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Derivation of test points for radio transmission and reception User Equipment (UE) conformance test cases (3GPP TR 38.905 version 18.2.0 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
Association à but non lucratif enregistrée à la
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Contents

Foreword

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

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1 Scope

The present document specifies and contains the derivation of Test Points for NR RF test cases, thereby 3GPP TSG RAN WG5 will have a way of storing the input contributions provided. The test cases are described in TS38.521-1[2], TS38.521-2[3] and TS38.521-3[4],

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

The present document is applicable from Release 15 up to the release indicated on the front page of the present Terminal conformance specifications.

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*

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

[2] 3GPP TS 38.521-1: "NR; UE conformance specification; Radio transmission and reception; Part 1: NR range 1".

[3] 3GPP TS 38.521-2: "NR; UE conformance specification; Radio transmission and reception; Part 2: NR range 2".

[4] 3GPP TS 38.521-3: "NR; UE conformance specification; Radio transmission and reception; Part 3: NR interworking between NR range1 + NR range2 and between NR and LTE".

[5] 3GPP TS 38.101-1: “NR; User Equipment (UE) radio transmission and reception; Part 1: Range 1 Standalone”.

[6] 3GPP TS 38.101-2: “NR; User Equipment (UE) radio transmission and reception; Part 2: Range 2 Standalone”.

[7] 3GPP TS 38.101-3: “NR; User Equipment (UE) radio transmission and reception; Part 3: Range 1 and Range 2 Interworking operation with other radios”.

[8] 3GPP TS 36.101: Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception”.

[9] R5-206841: “Discussion on test points in Receiver test cases for EN-DC configurations with exception requirements”.

[10] 3GPP TS 38.521-5: “NR; UE conformance specification; Radio transmission and reception; Part 5: Satellite access Radio Frequency (RF) and performance requirements”.

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

Other definitions used in the present document are listed in 3GPP TS 38.521-1 [2], 3GPP TS 38.521-2 [3] or 3GPP TS 38.521-3 [4].

Editor's note: intended to capture definitions

3.2 Symbols

Symbols used in the present document are listed in 3GPP TR 21.905 [1], 3GPP TS 38.521-1 [2], 3GPP TS 38.521-2 [3] or 3GPP TS 38.521-3 [4].

Editor's note: intended to capture definitions

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 38.521-1 [2], or 3GPP, 3GPP TS 38.521-1 [2], 3GPP TS 38.521-2 [3] or 3GPP TS 38.521-3 [4].

A-SE	Additional spurious emissions
A-SEM	Spectrum Emission Mask

4 Test coverage analysis

This clause contains information on test point analysis and test point selection for RX and TX test configuration tables in [2], [3] and [4]. The test point analysis should include selection of:

- Test environment
- Test frequencies
- Test channel bandwidth
- Test Subcarrier Spacing (SCS)
- Downlink configuration including modulation and RB allocation
- Uplink configuration including modulation and RB allocation
- Number of test points

4.1 Test point analysis for FR1 test cases in TS 38.521-1

4.1.1 Test point analysis per test case

4.1.1.1 FR1 single carrier, NR CA and UL MIMO test cases

This clause contains information on test point analysis and test point selection for single carrier, NR CA and UL MIMO test cases in [2] clause 6 and 7 with information about transmitting test point selection for FR1 listed in table 4.1.1.1-1 and receiver test point selection in table 4.1.1.1-2.

Table 4.1.1.1-1: NR UE transmitter test point selection for FR1

Subclause	Number of test points	Justification in attachment	Comments
6.2.1 UE maximum output power	540	“38.521-1_TPanalysis_6.2.1_MaxOP_v3.zip”	RAN5#89-e
6.2.2 Maximum Output Power Reduction (MPR)	contiguous allocation: 920 (1040[1],1000[2,3]) almost contiguous allocation: 120	”38.521-1_TPanalysis_6.2.2_MPR_6.5.2.2_SEM_6.5.2.4.1_NR_ACLR_v5.zip”	RAN5#99
6.2.3 UE A-MPR	See clause 4.1.2.1	See clause 4.1.2.1	See clause 4.1.2.1
6.2.4 Configured Transmitted Power	30	“38.521-1_TPanalysis_6.2.4_ConfigTP_v1.zip”	RAN5#91-e
6.2A.1.1 UE maximum output power for CA (2UL CA)	240	“38.521-1_TPanalysis_6.2A.1_MOP”	RAN5#83
6.2A.2.1 Maximum power reduction (MPR) for CA (2UL CA)	For inter-band CA:1480 For intra-band contiguous CA: 720 (contiguous RB allocation) 1080 (non-contiguous RB allocation) For intra-band non-contiguous CA: 2880	“38.521-1_TPanalysis_6.2A.2_MPR_6.5A.2.4.1_ACLR_6.5A.2.2.1_SEM”	RAN5#98
6.2A.4 Configured transmitted power for CA	Inter-band CA:20 Intra-band contiguous CA: 20 Intra-band non-contiguous CA:20	“38.521-1_TPanalysis_6.2A.4_ConfigTP_v2.zip”	RAN5#101
6.2C.1 Configured UE transmitted Output Power	270	“38.521-1_TPanalysis_6.2C.1_ConfigOPSUL.zip”	RAN5#80
6.2D.1 UE maximum output power for UL-MIMO	UL MIMO with ULFPTx: 540 UL MIMO with 2-layer: 0	“38.521-1_TPanalysis_6.2.1_MaxOP_v3.zip”	RAN5#89-e
6.2D.2 Maximum Power Reduction (MPR) for UL MIMO	UL MIMO with 2-layer: 400 UL MIMO with ULFPTx: 920	“38.521-1_TPanalysis_6.2.2_MPR_6.5.2.2_SEM_6.5.2.4.1_NR_ACLR_v5.zip	RAN5#99
6.2D.3 UE additional maximum output power reduction for UL-MIMO	Table 4.1.2.1-1	Table 4.1.2.1-1	See Table 4.1.2.1-1
6.2D.4 Configured Transmitted Power for UL-MIMO	15	“38.521-1_TPanalysis_6.2.4_ConfigTP_v1.zip”	RAN5#91-e
6.3.1 Minimum output power	45	“38.521-1_TPanalysis_6.3.1_MinOP_v3.zip”	RAN5#5-5G-NR Adhoc
6.3.3.2 General ON/OFF time mask	180	“38.521-1_TPanalysis_6.3.3.2_OnOff_M_v2.zip”	RAN5#5-5G-NR Adhoc
6.3.3.4 PRACH time mask		“38.521-1_TPanalysis_6.3.3.4_PRACH.zip”	RAN5#96-e
6.3.3.6 SRS time mask	30	“38.521-1_TPanalysis_6.3.3.3_SRS.zip”	RAN5#82
6.3.4.2 Absolute power tolerance	6	“38.521-1_TPanalysis_6.3.4.2_AbsPtol_v2.zip”	RAN5#83
6.3.4.3 Relative power tolerance	TBD	“38.521-1_TPanalysis_6.3.4.3_RelPtol_v2.zip”	RAN5#83

6.3.4.4 Aggregate power tolerance	PUCCH: 6 PUSCH: 6	"38.521-1_TPanalysis_6.3.4.4_AggPtol_v2.zip"	RAN5#83
6.3A.1.1 Minimum output power for CA (2UL CA)	20	38.521-1_TPanalysis_6.3A.1.1_MinOP_CA_v1.zip	RAN5#101
6.3A.3.1 Transmit ON/OFF time mask for CA (2UL CA)	40	"38.521-1_TPanalysis_6.3A.3.1_OnOff_M_CA_v1.zip"	RAN5#99
6.3A.3.2 Time mask for switching between two uplink carriers	1	"38.521-1_TPanalysis_6.3C.3.2_SULTxSwitch_M_v1.zip"	RAN5#102
6.3A.3.3 Time mask for switching between two uplink carriers	1	"38.521-1_TPanalysis_6.3C.3.2_SULTxSwitch_M_v1.zip"	RAN5#102
6.3A.3.4 Time mask for switching between one uplink band with one transmit antenna connector and one uplink band with two transmit antenna connectors (3UL CA)	1	"38.521-1_TPanalysis_6.3C.3.2_SULTxSwitch_M_v1.zip"	RAN5#102
6.3A.3.5 Time mask for switching between two uplink bands with two transmit antenna connectors (3UL CA)	1	"38.521-1_TPanalysis_6.3C.3.2_SULTxSwitch_M_v1.zip"	RAN5#102
6.3A.4.1 Absolute power tolerance for CA (2UL CA)	Intra-band contiguous CA:4 Intra-band non-contiguous CA:2	"38.521-1_TPanalysis_6.3A.4.1_Abs_PTol_CA_v3.zip"	RAN5#95-e
6.3A.4.2 Relative power tolerance for CA (2UL CA)	TBD	"38.521-1_TPanalysis_6.3A.4.2_Rel_PTol_CA_v1.zip"	RAN5#92-e
6.3A.4.3 Aggregate power tolerance for CA (2UL CA)	PUCCH:4 PUSCH:4	"38.521-1_TPanalysis_6.3A.4.3_Agg_PTol_CA_v1.zip"	RAN5#92-e
6.3D.1 Minimum output power for UL-MIMO	45	"38.521-1_TPanalysis_6.3.1_MinOP_v3.zip"	RAN5#5-5G-NR Adhoc
6.3D.3 Transmit ON/OFF time mask for UL-MIMO	TBD	"38.521-1_TPanalysis_6.3.3.2_OnOff_M_v2.zip"	RAN5#5-5G-NR Adhoc
6.3D.4.1 Absolute Power tolerance for UL-MIMO	6	"38.521-1_TPanalysis_6.3.4.2_AbsPtol_v2.zip"	RAN5#83
6.3D.4.2 Relative Power Tolerance for UL-MIMO	TBD	"38.521-1_TPanalysis_6.3.4.3_RelPtol_v2.zip"	RAN5#83
6.3D.4.3 Aggregate Power tolerance for UL-MIMO	PUCCH: 6 PUSCH: 6	"38.521-1_TPanalysis_6.3.4.4_AggPtol_v2.zip"	RAN5#83
6.4.1 Frequency error	5	"38.521-1_TPanalysis_6.4.1_FreqErr_v3.zip"	RAN5#84
6.4.2.1 Error Vector Magnitude	PUSCH: 252 PUCCH: 36 PRACH: 36	"38.521-1_TPanalysis_6.4.2.1_EVM_v3.zip"	RAN5#94-e
6.4.2.1a Error Vector Magnitude including symbols with transient period	PUSCH: 36	"38.521-1_TPanalysis_6.4.2.1_EVM_v3.zip"	RAN5#94e
6.4.2.2 Carrier leakage	3	"38.521-1_TPanalysis_6.4.2.2_CarrLeak_v2.zip"	RAN5#84
6.4.2.3 In-band emissions	36	"38.521-1_TPanalysis_6.4.2.3_IE_2.zip"	RAN5#84
6.4.2.4 EVM equalizer spectrum flatness	90	"38.521-1 TPanalysis_6.4.2.4_EVMequalizerSpectrumFlatness_v3.zip"	RAN5#84

6.4.2.5 EVM equalizer spectrum flatness for Pi/2 BPSK	9	"38.521-1 TPanalysis_6.4.2.5_EVMequalizerSpectrumFlatness_BPSK_v2.zip"	RAN5#92-e
6.4.2.6 Phase continuity requirements for DMRS bundling	PUSCH:36 PUCCH:36	38.521-1_TPanalysis_6.4.2.6_Phase_Continuity_v2.zip	RAN5#102
6.4A.1.1 Frequency error for CA (2UL CA)	Inter-band:5 Intra-band contiguous:5 Intra-band non-congituous:5	"38.521-1_TPanalysis on 6.4A.1.1_FreqErr_v1.zip"	RAN5#101
6.4A.2.1.1 Error Vector Magnitude for CA (2UL CA)	inter-band CA:112 Intra-band CA:144	"38.521-1_TPanalysis on 6.4A.2.1.1_EVM_v1.zip"	RAN5#100
6.4A.2.2.1 Carrier leakage for CA (2UL CA)	2	"38.521-1_TPanalysis on 6.4A.2.2.1_CarrLeak_v1.zip"	RAN5#101
6.4A.2.3.1 In-band emissions for CA (2UL CA)	16	"38.521-1_TPanalysis on 6.4A.2.2.1_IBE_v1.zip"	RAN5#101
6.4D.1 Frequency error	5	"38.521-1_TPanalysis_6.4.1_FreqErr_v3.zip"	RAN5#84
6.4D.2.1 Error Vector Magnitude for UL MIMO	PUSCH: 108	"38.521-1_TPanalysis on 6.4.2.1_EVM_v3.zip"	RAN5#94-e
6.4D.2.2 Carrier leakage for UL MIMO	3	"38.521-1_TPanalysis on 6.4.2.2_CarrLeak_v2.zip"	RAN5#84
6.4D.2.3 In-band emissions for UL MIMO	18	"38.521-1_TPanalysis_6.4.2.3_IE_2.zip"	RAN5#84
6.4D.2.4 EVM equalizer spectrum flatness for UL MIMO	45	"38.521-1_TPanalysis_6.4.2.4_EVMequalizerSpectrumFlatness_v3.zip"	RAN5#84
6.4D.3 Time alignment error for UL-MIMO	6	"38.521-1_TP analysis_6.4D.3_6.4H.1.3_TAE_MIMO_v1.zip"	RAN5#102
6.5.1 Occupied bandwidth	10	"38.521-1_TPanalysis_6.5.1_OccBW_v3.zip	RAN5#92-e
6.5.2.2 Spectrum Emission Mask	contiguous allocation: 144 (168[1], 160[2,3]) almost contiguous allocation: 24	"38.521-1_TPanalysis_6.2.2_MPR_6.5.2.2_SEM_6.5.2.4.1_NR_ACLR_v5.zip"	RAN5#99
6.5D.2.3 Additional spectrum emission mask for UL-MIMO	Table 4.1.2.1-1	Table 4.1.2.1-1	See Table 4.1.2.1-1
6.5.2.4.1 NR Adjacent channel leakage ratio	contiguous allocation: 920 (1040[1], 1000[2,3]) almost contiguous allocation: 120	"38.521-1_TPanalysis_6.2.2_MPR_6.5.2.2_SEM_6.5.2.4.1_NR_ACLR_v5.zip"	RAN5#99
6.5.2.4.2 UTRA ACLR	Same as NS_3U, NS_5U ,NS_43U, and NS_100 in Table 4.1.1.1-1	"38.521-1_TPanalysis_6.5.2.4.2_UTRA ACLR_v3.zip"	RAN5#91-e
6.5.3.1 General spurious emissions	27	"38.521-1_TP analysis_6.5.3.1_TX_Spurious_Emission_v1.zip"	RAN5#89-e
6.5.3.2 Spurious emissions for UE co-existence	27	"38.521-1_TP analysis_6.5.3.1_TX_Spurious_Emission_v1.zip"	RAN5#89-e
6.5.3.3 Additional spurious emissions	See Table 4.1.2.1-1	See Table 4.1.2.1-1	See Table 4.1.2.1-1
6.5.4 Transmit intermodulation	8	"38.521-1_TPanalysis_6.5.4_TxIm_v3.zip"	RAN5#100

6.5A.1.1 Occupied bandwidth for CA (2UL CA)	Inter-band: 2 Intra-band contiguous: 1 Intra-band non-contiguous: 1	"38.521-1_TPanalysis_6.5A.1.1_OccBW_v2.zip"	RAN5#92-e
6.5A.2.2.1 Spectrum emission mask for CA (2UL CA)	Inter-band CA:112 Intra-band contiguous CA:72 Intra-band non-contiguous CA:72	"38.521-1_TPanalysis_6.2A.2_MPR_6.5A.2.4.1_ACLR_6.5A.2.2.1_SEM"	RAN5#98
6.5A.2.4.1.1 NR ACLR for CA (2UL CA)	For inter-band CA:1480 For intra-band contiguous CA: 720 (contiguous RB allocation) 1080 (non-contiguous RB allocation) For intra-band non-contiguous CA: 2880	"38.521-1_TPanalysis_6.2A.2_MPR_6.5A.2.4.1_ACLR_6.5A.2.2.1_SEM"	RAN5#98
6.5A.2.4.2.1 UTRA ACLR for CA (2UL CA)	840	"38.521-1_TPanalysis on 6.5A.2.4.2.1 UTRA ACLR .zip"	RAN5#82
6.5A.3.1.1 General spurious emissions for CA (2UL CA)	For inter-band CA: 12 For intra-band contiguous CA: 20 For intra-band non-contiguous CA: 12	"38.521-1_TPanalysis_6.5A.3.1.1_Spurious_v3.zip"	RAN5#101
6.5A.3.2.1 Spurious emissions for UE co-existence for CA (2UL CA)	For inter-band CA See table 4.1.3.2-1 For intra-band contiguous CA: 8 For intra-band non-contiguous CA: 4	"38.521-1_TPanalysis_6.5A.3.2.1_SECoex_v3.zip"	RAN5#100
6.5A.4.1 Transmit intermodulation for CA (2UL CA)	16	"38.521-1_TPanalysis on 6.5A.4.1_TxIM_v1.zip"	RAN5#101
6.5D.1 Occupied bandwidth for UL-MIMO	10	38.521-1_TPanalysis_6.5.1_OBW_v3.zip	RAN5#92-e
6.5D.2.2 Spectrum emission mask for UL MIMO	UL MIMO with 2-layer: 64 UL MIMO with ULFPTx: 144	"38.521-1_TPanalysis_6.2.2_MPR_6.5.2.2_SEM_6.5.2.4.1_NR_ACLR_v5.zip"	RAN5#99
6.5D.2.4.1 NR ACLR for UL-MIMO	UL MIMO with 2-layer: 400 UL MIMO with ULFPTx: 920	"38.521-1_TPanalysis_6.2.2_MPR_6.5.2.2_SEM_6.5.2.4.1_NR_ACLR_v5.zip	RAN5#99
6.5D.2.4.2 UTRA ACLR for UL-MIMO	96 for NS_3U	"38.521-1_TPanalysis_6.5D.2.4.2_UTRA ALCR_NS_3U_v1.zip" "38.521-1_TPanalysis_6.5.2.4.2_UTRA ACLR_v3.zip"	RAN5#5-5G-NR Adhoc
6.5D.2_1.4.2 UTRA ACLR for UL MIMO (Rel-16 onward)	216 for NS_3U	"38.521-1_TPanalysis_6.5D.2.4.2_UTRA ALCR_NS_3U_v1.zip" "38.521-1_TPanalysis_6.5.2.4.2_UTRA ACLR_v3.zip"	RAN5#90-e
6.5D.3.1 General spurious emissions	27	"38.521-1_TP analysis_6.5.3.1_TX_Spurious_Emission_v1.zip"	RAN5#89-e

6.5D.3.2 Spurious emissions for UE co-existence for UL-MIMO	27	"38.521-1_TP analysis_6.5.3.1_TX_Spurious_Emission_v1.zip"	RAN5#89-e
6.5D.3.3 Additional spurious emissions for UL-MIMO	Table 4.1.2.1-1	Table 4.1.2.1-1	RAN5#5-5G-NR Adhoc
6.5D.3_1.1 General spurious emissions (Rel-16 onward)	27	"38.521-1_TP analysis_6.5.3.1_TX_Spurious_Emission_v1.zip"	RAN5#89-e
6.5D.3_1.2 Spurious emissions for UE co-existence for UL-MIMO (Rel-16 onward)	27	"38.521-1_TP analysis_6.5.3.1_TX_Spurious_Emission_v1.zip"	RAN5#89-e
6.5D.3_1.3 Additional spurious emissions for UL-MIMO (Rel-16 onward)	Table 4.1.1.1-1	Table 4.1.1.1-1	RAN5#89-e
6.5D.4 Transmit intermodulation for UL-MIMO		"38.521-1_TPanalysis_6.5.4_TxIm_v2.zip"	RAN5#82
NOTE 1: For power class 3 UE operating in bands n40, n41, n77, n78 and n79. NOTE 2: UE operating in FDD mode, or in TDD mode in bands other than n40, n41, n77, n78 and n79, or in TDD mode the IE powerBoostPi2BPSK is set to 0 for bands n40, n41, n77, n78 and n79. NOTE 3: UEs supporting pi/2 BPSK DMRS and the corresponding IE [DMRSPi2BPSK] is set to 1. NOTE 4: The maximum number of test point is 24 if only default points are applied.			

Table 4.1.1.1-2: NR UE receiver test point selection for FR1

Subclause	Number of test points	Justification in attachment	Comments
7.3 Reference sensitivity power level	symmetric channel bandwidths: 45 asymmetric channel bandwidths: 30	“38.521-1_TPanalysis_7.3_RefSense_v4.zip”	RAN5#95-e
7.3A Reference sensitivity for CA	See clause 4.1.3	See clause 4.1.3	See clause 4.1.3
7.3D.2 Reference sensitivity power level for UL-MIMO	45	“38.521-1_TPanalysis_7.3_RefSense_v4.zip”	RAN5#95-e
7.4 Maximum input level	symmetric channel bandwidths: 9 asymmetric channel bandwidths: 6	38.521-1_TPanalysis_7.4_Maximun input level_v4.zip“”	RAN5#100
7.4A Maximum input level for CA	2CC:3 3CC:3	“38.521-1_TPanalysis 7.4A maxIL for CA_v2.zip”	RAN5#100
7.4D Maximum input level for UL-MIMO	6	“38.521-1_TPanalysis_7.4_Maximun input level_v3.zip”	RAN5#96-e
7.5 Adjacent Channel Selectivity	symmetric channel bandwidths: 3 asymmetric channel bandwidths: 2	“38.521-1_TPanalysis_7.5_ACS_v3.zip”	RAN5#96-e
7.5A Adjacent channel selectivity for DL CA	intra-band contiguous CA: 2 inter-band CA: 1	“38.521-1_TPanalysis_7.5A.1_ACS_2CA.zip”	RAN5#83
7.5D Adjacent Channel Selectivity for UL-MIMO	3	“38.521-1_TPanalysis_7.5_ACS_v2.zip”	RAN5#82
7.6.2 In Band Blocking	symmetric channel bandwidths: 3 asymmetric channel bandwidths: 2	“38.521-1_TPanalysis_7.6.2_InB_Block_v3.zip”	RAN5#96-e
7.6.3 Out-of-band blocking	symmetric channel bandwidths: 3 asymmetric channel bandwidths: 2	“38.521-1_TPanalysis_7.6.3_OobBlocking_v3.zip”	RAN5#96-e
7.6.4 Narrow band blocking	symmetric channel bandwidths: 3 asymmetric channel bandwidths: 2	“38.521-1_TPanalysis_7.6.4_NarrowbBlocking_v3.zip”	RAN5#96-e
7.6A.2 Inband blocking for CA 2CC: 3CC:1	1	“38.521-1_TPanalysis 7.6A.2 IBB for CA_v1.zip”	RAN5#89-e
7.6A.3 Out-of-band blocking for CA	1	“38.521-1_TPanalysis_7.6A.3 Out-of-band blocking for CA_v1.zip”	RAN5#86-e
7.6A.4 Narrow band blocking for CA	1	“38.521-1_TPanalysis_7.6A.4 Narrow band blocking for CA_v1.zip”	RAN5#86-e
7.6D.2 Inband blocking for UL-MIMO	3	“38.521-1_TPanalysis_7.6.2_InB_Block_v3.zip”	RAN5#96-e
7.6D.3 Out-of-band blocking for UL-MIMO	3	“38.521-1_TPanalysis_7.6.3_OobBlocking_v3.zip”	RAN5#96-e
7.6D.4 Narrow band blocking for UL-MIMO	3	“38.521-1_TPanalysis_7.6.4_NarrowbBlocking_v3.zip”	RAN5#96-e

7.7 Spurious response	symmetric channel bandwidths: 3 asymmetric channel bandwidths: 2	"38.521-1_TPanalysis_7.7_Spurious response_v2.zip"	RAN5#96-e
7.7D Spurious response for UL-MIMO	3	"38.521-1_TPanalysis_7.7_Spurious response_v2.zip"	RAN5#96-e
7.8.2 Wide band Intermodulation	symmetric channel bandwidths: 3 asymmetric channel bandwidths: 2	"38.521-1_TPanalysis_7.8.2_WidebandIntermod_v3.zip"	RAN5#96-e
7.8A Wide band Intermodulation for CA	1	"38.521-1_TPanalysis_7.8A Wide band Intermodulation for CA_v1.zip"	RAN5#86-e
7.8D.2 Wide band Intermodulation for UL-MIMO	3	"38.521-1_TPanalysis_7.8.2_WidebandIntermod_v3.zip"	RAN5#96-e
7.9 Spurious emissions	3	"38.521-1_TPanalysis_7.9_RxSpurious.zip"	RAN5#81

4.1.1.2 FR1 SUL test cases

This section contains information on test point selection for SUL test cases in [2]. The basic principle is following the same rules for test point selection in single carrier test cases. In these SUL test cases, there are default test points to be used unless SUL configuration specific test points are over-ruling.

Basic rules for Tx SUL test cases:

For Test environment: Adopt the same selection of test environment in corresponding single carrier test cases.

For Test frequency: Considering that Non-SUL carrier should have no impact on SUL carrier testing results, for any SUL configurations, Mid range is chosen as default for Non-SUL carrier. Select the same test frequency in corresponding single carrier test cases for SUL carrier.

For Test SCS: Considering lowest supported SCS can obtain minimum guardband and maximum spectrum utilization, and only 15 kHz SCS is supported for SUL band in SUL configurations, it's reasonable to select 15 kHz SCS for SUL carrier and lowest supported SCS for Non-SUL carrier regardless of SUL configurations.

For Test channel bandwidths: Under the limit of 15 kHz SCS, only the lowest channel bandwidth is supported for current Non-SUL bands in SUL configurations, which are band n78 and n79. Select the lowest channel bandwidth that support 15kHz SCS for Non-SUL carrier. Select the same test channel bandwidths as in corresponding single carrier test cases for SUL carrier.

For waveform, modulation and RB allocations: Adopt the same selection of test configurations as in corresponding single carrier test cases for SUL carrier.

Basic rules for Rx SUL test cases:

In Rx testing for SUL, test point selection in clause 7.3C and 7.6C need to be defined. Considering the focus of Rx test cases is testing DL bands, the configuration of SUL carrier shall be selected to ensure the test coverage without costing too much testing time. The configuration of Non-SUL carrier shall be selected based on the same principle as single carrier test cases. The basic test point selection rule for Rx SUL test cases is specified as below:

For Test environment: Adopt the same selection of test environment in corresponding single carrier test cases.

For Test frequency: The Non-SUL carrier should select the same test frequency as corresponding single carrier test cases. Select Mid range as default for SUL carrier.

For Test SCS: Since the REFSENS requirement for SUL is specified for 15 kHz SCS for SUL band and the test point selection of clause 7.6C is also based on that of clause 7.3C, 15 kHz SCS should be selected for SUL carrier. For the Non-SUL carrier the SCS should be selected following the same rule as single carrier testing.

For test channel bandwidths: Highest channel bandwidth when SCS =15 kHz for SUL shall be selected for SUL carrier. For the Non-SUL carrier the channel bandwidth should be selected following the same rule as single carrier testing.

For waveform, modulation and RB allocations: Adopt the same selection of test configurations as single carrier test cases for Non-SUL carrier. SUL carrier select DFT-s-OFDM QPSK. The RB allocation of SUL carrier shall fulfill the requirement in clause 7.3C.0 in TS 38.521-1.

Number of test points for SUL test cases in FR1 are listed in table 4.1.1.2-1 and table 4.1.1.2-2.

