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and Evolved Universal Terrestrial
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Derivation of test points for radio transmission and reception conformance test cases
(3GPP TR 36.905 version 18.4.0 Release 18)

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650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
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Contents

Foreword

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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.
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[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 1 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	Commen
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
		6.6.2.2EA		Lowest, 5MHz, 10MHz, Highest	Low, Mid, High	RAN5#93
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
		6.6.2.2EA		5MHz, 10MHz, 15MHz, 20MHz	Low, Mid, High	RAN5#93
NS_05	1	6.2.4EA	See attachment TpAnalysisAMPR(NS_05)_6.2.4EA_subPRB.zip	5MHz	Low	RAN5#93
		6.6.3EA.3	Spur (Note 1)	5MHz	Low	RAN5#93
NS_07	13	6.6.2.2EA	See attachment “TpAnalysisAMPR(NS_07)_6.2.4EA_subPRB.zip”	10MHz	Low, Mid, High	A-MPR requiremen only define for 10 MHz channel bandwidth.
		6.6.3EA.3	Spur (Note 1)	10 MHz	Low	Emission requiremen only define 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 t 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	Commen
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 P_{cmaxc} 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 N_{RB_agg}, Highest N_{RB_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 N_{RB_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 W_{gap} specified for those 2 BW combinations in the Table 7.3A.0-3 are tested, larger W_{gap} 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.4.2.5.1Intra-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 N_{RB_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 N_{RB_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 N_{RB_agg} for the band with 2 CC and Highest N_{RB_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 N_{RB} 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 / N_{RB_agg} + largest SCC-only sub-block BW / N_{RB_agg} and largest PCC sub-block BW / N_{RB_agg} + smallest SCC-only sub-block BW / N_{RB_agg} are tested. All corner cases VS W_{gap} specified for those 2 BW combinations in the Table 7.3A.0-3 are tested, larger W_{gap} 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 N_{RB_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 N_{RB_agg} for the band with 2 CC and Highest N_{RB_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 N_{RB} 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-29A-66A	See attachment "TpAnalysis4DLRefSens_7.3A.9(2A-2A-29A-66A).zip"	Added at RAN5#102
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-29A-66A-66A	See attachment "TpAnalysis4DLRefSens_7.3A.9(2A-29A-66A-66A).zip"	Added at RAN5#102
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 N_{RB_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 N_{RB_agg} for the band with 2 CC and Highest N_{RB_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 N_{RB} 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-2A-29A-30A-66A	See attachment "TpAnalysis5DLRefSens_7.3A.10(2A-2A-29A-30A-66A).zip"	Added at RAN5#102
CA_2A-2A-29A-66A-66A	See attachment "TpAnalysis5DLRefSens_7.3A.10(2A-2A-29A-66A-66A).zip"	Added at RAN5#102
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 N_{RB_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 N_{RB_agg} for the band with 2 CC and Highest N_{RB_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 N_{RB} 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

5 Satellites ephemeris derivation

5.1 Tools

This section describes the procedure to emulate satellite orbits using the General Mission Analysis Tool (GMAT), an enterprise, multi-mission, open-source software system for space mission design, optimization, and navigation developed by a team of NASA, private industry, public, and private contributors.

5.2 Satellite Ephemeris Generation process

The goal is to generate satellites orbits for IoT NTN testing, so design techniques of a low Earth orbit such as stabilizations techniques of the orbit by selecting eccentricity with SMA (Semi-major Axis) and inclination are not included. Furthermore, the presented model contains only gravity force J0.

For the mission preparation, a brief description of GMAT instantiation main steps is given in the following sub sections through the graphical user interface (GUI). A related script is jointly updated once any created objects are validated using the GUI.

The GUI is used for all steps 5.2.1 to 5.2.7 using "resources" tab, 5.2.8 using "Mission" tab for mission sequence and the script for coding range and Doppler.

5.2.1 Spacecraft

The spacecraft object is generated from GUI in resources tab.

UTC time representation is defined as the timescale to be used for earth-space communication and therefore selected.

Keplerian representation can be selected to fill initial satellite state. However, Cartesian representation shall be selected for ephemeris generation in EarthFixed Frame.

Excentricity is set to 1e-7.

In case of GSO, the simulated orbit refers to a satellite at 35786 km altitude with an orbit inclination of 7° (configuration as per Figure 5.2.1-1 and Figure 5.2.1-2 below). In case of NGSO satellite, semimayor axis needs to be configured based on satellite altitude (as shown in Figure 5.2.1-3 below).

