3GPP TR 36.905 V18.3.0 (2023-12)

Technical Report

3rd Generation Partnership Project;

Technical Specification Group Radio Access Network;

Evolved Universal Terrestrial Radio Access (E-UTRA) and

Evolved Universal Terrestrial Radio Access Network (E-UTRAN);

Derivation of test points for radio transmission and reception conformance test cases

(Release 18)



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Keywords

mobile, UE, terminal, testing, radio, E-UTRA

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# Foreword

This Technical Report has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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# 1 Scope

The present document specifies and contains the derivation of Test Points for RF test cases, thereby 3GPP TSG RAN WG5 will have a way of storing the input contributions provided. The test cases are described in TS36.521-1[2] and TS 36.521-4 [5].

The test cases which have been analysed to determine Test Points are included as .zip files.

The present document is applicable from Release 10 up to the release indicated on the front page of the present Terminal conformance specifications.

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 36.521-1: "User Equipment (UE) conformance specification, Radio transmission and reception Part 1: conformance testing".

[3] 3GPP TS 36.101: "E-UTRA UE radio transmission and reception".

[4] 3GPP TS 36.521-2: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 2: Implementation Conformance Statement (ICS)".

[5] 3GPP TS 36.521-4: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 4: Satellite access Radio Frequency (RF) and performance Conformance Testing".

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

Other definitions used in the present document are listed in 3GPP TS 36.521-1 [2] or 3GPP TS 36.101 [3].

## 3.2 Symbols

Symbols used in the present document are listed in 3GPP TR 21.905 [1], 3GPP TS 36.521-1 [2] or 3GPP TS 36.101 [3].

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

Other abbreviations used in the present document are listed in 3GPP TS 36.521-1 [2] or 3GPP TS 36.101 [3].

# 4 Test coverage analysis

## 4.1 Test point selection in Additional Maximum Power Reduction (A-MPR) test cases

When deriving test points for these test cases the calculation of maximum output power backoff and determination of possible worst cases for out-of-band emissions are non-trivial and therefore require an analysis which is documented here.

### 4.1.1 A-MPR test case for single carrier

This section contains information on test point selection for test case 6.2.4 in [2], Additional Maximum Power Reduction (A-MPR).

Test points in this test were added in the past, and no selection information is therefore available prior the NS values in table 4.1.1-1.

Selection of test points should include some possible worst combinations based on the A-MPR characteristics specified for each NS value and these shall be selected so that they match with corresponding spectrum emission requirements test points. The number of test points should be realistic.

Table 4.1.1-1: NS value specific test points for A-MPR

|  |  |  |
| --- | --- | --- |
| NS value | Justification | Comments |
| NS\_05 | See attachment “TpAnalysisAMPR(NS\_05)\_6.2.4\_v2.zip” | Added at RAN5#73 |
| NS\_24 | See attachment “TpAnalysisAMPR\_6.2.4(NS\_24 and NS\_25).zip” | Added at RAN5#72 |
| NS\_25 | See attachment “TpAnalysisAMPR\_6.2.4(NS\_24 and NS\_25).zip” | Added at RAN5#72 |
| NS\_27 | See attachment “TpAnalysisAMPR\_6.2.4(NS\_27)\_v3.zip” | Added at RAN5#80 |
| NS\_04 (Power Class 2) | See attachment “TpAnalysisAMPR\_6.2.4\_1(NS\_04\_PC2).zip” | Added at RAN5#74 |
| NS\_04 (Power Class 3) | See attachment “TpAnalysisAMPR\_6.2.4(NS\_04\_PC3).zip” | Added at RAN5#75 |
| NS\_22 | See attachment “TpAnalysisAMPR\_6.2.4(NS\_22 and NS\_23).zip” | Added at RAN5#75 |
| NS\_23 | See attachment “TpAnalysisAMPR\_6.2.4(NS\_22 and NS\_23).zip” | Added at RAN5#75 |
| NS\_56 | See attachment “TpAnalysisAMPR\_6.2.4(NS\_56\_PC3).zip” | Added at RAN5#93-e |

The analyses for UE category M1 and category M2 are performed per NS-value in table 4.1.1-2 for category M1, table 4.1.1-2a for category M1 with subPRB allocation and in table 4.1.1-3 for category M2. The general principles for selection of test points are:

- For Additional spurious emissions, requirements are the same for all bandwidths. Since channel bandwidth is not judged to have any impact on the UE transmit signal for category M1, only one bandwidth needs to be tested. The lowest bandwidth with emissions requirement has lowest guard band and is therefore the most stringent. For category M2 the same applies, with the exception that channel bandwidth 5 MHz is always additionally selected, even if this is not the smallest bandwidth. Because maximum RB allocation of 24 resource blocks requires at least 5 MHz channel bandwidth.

- For NS-values with Additional SEM requirement and without any allowed A-MPR, same test points as in SEM test case 6.6.2.1EA for category M1 and same test points as in SEM test case 6.6.2.1EC for category M2 can be used.

- For NS-values with Additional Spurious requirement and without any allowed A-MPR, same test points as in spurious test case 6.6.3EA.1 for category M1 and same test points as in spurious test case 6.6.3EC.1 for category M2 can be used

- For Additional SEM, test frequency is selected as in SEM test case.

- For Additional spurious emissions, test frequency selection depends on if protected range is above or below the UE transmit signal in frequency. If protected range is above UE transmit frequency, then High frequency range is selected. If protected range is below UE transmit frequency, then Low frequency range is selected.

Table 4.1.1-2: NS value specific test points for A-MPR UE category M1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| NS value | Operating band | Applicable test case | RB allocation and modulation | Bandwidth | Test frequency | Comments |
| NS\_03 | 2, 4 | 6.6.2.2EA | SEM (Note 1) | Lowest, 5MHz, 10MHz, Highest | Low, Mid, High |  |
| NS\_04 | 41 | 6.6.2.2EA | TBD |  |  |  |
| NS\_05 | 1 | 6.6.3EA.3 | Spur (Note 2) | 5 MHz | Low |  |
| NS\_06 | 12, 13 | 6.6.2.2EA | SEM (Note 1) | Lowest, 5MHz, 10MHz, Highest | Low, Mid, High |  |
| NS\_07 | 13 | 6.6.2.2EA | See attachment “TpAnalysisAMPR(NS\_07)\_6.2.4EA.zip” | 10MHz | Low, Mid, High | Testing only 10 MHz to align with legacy LTE test case |
|  |  | 6.6.3EA.3 |  | 10 MHz | Low | Emission requirements are only defined for 10 MHz channel bandwidth |
| NS\_08 | 19 | 6.6.3EA.3 | Spur (Note 2) | 5 MHz | High |  |
| NS\_09 | 21 | 6.6.3EA.3 | Spur (Note 2) | 5 MHz | High |  |
| NS\_10 | 20 | N/A | | | | Not tested due to missing requirements |
| NS\_12 | 26 | 6.6.3EA.3 | TBD |  |  |  |
| NS\_13 | 26 | 6.6.3EA.3 | Spur (Note 2) | 1.4 MHz | Low (Note 3) |  |
| NS\_14 | 26 | 6.6.3EA.3 | Spur (Note 2) | 10 MHz | Low (Note 3) |  |
| NS\_15 | 26 | 6.6.3EA.3 | See attachment “TpAnalysisAMPR(NS\_15)\_6.2.4EA.zip” | 1.4 MHz | High, High – 4 MHz |  |
| NS\_16 | 27 | 6.6.3EA.3 | Spur (Note 2) | 1.4 MHz | Low |  |
| NS\_17 | 28 | 6.6.3EA.3 | Spur (Note 2) | 5 MHz | Low (Note 3) |  |
| NS\_18 | 28 | 6.6.3EA.3 | Spur (Note 2) | 5 MHz | Low |  |
| Note 1: No A-MPR allowed, same test points as SEM test case 6.6.2.1EA can be used for Additional SEM  Note 2: No A-MPR allowed, same test points as Spurious test case 6.6.3EA.1 can be used for Additional Spurious  Note 3: Protected range below UE transmit signal, and restricted carrier frequency. Use lowest allowed frequency | | | | | | |

Table 4.1.1-2a: NS value specific test points for A-MPR UE category M1, subPRB allocation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| NS value | Operating band | Applicable test case | RB allocation and modulation | Bandwidth | Test frequency | Comments |
| NS\_03 | 4 | 6.2.4EA | See attachment TpAnalysisAMPR(NS\_05)\_6.2.4EA\_subPRB.zip | Lowest, 5MHz, 10MHz, Highest | Low, Mid, High | RAN5#93-e |
|  |  | 6.6.2.2EA |  | Lowest, 5MHz, 10MHz, Highest | Low, Mid, High | RAN5#93-e |
| NS\_04 | 41 | 6.2.4EA | See attachment TpAnalysisAMPR(NS\_04)\_6.2.4EA\_subPRB.zip | 5MHz, 10MHz, 15MHz, 20MHz | Low, Mid, High | RAN5#93-e |
|  |  | 6.6.2.2EA |  | 5MHz, 10MHz, 15MHz, 20MHz | Low, Mid, High | RAN5#93-e |
| NS\_05 | 1 | 6.2.4EA | See attachment TpAnalysisAMPR(NS\_05)\_6.2.4EA\_subPRB.zip | 5MHz | Low | RAN5#93-e |
|  |  | 6.6.3EA.3 | Spur (Note 1) | 5MHz | Low | RAN5#93-e |
| NS\_07 | 13 | 6.6.2.2EA | See attachment “TpAnalysisAMPR(NS\_07)\_6.2.4EA\_subPRB.zip” | 10MHz | Low, Mid, High | A-MPR requirement is only defined for 10 MHz channel bandwidth. |
|  |  | 6.6.3EA.3 | Spur (Note 1) | 10 MHz | Low | Emission requirement is only defined for 10 MHz channel bandwidth |
| NS\_08 | 19 | 6.2.4EA | See attachment TpAnalysisAMPR(NS\_08)\_6.2.4EA\_subPRB.zip | 5MHz | High | RAN5#93-e |
|  |  | 6.6.3EA.3 | Spur (Note 2) | 5MHz | High | RAN5#93-e |
| NS\_09 | 21 | 6.2.4EA | See attachment TpAnalysisAMPR(NS\_09)\_6.2.4EA\_subPRB.zip | 5MHz | High | RAN5#93-e |
|  |  | 6.6.3EA.3 | Spur (Note 2) | 5MHz | High | RAN5#93-e |
| NS\_12 | 26 | 6.2.4EA | See attachment TpAnalysisAMPR(NS\_12)\_6.2.4EA\_subPRB.zip | 5MHz | 816.7MHz | RAN5#93-e |
|  |  | 6.6.3EA.3 |  | 5MHz | 816.7MHz | RAN5#93-e |
| NS\_13 | 26 | 6.2.4EA | See attachment TpAnalysisAMPR(NS\_13)\_6.2.4EA\_subPRB.zip | 5MHz | High | RAN5#93-e |
|  |  | 6.6.3EA.3 | Spur (Note 2) | 5MHz | High | RAN5#93-e |
| NS\_14 | 26 | 6.2.4EA | See attachment TpAnalysisAMPR(NS\_14)\_6.2.4EA\_subPRB.zip | 10MHz | 829MHz | RAN5#93-e |
|  |  | 6.6.3EA.3 |  | 10MHz | 829MHz | RAN5#93-e |
| NS\_15 | 26 | 6.2.4EA | See attachment TpAnalysisAMPR(NS\_15)\_6.2.4EA\_subPRB.zip | 5MHz | High | RAN5#93-e |
|  |  | 6.6.3EA.3 | Spur (Note 2) | 5MHz | High | RAN5#93-e |
| NS\_17 | 28 | 6.2.4EA | See attachment TpAnalysisAMPR(NS\_17)\_6.2.4EA\_subPRB.zip | 5MHz | 720.5MHz | RAN5#93-e |
|  |  | 6.6.3EA.3 |  | 5MHz | 720.5MHz | RAN5#93-e |
| NS\_18 | 28 | 6.2.4EA | See attachment TpAnalysisAMPR(NS\_18)\_6.2.4EA\_subPRB.zip | 5MHz | Low | RAN5#93-e |
|  |  | 6.6.3EA.3 | Spur (Note 1) | 5MHz | Low | RAN5#93-e |
| NS\_22 | 42 | 6.2.4EA | See attachment TpAnalysisAMPR(NS\_22)\_6.2.4EA\_subPRB.zip | 5MHz | Low, Mid, High | RAN5#93-e |
|  |  | 6.6.3EA.3 |  | 5MHz | Low, Mid, High | RAN5#93-e |
| NS\_23 | 42 | 6.2.4EA | See attachment TpAnalysisAMPR(NS\_23)\_6.2.4EA\_subPRB.zip | 5MHz | Low, Mid, High | RAN5#93-e |
|  |  | 6.6.3EA.3 |  | 5MHz | Low, Mid, High | RAN5#93-e |
| Note 1: Protected range is below UE transmit signal, and restricted carrier frequency. Use lowest allowed frequency  Note 2: Protected range is above UE transmit signal, and restricted carrier frequency. Use highest allowed frequency | | | | | | |

Table 4.1.1-3: NS value specific test points for A-MPR UE category M2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| NS value | Operating band | Applicable test case | RB allocation and modulation | Bandwidth | Test frequency | Comments |
| NS\_03 | 2, 4 | 6.6.2.2EC | TBD |  |  |  |
| NS\_04 | 41 | 6.6.2.2EC | TBD |  |  |  |
| NS\_05 | 1 | 6.6.3EC.3 | See attachment “TpAnalysisAMPR(NS\_05)\_6.2.4EC.zip” | 5 MHz, 20 MHz | Low |  |
| NS\_06 | 12, 13, 14, 85 | 6.6.2.2EC | SEM (Note 1) | Lowest, 5 MHz, 10 MHz, Highest | Low, Mid, High |  |
| NS\_07 | 13 | 6.6.2.2EC | TBD |  |  |  |
|  |  | 6.6.3EC.3 | TBD |  |  |  |
| NS\_08 | 19 | 6.6.3EC.3 | Spur (Note 2) | 5 MHz | High |  |
| NS\_09 | 21 | 6.6.3EC.3 | Spur (Note 2) | 5 MHz | High |  |
| NS\_10 | 20 | N/A | | | | Not tested due to missing requirements |
| NS\_12 | 26 | 6.6.3EC.3 | TBD |  |  |  |
| NS\_13 | 26 | 6.6.3EC.3 | TBD |  |  |  |
| NS\_14 | 26 | 6.6.3EC.3 | TBD |  |  |  |
| NS\_15 | 26 | 6.6.3EC.3 | TBD |  |  |  |
| NS\_16 | 27 | 6.6.3EC.3 | TBD |  |  |  |
| NS\_17 | 28 | 6.6.3EC.3 | TBD |  |  |  |
| NS\_18 | 28 | 6.6.3EC.3 | TBD |  |  |  |
| NS\_35 | 71 | 6.6.2.2EC | SEM (Note 1) | Lowest, 5 MHz, 10 MHz, Highest | Low, Mid, High |  |
| Note 1: No A-MPR allowed, same test points as SEM test case 6.6.2.1EC can be used for Additional SEM  Note 2: No A-MPR allowed, same test points as Spurious test case 6.6.3EC.1 can be used for Additional Spurious | | | | | | |

Table 4.1.1-3a: NS value specific test points for A-MPR UE category M2, subPRB allocation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| NS value | Operating band | Applicable test case | RB allocation and modulation | Bandwidth | Test frequency | Comments |
| NS\_05 | 1 | 6.2.4EC | See attachment “TpAnalysisAMPR(NS\_05)\_6.2.4EC\_subPRB.zip” | 5MHz, 10MHz, 15MHz, 20MHz | Low | RAN5#93-e |
|  |  | 6.6.3EC.3 | Spur (Note 1) | 5MHz, 10MHz, 15MHz, 20MHz | Low | RAN5#93-e |
| Note 1: Protected range is below UE transmit signal, and restricted carrier frequency. Use lowest allowed frequency | | | | | | |

### 4.1.2 A-MPR test case for intra-band contiguous UL CA

This section contains information on test point selection for test case 6.2.4A.1 in [2], Additional Maximum Power Reduction (A-MPR) for CA (intra-band contiguous DL CA and UL CA).

The analyses are performed per NS-value and are stored as zip-files as defined in annex A.