Table 4.1.1.2-1: Number of test points for SUL test cases in FR1 (NR UE Transmitter test)

Subclause	Number of test points	Comments
6.2C.1 Configured transmitted power for SUL	30	RAN5#86e
6.2C.3 UE maximum output power for SUL	270	RAN5#86e
6.2C.4 UE maximum output power reduction for SUL	460 (500[1])	RAN5#90e
6.2C.5 UE additional maximum output power reduction for SUL	Table 4.1.2.1-1	RAN5#87e
6.3C.1 Minimum output power for SUL	45	RAN5#87e
6.3C.3.1 Transmit ON/OFF time mask for SUL	45	RAN5#87e
6.3C.3.2 General transmit ON/OFF time mask for switching between two uplink carriers	1	RAN5#96e
6.3C.3.3 Time mask for switching between two uplink carriers with two transmit antenna connectors	1	RAN5#102
6.3A.3.4 Time mask for switching between one uplink band with one transmit antenna connector and one uplink band with two transmit antenna connectors (3UL CA)	1	RAN5#102
6.3A.3.5 Time mask for switching between two uplink bands with two transmit antenna connectors (3UL CA)	1	RAN5#102
6.3C.4.1 Absolute power tolerance for SUL	3	RAN5#87e
6.3C.4.2 Power Control Relative power tolerance for SUL	TBD	RAN5#87e
6.3C.4.3 Aggregate power tolerance for SUL	PUCCH: 3 PUSCH: 3	RAN5#87e
6.4C.1 Frequency error for SUL	5	RAN5#86e
6.4C.2.1 Error Vector Magnitude for SUL	PUSCH: 84 PUCCH: 24 PRACH: 12	RAN5#86e
6.4C.2.2 Carrier leakage for SUL	3	RAN5#90e
6.4C.2.3 In-band emissions for SUL	36	RAN5#90e
6.4C.2.4 EVM equalizer spectrum flatness for SUL	90	RAN5#90e
6.4C.2.5 EVM equalizer spectrum flatness for Pi/2 BPSK for SUL	9	RAN5#90e
6.5C.1 Occupied bandwidth for SUL	18	RAN5#86e
6.5C.2.2 Spectrum Emission Mask for SUL	72 (80[1])	RAN5#90e
6.5C.2.3 Additional spectrum emission mask for SUL	Table 4.1.2.1-1	RAN5#86e
6.5C.2.4.1 NR ACLR for SUL	460 (500[1])	RAN5#90e
6.5C.2.4.2 UTRA ACLR for SUL	Table 4.1.2.1-1	RAN5#86e
6.5C.3.1 General spurious emissions for SUL	27	RAN5#86e
6.5C.3.2 Spurious emission for UE co-existence for SUL	27	RAN5#86e
6.5C.3.3 Additional spurious emissions for SUL	115 for NS_05 28 for NS_43	RAN5#87e
6.5C.4 Transmit intermodulation for SUL	4	RAN5#86e
NOTE 1: UEs supporting pi/2 BPSK DMRS and the corresponding IE [DMRSPi2BPSK] is set to 1.		

Table 4.1.1.2-2: Number of test points for SUL test cases in FR1 (NR UE Receiver test)

Subclause	Number of test points	Comments
7.3C.2 Reference sensitivity power level for SUL	General test points:45 SUL configuration specific test points: SUL_n78-n80: 3 SUL_n78-n81:2	RAN5#102
7.6C.2 Inband Blocking for SUL	3	RAN5#87e
7.6C.3 Out-of-band blocking for SUL	3	RAN5#87e

4.1.1.3 FR1 V2X test cases

This section contains information on test point selection for V2X test cases 6.2E, 6.3E, 6.4E, 6.5E, 7.3E, 7.4E, 7.5E, 7.6E, 7.7E and 7.8E in [2].

Number of test points for V2X test cases in FR1 are listed in table 4.1.1.3-1 and table 4.1.1.3-2.

Table 4.1.1.3-1: Number of test points for V2X test cases in FR1 (NR UE Transmitter test)

Subclause	Number of test points	Justification in attachment	Comments
6.2E.2 UE maximum output power reduction for V2X	440	'38.521-1_TP analysis_V2X_6.2E.2_MPR_6.5E.2.2_SEM_6.5E.2.4_ACLR_v3.zip'	RAN5#95-e
6.2E.3.1 UE additional maximum output power reduction for V2X	82	'38.521-1_TP analysis_V2X_6.2E.3_AMPR_NS_33'	RAN5#102
6.3E.1 Minimum output power for V2X	360	'38.521-1_TP analysis_V2X_6.3E.1_MinOP_v1.zip'	RAN5#92-e
6.5E.2.2 Spectrum emission mask for V2X	88	'38.521-1_TP analysis_V2X_6.2E.2_MPR_6.5E.2.2_SEM_6.5E.2.4_ACLR_v3.zip'	RAN5#95-e
6.5E.2.3 Additional Spectrum emission mask for V2X	82	'38.521-1_TP analysis_V2X_6.2E.3_AMPR_NS_33'	RAN5#102
6.5E.2.4 Adjacent channel leakage ratio for V2X	440	'38.521-1_TP analysis_V2X_6.2E.2_MPR_6.5E.2.2_SEM_6.5E.2.4_ACLR_v3.zip'	RAN5#95-e
6.5E.3.3 Additional spurious emissions requirements for V2X	82	'38.521-1_TP analysis_V2X_6.2E.3_AMPR_NS_33'	RAN5#102

Table 4.1.1.3-2: Number of test points for V2X test cases in FR1 (NR UE Receiver test)

Subclause	Number of test points	Justification in attachment	Comments
FFS			

4.1.1.4 FR1 RedCap test cases

This section contains information on test point selection for RedCap test cases in [2]. The general rule in this section apply to all the RedCap test cases. Separate analysis is not provided for each single test case.

For the Tx requirements, basic PC3 requirements apply with the exception that the maximum channel bandwidth is 20MHz. Regarding test point selection, the same test points for PC3 non-RedCap UE apply for RedCap UE, except that the Low, Mid, Hight test channel bandwidth shall be selected among channel bandwidths up to 20MHz.

For the Rx REFSENS requirements, TDD/FDD 2Rx, TDD/FDD 1Rx, HD-FDD 2Rx and HD-FDD 1Rx requirements are specified separately. For test cases other than REFSENS, no exception requirements are specified, but considering those requirements have dependency on REFSENS, the UL/DL RB allocation would follow that of REFSENS.

- For TDD/FDD 2Rx capable RedCap UE, the basic 2Rx REFSENS requirements apply with the exception that the maximum channel bandwidth is 20MHz. For all the Rx test cases, the same test points for non-RedCap UE apply except that the Low, Mid, Hight test channel bandwidth shall be selected among channel bandwidths up to 20MHz.

- For TDD/FDD 1Rx capable RedCap UE, the exceptional REFSENS requirements are specified for channel bandwidth up to 20MHz. The UL/DL configuration required for 1Rx are the same for 2Rx requirements. For all the Rx test cases, the same test points for non-RedCap UE apply except that the Low, Mid, Hight test channel bandwidth shall be selected among channel bandwidths up to 20MHz.

- For HD-FDD 2Rx and 1Rx capable RedCap UE, the exceptional REFSENS requirements are specified for channel bandwidth up to 20MHz, with specific UL configuration specified along. For all the Rx test cases, the same test points for non-RedCap UE apply except that the Low, Mid, Hight test channel bandwidth shall be selected among channel bandwidths up to 20MHz, and the UL configuration shall follow Table 7.3I.2-5 in TS 38.101-1[2].

4.1.1.5 FR1 TxD test cases

This section contains information on test point selection for TxD test cases [2]. Except for test cases listed in Table 4.1.1.5-1, the test point selection principle in single carrier test cases applies to all TxD test cases in term of Test environment, Test SCS, Test channel bandwidths, modulation and RB allocations.

Table 4.1.1.5-1: NR UE transmitter test point selection for TxD test cases in FR1 (test)

Subclause	Number of test points	Justification in attachment	Comments
6.2G.1 UE maximum output power for Tx Diversity	Power Class 2: 270 Power Class 1.5: 0	"38.521-1_TPanalysis_6.2G.1_MaxOP_TxD.zip"	RAN5#95-e
6.2G.2 Maximum Output Power Reduction for Tx Diversity	Power Class 2: 920 (contiguous allocation), 120 (almost contiguous allocation) Power Class 1.5: 1080 Power Class 3: 1120	"38.521-1_TPanalysis_6.2G.2_MPR_6.5G.2.1_SEM_6.5G.2.3.1_NR_ACLR_TxD_v1.zip"	RAN5#97
6.2G.3 UE additional maximum output power reduction for Tx Diversity	See clause 4.1.2.1	See clause 4.1.2.1	See clause 4.1.2.1
6.5G.2.3.1 NR ACLR for Tx diversity	power class 2: 920 (contiguous allocation), 120 (almost contiguous allocation) power class 1.5: 1080	"38.521-1_TPanalysis_6.2G.2_MPR_6.5G.2.1_SEM_6.5G.2.3.1_NR_ACLR_TxD.zip"	RAN5#95-e

4.1.1.6 FR1 shared spectrum channel access test cases

This section contains information on test point selection for shared spectrum channel access test cases in TS 38.521-1[2]. The general rule in this section apply to all test cases for shared spectrum channel access test cases. Separate analysis for each FR1 shared spectrum channel access test case is not provided, unless deemed necessary.

From the latest core requirement for NR band with shared spectrum channel access, the frequency range are 5150 MHz – 5925 MHz for n46, and 5925 MHz – 7125 MHz for n96. Both bands support power class 5 operations with various channel bandwidths.

For all Tx and Rx test requirements of NR unlicensed band, the selections of test point shall be the same as for regular NR band for Test Environment, Test frequency, Test channel bandwidths, Test Subcarrier Spacing, Test uplink/downlink modulations and Test RB configurations, unless shared spectrum channel access configuration specific test points are over-ruling.

Table 4.1.1.6-1: UE transmitter test point selection for FR1 shared spectrum channel access

Subclause	Number of test points	Justification	Comments
6.2F.1 UE maximum output power for shared spectrum channel access	800	Same as 6.2.1	RAN5#98
6.2F.2 Maximum Output Power Reduction	600	38.521-1_TP analysis_NR-U_6.2F.3_MPR_6.5F.2.2_SEM_6.5F.2.4.1_ACLR_v1.zip	RAN5#101
6.2F.4 Configured transmitted power for shared spectrum access	30	38.521-1_TPanalysis_NR_U_6.2F.4_ConfigTP.zip	RAN5#102
6.2F.3 UE additional maximum output power reduction for shared spectrum access	144	38.521-1_TPanalysis_6.2F.3_AMPR_NS_28_NS_29.zip	RAN5#101
6.3F.4.3 Relative power tolerance for shared spectrum channel access	6	38.521-1_TPanalysis_NR-U_6.3F.4.3_RelPtol.zip	RAN5#102
6.4F.2.2 Carrier leakage	3	General rules of test point selection apply. Test points of TC 6.4.2.2 from TS 38.521-1 can be leveraged.	RAN5#97
6.4F.2.4 EVM equalizer spectrum flatness	90	General rules of test point selection apply. Test points of TC 6.4.2.4 from TS 38.521-1 can be leveraged.	RAN5#97
6.5F.1 Occupied bandwidth for shared spectrum channel access		TBD	
6.5F.2.2 Spectrum emission mask for operation with shared spectrum channel access	600	38.521-1_TP analysis_NR-U_6.2F.3_MPR_6.5F.2.2_SEM_6.5F.2.4.1_ACLR_v1.zip	RAN5#101
6.5F.2.3 Additional spectrum emission mask		TBD	
6.5F.2.4.1 Shared spectrum channel access ACLR	600	38.521-1_TP analysis_NR-U_6.2F.3_MPR_6.5F.2.2_SEM_6.5F.2.4.1_ACLR_v1.zip	RAN5#101
6.5F.2.4.2 Additional requirements for network signalled value "NS_29"		TBD	
6.5F.3.1 General spurious emissions	27	Test points of TC 6.5.3.1 from TS 38.521-1 can be leveraged.	RAN5#97
6.5F.3.3 Additional spurious emissions		TBD	
6.5F.4 Transmit intermodulation for shared spectrum channel access	8	“38.521-1_TPanalysis_6.5.4_TxIm_v3.zip”	RAN5#100

Table 4.1.1.6-2: UE receiver test point selection for FR1 shared spectrum channel access

Subclause	Number of test points	Justification	Comments
7.3F.2 Reference sensitivity power level	45	General rules of test point selection apply. Test points of TC 7.3.2 from TS 38.521-1 can be leveraged.	RAN5#97
7.5F.1 Adjacent channel selectivity for shared spectrum channel access	3	General rules of test point selection apply. Test points of TC 7.5 from TS 38.521-1 can be leveraged.	RAN5#97
7.6F.2.1 In-band blocking for shared spectrum channel access	3	General rules of test point selection apply. Test points of TC 7.6.2 from TS 38.521-1 can be leveraged.	RAN5#97
7.6F.3 Out of band blocking	3	General rules of test point selection apply. Test points of TC 7.6.3 from TS 38.521-1 can be leveraged.	RAN5#97
7.7F.1 Spurious response for shared spectrum channel access	7	General rules of test point selection apply. Test points of TC 7. from TS 38.521-1 can be leveraged.	RAN5#97

4.1.1.7 FR1 CA with UL MIMO test cases

This section contains information on test point selection for FR1 CA with UL MIMO test cases in TS 38.521-1[2]. The general rule in this section apply to all test cases for FR1 CA with UL MIMO test cases. Separate analysis for each FR1 CA with UL MIMO test case is not provided, unless deemed necessary.

For Test Environment, Test frequency, Test channel bandwidths, Test Subcarrier Spacing, modulation and RB allocation: adopt the same selection as the corresponding FR1 NR CA test cases.

As for waveform, CP-OFDM is mandatory in case of UL MIMO with two layer transmission and DFT-s-OFDM is not valid. Therefore CP-OFDM waveform is selected.

The test point selection for FR1 CA with UL MIMO test cases in [2] clause 6 is listed in Table 4.1.1.7-1.

Table 4.1.1.7-1: UE receiver test point selection for FR1 shared spectrum channel access

Subclause	Number of test points	Justification	Comments
6.2H.1.2 UE maximum output power reduction for intra-band UL contiguous CA with UL MIMO	320	General rules of test point selection apply. Test points of TC 6.2A.2.1 for intra-band contiguous CA from TS 38.521-1 can be leveraged excluding DFT-s-OFDM test points.	RAN5#101
6.2H.1.3 UE maximum output power reduction for intra-band UL contiguous CA with UL MIMO	CA_NS_04 :32	General rules of test point selection apply. Test points of TC 6.2A.3.1 for intra-band contiguous CA from TS 38.521-1 can be leveraged excluding DFT-s-OFDM test points.	RAN5#102
6.2H.1.4 Configured transmitted power for intra-band UL contiguous CA with UL MIMO	10	General rules of test point selection apply. Test points of TC 6.2A.4.1 for intra-band contiguous CA from TS 38.521-1 can be leveraged with CP-OFDM waveform replacement.	RAN5#101
6.3H.1.1 Minimum output power for intra-band UL contiguous CA with UL MIMO	20	General rules of test point selection apply. Test points of TC 6.3A.1.1 for intra-band contiguous CA from TS 38.521-1 can be leveraged with CP-OFDM waveform replacement.	RAN5#101
6.3H.1.3 Transmit ON/OFF time mask for intra-band UL contiguous CA with UL MIMO	40	General rules of test point selection apply. Test points of TC 6.3A.3.1 for intra-band contiguous CA from TS 38.521-1 can be leveraged with CP-OFDM waveform replacement.	RAN5#101
6.4H.1.1 Frequency error for intra-band UL contiguous CA with UL MIMO	5	General rules of test point selection apply. Test points of TC 6.4A.1.1 for intra-band contiguous CA from TS 38.521-1 can be leveraged with CP-OFDM waveform replacement.	RAN5#102
6.4H.1.2.1 Error Vector Magnitude for intra-band UL contiguous CA with UL MIMO	64	General rules of test point selection apply. Test points of TC 6.4A.1.1 for intra-band contiguous CA from TS 38.521-1 can be leveraged excluding DFT-s-OFDM test points.	RAN5#102
6.4H.1.2.2 Carrier leakage for intra-band UL contiguous CA with UL MIMO	2	General rules of test point selection apply. Test points of TC 6.4A.1.1 for intra-band contiguous CA from TS 38.521-1 can be leveraged with CP-OFDM waveform replacement.	RAN5#102
6.4H.1.2.3 In-band emissions for intra-band UL contiguous CA with UL MIMO	8	General rules of test point selection apply. Test points of TC 6.4A.1.1 for intra-band contiguous CA from TS 38.521-1 can be leveraged excluding DFT-s-OFDM test points.	RAN5#102
6.4H.1.3 Time alignment error for intra-band UL contiguous CA with UL MIMO	8	“38.521-1_TP analysis_6.4D.3_6.4H.1.3_TAE_MIMO_v1.zip“	RAN5#102
6.5H.1.2.1 Spectrum emission mask for intra-band UL contiguous CA for UL MIMO	32	General rules of test point selection apply. Test points of TC 6.5A.2.2.1 for intra-band contiguous CA from TS 38.521-1 can be leveraged excluding DFT-s-OFDM test points.	RAN5#101
6.5H.1.2.2 Additional spectrum emission mask for intra-band UL contiguous CA for UL MIMO	CA_NS_04 :16	General rules of test point selection apply. Test points of TC 6.5A.2.3.1 for intra-band contiguous CA from TS 38.521-1 can be leveraged excluding DFT-s-OFDM test points.	RAN5#102
6.5H.1.2.3 NR ACLR for intra-band UL contiguous CA for UL MIMO	320	General rules of test point selection apply. Test points of TC 6.5A.2.4.1.1 for intra-band contiguous CA from TS 38.521-1 can be leveraged excluding DFT-s-OFDM test points.	RAN5#101
6.5H.1.3.1 General spurious emissions for intra-band UL contiguous CA for UL MIMO	20	General rules of test point selection apply. Test points of TC 6.5A.3.1.1 for intra-band contiguous CA from TS 38.521-1 can be leveraged.	RAN5#102
6.5H.1.3.2 Spurious emissions for UE co-existence for intra-band UL contiguous CA for UL MIMO	8	General rules of test point selection apply. Test points of TC 6.5A.3.2.1 for intra-band contiguous CA from TS 38.521-1 can be leveraged.	RAN5#102
6.5H.1.3.3 Additional spurious emissions for intra-band UL contiguous CA for UL MIMO	CA_NS_04 :24	General rules of test point selection apply. Test points of TC 6.5A.3.3.1 for intra-band contiguous CA from TS 38.521-1 can be leveraged.	RAN5#102
6.5H.1.4 Transmit intermodulation for intra-band UL contiguous CA for UL MIMO	4	General rules of test point selection apply. Test points of TC 6.5A.4.1 for intra-band contiguous CA from TS 38.521-1 can be leveraged except the modulation type: -DFT-s-OFDM pi/2 BPSK is removed as BPSK is not supported by CP-OFDM - DFT-s-OFDM QPSK is replaced by CP-OFDM QPSK.	RAN5#102

4.1.1.8 FR1 ATG test cases

This section contains information on test point selection for ATG test cases in [2]. The general rules in this section apply to all the NR ATG 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:

Considering that NR ATG operating bands are defined like FR1 bands, test environment, frequencies, SCSs, channel bandwidths, waveforms, and modulations of a Tx or Rx test for an NR ATG band should be selected based on the same principles of the corresponding single carrier test for an FR1 band.

Table 4.1.1.8-1: NR UE transmitter test point selection for ATG test cases in FR1

Subclause	Number of test points	Justification in attachment	Comments
6.2J.1 UE maximum output power for ATG	540	General rules of test point selection apply. Test points of TC 6.2.1 from TS 38.521-1 can be leveraged.	RAN5#102
6.2J.2 Configured transmitted power for ATG	30	General rules of test point selection apply. Test points of TC 6.2.4 from TS 38.521-1 can be leveraged.	RAN5#102
6.3J.1 Minimum output power for ATG	45	General rules of test point selection apply. Test points of TC 6.3.1 from TS 38.521-1 can be leveraged.	RAN5#102
6.5J.1 Occupied bandwidth for ATG	10	General rules of test point selection apply. Test points of TC 6.5.1 from TS 38.521-1 can be leveraged.	RAN5#102
6.5J.3.1 General spurious emissions for ATG	27	General rules of test point selection apply. Test points of TC 6.5.3.1 from TS 38.521-1 can be leveraged.	RAN5#102

Table 4.1.1.8-2: NR UE receiver test point selection for ATG test cases in FR1

Subclause	Number of test points	Justification in attachment	Comments
7.4J Maximum input level for ATG	6	General rules of test point selection apply. Test points of TC 7.4 from TS 38.521-1 can be leveraged limiting the modulation to 64QAM and 256QAM.	RAN5#102
7.5J Adjacent channel selectivity for ATG	3	General rules of test point selection apply. Test points of TC 7.5 from TS 38.521-1 can be leveraged.	RAN5#102
7.6J.2 In-band blocking for ATG	3	General rules of test point selection apply. Test points of TC 7.6.2 from TS 38.521-1 can be leveraged.	RAN5#102
7.6J.3 Out-of-band blocking for ATG	3	General rules of test point selection apply. Test points of TC 7.6.3 from TS 38.521-1 can be leveraged.	RAN5#102
7.7J Spurious response for ATG	3	General rules of test point selection apply. Test points of TC 7.7 from TS 38.521-1 can be leveraged.	RAN5#102
7.8J.2 Wide band intermodulation for ATG	3	General rules of test point selection apply. Test points of TC 7.8.2 from TS 38.521-1 can be leveraged.	RAN5#102
7.9J Spurious emissions for ATG	3	General rules of test point selection apply. Test points of TC 7.9 from TS 38.521-1 can be leveraged.	RAN5#102

4.1.2 Test point analysis per NS value

4.1.2.1 A-MPR, A-SEM and A-SE FR1 test cases for single carrier and UL MIMO

This section contains information on test point selection for single carrier test cases 6.2.3, Additional Maximum Power Reduction (A-MPR), 6.5.2.3 Additional spectrum emission mask (A-SEM) and 6.5.3.3 Additional spurious emissions (A-SE); and for correspondent UL-MIMO test cases in 6.2D.3 and 6.5D.3.3 in [2].

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.

For pi/2 BPSK with Rel-16 DMRS, the correspondent A-MPR requirements are the same as that for Rel-15 DMRS but the PAPR is lower. Given the UE can pass the requirements using Rel-15 DMRS, it can be expected that the UE can pass the requirements using Rel-16 DMRS. Therefore there is no need to additionally test A-MPR, A-SEM and A-SE for Rel-16 DMRS.

Table 4.1.2.1-1 lists number of test points for A-MPR, A-SEM and A-SE single carrier test cases and for different NS values.

Table 4.1.2.1-1: NS value specific test points for A-MPR, A-SEM and A-SE single carrier

NS label	Number of test points for A-MPR	Number of test points A-SEM	Number of test points A-SE	Justification	Comments
NS_03 NS_03U	144 for Non-SUL testing 72 for SUL testing			"38.521-1_TPanalysis_6.2.3_AMPR_NS_03.zip"	RAN5#85
NS_04	6.2.3: 120 6.2D.3: 112 6.5D.3.3:112			"38.521-1_TPanalysis_6.2.3_AMPR_NS_04_v3.zip"	RAN5#93-e
NS_05	6.5.3.3: 432			"38.521-1_TP analysis_6.5.3.3_TX_Additional_Spurious_Emission_NS_05.zip"	RAN5#87-e
NS_05, NS_05U	6.2.3: 288 for PC3 6.2.3: 396 for PC2			"38.521-1_TPanalysis_6.2.3_AMPR_NS_05_v3.zip"	RAN5#96-e
NS_06	6.2.3: PC1 160 PC3 144			"38.521-1_TPanalysis_6.2.3_AMPR_NS_06_v2.zip"	RAN5#92-e
NS_07	162	162	162	"38.521-1_TPanalysis_6.2.3_AMPR_NS_07.zip"	RAN5#99
NS_12	48			"38.521-1_TPanalysis_6.2.3_AMPR_NS_12_13_14_15.zip"	RAN5#90-e
NS_13	21			"38.521-1_TPanalysis_6.2.3_AMPR_NS_12_13_14_15.zip"	RAN5#90-e
NS_14	6.2.3: 50 6.5.3.3: 25		25	"38.521-1_TPanalysis_6.2.3_AMPR_NS_12_13_14_15.zip" "38.521-1_TPanalysis_6.5.3.3_TX_Additional_Spurious_Emission_NS_14.zip	RAN5#90-e RAN5#96-e
NS_15	102			"38.521-1_TPanalysis_6.2.3_AMPR_NS_12_13_14_15.zip"	RAN5#90-e
NS_17	6.5.3.3: 4			"38.521-1_TPanalysis_6.5.3.3_TX_Additional_Spurious_Emission_NS_17_v2.zip"	RAN5#92-e
NS_18	88 6.2.3: 108 6.5.3.3: 54			"38.521-1_TPanalysis_6.2.3_AMPR_6.5.3.3_ASE_NS_18_v3.zip"	RAN5#89-e
NS_21	180	180	180	"38.521-1_TPanalysis_6.2.3_AMPR_NS_21_v1.zip"	RAN5#98
NS_24	6.2.3: 300			"38.521-1_TPanalysis_6.2.3_AMPR_NS_24.zip"	RAN5#87
NS_27	6.2.3: 360			"38.521-1_TPanalysis_6.2.3_AMPR_NS_27_v5.zip"	RAN5#98
NS_35	6.2.3: 144 6.2.3: 72			"38.521-1_TPanalysis_6.2.3_AMPR_NS_35_v2.zip"	RAN5#5-5G-NR-Adhoc
NS_37	6.2.3: 48			"38.521-1_TPanalysis_6.2.3_AMPR_NS_37.zip"	RAN5#86
NS_38	6.2.3: 96			"38.521-1_TPanalysis_6.2.3_AMPR_NS_38.zip"	RAN5#86
NS_39	6.2.3: 54			"38.521-1_TPanalysis_6.2.3_AMPR_NS_39.zip"	RAN5#86
NS_40	6.2.3: 24			"38.521-1_TPanalysis_6.2.3_AMPR_NS_40.zip"	RAN5#87
NS_41	6.2.3: 72			"38.521-1_TPanalysis_6.2.3_AMPR_NS_41.zip"	RAN5#87
NS_42	6.2.3: 108			"38.521-1_TPanalysis_6.2.3_AMPR_NS_42.zip"	RAN5#87
NS_43	6.2.3: 28			"38.521-1_TPanalysis_6.2.3_AMPR_NS_43_v2.zip"	RAN5#86
	6.5.3.3: 81			"38.521-1_TP analysis_6.5.3.3_TX_Additional_Spurious_Emission_NS_43.zip"	RAN5#87-e
NS_43U	6.2.3: 72			"38.521-1_TPanalysis_6.2.3_AMPR_NS_43U.zip"	RAN5#85
NS_44	360	N/A	180	"38.521-1_TPanalysis_6.2.3_AMPR_6.5.3.3_ASE_NS_44.zip"	RAN5#90-e

NS_45	24			"38.521-1_TPanalysis_6.2.3_AMPR_NS_45.zip"	RAN5#89-e
NS_46	176			"38.521-1_TPanalysis_6.2.3_AMPR_NS_46.zip"	RAN5#89-e
NS_47	70 for PC3 63 for PC272 for PC1.5			"38.521-1_TPanalysis_6.2.3_AMPR_NS_47_v1.zip"	RAN5#102
NS_48	240 for PC3 384 for PC2	N/A	96	"38.521-1_TPanalysis_6.2.3_AMPR_6.5.3.3_ASE_NS_48_v3.zip"	RAN5#96-e
NS_49	280 for PC3 392 for PC2	N/A	140 for PC3 191 for PC2	"38.521-1_TPanalysis_6.2.3_AMPR_6.5.3.3_ASE_NS_49_v2.zip"	RAN5#98-e
NS_50	120 for PC3 288 for PC2		120 for PC3 288 for PC2	"38.521-1_TPanalysis_6.2.3_AMPR_6.5.3.3_ASE_NS_50.zip"	RAN5#99
NS_56	175		175	38.521-1_TPanalysis_6.2.3_AMPR_6.5.3.3_ASE_NS_56.zip	RAN5#93-e
NS_100	144 for Non-SUL testing 72 for SUL testing			"38.521-1_TPanalysis_6.2.3_AMPR_NS_100.zip"	RAN5#85

4.1.2.2 A-MPR test cases for FR1 UL CA

This section contains information on test point selection for test case 6.2A.3.1 in [2], UE additional maximum output power reduction for CA.

