cell search requirements in clause 9.3C.4.

In this test, there are three cells: NR cell 1 as PCell in FR1 on NR RF channel 1 and NR cell 2 as neighbour cell in FR1 on NR RF channel 2, and NR cell 3 as neighbour cell in FR1 on NR RF channel 2. The test parameters are given in Tables A.14.5.2.4.1-1, A.14.5.2.4.1-2 and A.14.5.2.4.1-3.

In test 1 measurement gap pattern configuration # 0 as defined in Table A.14.5.2.4.1-2 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR cell 2 and NR cell 3.

**Table A.14.5.2.4.1-1: SA event triggered reporting tests without SSB index reading for FR1-FR1**

|  |  |
| --- | --- |
| **Config** | **Description** |
| 1 | GSO, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | NGSO, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2.  Note 2: target NR cell has the same SCS, BW and duplex mode as NR serving cell | |

**Table A.14.5.2.4.1-2: General test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Value** | **Comment** |
|  |  |  | **Test 1** |  |
| **Parameter** | **Unit** | **Test configuration** | **Value** | **Comment** |
| NR RF Channel Number |  | Config 1,2 | 1, 2 | Two FR1 NR carrier frequencies is used. |
| Active cell |  | Config 1,2 | NR cell 1 (Pcell) | NR Cell 1 is on NR RF channel number 1. |
| Neighbour cell |  | Config 1,2 | NR cell2 and NR cell 3 | NR cell 2 and NR cell 3 are on NR RF channel number 2. |
| Gap Pattern Id |  | Config 1,2 | 0 for MeasGapId #0  0 for MeasGapId #1 | As specified in clause 9.1.2-1. |
| Measurement gap offset |  | Config 1,2 | 9 for MeasGapId #0  19 for MeasGapId #1 |  |
| A3-Offset | dB | Config 1,2 | -6 |  |
| Hysteresis | dB | Config 1,2 | 0 |  |
| CP length |  | Config 1,2 | Normal |  |
| TimeToTrigger | s | Config 1,2 | 0 |  |
| Filter coefficient |  | Config 1,2 | 0 | L3 filtering is not used |
| DRX |  | Config 1,2 | OFF | DRX is not used |
| Time offset between serving and neighbour cell 2,3 |  | Config 1,2 | 3ms | Asynchronous cells.  The timing of Cell 2 and Cell 3 is 3ms later than the timing of Cell 1. |
| T1 | s | Config 1,2 | 5 |  |
| T2 | s | Config 1,2 | [1] |  |