Table 4.1.2-1: NS value specific test points for A-MPR

|  |  |  |
| --- | --- | --- |
| NS value | Justification | Comments |
| NS\_04 | See attachment “TpAnalysisAMPR(CA\_NS\_04)\_6.2.4A.1\_3(PC2).zip” | Added at RAN5#87e |

### 4.1.3 A-MPR test case for inter-band UL CA

This section contains information on test point selection for test case 6.2.4A.2 in [2], Additional Maximum Power Reduction (A-MPR) for CA (inter-band DL CA and UL CA).

TS 36.101 [3] specifies band dependent NS-values, which in the inter-band UL CA test cases become a combination of two NS-values. Testing all possible combinations would lead to too excessive testing and the combinations that are realistic should therefore be prioritized. This selection is documented in table 4.1.3-1.

Table 4.1.3-1: A-MPR test coverage per CA configuration for inter-band CA with 2 CC

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CA config with UL CA support (Note 1) | NS values in same order as Uplink CA Configuration column | | Applicable test case | Comment/Justification |
| CA\_1A-3A | NS\_05 | NS\_01 | 6.6.3.3A.2 | Note 3 |
| CA\_1A-5A | NS\_05 | NS\_01 | 6.6.3.3A.2 | Note 3 |
| CA\_1A-7A | NS\_05 | NS\_01 | 6.6.3.3A.2 | Note 3 |
| CA\_1A-8A | NS\_05 | NS\_01 | 6.6.3.3A.2 | Note 3 |
| CA\_1A-18A | NS\_05 | NS\_01 | 6.6.3.3A.2 | Note 3 |
| CA\_1A-19A | NS\_05 | NS\_08 | 6.6.3.3A.2 | Note 3 |
| CA\_1A-21A | NS\_05 | NS\_09 | 6.6.3.3A.2 | Note 3 |
| CA\_1A-26A | NS\_05 | NS\_01 | 6.6.3.3A.2 | Note 3 |
| CA\_1A-28A | NS\_05 | NS\_17 | 6.6.3.3A.2 |  |
| CA\_1A-42A | NS\_05 | NS\_01 | 6.6.3.3A.2 | Note 3 |
| CA\_2A-4A | NS\_03 | NS\_03 | 6.6.2.2A.2 |  |
| CA\_2A-5A | NS\_03 | NS\_01 | 6.6.2.2A.2 |  |
| CA\_2A-7A | NS\_03 | NS\_01 | 6.6.2.2A.2 |  |
| CA\_2A-12A | NS\_03 | NS\_06 | 6.6.2.2A.2 |  |
| CA\_2A-13A | NS\_03 | NS\_06 | 6.6.2.2A.2 |  |
| CA\_2A-13A | NS\_03 | NS\_07 | 6.6.2.2A.2, 6.6.3.3A.2 | Note 3 |
| CA\_2A-30A | NS\_03 | NS\_21 | 6.6.2.2A.2, 6.6.3.3A.2 | Note 5 |
| CA\_2A-66A | NS\_03 | NS\_03 | 6.6.2.2A.2 |  |
| CA\_3A-5A | NS\_01 | NS\_01 | N/A | Note 2 |
| CA\_3A-7A | NS\_01 | NS\_01 | N/A | Note 2 |
| CA\_3A-8A | NS\_01 | NS\_01 | N/A | Note 2 |
| CA\_3A-18A | NS\_01 | NS\_01 | N/A | Note 2 |
| CA\_3A-19A | NS\_01 | NS\_08 | 6.6.3.3A.2 |  |
| CA\_3A-20A | NS\_01 | NS\_10 | N/A | Note 4 |
| CA\_3A-26A | NS\_01 | NS\_12,  NS\_13,  NS\_14,  NS\_15 | 6.6.3.3A.2 | Note 3 |
| CA\_3A-28A | NS\_01 | NS\_17,  NS\_18 | N/A | Note 3 |
| CA\_3A-41A | NS\_01 | NS\_04 |  |  |
| CA\_4A-5A | NS\_03 | NS\_01 | 6.6.2.2A.2 |  |
| CA\_4A-7A | NS\_03 | NS\_01 | 6.6.2.2A.2 |  |
| CA\_4A-12A | NS\_03 | NS\_06 | 6.6.2.2A.2 |  |
| CA\_4A-13A | NS\_03 | NS\_06 | 6.6.2.2A.2 |  |
| CA\_4A-13A | NS\_03 | NS\_07 | 6.6.2.2A.2, 6.6.3.3A.2 | Note 3 |
| CA\_4A-17A | NS\_03 | NS\_06 | 6.6.2.2A.2 |  |
| CA\_5A-7A | NS\_01 | NS\_01 | N/A | Note 2 |
| CA\_5A-12A | NS\_01 | NS\_06 | 6.6.2.2A.2 |  |
| CA\_5A-17A | NS\_01 | NS\_06 | 6.6.2.2A.2 |  |
| CA\_5A-30A | NS\_01 | NS\_21 | 6.6.2.2A.2, 6.6.3.3A.2 | Note 5 |
| CA\_5A-66A | NS\_01 | NS\_03 | 6.6.2.2A.2 |  |
| CA\_7A-20A | NS\_01 | NS\_10 | N/A |  |
| CA\_7A-28A | NS\_01 | NS\_17 | 6.6.3.3A.2 | Note 3 |
| CA\_7A-28A | NS\_01 | NS\_18 | 6.6.3.3A.2 | Note 3 |
| CA\_11A-18A | NS\_01 | NS\_01 | N/A | Note 2 |
| CA\_12A-30A | NS\_06 | NS\_21 | 6.6.2.2A.2, 6.6.3.3A.2 | Note 5 |
| CA\_12A-66A | NS\_06 | NS\_03 | 6.6.2.2A.2 |  |
| CA\_18A-28A | NS\_01 | NS\_17 | 6.6.3.3A.2 |  |
| CA\_19A-21A | NS\_08 | NS\_09 | 6.6.3.3A.2 | Note 3 |
| CA\_39A-41A | NS\_01 | NS\_01 | N/A |  |
| Note 1: As per TS 36.101 V12.10.1  Note 2: No test required since band combinations where only NS\_01 is possible have no additional requirements, covered by section 6.2.3 test cases in TS 36.521-1 [2]  Note 3: No test required since only A-Spur requirements apply, and the frequency range to test is unaffected by intermodulation products as described in section 4.3.  Note 4: No test required since no A\_SEM and/or A-Spur requirements apply.  Note 5: Only A\_SEM requirements apply, as the frequency range to test for A-Spur requirements is unaffected by intermodulation products as described in section 4.3. | | | | |

The analyses are performed per NS-value and are stored as zip-files as defined in annex A. The general principle for selection of test points is:

- Test the minimum MPR + A-MPR value

- Test the maximum MPR + A-MPR value

- Test the maximum unbalanced total power backoff among CCs (max Pcmaxc difference).

The analyses are done for QPSK/16QAM test cases. For 64QAM test cases no analysis is made due to that it follows the same selection principle.

### 4.1.4 A-MPR test case for V2X test cases

This section contains information on test point selection for test cases 6.2.4G Additional Maximum Power Reduction (A-MPR) for V2X.

Selection of test points should include some possible worst combinations based on the A-MPR characteristics specified for each NS value and these shall be selected so that they match with corresponding spectrum emission requirements test points. The number of test points should be realistic.

Table 4.1.4-1: NS value specific test points for 6.2.4G.1 A-MPR for V2X non-concurrent with E-UTRA

|  |  |  |
| --- | --- | --- |
| NS value | Justification | Comments |
| NS\_33 | See attachment “TpAnalysisAMPR\_6.2.4G.1(NS\_33 NS\_34)\_v2.zip” | Added at RAN5#84 |
| NS\_34 | See attachment “TpAnalysisAMPR\_6.2.4G.1(NS\_33 NS\_34)\_v2.zip” | Added at RAN5#84 |

Table 4.1.4-2: NS value specific test points for 6.2.4G.2 A-MPR for V2X simultaneous transmission with E-UTRA

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| V2X band Configuration | NS values in same order as V2X Configuration column | | Applicable test case | Comment/Justification |
| V2X\_41A-47A | NS\_04 | NS\_33 | 6.6.2.2G.2 |  |

## 4.2 Test frequency and bandwidth selection in Reference sensitivity test cases

The determination of test frequency and channel bandwidths are made considering test time, possible worst cases and operator deployments. This is non-trivial and requires an analysis which is documented here.

### 4.2.1 Reference sensitivity level for single carrier

This section contains information on test point selection for test case 7.3 in [2], Reference sensitivity level

Test points in this test were added in the past, and no selection information is therefore available.

### 4.2.2 Reference sensitivity level for intra-band contiguous CA

This section contains information on test point selection for test cases 7.3A.1 - Reference sensitivity level for CA (intra-band contiguous DL CA and UL CA) and 7.3A.2 - Reference sensitivity level for CA (intra-band contiguous DL CA without UL CA).

In this test case, there are no CA configuration specific test points. The general rule of Low, High test frequency and Lowest NRB\_agg, Highest NRB\_agg is chosen for any CA configuration.

### 4.2.3 Reference sensitivity level for inter-band CA

This section contains information on test point selection for test case 7.3A.3 - Reference sensitivity level for CA (inter-band DL CA without UL CA)

In this test case, there are default test points to be used unless CA configuration specific test points are over-ruling in table 4.2.3-1. The default rule of Mid test frequency and Highest NRB\_agg is chosen for any CA configuration.

Table 4.2.3-1: CA configuration specific test points for inter-band CA with 2 CC

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |
| CA\_1A-3A | - |  |
| CA\_1A-11A | - |  |
| CA\_1A-18A | - |  |
| CA\_1A-19A | - |  |
| CA\_1A-21A | - |  |
| CA\_1A-26A | - |  |
| CA\_1A-28A | - |  |
| CA\_1A-41A | - |  |
| CA\_2A-13A | - |  |
| CA\_3A-8A | - |  |
| CA\_3A-18A | Test points are selected based on the industrial reason | Added at RAN5#79 |
| CA\_3A-19A | - |  |
| CA\_3A-26A | - |  |
| CA\_3A-27A | - |  |
| CA\_3A-28A | - |  |
| CA\_3A-42A | Test points are selected based on RAN4 defined exceptions |  |
| CA\_4A-5A | - |  |
| CA\_4A-13A | - |  |
| CA\_4A-17A | - |  |
| CA\_7A-28A | - |  |
| CA\_8A-11A | - |  |
| CA\_11A-18A | - |  |
| CA\_12A-66A | Test points are selected based on RAN4 defined exceptions | Added at RAN5#75 |
| CA\_18A-28A | - |  |
| CA\_18A-42A | Test points are selected based on the industrial reason | Added at RAN5#82 |
| CA\_19A-21A | - |  |
| CA\_20A-40A | Test points are selected based on RAN4 defined recommendation | Added at RAN5#84 |
| CA\_26A-41A | - |  |
| CA\_28A-40A | Test points are selected based on RAN4 defined recommendation | Added at RAN5#84 |
| CA\_28A-41A | Test points are selected based on the industrial reason |  |
| CA\_28A-42A | Test points are selected based on RAN4 defined exceptions |  |
| CA\_39A-41A | - |  |

### 4.2.4 Reference sensitivity level for intra-band non-contiguous CA

This section contains information on test point selection for test case 7.3A.4 Reference sensitivity level for CA (intra-band non-contiguous DL CA without UL CA).

Testpoint choice is based on the Table 7.3A.0-3. Only largest PCC BW + largest SCC BW and largest PCC BW + smallest SCC BW are tested. All corner cases VS Wgap specified for those 2 BW combinations in the Table 7.3A.0-3 are tested, larger Wgap being considered worse. PCC is allocated to the upper carrier, unless DL Band is below UL Band and wider operating band width than UL. Most testpoint IDs for FDD bands have to be tested twice, once with RB allocation applicable to PCC REFSENS test, which is the standard single carrier RB allocation, and once with RB Allocation applicable to SCC REFSENS test, as per Table 7.3A.0-3.

### 4.2.5 Reference sensitivity level for 3DL CA

This section contains information on test point selection for test case 7.3A.5 Reference sensitivity level for 3DL CA.

In the applicability conditions in TS 36.521-2 [4] it is defined that if the 3DL test is performed, testing of some fallback cases can be skipped , specifically:

- 2DL fallback 3DL/1UL -> 2DL/1UL: Test of fallback can be skipped in many cases. Analysis supplied per CA configuration later in this clause.

- 2DL fallback 3DL/2UL -> 2DL/2UL: It is FFS if fallback need to be tested

- 1UL fallback 3DL/2UL -> 3DL/1UL: Test of fallback is required due to different minimum requirements.

This implies that the test point analysis described later in this section currently only considers 1UL.4.2.5.1 Intra-band

In this case, there are default test points to be used unless CA configuration specific test points are over-ruling. The default rule of Low and High test frequency, Lowest and Highest NRB\_agg is chosen for any CA configuration.

Editor’s note: The specific test points for reference sensitivity level and 3DL CA Intra-band are under investigation.

#### 4.2.5.2 Inter-band

In this case, there are default test points to be used unless CA configuration specific test points are over-ruling in table 4.2.5.2-1. The default rule of Mid test frequency and Highest NRB\_agg is chosen for any CA configuration. For CA configurations where default test points are used and 2DL fallback cases also use default test points there is no need for justification in Table 4.2.5.2-1.

Selection of test points should include some possible worst combinations and these can be based on operator preference in case of the CA configuration is operator specific. The number of test points should not exceed the total number of the maximum number of the test points to cover fallback of 2DL CA case.