TS 38.101 [3] specifies band dependent NS-values, which in the inter-band UL CA test cases become a combination of two NS-values. For the inter-band UL CA configurations included in table 6.2A.3.1.3-1 in TS 38.101-1[3], the combined AMPR requirements per CA configuration will be tested based on following general principle:

- Test the minimum Total power backoff value
- Test the maximum Total power backoff value
- Test the maximum unbalanced Total power backoff among CCs (max PCMAX,c difference).

Where the Total power backoff value means: MAX[MPR, A-MPR]

The analyses are performed per NS-values combination and are stored as zip-files as defined in annex A and documented in table 4.1.2.2-1.

For the inter-band UL CA configurations that are NOT included in table 6.2A.3.1.3-1 in TS 38.101-1[3], the AMPR testing for the CA configuration can be skipped. The testing could be covered by the testing of 6.2.3 for each single band in this configuration.

Table 4.1.2.2-1: 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		Number of test points	Applicable test case	Justification	Comment
CA_n3-n78	NS_100	NS_01	24	N/A	"38.521-1_TPanalysis 6.2A.3 NS_100+NS_01.zip"	RAN5#87-e
CA_n8-n78	NS_43	NS_01	12	N/A	"38.521-1_TPanalysis 6.2A.3 NS_43+NS_01.zip"	RAN5#88-e
CA_n8-n78	NS_43U	NS_01	12	N/A	"38.521-1_TPanalysis 6.2A.3 NS_43U+NS_01.zip"	RAN5#88-e
CA_n28-n78 CA_n28-n79	NS_17	NS_01	12	N/A	"38.521-1_TPanalysis_6.2A.3_NS_17 +NS_01.zip"	RAN5#99
CA_n41A-n79A	NS_47	NS_01	3	N/A	"38.521-1_TPanalysis_6.2A.3_NS_47 +NS_01.zip"	RAN5#94-e
CA_n28A-n41A	NS_17	NS_47	12	N/A	"38.521-1_TPanalysis_6.2A.3_NS_17 +NS_47.zip"	RAN5#101
Note 1: As per TS 38.101.						

4.1.3 Test point analysis per NR CA configuration

4.1.3.1 Reference Sensitivity test cases for FR1 NR CA

Editor's note:

- Not all CA configurations completed in TS 38.521-1 refsens test cases are listed in Table 4.1.3.1-1 through Table 4.1.3.1-5.

This clause contains information on test point analysis, test frequency selection and status for FR1 NR CA test cases in TS 38.521-1 [2] clause 7. The analyses are performed per CA configuration in Table 4.1.3.1-1 through Table 4.1.3.1 4. The principles for selection of reference sensitivity test points for NR CA is given in Annex B including a test point analysis check list in B.9.

Table 4.1.3.1-1: Reference Sensitivity test cases per CA configuration (single band)

CA config	Single band refsens exception, victim band (Note 2)	Requirement coverage (Note 2)	Test point analysis updated
CA_n2(2A)	–	NE	RAN5#100
CA_n41C	–	NE	RAN5#89-e
CA_n48(2A)	-	NE	RAN5#102
CA_n48B	–	NE	RAN5#94-e
CA_n66B	–	NE	RAN5#86-e
CA_n66(2A)	–	NE	RAN5#86-e
CA_n66(3A)	–	NE	RAN5#100
CA_n71(2A)	–	NE	RAN5#94-e
CA_n77(2A)	–	NE	RAN5#100
CA_n77C	–	NE	RAN5#96e
CA_n78C	–	NE	RAN5#87-e
CA_n78(2A)	–	NE	RAN5#101
NOTE 1: Void. NOTE 2: Notations used: NE: Non-exception as defined in TS 38.101-1 [5], meaning single carrier NR requirements apply. HD: UL Harmonic Distortion, as defined in TS 38.101-1 [5], 7.3A.4 HM: RX Harmonic Mixing, as defined in TS 38.101-1 [5], 7.3A.4 IMD: Intermodulation Distortion, as defined in TS 38.101-1 [5], 7.3A.5 CBI: Cross Band Isolation, as defined in TS 38.101-1 [5], 7.3A.6			

Table 4.1.3.1-2: Reference Sensitivity test cases per CA configuration (two bands)

CA config	Two band refsens exception, victim band (Note 1)	Requirement coverage (Note 1)	Test point analysis updated
CA_n1A-n3A	n1 (IMD3) n3(CBI)	IMD,CBI	RAN5#95-e
CA_n1A-n8A	n1 (IMD4)	IMD	RAN5#95-e
CA_n1A-n28A	n1 (HD3)	HD	RAN5#101
CA_n1A-n41A	n1(CBI), n41(CBI)	CBI	RAN5#102
CA_n1A-n77A	n77 (HD2)	HD	RAN5#89-e
CA_n1A-n78A	n1 (IMD4)	IMD	RAN5#94
CA_n2A-n48A	n48 (HD2), n2(IMD4)	HD, IMD	RAN5#96-e
CA_n2A-n5A	-	NE	RAN5#97
CA_n2A-n14A	-	NE	RAN5#100
CA_n2A-n48A	n48 (HD2), n2(IMD4)	HD, IMD	RAN5#100
CA_n2A-n48(2A)	(NOTE 2)	NE	RAN5#102
CA_n2A-n48B	(NOTE 2)	NE	RAN5#101
CA_n2A-n66A	n2(IMD3), n66(IMD5)	IMD	RAN5#96-e
CA_n2A-n77A PC3	n77 (HD2), n2 (HM), n2(IMD2), n2(IMD4), n2(IMD5), n2(IMD7)	HD, HM, IMD,	RAN5#99
CA_n2A-n77A PC2	n77 (HD2), n2 (HM), n2(IMD2), n2(IMD4) n2(CBI)	HD, HM, IMD, CBI	RAN5#99
CA_n2A-n77C PC3	(NOTE 2)	NE	RAN5#101
CA_n2A-n77C PC2	(NOTE 2)	NE	RAN5#102
CA_n3A-n5A	n3 (IMD4 |2*fn3-2*fn5|) n5 (IMD2 |fn3-fn5|)	IMD	RAN5#95-e
CA_n3A-n8A	n8(IMD4), n3(IMD5)	IMD	RAN5#100
CA_n3A-n28A	-	NE	RAN5#101
CA_n3A-n41A PC2	n3 (IMD4), n3 (CBI)	IMD, CBI	RAN5#100
CA_n3A-n41A PC3	n3 (IMD4), n3 (CBI), n41 (CBI)	IMD, CBI	RAN5#100
CA_n3A-n77A	n77 (HD2), n3 (IMD2), n3 (IMD4)	HD, IMD	RAN5#99
CA_n3A-n77(2A)	(NOTE 2)	NE	RAN5#101
CA_n3A-n78A PC3	n3 (IMD2 |fn78-fn3|) n3 (IMD4 |fn78-3*fn3|) n78 (HD2)	HD, IMD	RAN5#101
CA_n3A-n78A PC2	n3 (IMD2 |fn78-fn3|) n3 (IMD4 |fn78-3*fn3|) n78 (HD2), n3 (HM)	HD, HM, IMD	RAN5#101
CA_n5A-n48A	-	NE	RAN5#102
CA_n5A-n48(2A)	-	NE	RAN5#102
CA_n5A-n48B	-	NE	RAN5#102
CA_n5A-n66A	n5(IMD2)	IMD	RAN5#96-e
CA_n5A-n77A PC3	n77 (HD4), n77 (HD5), n5 (HM), n5(IMD4), n5(IMD5)	HD, HM, IMD	RAN5#99
CA_n5A-n77A PC2	n77 (HD4), n77 (HD5), n5 (HM), n5(IMD4)	HD, HM, IMD	RAN5#99
CA_n5A-n77C PC3	(NOTE 2)	NE	RAN5#101
CA_n5A-n77C PC2	(NOTE 2)	NE	RAN5#102
CA_n5A-n78A	n78 (HD2)	HD	RAN5#94-e
CA_n7A-n78A	n7 and n78 (CBI)	CBI	RAN5#94-e
CA_n8A-n78A	n8 (IMD4 |fn78-3*fn8|) n78 (HD4)	HD, IMD	RAN5#87-e
CA_n14A-n30A	-	NE	RAN5#100
CA_n14A-n66A	-	NE	RAN5#100
CA_n14A-n77A	n77 (HD5), n14 (HM), n14 (IMD5)	HD, HM, IMD	RAN5#100
CA_n20A-n78A	n78 (HD4), n20 (IMD4)	HD, IMD	RAN5#100
CA_n25A-n66A	n25 (IMD3), n66 (IMD3), n66 (IMD5)	IMD	RAN5#101
CA_n25A-n77A	n77 (HD2), n25 (HM), n25 (IMD2), n25 (IMD4), n25 (IMD5)	HD, HM, IMD	RAN5#101
CA_n25A-n77(2A)	(NOTE 2)	NE	RAN5#101
CA_n25A-n78A	n78 (HD2), 25 (IMD2)	HD, IMD	RAN5#101
CA_n25A-n78(2A)	(NOTE 2)	NE	RAN5#101
CA_n26A-n66A	n26 (IMD2)	IMD	RAN5#94-e
CA_n26A-n70A	n26 (IMD2)	IMD	RAN5#94-e
CA_n28A-n41A	–	NE	RAN5#91-e
CA_n28A-n77A	n77 (HD5), n28 (IMD5)	HD, IMD	RAN5#99
CA_n28A-n77(2A)	(NOTE 2)	NE	RAN5#101
CA_n28A-n78A	n78 (HD5, HM)	HD, HM	RAN5#102

CA_n28A-n79A	–	NE	RAN5#91-e
CA_n29A-n66A	–	NE	RAN5#94-e
CA_n29A-n70A	–	NE	RAN5#94-e
CA_n29A-n71A	n29 (CBI)	CBI	RAN5#95-e
CA_n39A-n41A	-	NE	RAN5#100
CA_n41A-n66A[3]	n66 (CBI), n66 (IMD5)	CBI	RAN#97
CA_n41A-n71A[3]	n41(HD4), n71 (IMD4)	HD	RAN5#98
CA_n41A-n77A	n41(HM), n77(IMD9), n41(CBI), n77(CBI)	HM, IMD, CBI	RAN5#102
CA_n41A-n79A PC3	–	NE	RAN5#83
CA_n41A-n79A PC2	n41 (CBI), n79 (CBI)	CBI	RAN5#100
CA_n48A-n66A	n48 (HD2), n66 (IMD5)	HD, IMD	RAN5#94-e
CA_n48A-n66(2A)	(NOTE 2)	NE	RAN5#95-e
CA_n48A-n70A	n70 (IMD2)	IMD	RAN5#94-e
CA_n48A-n71A	–	NE	RAN5#94-e
CA_n48A-n71(2A)	-	NE	RAN5#95-e
CA_n48A-n77A PC3	-	NE	RAN5#97-e
CA_n48A-n77A PC2	-	NE	RAN5#102
CA_n48A-n77C	-	NE	RAN5#102
CA_n48B-n66A	(NOTE 2)	NE	RAN5#95-e
CA_n48B-n70A	(NOTE 2)	NE	RAN5#95-e
CA_n48B-n71A	-	NE	RAN5#95-e
CA_n48B-n77A	-	NE	RAN5#102
CA_n48(2A)-n66A	(NOTE 2)	NE	RAN5#95-e
CA_n48(2A)-n66(2A)	(NOTE 2)	NE	RAN5#96-e
CA_n48(2A)-n70A	(NOTE 2)	NE	RAN5#95-e
CA_n48(2A)-n71A	-	NE	RAN5#95-e
CA_n48(2A)-n71(2A)	-	NE	RAN5#96-e
CA_n48(2A)-n77A	-	NE	RAN5#102
CA_n66A-n70A	–	NE	RAN5#94-e
CA_n66A-n71A	n66 (IMD4)	IMD	RAN5#87-e
CA_n66A-n77A PC3	n77 (HD2), n66(IMD2), n66(IMD5), n66(IMD7)	HD, IMD	RAN5#102
CA_n66A-n77A PC2	n77 (HD2), n66(IMD2), n66(IMD5), n66(CBI)	HD, IMD, CBI	RAN5#99
CA_n66A-n77(2A) PC3	(NOTE 2)	NE	RAN5#101
CA_n66A-n77C PC3	(NOTE 2)	NE	RAN5#101
CA_n66A-n77C PC2	(NOTE 2)	NE	RAN5#102
CA_n66A-n78A	n78 (HD2), n66(IMD5)	HD, IMD	RAN5#101
CA_n66A-n78(2A)	(NOTE 2)	NE	RAN5#101
CA_n70A-n71A	n70 (HD3), n70 (IMD4)	HD, IMD	RAN5#85
CA_n71A-n77A	n71 (IMD5)	IMD	RAN5#97-e
CA_n71A-n77(2A)	(NOTE 2)	NE	RAN5#102
CA_n71A-n78A	n78 (HD5), n71 (IMD5)	HD, IMD	RAN5#102
CA_n71A-n78(2A)	(NOTE 2)	NE	RAN5#102

NOTE 1: Notations used
NE: Non-exception as defined in TS 38.101-1 [5], meaning single carrier NR requirements apply.
HD: UL Harmonic Distortion, as defined in TS 38.101-1 [5], 7.3A.4
HM: RX Harmonic Mixing, as defined in TS 38.101-1 [5], 7.3A.4
IMD: Intermodulation Distortion, as defined in TS 38.101-1 [5], 7.3A.5
CBI: Cross Band Isolation, as defined in TS 38.101-1 [5], 7.3A.6
NOTE 2: Exception for this band is tested with two carrier case.
NOTE 3: Only single uplink analysed. IMD exception not yet covered.

Table 4.1.3.1-3: Reference Sensitivity test cases per CA configuration (three bands)

CA config	Three band refsens exception, victim band (Note 1)	Requirement coverage (Note 1)	Test point analysis updated
CA_n1A-n3A-n28A	–	NE	RAN5#101
CA_n1A-n3A-n77A	n1(IMD2), n3(IMD2), n78(IMD2)	IMD	RAN5#102
CA_n1A-n3A-n78A	n3(IMD2), n78(IMD2, IMD4)	IMD	RAN5#101
CA_n1A-n8A-n78A	n8(IMD5), n78(IMD3)	IMD	RAN5#102
CA_n1A-n28A-n77A	n1(IMD3), n28(IMD5), n77(IMD3)	IMD	RAN5#102
CA_n1A-n28A-n78A	n1(IMD3), n28(IMD5), n78(IMD3)	IMD	RAN5#102
CA_n1A-n41A-n77A	n1(IMD4), n41(IMD4), n77(IMD3)	IMD	RAN5#102
CA_n2A-n5A-n48A	n2(IMD3), n48(IMD3)	IMD	RAN5#100
CA_n2A-n5A-n77A PC3	n2(IMD3), n5 (IMD5), n77(IMD3)	IMD	RAN5#98
CA_n2A-n5A-n77A PC2	n2(IMD3), n5 (IMD5)	IMD	RAN5#100
CA_n2A-n5A-n77C PC3	(NOTE 2)	NE	RAN5#102
CA_n2A-n48A-n66A	n48(IMD2), n66 (IMD4), n2(IMD2)	IMD	RAN5#100
CA_n2A-n48A-n77A PC3	-	NE	RAN5#100
CA_n2A-n48A-n77A PC2	-	NE	RAN5#102
CA_n2A-n48A-n77C	-	NE	RAN5#102
CA_n2A-n66A-n77A PC3	n2(IMD2, IMD4, IMD5), n66 (IMD2, IMD4, IMD5), n77(IMD2, IMD4)	IMD	RAN5#98
CA_n2A-n66A-n77A PC2	n2(IMD2), n66 (IMD2)	IMD	RAN5#100
CA_n2A-n66A-n77C PC3	(NOTE 2)	NE	RAN5#102
CA_n3A-n28A-n41A	n3(IMD2), n28(IMD2), n41(IMD2, IMD3)	IMD	RAN5#101
CA_n3A-n28A-n77A	n3(IMD3), n28(IMD3), n77(IMD3)	IMD	RAN5#101
CA_n3A-n28A-n78A	n78(IMD3, IMD5)	IMD	RAN5#102
CA_n3A-n41A-n77A	n3(IMD3), n41(IMD5), n77(IMD3)	IMD	RAN5#102
CA_n5A-n48A-n66A	n48(IMD5)	IMD	RAN5#100
CA_n5A-n48A-n77A PC3	-	NE	RAN5#100
CA_n5A-n48A-n77A PC2	-	NE	RAN5#102
CA_n5A-n48A-n77C	-	NE	RAN5#102
CA_n5A-n66A-n77A PC3	n66 (IMD3), n77(IMD3, IMD4, IMD5)	IMD	RAN5#98
CA_n5A-n66A-n77A PC2	n66 (IMD3)	IMD	RAN5#100
CA_n5A-n66A-n77C PC3	(NOTE 2)	NE	RAN5#102
CA_n25A-n66A-n77	n25 (IMD2, IMD3, IMD4, IMD5), n66 (IMD2, IMD3, IMD4, IMD5, IMD7)	IMD	RAN5#101
CA_n25A-n66A-n77(2A)	(NOTE 2)	NE	RAN5#101
CA_n25A-n66A-n78	n78(IMD2)	IMD	RAN5#101
CA_n25A-n66A-n78(2A)	(NOTE 2)	NE	RAN5#101
CA_n26A-n66A-n70A	–	NE	RAN5#94-e
CA_n26A-n66(2A)-n70A	–	NE	RAN5#96-e
CA_n28A-n41A-n79A	n28(IMD3), n41 (IMD4), n79(IMD3)	IMD	RAN5#100
CA_n29A-n66A-n70A	–	NE	RAN5#89-e
CA_n41A-n66A-n71A	–	NE	RAN5#99
CA_n48A-n66A-n71(2A)	-	NE	RAN5#96-e
CA_n48A-n66A-n77A PC3	-	NE	RAN5#100
CA_n48A-n66A-n77A PC2	-	NE	RAN5#102
CA_n48A-n66A-n77C	-	NE	RAN5#102
CA_n48A-n66(2A)-n70A	-	NE	RAN5#96-e
CA_n48A-n66(2A)-n71A	-	NE	RAN5#96-e
CA_n48A-n70A-n71(2A)	-	NE	RAN5#96-e
CA_n48B-n66A-n70A	-	NE	RAN5#96-e
CA_n48B-n66A-n71A	-	NE	RAN5#96-e
CA_n48B-n70A-n71A	-	NE	RAN5#96-e
CA_n48(2A)-n66A-n70A	-	NE	RAN5#96-e
CA_n48(2A)-n66A-n71A	-	NE	RAN5#96-e
CA_n48(2A)-n70A-n71A	-	NE	RAN5#96-e
CA_n66A-n70A-n71A	–	NE	RAN5#87-e
CA_n66A-n71A-n77A	n66 (IMD3), n71 (IMD3), n77 (IMD3)	IMD	RAN5#102
CA_n66A-n71A-n77(2A)	(NOTE 2)	NE	RAN5#102
CA_n66A-n71A-n78A	n66 (IMD3), n78 (IMD4)	IMD	RAN5#102
CA_n66A-n71A-n78(2A)	(NOTE 2)	NE	RAN5#102

NOTE 1: Notations used
NE: Non-exception as defined in TS 38.101-1 [5], meaning single carrier NR requirements apply.
HD: UL Harmonic Distortion, as defined in TS 38.101-1 [5], 7.3A.4
HM: RX Harmonic Mixing, as defined in TS 38.101-1 [5], 7.3A.4
IMD: Intermodulation Distortion, as defined in TS 38.101-1 [5], 7.3A.5
CBI: Cross Band Isolation, as defined in TS 38.101-1 [5], 7.3A.6
NOTE 2: Exception for this band is tested with three carrier case.

Table 4.1.3.1-4: Reference Sensitivity test cases per CA configuration (four bands)

CA config	Four band refsens exception, victim band (Note 1)	Requirement coverage (Note 1)	Test point analysis updated
CA_n1A-n3A-n28A-n78A	–	NE	RAN5#101
CA_n2A-n5A-n48A-n66A		NE	RAN5#102
CA_n2A-n5A-n48A-n77A		NE	RAN5#102
CA_n2A-n5A-n66A-n77A		NE	RAN5#102
CA_n2A-n48A-n66A-n77A		NE	RAN5#102
CA_n5A-n48A-n66A-n77A		NE	RAN5#102
NOTE 1: No exceptions can occur for four bands. NE: Non-exception as defined in TS 38.101-1 [5], meaning single carrier NR requirements apply.			

Table 4.1.3.1-5: Reference Sensitivity test cases per CA configuration (five bands)

CA config	Five band refsens exception, victim band (Note 1)	Requirement coverage (Note 1)	Test point analysis updated
TBD	–	TBD	TBD
NOTE 1: No exceptions can occur for five bands.			

For CA configurations affected by exceptions the test frequency cannot be freely chosen. One test frequency per exception requirement is sufficient to test the requirement, in addition to testing the case where the exception is avoided. This is indicated in Table 4.1.3.1-6. Exceptions in TS 38.101-1 [5] clause 7.3A.5 (2UL intermodulation) and 7.3A.6 (cross band isolation) are not specified since the test frequency and channel bandwidth is already specified in TS 38.101-1 [5].

Table 4.1.3.1-6: Test frequency selection per band pair for bands and test points with exceptions avoidable by test frequency setting (UL harmonics, Rx mixing)

Band pair (Note 2)	Frequency	Channel BW [MHz]	Comment
n1A / n28A	UL 713 MHz / DL 2139 MHz	5/5	Exception Note 3 of TS38.101 table 7.3A.4-1
	UL 713 MHz / DL 2139 MHz	50/5	Exception Note 3 of TS38.101 table 7.3A.4-1
n1A / n77A	Mid / Low	Highest(50)/ Highest(100)	Non-exception. Not overlapping interference since BWINT=2*50 MHz, FINT (550) ≥ (100+100)/2.
	Mid / 3900	5/10	Exception Note 2 of TS 38.101 table 7.3A.4-1
	Mid / 3900	20/100	Exception Note 2 of TS 38.101 table 7.3A.4-1
	Mid / 3875	5/10	Exception Note 6 of TS 38.101 table 7.3A.4-1
n2A/n48A	Mid/Mid	Highest(40)/ Highest(40)	Non-exception. Not overlapping interference since BWINT=2*40 MHz, FINT (135) ≥ (80+40)/2.
n2A/n48A	UL 1860 MHz / DL 3690 MHz	5/10	Exception Note 6 of TS 38.521 Table 7.3A.0.4-1
n2A/n77A	Mid / 3850 Mhz	20/100	Non-exception. Not overlapping interference since BWINT=2*20 MHz, FINT (90) ≥ (40+100)/2.
	UL 1880 MHz / DL 3760 MHz	5/10	Exception Note 2 of TS 38.101 Table 7.3A.4-1
	UL 1880 MHz / DL 3760 MHz	10/100	Exception Note 2 of TS 38.101 Table 7.3A.4-1
	UL 1880 MHz / DL 3735 MHz	5/10	Exception Note 6 of TS 38.101 Table 7.3A.4-1
	UL 3920 MHz/ Mid	10/5	Exception Note 7 of TS 38.101 Table 7.3A.4-4
	UL 3920 MHz/ Mid	20/20	Exception Note 7 of TS 38.101 Table 7.3A.4-4
n3A / n77A	Mid/High	Highest/Highest	Non-exception.
	Mid/3495 MHz	5/10	Exception Note 2 of TS38.101 table 7.3A.4-1
	Mid/3495 MHz	10/100	Exception Note 2 of TS38.101 table 7.3A.4-1
	Mid/3470 MHz	5/10	Exception Note 6 of TS38.101 table 7.3A.4-1
n3A / n78A	Mid/High	Highest(50)/ Highest(100)	Non-exception. Not overlapping interference since BWINT=2*50 MHz, FINT (255) ≥ (100+100)/2.
	Mid/3495 MHz	5/10	Exception Note 2 of TS38.101 table 7.3A.4-1
	Mid/3465	10/100	Exception Note 2 of TS38.101 table 7.3A.4-1
	Mid/3470 MHz	5/10	Exception Note 6 of TS38.101 table 7.3A.4-1
n5A/n77A	Mid/Mid	Highest(20)/ Highest(100)	Non-exception. Not overlapping interference since BWINT=5*20 MHz, FINT (432.5) ≥ (100+100)/2 for HD5 and BWINT=4*20+100 MHz, FINT (224) ≥ (180+100)/2 for HM4.
	UL 836.5 MHz / DL 3346 MHz	5/10	Exception Note 4 of TS 38.101-1 table 7.3A.4-1
	UL 846.5 MHz / DL 3386 MHz	5/100	Exception Note 4 of TS 38.101-1 table 7.3A.4-1
	UL 826.5 MHz / DL 4132.5 MHz	5/10	Exception Note 5 TS 38.101-1 table 7.3A.4-1
	UL 826.5 MHz / DL 4132.5 MHz	5/100	Exception Note 5 of TS 38.101-1 table 7.3A.4-1
n5A/n77A	UL 3526 MHz / DL Mid	20/20	Exception Note 5 of TS 38.101 Table 7.3A.4-4
	UL 3526 MHz / DL Mid	10/10	Exception Note 5 of TS 38.101 Table 7.3A.4-4
n5A / n78A	Mid/High	Highest(20)/ Highest(100)	Non-exception. Not overlapping interference since BWINT=5*20 MHz, FINT (432.5) ≥ (100+100)/2 for HD5 and BWINT=4*20+100 MHz, FINT (224) ≥ (180+100)/2 for HM4.
	Mid/3346 MHz	5/10846.5	Exception Note 4 of TS 38.101 [5] table 7.3A.4-1
	/3386 MHz	5/100	Exception Note 4 of TS 38.101 [5] table 7.3A.4-1

n8A / n78A	Mid/High	Highest(20)/ Highest(100)	Non-exception. Not overlapping interference since BWINT=4*20 MHz, FINT (160) ≥ (80+100)/2.
	Mid/3590 MHz	5/10	Exception Note 4 of TS38.101 table 7.3A.4-1
	Mid/3590 MHz	5/100	Exception Note 4 of TS38.101 table 7.3A.4-1
n20 / n78A	Mid/High	5/10	Exception Note 4 of TS38.101 table 7.3A.4-1
	Mid/3388 MHz	5/100	Exception Note 4 of TS38.101 table 7.3A.4-1
n25A / n77A	Mid/High	Highest(45)/ Highest(100)	Non-exception. Not overlapping interference since BWINT=2*45 MHz, FINT (385) ≥ (90+100)/2 for HD2.
	UL 1882.5 MHz / DL 3765 MHz	5/10	Exception Note 2 of TS 38.101 Table 7.3A.4-1
	UL 1882.5 MHz / DL 3765 MHz	10/100	Exception Note 2 of TS 38.101 Table 7.3A.4-1
	UL 1852.5 MHz / DL 3680 MHz	5/10	Exception Note 6 of TS 38.101 Table 7.3A.4-1
n25A / n77A	UL 3925 MHz/ DL 1962.5 MHz	5/10	Exception Note 7 of TS 38.101 Table 7.3A.4-4
	UL 3925 MHz/ DL 1962.5 MHz	40/20	Exception Note 7 of TS 38.101 Table 7.3A.4-4
n25A / n78A	High/Low	Highest(45)/ Highest(100)	Non-exception. Not overlapping interference since BWINT=2*45 MHz, FINT (435) ≥ (90+100)/2 for HD2.
	UL 1882.5 MHz / DL 3765 MHz	5/10	Exception Note 2 of TS 38.101 Table 7.3A.4-1
	UL 1882.5 MHz / DL 3765 MHz	10/100	Exception Note 2 of TS 38.101 Table 7.3A.4-1
	UL 1852.5 MHz / DL 3680 MHz	5/10	Exception Note 6 of TS 38.101 Table 7.3A.4-1
n28 / n77A	Low / Low	Highest/Highest	Non-exception
	UL 705.5 MHz / DL 3527.5 MHz	5/10	Exception Note 5 of TS38.101 table 7.3A.4-1
	UL 705.5 MHz / DL 3527.5 MHz	5/100	Exception Note 5 of TS38.101 table 7.3A.4-1
n28A / n78A	Mid/High	Highest(20)/ Highest(100)	Non-exception. Not overlapping interference since BWINT=5*20 MHz, FINT (110) ≥ (100+100)/2 for HD5
	UL 705.5 MHz / DL 3527.5 MHz	5/10	Exception Note 5 of TS 38.101 [5] table 7.3A.4-1
	UL 705.5 MHz / DL 3527.5 MHz	5/100	Exception Note 5 of TS 38.101 [5] table 7.3A.4-1
	UL 705.5 MHz / DL 3527.5 MHz	5/10	Exception Note 5 of TS 38.101 [5] table 7.3A.4-4
n41A/n71A	UL Low/DL Low	Highest/Highest	Non-exception. Not overlapping interference since BW_{INT}=4*20 MHz, F_{INT} (146) ≥ (80+100)/2 for HD4. To be used in test cases 7.3A.1 to 7.3A.4
	UL Low / DL 2662 MHz	UL 5 / DL 10	Exception Note 4 of TS 38.101 Table 7.3A.4-1
	UL Low / DL High	UL 5 / DL 100	Exception Note 4 of TS 38.101 Table 7.3A.4-1
n66A/n77A	Mid/Mid	Highest(45)/ Highest(100)	Non-exception. Not overlapping interference since BWINT=2*45 MHz, FINT (260) ≥ (90+100)/2.
	UL 1750 MHz / DL 3500 MHz	5/10	Exception Note 2 of TS 38.101 Table 7.3A.4-1
	UL 1750 MHz / DL 3500 MHz	20/100	Exception Note 2 of TS 38.101 Table 7.3A.4-1
	UL 1712.5 MHz / DL 3400 MHz	5/10	Exception Note 6 of TS 38.101 Table 7.3A.4-1
n66A/n78A	Mid/Mid	Highest(45)/ Highest(100)	Non-exception. Not overlapping interference since BWINT=2*45 MHz, FINT (330) ≥ (90+100)/2.
	UL 1750 MHz / DL 3500 MHz	5/10	Exception Note 2 of TS 38.101 Table 7.3A.4-1
	UL 1750 MHz / DL 3500 MHz	20/100	Exception Note 2 of TS 38.101 Table 7.3A.4-1
	UL 1712.5 MHz / DL 3400 MHz	5/10	Exception Note 6 of TS 38.101 Table 7.3A.4-1

n70A / n71A	Mid/High	Highest(25) /Highest(20)	Non-exception. Not overlapping interference since BWINT=3*20 MHz, FINT (56.5) ≥ (60+25)/2.
	Low/Low	Highest / 10	Exception Note 9 of TS38.101 table 7.3A.4-1 n71 UL RB allocation 20@10
	Low/Low	5 / 5	Exception Note 9 of TS38.101 table 7.3A.4-1 n71 UL RB allocation 8@10
n71A/**n78A**	Mid/Mid	Highest(35)/ Highest(100)	Non-exception. Not overlapping interference since BWINT=2*35 MHz, FINT (147.5) ≥ (70+100)/2.
	UL 680.5 MHz / DL 3402.5 MHz	5/10	Exception Note 5 of TS 38.101 Table 7.3A.4-1
NOTE 1: This selection is used in test case 7.3A.1_1 unless otherwise stated. NOTE 2: Aggressor band in bold. NOTE 3: Non-exception test frequencies are required to be used in test cases 7.3A.1, 7.3A.2, 7.3A.3, 7.3A.4 which are also referred to in other Rx test cases under chapter 7 of TS38.521-1 [2]			

4.1.3.2 Spurious emissions test cases for FR1 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.

NOTE: Compared to the test points in test configuration Table 6.5A.3.2.1.4.1-1 in TS 38.521-1[2], additional test points in the test point analysis for Spurious emissions for UE co-existence in "6.5A.3.2.3 co-existence" tab of the zip-files shown in Table 4.1.3.2-1 introduced before RAN5#102 shall be ignored.