**Table A.14.5.2.4.1-3: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | | **Cell 3** | | |
|  | |  |  | **T1** | **T2** | **T1** | **T2** | **T1** | **T2** | |
| NR RF Channel Number | |  | Config 1,2 | 1 | | 2 | | 2 | | |
| Satellite information | |  | Config 1 | SSC.1 | | NSC.1 | | | | |
|  | |  | Config 2 | SSC.2 | | NSC.2 | | | | |
| Duplex mode | |  | Config 1,2 | FDD | | | | | | |
| BWchannel | | MHz | Config 1,2 | 10: NRB,c = 52 | | | | | | |
| BWP BW | | MHz | Config 1,2 | 10: NRB,c = 52 | | | | | | |
| BWP configuration | Initial DL BWP |  | Config 1,2 | DLBWP.0.1 | | NA | | NA | | |
|  | Initial UL BWP |  |  | ULBWP.0.1 | | NA | | NA | | |
|  | Dedicated DL BWP |  |  | DLBWP.1.1 | | NA | | NA | | |
|  | Dedicated UL BWP |  |  | ULBWP.1.1 | | NA | | NA | | |
| TRS configuration | |  | Config 1,2 | TRS.1.1 FDD | | NA | | NA | | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1) | |  | Config 1,2 | OP.1 | | OP.1 | | OP.1 | | |
| PDSCH Reference measurement channel | |  | Config 1,2 | SR.1.1 FDD | |  | |  | | |
| RMSI CORESET Reference Channel | |  | Config 1,2 | CR.1.1 FDD | |  | |  | | |
| Dedicated CORESET Reference Channel | |  | Config 1,2 | CCR.1.1 FDD | |  | |  | | |
| SSB parameters | |  | Config 1,2 | SSB.1 FR1 | | SSB.5 FR1 | | SSB.1 FR1 | | |
| SMTC configuration defined in A.3.11 | |  | Config 1,2 | SMTC.2 | | SMTC.Y | | SMTC.1 | | |
| PDSCH/PDCCH subcarrier spacing | | kHz | Config 1,2 | 15 | | | | | | |
| EPRE ratio of PSS to SSS | |  | Config 1,2 | 0 | | 0 | | 0 | | |
| EPRE ratio of PBCH DMRS to SSS | |  |  |  | |  | |  | | |
| EPRE ratio of PBCH to PBCH DMRS | |  |  |  | |  | |  | | |
| EPRE ratio of PDCCH DMRS to SSS | |  |  |  | |  | |  | | |
| EPRE ratio of PDCCH to PDCCH DMRS | |  |  |  | |  | |  | | |
| EPRE ratio of PDSCH DMRS to SSS | |  |  |  | |  | |  | | |
| EPRE ratio of PDSCH to PDSCH | |  |  |  | |  | |  | | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | |  |  |  | |  | |  | | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |  |  |  | |  | |  | | |
| Note2 | | dBm/15kHz | Config 1,2 | -98 | | -98 | | -98 | | |
| Note2 | | dBm/SCS | Config 1,2 | -98 | | -98 | | -98 | | |
| SS-RSRP Note 3 | | dBm/SCS | Config 1,2 | -94 | -94 | -Infinity | -91 | -Infinity | | -91 |
|  | | dB | Config 1,2 | 4 | 4 | -Infinity | 7 | -Infinity | | 7 |
|  | | dB | Config 1,2 | 4 | 4 | -Infinity | 7 | -Infinity | | 7 |
| IoNote3 | | dBm/9.36MHz | Config 1,2 | -64.59 | -64.59 | -70.05 | -62.26 | -70.05 | | -62.26 |
| Propagation Condition | |  | Config 1,2 | AWGN | | AWGN | | AWGN | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | | | | | | | |

A.14.5.2.4.2 Test Requirements

In test 1 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than [920] ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90%.

In test 1 UE is not required to report SSB time index.

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.14.5.2.5 void

A.14.5.2.5.1 void

A.14.5.2.5.2 void

A.14.5.2.6 SA event triggered reporting tests for FR1 without SSB time index detection when DRX is not used with two gaps in partially partial overalpping for satellite access

A.14.5.2.6.1 Test Purpose and Environment

The purpose of this test is to verify that the multiple gaps capable UE makes correct reporting of events. This test will partly verify the SA inter-frequency NR cell search requirements in clause 9.3C.4.

In this test, there are three cells: NR cell 1 as PCell in FR1 on NR RF channel 1 and NR cell 2 as neighbour cell in FR1 on NR RF channel 2, and NR cell 3 as neighbour cell in FR1 on NR RF channel 2. The test parameters are given in Tables A.14.5.2.6.1-1, A.14.5.2.6.1-2 and A.14.5.2.6.1-3.

In test 1 measurement gap pattern configuration # 0 and #1 as defined in Table A.14.5.2.6.1-2 are provided. MeasGapId #1 is configured with a higher priority than MeasGapId #0.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR cell 2 and NR cell 3.