Table 4.2.5.2-1: CA configuration specific test points for 3DL CA (Inter-band)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |
| CA\_1A-3A-5A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-3A-5A).zip” |  |
| CA\_1A-3A-7A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-3A-7A)\_V2.zip” | Added at RAN5#70 Modified at RAN5#73 |
| CA\_1A-3A-8A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-3A-8A).xls” | Added at RAN5#69 |
| CA\_1A-3A-11A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-3A-11A).zip” | Added at RAN5#76 |
| CA\_1A-3A-18A | See attachment “TpAnalysis3DLReceiver(1A-3A-18A).zip” | Added at RAN5#79 |
| CA\_1A-3A-19A | - |  |
| CA\_1A-3A-20A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-3A-20A).zip” | Added at RAN5#70 |
| CA\_1A-3A-26A | See attachment “TpAnalysis3DLReceiver(1A-3A-26A)\_V2.zip” | Added at RAN5#80 |
| CA\_1A-3A-28A | See attachment “TpAnalysis3DLReceiver(1A-3A-28A).zip” | Added at RAN5#79 |
| CA\_1A-3A-32A | See attachment “TpAnalysis3DLRefSens (1A-3A-32A).zip” | Added at RAN5#82 |
| CA\_1A-3A-40A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-3A-40A).zip” | Added at RAN5#77 |
| CA\_1A-3A-41A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-3A-41A).zip” | Added at RAN5#73 |
| CA\_1A-3A-42A | See attachment ”TpAnalysis3DLReceiver(1A-3A-42A).zip” | Added at RAN5#79 |
| CA\_1A-7A-8A | See attachment ”TpAnalysis3DLReceiver(1A-7A-8A).zip” | Added at RAN5#80 |
| CA\_1A-7A-20A | - |  |
| CA\_1A-7A-28A BCS2 | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-7A-28A BCS2).zip” | Added at RAN5#87-e |
| CA\_1A-8A-11A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-8A-11A).zip” | Added at RAN5#71 |
| CA\_1A-8A-28A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-8A-28A).zip” | Added at RAN5#74 |
| CA\_1A-8A-38A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-8A-38A).zip” | Added at RAN5#84 |
| CA\_1A-11A-18A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-11A-18A).zip” | Added at RAN5#73 |
| CA\_1A-11A-28A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-11A-28A).zip” | Added at RAN5#75 |
| CA\_1A-18A-28A | See attachment “TpAnalysis3DLReceiver(1A-18A-28A).zip” | Added at RAN5#79 |
| CA\_1A-18A-42A | See attachment “TpAnalysis3DLReceiver(1A-18A-42A).zip” | Added at RAN5#84 |
| CA\_1A-19A-21A | - |  |
| CA\_1A-19A-28A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-19A-28A).zip” | Added at RAN5#70 |
| CA\_1A-19A-42A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-19A-42A).zip” | Added at RAN5#75 |
| CA\_1A-21A-42A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-21A-42A).zip” | Added at RAN5#75 |
| CA\_1A-41A-42A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-41A-42A).zip” | Added at RAN5#72 |
| CA\_2A-4A-5A | See attachment “TpAnalysis3DLRefSens\_7.3A.5.zip” | Added at RAN5#69 |
| CA\_2A-4A-7A\_UL\_2A-4A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(2A-4A-7A\_UL\_2A-4A).zip” | Added at RAN5#77 |
| CA\_2A-4A-12A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(2A-4A-12A).zip” |  |
| CA\_2A-4A-13A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(2A-4A-13A).zip” |  |
| CA\_2A-4A-71A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(2A-4A-71A)\_v2.zip” | Added at RAN5#80  Modified at RAN5#82 |
| CA\_2A-66A-71A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(2A-66A-71A)\_v2.zip” | Added at RAN5#80  Modified at RAN5#81 |
| CA\_3A-41A-42A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-41A-42A).zip” | Added RAN5#75 |
| CA\_2A-4A-30A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(2A-4A-30A).zip” | Added at RAN5#74 |
| CA\_2A-4A-29A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(2A-4A-29A).zip” | Added at RAN5#74 |
| CA\_2A-5A-13A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(2A-5A-13A).zip” | Added at RAN5#68 |
| CA\_2A-5A-29A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(2A-5A-29A).zip” | Added at RAN5#83 |
| CA\_2A-12A-66A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(2A-12A-66A)\_v2.zip” | Added at RAN5#76 |
| CA\_3A-7A-8A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-7A-8A)\_v2.zip” | Added at RAN5#71  Modified at RAN5#80 |
| CA\_3A-7A-20A | - |  |
| CA\_3A-7A-20A\_2UL\_3A-20A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-7A-20A\_2UL\_3A-20A).zip” | Added at RAN5#78 |
| CA\_3A-7A-20A\_2UL\_3A-7A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-7A-20A\_2UL\_3A-7A).zip” | Added at RAN5#78 |
| CA\_3A-7A-20A\_2UL\_7A-20A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-7A-20A\_2UL\_7A-20A).zip” | Added at RAN5#78 |
| CA\_3A-7A-28A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-7A-28A).zip” | Added at RAN5#83 |
| CA\_3A-7A-38A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-7A-38A).zip” | Added at RAN5#84 |
| CA\_3A-7A-42A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-7A-42A).zip” | Added at RAN5#79 |
| CA\_3A-8A-11A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-8A-11A).zip” | Added at RAN5#76 |
| CA\_3A-8A-28A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-8A-28A).zip” | Added at RAN5#74 |
| CA\_3A-8A-40A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-8A-40A).zip” | Added at RAN5#77 |
| CA\_3A-11A-28A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-11A-28A).zip” | Added at RAN5#76 |
| CA\_3A-18A-42A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-18A-42A).zip” | Added at RAN5#82 |
| CA\_3A-19A-42A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-19A-42A).zip” | Added at RAN5#70 |
| CA\_3A-20A-32A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-20A-32A).zip” | Added at RAN5#75 |
| CA\_3A-20A-42A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-20A-42A).zip” | Added at RAN5#79 |
| CA\_3A-28A-38A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-28A-38A).zip” | Added at RAN5#84 |
| CA\_3A-28A-41A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-28A-41A).zip” | Added at RAN5#74 |
| CA\_4A-5A-13A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(4A-5A-13A).zip” | Added at RAN5#68 |
| CA\_4A-5A-30A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(4A-5A-30A)\_v2.zip” | Added at RAN5#73 |
| CA\_4A-7A-12A\_BCS1 | See attachment “TpAnalysis3DLRefSens\_7.3A.5(4A-7A-12A).zip” | Added at RAN5#76 |
| CA\_4A-12A-30A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(4A-12A-30A).zip” | Added at RAN5#75 |
| CA\_8A-11A-28A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(8A-11A-28A).zip” | Added at RAN5#75 |
| CA\_8A-20A-28A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(8A-20A-28A).zip” | Added at RAN5#84 |
| CA\_19A-21A-42A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(19A-21A-42A).zip” | Added at RAN5#75 |
| CA\_12A-30A-66A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(12A-30A-66A).zip” | Added at RAN5#75 |
| CA\_29A-46A-66A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(29A-46A-66A).zip” | Added at RAN5#76 |
| CA\_29A-66A-70A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(29A-66A-70A).zip” | Added at RAN5#79 |
| CA\_66A-70A-71A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(66A-70A-71A).zip” | Added at RAN5#80 |

#### 4.2.5.3 Intra-band contiguous + Inter-band

In this test case, there are default test points to be used unless CA configuration specific test points are over-ruling in table 4.2.5.3-1. The default rule of Low and High test frequency for the band with 2 CC and Mid test frequency for the band with 1CC, Lowest and Highest NRB\_agg for the band with 2 CC and Highest NRB\_agg for the band with 1 CC is chosen for any CA configuration. For CA configurations where default test points are used and 2DL fallback cases also use default test points there is no need for justification in Table 4.2.5.3-1.

Table 4.2.5.3-1: CA configuration specific test points for 3DL CA (Intra-band contiguous + Inter-band)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |
| CA\_1A-3C | TpAnalysis3DLRefSens\_CA\_1A-3C.zip | Added at RAN5#72 |
| CA\_1C-3A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1C-3A).zip” | Added at RAN5#74 |
| CA\_1A-42C | See attachment “TpAnalysis3DLReceiver (1A-42C).zip” | Added at RAN5#79 |
| CA\_2C-30A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(2C-30A).zip | Added at RAN5#74 |
| CA\_3A-7B | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-7B)\_v2.zip” | Added at RAN5#88-e |
| CA\_3A-7C | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-7C).zip” | Added at RAN5#83 |
| CA\_3C-8A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3C-8A).zip” | Added at RAN5#75 |
| CA\_3C-20A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3C-20A).zip” | Added at RAN5#87-e |
| CA\_3A-42C | See attachment “TpAnalysis3DLReceiver (3A-42C).zip” | Added at RAN5#79 |
| CA\_5A-12B | See attachment “TpAnalysis3DLRefSens\_7.3A.5(5A-12B).zip” | Added at RAN5#74 |
| CA\_7B-28A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(7B-28A).zip” | Added at RAN5#83 |
| CA\_7C-28A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(7C-28A).zip” | Added at RAN5#83 |
| CA\_8A-40C | See attachment “TpAnalysis3DLRefSens\_7.3A.5(8A-40C).zip” | Added at RAN5#84 |
| CA\_8A-41C | See attachment “TpAnalysis3DLRefSens\_7.3A.5(8A-41C).zip” | Added at RAN5#75 |
| CA\_8A-42C | See attachment “TpAnalysis3DLRefSens\_7.3A.5(8A-42C).zip” | Added at RAN5#72 |
| CA-18A-42C | See attachment “TpAnalysis3DLRefSens\_7.3A.5(18A-42C).zip” | Added at RAN5#84 |
| CA\_11A-41C | See attachment “TpAnalysis3DLRefSens\_7.3A.5(11A-41C).zip” | Added at RAN5#84 |
| CA\_11A-42C | See attachment “TpAnalysis3DLRefSens\_7.3A.5(11A-42C).zip” | Added at RAN5#84 |
| CA\_28A-41C | See attachment “TpAnalysis3DLRefSens\_7.3A.5(28A-41C).zip” | Added at RAN5#71 |
| CA\_28A-42C | See attachment “TpAnalysis3DLRefSens\_7.3A.5(28A-42C).zip” | Added at RAN5#71 |
| CA\_29A-70C | See attachment “TpAnalysis3DLRefSens\_7.3A.5(29A-70C).zip” | Added at RAN5#79 |
| CA\_38A-40C BCS1 | See attachment “TpAnalysis3DLRefSens\_7.3A.5(38A-40C BCS1).zip” | Added at RAN5#87-e |
| CA\_39A-41C, CA\_39C-41A | Choose Mid range for B41, choose Low, mid, high range for B39 according to the real deploy condition | Added at RAN5#68 |
| CA\_41A-42C | See attachment “TpAnalysis3DLReceiver (41A-42C).zip” | Added at RAN5#79 |
| CA\_41C-42A | See attachment “TpAnalysis3DLReceiver (41C-42A).zip” | Added at RAN5#79 |
| CA\_46A-66C | See attachment “TpAnalysis3DLRefSens\_7.3A.5(46A-66C).zip” | Added at RAN5#76 |
| CA\_46C-66A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(46C-66A).zip” | Added at RAN5#75 |
| CA\_66A-70C | See attachment “TpAnalysis3DLRefSens\_7.3A.5(66A-70C).zip” | Added at RAN5#79 |
| CA\_66C-70A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(66C-70A).zip” | Added at RAN5#79 |
| CA\_66C-71A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(66C-71A).zip” | Added at RAN5#80 |
| CA\_70C-71A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(70C-71A).zip” | Added at RAN5#80 |

#### 4.2.5.4 Intra-band non-contiguous + Inter-band

In this test case, there are default test points for each intra-band non-contiguous band to be used unless CA configuration specific test points are over-ruling in table 4.2.5.4-1. The default test points are based on fallback non-contiguous CA test points, with the inter-band CC using Max NRB and Mid test frequency, as per default Inter-Band test points. For CA configurations where default test points are used and 2DL fallback cases also use default test points there is no need for justification in Table 4.2.5.4-1.

Table 4.2.5.4-1: CA configuration specific test points for 3DL CA (Intra-band non-contiguous + Inter-band)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |
| CA\_1A-1A-7A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-1A-7A).zip” | Added at RAN5#84 |
| CA\_1A-7A-7A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(1A-7A-7A).zip” | Added at RAN5#87-e |
| CA\_2A-2A-5A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(2A-2A-XA).zip” | Added at RAN5#68 Modified at RAN5#69 |
| CA\_2A-2A-12A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(2A-2A-XA).zip” |  |
| CA\_2A-2A-13A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(2A-2A-XA).zip” |  |
| CA\_2A-2A-30A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(2A-2A-XA).zip” |  |
| CA\_2A-2A-71A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(2A-2A-71A)\_v2.zip” | Added at RAN5#80  Modified at RAN5#82 |
| CA\_3A-3A-XA | Test point choice based on fallback CA\_3A-3A test points, | Added at RAN5#69 |
| CA\_3A-3A-8A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(3A-3A-8A).zip” |  |
| CA\_4A-4A-5A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(4A-4A-XA).zip” | Added at RAN5#68 Modified at RAN5#69 |
| CA\_4A-4A-7A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(4A-4A-XA).zip” |  |
| CA\_4A-4A-12A | Exception of Test configuration for CA\_4A-4A-12A is needed due to H3 of B12 TX falling into B4 RX if B12 is PCC. Test points are selected based on RAN4 defined exception points. | Added at RAN5#69 |
| CA\_7A-7A-XA | See attachment “TpAnalysis3DLRefSens\_7.3A.5(7A-7A-XA).zip” | Added at RAN5#75 |
| CA\_7A-42A-42A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(7A-42A-42A).zip” | Added at RAN5#80 |
| CA\_12A-66A-66A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(12A-66A-66A).zip” | Added at RAN5#75 |
| CA\_20A-42A-42A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(20A-42A-42A).zip” | Added at RAN5#80 |
| CA\_38A-40A-40A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(38A-40A-40).zip | Added at RAN5#85 |
| CA\_46A-46A-66A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(46A-46A-66A).zip” | Added at RAN5#75 |
| CA\_XA-42A-42A | Test point choice based on fallback CA\_42A-42A test points | Added at RAN5#69 |
| CA\_XA-66A-66A  CA\_66A-66A-XA | Test point choice based on fallback CA\_66A-66A test points | Added at RAN5#75 |
| CA\_66A-66A-70A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(66A-66A-70A).zip” | Added at RAN5#79 |
| CA\_66A-66A-71A | See attachment “TpAnalysis3DLRefSens\_7.3A.5(66A-66A-71A).zip” | Added at RAN5#80 |

#### 4.2.5.5 Intra-band non-contiguous + Intra-band contiguous

Testpoint choice is based on the Table 7.3A.0-3. Only largest PCC sub-block BW / NRB\_agg + largest SCC-only sub-block BW / NRB\_agg  and largest PCC sub-block BW / NRB\_agg + smallest SCC-only sub-block BW / NRB\_agg are tested. All corner cases VS Wgap specified for those 2 BW combinations in the Table 7.3A.0-3 are tested, larger Wgap being considered worse. PCC is allocated to the highest carrier, unless DL Band is below UL Band and wider operating band width than UL. Most testpoint IDs for FDD bands have to be tested twice, once with RB allocation applicable to PCC REFSENS test, which is the standard single carrier RB allocation, and once with RB Allocation applicable to SCC REFSENS test, as per Table 7.3A.0-3.

### 4.2.6 Reference sensitivity level for 4DL CA

This section contains information on test point selection for test case 7.3A.9 Reference sensitivity level for 4DL CA.

In the applicability conditions in TS 36.521-2 [4] it is defined that if the 4DL test is performed, testing of any 3DL or 2DL fallbacks can be skipped specifically:

- 3DL fallback 4DL/1UL -> 3DL/1UL: Test of fallback can be skipped in many cases. Analysis supplied per CA configuration later in this clause.

- 3DL fallback 4DL/2UL -> 3DL/2UL: It is FFS if fallback need to be tested.

- 1UL fallback 4DL/2UL -> 4DL/1UL: Test of fallback is required due to different minimum requirements.

This implies that the test point analysis described later in this section currently only considers 1UL.

#### 4.2.6.1 Intra-band contiguous

FFS

#### 4.2.6.2 Inter-band

In this case, there are default test points to be used unless CA configuration specific test points are over-ruling in table 4.2.6.2-1. The default rule of Mid test frequency and Highest NRB\_agg is chosen for any CA configuration. For CA configurations where default test points are used and the 3DL fallback cases also use default test points there is no need for justification in Table 4.2.6.2-1.

Selection of test points should include some possible worst combinations and these can be based on operator preference in case of the CA configuration is operator specific. The number of test points should not exceed the total number of the maximum number of the test points to cover fallback of 2DL and 3DL CA case.

Table 4.2.6.2-1: CA configuration specific test points for 4DL CA (Inter-band)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |
| CA\_1A-3A-7A-8A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(1A-3A-7A-8A).zip” | Added at RAN5#80 |
| CA\_1A-3A-7A-20A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(1A-3A-7A-20A).zip” | Added at RAN5#80 |
| CA\_1A-3A-7A-32A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(1A-3A-7A-32A).zip” | Added at RAN5#82 |
| CA\_1A-3A-7A-28A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(1A-3A-7A-28A).zip” | Added at RAN5#101 |
| CA\_1A-3A-8A-40A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(1A-3A-8A-40A).zip” | Added at RAN5#77 |
| CA\_1A-3A-18A-42A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(1A-3A-18A-42A).zip” | Added at RAN5#84 |
| CA\_1A-3A-19A-42A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(1A-3A-19A-42A)\_v2.zip” | Added at RAN5#75 |
| CA\_1A-3A-41A-42A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(1A-3A-41A-42A).zip” | Added at RAN5#83 |
| CA\_1A-19A-21A-42A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(1A-19A-21A-42A)\_v2.zip” | Added at RAN5#75 |
| CA\_2A-4A-5A-12A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-4A-5A-12A).zip” | Added at RAN5#74 |
| CA\_2A-4A-5A-30A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-4A-5A-30A).zip” | Added at RAN5#72 |
| CA\_2A-4A-7A-12A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-4A-7A-12A).zip” | Added at RAN5#76 |
| CA\_2A-4A-12A-30A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-4A-12A-30A).zip” | Added at RAN5#74 |
| CA\_2A-4A-29A-30A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-4A-29A-30A).zip” | Added at RAN5#74 |
| CA\_2A-12A-30A-66A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-4A-29A-30A).zip” | Added at RAN5#75 |
| CA\_3A-7A-20A-32 | See attachment “TpAnalysis4DLRefSens\_7.3A.9(3A-7A-20A-32A).zip” | Added at RAN5#78 |

#### 4.2.6.3 Intra-band contiguous + Inter-band

In this test case, there are default test points to be used unless CA configuration specific test points are over-ruling in table 4.2.6.3-1. The default rule of Low and High test frequency for the band with 2 CC and Mid test frequency for the band with 1CC, Lowest and Highest NRB\_agg for the band with 2 CC and Highest NRB\_agg for the band with 1 CC is chosen for any CA configuration. For CA configurations where default test points are used and the 3DL fallback cases also use default test points there is no need for justification in Table 4.2.6. 3-1.