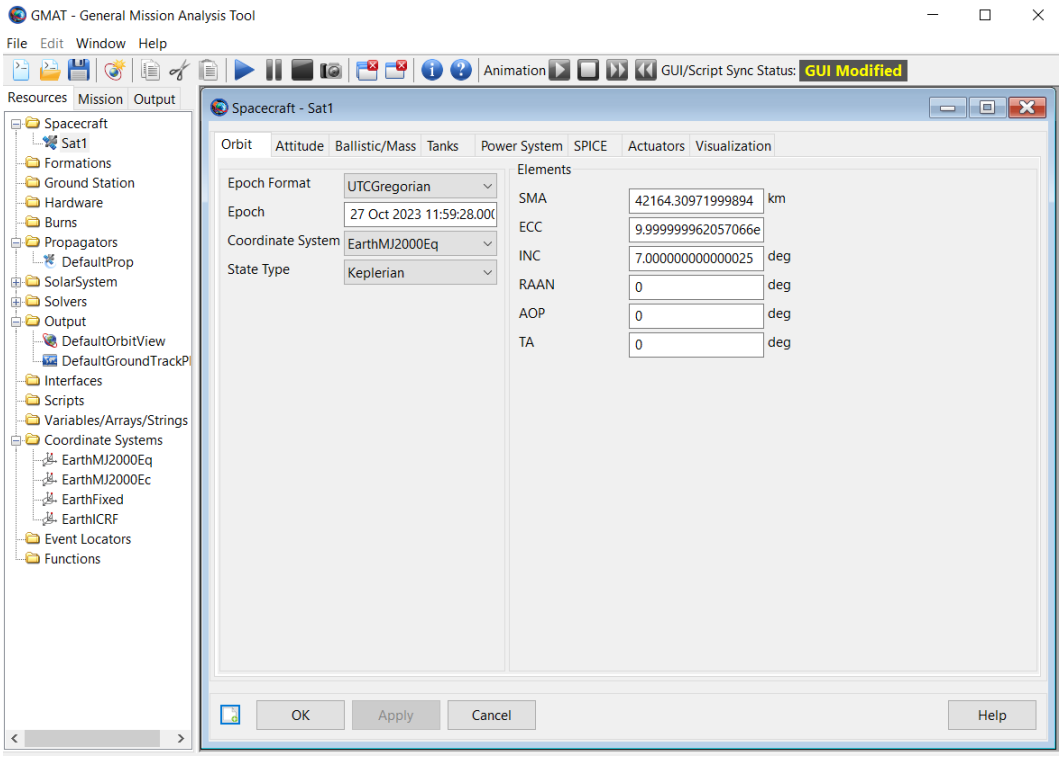

Figure 5.2.1-1: GSO Satellite Setting – Orbit (Spacecraft in resources tab)

As the drag model cannot be deselected when configuring propagators & force models, the spacecraft configuration shown in Figure 5.2.1-2 setting spacecraft drag surfaces properties to 0 is required to mitigate this perturbation.

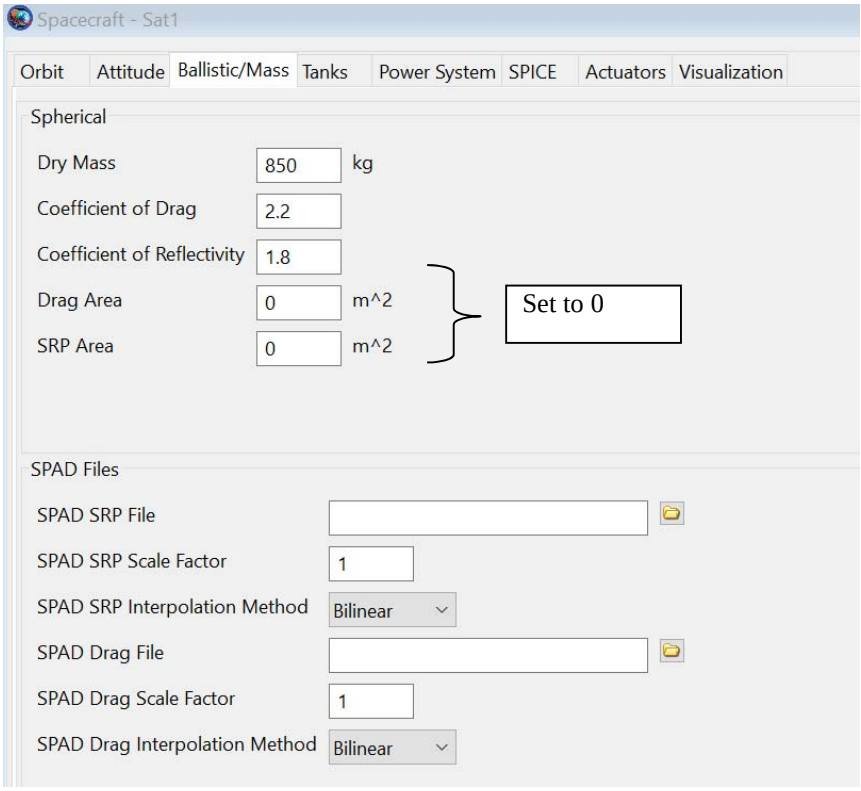

Figure 5.2.1-2: GSO Satellite Setting - Ballistic/Mass (Spacecraft in resources tab)

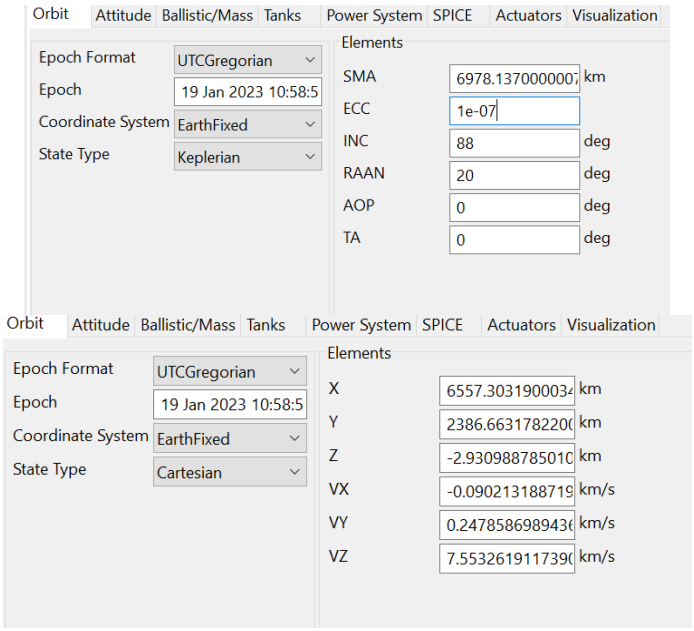

Figure 5.2.1-3: NGSO Satellite Setting – Orbit (Spacecraft in resources tab)

5.2.2

5.2.3 Ground Station simulating the UE

The IOT NTN UE is modelled in GMAT Tool by a Ground Station.

The ground station object (hereafter GDS) is generated from GUI in resources tab.

Ground Station location for simulation is given in EarthFixed frame with Earth ellipsoid model selected and is considered fixed.

UE location is configured as indicated in TS 36.508 clause 5.6.1.

To be noticed that, for any given UE location, the daily elevation variation remains rather low compared to NGSO cases. However, the UE location is limited by the Earth visibility domain with the minimum angle of 10° or 30°.

As an indication, the Earth visibility domain as seen by a satellite in geostationary position and 0° inclination for a minimum elevation of 0° is given in figure 5.2.3-1.