Table 4.1.3.2-1: Frequency range analysis availability per CA configuration

CA config	Number of test point	Justification	Comments
CA_n1A-n3A		38.521-1_TpAnalysisSpur(CA_n1A-n3A).zip	RAN5#99
CA_n1A-n8A	1	38.521-1_TpAnalysisSpur(CA_n1A-n8A).zip	RAN5#98
CA_n1A-n28A	1	38.521-1_TpAnalysisSpur(CA_n1A-n28A).zip	RAN5#102
CA_n1A-n78A	3	38.521-1_TpAnalysisSpur(CA_n1A-n78A) v3.zip	RAN5#97
CA_n1A-n79A	4	38.521-1_TpAnalysisSpur(CA_n1A-n79A).zip	RAN5#97
CA_n2A-n14A	2	38.521-1_TpAnalysisSpur(CA_n2A-n14A).zip	RAN5#101
CA_n2A-n77A	3	38.521-1_TpAnalysisSpur(CA_n2A-n77A)_v3.zip	RAN5#100
CA_n2A-n5A	3	38.521-1_TpAnalysisSpur(CA_n2A_n5A)_v1.zip	RAN5#100
CA_n2A-n48A	3	38.521-1_TpAnalysisSpur(CA_n2A_n48A)_v1.zip	RAN5#100
CA_n3A-n8A	3	38.521-1_TpAnalysisSpur(CA_n3A-n8A).zip	RAN5#100
CA_n3A-n28A	3	38.521-1_TpAnalysisSpur(CA_n3A-n28A).zip	RAN5#101
CA_n3A-n41A	6	38.521-1_TpAnalysisSpur(CA_n3A-n41A).zip	RAN5#97
CA_n3A-n77A	1	38.521-1_TpAnalysisSpur(CA_n3A-n77A).zip	RAN5#100
CA_n3A-n78A	4	38.521-1_TpAnalysisSpur(CA_n3A-n78A) v1.zip	RAN5#97
CA_n5A-n48A	7	38.521-1_TpAnalysisSpur(CA_n5A-n48A)_v1.zip	RAN5#100
CA_n5A-n66A	3	38.521-1_TpAnalysisSpur(CA_n5A-n66A).zip	RAN5#100
CA_n5A-n77A	7	38.521-1_TpAnalysisSpur(CA_n5A-n77A)_v3.zip	RAN5#100
CA_n8A-n78A	5	38.521-1_TpAnalysisSpur(CA_n8A-n78A) v1.zip	RAN5#97
CA_n14A-n30A	2	38.521-1_TpAnalysisSpur(CA_n14A-n30A).zip	RAN5#101
CA_n14A-n66A	2	38.521-1_TpAnalysisSpur(CA_n14A-n66A).zip	RAN5#101
CA_n14A-n77A	2	38.521-1_TpAnalysisSpur(CA_n14A-n77A).zip	RAN5#101
CA_n20A-n78A	5	38.521-1_TpAnalysisSpur(CA_n20A-n78A).zip	RAN5#100
CA_n24A-n41A	5	38.521-1_TpAnalysisSpur(CA_n24A-n41A).zip	RAN5#95e
CA_n24A-n48A	2	38.521-1_TpAnalysisSpur(CA_n24A-n48A).zip	RAN5#95e
CA_n24A-n77A	4	38.521-1_TpAnalysisSpur(CA_n24A-n77A).zip	RAN5#95e
CA_n25A-n66A	5	38.521-1_TpAnalysisSpur(CA_n25A-n66A).zip	RAN5#101
CA_n25A-n77A	3	38.521-1_TpAnalysisSpur(CA_n25A-n77A).zip	RAN5#101
CA_n25A-n78A	1	38.521-1_TpAnalysisSpur(CA_n25A-n78A).zip	RAN5#101
CA_n26A-n66A	1	38.521-1_TpAnalysisSpur(CA_n26A-n66A).zip	RAN5#96e
CA_n26A-n70A	1	38.521-1_TpAnalysisSpur(CA_n26A-n70A).zip	RAN5#96e
CA_n28A-n41A	4	38.521-1_TpAnalysisSpur(CA_n28A-n41A) v1.zip	RAN5#97
CA_n28A-n77A	1	38.521-1_TpAnalysisSpur(CA_n28A-n77A).zip	RAN5#100
CA_n28A-n78A	6	38.521-1_TpAnalysisSpur(CA_n28A-n78A).zip	RAN5#99
CA_n28A-n79A	1	38.521-1_TpAnalysisSpur(CA_n28A-n79A).zip	RAN5#100
CA_n39A-n41A	1	38.521-1_TpAnalysisSpur(CA_n39A-n41A).zip	RAN5#97
CA_n41A-n77A	1	38.521-1_TpAnalysisSpur(CA_n41A-n77A).zip	RAN5#102
CA_n41A-n79A	8	38.521-1_TpAnalysisSpur(CA_n41A-n79A) v1.zip	RAN5#97
CA_n48A-n66A	1	38.521-1_TpAnalysisSpur(CA_n48A-n66A) v1.zip	RAN5#97
CA_n48A-n70A	2	38.521-1_TpAnalysisSpur(CA_n48A-n70A).zip	RAN5#96e
CA_n48A-n71A	2	38.521-1_TpAnalysisSpur(CA_n48A-n71A)_v2.zip	RAN5#100
CA_n66A-n71A	1	38.521-1_TpAnalysisSpur(CA_n66A-n71A)_v1.zip	RAN5#99
CA_n66A-n77A	9	38.521-1_TpAnalysisSpur(CA_n66A-n77A) v2.zip	RAN5#97
CA_n66A-n78A	1	38.521-1_TpAnalysisSpur(CA_n66A-n78A).zip	RAN5#101
CA_n70A-n71A	1	38.521-1_TpAnalysisSpur(CA_n70A-n71A).zip	RAN5#96e
CA_n71A-n77A	7	38.521-1_TpAnalysisSpur(CA_n71A-n77A)_v1.zip	RAN5#100
CA_n71A-n78A	0	38.521-1_TpAnalysisSpur(CA_n71A-n78A)_v1.zip	RAN5#102

4.2 Test point analysis for FR2 test cases in TS 38.521-2

4.2.1 Test point analysis per test case

4.2.1.1 FR2 single carrier, NR CA and UL MIMO test cases

This clause contains information on test point analysis and test point selection for single carrier, NR CA and UL MIMO test cases in [3] clause 6 and 7 with information about transmitting test point selection for FR2 listed in table 4.2.1.1-1 and receiver test point selection in table 4.2.1.1-2.

Table 4.2.1.1-1: NR UE transmitter test point selection for FR2

Subclause	Number of test points	Justification in attachment	Comments
6.2.1 UE maximum output power	x	“38.521-2_TPanalysis_6.2.1_MOP_v3.zip”	RAN5#94-e
6.2.2 UE maximum output power reduction	power class 1: 90 power class 2&3&4: 84	”38.521-2_TPanalysis_6.2.2_MPR_6.5.2.1_SEM_6.5.2.3_NR_ACLR_v6.zip”	RAN5#89-e RAN5#90-e RAN5#91-e RAN5#92-e RAN5#94-e RAN5#95-e RAN5#98
6.2.4_1 Configured transmitted power with Power Boost	x	“38.521-2_TPanalysis_6.2.1_MOP_v3.zip”	RAN5#96-e
6.2.5 UE Maximum Output Power – EIRP with UL Gaps	x	“38.521-2_TPanalysis_6.2.5_EIRP_UL-Gaps_v1.zip”	RAN5#99
6.2A.1.1 UE maximum output power - EIRP and TRP for CA	TRP: 4 EIRP: 20	“38.521-2_TPanalysis_6.2A.1.x_MOP_Spherical Coverage_CA_v1”	RAN5#84
6.2A.1.2 UE maximum output power - Spherical coverage for CA	20	“38.521-2_TPanalysis_6.2A.1.x_MOP_Spherical Coverage_CA_v1”	RAN5#84
6.2A.2 UE maximum output power reduction for CA	FFS	“38.521-2_TPanalysis_6.2A.2_MPR_v3.zip”	RAN5#84 RAN5#96-e RAN5#99
6.2D.1 UE maximum output power for UL MIMO	x	“38.521-2_TPanalysis_6.2.1_MOP_v3.zip”	RAN5#94-e
6.2D.2 UE maximum output power reduction for UL MIMO	x	”38.521-2_TPanalysis_6.2.2_MPR_6.5.2.1_SEM_6.5.2.3_NR_ACLR_v6.zip”	RAN5#91-e RAN5#92-e RAN5#94-e RAN5#95-e RAN5#98
6.3.1 Minimum output power	9	“38.521-2_TPanalysis_6.3.1_MinOP_v2.zip“	RAN5#84
6.3.2 Transmit OFF power	3	“38.521-2_TPanalysis_6.3.2_Tx_OFF_power”	RAN5#83
6.3.3.2 General ON/OFF time mask	9	“38.521-2_TPanalysis_6.3.3.2_OnOff.zip”	RAN5#92-e
6.3.4.2 Absolute power tolerance	8	“38.521-2_TPanalysis_6.3.4.2_AbsPtol.zip”	RAN5#91-e
6.3.4.3 Relative power tolerance	Ramp up: 1 Ramp down: 1 Alternating: 1	“38.521-2_TPanalysis_6.3.4.3_RelPtol_v3.zip”	RAN5#82 RAN5#91-e RAN5#93-e
6.3.4.4 Aggregate power tolerance	PUCCH: 6 PUSCH: 6	“38.521-2_TPanalysis_6.3.4.4_AggPtol_2.zip”	RAN5#82 RAN5#91-e
6.3A.1.1 Minimum output power for CA (2UL CA)	4	“38.521-2_TPanalysis_6.3A.1.1_MinOP.zip”	RAN5#83
6.3A.2.1 Transmit OFF power for CA (2UL CA)	3	“38.521-2_TPanalysis_6.3A.2.1_Tx_OFF_Power_CA.zip”	RAN5#88-e

6.3A.4.2.1 Absolute power tolerance for CA (2UL CA)	6	38.521-2_TPanalysis_6.3A.4.2.1_AbsPCTol_CA.zip	RAN5#85
6.3A.4.2.2 Absolute power tolerance for CA (3UL CA)	6	38.521-2_TPanalysis_6.3A.4.2.1_AbsPCTol_CA.zip	RAN5#85
6.3A.4.2.3 Absolute power tolerance for CA (4UL CA)	6	38.521-2_TPanalysis_6.3A.4.2.1_AbsPCTol_CA.zip	RAN5#85
6.3A.4.2.4 Absolute power tolerance for CA (5UL CA)	6	38.521-2_TPanalysis_6.3A.4.2.1_AbsPCTol_CA.zip	RAN5#85
6.3A.4.2.5 Absolute power tolerance for CA (6UL CA)	6	38.521-2_TP analysis_6.3A.4.2.1_AbsPCTol_CA.zip	RAN5#85
6.3A.4.2.6 Absolute power tolerance for CA (7UL CA)	6	38.521-2_TP analysis_6.3A.4.2.1_AbsPCTol_CA.zip	RAN5#85
6.3A.4.2.7 Absolute power tolerance for CA (8UL CA)	6	38.521-2_TPanalysis_6.3A.4.2.1_AbsPCTol_CA.zip	RAN5#85
6.3A.4.4 Aggregate power tolerance for CA	1	38.521-2_TPanalysis_6.3A.4.4_Aggregate power tolerance for CA.zip	RAN5#92-e
6.3D.1 Minimum output power for UL MIMO	9	“38.521-2_TPanalysis_6.3.1_MinOP_v2.zip“	RAN5#84
6.3D.3.4 SRS time mask for UL-MIMO	18	“38.521-2_TPanalysis_6.3.3.2_SRS_M_UL-MIMO.zip“	RAN5#85
6.4.1 Frequency error	1	“38.521-2_TPanalysis_6.4.1_FreqErr.zip”	RAN5#80
6.4.2.1 Error Vector Magnitude	PUSCH: 168 PUCCH: 24 PRACH: 24	“38.521-2_TPanalysis_6.4.2.1_EVM.zip”	RAN5#3-5G-NR Adhoc
6.4.2.1_1 Error vector magnitude with Power Boost	PUSCH: 36 PUCCH: 9	“38.521-2_TPanalysis_6.2.1_MOP_v3.zip”	RAN5#97
6.4.2.2 Carrier leakage	3	“38.521-2_TPanalysis_6.4.2.2_CarrLeak_v3.zip”	RAN5#93-e
6.4.2.3 In-band emissions	PUSCH: 36 PUCCH: 18	“38.521-1_TPanalysis_6.4.2.3_IE_v2.zip”	RAN5#89-e
6.4.2.4 EVM equalizer spectrum flatness	18	“38.521-2_TP analysis_6.4.2.4_6.4.2.5_EVMequalizerSpectrumFlatness.zip”	RAN5#3-5G-NR Adhoc
6.4.2.5 EVM spectral flatness for pi/2 BPSK modulation with spectrum shaping	9	“38.521-2_TP analysis_6.4.2.4_6.4.2.5_EVMequalizerSpectrumFlatness.zip”	RAN5#3-5G-NR Adhoc
6.4.2.6 Phase continuity requirements for DMRS bundling	90PUSCH: 36 PUCCH: 18	“38.521-2_TPanalysis_6.4.2.6_Phase_Continuity_v2.zip”	RAN5#102
6.4.2.6 Phase continuity requirements for DMRS bundling	90	“38.521-2_TPanalysis_6.4.2.6_Phase_Continuity_v1.zip”	RAN5#100
6.4A.1 Frequency error for CA	N (1 test point per UL carrier)	“38.521-2_TPanalysis_6.4A.1_FreqErr_CA_v2.zip”	RAN5#87-e RAN5#90-e
6.4A.2.1 Error Vector Magnitude for CA	224	“38.521-2_TPanalysis_6.4A.2.1_EVM_CA.zip”	RAN5#91-e

6.4A.2.2 Carrier leakage for CA	2	"38.521-2_TPanalysis_6.4A.2.2_CarrLeak_CA_v3.zip"	RAN5#93-e
6.4D.3 Time alignment error for UL MIMO	6	"38.521-2_TPanalysis_6.4D.3_TAE_MIMO.zip"	RAN5#92-e
6.5.1 Occupied Bandwidth	12	"38.521-2_TPanalysis_6.5.1_OccBW_v3.zip"	RAN5#89-e RAN5#91-e
6.5.2.1 Spectrum Emission Mask	90	"38.521-2_TPanalysis_6.2.2_MPR_6.5.2.1_SEM_6.5.2.3_NR_ACLR_v6.zip"	RAN5#2-5G-NR Adhoc RAN5#79 RAN5#80 RAN5#89-e RAN5#90-e RAN5#91-e RAN5#92-e RAN5#94-e RAN5#95-e RAN5#98
6.5.2.1_1 Spectrum Emission Mask with Power Boost	x	"38.521-2_TPanalysis_6.5.2.1_1 SEM with Power Boost_v1.zip"	RAN5#97
6.5.2.3 Adjacent Channel Leakage Ratio	TBD	"38.521-2_TPanalysis_6.2.2_MPR_6.5.2.1_SEM_6.5.2.3_NR_ACLR_v6.zip"	RAN5#2-5G-NR Adhoc RAN5#89-e RAN5#90-e RAN5#91-e RAN5#92-e RAN5#94-e RAN5#95-e RAN5#98
6.5.3.1 Spurious emissions	4	"38.521-2_TPanalysis_6.5.3_TxSpurious_v3.zip"	RAN5#94-e
6.5.3.1_1 Transmitter Spurious emissions with Power Boost	x	"38.521-2_TPanalysis_6.5.3.1_1_6.5.3.2.1_1_6.5.3.3_1_TxSpurious with Power Boost_v1.zip"	RAN5#97
6.5.3.2 Spurious emissions UE band co-existence	4	"38.521-2_TPanalysis_6.5.3_TxSpurious_v3.zip"	RAN5#94-e
6.5.3.2_1 Spurious emission band UE co-existence with Power Boost	x	"38.521-2_TPanalysis_6.5.3.1_1_6.5.3.2.1_1_6.5.3.3_1_TxSpurious with Power Boost_v1.zip"	RAN5#97
6.5.3.3 Additional spurious emission	NS202: 4 NS203: 4	"38.521-2_TPanalysis_6.2.3_AMPR_NS_202.zip" "38.521-2_TPanalysis_6.2.3_AMPR_NS_203.zip"	RAN5#90-e
6.5.3.3_1 Additional spurious emissions with Power Boost	x	"38.521-2_TPanalysis_6.5.3.1_1_6.5.3.2.1_1_6.5.3.3_1_TxSpurious with Power Boost_v1.zip"	RAN5#97
6.5A.2.1 Spectrum Emission Mask for CA	30	"38.521-2_TPanalysis_6.5A.2.1_SEM for CA_v2.zip"	RAN5#89-e RAN5#99
6.5A.2.2 Adjacent channel leakage ratio for CA	52	"38.521-2_TPanalysis_6.5A.2.2_ACLR for CA_v2.zip"	RAN5#89-e RAN5#99
6.5A.3.1 Spurious emissions for CA	4	38.521-2_TPanalysis_6.5A.3_Spur_CA_v2.zip	RAN5#91-e RAN5#99
6.5A.3.2 Spurious emissions for CA	4	38.521-2_TPanalysis_6.5A.3_SpurCoEx_CA_v2.zip	RAN5#93-e RAN5#99

6.5D.1 Occupied Bandwidth for UL MIMO	12	“38.521-2_TPanalysis_6.5.1_OccBW_v3.zip”	RAN5#91-e
6.5D.2.1 Spectrum Emission Mask for UL MIMO	x	”38.521-2_TPanalysis_6.2.2_MPR_6.5.2.1_SEM_6.5.2.3_NR_ACLR_v6.zip”	RAN5#91-e RAN5#92-e RAN5#94-e RAN5#95-e RAN5#98
6.5D.2.2 Adjacent channel leakage ratio for UL MIMO	x	”38.521-2_TPanalysis_6.2.2_MPR_6.5.2.1_SEM_6.5.2.3_NR_ACLR_v6.zip”	RAN5#91-e RAN5#92-e RAN5#94-e RAN5#95-e RAN5#98
6.5D.3.1 Transmitter Spurious emissions for UL MIMO	4	“38.521-2_TPanalysis_6.5.3_TxSpurious_v3.zip”	RAN5#94-e
6.5D.3.2 Spurious emission band UE co-existence for UL MIMO	4	“38.521-2_TPanalysis_6.5.3_TxSpurious_v3.zip”	RAN5#94-e
6.5D.3.3 Additional spurious emissions for UL MIMO	NS202: 4 NS203: 4	“38.521-2_TPanalysis_6.2.3_AMPR_NS_202.zip” “38.521-2_TPanalysis_6.2.3_AMPR_NS_203.zip”	RAN5#94-e
6.6 Beam Correspondence	6	“38.521-2_TPanalysis_6.6_Beam_Correspond_v1.zip”	RAN5#85

Table 4.2.1.1-2: NR UE receiver test point selection for FR2

Subclause	Number of test points	Justification in attachment	Comments
7.3 Reference sensitivity	9	“38.521-2_TPanalysis_7.3_RefSense.zip”	RAN5#80
7.3A Reference sensitivity for CA	9	“38.521-2_TPanalysis_7.3A_RefSenseCA.zip”	RAN5#86-e
7.4 Maximum input level	6	“38.521-2_TPanalysis_7.4_Maximun input level_v1.zip”	RAN5#93-e
7.4A Maximum input level for CA	2	“38.521-2_TPanalysis_7.4A_Maximun input level_for_CA_v1.zip”	RAN5#93-e
7.5 Adjacent channel selectivity	3	“38.521-2_TPanalysis_7.5 ACS_v1.zip”	RAN5#83
7.6.2 In Band Blocking	3	“38.521-2_TPanalysis_7.6.2 InB_Block_v1.zip”	RAN5#83

4.2.2 Test point analysis per NS value

4.2.2.1 A-MPR and A-SE FR2 test cases for single carrier

This section contains information on test point selection for test case 6.2.3 in [3] Additional Maximum Power Reduction (A-MPR) as well as the related spectrum emissions test case 6.5.3.3 in [3] Additional Spurious emission (A-SE). Selection of test points should include some possible worst combinations based on the A-MPR and spectrum emissions characteristics specified for each NS value. The number of test points should be realistic.

Since A-MPR is defined by RAN4 together with A-Spurious requirements, a combined analysis is required. In general, the following non-compliant UE behaviours need to be checked:

a) UE apply too much A-MPR (more than RAN4 allow)

b) UE apply to little A-MPR (causing too much spectrum emissions)

Case A can be verified in A-MPR test case

Case B can be verified in A-SE test case if it is ensured that the same test point is tested inside A-MPR test. Therefore, the test points in spectrum emissions test case must be a subset of the test points in the A-MPR test case.

Note: Even if there are identical test points in the MPR test case the A-MPR test case is still needed to verify UE output power when NS-value is signalled.

Table 4.2.2.1-1: NS value specific test points for A-MPR single carrier

NS label	Number of test points	Justification	Comments
NS_202	6.2.3: 3 6.5.3.3: 3 6.2D.3: 3 6.5D.3.3: 3	"38.521-2_TPanalysis_6.2.3_AMPR_NS_202_v3.zip"	RAN5#95-e
NS_203	6.2.3: 3 6.5.3.3: 3 6.2D.3: 3 6.5D.3.3: 3	"38.521-2_TPanalysis_6.2.3_AMPR_NS_203_v3.zip"	RAN5#95-e
CA_NS_203	6.2A.3.1: 1 6.2A.3.2: 1 6.2A.3.3: 1 6.5A.3.3.1:1 6.5A.3.3.2:1 6.5A.3.3.3:1	"38.521-2_TPanalysis_6.2A.3_AMPR_CA_NS_203.zip"	RAN5#101

4.2.2.2 A-MPR and A-SE FR2 test cases for CA

This section contains information on test point selection for test cases 6.2A.3.1, 6.2A.3.2, and 6.2A.3.3 in [3], UE additional maximum output power reduction for CA as well as the related spectrum emissions test case 6.5A.3.3.1, 6.5A.3.3.2, and 6.5A.3.3.3 in [3] Additional Spurious emission (A-SE) for CA.

Selection of test points should include some possible worst combinations based on the A-MPR and spectrum emissions characteristics specified for each CA_NS value. The number of test points should be realistic.

Since A-MPR is defined by RAN4 together with A-Spurious requirements, a combined analysis is required. In general, the following non-compliant UE behaviours need to be checked:

a) UE apply too much A-MPR (more than RAN4 allow)

b) UE apply to little A-MPR (causing too much spectrum emissions)

Case A can be verified in A-MPR test case

Case B can be verified in A-SE test case if it is ensured that the same test point is tested inside A-MPR test. Therefore, the test points in spectrum emissions test case must be a subset of the test points in the A-MPR test case.

Note: Even if there are identical test points in the MPR test case the A-MPR test case is still needed to verify UE output power when NS-value is signalled.

Table 4.2.2.1-1: NS value specific test points for A-MPR single carrier

NS label	Number of test points	Justification	Comments
CA_NS_202	6.2A.3.1: 4 6.2A.3.2: 4 6.2A.3.3: 4 6.5A.3.3.1:4 6.5A.3.3.2:4 6.5A.3.3.2:4	"38.521-2_TPanalysis_6.2.3_AMPR_CA_NS_202v1.zip"	RAN5#101

4.2.3 Test point analysis per NR CA configuration

4.2.3.1 Reference Sensitivity test cases for FR2 NR CA

Editor's note: TP analyses for FR2 NR CA will be added to this clause.