Table 4.2.6.3-1: CA configuration specific test points for 4DL CA (Intra-band contiguous + Inter-band)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |
| CA\_1A-3C-8A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(1A-3C-8A).zip” | Added at RAN5#76 |
| CA\_1A-3A-41C | See attachment “TpAnalysis4DLRefSens\_7.3A.9(1A-3A-41C).zip” | Added at RAN5#83 |
| CA\_1A-3A-42C | See attachment “TpAnalysis4DLRefSens\_7.3A.9(1A-3A-42C)\_v3.zip” | Added at RAN5#85 |
| CA\_1A-18A-42C | See attachment “TpAnalysis4DLRefSens\_7.3A.9(1A-18A-42C).zip” | Added at RAN5#85 |
| CA\_1A-19A-42C | See attachment “TpAnalysis4DLRefSens\_7.3A.9(1A-19A-42C)\_v3.zip” | Added at RAN5#75 |
| CA\_1A-21A-42C | See attachment “TpAnalysis4DLRefSens\_7.3A.9(1A-21A-42C)\_v3.zip” | Added at RAN5#75 |
| CA\_1A-41A-42C | See attachment “TpAnalysis4DLRefSens\_7.3A.9(1A-41A-42C).zip” | Added at RAN5#74 |
| CA\_1A-41C-42A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(1A-41C-42A).zip” | Added at RAN5#74 |
| CA\_2A-5A-12B | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-5A-12B).zip” | Added at RAN5#74 |
| CA\_2A-66C-71A | See attachment “TpAnalysis4DLReceiver(2A-66C-71A).zip” | Added at RAN5#81 |
| CA\_2C-12A-30A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2C-12A-30A).zip” | Added at RAN5#74 |
| CA\_2C-29A-30A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2C-29A-30A.zip” | Added at RAN5#74 |
| CA\_3A-18A-42C | See attachment “TpAnalysis4DLRefSens\_7.3A.9(3A-18A-42C).zip” | Added at RAN5#85 |
| CA\_3A-19A-42C | See attachment “TpAnalysis4DLRefSens\_7.3A.9(3A-19A-42C)\_v2.zip” | Added at RAN5#73 |
| CA\_3A-41A-42C | See attachment “TpAnalysis4DLRefSens\_7.3A.9(3A-41A-42C).zip” | Added at RAN5#81 |
| CA\_3A-41C-42A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(3A-41C-42A).zip | Added at RAN5#81 |
| CA\_19A-21A-42C | See attachment “TpAnalysis4DLRefSens\_7.3A.9(19A-21A-42C)\_v3.zip” | Added at RAN5#75 |
| CA\_28A-40D | See attachment “TpAnalysis4DLRefSens\_7.3A.9 (28A-40D).zip” |  |
| CA\_29A-66A-70C | See attachment “TpAnalysis4DLRefSens\_7.3A.9(29A-66A-70C).zip” | Added at RAN5#79 |
| CA\_29A-66C-70A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(29A-66C-70A).zip” | Added at RAN5#79 |
| CA\_41C-42C | See attachment “TpAnalysis4DLReceiver(41C-42C).zip” | Added at RAN5#79 |
| CA\_66C-70C | See attachment “TpAnalysis4DLRefSens\_7.3A.9(66C-70C).zip” | Added at RAN5#79 |
| CA\_66A-70C-71A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(66A-70C-71A).zip” | Added at RAN5#80 |
| CA\_66C-70A-71A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(66C-70A-71A).zip” | Added at RAN5#80 |

#### 4.2.6.4 Intra-band non-contiguous + Inter-band

In this test case, there are default test points for each intra-band non-contiguous band to be used unless CA configuration specific test points are over-ruling in table 4.2.6.4-1. The default test points are based on fallback non-contiguous CA test points, with the inter-band CC using Max NRB and Mid test frequency, as per default Inter-Band test points. For CA configurations where default test points are used and the 3DL fallback cases also use default test points there is no need for justification in Table 4.2.6.2-1.

Table 4.2.6.4-1: CA configuration specific test points for 4DL CA (Intra-band non-contiguous + Inter-band)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |
| CA\_2A-2A-4A-5A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-2A-4A-5A).zip” | Added at RAN5#73 |
| CA\_2A-2A-4A-71A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-2A-4A-71A).zip” | Added at RAN5#82 |
| CA\_2A-2A-5A-12A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-2A-5A-12A).zip” | Added at RAN5#73 |
| CA\_2A-2A-5A-66A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-2A-5A-66A).zip” | Added at RAN5#100 |
| CA\_2A-2A-12A-30A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-2A-12A-30A).zip” | Added at RAN5#75 |
| CA\_2A-2A-12A-66A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-2A-12A-66A).zip” | Added at RAN5#100 |
| CA\_2A-2A-30A-66A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-2A-30A-66A).zip” | Added at RAN5#100 |
| CA\_2A-2A-66A-71A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-2A-66A-71A)\_v1.zip” | Added at RAN5#85 |
| CA\_2A-4A-4A-5A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-4A-4A-5A).zip” | Added at RAN5#85 |
| CA\_2A-4A-7A-7A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-4A-7A-7A).zip” | Added at RAN5#77 |
| CA\_2A-4A-7A-7A\_UL\_2A-4A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-4A-7A-7A).zip” | Added at RAN5#77 |
| CA\_2A-5A-66A-66A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-5A-66A-66A).zip” | Added at RAN5#100 |
| CA\_2A-12A-66A-66A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-12A-66A-66A).zip” | Added at RAN5#75 |
| CA\_2A-66A-66A-66A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-66A-66A-66A).zip” | Added at RAN5#101 |
| CA\_2A-66A-66A-71A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-66A-66A-71A).zip” | Added at RAN5#82 |
| CA\_3A-3A-7A-7A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(3A-3A-7A-7A).zip” | Added at RAN5#75 |
| CA\_4A-4A-5A-30A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(4A-4A-5A-30A).zip” | Added at RAN5#73 |
| CA\_4A-4A-12A-30A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(4A-4A-12A-30A).zip” | Added at RAN5#73 |
| CA\_4A-4A-29A-30A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(4A-4A-29A-30A).zip” | Added at RAN5#73 |
| CA\_5A-30A-66A-66A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(5A-30A-66A-66A).zip” | Added at RAN5#100 |
| CA\_12A-30A-66A-66A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(12A-30A-66A-66A).zip” | Added at RAN5#100 |
| CA\_29A-66A-66A-70A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(29A-66A-66A-70A).zip” | Added at RAN5#79 |
| CA\_29A-30A-66A-66A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(29A-30A-66A-66A).zip” | Added at RAN5#101 |
| CA\_66A-66A-70A-71A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(66A-66A-70A-71A).zip” | Added at RAN5#79 |

#### 4.2.6.5 Intra-band non-contiguous + Intra-band contiguous

Table 4.2.6.5-1: CA configuration specific test points for 4DL CA (Intra-band non-contiguous + Intra-band contiguous)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |
| CA\_2A-2A-12B | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-2A-12B)\_v2.zip” | Added at RAN5#75 |
| CA\_2C-66A-66A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2C-66A-66A).zip” | Added at RAN5#81 |
| CA\_66A-66A-70C | See attachment “TpAnalysis4DLRefSens\_7.3A.9(66A-66A-70C).zip” | Added at RAN5#79 |
| CA\_5B-66A-66A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(5B-66A-66A).zip” | Added at RAN5#101 |

#### 4.2.6.6 Intra-band non-contiguous + Intra-band non-contiguous

In this test case, there are default test points for each intra-band non-contiguous band to be used unless CA configuration specific test points are over-ruling in table 4.2.6.6-1. The default test points are based on fallback non-contiguous CA test points For CA configurations where default test points are used and the 3DL fallback cases also use default test points there is no need for justification in Table 4.2.6.2-1.

Table 4.2.6.6-1: CA configuration specific test points for 4DL (Intra-band non-contiguous + Intra-band non-contiguous)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |
| CA\_2A-2A-4A-4A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-2A-4A-4A).zip” | Added at RAN5#72 |
| CA\_2A-2A-66A-66A | See attachment “TpAnalysis4DLRefSens\_7.3A.9(2A-2A-66A-66A).zip” | Added at RAN5#101 |

### 4.2.7 Reference sensitivity level for 5DL CA

This section contains information on test point selection for test case 7.3A.10 Reference sensitivity level for 5DL CA.

[In the applicability conditions in TS 36.521-2 [4] it is defined that if the 5DL test is performed, testing of any 4DL or 3DL or 2DL fallbacks can be skipped specifically:

- 4DL fallback 5DL/1UL -> 4DL/1UL: Test of fallback can be skipped in many cases. Analysis supplied per CA configuration later in this clause.

- 4DL fallback 5DL/2UL -> 4DL/2UL: It is FFS if fallback need to be tested.

- 1UL fallback 5DL/2UL -> 5DL/1UL: Test of fallback is required due to different minimum requirements.]

This implies that the test point analysis described later in this section currently only considers 1UL.

#### 4.2.7.1 Intra-band contiguous

FFS

#### 4.2.7.2 Inter-band

In this case, there are default test points to be used unless CA configuration specific test points are over-ruling in table 4.2.7.2-1. The default rule of Mid test frequency and Highest NRB\_agg is chosen for any CA configuration. For CA configurations where default test points are used and the 4DL fallback cases also use default test points there is no need for justification in Table 4.2.7.2-1.

Selection of test points should include some possible worst combinations and these can be based on operator preference in case of the CA configuration is operator specific. The number of test points should not exceed the total number of the maximum number of the test points to cover fallback of 2DL and 3DL and 4DL CA case.

Table 4.2.7.2-1: CA configuration specific test points for 5DL CA (Inter-band)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |

#### 4.2.7.3 Intra-band contiguous + Inter-band

In this test case, there are default test points to be used unless CA configuration specific test points are over-ruling in table 4.2.7.3-1. The default rule of Low and High test frequency for the band with 2 CC and Mid test frequency for the band with 1CC, Lowest and Highest NRB\_agg for the band with 2 CC and Highest NRB\_agg for the band with 1 CC is chosen for any CA configuration. For CA configurations where default test points are used and the 4DL fallback cases also use default test points there is no need for justification in Table 4.2.7.3-1.

Table 4.2.7.3-1: CA configuration specific test points for 5DL CA (Intra-band contiguous + Inter-band)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |
| CA\_1A-3A-18A-42C | See attachment “TpAnalysis5DLRefSens\_7.3A.10(1A-3A-18A-42C).zip” | Added at RAN5#85 |
| CA\_1A-3A-19A-42C | See attachment “TpAnalysis5DLRefSens\_7.3A.10(1A-3A-19A-42C).zip” | Added at RAN5#75 |
| CA\_1A-3A-41C-42A | See attachment “TpAnalysis5DLRefSens\_7.3A.10(1A-3A-41C-42A).zip | Added at RAN5#83 |
| CA\_1A-3A-41A-42C | See attachment “TpAnalysis5DLRefSens\_7.3A.10(1A-3A-41A-42C).zip | Added at RAN5#83 |
| CA\_1A-19A-21A-42C | See attachment “TpAnalysis5DLRefSens\_7.3A.10(1A-19A-21A-42C).zip” | Added at RAN5#75 |
| CA\_1A-41C-42C | See attachment “TpAnalysis5DLRefSens\_7.3A.10(1A-41C-42C).zip” | Added at RAN5#76 |
| CA\_3A-41C-42C | See attachment “TpAnalysis5DLRefSens\_7.3A.10(3A-41C-42C).zip” | Added at RAN5#81 |
| CA\_29A-66C-70C | See attachment “TpAnalysis5DLRefSens\_7.3A.10(29A-66C-70C).zip” | Added at RAN5#79 |
| CA\_66C-70C-71A | See attachment “TpAnalysis5DLRefSens\_7.3A.10(66C-70C-71A).zip” | Added at RAN5#80 |

#### 4.2.7.4 Intra-band non-contiguous + Inter-band

In this test case, there are default test points for each intra-band non-contiguous band to be used unless CA configuration specific test points are over-ruling in table 4.2.7.4-1. The default test points are based on fallback non-contiguous CA test points, with the inter-band CC using Max NRB and Mid test frequency, as per default Inter-Band test points. For CA configurations where default test points are used and the 3DL fallback cases also use default test points there is no need for justification in Table 4.2.7.2-1.

Table 4.2.7.4-1: CA configuration specific test points for 5DL CA (Intra-band non-contiguous + Inter-band)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |
| CA\_2A-2A-12A-66A-66A | See attachment “TpAnalysis5DLRefSens\_7.3A.10(2A-2A-12A-66A-66A).zip” | Added at RAN5#101 |
| CA\_2A-5A-30A-66A-66A | See attachment “TpAnalysis5DLRefSens\_7.3A.10(2A-5A-30A-66A-66A).zip” | Added at RAN5#101 |

#### 4.2.7.5 Intra-band non-contiguous + Intra-band contiguous

Table 4.2.7.5-1: CA configuration specific test points for 5DL CA (Intra-band non-contiguous + Intra-band contiguous)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |

#### 4.2.7.6 Intra-band non-contiguous + Intra-band non-contiguous

In this test case, there are default test points for each intra-band non-contiguous band to be used unless CA configuration specific test points are over-ruling in table 4.2.7.6-1. The default test points are based on fallback non-contiguous CA test points For CA configurations where default test points are used and the 4DL fallback cases also use default test points there is no need for justification in Table 4.2.7.2-1.

Table 4.2.7.6-1: CA configuration specific test points for 5DL (Intra-band non-contiguous + Intra-band non-contiguous)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |

#### 4.2.7.7 Intra-band non-contiguous + Intra-band contiguous Inter-band + Inter-band

Table 4.2.7.7-1: CA configuration specific test points for 5DL CA (Intra-band non-contiguous + Intra-band contiguous Inter-band + Inter-band)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |
| CA\_29A-66A-66A-70C | See attachment “TpAnalysis5DLRefSens\_7.3A.10(29A-66A-66A-70C).zip” | Added at RAN5#79 |
| CA\_66A-66A-70C-71A | See attachment “TpAnalysis5DLRefSens\_7.3A.10(66A-66A-70C-71A).zip” | Added at RAN5#80 |

### 4.2.8 Reference sensitivity level for 6DL CA

This section contains information on test point selection for test case 7.3A.11 Reference sensitivity level for 6DL CA.

In the applicability conditions in TS 36.521-2 [4] it is defined that if the 6DL test is performed, testing of any 5DL or 4DL or 3DL or 2DL fallbacks can be skipped specifically:

- 5DL fallback 6DL/1UL -> 5DL/1UL: Test of fallback can be skipped in many cases. Analysis supplied per CA configuration later in this clause.

- 5DL fallback 6DL/2UL -> 5DL/2UL: It is FFS if fallback need to be tested.

- 1UL fallback 6DL/2UL -> 6DL/1UL: Test of fallback is required due to different minimum requirements.

This implies that the test point analysis described later in this section currently only considers 1UL.

#### 4.2.8.1 Intra-band contiguous

FFS

#### 4.2.8.2 Inter-band

In this case, there are default test points to be used unless CA configuration specific test points are over-ruling in table 4.2.8.2-1. The default rule of Mid test frequency and Highest NRB\_agg is chosen for any CA configuration. For CA configurations where default test points are used and the 5DL fallback cases also use default test points there is no need for justification in Table 4.2.8.2-1.

Selection of test points should include some possible worst combinations and these can be based on operator preference in case of the CA configuration is operator specific. The number of test points should not exceed the total number of the maximum number of the test points to cover fallback of 2DL and 3DL and 4DL and 5DL CA case.

Table 4.2.8.2-1: CA configuration specific test points for 6DL CA (Inter-band)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |

#### 4.2.8.3 Intra-band contiguous + Inter-band

In this test case, there are default test points to be used unless CA configuration specific test points are over-ruling in table 4.2.8.3-1. The default rule of Low and High test frequency for the band with 2 CC and Mid test frequency for the band with 1CC, Lowest and Highest NRB\_agg for the band with 2 CC and Highest NRB\_agg for the band with 1 CC is chosen for any CA configuration. For CA configurations where default test points are used and the 5DL fallback cases also use default test points there is no need for justification in Table 4.2.8.3-1.