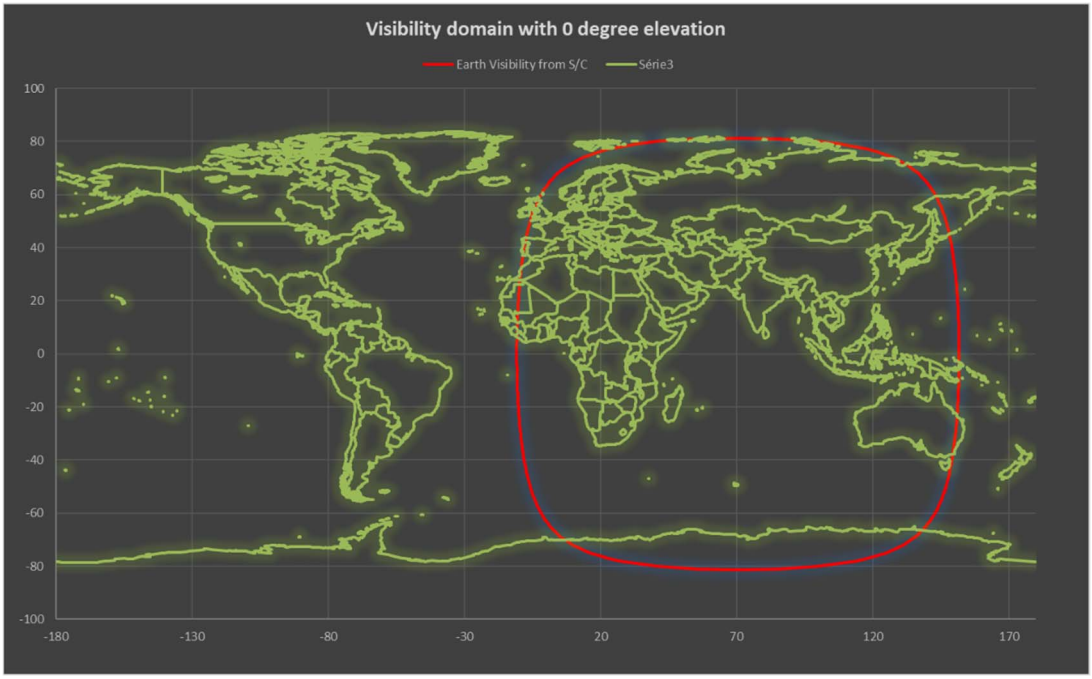

Figure 5.2.3-1: Visibility domain from a geostationary satellite, Minimum UE elevation=0

Table 5.2.3-1 shows, at satellite longitude, the maximum UE latitude with its minimum elevation angle:

Minimum UE Elevation (degree)	Maximum UE latitude with satellite longitude at UE longitude (spherical Earth)
0	81.30
5	76.33
10	71.43
15	66.60
20	61.83
25	57.12
30	52.47

Table 5.2.3-1: Maximum UE latitude with satellite longitude at UE longitude

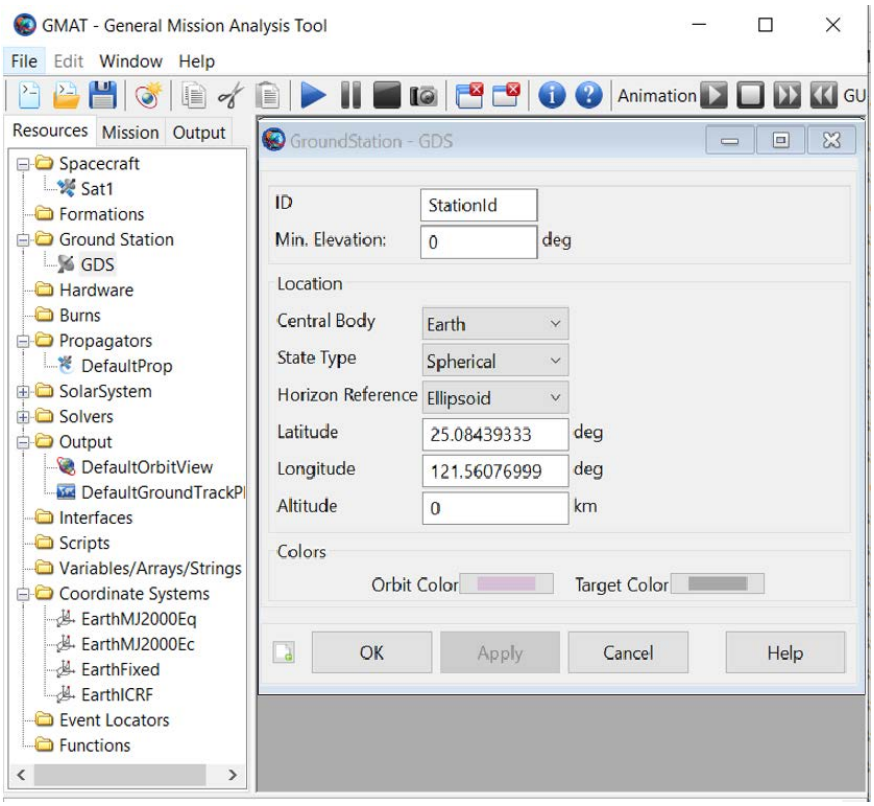

Figure 5.2.3-1: IoT NTN UE Setting (Ground Station in resources tab)

5.2.4 Propagators & Force Models

The default propagator type is used.

Default Gravity JGM2 is kept.

For GSO satellites, degree of Earth potential is set to 70 and an order of 0 while for NGSO satellites degree of Earth potential is set to 2 and an order of 0

Drag and Atmospheric model unchanged. The drag & atmospheric cannot be disabled.

The max Step Size is adjusted such timestamp allows to get Doppler shift in S-band lower than ±50Hz for a carrier frequency of 2 GHz. The possible values to be considered are 2n*10 ms with n=0,1,2,..8.

Max Setp size is 2.56s for GSO satellites while it is 0.64s for NGSO satellites (including 600km and 1200km altitudes).