4.3 Test point analysis for test cases in TS 38.521-3

4.3.1 Test point analysis per test case

4.3.1.1 EN-DC test cases

Table 4.3.1.1-1: NR UE transmitter test point selection for EN-DC

Subclause	Number of test points	Justification in attachment	Comments
6.2B.1.1 UE Maximum Output Power for Intra-Band Contiguous EN-DC	20	"38.521-3_TPanalysis_6.2B.1.1_MOP_Intra_B_contig_v4.zip"	RAN5#88-e
6.2B.1.2 UE Maximum Output Power for Intra-Band Non-Contiguous EN-DC	40	"38.521-3_TPanalysis_6.2B.1.2_MOP_Intra_B_non-contig_v2.zip"	RAN5#87-e
6.2B.1.3 UE Maximum Output Power for Inter-Band EN-DC	600	"38.521-3_TPanalysis_6.2B.1.3_MOP_Inter_B_Config_v2.zip"	RAN5#86-e
6.2B.1.3_1 UE Maximum Output Power for Inter-Band EN-DC within FR1 (2 E-UTRA CC, 1 NR CC)	400	"38.521-3_TPanalysis_6.2B.1.3_1_MOP_Inter_B_2 LTE_1NR.zip"	RAN5#95-e
6.2B.2.1 UE Maximum Output Power reduction for Intra-Band Contiguous EN-DC	1880	"38.521-3_TPanalysis_6.2B.2.1_MPR_6.5B.2.1_SEM_6.5B.2.1.3_ACLR.zip"	RAN5#87-e
6.2B.2.2 UE Maximum Output Power reduction for Intra-Band Non-Contiguous EN-DC	1140	" 38.521-3_TPanalysis_6.2B.2.2_MPR_6.5B.2.2.1_SEM_6.5B.2.2.3_ACLR_v1.zip"	RAN5#93-e
6.2B.2.3 UE Maximum Output Power reduction for Inter-Band EN-DC within FR1	Same as Table 4.1.1-1, test case 6.5.2	Same as Table 4.1.1.1-1, test case 6.5.2.	RAN5#3-5G-NR Adhoc
6.2B.2.4 UE Maximum Output Power reduction for Inter-Band EN-DC including FR2	Same as Table 4.1.1-1, test case 6.2.2	Same as Table 4.1.1.1-1, test case 6.2.2	RAN5#5-5G-NR-Adhoc
6.2B.3.1 UE Additional Maximum Output Power reduction for Intra-band contiguous EN-DC	340	"38.521-3_TPanalysis_6.2B.3.1_AMPR_NS_04_v3.zip"	RAN5#81
	8	"38.521-3_TPanalysis_6.2B.3.1_AMPR_NS_35.zip"	RAN5#3-5G-NR Adhoc
6.2B.4.1.1 Configured Output Power Level for Intra-Band Contiguous EN-DC	-UE not supporting DPS: 90 -UE supporting DPS: 120	"38.521-3_TPanalysis_6.2B.4.1.1_ConfiguredTP_Intra_B_Contig_v2.zip"	RAN5#86-e
6.2B.4.1.2 Configured Output Power for Intra-Band Non-Contiguous EN-DC	-UE not supporting DPS: 70 -UE supporting DPS: 100	"38.521-3_TPanalysis_6.2B.4.1.2_ConfiguredTP_Intra_B_Non-contig_v2.zip"	RAN5#86-e
6.2B.4.1.3 Configured Output Power for Inter-Band EN-DC within FR1	-UE not supporting DPS: 100 -UE supporting DPS: 140	"38.521-3_TPanalysis_6.2B.4.1.3_ConfiguredTP_Inter_B_within_FR1_v3.zip"	RAN5#95-e
6.2B.4.1.3_1 Configured Output Power for Inter-Band EN-DC within FR1 (2 E-UTRA CCs, 1 NR CC)	-UE not supporting DPS: 100 -UE supporting DPS: 140	"38.521-3_TPanalysis_6.2B.4.1.3_ConfiguredTP_Inter_B_within_FR1_v3.zip"	RAN5#95-e
6.4B.2.1.3 In-band emissions for intra-band contiguous EN-DC	36	"38.521-3_TPanalysis_6.4B.2.1.3_IBE_Intra_B_contig_v1.zip"	RAN5#92-e
6.5B.1.1 Occupied bandwidth for Intra-Band Contiguous EN-DC	X= intra-band ENDC channel BWs supported by UE	"38.521-3_TPanalysis_6.5B.1.1_OBW_Intra_B_contig.zip"	RAN5#3-5G-NR adhoc

6.5B.2.1.1 Spectrum emissions mask for intra-band contiguous EN-DC	304	“38.521-3_TPanalysis_6.2B.2.1_MPR_6.5B.2.1_SEM_6.5B.2.1.3_ACLR.zip”	RAN5#87-e
6.5B.2.1.3 Adjacent channel leakage ratio for intra-band contiguous EN-DC	2160	38.521-3_TPanalysis_6.2B.2.1_MPR_6.5B.2.1_SEM_6.5B.2.1.3_ACLR.zip“”	RAN5#87-e
6.5B.2.2.1 Spectrum emissions mask for intra-band non-contiguous EN-DC	228	38.521-3_TPanalysis_6.2B.2.2_MPR_6.5B.2.2.1_SEM_6.5B.2.2.3_ACLR_v1.zip	RAN5#93-e
6.5B.2.2.3 Adjacent channel leakage ratio for intra-band non-contiguous EN-DC	1140	38.521-3_TPanalysis_6.2B.2.2_MPR_6.5B.2.2.1_SEM_6.5B.2.2.3_ACLR_v1.zip	RAN5#93-e
6.5B.3.1.2 Spurious emission band UE co-existence for intra-band contiguous EN-DC	8	“38.521-3_TP analysis_6.5B.3_TX_SpurEmission_Intra_B_EN-DC”	RAN5#91-e
6.5B.3.2.2 Spurious emission band UE co-existence for intra-band non-contiguous EN-DC	8	“38.521-3_TP analysis_6.5B.3_TX_SpurEmission_Intra_B_EN-DC”	RAN5#91-e
6.5B.3.3.1 General spurious emissions for Inter-band EN-DC within FR1	12	“38.521-3_TP analysis_6.5B.3.3.1_TX_SpurEmission_Inter_B_EN-DC.zip”	RAN5#91-e
6.5B.3.3.2 Spurious Emissions band UE co-existence for Inter-band within FR1	Note 1	“38.521-3_TP analysis_6.5B.3.3.2_TX_SpurEmission_Inter_B_EN-DC”	RAN5#91-e
Note 1: The maximum number of test point is 2 if only default points are applied.			

Table 4.3.1.1-2: NR UE receiver test point selection for EN-DC

Subclause	Number of test points	Justification in attachment	Comments
7.3B Reference sensitivity for EN-DC		"38.521-3_TPanalysis_7.3B_RxSense_EN-DC with FR1_v2.zip"	RAN5#89-e
7.4B.1 Maximum Input Level for Intra-Band Contiguous EN-DC	6	"38.521-3_TP analysis_7.4B.1.1_MaxIL_Intra_B_contig.zip"	RAN5#82
7.4B.2 Maximum Input Level for Intra-Band Non-Contiguous EN-DC	6	"38.521-3_TP analysis_7.4B.2_MaxIL_Intra_B_noncontig.zip"	RAN5#82
7.5B.1 Adjacent Channel Selectivity for intra-band contiguous EN-DC (2 CCs)	2	"38.521-3_TP analysis_7.5B.1_ACS_Intra_B_contig.zip"	RAN5#94-e
7.5B.2 Adjacent Channel Selectivity for intra-band non-contiguous EN-DC (2 CCs)	2	Same as Table 4.1.1-1, test case 7.5	RAN5#94-e
7.5B.3 Adjacent Channel Selectivity for inter-band EN-DC (1 NR CC)	3	Same as Table 4.1.1-1, test case 7.5	RAN5#94-e
7.6B.2.1 Inband blocking for intra-band contiguous EN-DC in FR1 (2 CCs)	2	"38.521-3_TP analysis_7.6B.2.1_IBB_Intra_B_contig.zip"	RAN5#87-e
7.6B.2.2 Inband blocking for intra-band non-contiguous EN-DC in FR1 (2 CCs)	1	"38.521-3_TPanalysis_7.6B.2.2_IBB_Intra_B_non-contig.zip"	RAN5#87-e
7.6B.2.3 Inband blocking for inter-band EN-DC within FR1 (2 CCs)	Same as Table 4.1-2, test case 7.6.2.	Same as Table 4.1-2, test case 7.6.2.	RAN5#87-e
7.6B.3.1 Out-of-band blocking for intra-band contiguous EN-DC in FR1 (2 CCs)	1	"38.521-3_TP analysis_7.6B.3.1_OOBB_Intra_B_contig.zip"	RAN5#87-e
7.6B.3.2 Out-of-band blocking for intra-band non-contiguous EN-DC in FR1 (2 CCs)	1	"38.521-3_TPanalysis_7.6B.3.2_OOBB_Intra_B_non-contig.zip"	RAN5#87-e
7.6B.3.3 Out-of-band blocking for inter-band EN-DC within FR1 (2 CCs)	1	"38.521-3_TP analysis_7.6B.3.3_OOBB_Inter_B_within FR1.zip"	RAN5#87-e
7.6B.4.1 Narrow band blocking for intra-band contiguous EN-DC in FR1 (2 CCs)	2	"38.521-3_TP analysis_7.6B.4.1_NBB_Intra_B_contig.zip"	RAN5#87-e
7.6B.4.2 Narrow band blocking for intra-band non-contiguous EN-DC in FR1 (2 CCs)	1	"38.521-3_TPanalysis_7.6B.4.2_NBB_Intra_B_non-contig.zip"	RAN5#87-e
7.6B.4.3 Narrow band blocking for inter-band EN-DC within FR1 (2 CCs)	Same as Table 4.1-2, test case 7.6.4.	Same as Table 4.1-2, test case 7.6.4.	RAN5#87-e
7.7B.1 Spurious Response for intra-band contiguous EN-DC in FR1 (2 CCs)	Same as Table 4.3-2, test case 7.6B.3.1.	Same as Table 4.3-2, test case 7.6B.3.1.	RAN5#87-e
7.7B.2 Spurious Response for intra-band non-contiguous EN-DC in FR1 (2 CCs)	Same as Table 4.3-2, test case 7.6B.3.2.	Same as Table 4.3-2, test case 7.6B.3.2.	RAN5#87-e

7.7B.3 Spurious Response for inter-band EN-DC within FR1 (2 CCs)	Same as Table 4.3-2, test case 7.6B.3.3.	Same as Table 4.3-2, test case 7.6B.3.3.	RAN5#87-e
7.8B.2.3 Wideband Intermodulation for inter-band EN-DC within FR1	Same as Table 4.1-2, test case 7.8.2.	Same as Table 4.1-2, test case 7.8.2.	RAN5#81
7.9A.1 Spurious emission for 2DL CA	3	"38.521-1_TPanalysis_7.9A_Spurious Emission_DL CA.zip"	RAN5#82
7.9B.3 Spurious Emissions for inter-band EN-DC within FR1	Same as Table 4.1-2, test case 7.9.	Same as Table 4.1-2, test case 7.9.	RAN5#81

4.3.1.2 V2X test cases

Table 4.3.1.2-1: UE transmitter test point selection for E-UTRA-NR V2X

Subclause	Number of test points	Justification in attachment	Comments
6.2E.1 UE Maximum Output Power for V2X	Intra-band contiguous V2X: N/A Intra-band non-contiguous V2X: N/A Inter-band con-current V2X: 20	"38.521-3_TPanalysis_V2X_6.2E.1_MOP.zip"	RAN5#93-e
6.2E.2 UE maximum output power reduction for V2X	Intra-band contiguous V2X: N/A Intra-band non-contiguous V2X: N/A Inter-band con-current V2X: - 80 for E-UTRA Uu + NR SL - 220 for NR Uu + E-UTRA SL	"38.521-3_TPanalysis_V2X_6.2E.2_MPR_6.5E.2.1_SEM_6.5E.2.3_ACLR.zip"	RAN5#93-e
6.5E.2.1 Spectrum emission mask for V2X	Intra-band contiguous V2X: N/A Intra-band non-contiguous V2X: N/A Inter-band con-current V2X: - 8 for E-UTRA Uu + NR SL - 28 for NR Uu + E-UTRA SL	"38.521-3_TPanalysis_V2X_6.2E.2_MPR_6.5E.2.1_SEM_6.5E.2.3_ACLR.zip"	RAN5#93-e
6.5E.2.3 Adjacent channel leakage ratio for V2X	Intra-band contiguous V2X: N/A Intra-band non-contiguous V2X: N/A Inter-band con-current V2X: - 80 for E-UTRA Uu + NR SL - 220 for NR Uu + E-UTRA SL	"38.521-3_TPanalysis_V2X_6.2E.2_MPR_6.5E.2.1_SEM_6.5E.2.3_ACLR.zip"	RAN5#93-e

4.3.2 Test point analysis per NS value

4.3.2.1 A-MPR and A-SE test cases for EN-DC

FFS

4.3.3 Test point analysis per EN-DC configuration

4.3.3.1 Reference sensitivity test cases for EN-DC

This clause contains information on test point analysis and status for FR1 EN-DC test cases in TS 38.521-3 [4] clause 7. The analyses are performed per EN-DC configuration in Table 4.3.3.1-1, Table 4.3.3.1-2 and Table 4.3.3.1-3.

Table 4.3.3.1-1: Reference Sensitivity test cases per EN-DC configuration (2CC)

Band or band configuration	Single UL	Refsens exception, victim band (NOTE 2)	Requirement coverage (NOTE 2)	Comments
DC_(n)XAA				
5	Only single UL requirements defined	5	Exception	RAN5#92-e
12	Only single UL requirements defined	12	Exception	RAN5#92-e
38	Only single UL requirements defined	N/A	NE	RAN5#88-e
41	Yes	N/A	NE	RAN5#88-e
48	Only single UL requirements defined	N/A	NE	RAN5#88-e
71	Yes	71	Exception	RAN5#88-e
DC_XA_nXA				
DC_2A_n2A	Only single UL requirements defined	N/A	NE	RAN5#88-e
DC_3A_n3A	Yes	3	Exception	RAN5#88-e
DC_5A_n5A	Only single UL requirements defined	N/A	NE	RAN5#88-e
DC_7A_n7A	Only single UL requirements defined	N/A	NE	RAN5#88-e
DC_41A_n41A	Only single UL requirements defined	N/A	NE	RAN5#88-e
DC_48A_n48A	Only single UL requirements defined	N/A	NE	RAN5#88-e
DC_66A_n66A	Only single UL requirements defined	N/A	NE	RAN5#88-e
DC_71A_n71A	Only single UL requirements defined	N/A	NE	RAN5#92-e
DC_XA_nYA (NOTE 1)				
DC_1A_n3A	Yes	1 (IMD3) CBI	NE IMD3 CBI, CBI avoid	RAN5#89-e
DC_1A_n7A	No	N/A	NE	RAN5#94-e
DC_1A_n8A	No	1 (IMD4)	NE IMD4	RAN5#95-e
DC_1A_n28A	No	1 (HD3)	NE HD, HD avoid	RAN5#98
DC_1A_n41A	No	1 (CBI) n41 (CBI)	NE CBI	RAN5#98
DC_1A_n77A	No	n77 (HD2) B1 (IMD2) B1 (IMD4)	NE HD IMD2 IMD4	Added at RAN5#96-e
DC_1A_n78A	No	1 (IMD4)	NE IMD4	RAN5#88-e
DC_2A_n41A	No	2 (CBI)	NE CBI	Added at RAN5#96-e
DC_2A_n66A	No	3 (IMD3) n66 (IMD5)	NE IMD3 IMD5	RAN5#94-e
DC_2A_n71A	No	2 (HD3) n71 (HM)	NE HD HM	RAN5#93-e
DC_2A_n77A	No	n77 (HD) 2 (HM) 2 (IMD2) 2 (IMD4) 2 (IMD5)	NE HD, HD avoid HM, HM avoid IMD2 PC2&PC3 IMD4 PC2&PC3 IMD5 PC3	RAN5#94-e
DC_2A_n78A	No	n78 (HD2) 2 (IMD2) 2 (IMD4)	NE HD IMD2 IMD4	RAN5#94-e
DC_3A_n1A	Yes	1 (IMD3) CBI	NE IMD3 CBI, CBI avoid	RAN5#89-e
DC_3A_n5A	Yes	3 (IMD4) n5 (IMD2)	NE IMD2 IMD4	RAN5#94-e
DC_3A_n8A	No	3 (IMD5) n8 (IMD4)	NE IMD4 IMD5	RAN5#96-e
DC_3A_n28A	No	N/A	NE	RAN5#95-e

DC_3A_n77A	No	n77 (HD2) B3 (HM) B3 (IMD2) B3 (IMD4)	NE HD HM PC2&PC3 IMD2 IMD4	Added at RAN5#96-e
DC_3A_n78A	Yes	3 (IMD2) 3 (IMD4) 3 (HD) n78 (HM)	NE IMD2 PC2&PC3 IMD4 PC2&PC3 HD HM, HM avoid	RAN5#89-e
DC_5A_n66A	Yes	5 (IMD2)	NE (anchor agnostic) IMD2	RAN5#93-e
DC_5A_n77A	No	n77 (HD) 5 (IMD4) 5 (IMD5)	NE HD, HD avoid IMD4 PC2&PC3 IMD5 PC3	RAN5#94-e
DC_5A_n78A	No	n78 (HD4) B5 (IMD4)	NE HD, HD avoid IMD4	Added at RAN5#96-e
DC_7A_n1A	No	N/A	NE	RAN5#90-e
DC_7A_n3A	No	7 (IMD4|3*fB3-1*fB7|)	NE, IMD4	RAN5#90-e
DC_7A_n5A	Yes	n5 (IMD3)	NE, IMD3	RAN5#94-e
DC_7A_n8A	No	N/A	NE	RAN5#95-e
DC_7A_n28A	No	N/A	NE	RAN5#94-e
DC_7A_n66A	No	B7 (IMD4)	NE IMD4	RAN5#99
DC_7A_n71A	No	B7 (HD)	NE HD, HD avoid	RAN5#99
DC_7A_n77A	No	B7 (IMD4)	NE IMD4	RAN5#99
DC_7A_n78A	No	CBI	NE, CBI	RAN5#94-e
DC_8A_n1A	No	n1 (IMD4 |2*fB1-2*fB8|)	NE, IMD4	RAN5#90-e
DC_8A_n3A	No	8 (IMD4 |3*fB8-1*fB3|), n3 (IMD5 |4*fB8-1*fB3|)	NE, IMD4, IMD5	RAN5#90-e
DC_8A_n20A	Yes	8 (IMD3) n20 (IMD3)	NE IMD3	RAN5#94-e
DC_8A_n28A	No	N/A	NE	RAN5#95-e
DC_8A_n41A	No	n41 (HD3), 8 (IMD3)	NE HD, HD avoid IMD3	RAN5#98
DC_8A_n77A	No	8 (HD4), 8 (IMD4)	NE HD, HD avoid IMD4	RAN5#92-e
DC_8A_n78A	No	N78 (HD4), 8 (IMD4)	NE HD, HD avoid IMD4	Added at RAN5#96-e
DC_8A_n79A	No	n79 (HD5), 8 (IMD5)	NE HD, HD avoid IMD5	Added at RAN5#96-e
DC_11A_n77A	No	N/A	NE	RAN5#91-e
DC_11A_n78A	No	N/A	NE	RAN5#91-e
DC_11A_n79A	No	11 (HM)	NE HM, HM avoid	RAN5#92-e
DC_12A_n2A	No	N/A	NE	RAN5#98
DC_12A_n66A	No	N66 (HD3)	NE HD, HD avoid	RAN5#97

DC_12A_n78A	Yes (DC_12_n78)	n78 (HD5) 12 (IMD5)	NE HD, HD avoid IMD5	RAN5#98
DC_13A_n77A	No	n77 (HD) 13 (HM) 13 (IMD5)	NE HD, HD avoid HM, HM avoid IMD5 PC2&PC3	RAN5#94-e
DC_14A_n2A	No	N/A	NE	RAN5#98
DC_18A_n77A	No	n77 (HD5)	NE HD	RAN5#97
DC_18A_n78A	No	N/A	NE	RAN5#97
DC_19A_n77A	No	n77 (HD5) n77 (HD4)	NE HD	RAN5#99
DC_19A_n78A	No	n78(HD4), 19(HM), 19(IMD4)	NE, HD, HM PC2&PC3, IMD4 PC2&PC3	RAN5#102
DC_19A_n79A	No	19 (HM |5*fB19DL-1*fB79|),	NE, HM PC2&PC3, HM avoid	Added at RAN5#101
DC_20A_n1A	No	N/A	NE	RAN5#90-e
DC_20A_n3A	No	n3 (IMD4), 20 (IMD4)	NE IMD4	RAN5#89-e
DC_20A_n7A	DC_20_n7	20 (IMD3)	NE IMD3	RAN5#94-e
DC_20A_n8A	DC_20_n8	20 (IMD3) n8 (IMD3)	NE IMD3	RAN5#95-e
DC_20A_n78A	No	20 (IMD4), n78 (HD)	NE IMD4, HD, HD avoid	RAN5#88-e
DC_21A_n28A	Yes	21 (IMD5)	NE, IMD5	RAN5#99
DC_21A_n79A	No	B21 HM B21 IMD3	NE HM PC2&PC3, HM avoid IMD3 PC2&PC3	Added at RAN5#101
DC_25A_n41A	No	B25	CBI	RAN5#98
DC_26A_n41A	No	n41 (HD3), 26 (IMD3)	NE HD, HD avoid IMD	RAN5#92-e
DC_26A_n77A	No	n77 (HD4), 26 (IMD4)	NE HD, HD avoid IMD	RAN5#92-e
DC_26A_n78A	No	n78 (HD4), 26 (IMD4)	NE HD, HD avoid IMD	RAN5#92-e
DC_26A_n79A	No	26 (HM |4*fB26DL-1*fB79|)	NE HM, HM avoid	RAN5#92-e
DC_28A_n5A	No	CBI	NE CBI, CBI avoid	RAN5#94-e
DC_28A_n7A	No	N/A	NE	RAN5#94-e
DC_28A_n77A	No	n77 (HD), n77 (HM), 28 (IMD5)	NE (HD avoid), HD, HM, IMD5 PC2&PC3	RAN5#92-e
DC_28A_n78A	No	n78 (HD), 28 (IMD5)	NE (HD avoid), HD, IMD5	RAN5#92-e
DC_30A_n66A	No	n66 (CBI)	NE CBI	RAN5#97
DC_38A_n78A	No	B38 (CBI)	NE CBI	RAN5#99

DC_40A_n1A	No	N/A	NE	RAN5#89-e
DC_40A_n78A	No	40 (HM)	NE HM, HM avoid	RAN5#89-e
DC_40A_n79A	No	N/A	NE	RAN5#94-e
DC_41A_n28A	No	N/A	NE	RAN5#98
DC_41A_n77A (NOTE 3)	No	41 (HM |3*fB41DL-2*fB77|), 41 (CBI), n77 (CBI)	NE HM CBI	RAN5#92-e
DC_41A_n78A (NOTE 3)	No	41 (HM |3*fB41DL-2*fB77|), 41 (CBI), n78 (CBI)	NE HM CBI	RAN5#92-e
DC_42A_n77A	Only single UL requirements defined	N/A	NE	RAN5#91-e
DC_48A_n66A	No	48 (HD2) 66 (IMD5)	NE (anchor agnostic) HD2 IMD5	RAN5#92-e
DC_66A_n2A	DC_66_n2	n2 (IMD3) 66 (IMD5)	NE (anchor agnostic) IMD3 IMD5	RAN5#93-e
DC_66A_n5A	No	n5 (IMD2)	NE IMD2	RAN5#97
DC_66A_n25A	No	B66, n25 (IMD3) B66 (IMD5)	NE IMD3 IMD5	RAN5#99
DC_66A_n41A	No	66 (CBI)	NE CBI	RAN5#98
DC_66A_n71A	No	66 (IMD4)	NE (anchor agnostic) IMD4	RAN5#93-e
DC_66A_n77A	No	n77 (HD) 66 (IMD2) 66 (IMD5)	NE HD, HD avoid IMD2 PC2&PC3 IMD5 PC2&PC3	RAN5#94-e
DC_66A_n78A	No	n78 (HD2) 66 (IMD5)	NE (anchor agnostic) HD2 IMD5	RAN5#93-e
DC_71A_n2A	No	n78 (HD2) 66 (IMD5)	NE (anchor agnostic) HD HM HM avoid	RAN5#98
DC_71A_n66A	No	n66 (IMD4)	NE (anchor agnostic) IMD4	RAN5#98

NOTE 1: If single UL is allowed in a DC_XA_nYA configuration the IMD requirements does not apply for UEs supporting UE capability *singleUL-Transmission.*

NOTE 2: Notations used
NE: Non-exception as defined in TS 38.101-3 [7], meaning standalone LTE in TS 36.101 [8] and NR in 38.101-1 [5] requirements apply.
HD: UL Harmonic Distortion, as defined in TS 38.101-3 [7], 7.3B.2.3.1
HM: RX Harmonic Mixing, as defined in TS 38.101-3 [7], 7.3B.2.3.2
IMD: Intermodulation Distortion, as defined in TS 38.101-3 [7], 7.3B.2.3.5
CBI: Cross Band Isolation, as defined in TS 38.101-3 [7], 7.3B.2.3.4
HD avoid: single carrier requirements apply with aggressor of UL Harmonic Distortion active.
HM avoid: single carrier requirements apply with aggressor of RX Harmonic Mixing active.
CBI avoid: single carrier requirements apply with aggressor of Cross Band Isolation active.

NOTE 3: HM cannot be avoided with aggressor still active since CBI exception always exists. Therefore, no HM avoid test point is added.