**Table A.14.5.2.6.1-1: SA event triggered reporting tests without SSB index reading for FR1-FR1**

|  |  |
| --- | --- |
| **Config** | **Description** |
| 1 | GSO, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | NGSO, NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| Note 1: If UE supports both NGSO and GSO, the test case Config 1 can be skipped if the UE passes test case Config 2.  Note 2: target NR cells have the same SCS, BW and duplex mode as NR serving cell | |

**Table A.14.5.2.6.1-2: General test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Value** | **Comment** |
| NR RF Channel Number |  | Config 1,2 | 1, 2 | Two FR1 NR carrier frequencies is used. |
| Active cell |  | Config 1,2 | NR cell 1 (Pcell) | NR Cell 1 is on NR RF channel number 1. |
| Neighbour cell |  | Config 1,2 | NR cell2 and NR cell 3 | NR cell 2 and NR cell 3 are on NR RF channel number 2. |
| Gap Pattern Id |  | Config 1,2 | 0 for MeasGapId #0  1 for MeasGapId #1 | As specified in clause 9.1.2-1. |
| Measurement gap offset |  | Config 1,2 | 39 for MeasGapId #0  4 for MeasGapId #1 |  |
| A3-Offset | dB | Config 1,2 | -6 |  |
| Hysteresis | dB | Config 1,2 | 0 |  |
| CP length |  | Config 1,2 | Normal |  |
| TimeToTrigger | s | Config 1,2 | 0 |  |
| Filter coefficient |  | Config 1,2 | 0 | L3 filtering is not used |
| DRX |  | Config 1,2 | OFF | DRX is not used |
| Time offset between serving and neighbour cell 1 |  | Config 1,2 | 3μs | Synchronous. |
| Time offset between serving and neighbour cell 2 |  | Config 1,2 | 5ms | Asynchronous.  The timing of Cell 3 is 5ms later than the timing of Cell 1. |
| T1 | s | Config 1,2 | 5 |  |
| T2 | s | Config 1,2 | 1.5 |  |

**Table A.14.5.2.6.1-3: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | | **Cell 3** | | |
|  | |  |  | **T1** | **T2** | **T1** | **T2** | **T1** | **T2** | |
| NR RF Channel Number | |  | Config 1,2 | 1 | | 2 | | 2 | | |
| Satellite information | |  | Config 1 | SSC.1 | | NSC.1 | | | | |
| Config 2 | SSC.2 | | NSC.2 | | | | |
| Duplex mode | |  | Config 1,2 | FDD | | | | | | |
| BWchannel | | MHz | Config 1,2 | 10: NRB,c = 52 | | | | | | |
| BWP BW | | MHz | Config 1,2 | 10: NRB,c = 52 | | | | | | |
| BWP configuration | Initial DL BWP |  | Config 1,2 | DLBWP.0.1 | | NA | | NA | | |
|  | Initial UL BWP |  |  | ULBWP.0.1 | | NA | | NA | | |
|  | Dedicated DL BWP |  |  | DLBWP.1.1 | | NA | | NA | | |
|  | Dedicated UL BWP |  |  | ULBWP.1.1 | | NA | | NA | | |
| TRS configuration | |  | Config 1,2 | TRS.1.1 FDD | | NA | | NA | | |
| OCNG Patterns defined in A.3.2.1.1 (OP.1) | |  | Config 1,2 | OP.1 | | OP.1 | | OP.1 | | |
| PDSCH Reference measurement channel | |  | Config 1,2 | SR.1.1 FDD | |  | |  | | |
| RMSI CORESET Reference Channel | |  | Config 1,2 | CR.1.1 FDD | |  | |  | | |
| Dedicated CORESET Reference Channel | |  | Config 1,2 | CCR.1.1 FDD | |  | |  | | |
| SSB parameters | |  | Config 1,2 | SSB.1 FR1 | | SSB.1 FR1 | | SSB.1 FR1 | | |
| SMTC configuration defined in A.3.11 | |  | Config 1,2 | SMTC.2 | | SMTC.2 | | SMTC.Y | | |
| PDSCH/PDCCH subcarrier spacing | | kHz | Config 1,2 | 15 | | | | | | |
| EPRE ratio of PSS to SSS | |  | Config 1,2 | 0 | | 0 | | 0 | | |
| EPRE ratio of PBCH DMRS to SSS | |  |  |  | |  | |  | | |
| EPRE ratio of PBCH to PBCH DMRS | |  |  |  | |  | |  | | |
| EPRE ratio of PDCCH DMRS to SSS | |  |  |  | |  | |  | | |
| EPRE ratio of PDCCH to PDCCH DMRS | |  |  |  | |  | |  | | |
| EPRE ratio of PDSCH DMRS to SSS | |  |  |  | |  | |  | | |
| EPRE ratio of PDSCH to PDSCH | |  |  |  | |  | |  | | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) | |  |  |  | |  | |  | | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) | |  |  |  | |  | |  | | |
| Note2 | | dBm/15kHz | Config 1,2 | -98 | | -98 | | -98 | | |
| Note2 | | dBm/SCS | Config 1,2 | -98 | | -98 | | -98 | | |
| SS-RSRP Note 3 | | dBm/SCS | Config 1,2 | -94 | -94 | -Infinity | -91 | -Infinity | | -91 |
|  | | dB | Config 1,2 | 4 | 4 | -Infinity | 7 | -Infinity | | 7 |
|  | | dB | Config 1,2 | 4 | 4 | -Infinity | 7 | -Infinity | | 7 |
| IoNote3 | | dBm/9.36MHz | Config 1,2 | -64.59 | -64.59 | -70.05 | -62.26 | -70.05 | | -62.26 |
| Propagation Condition | |  | Config 1,2 | AWGN | | AWGN | | AWGN | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. | | | | | | | | | | |