Table 4.2.8.3-1: CA configuration specific test points for 6DL CA (Intra-band contiguous + Inter-band)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |
| CA\_1A-3A-41C-42C | See attachment “TpAnalysis6DLRefSens\_7.3A.11(1A-3A-41C-42C).zip” | Added at RAN5#83 |

#### 4.2.8.4 Intra-band non-contiguous + Inter-band

In this test case, there are default test points for each intra-band non-contiguous band to be used unless CA configuration specific test points are over-ruling in table 4.2.8.4-1. The default test points are based on fallback non-contiguous CA test points, with the inter-band CC using Max NRB and Mid test frequency, as per default Inter-Band test points. For CA configurations where default test points are used and the 5DL fallback cases also use default test points there is no need for justification in Table 4.2.8.2-1.

Table 4.2.8.4-1: CA configuration specific test points for 6DL CA (Intra-band non-contiguous + Inter-band)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |

#### 4.2.8.5 Intra-band non-contiguous + Intra-band contiguous

Table 4.2.8.5-1: CA configuration specific test points for 6DL CA (Intra-band non-contiguous + Intra-band contiguous)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |

#### 4.2.8.6 Intra-band non-contiguous + Intra-band non-contiguous

In this test case, there are default test points for each intra-band non-contiguous band to be used unless CA configuration specific test points are over-ruling in table 4.2.8.6-1. The default test points are based on fallback non-contiguous CA test points For CA configurations where default test points are used and the 5DL fallback cases also use default test points there is no need for justification in Table 4.2.8.2-1.

Table 4.2.8.6-1: CA configuration specific test points for 6DL (Intra-band non-contiguous + Intra-band non-contiguous)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |

#### 4.2.8.7 Intra-band non-contiguous + Intra-band contiguous Inter-band + Inter-band

Table 4.2.8.7-1: CA configuration specific test points for 6DL CA (Intra-band non-contiguous + Intra-band contiguous Inter-band + Inter-band)

|  |  |  |
| --- | --- | --- |
| CA config | Justification | Comments |

## 4.3 Test points selection and Frequency ranges to cover in Tx spurious emissions test cases for UL CA

In this case, it is sufficient to verify the minimum requirements in frequency ranges affected by 2nd and 3rd order intermodulation products. The frequency ranges and UL RB allocations used in the test are calculated here.

The analyses are performed per CA configuration and are stored as zip-files as defined in annex A.

Table 4.3-1: Frequency range analysis availability per CA configuration

|  |  |  |
| --- | --- | --- |
| CA config | File name | Comments |
| CA\_1A-3A | TpAnalysisSpur(1A-3A)\_v4.zip | Added at RAN5#78 |
| CA\_1A-5A | TpAnalysisSpur(1A-5A)\_v3.zip | Added at RAN5#78 |
| CA\_1A-7A | TpAnalysisSpur(1A-7A)\_v3.zip | Added at RAN5#78 |
| CA\_1A-8A | TpAnalysisSpur(1A-8A)\_v3.zip | Added at RAN5#78 |
| CA\_1A-18A | TpAnalysisSpur(1A-18A)\_v2.zip | Added at RAN5#78 |
| CA\_1A-19A | TpAnalysisSpur(1A-19A)\_v3.zip | Added at RAN5#78 |
| CA\_1A-21A | TpAnalysisSpur(1A-21A)\_v3.zip | Added at RAN5#78 |
| CA\_1A-26A | TpAnalysisSpur(1A-26A)\_v3.zip | Added at RAN5#78 |
| CA\_1A-28A | TpAnalysisSpur(1A-28A)\_v3.zip | Added at RAN5#78 |
| CA\_1A-42A | TpAnalysisSpur(1A-42A)\_v3.zip | Added at RAN5#78 |
| CA\_2A-4A | TpAnalysisSpur(2A-4A)\_v4.zip | Added at RAN5#83 |
| CA\_2A-5A | TpAnalysisSpur(2A-5A)\_v4.zip | Added at RAN5#100 |
| CA\_2A-7A | TpAnalysisSpur(2A-7A)\_v2.zip | Added at RAN5#78 |
| CA\_2A-12A | TpAnalysisSpur(2A-12A)\_v4.zip | Added at RAN5#100 |
| CA\_2A-13A | TpAnalysisSpur(2A-13A)\_v5.zip | Added at RAN5#100 |
| CA\_2A-30A | TpAnalysisSpur(2A-30A)\_v1.zip | Added at RAN5#100 |
| CA\_2A-46A | TpAnalysisSpur(2A-46A).zip | Added at RAN5#80 |
| CA\_2A-48A | TpAnalysisSpur(2A-48A).zip | Added at RAN5#100 |
| CA\_2A-66A | TpAnalysisSpur(2A-66A).zip | Added at RAN5#75 |
| CA\_3A-5A | TpAnalysisSpur(3A-5A)\_v3.zip | Added at RAN5#78 |
| CA\_3A-7A | TpAnalysisSpur(3A-7A)\_v3.zip | Added at RAN5#78 |
| CA\_3A-8A | TpAnalysisSpur(3A-8A)\_v3.zip | Added at RAN5#78 |
| CA\_3A-18A | TpAnalysisSpur(3A-18A).zip | Added at RAN5#80 |
| CA\_3A-19A | TpAnalysisSpur(3A-19A)\_v2.zip | Added at RAN5#78 |
| CA\_3A-20A | TpAnalysisSpur(3A-20A)\_v3.zip | Added at RAN5#78 |
| CA\_3A-26A | TpAnalysisSpur(3A-26A)\_v3.zip | Added at RAN5#78 |
| CA\_3A-28A | TpAnalysisSpur(3A-28A).zip | Added at RAN5#81 |
| CA\_3A-41A | TpAnalysisSpur(3A-41A)\_v2.zip | Added at RAN5#88-e |
| CA\_3A-42A | TpAnalysisSpur(3A-42A)\_v1.zip | Added at RAN5#80 |
| CA\_4A-5A | TpAnalysisSpur(4A-5A)\_v4.zip | Added at RAN5#83 |
| CA\_4A-7A | TpAnalysisSpur(4A-7A)\_v4.zip | Added at RAN5#78 |
| CA\_4A-12A | TpAnalysisSpur(4A-12A)\_v3.zip | Added at RAN5#78 |
| CA\_4A-13A | TpAnalysisSpur(4A-13A)\_v4.zip | Added at RAN5#83 |
| CA\_4A-17A | TpAnalysisSpur(4A-17A)\_v4.zip | Added at RAN5#83 |
| CA\_5A-7A | TpAnalysisSpur(5A-7A)\_v3.zip | Added at RAN5#78 |
| CA\_5A-12A | TpAnalysisSpur(5A-12A)\_v6.zip | Added at RAN5#100 |
| CA\_5A-17A | TpAnalysisSpur(5A-17A)\_v5.zip | Added at RAN5#100 |
| CA\_5A-30A | TpAnalysisSpur(5A-30A)\_v1.zip | Added at RAN5#100 |
| CA\_5A-66A | TpAnalysisSpur(5A-66A).zip | Added at RAN5#75 |
| CA\_7A-20A | TpAnalysisSpur(7A-20A)\_v3.zip | Added at RAN5#78 |
| CA\_7A-28A | TpAnalysisSpur(7A-28A)\_v3.zip | Added at RAN5#78 |
| CA\_8A-41A | TpAnalysisSpur(8A-41A).zip | Added at RAN5#100 |
| CA\_11A-18A | TpAnalysisSpur(3A-28A).zip | Added at RAN5#81 |
| CA\_12A-30A | TpAnalysisSpur(12A-30A)\_v1.zip | Added at RAN5#100 |
| CA\_18A-28A | TpAnalysisSpur(18A-28A)\_v3.zip | Added at RAN5#78 |
| CA\_19A-21A | TpAnalysisSpur(19A-21A)\_v2.zip | Added at RAN5#72 |
| CA\_26A-46A | TpAnalysisSpur(26A-46A).zip | Added at RAN5#80 |
| CA\_39A-41A | TpAnalysisSpur(39A-41A)\_v3.zip | Added at RAN5#78 |
| CA\_41A-42A | TpAnalysisSpur(41A-42A)\_v2.zip | Added at RAN5#78 |
| CA\_41C-42C | TpAnalysisSpur(41C-42C).zip | Added at RAN5#93-e |

## 4.3G Test points selection and Frequency ranges to cover in Tx spurious emissions test cases for Inter-band con-current V2X configurations

In this case, it is sufficient to verify the minimum requirements in frequency ranges affected by 2nd and 3rd order intermodulation products. The frequency ranges and UL RB allocations used in the test are calculated here.

The analyses are performed per Inter-band con-current V2X configuration and are stored as zip-files as defined in annex A.

Table 4.3G-1: Frequency range analysis availability per V2X configuration

|  |  |  |
| --- | --- | --- |
| V2X config | File name | Comments |
| V2X\_3A-47A | TpAnalysisSpur(V2X\_3A-47A)\_v2.zip | Added at RAN5#82 |
| V2X\_5A-47A | TpAnalysisSpur(V2X\_5A-47A)\_v4.zip | Added at RAN5#83 |
| V2X\_7A-47A | TpAnalysisSpur(V2X\_7A-47A)\_v2.zip | Added at RAN5#82 |
| V2X\_8A-47A | TpAnalysisSpur(V2X\_8A-47A)\_v2.zip | Added at RAN5#82 |
| V2X\_20A-47A | TpAnalysisSpur(V2X\_20A-47A)\_v2.zip | Added at RAN5#82 |
| V2X\_28A-47A | TpAnalysisSpur(V2X\_28A-47A)\_v2.zip | Added at RAN5#82 |
| V2X\_34A-47A | TpAnalysisSpur(V2X\_34A-47A)\_v2.zip | Added at RAN5#82 |
| V2X\_39A-47A | TpAnalysisSpur(V2X\_39A-47A)\_v2.zip | Added at RAN5#82 |
| V2X\_41A-47A | TpAnalysisSpur(V2X\_41A-47A)\_v2.zip | Added at RAN5#82 |
| V2X\_71A-47A | TpAnalysisSpur(V2X\_71A-47A)\_v4.zip | Added at RAN5#83 |

## 4.4 Test points selection in 3DL Receiver test cases to align with 2DL test cases and skipping of 2DL fallback

This section contains information, per test case, for 2DL and 3DL CA Receiver test cases about alignment of test parameters between 2DL and 3DL variant of the same test, and recommendation on possible skipping of 2DL test if 3DL test is performed.

Editor’s note: Information about alignment of test parameters between 2DL and 3DL variant of the same test will be added in this section for relevant test cases.

## 4.5 Test points selection for test cases in TS 36.521-4

This section contains information on test points selection for IoT NTN test cases in [5]. The general rules in this section apply to all the IoT NTN test cases. Separate analysis is not provided for each single test case unless specific test requirement deviates from the general rules.

General rules of test point selection for Tx and Rx test cases

Considering that IoT NTN operating bands are defined like E-UTRA FDD bands except for the channel bandwidth for category M1 is only limited to 1.4MHz, test environment, frequencies, SCSs, channel bandwidths, waveforms, and modulations of a Tx or Rx test for an IoT NTN band should be selected based on the same principles of the corresponding single carrier test for an E-UTRA FDD band except for the channel bandwidth for category M1 to be replaced by 1.4MHz for some test cases.

Table 4.5-1: IoT UE transmitter test points selection for NTN

|  |  |  |  |
| --- | --- | --- | --- |
| Subclause | Number of test points | Justification | Comments |
| 6.2A.1 UE maximum output power for category M1 | 30 | General rules of test point selection apply. Test points of TC 6.2.2EA from TS 36.521-1 can be leveraged. | RAN5#99 |
| 6.2A.2 UE maximum output power reduction for category M1 | 9 | General rules of test point selection apply. Test points of TC 6.2.3EA from TS 36.521-1 can be leveraged. | RAN5#99 |
| 6.2A.3 UE additional maximum output power reduction for category M1 UE | 30 | TpAnalysisAMPR(NS\_02N+NS\_24)\_6.2A.3v1.0 | RAN5#101 |
| 6.2A.4 Configured transmitted Power for category M1 | 5 | General rules of test point selection apply. Test points of TC 6.2.5EA from TS 36.521-1 can be leveraged. | RAN5#99 |
| 6.2B.1 UE maximum output power for category NB1 and NB2 | 15 | General rules of test point selection apply. Test points of TC 6.2.2F from TS 36.521-1 can be leveraged. | RAN5#99 |
| 6.2B.2 UE maximum output power reduction for category NB1 and NB2 | 50 | General rules of test point selection apply. Test points of TC 6.2.3F from TS 36.521-1 can be leveraged. | RAN5#99 |
| 6.2B.3 UE additional maximum output power reduction for category NB1 and NB2 UE | 150 | TpAnalysisAMPR(NS\_02N+NS\_24)\_6.2A.3v1.0 | RAN5#101 |
| 6.2B.4 Configured transmitted Power for category NB1 and NB2 | 5 | General rules of test point selection apply. Test points of TC 6.2.5F from TS 36.521-1 can be leveraged. | RAN5#99 |
| 6.3A.1 UE Minimum output power for category M1 | 30 | General rules of test point selection apply. Test points of TC 6.3.2EA from TS 36.521-1 can be leveraged. | RAN5#100 |
| 6.3A.2 Transmit OFF power for category M1 | —— | This test is covered by clause 6.3A.3.1 ON/OFF time mask and 6.3A.3.2 PRACH and SRS time mask. | RAN5#100 |
| 6.3A.3.1 General ON/OFF time mask for category M1 | 15 | General rules of test point selection apply. Test points of TC 6.3.4EA.1 from TS 36.521-1 can be leveraged. | RAN5#100 |
| 6.3A.3.2.1 PRACH time mask for UE category M1 | 5 | General rules of test point selection apply. Test points of TC 6.3.4EA.2.1 from TS 36.521-1 can be leveraged. | RAN5#100 |
| 6.3A.3.2.2 SRS time mask for UE category M1 | 5 | General rules of test point selection apply. Test points of TC 6.3.4EA.2.2 from TS 36.521-1 can be leveraged. | RAN5#100 |
| 6.3A.4.1 Power Control Absolute power tolerance for UE category M1 | 15 | General rules of test point selection apply. Test points of TC 6.3.5EA.1 from TS 36.521-1 can be leveraged. | RAN5#100 |
| 6.3A.4.2 Power Control Relative power tolerance for UE category M1 | 5 | General rules of test point selection apply. Test points of TC 6.3.5EA.2 from TS 36.521-1 can be leveraged. | RAN5#100 |
| 6.3A.4.3 Aggregate power control tolerance for UE category M1 | 1 | General rules of test point selection apply. Test points of TC 6.3.5EA.3 from TS 36.521-1 can be leveraged. | RAN5#100 |
| 6.3B.1 UE Minimum output power for category NB1 and NB2 | 15 | General rules of test point selection apply. Test points of TC 6.3.2F from TS 36.521-1 can be leveraged. | RAN5#100 |
| 6.3B.2 Transmit OFF power for category NB1 and NB2 | —— | This test is covered by clause 6.3B.3.1 General ON/OFF time mask for category NB1 and NB2 and 6.3B.3.2 NPRACH time mask for category NB1 and NB2. | RAN5#100 |
| 6.3B.3.1 General ON/OFF time mask for category NB1 and NB2 | 1 | General rules of test point selection apply. Test points of TC 6.3.4F.1 from TS 36.521-1 can be leveraged. | RAN5#100 |
| 6.3B.3.2 NPRACH time mask for category NB1 and NB2 | 1 | General rules of test point selection apply. Test points of TC 6.3.4F.2 from TS 36.521-1 can be leveraged. | RAN5#100 |
| 6.3B.4.1 Power Control Absolute power tolerance for category NB1 and NB2 | 15 | General rules of test point selection apply. Test points of TC 6.3.5F.1 from TS 36.521-1 can be leveraged. | RAN5#100 |
| 6.3B.4.2 Power Control Relative power tolerance for category NB1 and NB2 | 5 | General rules of test point selection apply. Test points of TC 6.3.5F.2 from TS 36.521-1 can be leveraged. | RAN5#100 |
| 6.3B.4.3 Aggregate power control tolerance for category NB1 and NB2 | 3 | General rules of test point selection apply. Test points of TC 6.3.5F.3 from TS 36.521-1 can be leveraged. | RAN5#100 |
| 6.4A.1 Frequency error for UE category M1 | 45 | 36.521-4\_TPanalysis\_6.4A.1\_6.4B.1\_FreqErr\_v1.zip | RAN5#101 |
| 6.4A.2.1 Error Vector Magnitude (EVM) for category M1 | 18 | General rules of test point selection apply. Test points of TC 6.5.2.1EA from TS 36.521-1 can be leveraged | RAN5#101 |
| 6.4A.2.2 Carrier leakage for category M1 | 15 | General rules of test point selection apply. Test points of TC 6.5.2.2EA from TS 36.521-1 can be leveraged. | RAN5#101 |
| 6.4A.2.3 In-band emissions for non allocated RB for category M1 | 30 | General rules of test point selection apply. Test points of TC 6.5.2.3EA from TS 36.521-1 can be leveraged. | RAN5#101 |
| 6.4A.2.4 EVM equalizer spectrum flatness for category M1 | 15 | General rules of test point selection apply. Test points of TC 6.5.2.4EA from TS 36.521-1 can be leveraged. | RAN5#101 |
| 6.4B.1 Frequency error for UE category NB1 and NB2 | 75 | 36.521-4\_TPanalysis\_6.4A.1\_6.4B.1\_FreqErr\_v1.zip | RAN5#101 |
| 6.4B.2.1 | 12 | General rules of test point selection apply. Test points of TC 6.5.2.1F from TS 36.521-1 can be leveraged | RAN5#101 |
| 6.4B.2.2 Transmit modulation quality for Category NB1 and NB2 | 8 | General rules of test point selection apply. Test points of TC 6.5.2.2F from TS 36.521-1 can be leveraged. | RAN5#101 |
| 6.4B.2.3 Transmit modulation quality for Category NB1 and NB2 | 8 | General rules of test point selection apply. Test points of TC 6.5.2.3F from TS 36.521-1 can be leveraged. | RAN5#101 |
| 6.5A.2 Occupied bandwidth for category M1 | 1 | General rules of test point selection apply. Test points of TC 6.6.1EA from TS 36.521-1 can be leveraged. | RAN5#101 |
| 6.5A.3.2 Spectrum emission mask | 15 | General rules of test point selection apply. Test points of TC 6.6.2.1EA from TS 36.521-1 can be leveraged. | RAN5#101 |
| 6.5A.3.4 Adjacent Channel Leakage Ratio for category M1 | 78 | General rules of test point selection apply. Test points of TC 6.6.2.2EA from TS 36.521-1 can be leveraged. | RAN5#101 |
| 6.5A.4.2 Transmitter Spurious emissions | 9 | General rules of test point selection apply. Test points of TC 6.6.3EA.1 from TS 36.521-1 can be leveraged | RAN5#101 |
| 6.5A.4.3 Spurious emission band UE co-existence | 9 | General rules of test point selection apply. Test points of TC 6.6.3EA.2 from TS 36.521-1 can be leveraged. | RAN5#101 |
| 6.5A.4.4 Additional spurious emissions | 27 | General rules of test point selection apply. Test points of TC 6.6.3EA.3 from TS 36.521-1 can be leveraged | RAN5#101 |
| 6.5B.2 Occupied bandwidth for category NB1 and NB2 | 9 | General rules of test point selection apply. Test points of TC 6.6.1F from TS 36.521-1 can be leveraged. | RAN5#101 |
| 6.5B.3.2 Spectrum emission mask | 20 | General rules of test point selection apply. Test points of TC 6.6.2.1F from TS 36.521-1 can be leveraged. | RAN5#101 |
| 6.5B.3.4 Adjacent Channel Leakage Ratio for category NB1 and NB2 | 20 | General rules of test point selection apply. Test points of TC 6.6.2.3F from TS 36.521-1 can be leveraged. | RAN5#101 |
| 6.5B.4.2 Transmitter Spurious emissions | 10 | General rules of test point selection apply. Test points of TC 6.6.2.3F.1 from TS 36.521-1 can be leveraged | RAN5#101 |
| 6.5B.4.3 Spurious emission band UE co-existence | 10 | General rules of test point selection apply. Test points of TC 6.6.3F.2 from TS 36.521-1 can be leveraged. | RAN5#101 |
| 6.5B.4.4 Additional spurious emissions | 24 | TpAnalysisAMPR(NS\_02N+NS\_24)\_6.2B.3v1.0.zip | RAN5#101 |
| 6.6B Transmit intermodulation for category NB1 and NB2 | 3 | General rules of test point selection apply. Test points of TC 6.7F from TS 36.521-1 can be leveraged. | RAN5#101 |