Table 4.3.3.1-2: Reference Sensitivity test cases per EN-DC configuration (3CC)

Band or band configuration	Single UL	UL config	Refsens exception, victim band	Requirement coverage (NOTE 2)	Fallback DC configurations	Comments
DC_(n)XCA						
41	Yes	DC_(n)41AA	N/A	NE	DC_(n)41AA DC_41A_n41A	RAN5#89-e
41	Yes	DC_41A_n41A	N/A	NE	DC_(n)41AA DC_41A_n41A	RAN5#89-e
48	Only single UL requirements defined	DC_(n)48AA	N/A	NE	DC_(n)48AA DC_48A_n48A	RAN5#89-e
48	Only single UL requirements defined	DC_48A_n48A	N/A	NE	DC_(n)48AA DC_48A_n48A	RAN5#89-e
DC_XA_nYC						
DC_3A_n78C	Yes	DC_3A_n78A	N/A	NE		RAN5#93-e
DC_XA_nY(2A)						
FFS						
DC_XA_nYA-nZA						
DC_1A_n28A-n78A	No	DC_1A_n28A	n78 (3 band IMD3)	NE, IMD3		RAN5#92-e
	No	DC_1A_n78A	n28 (3 band IMD5)	NE, IMD5		RAN5#92-e
DC_3A_n28A-n78A	No	DC_3A_n28A	n78 (3 band IMD5)	NE, IMD5		RAN5#92-e
	Yes	DC_3A_n78A	No 3CC exception	No test required		
DC_7A_n5A-n78A	Yes	DC_7A_n5A	No 3CC exception	No test required		RAN5#94-e
	No	DC_7A_n78A	No 3CC exception	No test required		RAN5#94-e
DC_7A_n28A-n78A	No	DC_7A_n28A	n78 (3 band IMD2)	NE, IMD2		RAN5#92-e
	No	DC_7A_n78A	n28 (3 band IMD2)	NE, IMD2		
DC_20A_n28A-n78A	No	DC_20A_n28A	n78 (3 band IMD4)	NE, IMD4		RAN5#93-e
	No	DC_20A_n78A	n28 (3 band IMD4)	NE, IMD4		RAN5#93-e
DC_28A_n7A-n78A	No	DC_28A_n7A	n78 (3 band IMD2)	NE, IMD2		RAN5#94-e
	No	DC_28A_n78A	n7 (3 band IMD2)	NE, IMD2		RAN5#94-e
DC_XA-YA_nZA						
DC_1A-3A_n28A	No	DC_1A_n28A	3 (3 band IMD5)	IMD5		RAN5#92-e
	No	DC_3A_n28A	1 (3 band IMD4)	IMD4		RAN5#92-e
DC_1A-3A_n41A	No	DC_1A_n41A	No 3CC exception	No test required		RAN5#98
	No	DC_3A_n41A	No 3CC exception	No test required		RAN5#98
DC_1A-3A_n77A	Yes	DC_1A_n77A	3 (3 band IMD2) 3 (3 band IMD4)	IMD2, IMD4		RAN5#98
	Yes	DC_3A_n77A	1 (3 band IMD2)	IMD2		RAN5#98
DC_1A-3A_n78A	No	DC_1A_n78A	3 (3 band IMD2)	IMD2 PC2&PC3		RAN5#102
	Yes	DC_3A_n78A	1 (3 band IMD5)	IMD5 PC2&PC3		RAN5#102
DC_1A-3A_n79A	No	DC_1A_n79A	No 3CC exception	No test required		RAN5#101
	No	DC_3A_n79A	1(3 band IMD5)	IMD5 PC2&PC3		RAN5#102

DC_1A-7A_n3A	Yes	DC_1A_n3A	No 3CC exception	No test required		
	No	DC_7A_n3A				
DC_1A-7A_n28A	No	DC_1A_n28A	7 (3 band IMD2)	IMD2		RAN5#92-e
	No	DC_7A_n28A	No 3 band exception	No test required		RAN5#92-e
DC_1A-7A_n78A	No	DC_1A_n78A	7 (IMD4 |3*fB1-1*fB78|)	IMD4		
	No	DC_7A_n78A	1 (IMD4 |2*fB7-2*fB78|)	IMD4		
DC_1A-8A_n3A	Yes	DC_1A_n3A	No 3CC exception	No test required		
	No	DC_8A_n3A				
DC_1A-18A_n77A	No	DC_1A_n77A	18 (3 band IMD5)	IMD5		RAN5#98
	No	DC_18A_n77A	1 (3 band IMD3)	IMD3		RAN5#98
DC_1A-19A_n78A	No	DC_1A_n78A	19 (3 band IMD5)	IMD5 PC2&PC3		RAN5#102
	No	DC_19A_n78A	1 (3 band IMD3)	IMD3 PC2&PC3		RAN5#102
DC_1A-19A_n79A	No	DC_1A_n79A	19 (3 band IMD3)	IMD3 PC2&PC3		RAN5#102
	No	DC_19A_n79A	1 (3 band IMD4)	IMD4 PC2&PC3		RAN5#102
DC_1A-20A_n3A	Yes	DC_1A_n3A	No 3CC exception	No test required		
	No	DC_20A_n3A				
DC_1A-20A_n8A	No	DC_1A_n8A	20 (3 band IMD4)	IMD4		RAN5#95-e
	Yes	DC_20A_n8A	No 3CC exception	-		RAN5#95-e
DC_1A-20A_n28A	No	DC_1A_n28A	No 3CC exception	No test required		RAN5#93-e
	No	DC_20A_n28A	No 3CC exception	No test required		RAN5#93-e
DC_1A-20A_n78A	No	DC_1A_n78A	20 (IMD5 |	IMD5		
	No	DC_20A_n78A	1 (IMD3	IMD3		
DC_1A-21A_n78A	No	DC_1A_n78A	21 (3 band IMD2) 21 (3 band IMD5)	IMD2, IMD5 PC2&PC3		RAN5#102
	No	DC_21A_n78A	1 (3 band IMD2) 1 (3 band IMD5)	IMD2, IMD5 PC2&PC3		RAN5#102
DC_1A-21A_n79A	No	DC_1A_n79A	No 3CC exception	No test required		RAN5#101
	No	DC_21A_n79A	No 3CC exception	No test required		RAN5#101

DC_1A-28A_n3A	Yes	DC_1A_n3A	1 (3 band IMD4)	IMD4	Yes	RAN5#90-e
	No	DC_28A_n3A	No 3CC exception	-	No	
DC_1A-28A_n5A	No	DC_1A_n5A	No 3CC exception	No test required		RAN5#95-e
	No	DC_28A_n5A				
DC_1A-28A_n78A	No	DC_1A_n78A	28 (3 band IMD3)	IMD3		RAN5#92-e
	No	DC_28A_n78A	1 (3 band IMD5)	IMD5	DC_28A_n78A	
DC_1A-41A_n28A	No	DC_1A_n28A	41 (IMD2 |1*fB1+1*fn28|)	IMD2		RAN5#98
	No	DC_41A_n28A	No 3CC exception	No test required		RAN5#98
DC_1A-41A_n41A	No	DC_1A_n41A	No 3CC exception	No test required		RAN5#98
DC_1A-41A_n77A	No	DC_1A_n77A	41 (IMD4 |1*fn77-3*fB1|) 41 (IMD5 |3*fB1-2*fn77|)	IMD4, IMD5		RAN5#98
	No	DC_41A_n77A	No 3CC exception	No test required		RAN5#98
DC_1A-42A_n79A	No	DC_1A_n79A	42 (3 band IMD5)	IMD5 PC2&PC3		RAN5#102
	No	DC_42A_n79A	No 3CC exception	No test required		RAN5#102

DC_2A-66A_n5A	No	DC_2A_n5A	66 (3 band IMD4)	IMD4		RAN5#98
	Yes (DC_66_n5)	DC_66A_n5A	No 3CC exception	No test required		
DC_2A_n5A-n77A	No	DC_2A_n5A	n77 (3 band IMD3)	NE, IMD3		RAN5#101
	No	DC_2A_n77A	No 3CC exception	NE		
DC_2A-13A_n77A	No	DC_2A_n77A	No 3CC exception	NE		RAN5#101
	No	DC_13A_n77A	2 (3 band IMD3)	NE, IMD3		
DC_2A-66A_n41A	No	DC_2A_n41A	2 (3 band IMD4)	IMD4		RAN5#96-e
	No	DC_66A_n41A	No 3CC exception			
DC_2A-66A_n77A	No	DC_2A_n77A	66 (3 band IMD2, IMD4, IMD5)	NE, IMD2, IMD4, IMD5		RAN5#101
	No	DC_66A_n77A	2(3 band IMD2)	NE, IMD2		
DC_3A-7A_n1A	Yes	DC_3A_n1A	No 3CC exception	No test required		RAN5#90-e
	No	DC_7A_n1A	No 3CC exception			
DC_3A-7A_n5A	Yes	DC_3A_n5A	7 (3 band IMD2)	IMD2		RAN5#95-e
	Yes	DC_7A_n5A	No 3CC exception	-		RAN5#95-e
DC_3A-7A_n8A	No	DC_3A_n8A	7 (3 band IMD2, IMD3)	IMD2, IMD3		RAN5#96-e
	No	DC_7A_n8A	No 3CC exception	No test required		RAN5#96-e
DC_3A-7A_n28A	No	DC_3A_n28A	7 (3 band IMD3)	IMD3		RAN5#92-e
	No	DC_7A_n28A	3 (3 band IMD2)	IMD2		RAN5#92-e
DC_3A-8A_n28A	No	DC_3A_n28A	No 3CC exception	No test required		RAN5#95-e
	No	DC_8A_n28A				
DC_3A-18A_n77A	Yes	DC_3A_n77A	No 3CC exception	No test required		RAN5#98
	No	DC_18A_n77A	No 3CC exception	No test required		RAN5#98
DC_3A-19A_n78A	Yes	DC_3A_n78A	No 3CC exception	No test required		RAN5#102
	No	DC_19A_n78A	3 (3 band IMD3)	IMD3 PC2&PC3		RAN5#102
DC_3A-19A_n79A	No	DC_3A_n79A	19 (3 band IMD3)	IMD3 PC2&PC3		RAN5#101
	No	DC_19A_n79A	3 (3 band IMD4)	IMD4 PC2&PC3		RAN5#101
DC_3A-20A_n1	Yes	DC_3A_n1A	No 3CC exception	No test required		
	No	DC_20A_n1A				
DC_3A-20A_n8A	No	DC_3A_n8A	No 3CC exception	No test required		RAN5#96-e
	Yes (DC_20_n8)	DC_20A_n8A	3 (3 band IMD4)	IMD4		RAN5#96-e
DC_3A-20A_n28A	No	DC_3A_n28A	No 3CC exception	No test required		RAN5#92-e
	No	DC_20A_n28A	3 (3 band IMD4)	IMD4		RAN5#92-e
DC_3A-20A_n78	Yes	DC_3A_n78A	No 3CC exception			
	No	DC_20A_n78A	3 (3 band IMD3)	IMD3		
DC_3A-21A_n78	Yes	DC_3A_n78A	21 (3 band IMD4) 21 (3 band IMD5)	IMD4 PC2&PC3, IMD5 PC2&PC3		RAN5#102
	No	DC_21A_n78A	3 (3 band IMD2)	IMD2		RAN5#101
DC_3A-21A_n79	No	DC_3A_n79A	No 3CC exception	No test required		RAN5#101
	No	DC_21A_n79A	3 (3 band IMD3)	IMD3 PC2&PC3		RAN5#102

DC_3A-28A_n78A	Yes	DC_3A_n78A	No 3CC exception		DC_3A_n78A	RAN5#92-e
	No	DC_28A_n78A	3 (3 band IMD3)	IMD3	DC_28A_n78A	
DC_3A-40A_n1A	Yes	DC_3A_n1A	40 (3 band IMD5)	IMD5 if UE supporting dual UL		
	No	DC_40A_n1A	No 3CC exception			
DC_3A-41A_n28A	No	DC_3A_n28A	41 (IMD2 |1*fB3+1*fn28|) 41 (IMD3 |2*fB3-fn28|)	IMD2, IMD3		RAN5#98
	No	DC_41A_n28A	3 (IMD2 |1*fB41-1*fn28|)	IMD2		RAN5#98
DC_3A-41A_n41A	No	DC_3A_n41A	No 3CC exception	No test required		RAN5#98
DC_3A-41A_n77A	Yes	DC_3A_n77A	41 (IMD5 |3*fB3-2*fB77|)	IMD5		RAN5#97
	No	DC_41A_n77A	3 (IMD3 |2*fB41-1*fB77|)	IMD3		RAN5#97
DC_7A-8A_n3A	No	DC_7A_n3A	8 (3 band IMD3)	IMD3		RAN5#95-e
	No	DC_8A_n3A	7 (3 band IMD2) 7 (3 band IMD3)	IMD2, IMD3		RAN5#95-e
DC_7A-20A_n1A	No	DC_20A_n1A	20 (3 band IMD5)	IMD5		RAN5#90-e
	No	DC_7A_n1A	No 3CC exception	–		
DC_7A-20A_n3A	No	DC_7A_n3A	20 (IMD2 |1*fB7-1*fB3)	NE, IMD2		
	No	DC_20A_n3A	7 (IMD2 |1*fB3+1*fB20)	NE, IMD2		
DC_7A-20A_n8A	No	DC_7A_n8A	20 (3 band IMD3)	IMD3		RAN5#95-e
	Yes	DC_20A_n8A	7 (3 band IMD3)	IMD3		RAN5#95-e
DC_7A-20A_n28A	No	DC_7A_n28A	No 3CC exception	No test required		RAN5#92-e
	No	DC_20A_n28A	7 (3 band IMD5)	IMD 5		
DC_7A-20A_n78A	No	DC_7A_n78A	20 (3 band IMD2) 20 (3 band IMD5)	IMD2, IMD5		
	No	2 DC_0A_n78A	7 (3 band IMD2)	IMD2		
DC_7A-28A_n3A	No	DC_7A_n3A	28 (3 band IMD2)	IMD2		RAN5#90-e
	No	DC_28A_n3A	7 (3 band IMD3)	IMD3		
DC_7A-28A_n5A	Yes	DC_7A_n5A	28 (3 band IMD5)	IMD5		RAN5#95-e
	No	DC_28A_n5A	7 (3 band IMD5)	IMD5		RAN5#95-e
DC_7A-28A_n78A	No	DC_7A_n78A	28 (3 band IMD2) 28 (3 band IMD5)	IMD2, IMD5		RAN5#92-e
	No	DC_28A_n78A	7 (3 band IMD2)	IMD2	DC_28A_n78A	
DC_13A_n2A-n77A	No	DC_13A_n2A	n77 (3 band IMD3)	NE, IMD3		RAN5#101
	No	DC_13A_n77A	n2 (3 band IMD3)	NE, IMD3		
DC_13A-66A_n2A	No	DC_13A_n2A	66 (3 band IMD4)	NE, IMD4		RAN5#101
	No	DC_66A_n2A	No 3CC exception	NE		
DC_13A-66A_n77A	No	DC_13A_n5A	66 (3 band IMD3)	NE, IMD3		RAN5#101
	No	DC_66A_n5A	No 3CC exception	NE		
DC_18A-41A_n77A	No	DC_18A_n77A	No 3CC exception	No test required		Added at RAN5#95-e
	No	DC_41A_n77A	18 (IMD5 |2*fB77-3*fB41|)	IMD5		
DC_18A-41A_n78A	No	DC_18A_n78A	No 3CC exception	No test required		Added at RAN5#95-e
	No	DC_41A_n78A	18 (IMD5 |2*fB78-3*fB41|)	IMD5		
DC_19A-21A_n78A	No	DC_19A_n78A	No 3CC exception	No test required		RAN5#102

	No	DC_21A_n78A	19 (3 band IMD3) 19 (3 band IMD4)	IMD3 PC2&PC3, IMD4 PC2&PC3		RAN5#102
DC_19A-21A_n79A	No	DC_19A_n79A	21 (3 band IMD5)	IMD5 PC2&PC3		RAN5#102
	No	DC_21A_n79A	No 3CC exception	No test required		RAN5#101
DC_66A_n2A-n77A	No	DC_66A_n2A	No 3CC exception	NE		RAN5#101
	No	DC_66A_n77A	n2 (3 band IMD2)	NE, IMD2		
DC_66A_n5A-n77A	No	DC_66A_n5A	n77 (3 band IMD3)	NE, IMD3		RAN5#101
	No	DC_66A_n77A	No 3CC exception	NE		
DC_(n)XAA-nYA						
FFS						
DC_XA_nXA_nYA						
FFS						

NOTE 1: If single UL is allowed in a DC_XA_nYA configuration the IMD requirements does not apply for UEs supporting UE capability *singleUL-Transmission*.

NOTE 2: Notations used

NE: Non-exception as defined in TS 38.101-3 [7], meaning standalone LTE in TS 36.101 [8] and NR in 38.101-1 [5] requirements apply.
HD: UL Harmonic Distortion, as defined in TS 38.101-3 [7], 7.3B.2.3.1
HM: RX Harmonic Mixing, as defined in TS 38.101-3 [7], 7.3B.2.3.2
IMD: Intermodulation Distortion, as defined in TS 38.101-3 [7], 7.3B.2.3.5
CBI: Cross Band Isolation, as defined in TS 38.101-3 [7], 7.3B.2.3.4

Table 4.3.3.1-3: Reference Sensitivity test cases per EN-DC configuration (4CC)

Band or band configuration	Single UL	UL config	Refsens exception, victim band	Requirement coverage (NOTEote 2)	Fallback DC configurations	Comments
DC_(n)XDA						
41	Yes	DC_(n)41AA	N/A	NE	DC_(n)41CA DC_41C_n41A	RAN5#89-e
41	Yes	DC_41A_n41A	N/A	NE	N/A	RAN5#89-e
48	Only single UL requirements defined	DC_(n)48AA	N/A	NE	DC_(n)48CA DC_48C_n48A	RAN5#89-e
48	Only single UL requirements defined	DC_48A_n48A	N/A	NE	N/A	RAN5#89-e
DC_XA_nY(2A)-nZA						
FFS						
DC_XA_nYA-nZC						
FFS						

NOTE 1: If single UL is allowed in a DC_XA_nYA configuration the IMD requirements does not apply for UEs supporting UE capability *singleUL-Transmission*.

NOTE 2: Notations used

NE: Non-exception as defined in TS 38.101-3 [7], meaning standalone LTE in TS 36.101 [8] and NR in 38.101-1 [5] requirements apply.
HD: UL Harmonic Distortion, as defined in TS 38.101-3 [7], 7.3B.2.3.1
HM: RX Harmonic Mixing, as defined in TS 38.101-3 [7], 7.3B.2.3.2
IMD: Intermodulation Distortion, as defined in TS 38.101-3 [7], 7.3B.2.3.5
CBI: Cross Band Isolation, as defined in TS 38.101-3 [7], 7.3B.2.3.4

For EN-DC configurations affected by exceptions, the test frequency cannot be freely chosen. One test frequency per exception requirement is sufficient to test the requirement. This is indicated in Table 4.3.3.1-4 following the frequency relation formulas defined in clause D.2.3. Exceptions in TS 38.101-3 clause 7.3A.5 (2UL intermodulation) are not specified since the test frequency and channel bandwidth is already specified in TS 38.101-1.

Table 4.3.3.1-4: Test frequency selection per band pair for bands and test points with exceptions avoidable by test frequency setting (UL harmonics, Rx mixing, cross band isolation)

Band set (Note 2)	Frequency	Channel BW [MHz]	Exception type	Comments
1A / n3A	Mid/Mid	Highest/Highest	-	Non-Exception.
	Low/High	20 / 40	Cross band isolation	Exception in TS 38.101-3 table 7.3B.2.3.4-1
1A / n28A	DL 2140 / UL 713 MHz	20/10	UL Harmonic Interference HD3	Exception Note 9 of TS 38.101-3 Table 7.3B.2.3.1-1
	DL 2160 / UL 708 MHz	20/10	UL Harmonic avoiding	Exception avoiding. Not overlapping interference since BW_{INT}=30 MHz, $\|F_{INT}\|$ = 36, $\|F_{INT}\|$ > (30+20)/2
1A/77A	UL 1950/ DL 3900	20/100	UL Harmonic Interference	Exception Note 2 and 13 of TS 38.101-3 table 7.3B.2.3.1-1
	UL 1950/ DL 3870	20/20	UL Harmonic Interference	Exception Note 3 and 13 of TS 38.101-3 table 7.3B.2.3.1-1
	UL 1950/UL 4090.005	5/5	Dual UL intermodulation	Exception in TS 38.101-3 Table 7.3B.2.3.5.1-1
	UL 1950/ UL3709.005	5/5	Dual UL intermodulation	Exception in TS 38.101-3 Table 7.3B.2.3.5.1-1
2A / n41A	High/Low	20/100	Cross band isolation	Exception in TS 38.101-3 table 7.3B.2.3.4-1
2A/71A	DL1980 MHz/ UL665.5 MHz	20/5	UL Harmonic Interference	Exception Note 11 of TS 38.101-3 table 7.3B.2.3.1-1
	DL1980 MHz/ UL673 MHz	20/10	UL Harmonic Interference	Exception Note 12 of TS 38.101-3 table 7.3B.2.3.1-1
	UL1881 MHz/UL Low	20/20	Receiver Harmonic Mixing	Exception Note 4 in TS 38.101-3 Table 7.3B.2.3.2-1
2A/n77A	UL 1860 MHz / DL 3720 MHz	20/100	UL Harmonic Interference	Exception Note 2, 13 of TS 38.101-3 table 7.3B.2.3.1-1
	UL 1860 MHz / DL 3690 MHz	20/20	UL Harmonic Interference	Exception Note 3 of TS 38.101-3 table 7.3B.2.3.1-1
	DL Mid (1960) / UL 3920	20/100	Receiver harmonic mixing HM2	Receiver Harmonic Mixing Exception in TS38.101-3 Table 7.3B.2.3.2-1
	UL 1860 MHz / DL 3850 MHz	20/100		HD avoid
	DL Mid / UL Mid	20/100		HM avoid
2A/78A	DL 3740 MHz / UL 1870 MHZ	Highest (20 MHz) / Highest (100 MHz)	UL Harmonic Interference HD2	Exception Note 2, 13 of TS38.101-3 table 7.3B.2.3.1-1
	DL 3740 MHz / UL 1885 MHz	20 MHz) / Highest (20 MHz)	UL Harmonic Interference HD2	Exception Note 3 of TS38.101-3 table 7.3B.2.3.1-1
3A / n1A	Mid/Mid	Highest/Highest	-	Non-Exception.
	High/Low	20 / 20	Cross band isolation	Exception in TS 38.101-3 table 7.3B.2.3.4-1
3A / n41A				CMCC CR R5-205929
3A / n77A **3A** / n78A	Mid/High	Highest/Highest	-	Non-Exception.
	Mid/3495	Highest/Highest	UL Harmonic Interference	Exception Note 2 of TS 38.101-3 table 7.3B.2.3.1-1
	Mid/3525	20/20	UL Harmonic Interference	Exception Note 3 of TS 38.101-3 table 7.3B.2.3.1-1
	Mid /3685.005	20/20	Receiver Harmonic Mixing	Receiver Harmonic Mixing Exception in TS 38.101-3 Table 7.3B.2.3.2-1
	Low/High	20/20		Receiver Harmonic Mixing avoided
	UL 1740/ UL3574.995	5/10	Dual UL intermodulation	Exception in TS 38.101-3 Table 7.3B.2.3.5.1-1
	UL 1765/ UL 3435	5/10	Dual UL intermodulation	Exception in TS 38.101-3 Table 7.3B.2.3.5.1-1
5A/n77A	UL 837.5 MHz / DL 3350.01 MHz	10/100	UL Harmonic Interference	Exception Note 6, 7, 17 of TS 38.101-3 table 7.3B.2.3.1-1
	UL 829 MHz / DL 4145.01 MHz	10/100	UL Harmonic Interference	Exception Note 4, 5, 17 of TS 38.101-3 table 7.3B.2.3.1-1
	UL Mid/DL Mid	10/100		HD avoid

	UL 844 MHz/DL 3421.005 MHz	5/10	Dual UL intermodulation	Exception in TS 38.101-3 Table 7.3B.2.3.5.1-1
	UL 826.5 MHz/DL 4177.5 MHz	5/10	Dual UL intermodulation	Exception in TS 38.101-3 Table 7.3B.2.3.5.1-1
5A/n78A	UL 840 MHz / DL 3360 MHz	10/100	UL Harmonic Interference	Exception Note 6, 7, 17 of TS 38.101-3 table 7.3B.2.3.1-1
	UL 840 MHz / DL 3560.01 MHz	10/100		HD avoid
	UL 844 MHz/UL 3421.005 MHz	5/10	Dual UL intermodulation	Exception in TS 38.101-3 Table 7.3B.2.3.5.1-1
7A / n66A	UL2535 MHz/ UL 1730 MHz	10/5	Dual UL intermodulation	Exception in TS 38.101-3 Table 7.3B.2.3.5.1-1
7A / n71A	UL 668 MHz/ DL 2672 MHz	20/5	UL Harmonic Interference	Exception Note 6, 7, 17 of TS 38.101-3 table 7.3B.2.3.1-1
	UL 668 MHz/ DL 2620 MHz	20/5	UL Harmonic avoiding	HD avoid
7A / n77A	UL2540 MHz/ UL 3870 MHz	5/10	Dual UL intermodulation	Exception in TS 38.101-3 Table 7.3B.2.3.5.1-1
7A / n78A	High/Low	20/100	Cross band isolation	Exception in TS 38.101-3 table 7.3B.2.3.4-1
8A / n41A	UL 885 / DL 2655 MHz	10/100	UL Harmonic Interference HD3	Exception Note 9 of TS 38.101-3 Table 7.3B.2.3.1-1
	UL 885 / DL 2546 MHz	10/100	UL Harmonic avoiding	Exception avoiding. Not overlapping interference since BW_{INT}=30 MHz, $\|F_{INT}\|$ = 109, $\|F_{INT}\|$ > (30+100)/2
8A /n77A **8A**/n78A	Mid (UL 897.5 MHz) / 3590.01	Highest (10 MHz) / Highest (100 MHz)	UL Harmonic Interference HD4	Exception Note 7 of TS38.101-3 table 7.3B.2.3.1-1
	Mid (UL 897.5 MHz) / 3520.005	Highest (10 MHz) / Highest (100 MHz)		Non-Exception. Not overlapping interference since BW_{INT}=40 MHz, F_{INT} = (40+100)/2 = 70
	UL 897.5/ UL 3634.995	5/40	Dual UL intermodulation	Exception in TS 38.101-3 Table 7.3B.2.3.5.1-1
8A / **n79A**	UL 900/DL 4500	10/100	UL Harmonic Interference	Exception Note 4 nad 5 of TS38.101-3 table 7.3B.2.3.1-1
	UL 900/DL 4299.99	10/100		HD avoid
	UL 897.5/ UL 4532.505	5/40	Dual UL intermodulation	Exception in TS 38.101-3 Table 7.3B.2.3.5.1-1
11A / n79A	Mid (DL 1485.9 MHz) / 4457.7	Highest (10 MHz) / Highest (100 MHz)	Receiver Harmonic Mixing HM3	Receiver Harmonic Mixing Exception in TS38.101-3 Table 7.3B.2.3.2-1
	Mid (DL 1485.9 MHz) / 4512.7 MHz	Highest (10 MHz) / Highest (100 MHz)		Non-Exception. Not overlapping interference since BW_{INT}=100 MHz, F_{INT} = (100+10)/2 = 55
12A/**n66A**	UL 710/DL 2130	10/40	UL Harmonic Interference	Exception Note 4 nad 5 of TS38.101-3 table 7.3B.2.3.1-1
	UL 710/DL 2165	10/40	UL Harmonic avoid	Non-Exception. Not overlapping interference since BWINT=30 MHz, FINT = (30+40)/2 = 35
12A / n78A	UL 707 / DL 3535 MHz	10/100	UL Harmonic Interference HD5	Exception Note 5 of TS 38.101-3 Table 7.3B.2.3.1-1
	UL 707 / DL 3750 MHz	10/100	UL Harmonic avoiding	Exception avoiding. Not overlapping interference since BW_{INT}=50 MHz, $\|F_{INT}\|$ = 215, $\|F_{INT}\|$ > (50+100)/2
13A/n77A	UL 782 MHz / DL 3910 MHz	10/100	UL Harmonic Interference	Exception Note 4, 5 of TS 38.101-3 table 7.3B.2.3.1-1
	DL Mid (751) / UL 3755	10/100	Receiver harmonic mixing	Receiver Harmonic Mixing Exception in TS38.101-3 Table 7.3B.2.3.2-1
	UL 782 MHz /DL Mid	10/100		HD avoid
	DL Mid / UL 3850	10/100		HM avoid