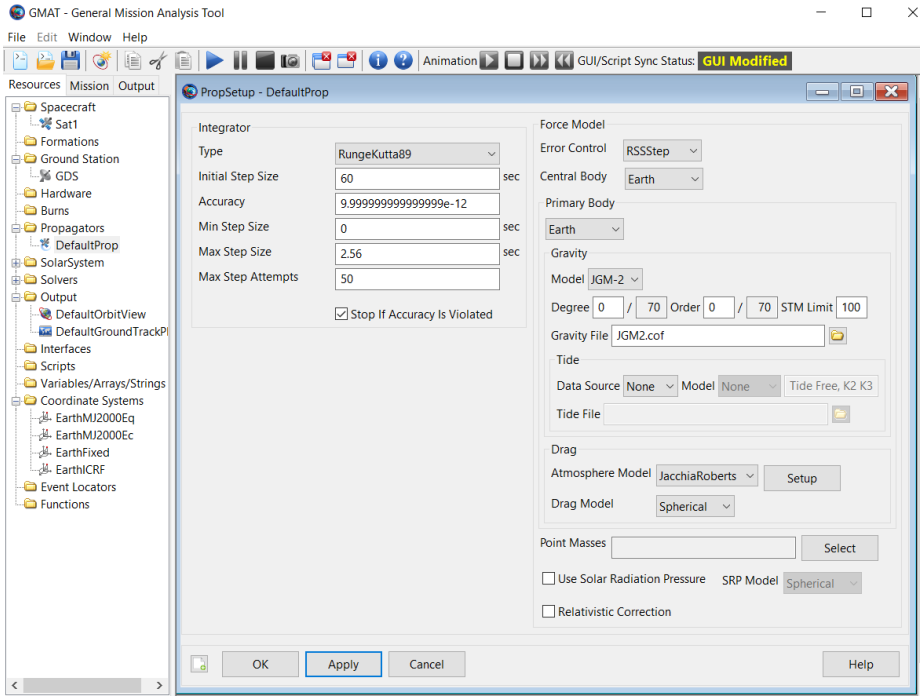

Figure 5.2.4-1: Propagator Setting for GSO Satellites

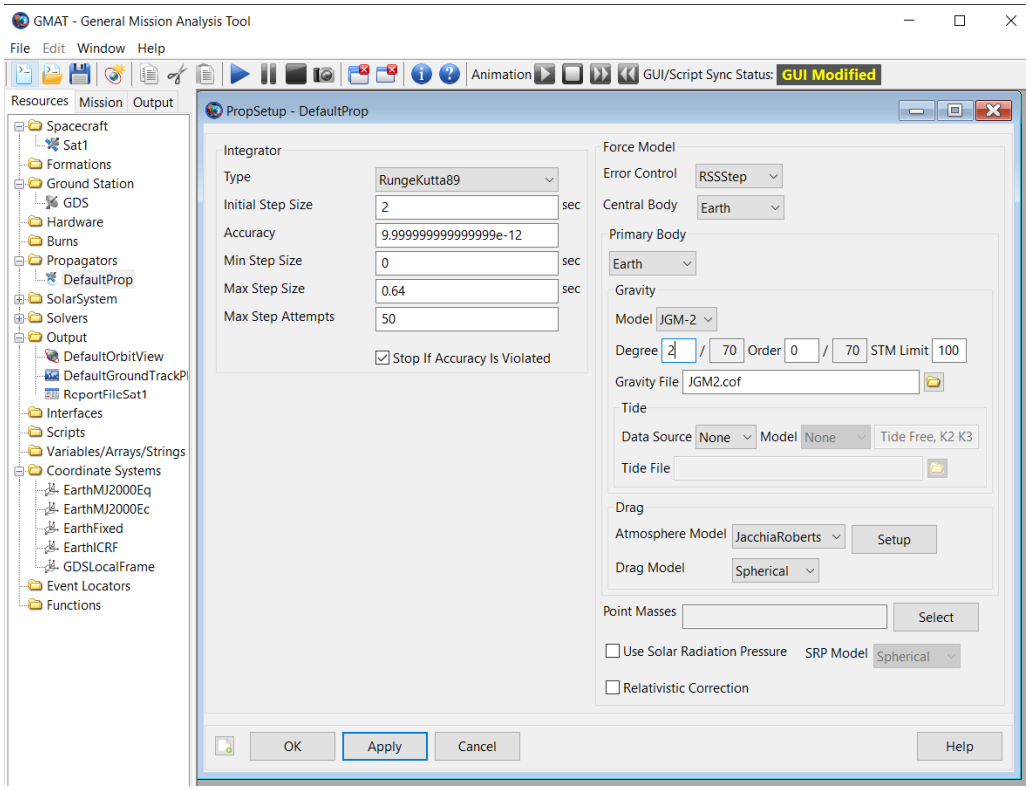

Figure 5.2.4-2: Propagator Setting for NGSO Satellites

5.2.5 UE Coordinate Systems

A local topocentric frame is attached to the ground station. This allows to get satellite coordinates in local ground station frame in order to calculate satellite Elevation while enabling the determination of the satellite visibility start and stop.

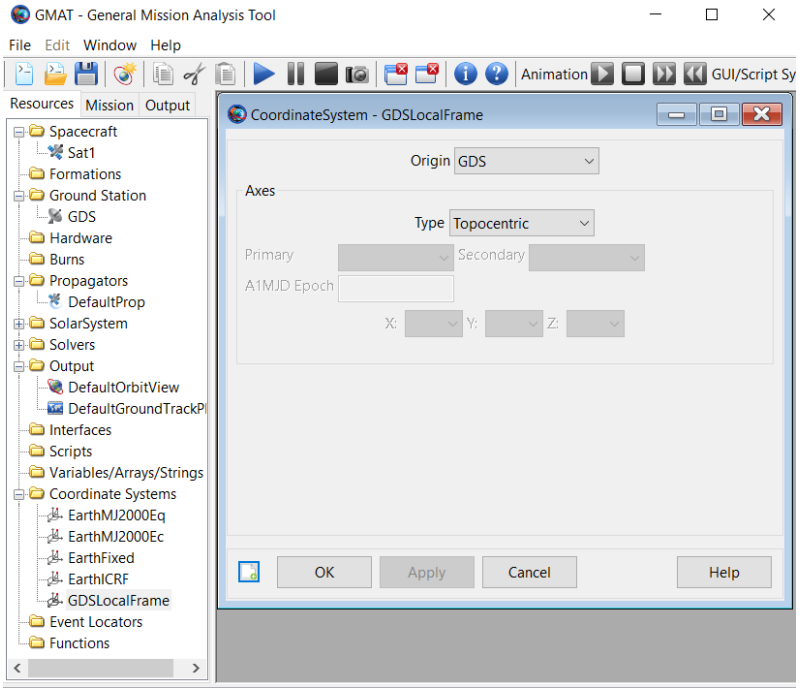

Figure 5.2.5-1: Creation of topocentric frame attached to the ground station (Coordinate Systems in resources tab)

Once this topocentric frame is defined, GMAT automatically allows access to satellite vector in UE frame without any additional coding.