Table 4.5-2: IoT UE receiver test points selection for NTN

|  |  |  |  |
| --- | --- | --- | --- |
| Subclause | Number of test points | Justification | Comments |
| 7.3A Reference sensitivity power level for UE category NB1 and NB2 | 15 | General rules of test point selection apply. Test points of TC 7.3EA from TS 36.521-1 can be leveraged except for the channel bandwidth to be replaced by 1.4MHz. | RAN5#101 |
| 7.3B Reference sensitivity power level for UE category NB1 and NB2 | 10 | General rules of test point selection apply. Test points of TC 7.3F from TS 36.521-1 can be leveraged. | RAN5#101 |
| 7.4A Maximum input level for category M1 | 1 | General rules of test point selection apply. Test points of TC 7.4EA from TS 36.521-1 can be leveraged except for the channel bandwidth to be replaced by 1.4MHz. | RAN5#101 |
| 7.4B Maximum input level for category NB1 and NB2 | 2 | General rules of test point selection apply. Test points of TC 7.4F from TS 36.521-1 can be leveraged. | RAN5#101 |
| 7.5A Adjacent Channel Selectivity for category M1 | 1 | General rules of test point selection apply. Test points of TC 7.5EA from TS 36.521-1 can be leveraged except for the channel bandwidth to be replaced by 1.4MHz. | RAN5#101 |
| 7.5B Adjacent Channel Selectivity for category NB1 and NB2 | 2 | General rules of test point selection apply. Test points of TC 7.4F from TS 36.521-1 can be leveraged. | RAN5#101 |
| 7.6A.2 In-band blocking for category M1 | 1 | General rules of test point selection apply. Test points of TC 7.6.1EA from TS 36.521-1 can be leveraged except for the channel bandwidth to be replaced by 1.4MHz. | RAN5#101 |
| 7.6A.3 Out-of-band blocking for category M1 | 1 | General rules of test point selection apply. Test points of TC 7.6.2EA from TS 36.521-1 can be leveraged except for the channel bandwidth to be replaced by 1.4MHz. | RAN5#101 |
| 7.6A.4 Narrow band blocking for category M1 | 1 | General rules of test point selection apply. Test points of TC 7.6.3EA from TS 36.521-1 can be leveraged except for the channel bandwidth to be replaced by 1.4MHz. | RAN5#101 |
| 7.6B.2 In-band blocking for category NB1 and NB2 | 2 | General rules of test point selection apply. Test points of TC 7.6.1F from TS 36.521-1 can be leveraged. | RAN5#101 |
| 7.6B.3 Out-of-band blocking for category NB1 and NB2 | 1 | General rules of test point selection apply. Test points of TC 7.6.2F from TS 36.521-1 can be leveraged. | RAN5#101 |
| 7.7A Spurious response for category M1 | 1 | Same test points as TC 7.6A.3 of TS 36.521-4. | RAN5#101 |
| 7.7B Spurious response for category NB1 and NB2 | 1 | Same test points as TC 7.6B.3 of TS 36.521-4. | RAN5#101 |
| 7.8A Intermodulation characteristics for category M1 | 1 | General rules of test point selection apply. Test points of TC 7.8.1EA from TS 36.521-1 can be leveraged except for the channel bandwidth to be replaced by 1.4MHz. | RAN5#101 |
| 7.8B Intermodulation characteristics for category NB1 and NB2 | 2 | General rules of test point selection apply. Test points of TC 7.8.1F from TS 36.521-1 can be leveraged. | RAN5#101 |
| 7.9A Spurious emissions for category M1 | 3 | General rules of test point selection apply. Test points of TC 7.9EA from TS 36.521-1 can be leveraged except for the channel bandwidth to be replaced by 1.4MHz. | RAN5#101 |
| 7.9B Spurious emissions for category NB1 and NB2 | 2 | General rules of test point selection apply. Test points of TC 7.9F from TS 36.521-1 can be leveraged. | RAN5#101 |

Annex A: Derivation documents

The documents (and spreadsheets where applicable) used to give the background for the selected test points for each test case are included in the present document as zip files.

The name of the zip shall:

- Include a prefix allowing easier grouping of files in the same area, e.g. “TestReqTxSpur2UL”.

- Include Test Case Number(s), e.g. “6.6.3.1A.2+6.6.3.2A.2”.

- In cases where multiple analysis is needed per test cases, e.g. for different CA configurations, include the CA band combination applicable in the parentheses, e.g. add “(1A-3A)” for CA\_1A-3A.

Concatenated example file name: “TestReqTxSpur2UL\_6.6.3.1A.2+6.6.3.2A.2(1A-3A).zip”.

If there is an update of test points for a test case the old corresponding zip file shall be replaced with a new zip file with a version stepping in the file name. e.g. “TestReqTxSpur2UL\_6.6.3.1A.2+6.6.3.2A.2(1A-3A)\_V2.zip”. The aim is to provide a reference to completed test cases, so that test points for similar test cases can be selected on a common basis.