A.14.5.2.6.2 Test Requirements

In test 1 and 2 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1280 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90%.

In test 1 and 2 UE is not required to report SSB time index.

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.14.5.2.7 Event triggered reporting test without gap under non-DRX

A.14.5.2.7.1 Test purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the inter-frequency cell search requirements in clauses 9.3C.7.

A.14.5.2.7.2 Test parameters

Two cells are deployed in the test, which are FR1 PCell (Cell 1) on NR RF channel 1 and a FR1 neighbour cell (Cell 2) on NR RF channel 2. The test parameters for PCell and neighbour cell are given in Table A.14.5.2.7.2-1, A.14.5.2.7.2-2 and A.14.5.2.7.2-3 below. In the measurement control information, a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

The UE shall be provided with the valid information about the SAN serving the each cell in the test before the test.

UE is configured with 2 non-overlapping SMTCs for the inter-frequency measurement. The SMTC periodicity is 40ms, and SMTC1 is associated with Cell 1 with offset 0, and SMTC2 is associated with Cell 2 with offset 20ms.

**Table A.14.5.2.7.2-1: Supported test configurations**

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, NR FDD, SSB SCS 15 kHz, data SCS 15 kHz, BW 10 MHz |
| 2 | NGSO, NR FDD, SSB SCS 15 kHz, data SCS 15 kHz, BW 10 MHz |
| Note: The UE is only required to be tested in one of the supported test configurations | |

**Table A.14.5.2.7.2-2: General test parameters for inter-frequency event triggered reporting without gap for FR1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Value** | **Comment** |
| Active cell |  | 1, 2 | Cell 1 |  |
| Neighbour cell |  | 1, 2 | Cell 2 | Cell to be identified. |
| RF Channel Number |  | 1, 2 | 1: Cell 1 and Cell 2 |  |
| SMTC1 configuration |  | 1 | SMTC.1 | Period: 20ms, offset: 0 |
| SMTC2 configuration |  | 2 | SMTC.4 | Period: 20ms, offset: 10ms |
| A3-Offset | dB | 1, 2 | -4.5 |  |
| CP length |  | 1, 2 | Normal |  |
| Hysteresis | dB | 1, 2 | 0 |  |
| Time To Trigger | s | 1, 2 | 0 |  |
| Filter coefficient |  | 1, 2 | 0 | L3 filtering is not used |
| DRX |  | 1, 2 |  | OFF |
| Time offset between serving and neighbour cells |  | 1, 2 | 20 ms | Asynchronous cells.  The timing of Cell 2 is 20ms later than the timing of Cell 1. |
| T1 | s | 1, 2 | 5 |  |
| T2 | s | 1, 2 | 5 |  |