5.2.6 Variables, Arrays, String

Variables can be created through the GUI.

The following variables shall be created as result variables:

- Range
- Delay
- Doppler
- DelayRate
- Sat_El_GDS

The following 6 variables are created to get satellite position and velocity in SIB31/SIB-31NB INTEGER format as required in 3GPP TS 36.331:

- Xsat_ECEF_Coded
- Ysat_ECEF_Coded
- Zsat_ECEF_Coded
- VXsat_ECEF_Coded,

- VYsat_ECEF_Coded,
- VZsat_ECEF_Coded

Intermediate variables are created for computation purpose and not stored.

Table 5.2.6-1 provides the correspondence between created variables in GMAT tool and SIB31/SIB-31NB parameters.

	SIB31/SIB-31NB Release17	GMAT variable
StateVector	PositionX-r17	Xsat_ECEF_Coded
	PositionY-r17	Ysat_ECEF_Coded
	PositionZ-r17	Zsat_ECEF_Coded
	VelocityVX-r17	VXsat_ECEF_Coded
	VelocityVY-r17	VYsat_ECEF_Coded
	VelocityVZ-r17	VZsat_ECEF_Coded
Orbital elements	semiMajorAxis-r17	sma_ECEF_Coded
	eccentricity-r17	Excentricit_ECEF_Coded
	periapsis-r17	AOP_ECEF_Coded
	longitude-r17	RAAN_ECEF_Coded
	inclination-r17	Inc_ECEF_Coded
	meanAnomaly-r17	MeanAnom_ECEF_Coded

Table 5.2.6-1: SIB31/SIB-31NB parameter vs GMAT variable

5.2.7 Subscribers/Output

The subscribers or outputs in this context are data representation such as plots, ground track view, orbit view or results file generation.

The object has to be created from GUI "resources".

Configuration is as follows:

- Orbitview is set to default.
- Groundtrackplot is set to default, except groundstation object is enabled through the GUI.
- Result file generation

The parameters to be saved are selectable through the GUI. Variables can be added once created.

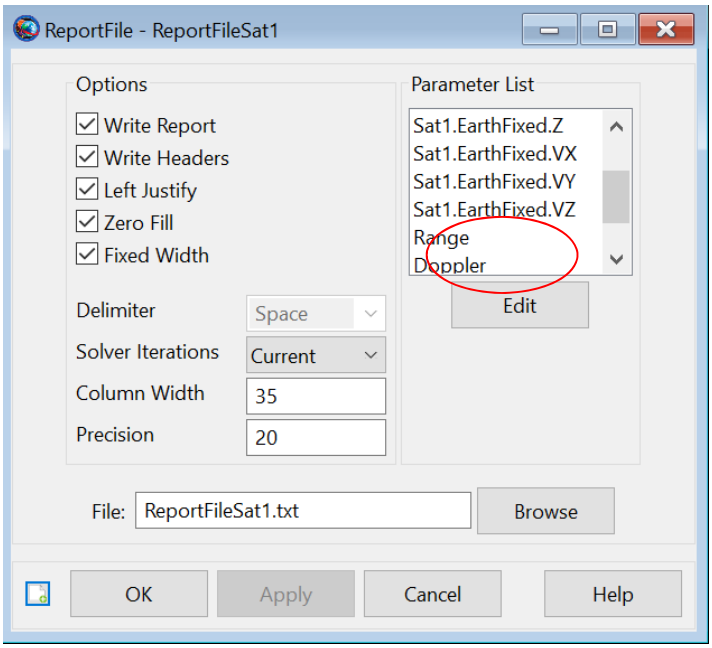

Figure 5.2.7-1: Reportfile setting for Sat1

Range, Delay, Doppler, Sat_El_GDS have been previously created variables and therefore can selected through the GUI.

The list of stored parameters for this use-case are:

- Sat_El_GDS,
- UTC_Gregorian,
- One-WayDelay,
- Xsat_ECEF_Coded,
- Ysat_ECEF_Coded,
- Zsat_ECEF_Coded,
- VXsat_ECEF_Coded,
- VYsat_ECEF_Coded,
- VZsat_ECEF_Coded,
- sma_ECEF_Coded,
- Excentricit_ECEF_Coded,
- Inc_ECEF_Coded,
- RAAN_ECEF_Coded
- AOP_ECEF_Coded,
- MeanAnom_ECEF_Coded.

5.2.8 Mission Preparation using the GUI

This mission preparation aims to define the different execution steps using the "resources" tab.

First step is to initialize the variables.

Second step is to create the logical structure While 'condition' endwhile.

The condition is related to the use of the propagator:

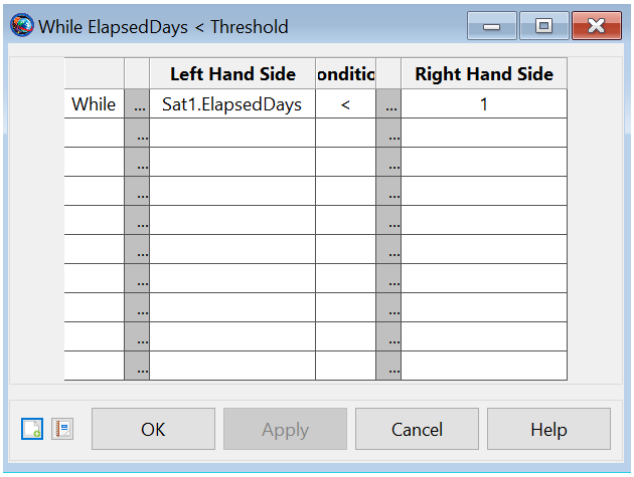

Figure 5.2.8-1: While condition for GSO satellites

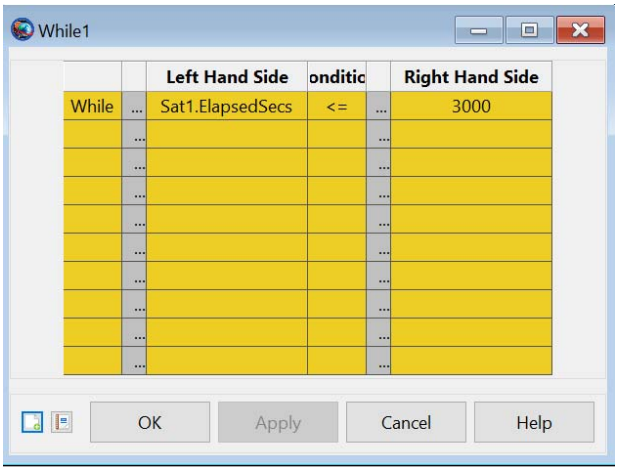

Figure 5.2.8-2: While condition for NGSO satellites

Third step is to create a verification if satellite is visible from the ground station: a logical structure "if …" is created with the condition shown in Figure 5.2.8-3.

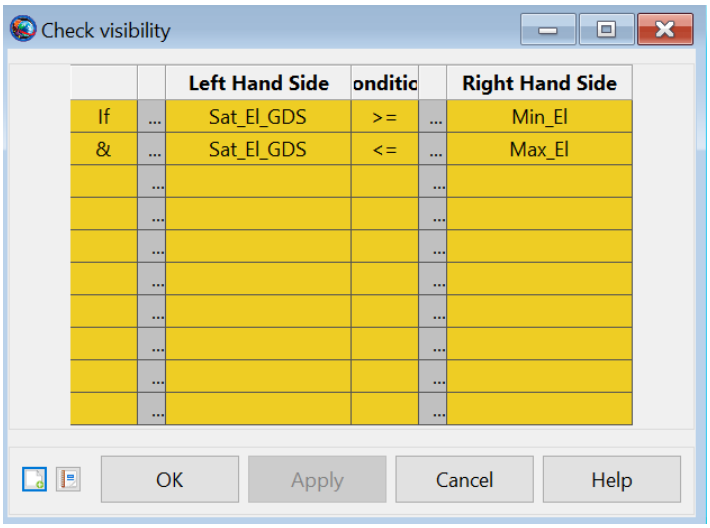

Figure 5.2.8-3: Visibility checking

5.2.9 Mission preparation using the script

After creation of the logical structure, Sat_El_GDS, range and Doppler equations need to be implemented.

Modified script is shown below to compute state vector components in SIB31/SIB-31NB decimal format.

Sat_El_GDS (elevation angle from the UE) is calculated as the elevation of the spacecraft in GDS frame.

Range and Doppler are computed in GDS frame allowing simpler calculations:

- The radial range is the norm of the Sat1 position vector;
- The radial range rate is the orthogonal projection of velocity vector on axis supported normalized Sat1 position vector;
- The Doppler effect is the minus radial range rate divided by the range and by the light celerity;
- The Delay Shift is the Delay multiplied by Doppler effect.

The resulting GSO satellite script for the while loop should be as follows:

```
BeginScript 'Initialisation'
GMAT RAAN_Init = Sat1.RAAN;
EndScript;
GMAT 'Set variable GDS_longitude to actual longitude' GDS_longitude = 121.56076999;
GMAT DeltaRAAN = Sat1.EarthFixed.PlanetodeticLON-GDS_longitude;
GMAT temp = RAAN_Init-DeltaRAAN;
GMAT Sat1.RAAN = temp;
While 'While ElapsedDays < Threshold' Sat1.ElapsedDays < 1
   GMAT Xsat_GDS = Sat1.GDS.X;
   GMAT Ysat_GDS = Sat1.GDS.Y;
   GMAT Zsat_GDS = Sat1.GDS.Z;
   GMAT VXsat_GDS = Sat1.GDS.VX;
   GMAT VYsat_GDS = Sat1.GDS.VY;
   GMAT VZsat_GDS = Sat1.GDS.VZ;
   GMAT D = sqrt(Sat1.GDS.X^2+Sat1.GDS.Y^2+Sat1.GDS.Z^2);
   GMAT Dz = Zsat_GDS;
   GMAT Dy = Ysat_GDS;
   GMAT Dx = Xsat_GDS;
```

```
   GMAT DopplerEffect =
(Xsat_GDS*VXsat_GDS+Ysat_GDS*VYsat_GDS+Zsat_GDS*VZsat_GDS)/D/LightCel;
   GMAT Doppler_ppm = DopplerEffect*1000000;
   GMAT OneWayDelay_ms = D/LightCel*1000;
   GMAT El_GDS = RadToDeg(asin(Zsat_GDS/D));
   If Xsat_GDS < 0
      GMAT El_GDS = 180-RadToDeg(asin(Zsat_GDS/D));
   EndIf;
   GMAT 'Generate Xsat_ECEF_Coded (m)' temp = Sat1.EarthFixed.X*1000/1.3;
   GMAT Xsat_ECEF_Coded_m = floor(temp+0.5);
   GMAT 'Generate Ysat_ECEF_Coded (m)' temp = Sat1.EarthFixed.Y*1000/1.3;
   GMAT Ysat_ECEF_Coded_m = floor(temp+0.5);
   GMAT 'Generate Zsat_ECEF_Coded (m)' temp = Sat1.EarthFixed.Z*1000/1.3;
   GMAT Zsat_ECEF_Coded_m = floor(temp+0.5);
   GMAT 'Generate VXsat_ECEF_Coded (m)' temp = Sat1.EarthFixed.VX*1000/0.06;
   GMAT VXsat_ECEF_Coded_m = floor(temp+0.5);
   GMAT 'Generate VYsat_ECEF_Coded (m)' temp = Sat1.EarthFixed.VY*1000/0.06;
   GMAT VYsat_ECEF_Coded_m = floor(temp+0.5);
   GMAT 'Generate VZsat_ECEF_Coded (m)' temp = Sat1.EarthFixed.VZ*1000/0.06;
   GMAT VZsat_ECEF_Coded_m = floor(temp+0.5);

   GMAT 'Generate sma_ECEF_Coded (m)' temp = (Sat1.Earth.SMA*1000-6500000)/0.004249;
   GMAT sma_ECEF_Coded_m = floor(temp+0.5);

   GMAT 'Generate Excentricity_ECEF_Coded ' temp = Sat1.Earth.ECC/0.00000001431;
   GMAT Excentricity_ECEF_Coded = floor(temp+0.5);
   GMAT 'Generate Inc_ECEF_Coded (rad)' temp = DegToRad(Sat1.EarthFixed.INC)/0.00000002341;
   GMAT Inc_ECEF_Coded = floor(temp+0.5);
   GMAT 'Generate RAAN_ECEF_Coded (rad)' temp =
DegToRad(Sat1.EarthFixed.RAAN)/0.00000002341;
   GMAT RAAN_ECEF_Coded = floor(temp+0.5);
   GMAT 'Generate AOP_ECEF_Coded (rad)' temp = DegToRad(Sat1.EarthFixed.AOP)/0.00000002341;
   GMAT AOP_ECEF_Coded = floor(temp+0.5);
   GMAT 'Generate MeanAnom_ECEF_Coded(rad)' temp = DegToRad(Sat1.Earth.MA)/0.00000002341;
   GMAT MeanAnom_ECEF_Coded = floor(temp+0.5);

   Propagate 'Prop One Step' DefaultProp(Sat1);
EndWhile;
```