Annex B:  
Change history

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **TSG #** | **TSG Doc.** | **CR** | **Rev** | **Subject/Comment** | **Old** | **New** |
| 2015-04 | RAN5#67 | R5-152110 | - | - | TR 36.905 Skeleton proposed for RAN5#67 | - | 0.0.1 |
| 2015-09 | RAN5#68 | R5-154027 | - | - | Text proposal to TR 36.905 v0.0.1 | 0.0.1 | 0.0.2 |
| 2015-11 | RAN5#69 | R5-155414 | - | - | Text proposal to TR 36.905 v0.0.1 (Justification of Reference sensitivity level for CA\_3A-42A) | 0.0.2 | 2.0.0 |
| 2015-11 | RAN5#69 | R5-155669 | - | - | Text proposal to TR 36.905 v0.0.2 - Test point selection for CA\_2A-4A-5A in Reference sensitivity test case 7.3A.5 | 0.0.2 | 2.0.0 |
| 2015-11 | RAN5#69 | R5-155854 | - | - | Addition of Test Points for CA\_1A-3A-8A to TR 36.905 v0.0.2 | 0.0.2 | 2.0.0 |
| 2015-11 | RAN5#69 | R5-155858 | - | - | Add test point's analysis for 7.3A.5 Reference sensitivity level for CA(Intra-band non-contiguous + Inter-band) | 0.0.2 | 2.0.0 |
| 2015-12 | RAN#70 | - | - | - | brought under change control by MCC | 2.0.0 | 12.0.0 |
| 2016-03 | RAN#71 | R5-160830 | 0008 | 1 | Add Test point analysis for Reference sensitivity test case 7.3A.5 for CA\_4A-4A-13A | 12.0.0 | 12.1.0 |
| 2016-03 | RAN#71 | R5-160832 | 0003 | 1 | Addition of test point derivation explanation for 3DL CA REFSENS testcases, Intel combinations | 12.0.0 | 12.1.0 |
| 2016-03 | RAN#71 | R5-160842 | 0006 | 1 | Test coverage analysis for Inter-band CA A-MPR test case | 12.0.0 | 12.1.0 |
| 2016-03 | RAN#71 | R5-160843 | 0007 | 1 | Add Test point analysis for A-MPR test case 6.2.4A.2 | 12.0.0 | 12.1.0 |
| 2016-03 | RAN#71 | R5-160844 | 0001 | 1 | Addition of test points selection for 2UL inter-band CA spurious test cases | 12.0.0 | 12.1.0 |
| 2016-03 | RAN#71 | R5-161011 | 0005 | 1 | 36.905 Addition of Test Points for CA\_1A-3A-7A | 12.0.0 | 12.1.0 |
| 2016-03 | RAN#71 | R5-161013 | 0004 | 1 | 36.905 Addition of Test Points for CA\_1A-3A-20A | 12.0.0 | 12.1.0 |
| 2016-03 | RAN#71 | R5-161060 | 0002 | 1 | Addition of test points analysis for CA\_1A-3A-42A, CA\_1A-19A-28A and CA\_3A-19A-42A | 12.0.0 | 12.1.0 |
| 2016-06 | RAN#72 | R5-162871 | 0015 | 1 | Addition of test points selection for 2UL inter-band CA spurious test cases | 12.1.0 | 12.2.0 |
| 2016-06 | RAN#72 | R5-162998 | 0013 | 1 | A-MPR band coverage for inter-band UL CA | 12.1.0 | 12.2.0 |
| 2016-06 | RAN#72 | R5-162999 | 0014 | 1 | Test point analysis for A-MPR test case 6.2.4A.2 | 12.1.0 | 12.2.0 |
| 2016-06 | RAN#72 | R5-162360 | 0010 | - | Test point and test requirements analysis for CA\_4A-5A spurious test cases | 12.2.0 | 13.0.0 |
| 2016-06 | RAN#72 | R5-162845 | 0011 | 1 | 36.905 Addition of Test Points for CA\_3A-7A-8A | 12.2.0 | 13.0.0 |
| 2016-06 | RAN#72 | R5-162988 | 0012 | 1 | New CA band combinations CA\_28A-41A, CA\_28A-41C, CA\_28A-42A and CA\_28A-42C - Updates of test points analysis | 12.2.0 | 13.0.0 |
| 2016-06 | RAN#72 | R5-163020 | 0016 | - | Addition of test points analysis for CA\_1A-8A-11A | 12.2.0 | 13.0.0 |
| 2016-09 | RAN#73 | R5-166032 | 0018 | 1 | Introduction of test point analysis for CA\_8A-42C (3DL) and test case 7.3A.5 | 13.0.0 | 13.1.0 |
| 2016-09 | RAN#73 | R5-166110 | 0026 | 1 | 36.905 Addition of test points selection for 2UL inter-band CA spurious test cases | 13.0.0 | 13.1.0 |
| 2016-09 | RAN#73 | R5-166130 | 0025 | 1 | Test point analysis for NS\_24 and NS\_25 | 13.0.0 | 13.1.0 |
| 2016-09 | RAN#73 | R5-166144 | 0023 | 1 | Addition of test point analysis for TC 7.3A.9 Reference sensitivity level for 4DL CA | 13.0.0 | 13.1.0 |
| 2016-09 | RAN#73 | R5-166146 | 0019 | 1 | Addition of test points analysis for CA\_1A-3C to 36.905 | 13.0.0 | 13.1.0 |
| 2016-09 | RAN#73 | R5-166153 | 0024 | 1 | Change of test points and requirements for NS\_05 A-MPR - Updates of test points analysis | 13.0.0 | 13.1.0 |
| 2016-09 | RAN#73 | R5-166052 | 0021 | 1 | New CA band combinations CA\_1A-41A-42A - Updates of test points analysis | 13.1.0 | 14.0.0 |
| 2016-12 | RAN#74 | R5-168559 | 0041 | - | Update of the test point analysis for TC 7.3A.9 REFSENS 4DL CA | 14.0.0 | 14.1.0 |
| 2016-12 | RAN#74 | R5-168793 | 0047 | - | Test point analysis of A-MPR test cases for Category M1 | 14.0.0 | 14.1.0 |
| 2016-12 | RAN#74 | R5-169162 | 0059 | - | Addition of test point analysis for TC 7.3A.9 Reference sensitivity level | 14.0.0 | 14.1.0 |
| 2016-12 | RAN#74 | R5-169171 | 0058 | - | Correction of test point analysis for CA\_4A-5A-30A | 14.0.0 | 14.1.0 |
| 2016-12 | RAN#74 | R5-169538 | 0043 | - | New CA band combination CA\_1A-11A-18A - Updates of test points analysis | 14.0.0 | 14.1.0 |
| 2016-12 | RAN#74 | R5-169540 | 0044 | - | New CA band combination CA\_41C-42C - Updates of test points analysis | 14.0.0 | 14.1.0 |
| 2016-12 | RAN#74 | R5-169542 | 0045 | - | New CA band combination CA\_1A-18A, 1A-26A, 1A-28A, 1A-42A and 18A-28A - Updates of test points analysis | 14.0.0 | 14.1.0 |
| 2016-12 | RAN#74 | R5-169551 | 0048 | - | Correction of invalid test point for CA\_1A-3A-7A | 14.0.0 | 14.1.0 |
| 2016-12 | RAN#74 | R5-169555 | 0030 | - | Addition of test points analysis for CA\_2A-2A-12B to 36.905 | 14.0.0 | 14.1.0 |
| 2016-12 | RAN#74 | R5-169556 | 0031 | - | Addition of test points analysis for CA\_2A-2A-5A-12A to36.905 | 14.0.0 | 14.1.0 |
| 2016-12 | RAN#74 | R5-169557 | 0032 | - | Addition of test points analysis for CA\_2A-2A-4A-5A to36.905 | 14.0.0 | 14.1.0 |
| 2016-12 | RAN#74 | R5-169566 | 0028 | - | Addition of test points analysis for CA\_1A-3A-41A to36.905 | 14.0.0 | 14.1.0 |
| 2016-12 | RAN#74 | R5-169614 | 0029 | - | Update of section 4.3 with TPs selection analyses | 14.0.0 | 14.1.0 |
| 2016-12 | RAN#74 | R5-169717 | 0042 | - | Correction of test point analysis for NS\_05 A-MPR | 14.0.0 | 14.1.0 |
| 2017-03 | RAN#75 | R5-171255 | 0082 | - | Clarification of Test point analysis process for 3DL and 4DL CA Reference sensitivity test cases | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171710 | 0073 | 1 | Addition of test points analysis for CA\_1A-8A-28A | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171713 | 0074 | 1 | Addition of test points analysis for CA\_3A-8A-28A | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171716 | 0075 | 1 | Addition of test points analysis for CA\_3A-28A-41A | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171723 | 0060 | 1 | Addition of test points analysis for CA\_1C-3A to 36.905 | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171724 | 0080 | 1 | New CA band combinations CA\_1A-41A-42C and 1A-41C-42A - Updates of test points analysis | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171815 | 0081 | 1 | Test point analysis of A-MPR test cases for Category M1 | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171820 | 0062 | 1 | Addition of CA\_1A-3A-28A in 36.905 | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171822 | 0063 | 1 | Addition of test points analysis for CA\_2A-4A-30A to36.905 | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171824 | 0064 | 1 | Addition of test points analysis for CA\_2A-4A-12A-30A to36.905 | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171826 | 0065 | 1 | Addition of test points analysis for CA\_2A-4A-29A to36.905 | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171827 | 0066 | 1 | Addition of test points analysis for CA\_2A-4A-29A-30A to 36.905 | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171828 | 0068 | 1 | Addition of test points analysis for CA\_5A-12B to36.905 | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171830 | 0067 | 1 | Addition of test points analysis for CA\_2A-5A-12B to36.905 | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171831 | 0069 | 1 | Addition of test points analysis for CA\_2A-4A-5A-12A to 36.905 | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171833 | 0070 | 1 | Addition of test points analysis for CA\_2C-12A-30A to 36.905 | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171835 | 0071 | 1 | Addition of test points analysis for CA\_2C-29A-30A to 36.905 | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171836 | 0072 | 1 | Addition of test points analysis for CA\_2C-30A to 36.905 | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171841 | 0077 | 1 | Update of A-MPR analyses for (NS\_03+NS\_01) and (NS\_03+NS\_06) | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171843 | 0078 | 1 | CA band combinations CA\_1A-26A, 1A-28A, 1A-42A and 18A-28A - Updates of test points analysis | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171845 | 0079 | 1 | CA band combinations CA\_1A-18A-28A - Updates of test points analysis | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171895 | 0076 | 1 | Update for NS\_04 Power Class 2 Test points | 14.1.0 | 14.2.0 |
| 2017-03 | RAN#75 | R5-171903 | 0061 | 1 | Update TR 36.905 with Test Points Analysis for Band 48 | 14.1.0 | 14.2.0 |
| 2017-06 | RAN#76 | R5-172114 | 0086 | - | TP analysis for CA\_46A-46A-66A, CA\_46C-66A | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-172138 | 0087 | - | Resubmission of Update TS 36.905 with Test Points Analysis for Band 48 | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-172357 | 0093 | - | Update for NS\_04, NS\_22 and NS\_23 test points | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-172565 | 0099 | - | Addition of CA\_3A-3A-7A-7A in 36.905 | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-172566 | 0100 | - | Addition of CA\_7A-7A-XA in 36.905 | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-172649 | 0106 | - | Addition of test points analysis for CA\_xA-66A-66A and CA\_66A-66C | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-172663 | 0107 | - | Correction of PCC allocation rules for intra-band non-contiguous CA | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-173208 | 0085 | 1 | TP analysis for TC 7.3A.5 for CA\_4A-12A-30A | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-173211 | 0088 | 1 | Addition of CA\_3C-8A in 36.905 | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-173213 | 0089 | 1 | A-MPR analyses for new Rel-14 CA configurations | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-173214 | 0090 | 1 | Spurious emission TP analyses for new Rel-14 CA configurations | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-173218 | 0095 | 1 | Addition of test points analysis for CA\_1A-11A-28A | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-173219 | 0096 | 1 | Addition of test points analysis for CA\_8A-11A-28A | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-173222 | 0104 | 1 | Addition of test points analysis for CA\_3A-20A-32A | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-173292 | 0092 | 1 | Update of the Test point analysis about REFSENS for 3DL and 4DL CA | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-173293 | 0091 | 1 | Addition of the Test point analysis about REFSENS for 5DL CA | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-173294 | 0094 | 1 | Update of TpAnalysis4DLRefSens\_7.3A.9(2A-2A-12B) | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-173300 | 0101 | 1 | Addition of test point analysis for CA\_8A-41C | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-173304 | 0098 | 1 | Addition of CA\_3A-41A-42A in 36.905 | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-173389 | 0097 | 1 | Addition of test point analysis for 2UL/2DL of CA\_41A-42A | 14.2.0 | 14.3.0 |
| 2017-06 | RAN#76 | R5-173394 | 0102 | 1 | Addition of test point analysis for Rel-14 CA | 14.2.0 | 14.3.0 |
| 2017-09 | RAN#77 | R5-175014 | 0115 | 1 | Addition of TP analysis for Reference sensitivity TC | 14.3.0 | 14.4.0 |
| 2017-09 | RAN#77 | R5-175017 | 0116 | 1 | Addition of CA\_1A-3C-8A in 36.905 | 14.3.0 | 14.4.0 |
| 2017-09 | RAN#77 | R5-175018 | 0109 | 1 | Addition of test points analysis for CA\_1A-3A-11A | 14.3.0 | 14.4.0 |
| 2017-09 | RAN#77 | R5-175019 | 0110 | 1 | Addition of test points analysis for CA\_3A-8A-11A | 14.3.0 | 14.4.0 |
| 2017-09 | RAN#77 | R5-175020 | 0111 | 1 | Addition of test points analysis for CA\_3A-11A-28A | 14.3.0 | 14.4.0 |
| 2017-09 | RAN#77 | R5-175021 | 0114 | 1 | TP analysis for CA\_29A-46A-66A, CA\_46A-66C | 14.3.0 | 14.4.0 |
| 2017-09 | RAN#77 | R5-175023 | 0112 | 1 | New CA band combinations CA\_41A-42C and CA\_41C-42A - Updates of test points analysis | 14.3.0 | 14.4.0 |
| 2017-09 | RAN#77 | R5-175024 | 0113 | 1 | New CA band combinations CA\_1A-41C-42C - Updates of test points analysis | 14.3.0 | 14.4.0 |
| 2017-12 | RAN#78 | R5-176385 | 0117 | - | Addition of CA\_1A-3A-40A and CA\_3A-8A-40A in 36.905 | 14.4.0 | 14.5.0 |
| 2017-12 | RAN#78 | R5-176387 | 0118 | - | Addition of CA\_1A-3A-8A-40A in 36.905 | 14.4.0 | 14.5.0 |
| 2017-12 | RAN#78 | R5-176434 | 0119 | - | Addition of test points analysis for CA\_2A-4A-7A\_UL\_2A-4A to 36.905 | 14.4.0 | 14.5.0 |
| 2017-12 | RAN#78 | R5-176435 | 0120 | - | Addition of test points analysis for CA\_2A-4A-7A-7A and CA\_2A-4A-7A-7A\_UL\_2A-4A to 36.905 | 14.4.0 | 14.5.0 |
| 2018-03 | RAN#79 | R5-180800 | 0122 | - | Correction of test point analysis for A-MPR for Band 48 (NS\_27) | 14.5.0 | 14.6.0 |
| 2018-03 | RAN#79 | R5-181542 | 0123 | 1 | Correction of TP analyses for spurious co-existence | 14.5.0 | 14.6.0 |
| 2018-03 | RAN#79 | R5-181617 | 0124 | 1 | Addition of test points analysis for CA\_3DL\_3A-7A-20A\_2UL | 14.5.0 | 14.6.0 |
| 2018-03 | RAN#79 | R5-181618 | 0126 | 1 | Addition of test points analysis for CA\_3A-7A-20A-32A 4DL/1UL | 14.5.0 | 14.6.0 |
| 2018-03 | RAN#79 | R5-180768 | 0121 | - | Update TP analyses for spurious co-existence to Rel-15 requirements | 14.6.0 | 15.0.0 |
| 2018-06 | RAN#80 | R5-182712 | 0134 | - | New CA band combination CA\_3A-18A - Updates of test points analysis | 15.0.0 | 15.1.0 |
| 2018-06 | RAN#80 | R5-183733 | 0137 | 1 | Addition of test points analysis for CA\_3A-7A-42A 3DL/1UL | 15.0.0 | 15.1.0 |
| 2018-06 | RAN#80 | R5-183734 | 0138 | 1 | Addition of test points analysis for CA\_3A-20A-42A 3DL/1UL | 15.0.0 | 15.1.0 |
| 2018-06 | RAN#80 | R5-183745 | 0131 | 1 | CA band combination CA\_1A-18A-28A - Updates of test points analysis | 15.0.0 | 15.1.0 |
| 2018-06 | RAN#80 | R5-183768 | 0132 | 1 | CA band combination CA\_41C-42C - Updates of test points analysis | 15.0.0 | 15.1.0 |
| 2018-06 | RAN#80 | R5-183769 | 0133 | 1 | CA band combinations CA\_1A-3A-28A, CA\_1A-3A-42A, CA\_1A-42C and 3A-42C - Updates of test points analysis | 15.0.0 | 15.1.0 |
| 2018-06 | RAN#80 | R5-183775 | 0135 | 1 | CA band combinations CA\_1A-3A-18A and CA\_1A-3A-26A - Updates of test points analysis | 15.0.0 | 15.1.0 |
| 2018-06 | RAN#80 | R5-183777 | 0136 | 1 | CA band combinations CA\_41A-42C and 41C-42A - Updates of test points analysis | 15.0.0 | 15.1.0 |