**Table A.14.5.2.7.2-3: NR Cell specific test parameters for inter-frequency event triggered reporting without gap for FR1**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | |
|  |  |  | **T1** | **T2** | **T1** | **T2** |
| Satellite information |  | 1 | SSC.1 | | NSC.1 | |
| 2 | SSC.2 | | NSC.2 | |
| SSB configuration |  | 1, 2 | SSB.1 FR1 | | SSB.1 FR1 | |
| PDSCH RMC configuration |  | 1, 2 | SR.1.1 FDD | | N/A | |
| RMSI CORESET RMC configuration |  | 1, 2 | CR.1.1 FDD | | N/A | |
| Dedicated CORESET RMC configuration |  | 1, 2 | CCR.1.1 FDD | | N/A | |
| OCNG Patterns |  | 1, 2 | OP.1 | | OP.1 | |
| TRS Configuration |  | 1, 2 | TRS.1.1 FDD | | N/A | |
| IInitial BWP configuration |  | 1, 2 | DLBWP.0.1 ULBWP.0.1 | | DLBWP.0.1 ULBWP.0.1 | |
| Active DL BWP configuration |  | 1, 2 | DLBWP.1.1 | | DLBWP.1.1 | |
| Active UL BWP configuration |  | 1, 2 | ULBWP.1.1 | | ULBWP.1.1 | |
| RLM-RS |  | 1, 2 | SSB | | SSB | |
| Note 2 | dBm/SCS | 1, 2 | -98 | | | |
| Note 2 | dBm/15 kHz | 1, 2 | -98 | | | |
|  | dB | 1, 2 | 4 | -1.46 | -Infinity | -1.46 |
|  | dB | 1, 2 | 4 | 4 | -Infinity | 4 |
| SS-RSRP Note 3 | dBm/SCS kHz | 1, 2 | -94 | -94 | -Infinity | -94 |
| Io | dBm/9.36 MHz | 1, 2 | -64.60 | -62.25 | --64.60 | -62.25 |
| Propagation Condition |  | 1, 2 | AWGN | | | |
| Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | |

A.14.5.2.7.3 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2. The UE is not required to read the neighbour cell SSB index in this test.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.14.5.2.8 Event triggered reporting tests without gap under DRX

A.14.5.2.8.1 Test purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the inter-frequency cell search requirements in clauses 9.3C.7.

A.14.5.2.8.2 Test parameters

Two cells are deployed in the test, which are FR1 PCell (Cell 1) on NR RF channel 1 and a FR1 neighbour cell (Cell 2) on NR RF channel 2. The test parameters for PCell are given in Table A.14.5.2.8.2-1, A.14.5.2.8.2-2 and A.14.5.2.8.2-3 below. In the measurement controlinformation, a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided with new Timing Advance Command MAC control element at least once during each time alignment timer period to maintain uplink time alignment. Furhtermore UE is allocated with PUSCH resource at every DRX cycle.

The UE shall be provided with the valid information about the SAN serving the each cell in the test before the test.

UE is configured with 1 SMTC for the inter-frequency measurement. Both Cell 1 and Cell 2 are associated with the configured SMTC.