18A/ n77A	UL 820MHz/ DL 4100 MHz	10/40	UL Harmonic Interference	Exception Note 4, 5 of TS 38.101-3 table 7.3B.2.3.1-1
	UL 820MHz/ DL 4000 MHz	10/40	UL Harmonic avoiding	HD avoid
19A/ n77A	UL 835MHz/ DL 4175 MHz	10/40	UL Harmonic Interference	Exception Note 4, 5 of TS 38.101-3 table 7.3B.2.3.1-1
	UL 835MHz/ DL 4100 MHz	10/40	UL Harmonic avoiding	HD avoid
19A / n79A	DL 884 MHz / Low (4420.02 MHz)	10 MHz / 40 MHz	Receiver Harmonic Mixing HM3	Receiver Harmonic Mixing Exception in TS38.101-3 Table 7.3B.2.3.2-1
	DL 884 MHz / Low (4445.02 MHz)	10 MHz / 40 MHz		Non-Exception. Not overlapping interference since BW_{INT}=40 MHz, F_{INT} = (40+10)/2 = 25
20A / n78A	Mid/Mid	Highest/Highest	-	Non-Exception.
	Mid/3388	Highest/Highest	UL Harmonic Interference	Exception Note 7 of TS 38.101-3 table 7.3B.2.3.1-1
21A / n79A	DL 1506/UL4518	20/100	Receiver Harmonic Mixing HM3	Receiver Harmonic Mixing Exception in TS38.101-3 Table 7.3B.2.3.2-1
	DL 1506/ UL 4800	20/100		Receiver Harmonic Mixing avoid
	UL 1457.5/UL 4420.5	5/40	Dual UL intermodulation	Exception in TS 38.101-3 Table 7.3B.2.3.5.1-1
26A / n41A	High (UL 841.5 MHz) / 2524.5 MHz)	Highest (15 MHz) / 50 MHz	UL Harmonic Interference HD3	Exception Note 9 of TS38.101-3 table 7.3B.2.3.1-1
	High (UL 841.5 MHz) / 2572 MHz	Highest (15 MHz) / 50 MHz		Non-Exception. Not overlapping interference since BW_{INT}=45 MHz, F_{INT} = (45+50)/2 = 47.5
26A / n77A **26A** / n78A	High (UL 841.5 MHz) / 3366 MHz	Highest (15 MHz) / Highest (100 MHz)	UL Harmonic Interference HD4	Exception Note 7 of TS38.101-3 table 7.3B.2.3.1-1
	High (UL 841.5 MHz) / 3446 MHz	Highest (15 MHz) / Highest (100 MHz)		Non-Exception. Not overlapping interference since BW_{INT}=60 MHz, F_{INT} = (60+100)/2 = 80
26A / n79A	High (DL 886.5 MHz) / 4432.5 MHz)	Highest (15 MHz) / 60 MHz	Receiver Harmonic Mixing HM5	Receiver Harmonic Mixing Exception in TS38.101-3 Table 7.3B.2.3.2-1
	High (DL 886.5 MHz) / 4470.5 MHz)	Highest (15 MHz) / 60 MHz		Non-Exception. Not overlapping interference since BW_{INT}=60 MHz, F_{INT} = (60+15)/2 = 37.5
30A/**n66A**	Low/High	10/40	Cross band isolation	Exception in TS 38.101-3 table 7.3B.2.3.4-1
38A/n78A	DL High/UL Low	10/20	Cross band isolation	Exception in TS 38.101-3 table 7.3B.2.3.4-1
40A / n78A	Low/Mid	Highest/Highest	-	Non-Exception.
	Mid/3525	20/20	Receiver Harmonic Mixing	Receiver Harmonic Mixing Exception Note 8 in TS38.101-3 Table 7.3B.2.3.2-1
41A / **n77A** 41A / **n78A**	Low (DL 2593 MHz) / 3750 MHz)	Highest (20 MHz) / Highest (100 MHz)	Receiver Harmonic Mixing HM4	Receiver Harmonic Mixing Exception in TS38.101-3 Table 7.3B.2.3.2-1
	Mid (DL 2593 MHz) / 3974.5 MHz)	Highest (20 MHz) / Highest (100 MHz)	Cross band isolation	Not overlapping HM interference since BW_{INT}=240 MHz, F_{INT} = (240+100)/2 = 170
	Mid / Mid	Highest / Highest	-	Non-Exception only possible with 1UL in band 41
48A/**n66A**	DL 3555 MHz/ UL 1777.5 MHz	10/20	UL Harmonic Interference HD2	Exception Note 2, 13 of TS38.101-3 table 7.3B.2.3.1-1
	DL 3565 MHz/ UL 1770 MHz	10/20	UL Harmonic Interference HD2	Exception Note 3 of TS38.101-3 table 7.3B.2.3.1-1
66A/**n25A**	UL 1775 MHz / UL 1855 MHz	5/5	Dual UL intermodulation	Exception in TS 38.101-3 Table 7.3B.2.3.5.1-1
66A/n25A	UL 1712.5 MHz / UL 1912.5 MHz	5/5	Dual UL intermodulation	Exception in TS 38.101-3 Table 7.3B.2.3.5.1-1
66A/n25A	UL 1750 MHz / UL 1883.3 MHz	5/5	Dual UL intermodulation	Exception in TS 38.101-3 Table 7.3B.2.3.5.1-1

66A/n77A	UL 1720 MHz / DL 3440 MHz	20/100	UL Harmonic Interference	Exception Note 2, 13 of TS38.101-3 table 7.3B.2.3.1-1
	UL 1720 MHz / DL 3420 MHz	20/20	UL Harmonic Interference	Exception Note 3 of TS38.101-3 table 7.3B.2.3.1-1
	UL Mid / DL Mid	20/100		HD avoid
66A/n78A	DL 3510 MHz/ UL 1755 MHZ	Highest (20 MHz) / Highest (100 MHz)	UL Harmonic Interference HD2	Exception Note 2, 13 of TS38.101-3 table 7.3B.2.3.1-1
	DL 3480 MHz/ UL 1755 MHz	Highest (20 MHz) / Highest (100 MHz)	UL Harmonic Interference HD2	Exception Note 3 of TS38.101-3 table 7.3B.2.3.1-1
66A/n41A (PC2 and PC3)	High/Low	20/100	Cross band isolation	Exception in TS 38.101-3 table 7.3B.2.3.4-1
71A/n2A	UL665.5 MHz/ DL1987.5 MHz	5/5	UL Harmonic Interference	Exception Note 11 of TS 38.101-3 table 7.3B.2.3.1-1
	UL673 MHz/ DL1980 MHz	20/10	UL Harmonic Interference	Exception Note 12 of TS 38.101-3 table 7.3B.2.3.1-1
	DL Low / UL1881 MHz	20/20	Receiver Harmonic Mixing	Exception Note 4 in TS 38.101-3 Table 7.3B.2.3.2-1
	DL High / UL1881 MHz	20/20	HM avoid	Exception avoiding. Not overlapping interference since BW_{INT}=20 MHz, $\|F_{INT}\|$ = 45, $\|F_{INT}\|$ > (20+20)/2
NOTE 1: This selection is used in test case 7.3B.2.3 unless otherwise stated NOTE 2: Aggressor band in bold NOTE 3: Test frequencies defined in this table are required to be used in test cases 7.3B.2.3 and 7.3B.2.3_1.1 of TS38.521-1 [2]				

4.3.3.2 Spurious emissions test cases for EN-DC

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 EN-DC configuration and are stored as zip-files as defined in annex A.

Table 4.3.3.2-1: Frequency range analysis availability per EN-DC configuration

EN-DC config	Justification	Comments
DC_1A_n3A	38.521-3_TpAnalysisSpur(DC_1A-n3A).zip	RAN5#89-e
DC_1A_n5A	38.521-3_TpAnalysisSpur(DC_1A_n5A).zip	RAN5#94-e
DC_1A_n7A	38.521-3_TpAnalysisSpur(DC_1A_n7A).zip	RAN5#94-e
DC_1A_n8A	38.521-3_TpAnalysisSpur(DC_1A_n8A).zip	RAN5#95-e
DC_1A_n28A	38.521-3_TpAnalysisSpur(DC_1A_n28A).zip	RAN5#92-e
DC_1A_n41A	38.521-3_TpAnalysisSpur(DC_1A_n41A).zip	RAN5#98
DC_1A_n77A	38.521-3_TpAnalysisSpur(DC_1A_n77A).zip	RAN5#92-e
DC_1A_n78A	38.521-3_TpAnalysisSpur(DC_1A_n78A)_v1.zip	RAN5#92-e
DC_1A_n79A	38.521-3_TpAnalysisSpur(DC_1A_n79A).zip	RAN5#92-e
DC_2A_n5A	38.521-3_TpAnalysisSpur(DC_2A_n5A)_v1.zip	RAN5#100
DC_2A_n41A	38.521-3_TpAnalysisSpur(DC_2A_n41A)_v2.zip	RAN5#100
DC_2A_n48A	38.521-3_TpAnalysisSpur(DC_2A_n48A).zip	RAN5#100
DC_2A_n66A	38.521-3_TpAnalysisSpur(DC_2A_n66A)_v2.zip	RAN5#102
DC_2A_n71A	38.521-3_TpAnalysisSpur(DC_2A_n71A)_v3.zip	RAN5#100
DC_2A_n77A	38.521-3_TpAnalysisSpur(DC_2A_n77A)_v3.zip	RAN5#100
DC_2A_n78A	38.521-3_TpAnalysisSpur(DC_2A_n78A).zip	RAN5#88-e
DC_3A_n1A	38.521-3_TpAnalysisSpur(DC_3A_n1A).zip	RAN5#88-e
DC_3A_n5A	38.521-3_TpAnalysisSpur(DC_3A_n5A).zip	RAN5#94-e
DC_3A_n7A	38.521-3_TpAnalysisSpur(DC_3A_n7A)_v1.zip	RAN5#91-e
DC_3A_n8A	38.521-3_TpAnalysisSpur(DC_3A_n8A).zip	Added at RAN5#96-e
DC_3A_n28A	38.521-3_TpAnalysisSpur(DC_3A_n28A).zip	RAN5#92-e
DC_3A_n41A	38.521-3_TpAnalysisSpur(DC_3A_n41A)_v3.zip	RAN5#94-e
DC_3A_n77A	38.521-3_TpAnalysisSpur(DC_3A_n77A).zip	RAN5#92-e
DC_3A_n78A	38.521-3_TpAnalysisSpur(DC_3A_n78A)_v1.zip	RAN5#91-e
DC_3A_n79A	38.521-3_TpAnalysisSpur(DC_3A-n79A)_v1.zip	RAN5#83
DC_5A_n2A	38.521-3_TpAnalysisSpur(DC_5A_n2A)_v3.zip	RAN5#100
DC_5A_n66A	38.521-3_TpAnalysisSpur(DC_5A_n66A)_v2.zip	RAN5#92-e
DC_5A_n77A	38.521-3_TpAnalysisSpur(DC_5A_n77A)_v3.zip	RAN5#100
DC_5A_n78A	38.521-3_TpAnalysisSpur(DC_5A_n78A)_v2.zip	RAN5#92-e
DC_7A_n1A	38.521-3_TpAnalysisSpur(DC_7A_n1A).zip	RAN5#88-e
DC_7A_n3A	38.521-3_TpAnalysisSpur(DC_7A_n3A)_v1.zip	RAN5#96-e
DC_7A_5A	38.521-3_TpAnalysisSpur(DC_7A_n5A).zip	RAN5#94-e
DC_7A_n8A	38.521-3_TpAnalysisSpur(DC_7A_n8A).zip	RAN5#95-e
DC_7A_n28A	38.521-3_TpAnalysisSpur(DC_7A_n28A).zip	RAN5#92-e
DC_7A_n66A	38.521-3_TpAnalysisSpur(DC_7A_n66A).zip	RAN5#88-e
DC_7A_n78A	38.521-3_TpAnalysisSpur(DC_7A_n78A)_v1.zip	RAN5#92-e
DC_8A_n1A	38.521-3_TpAnalysisSpur(DC_8A_n1A).zip	RAN5#88-e
DC_8A_n3A	38.521-3_TpAnalysisSpur(DC_8A_n3A)_v2.zip	RAN5#96-e
DC_8A_n20A	38.521-3_TpAnalysisSpur(DC_8A_n20A)_v1.zip	RAN5#96-e
DC_8A_n28A	38.521-3_TpAnalysisSpur(DC_8A_n28A).zip	RAN5#95-e
DC_8A_n41A	38.521-3_TpAnalysisSpur(DC_8A_n41A)_v4.zip	RAN5#100
DC_8A_n77A	38.521-3_TpAnalysisSpur(DC_8A_n77A)_v2.zip	RAN5#100
DC_8A_n78A	38.521-3_TpAnalysisSpur(DC_8A_n78A)_v1.zip	RAN5#93-e
DC_11A_n77A	38.521-3_TpAnalysisSpur(DC_11A_n77A)_v1.zip	RAN5#92-e
DC_11A_n78A	38.521-3_TpAnalysisSpur(DC_11A_n78A)_v1.zip	RAN5#92-e
DC_11A_n79A	38.521-3_TpAnalysisSpur(DC_11A_n79A)_v1.zip	RAN5#92-e
DC_12A_n2A	38.521-3_TpAnalysisSpur(DC_12A_n2A)_v1.zip	RAN5#100
DC_12A_n66A	38.521-3_TpAnalysisSpur(DC_12A_n66A)_v1.zip	RAN5#91-e
DC_12A_n77A	38.521-3_TpAnalysisSpur(DC_12A_n77A).zip	RAN5#101
DC_12A_n78A	38.521-3_TpAnalysisSpur(DC_12A_n78A)_v1.zip	RAN5#92-e
DC_13A_n2A	38.521-3_TpAnalysisSpur(DC_13A_n2A)_v4.zip	RAN5#100
DC_13A_n66A	38.521-3_TpAnalysisSpur(DC_13A_n66A).zip	RAN5#89-e
DC_13A_n77A	38.521-3_TpAnalysisSpur(DC_13A_n77A)_v3.zip	RAN5#100
DC_14A_n2A	38.521-3_TpAnalysisSpur(DC_14A_n2A)_v5.zip	RAN5#100
DC_14A_n66A	38.521-3_TpAnalysisSpur(DC_14A_n66A)_v4.zip	RAN5#95-e
DC_14A_n77A	38.521-3_TpAnalysisSpur(DC_14A_n77A).zip	RAN5#101
DC_18A_n77A	38.521-3_TpAnalysisSpur(DC_18A_n77A).zip	RAN5#97
DC_18A_n78A	38.521-3_TpAnalysisSpur(DC_18A_n78A).zip	RAN5#97
DC_19A_n1A	38.521-3_TpAnalysisSpur(DC_19A_n1A).zip	RAN5#94-e
DC_19A_n77A	38.521-3_TpAnalysisSpur(DC_19A_n77A).zip	RAN5#92-e
DC_19A_n78A	38.521-3_TpAnalysisSpur(DC_19A_n78A).zip	RAN5#92-e
DC_19A_n79A	38.521-3_TpAnalysisSpur(DC_19A_n79A).zip	RAN5#92-e
DC_20A_n1A	38.521-3_TpAnalysisSpur(DC_20A-n1A)_v1.zip	RAN5#96-e
DC_20A_n3A	38.521-3_TpAnalysisSpur(DC_20A_n3A)_v2.zip	RAN5#96-e

DC_20A_n7A	38.521-3_TpAnalysisSpur(DC_20A_n7A).zip	RAN5#94-e
DC_20A_n8A	38.521-3_TpAnalysisSpur(DC_20A_n8A).zip	RAN5#95-e
DC_20A_n78A	38.521-3_TpAnalysisSpur(DC_20A_n78A).zip	RAN5#92-e
DC_20A_n28A	38.521-3_TpAnalysisSpur(DC_20A_n28A).zip	RAN5#92-e
DC_21A_n1A	38.521-3_TpAnalysisSpur(DC_21A_n1A).zip	RAN5#94-e
DC_21A_n28A	38.521-3_TpAnalysisSpur(DC_21A_n28A)_v2.zip	RAN5#99
DC_21A_n77A	38.521-3_TpAnalysisSpur(DC_21A_n77A).zip	RAN5#92-e
DC_21A_n78A	38.521-3_TpAnalysisSpur(DC_21A_n78A).zip	RAN5#92-e
DC_21A_n79A	38.521-3_TpAnalysisSpur(DC_21A_n79A).zip	RAN5#92-e
DC_25A_n41A	38.521-3_TpAnalysisSpur(DC_25A_n41A)_v3.zip	RAN5#100
DC_25A_n77A	38.521-3_TpAnalysisSpur(DC_25A_n77A).zip	RAN5#100
DC_26A_n41A	38.521-3_TpAnalysisSpur(DC_26A_n41A)_v3.zip	RAN5#100
DC_26A_n77A	38.521-3_TpAnalysisSpur(DC_26A_n77A)_v2.zip	RAN5#100
DC_26A_n78A	38.521-3_TpAnalysisSpur(DC_26A_n78A)_v1.zip	RAN5#92-e
DC_26A_n79A	38.521-3_TpAnalysisSpur(DC_26A_n79A)_v1.zip	RAN5#91-e
DC_28A_n3A	38.521-3_TpAnalysisSpur(DC_28A_n3A)_v1.zip	RAN5#92-e
DC_28A_n5A	38.521-3_TpAnalysisSpur(DC_28A_n5A).zip	RAN5#94-e
DC_28A_n7A	38.521-3_TpAnalysisSpur(DC_28A_n7A).zip	RAN5#94-e
DC_28A_n78A	38.521-3_TpAnalysisSpur(DC_28A_n78A).zip	RAN5#92-e
DC_28A_n77A	38.521-3_TpAnalysisSpur(DC_28A_n77A).zip	RAN5#92-e
DC_28A_n79A	38.521-3_TpAnalysisSpur(DC_28A_n79A).zip	RAN5#92-e
DC_30A_n2A	38.521-3_TpAnalysisSpur(DC_30A_n2A).zip	RAN5#101
DC_30A_n5A	38.521-3_TpAnalysisSpur(DC_30A_n5A)_v2.zip	RAN5#100
DC_30A_n66A	38.521-3_TpAnalysisSpur(DC_30A_n66A).zip	RAN5#102
DC_30A_n77A	38.521-3_TpAnalysisSpur(DC_30A_n77A).zip	RAN5#100
DC_39A_n41A	38.521-3_TpAnalysisSpur(DC_39A_n41A)_v2.zip	RAN5#94-e
DC_39A_n79A	38.521-3_TpAnalysisSpur(DC_39A_n79A)_v1.zip	RAN5#92-e
DC_40A_n1A	38.521-3_TpAnalysisSpur(DC_40A_n1A)_v1.zip	RAN5#92-e
DC_40A_n41A	38.521-3_TpAnalysisSpur(DC_40A_n41A)_v2.zip	RAN5#94-e
DC_40A_n78A	38.521-3_TpAnalysisSpur(DC_40A_n78A)_v1.zip	RAN5#92-e
DC_40A_n79A	38.521-3_TpAnalysisSpur(DC_40A_n79A).zip	RAN5#94-e
DC_41A_n28A	38.521-3_TpAnalysisSpur(DC_41A_n28A).zip	RAN5#98
DC_41A_n77A	38.521-3_TpAnalysisSpur(DC_41A_n77A)_v2.zip	RAN5#100
DC_41A_n78A	38.521-3_TpAnalysisSpur(DC_41A_n78A)_v1.zip	RAN5#92-e
DC_41A_n79A	38.521-3_TpAnalysisSpur(DC_41A_n79A)_v1.zip	RAN5#92-e
DC_42A_n77A	38.521-3_TpAnalysisSpur(DC_42A_n77A).zip	RAN5#92-e
DC_48A_n5A	38.521-3_TpAnalysisSpur(DC_48A_n5A)_v2.zip	RAN5#100
DC_48A_n66A	38.521-3_TpAnalysisSpur(DC_48A_n66A)_v1.zip	RAN5#96-e
DC_66A_n2A	38.521-3_TpAnalysisSpur(DC_66A_n2A).zip	RAN5#88-e
DC_66A_n5A	38.521-3_TpAnalysisSpur(DC_66A_n5A)_v1.zip	RAN5#92-e
DC_66A_n41A	38.521-3_TpAnalysisSpur(DC_66A_n41A)_v1.zip	RAN5#96-e
DC_66A_n71A	38.521-3_TpAnalysisSpur(DC_66A_n71A)_v2.zip	RAN5#92-e
DC_66A_n77A	38.521-3_TpAnalysisSpur(DC_66A_n77A)_v2.zip	RAN5#94-e
DC_66A_n78A	38.521-3_TpAnalysisSpur(DC_66A_n78A)_v2.zip	RAN5#92-e
DC_71A_n2A	38.521-3_TpAnalysisSpur(DC_71A_n2A)_v1.zip	RAN5#100
DC_71A_n66A	38.521-3_TpAnalysisSpur(DC_71A_n66A).zip	RAN5#98

4.4 Test point analysis for satellite access test cases in TS 38.521-5

This section contains information on test point selection for NR NTN test cases in [10]. The general rules in this section apply to all the NR 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:

Considering that NR NTN operating bands are defined like FR1 FDD bands, test environment, frequencies, SCSs, channel bandwidths, waveforms, and modulations of a Tx or Rx test for an NR NTN band should be selected based on the same principles of the corresponding single carrier test for an FR1 FDD band.

Table 4.4-1: NR UE transmitter test point selection for NTN

Subclause	Number of test points	Justification	Comments
6.2.1 UE maximum output power	540	General rules of test point selection apply. Test points of TC 6.2.1 from TS 38.521-1 can be leveraged.	RAN5#98
6.2.2 Maximum Output Power Reduction (MPR)	contiguous allocation: 1000	General rules of test point selection apply. Test points of TC 6.2.2 from TS 38.521-1 can be leveraged except for the test point for almost contiguous allocation. Note: There is no test point for almost contiguous allocation because test channel bandwidth for almost contiguous resource allocation should be greater than 20MHz, which is not supported by NR NTN operating bands.	RAN5#98
6.2.3 UE additional maximum output power reduction	216 for NS_100; 264 for NS_24	General rules of test point selection apply. AMPR test points for NS_100 and NS_24 in TC 6.2.3 of TS 38.521-1 can be leveraged.	RAN5#100
6.2.4 Configured transmitted power	30	General rules of test point selection apply. Test points of TC 6.2.4 from TS 38.521-1 can be levereage except for Test ID 3, which applies to TDD bands only.	RAN5#99
6.3.1 Minimum output power	45	General rules of test point selection apply. Test points of TC 6.3.1 from TS 38.521-1 can be leveraged.	RAN5#98
6.3.3 Transmit On/OFF Time Mask	40	General rules of test point selection apply. Test points of TC 6.3.3 from TS 38.521-1 can be leveraged.	RAN5#100
6.4.1 Frequency error	15	38.521-5_TPanalysis_6.4.1_FreqErr_v1.zip	RAN5#101
6.5.2.2 Spectrum emission mask	contiguous allocation: 144	General rules of test point selection apply. Test points applicable to PC3 from TC 6.5.2.2 of TS 38.521-1 can be leveraged except for: -: Test IDs for almost contiguous allocation because test channel bandwidth for almost contiguous resource allocation should be greater than 20MHz, which is not supported by NR NTN operating bands. - Test IDs that are specified with NOTE 3 in Table 6.5.2.2.4.1-1 of TS 38.521-1, which applies to TDD bands only - [Test IDs listed as applicable to UEs indicating support for UE capability *lowPAPR-DMRS-PUSCHwithPrecoding-r16]*	RAN5#100
6.5.2.4 Adjacent channel leakage ratio	contiguous allocation: 1000	General rules of test point selection apply. Test points of TC 6.5.2.4 which are derived from Table 6.2.2.4.1-1 of TS 38.521-1, applicable to PC3, can be leveraged except for: - Test IDs for almost contiguous allocation because test channel bandwidth for almost contiguous resource allocation should be greater than 20MHz, which is not supported by NR NTN operating bands. - Test IDs that are specified with NOTE 3 in Table 6.2.2.4.1-1 of TS 38.521-1, which applies to TDD bands only	RAN5#100
6.5.3.1 General spurious emission	27	General rules of test point selection apply. Test points of TC 6.5.3.1 from TS 38.521-1 can be leveraged	RAN5#100
6.5.3.2 Spurious emissions for UE co-existence	27	General rules of test point selection apply. Test points of TC 6.5.3.2 from TS 38.521-1 can be leveraged	RAN5#100
6.5.4 Transmit intermodulation	8	General rules of test point selection apply. Test points of TC 6.5.4 from TS 38.521-1 can be leveraged	RAN5#100

Table 4.4-2: NR UE receiver test point selection for NTN

Subclause	Number of test points	Justification	Comments
7.3.2 Reference sensitivity power level	45	General rules of test point selection apply. Test points of TC 7.3.2 from TS 38.521-1 can be leveraged	RAN5#100
7.4 Maximum input level	3	General rules of test point selection apply. Test points of TC 7.4 from TS 38.521-1 can be leveraged limiting the modulation to 64QAM.	RAN5#99
7.5 Adjacent channel selectivity7.5 Adjacent channel selectivity	3	General rules of test point selection apply. Test points of TC 7.5 from TS 38.521-1 can be leveraged.	RAN5#101
7.6.2 In-band blocking	3	General rules of test point selection apply. Test points of TC 7.6.2 from TS 38.521-1 can be leveraged.	RAN5#101
7.6.3 Out of Band Blocking	3	General rules of test point selection apply. Test points of TC 7.6.3 from TS 38.521-1 can be leveraged.	RAN5#101
7.6.4 Narrow band blocking	3	General rules of test point selection apply. Test points of TC 7.6.4 from TS 38.521-1 can be leveraged.	RAN5#101
7.7 Spurious response	3	Same test points as TC 7.6.3 of TS 38.521-5.	RAN5#101
7.8.2 Wide band Intermodulation	3	General rules of test point selection apply. Test points of TC 7.8.2 from TS 38.521-1 can be leveraged.	RAN5#101
7.9 Spurious emissions	3	General rules of test point selection apply. Test points of TC 7.9 from TS 38.521-1 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 NR 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).

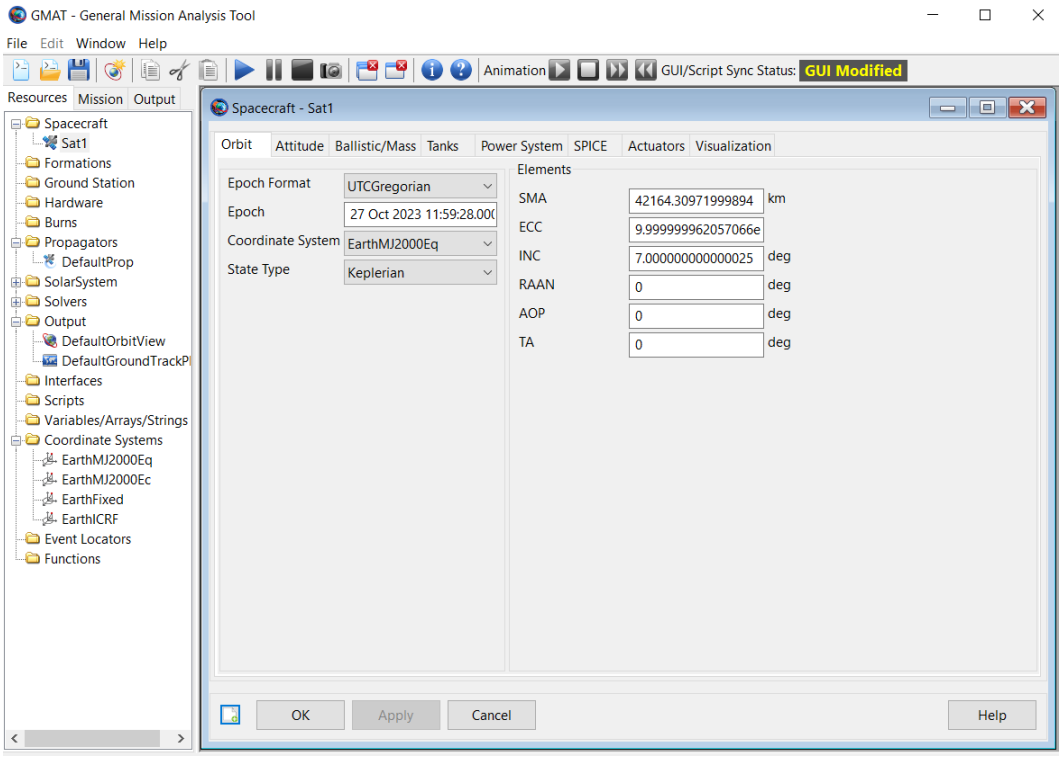

Figure 5.2.1-1: GSO Satellite Setting – Orbit (Spacecraft in resources tab)

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.