The resulting NGSO satellite script for the while loop should be as follows:

```
While Sat1.ElapsedSecs <= 3000
   GMAT 'Initialize x2 with Sat1.GDSLocalFrame.X' x2 = Sat1.GDSLocalFrame.X;
   GMAT 'Initialize y2 with Sat1.GDSLocalFrame.Y' y2 = Sat1.GDSLocalFrame.Y;
   GMAT 'Initialize z2 with Sat1.GDSLocalFrame.Z' z2 = Sat1.GDSLocalFrame.Z;
   GMAT 'Initialize Vx2 with Sat1.GDSLocalFrame.VX' Vx2 = Sat1.GDSLocalFrame.VX;
   GMAT 'Initialize Vy2 with Sat1.GDSLocalFrame.VY' Vy2 = Sat1.GDSLocalFrame.VY;
   GMAT 'Initialize Vz2 with Sat1.GDSLocalFrame.VZ' Vz2 = Sat1.GDSLocalFrame.VZ;
   GMAT 'Initialize ax2 with Sat1.GDSLocalFrame.VX' ax2 =
Sat1.LowEarthProp1_ForceModel.AccelerationX;
   GMAT 'Initialize ay2 with Sat1.GDSLocalFrame.VY' ay2 =
Sat1.LowEarthProp1_ForceModel.AccelerationZ;
   GMAT 'Initialize az2 with Sat1.GDSLocalFrame.VZ' az2 =
Sat1.LowEarthProp1_ForceModel.AccelerationZ;
   GMAT 'Initialize x1 to 0' x1 = 0;
   GMAT 'Initialize y1 to 0' y1 = 0;
   GMAT 'Initialize z1 to 0' z1 = 0;
   GMAT 'Initialize Vx1 to 0' Vx1 = 0;
```

```
   GMAT 'Initialize Vy1 to 0' Vy1 = 0;
   GMAT 'Initialize Vz1 to 0' Vz1 = 0;
   GMAT 'Calculate satellite Local Elevation' Sat_El_GDS = RadToDeg(asin(z2/sqrt(x2^2+y2^2+y2^2)));
   GMAT 'Calculate satellite Local Azimuth' Sat_Az_GDS = RadToDeg(acos(x2/sqrt(x2^2+y2^2+y2^2)));
   If 'Check visibility' Sat_El_GDS >= Min_El & Sat_El_GDS <= Max_El
      GMAT 'Calculate Range' Range = sqrt((x1-x2)^2+(y1-y2)^2+(z1-z2)^2);
      GMAT 'Calculate Doppler' Doppler = - (x2*Vx2+y2*Vy2+z2*Vz2)/Range/LightCelerity;
      GMAT 'Calculate Delay' Delay = 1000*Range/LightCelerity;
      GMAT 'Calculate Delay Shift' DelayShift = Delay*Doppler;
      %GMAT 'Calculate Delay Rate' DelayRate = Delay*DopplerRate;
      GMAT 'Generate Xsat_ECEF_Coded (kms)' Xsat_ECEF_Coded =
Sat1.EarthFixed.X*1000/1.3;
      GMAT 'Generate Ysat_ECEF_Coded (kms)' Ysat_ECEF_Coded =
Sat1.EarthFixed.Y*1000/1.3;
      GMAT 'Generate Zsat_ECEF_Coded (kms)' Zsat_ECEF_Coded =
Sat1.EarthFixed.Z*1000/1.3;
      GMAT 'Generate VXsat_ECEF_Coded (kms)' VXsat_ECEF_Coded =
Sat1.EarthFixed.VX*1000/0.06;
      GMAT 'Generate VYsat_ECEF_Coded (kms)' VYsat_ECEF_Coded =
Sat1.EarthFixed.VY*1000/0.06;
      GMAT 'Generate VZsat_ECEF_Coded (kms)' VZsat_ECEF_Coded = Sat1.EarthFixed.VZ*1000/0.06;
      GMAT 'Generate sma_ECEF_Coded (kms)' sma_ECEF_Coded = (Sat1.Earth.SMA*1000-
6500000)/0.004249;
      GMAT 'Generate Excentricit_ECEF_Coded (kms)' Excentricit_ECEF_Coded =
Sat1.Earth.ECC/0.00000001431;
      GMAT 'Generate Inc_ECEF_Coded (kms)' Inc_ECEF_Coded =
DegToRad(Sat1.EarthFixed.INC)/0.00000002341;
      GMAT 'Generate RAAN_ECEF_Coded (kms)' RAAN_ECEF_Coded =
DegToRad(Sat1.EarthFixed.RAAN)/0.00000002341;
      GMAT 'Generate AOP_ECEF_Coded (kms)' AOP_ECEF_Coded =
DegToRad(Sat1.EarthFixed.AOP)/0.00000002341;
      GMAT 'Generate MeanAnom_ECEF_Coded (kms)' MeanAnom_ECEF_Coded =
DegToRad(Sat1.Earth.MA)/0.00000002341;

   Else
      GMAT 'Non visible set Range to 0' Range = 0;
      GMAT 'Non visible set Doppler to 0' Doppler = 0;
      GMAT 'Non visible set Doppler Rate to 0' DopplerRate = 0;
      GMAT 'Non visible set Delay to 0' Delay = 0;
      GMAT 'Non visible set DelayShift to 0' DelayShift = 0;
      GMAT 'Non visible set DelayRate' DelayRate = 0;
      GMAT 'Generate Xsat_ECEF_Coded (kms)' Xsat_ECEF_Coded = 0;
      GMAT 'Generate Ysat_ECEF_Coded (kms)' Ysat_ECEF_Coded = 0;
      GMAT 'Generate Zsat_ECEF_Coded (kms)' Zsat_ECEF_Coded = 0;
      GMAT 'Generate VXsat_ECEF_Coded (kms)' VXsat_ECEF_Coded = 0;
      GMAT 'Generate VYsat_ECEF_Coded (kms)' VYsat_ECEF_Coded = 0;
      GMAT 'Generate VZsat_ECEF_Coded (kms)' VZsat_ECEF_Coded = 0
.....GMAT 'Generate sma_ECEF_Coded (kms)' sma_ECEF_Coded = 0;
      GMAT 'Generate Excentricit_ECEF_Coded (kms)' Excentricit_ECEF_Coded =0;
      GMAT 'Generate Inc_ECEF_Coded (kms)' Inc_ECEF_Coded = 0;
      GMAT 'Generate RAAN_ECEF_Coded (kms)' RAAN_ECEF_Coded = 0;
      GMAT 'Generate AOP_ECEF_Coded (kms)' AOP_ECEF_Coded = 0;
      GMAT 'Generate MeanAnom_ECEF_Coded (kms)' MeanAnom_ECEF_Coded =0;
      GMAT Zsat_ECEF_Coded (kms)' VZsat_ECEF_Coded = 0;
   EndIf;
   Propagate 'Propagate Sat1' LowEarthProp1(Sat1);
EndWhile;
```