**Table A.14.5.2.8.2-1: Supported test configurations**

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | GSO, NR FDD, SSB SCS 15 kHz, data SCS 15 kHz, BW 10 MHz |
| 2 | NGSO, NR FDD, SSB SCS 15 kHz, data SCS 15 kHz, BW 10 MHz |
| Note: The UE is only required to be tested in one of the supported test configurations | |

**Table A.14.5.2.8.2-2: General test parameters for inter-frequency event triggered reporting without gap for PCell in FR1 with DRX**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Value** | | **Comment** |
|  |  |  | **Test 1** | **Test 2** |  |
| Active cell |  | 1, 2 | Cell 1 | |  |
| Neighbour cell |  | 1, 2 | Cell 2 | | Cell to be identified. |
| RF Channel Number |  | 1, 2 | 1: Cell 1 and Cell 2 | |  |
| SMTC configuration |  | 1, 2 | SMTC.2 | |  |
| A3-Offset | dB | 1, 2 | -4.5 | |  |
| CP length |  | 1, 2 | Normal | |  |
| Hysteresis | dB | 1, 2 | 0 | |  |
| Time To Trigger | s | 1, 2 | 0 | |  |
| Filter coefficient |  | 1, 2 | 0 | | L3 filtering is not used |
| DRX |  | 1, 2 | DRX.1 | DRX. 7 |  |
| Time offset between serving and neighbour cells |  | 1, 2 | 3 μs | | Synchronous cells |
| T1 | s | 1, 2 | 5 | |  |
| T2 | s | 1, 2 | 5 | 10 |  |

**Table A.14.5.2.8.2-3: NR Cell specific test parameters for inter-frequency event triggered reporting without gap for PCell in FR1 with DRX**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Cell 1** | | **Cell 2** | |
|  |  |  | **T1** | **T2** | **T1** | **T2** |
| Satellite information |  | 1 | SSC.1 | | NSC.1 | |
| 2 | SSC.2 | | NSC.2 | |
| SSB configuration |  | 1, 2 | SSB.1 FR1 | | SSB.1 FR1 | |
| PDSCH RMC configuration |  | 1, 2 | SR.1.1 FDD | | N/A | |
| RMSI CORESET RMC configuration |  | 1, 2 | CR.1.1 FDD | | N/A | |
| Dedicated CORESET RMC configuration |  | 1, 2 | CCR.1.1 FDD | | N/A | |
| OCNG Patterns |  | 1, 2 | OP.1 | | OP.1 | |
| TRS configuration |  | 1, 2 | TRS.1.1 FDD | | N/A | |
| IInitial BWP configuration |  | 1, 2 | DLBWP.0.1 ULBWP.0.1 | | DLBWP.0.1 ULBWP.0.1 | |
| Active DL BWP configuration |  | 1, 2 | DLBWP.1.1 | | DLBWP.1.1 | |
| Active UL BWP configuration |  | 1, 2 | ULBWP.1.1 | | ULBWP.1.1 | |
| RLM-RS |  | 1, 2 | SSB | | SSB | |
| Note 2 | dBm/SCS | 1, 2 | -98 | | | |
| Note 2 | dBm/15 kHz | 1, 2 | -98 | | | |
|  | dB | 1, 2 | 4 | -1.46 | -Infinity | -1.46 |
|  | dB | 1, 2 | 4 | 4 | -Infinity | 4 |
| SS-RSRP Note 3 | dBm/SCS kHz | 1, 2 | -94 | -94 | -Infinity | -94 |
| Io | dBm/9.36 MHz | 1, 2 | -64.60 | -62.25 | --64.60 | -62.25 |
| Propagation Condition |  | 1, 2 | AWGN | | | |
| Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | |

A.14.5.2.8.3 Test Requirements

In test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than X ms from the beginning of time period T2. The UE is not required to read the neighbour cell SSB index in this test. X=1280 for test configuration 2 and if UE indicates ‘n1’ for *maxNumber-NGSO-SatellitesWithinOneSMTC*, otherwise X=920.

In test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than Y ms from the beginning of time period T2. The UE is not required to read the neighbour cell SSB index in this test. Y=12800 for test configuration 2 and if UE indicates ‘n1’ for *maxNumber-NGSO-SatellitesWithinOneSMTC*, otherwise Y=6400.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

< End of change# >