| 2018-06 | RAN#80 | R5-183778 | 0139 | 1 | RF TP analysis for CA\_29A-66A-70A, CA\_29A-66A-66A-70A, CA\_29A-66A-66A-70C, CA\_29A-66A-70C, CA\_29A-66C-70A, CA\_29A-66C-70C, CA\_29A-70C, CA\_66A-66A-70A, CA\_66A-66A-70C, CA\_66A-70A, CA\_66A-70C, CA\_66C-70A, CA\_66C-70C | 15.0.0 | 15.1.0 |
| 2018-09 | RAN#81 | R5-184197 | 0143 | - | CA band combination CA\_2A-46A CA\_26A-46A - Updates of test points analysis | 15.1.0 | 15.2.0 |
| 2018-09 | RAN#81 | R5-184277 | 0144 | - | Update of TP analysis of CA\_3A-7A-8A | 15.1.0 | 15.2.0 |
| 2018-09 | RAN#81 | R5-184278 | 0145 | - | Addition of TP analysis of CA\_1A-7A-8A in 36.905 | 15.1.0 | 15.2.0 |
| 2018-09 | RAN#81 | R5-184279 | 0146 | - | Addition of TP analysis of CA\_1A-3A-7A-8A in 36.905 | 15.1.0 | 15.2.0 |
| 2018-09 | RAN#81 | R5-184280 | 0147 | - | Addition of TP analysis of CA\_7A-42A-42A in 36.905 | 15.1.0 | 15.2.0 |
| 2018-09 | RAN#81 | R5-184281 | 0148 | - | Addition of TP analysis of CA\_20A-42A-42A in 36.905 | 15.1.0 | 15.2.0 |
| 2018-09 | RAN#81 | R5-184553 | 0149 | - | Update of (NS\_01/NS\_17), (NS\_03/NS\_07), (NS\_05/NS\_01) and (NS\_05/NS\_17) TP analysis for A-MPR test case for inter-band UL CA | 15.1.0 | 15.2.0 |
| 2018-09 | RAN#81 | R5-184638 | 0150 | - | CA\_1A-3A-26A(1UL) - Updates of test points analysis | 15.1.0 | 15.2.0 |
| 2018-09 | RAN#81 | R5-184773 | 0152 | - | RF TP analysis for CA\_66A-66A-70C-71A, CA\_66A-66A-70A-71A, CA\_66A-70C-71A, CA\_66A-70A-71A, CA\_66A-66A-71A, CA\_70A-71A, CA\_66A-71A, CA\_66C-70C-71A, CA\_66C-70A-71A, CA\_70C-71A, CA\_66C-71A | 15.1.0 | 15.2.0 |
| 2018-09 | RAN#81 | R5-184800 | 0153 | - | Update to test point analysis for NS\_27 | 15.1.0 | 15.2.0 |
| 2018-09 | RAN#81 | R5-184821 | 0154 | - | Inter-band con-current V2X configurations- Updates of test points analysis | 15.1.0 | 15.2.0 |
| 2018-09 | RAN#81 | R5-185345 | 0141 | 1 | New CA band combination CA\_1A-3A-7A-20A - Update of test point analysis | 15.1.0 | 15.2.0 |
| 2018-09 | RAN#81 | R5-185437 | 0155 | 1 | Test point and test requirements analysis for CA\_3A-41A, 41A-42A,3A-42A spurious test cases | 15.1.0 | 15.2.0 |
| 2018-09 | RAN#81 | R5-185502 | 0156 | 1 | Addition of new CA band combination – Updates of test points analysis | 15.1.0 | 15.2.0 |
| 2018-09 | RAN#81 | R5-185543 | 0151 | 1 | CA\_3A-18A - Updates of test points analysis | 15.1.0 | 15.2.0 |
| 2018-12 | RAN#82 | R5-186450 | 0157 | - | Addition of test point calculation for BW combination 75-25 in TC 6.2.4A.2 | 15.2.0 | 15.3.0 |
| 2018-12 | RAN#82 | R5-187268 | 0160 | - | CA\_3A-28A - Updates of test points analysis | 15.2.0 | 15.3.0 |
| 2018-12 | RAN#82 | R5-187292 | 0161 | - | CA\_11A-18A - Updates of test points analysis | 15.2.0 | 15.3.0 |
| 2018-12 | RAN#82 | R5-187452 | 0169 | - | Inter-band concurrent V2X configurations- Add 71A\_47A Spurious Emission Test points analysis | 15.2.0 | 15.3.0 |
| 2018-12 | RAN#82 | R5-187865 | 0165 | 1 | TP analyses for new Rel-15 CA configurations | 15.2.0 | 15.3.0 |
| 2018-12 | RAN#82 | R5-187867 | 0158 | 1 | Inter-band concurrent V2X configurations- Add 3A\_47A Spurious Emission Test points analysis | 15.2.0 | 15.3.0 |
| 2018-12 | RAN#82 | R5-187868 | 0167 | 1 | Inter-band concurrent V2X configurations- Add 5A\_47A Spurious Emission Test points analysis | 15.2.0 | 15.3.0 |
| 2018-12 | RAN#82 | R5-187960 | 0162 | 1 | CA\_3A-41A-42C(1UL) - Updates of test points analysis | 15.2.0 | 15.3.0 |
| 2018-12 | RAN#82 | R5-187961 | 0163 | 1 | CA\_3A-41C-42A(1UL) - Updates of test points analysis | 15.2.0 | 15.3.0 |
| 2018-12 | RAN#82 | R5-187962 | 0164 | 1 | CA\_3A-41C-42C(1UL) - Updates of test points analysis | 15.2.0 | 15.3.0 |
| 2018-12 | RAN#82 | R5-187969 | 0166 | 1 | Update for reference sensitivity TP analysis for CA\_2A-66A-71A CA configuration | 15.2.0 | 15.3.0 |
| 2019-03 | RAN#83 | R5-191174 | 0170 | - | Addition of TP analysis for UE-coexistence SE requirements for V2X\_7A-47A | 15.3.0 | 15.4.0 |
| 2019-03 | RAN#83 | R5-191175 | 0171 | - | Addition of TP analysis for UE-coexistence SE requirements for V2X\_8A-47A | 15.3.0 | 15.4.0 |
| 2019-03 | RAN#83 | R5-191176 | 0172 | - | Addition of TP analysis for UE-coexistence SE requirements for V2X\_20A-47A | 15.3.0 | 15.4.0 |
| 2019-03 | RAN#83 | R5-191177 | 0173 | - | Addition of TP analysis for UE-coexistence SE requirements for V2X\_28A-47A | 15.3.0 | 15.4.0 |
| 2019-03 | RAN#83 | R5-191178 | 0174 | - | Addition of TP analysis for UE-coexistence SE requirements for V2X\_34A-47A | 15.3.0 | 15.4.0 |
| 2019-03 | RAN#83 | R5-191179 | 0175 | - | Addition of TP analysis for UE-coexistence SE requirements for V2X\_39A-47A | 15.3.0 | 15.4.0 |
| 2019-03 | RAN#83 | R5-191180 | 0176 | - | Addition of TP analysis for UE-coexistence SE requirements for V2X\_41A-47A | 15.3.0 | 15.4.0 |
| 2019-03 | RAN#83 | R5-191181 | 0177 | - | Update of TP analysis for UE-coexistence SE requirements for V2X\_3A-47A | 15.3.0 | 15.4.0 |
| 2019-03 | RAN#83 | R5-191182 | 0178 | - | Update of TP analysis for UE-coexistence SE requirements for V2X\_71A-47A | 15.3.0 | 15.4.0 |
| 2019-03 | RAN#83 | R5-191469 | 0179 | - | Update of TP analysis for UE-coexistence SE requirements for V2X\_5A-47A | 15.3.0 | 15.4.0 |
| 2019-03 | RAN#83 | R5-191792 | 0182 | - | Correction to Table 4.1.3-1 in clause 4.1.3 | 15.3.0 | 15.4.0 |
| 2019-03 | RAN#83 | R5-191957 | 0185 | - | Updating and correction of TP analysis for 3DL CA configuration | 15.3.0 | 15.4.0 |
| 2019-03 | RAN#83 | R5-191958 | 0186 | - | Updating of TP analysis for 4DL CA configuration | 15.3.0 | 15.4.0 |
| 2019-03 | RAN#83 | R5-192636 | 0183 | 1 | New CA band combination CA\_18A-42A - Updates of test points analysis | 15.4.0 | 16.0.0 |
| 2019-03 | RAN#83 | R5-192637 | 0184 | 1 | New CA band combination CA\_3A-18A-42A - Updates of test points analysis | 15.4.0 | 16.0.0 |
| 2019-06 | RAN#84 | R5-193712 | 0187 | - | New CA band combination CA\_1A-3A-41C - Updates of test points analysis | 16.0.0 | 16.1.0 |
| 2019-06 | RAN#84 | R5-194021 | 0188 | - | CA\_1A-3A-41A-42A - Updates of test points analysis | 16.0.0 | 16.1.0 |
| 2019-06 | RAN#84 | R5-194072 | 0190 | - | TpAnalysisSpur\_2A-4A\_v4 | 16.0.0 | 16.1.0 |
| 2019-06 | RAN#84 | R5-194421 | 0207 | - | Updates of test points analysis for R16 CA | 16.0.0 | 16.1.0 |
| 2019-06 | RAN#84 | R5-194967 | 0204 | 1 | Addition of test points analysis CA\_3A\_7A\_28A, CA\_3X\_7Y and CA\_7X\_28Y | 16.0.0 | 16.1.0 |
| 2019-06 | RAN#84 | R5-195006 | 0205 | 1 | Analysis of new CA band 2A-5A-29A for CA 3DL CA REFSENS | 16.0.0 | 16.1.0 |
| 2019-06 | RAN#84 | R5-195057 | 0203 | 1 | CA\_1A-3A-41C-42C - Updates of test points analysis | 16.0.0 | 16.1.0 |
| 2019-06 | RAN#84 | R5-195068 | 0206 | 1 | Introduction of category M2 in section 4.1.1 | 16.0.0 | 16.1.0 |
| 2019-06 | RAN#84 | R5-195112 | 0191 | 1 | TpAnalysisSpur\_2A-5A\_v3 | 16.0.0 | 16.1.0 |
| 2019-06 | RAN#84 | R5-195113 | 0192 | 1 | TpAnalysisSpur\_2A-12A\_v3 | 16.0.0 | 16.1.0 |
| 2019-06 | RAN#84 | R5-195114 | 0193 | 1 | TpAnalysisSpur\_2A-13A\_v4 | 16.0.0 | 16.1.0 |
| 2019-06 | RAN#84 | R5-195115 | 0194 | 1 | TpAnalysisSpur\_4A-5A\_v4 | 16.0.0 | 16.1.0 |
| 2019-06 | RAN#84 | R5-195116 | 0195 | 1 | TpAnalysisSpur\_4A-13A\_v4 | 16.0.0 | 16.1.0 |
| 2019-06 | RAN#84 | R5-195117 | 0196 | 1 | TpAnalysisSpur\_4A-17A\_v4 | 16.0.0 | 16.1.0 |
| 2019-06 | RAN#84 | R5-195118 | 0197 | 1 | TpAnalysisSpur\_5A-12A\_v5 | 16.0.0 | 16.1.0 |
| 2019-06 | RAN#84 | R5-195119 | 0198 | 1 | TpAnalysisSpur\_5A-17A\_v4 | 16.0.0 | 16.1.0 |
| 2019-06 | RAN#84 | R5-195120 | 0199 | 1 | TpAnalysisSpur\_V2X\_5A-47A\_v4 | 16.0.0 | 16.1.0 |
| 2019-06 | RAN#84 | R5-195121 | 0200 | 1 | TpAnalysisSpur\_V2X\_71A-47A\_v4 | 16.0.0 | 16.1.0 |
| 2019-09 | RAN#85 | R5-195716 |  | - | Addition of test point analysis for V2X AMPR test cases | 16.1.0 | 16.2.0 |
| 2019-09 | RAN#85 | R5-195796 |  | - | New CA band combination CA\_20A\_40A specific test points | 16.1.0 | 16.2.0 |
| 2019-09 | RAN#85 | R5-195801 |  | - | Addition of Refsens test points analysis for CA\_11A\_41C and CA\_11A\_42C | 16.1.0 | 16.2.0 |
| 2019-09 | RAN#85 | R5-196559 |  | - | Addition of TP analysis for CA\_8A-40C to 36.905 | 16.1.0 | 16.2.0 |
| 2019-09 | RAN#85 | R5-196560 |  | - | Addition of TP analysis for CA\_8A-20A-28A to 36.905 | 16.1.0 | 16.2.0 |
| 2019-09 | RAN#85 | R5-196561 |  | - | Addition of TP analysis for CA\_3A-28A-38A to 36.905 | 16.1.0 | 16.2.0 |
| 2019-09 | RAN#85 | R5-196562 |  | - | Addition of TP analysis for CA\_1A-8A-38A to 36.905 | 16.1.0 | 16.2.0 |
| 2019-09 | RAN#85 | R5-196563 |  | - | Addition of TP analysis for CA\_1A-1A-7A to 36.905 | 16.1.0 | 16.2.0 |
| 2019-09 | RAN#85 | R5-196564 |  | - | Addition of TP analysis for CA\_3A-7A-38A to 36.905 | 16.1.0 | 16.2.0 |
| 2019-09 | RAN#85 | R5-196565 |  | - | Addition of TP analysis for CA\_3A-3A-8A to 36.905 | 16.1.0 | 16.2.0 |
| 2019-09 | RAN#85 | R5-196566 |  | - | Addition of TP analysis for CA\_28A-40D to 36.905 | 16.1.0 | 16.2.0 |
| 2019-09 | RAN#85 | R5-197462 |  | 1 | New CA band combination CA\_1A-18A-42A - Updates of test points analysis | 16.1.0 | 16.2.0 |
| 2019-09 | RAN#85 | R5-197463 |  | 1 | New CA band combination CA\_18A-42C - Updates of test points analysis | 16.1.0 | 16.2.0 |
| 2019-09 | RAN#85 | R5-197464 |  | 1 | New CA band combination CA\_1A-3A-18A-42A - Updates of test points analysis | 16.1.0 | 16.2.0 |
| 2019-12 | RAN#86 | R5-198291 | 0225 | - | Update of test point analysis for V2X AMPR test cases | 16.2.0 | 16.3.0 |
| 2019-12 | RAN#86 | R5-198339 | 0226 | - | New CA band combination CA\_38A\_40A\_40A specific test points | 16.2.0 | 16.3.0 |
| 2019-12 | RAN#86 | R5-198341 | 0227 | - | New CA band combination CA\_2A\_4A\_4A\_5A specific test points | 16.2.0 | 16.3.0 |
| 2019-12 | RAN#86 | R5-198691 | 0228 | - | Correction to Rx test points for CA\_1A-3A-42C | 16.2.0 | 16.3.0 |
| 2019-12 | RAN#86 | R5-198729 | 0229 | - | Correction of test point analysis for CA\_2A-2A-66A-71A | 16.2.0 | 16.3.0 |
| 2019-12 | RAN#86 | R5-199466 | 0222 | 1 | New CA band combination CA\_1A-18A-42C - Updates of test points analysis | 16.2.0 | 16.3.0 |
| 2019-12 | RAN#86 | R5-199467 | 0223 | 1 | New CA band combination CA\_3A-18A-42C - Updates of test points analysis | 16.2.0 | 16.3.0 |
| 2019-12 | RAN#86 | R5-199468 | 0224 | 1 | New CA band combination CA\_1A-3A-18A-42C - Updates of test points analysis | 16.2.0 | 16.3.0 |
| 2020-06 | RAN#88 | R5-202443 | 0236 | - | Update of Test Point Analysis for CA\_3A-7B | 16.3.0 | 16.4.0 |
| 2020-06 | RAN#88 | R5-202706 | 0231 | 1 | Addition of TP analysis for CA\_1A-7A-7A to 36.905 | 16.3.0 | 16.4.0 |
| 2020-06 | RAN#88 | R5-202707 | 0232 | 1 | Addition of TP analysis for CA\_1A-7A-28A BW set2 to 36.905 | 16.3.0 | 16.4.0 |
| 2020-06 | RAN#88 | R5-202764 | 0235 | 1 | Addition of test points for A-MPR for CA HPUE | 16.3.0 | 16.4.0 |
| 2020-06 | RAN#88 | R5-202819 | 0233 | 1 | Addition of TP analysis for CA\_3C-20A to 36.905 | 16.3.0 | 16.4.0 |
| 2020-06 | RAN#88 | R5-202854 | 0234 | 1 | Addition of TP analysis for CA\_38A-40C BCS1 to 36.905 | 16.3.0 | 16.4.0 |
| 2020-09 | RAN#89 | R5-203987 | 0237 | - | Updating test point analysis for AMPR of NS\_01 and NS\_04 | 16.4.0 | 16.5.0 |
| 2020-09 | RAN#89 | R5-203988 | 0238 | - | Updating test point analysis for 3A-41A to add SE-coex | 16.4.0 | 16.5.0 |
| 2020-09 | RAN#89 | R5-204276 | 0239 | - | Update of test point analysis for CA\_3A-7B | 16.4.0 | 16.5.0 |
| 2020-12 | RAN#90 | R5-205706 | 0240 | - | Update of A-MPR for inter-band UL CA | 16.5.0 | 16.6.0 |
| 2020-12 | RAN#90 | R5-205985 | 0241 | - | Addition of A-MPR TP analysis for NS\_44 | 16.5.0 | 16.6.0 |
| 2021-09 | RAN#93 | R5-214719 | 0242 | - | Test point analysis for cat M1 subPRB allocation NS\_07 | 16.6.0 | 16.7.0 |
| 2021-12 | RAN#94 | R5-217147 | 0244 | - | Test point analysis for cat M1 A-MPR with subPRB allocation | 16.7.0 | 16.8.0 |
| 2021-12 | RAN#94 | R5-217148 | 0245 | - | Test point analysis for cat M2 A-MPR with subPRB allocation | 16.7.0 | 16.8.0 |
| 2021-12 | RAN#94 | R5-217544 | 0247 | - | Spurious emission TP analyses for CA\_42C-41C | 16.7.0 | 16.8.0 |
| 2021-12 | RAN#94 | R5-218378 | 0243 | 1 | Addition of A-MPR TP analysis for NS\_56 (B24) | 16.7.0 | 16.8.0 |
| 2023-03 | RAN#99 | - | - | - | Upgrade to Rel-17 with no change | 16.8.0 | 17.0.0 |
| 2023-03 | RAN#99 | R5-230403 | 0248 | - | Update to scope and reference of E-UTRA RF test points for IoT-NTN | 17.0.0 | 18.0.0 |
| 2023-06 | RAN#100 | R5-232820 | 0250 | - | IoT NTN test point analysis | 18.0.0 | 18.1.0 |
| 2023-09 | RAN#101 | R5-234616 | 0257 | - | Updates and additions to TP analyses for spurious emissions UE coexistence for CA combinations as part of the introduction of LTE TDD Band 54 | 18.1.0 | 18.2.0 |
| 2023-09 | RAN#101 | R5-234769 | 0258 | - | Update of IoT NTN test point analysis | 18.1.0 | 18.2.0 |
| 2023-09 | RAN#101 | R5-235806 | 0251 | 1 | Adding Test Point Analysis for 4DLRefSens TC7.3A.9(2A-2A-5A-66A) | 18.1.0 | 18.2.0 |
| 2023-09 | RAN#101 | R5-235807 | 0252 | 1 | Adding Test Point Analysis for 4DLRefSens TC7.3A.9(2A-2A-12A-66A) | 18.1.0 | 18.2.0 |
| 2023-09 | RAN#101 | R5-235808 | 0253 | 1 | Adding Test Point Analysis for 4DLRefSens TC7.3A.9(2A-2A-30A-66A) | 18.1.0 | 18.2.0 |
| 2023-09 | RAN#101 | R5-235809 | 0254 | 1 | Adding Test Point Analysis for 4DLRefSens TC7.3A.9(2A-5A-66A-66A) | 18.1.0 | 18.2.0 |
| 2023-09 | RAN#101 | R5-235811 | 0255 | 1 | Adding Test Point Analysis for 4DLRefSens TC7.3A.9(CA\_5A-30A-66A-66A) | 18.1.0 | 18.2.0 |
| 2023-09 | RAN#101 | R5-235812 | 0256 | 1 | Adding Test Point Analysis for 4DLRefSens TC7.3A.9(CA\_12A-30A-66A-66A) | 18.1.0 | 18.2.0 |
| 2023-12 | RAN#102 | R5-236396 | 0262 | - | Adding Test Point Analysis for 5DLRefSens TC7.3A.10(CA\_2A-5A-30A-66A-66A) | 18.2.0 | 18.3.0 |
| 2023-12 | RAN#102 | R5-236397 | 0263 | - | Adding Test Point Analysis for 4DL & 5DL RefSens | 18.2.0 | 18.3.0 |
| 2023-12 | RAN#102 | R5-236470 | 0264 | - | Adding TP analylsis of REFSENS of CA\_1A-3A-7A-28A | 18.2.0 | 18.3.0 |
| 2023-12 | RAN#102 | R5-237677 | 0260 | 1 | Test point analysis for IoT NTN receiver test cases | 18.2.0 | 18.3.0 |
| 2023-12 | RAN#102 | R5-237678 | 0259 | 1 | Addition of general rules of test point selection for IoT NTN Rx test cases | 18.2.0 | 18.3.0 |
| 2023-12 | RAN#102 | R5-237679 | 0261 | 1 | Adding Test point analysis for IoT NTN TX test cases | 18.2.0 | 18.3.0 |
| 2023-12 | RAN#102 | R5-237821 | 0268 | 1 | Adding Test Point Analysis for 4DLRefSens TC7.3A.9(2A-2A-66A-66A) | 18.2.0 | 18.3.0 |
| 2023-12 | RAN#102 | R5-237822 | 0269 | 1 | Addition of REFSENS TP Analysis for CA\_5B-66A-66A | 18.2.0 | 18.3.0 |
| 2023-12 | RAN#102 | R5-237872 | 0270 | 1 | Adding Test point analysis for IoT NTN frequency error test cases | 18.2.0 | 18.3.0 |