Coding of satellite position and velocity components using transfert functions

The generated report files for SIB31/SIB-31NB containing ephemeris for the whole simulation time base on satellite propagator model are attached to this technical report.

To be noticed that in case of NGSO satellites, output variables Doppler. Doppler rate, Delay and Delay shift are set to 0 when satellite is not visible from ground station.

Units:

- Satellite elevation in UE frame in degree,
- One-way Delay in ms,
- Doppler in ppm,
- position for SIB31/SIB-31NB in INTEGER,
- velocity component for SIB31/SIB-31NB in INTEGER.

5.3 Assumptions for satellite ephemeris calculation

The following assumptions have been considered to calculate satellite ephemeris:

- UE location and satellite location shall be such that it allows the definition of ephemeris for RRM test cases such that elevation angle perceived by the UE i.a equal or higher than 30º for both serving and neighbour cells.
- For GSO satellites, a satellite orbit inclination over the equator of 7 degrees is a representative worst case.
- Ephemeris granularity for GSO satellites to be 2.56s while it is 0.64 ms for NGSO satellites.
- StateVectors and Orbital parameters ephemeris format shall be generated.
- Ephemeris files shall include the full orbit for GSO satellites and the satellite visibility window for NGSO satellite including all possible elevation angles.
- Ephemeris calculated should include additional information such as elevation angle, one-way delay and Doppler effect in [ppm] to enable the checking of related signalled parameters.
- When defining ephemeris for neighbour cell for IoT NTN, assume that neighbour cell satellite type is same as serving cell, including its altitude.
- When defining ephemeris for GEO neighbour cells, consider satellites in different orbits so there is some difference in elevation angles for the satellite in charge of serving cell and the one in charge of the neighbour cell.
- GSO orbits can be leveraged to gather ephemeris for serving and neighbour cell for GEO satellites (using zero Doppler conditions within the GSO orbits).

5.4 Satellite Ephemeris generated files

This section contains information about the satellite orbits generated according to the procedure defined in clause 5.2.

Table 5.4-1: Satellite ephemeris files generated for IoT NTN

Satellite Type	Satellite parameters	UE location	Applicable to Serving cell / Neighbour cell	File can be found in attachment	Comments
GSO	7º inclination Satellite longitude: 121.56076999 Satellite altitude: 35786 km	Longitude: 121.56076999 Latitude: 55.0 Altitude: 0	Serving cell	"ReportFile2_GSO-Inc7deg-Lat55-Long121.56076999-Step2.56sec-v2.zip"	Added in RAN5#102
GSO	7º inclination Satellite longitude: 101.56076999 Satellite altitude: 35786 km	Longitude: 121.56076999 Latitude: 55.0 Altitude: 0	Neighbour cell	"ReportFile2_GSO-SATLong101.56076999-UELong121.56076999_Lat55-Inc7_v2.zip"	Added in RAN5#102
GSO	7º inclination Satellite longitude: 141.56076999 Satellite altitude: 35786 km	Longitude: 121.56076999 Latitude: 55.0 Altitude: 0	Neighbour cell	"ReportFile2_GSO-SATLong141.56076999-UELong121.56076999_Lat55-Inc7_v2.zip"	Added in RAN5#102
NGSO	Satellite altitude 600 km	Longitude: 121.56076999 Latitude: 25.08439333 Altitude: 0	Serving cell	"ReportFile-NGSO-LEO600km-MinElev0-Lat25.08439333-Long121.56076999-Step0.640sec.zip"	Added in RAN5#102
NGSO	Satellite altitude 1200 km	Longitude: 121.56076999 Latitude: 25.08439333 Altitude: 0	Serving cell	"ReportFile-NGSO-LEO1200km-MinElev0-Lat25.08439333-Long121.56076999-Step0.640sec.zip"	Added in RAN5#102

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 analysis 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
2024-03	RAN#103	R5-241202	0271	-	Adding Test Point Analysis for 4DL and 5DL RefSens	18.3.0	18.4.0
2024-03	RAN#103	R5-241955	0272	1	Description of ephemeris calculation process	18.3.0	18.4.0

History

Document history		
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