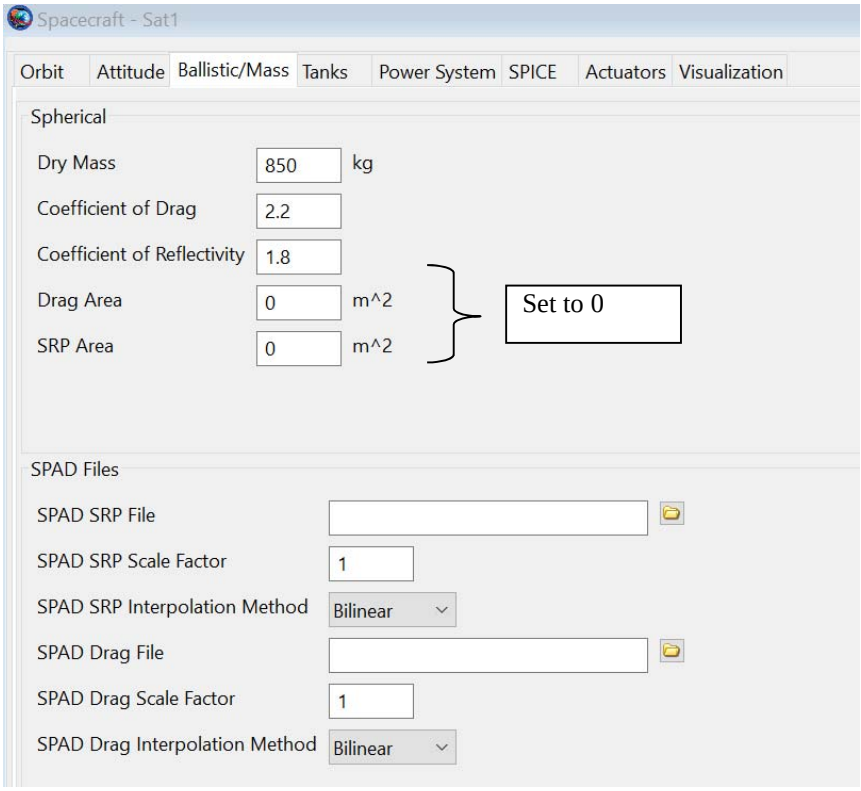

Figure 5.2.1-2: GSO Satellite Setting - Ballistic/Mass (Spacecraft in resources tab)

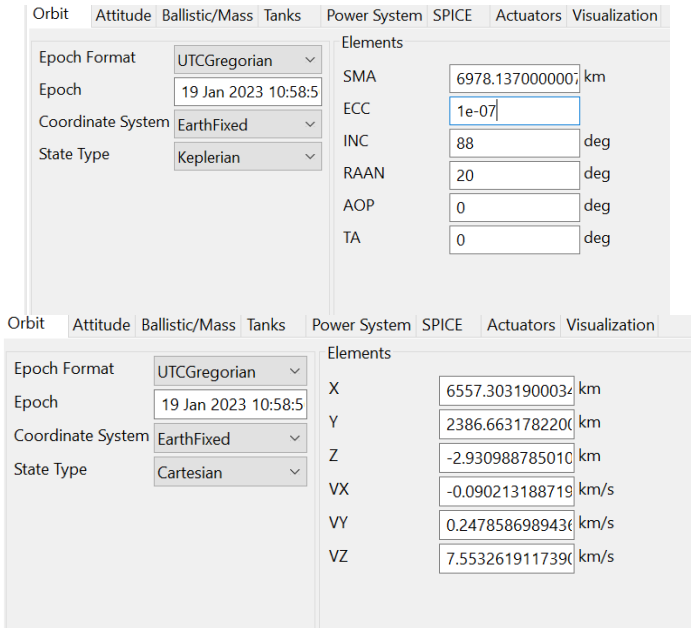

Figure 5.2.1-3: NGSO Satellite Setting – Orbit (Spacecraft in resources tab)

5.2.3 Ground Station simulating the UE

The NR NTN UE is modeled 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 38.508-1 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.

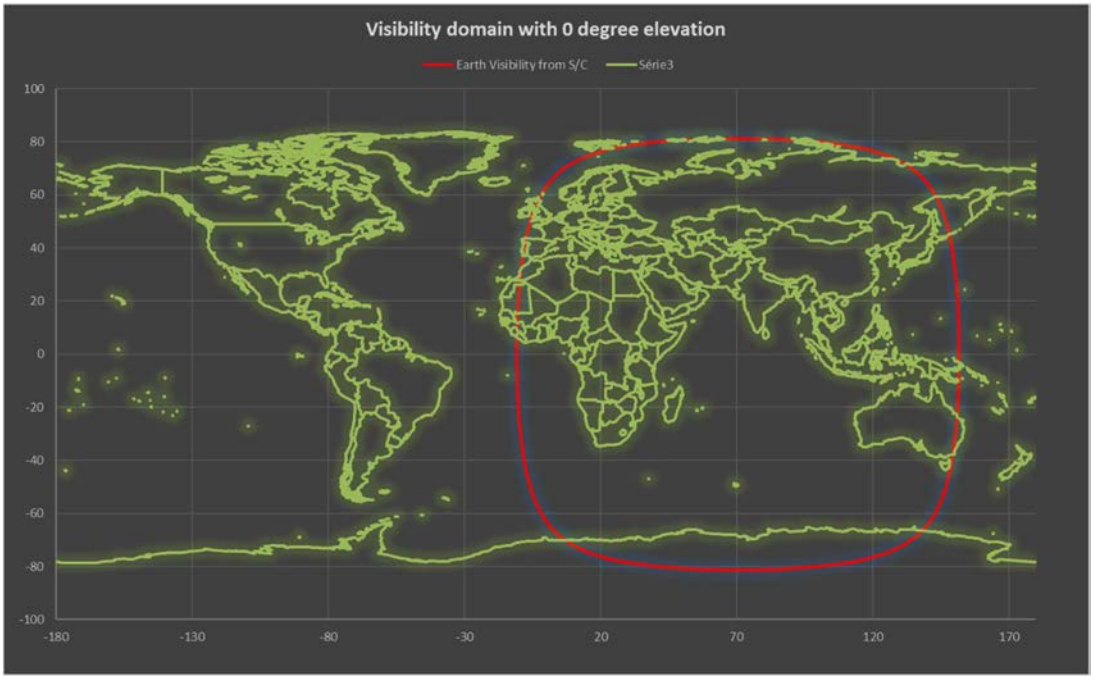

Figure 5.2.3-1: Visibility domain from a geostationary satellite, Minimum UE elevation=0

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

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

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

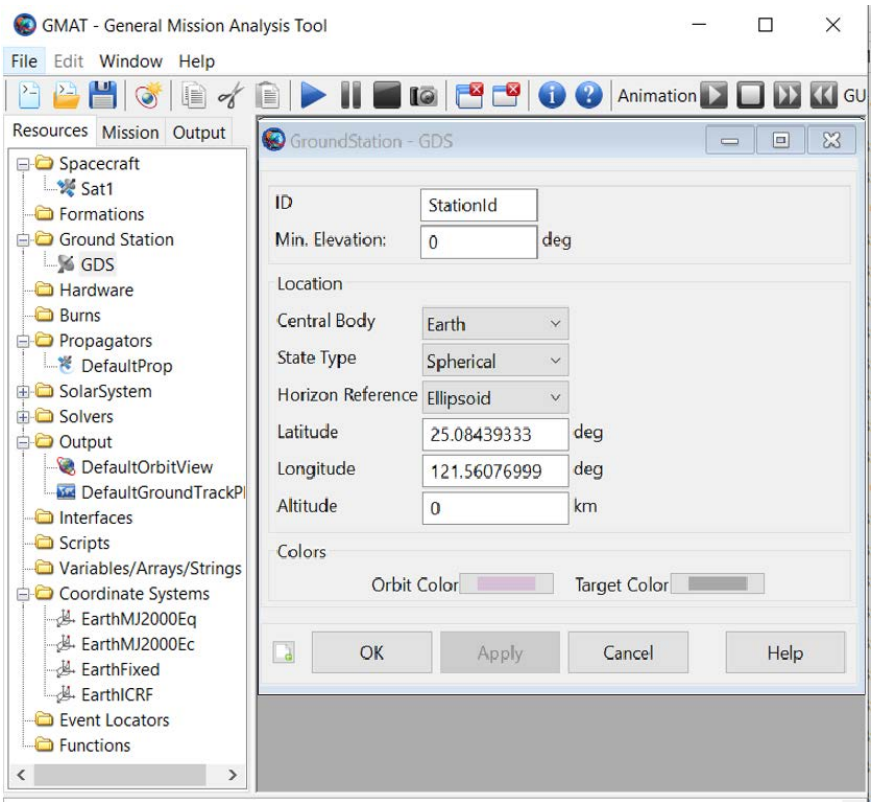

Figure 5.2.3-1: NR NTN UE Setting (Ground Station in resources tab)

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

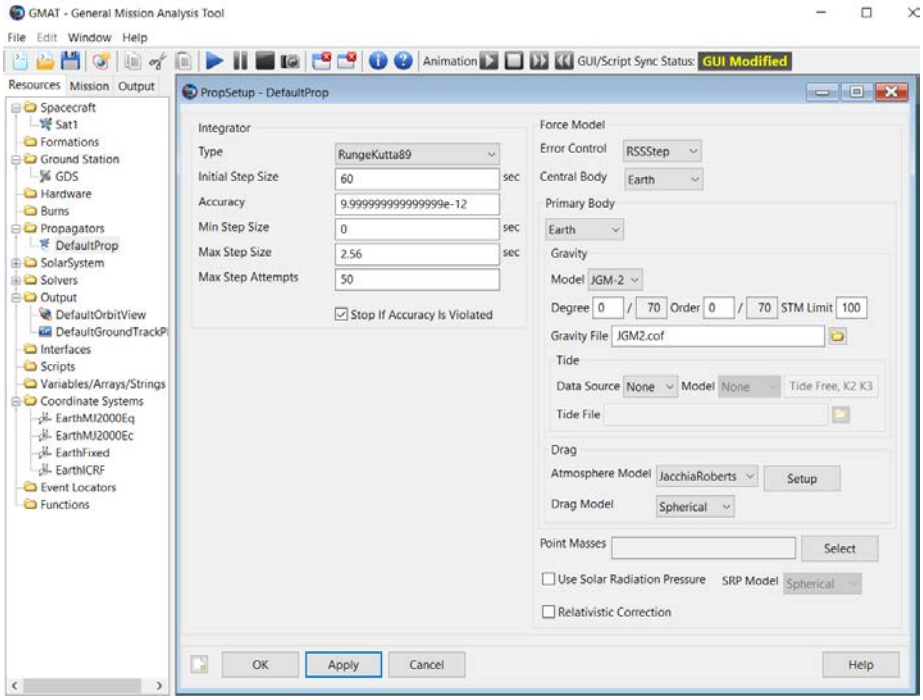

Figure 5.2.4-1: Propagator Setting for GSO Satellites

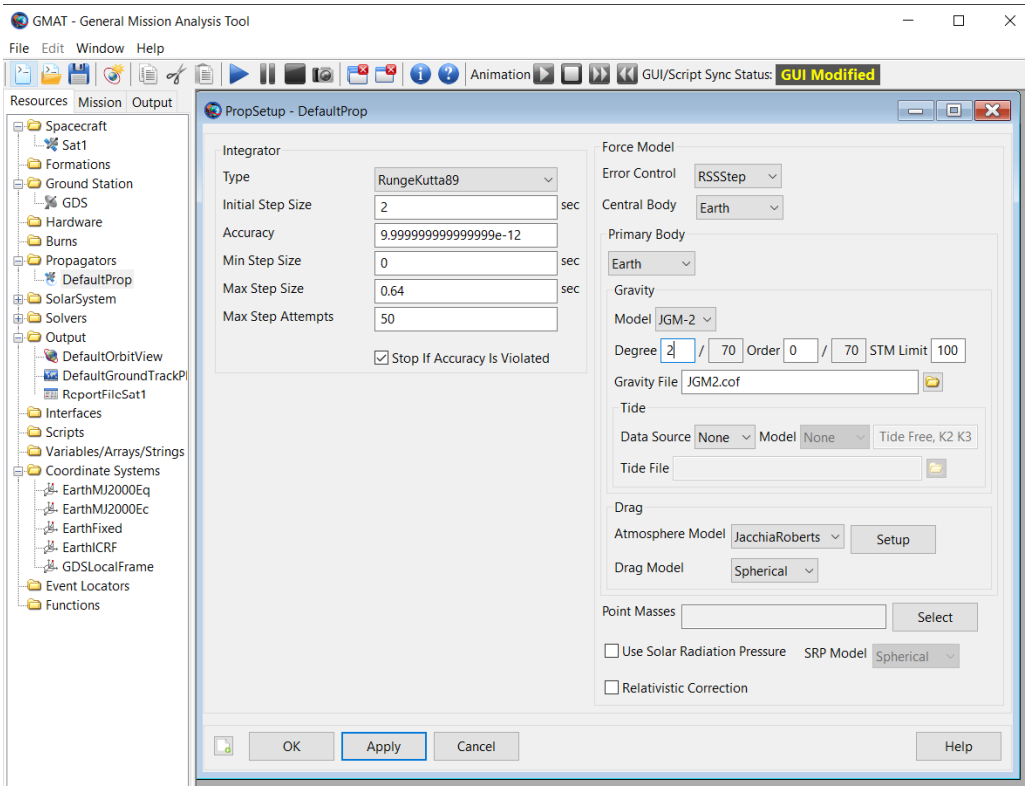

Figure 5.2.4-2: Propagator Setting for NGSO Satellites

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.

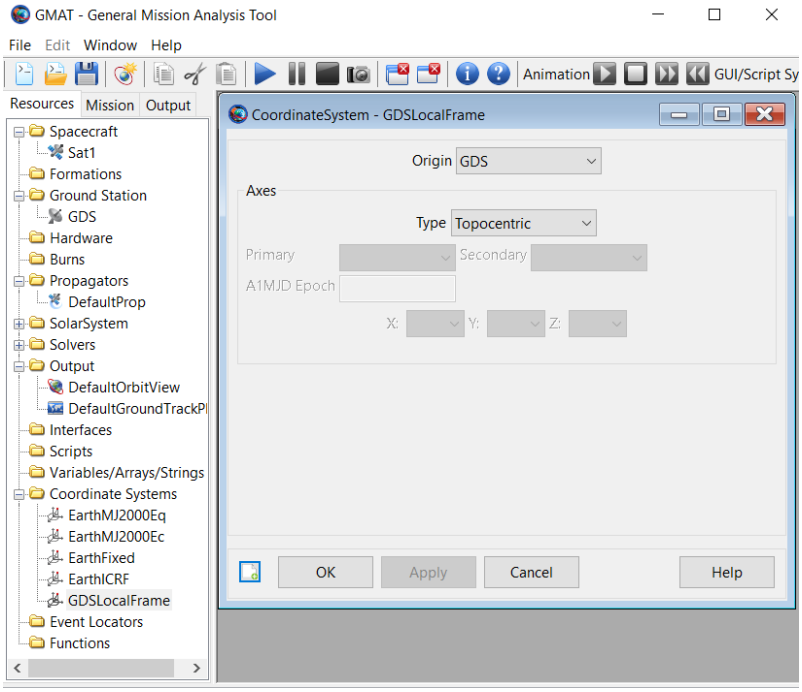

Figure 5.2.5-1: Creation of topocentric frame attached to the ground station (Coordinate Systems in resources tab)

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 SIB19 INTEGER format as required in 3GPP TS 38.331:

- 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 SIB19 parameters.

Table 5.2.6-1: SIB19 parameter vs GMAT variable

	SIB19 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

5.2.7 Subscribers/Output

The subscribers or outputs in this context are data representation such as plots, groundtrack 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.

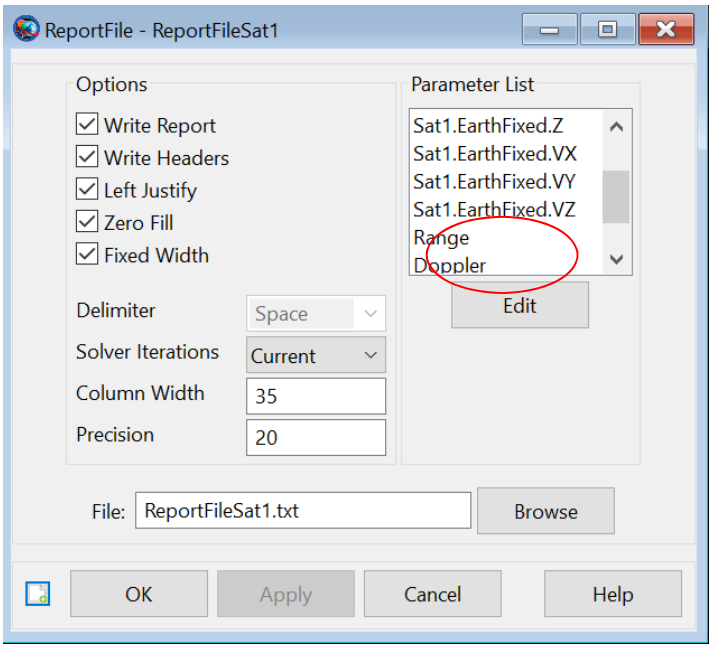

Figure 5.2.7-1: Reportfile setting for Sat1

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:

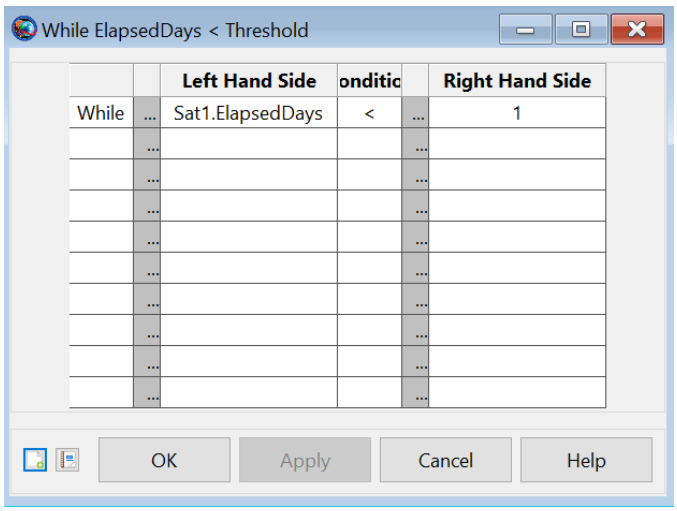

Figure 5.2.8-1: While condition for GSO satellites

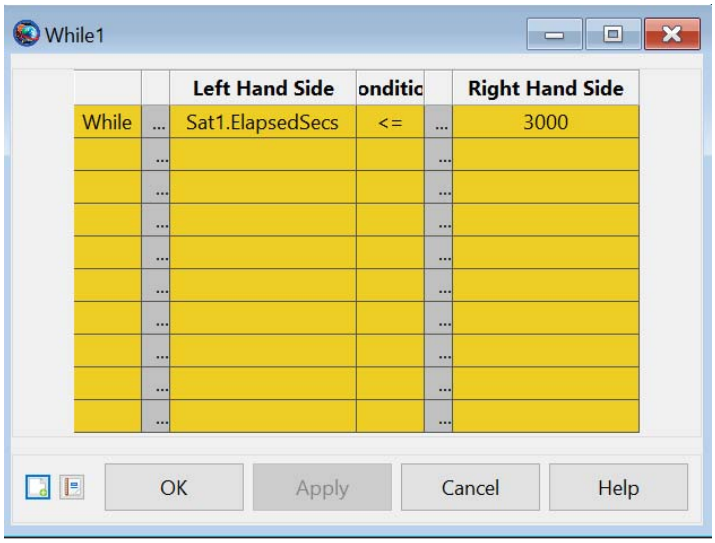

Figure 5.2.8-2: While condition for NGSO satellites

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.

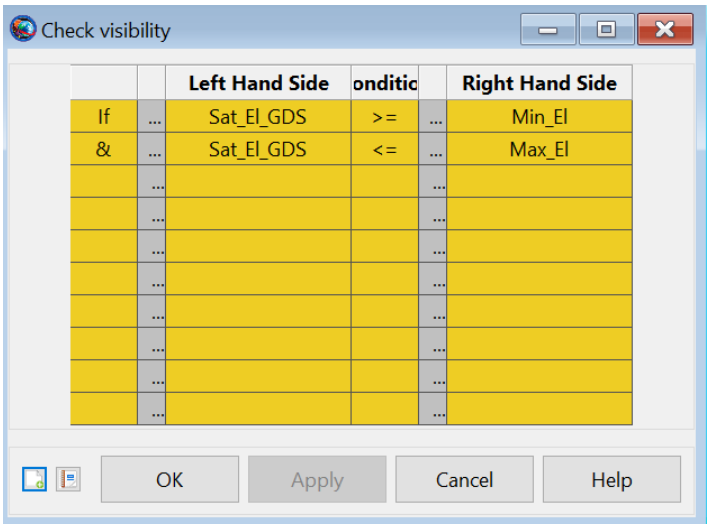

Figure 5.2.8-3: Visibility checking

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 SIB19 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 SIB19 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 SIB19 in INTEGER,
- velocity component for SIB19 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 ia 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 addiottional 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 NR NTN, assume that neighbour cell satellite type is same as serving cell, including its altitude.
- When defining ephemeris for GSO 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.
- When defining ephemeris for NGSO neighbour cells, consider satellites in the same orbital plane shifted in time while trying to maximize the Doppler and the elevation angles between all cells.

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 NR 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 & neighbour cell(s)	"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 & neighbour cell(s)	"ReportFile-NGSO-LEO1200km-MinElev0-Lat25.08439333-Long121.56076999-Step0.640sec.zip"	Added in RAN5#102

Annex A: Derivation documents

The documents and spreadsheets 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 fi"*38.521-1_TPanalysis*", "*38.521-2_TPanalysis*" or "*38.521-3_TPanalysis*".les in the same area, e.g.
- Include Test Case Number(s) and an abbreviation Test Case Name, e.g. "*6.2.1_MOP*", "*7.6.2.InB_Block*" or "*6.2.1_MOP+6.2.2_MPR*".
- 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: "*38.521-1_TPanalysis_6.2.1_MOP.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. "nnn_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.

For cases when no spreadsheet is used then the principles for selecting reference sensitivity test points are described in Annex B, C or D.

Annex B: Principles for test point selection for NR CA reference sensitivity test cases

B.1 General

From TS 38.521-1 [2] (Table 7.3.2.4.1-1), the initial conditions used for NR RX reference sensitivity is given below.

<table>
<tr><th colspan="5">Initial Conditions</th></tr>
<tr><td colspan="3">Test Environment as specified in TS 38.508-1 [5] subclause 4.1</td><td colspan="2">Normal, TL/VL, TL/VH, TH/VL, TH/VH</td></tr>
<tr><td colspan="3">Test Frequencies as specified in TS 38.508-1 [5] subclause4.3.1</td><td colspan="2">Low range, Mid range, High range (NOTE 4)</td></tr>
<tr><td colspan="3">Test Channel Bandwidths as specified in TS 38.508-1 [5] subclause 4.3.1</td><td colspan="2">Lowest, Mid, Highest (NOTE 4)
Lowest UL / Lowest DL, Lowest UL / Highest DL (NOTE 3)</td></tr>
<tr><td colspan="3">Test SCS as specified in Table 5.3.5-1</td><td colspan="2">Lowest</td></tr>
<tr><th colspan="5">Test Parameters</th></tr>
<tr><th rowspan="2">Test ID</th><th colspan="2">Downlink Configuration</th><th colspan="2">Uplink Configuration</th></tr>
<tr><th>Modulation</th><th>RB allocation</th><th>Modulation</th><th>RB allocation</th></tr>
<tr><td>1</td><td>CP-OFDM QPSK</td><td>Full RB (NOTE 1)</td><td>DFT-s-OFDM QPSK</td><td>REFERENCE SENSITIVITY (NOTE 2)</td></tr>
<tr><td colspan="5">NOTE 1: Full RB allocation shall be used per each SCS and channel BW as specified in Table 7.3.2.4.1-2.
NOTE 2: REFERENCE SENSITIVITY refers to Table 7.3.2.4.1-3 which defines uplink RB configuration and start RB location for each SCS, channel BW and NR band.
NOTE 3: According to asymmetric channel bandwidths specified in clause 5.3.6.
NOTE 4: For n70, in addition to default test configurations, additional configurations shall be used to verify reference sensitivity requirements with the UE TX-RX frequency separation of 295MHz (table 5.4.4-1):
5 MHz CH BW with DL @ low range, UL @ mid range
5 MHz CH BW with DL @ mid range, UL @ high range
10 MHz CH BW with DL @ low range, UL @ high range</td></tr>
</table>

For reference, the initial test condition for E-UTRA-CA (inter-band DL CA and UL CA) is listed below: (Table 7.3B.4.1-1 in TS 38.521-1 [2])

Initial Conditions	
Test Environment as specified in TS 36.508[7] subclause 4.1	NC, TL/VL, TL/VH, TH/VL, TH/VH
Test Frequencies as specified in TS36.508 [7] subclause 4.3.1 for different CA bandwidth classes, and PCC and SCCs are mapped onto physical frequencies according to Table 7.1-2	B: Low range, High range C: Low range, High range (Note 4)
Test CC Combination setting (N_{RB_agg}) as specified in subclause 5.4.2A.1 for the CA Configuration across bandwidth combination sets supported by the UE.	Lowest N_{RB_agg}, Highest N_{RB_agg} (Notes 3, 4)

Test Parameters for CA Configurations

CA Configuration / N_{RB_agg}		DL Allocation		UL Allocation					
PCC N_{RB}	SCCs N_{RB}	CC MOD	PCC & SCC RB allocation	CC MOD	N_{RB_alloc}	PCC & SCC RB allocations (L_{CRB} @ RB_{start})			
6	25	QPSK	6+25	QPSK	6	P_6@0	-	-	-
15	50	QPSK	15+50	QPSK	15	P_15@0	-	-	-
25	25	QPSK	25+25	QPSK	20	P_20@0	-	-	-

B.2 Test case structure

This approach which is described in this clause is relying on certain properties of the RAN4 CA requirements and applies to both NR CA and EN-DC.

1. For E-UTRA, fallbacks are skipped unless there is a documented exception in TS36.521-2. This may cause that a fallback is skipped even if no technical analysis has been made leading to insufficient testing of demanding CA configurations. For NR fallback can only be skipped if there has been a technical analysis performed in TR 38.905.

2. The RAN4 decision to only specify the affected (aggressor and victim) bands for an exception enables a different approach than in E-UTRA that in most cases makes fallback analysis redundant. This is not entirely true for requirements under clause 7.3A.5 and 7.3A.6 of TS38.101-1 [5] but it is assumed that the same approach can be used also in those cases as it greatly simplifies test cases.

3. Test cases can be split into *default* and *additional* test cases where default test cases only test where there is no exception (single carrier requirements apply), and additional only test the exceptions in TS 38.101-1 [5] clause 7.3A.

4. Default test cases need to be defined from 2 up to 5 CCs. Since they cover no exception, no fallback analysis is required, and the applicability rule should say that only highest CC number is required (similar to other Rx tests).

5. As the *default* test cases are not covering any CA exceptions, there is no need to configure UL CA in these test cases. Single UL configuration is sufficient to fulfil the test purpose.

6. Additional test cases only need to be defined for 2CC (and for intermodulation also 3CC) since this is sufficient for testing the exception. Adding more CCs is not considered to affect the test result and does not add any value.

7. Additional test cases only need to consider pure inter-band configurations since requirements are the same for intra-band contiguous or non-contiguous, and the essential aspect to test is the interference between bands.

8. It is important for sufficient test coverage to ensure that all band combinations with the highest number of CCs supported in the UE can always be tested.

9. The highest supported CC number may be with a band including an exception that can be avoided by setting a different test frequency (e.g. harmonic interference). In such cases, there is a need to include test points in the *default* test case so that this CA configuration can be tested without an exception (see example 1 below).

10. The highest supported CC number may be with a band including an exception that cannot be avoided by setting a different test frequency (e.g. cross band isolation). In this case the test requirements of the *default* test that are normally general for any CA config need to include this specific exception requirement. In addition, one

fallback configuration needs to be tested to ensure test coverage of the single carrier requirement for the victim band that applies in this case. In order to simplify test applicability this fallback configuration will be specified inside the higher order test case (see example 2 below).

11. The highest supported CC number may be with a band including a limitation that is not present in the lower order fallback (e.g. UL is not possible in one of the bands). In this case, one fallback configuration needs to be tested to ensure test coverage of the single carrier requirement with UL active in the band. In order to simplify test applicability this fallback configuration will be specified inside the higher order test case.

12. To ensure that it has been checked that the CA configuration has been fully analysed with regard to test configuration and fallback testing, the CA configuration is listed in TR 38.905.

B.3 Test Environment

Reference sensitivity is one of the critical test cases for NR. Considering NR CA testing scenario is very similar to E-UTRA_CA test case, similar Test Environment shall be used for NR CA testing, i.e. NC, TL/VL, TL/VH, TH/VL, TH/VH.

B.4 Test Frequencies selection

In E-UTRA DL CA and UL CA reference sensitivity testing, Low range and High range are selected for intra-band CA testing. Mid range is selected for inter band E-UTRA CA testing.

Considering NR CA testing scenario is very similar to E-UTRA_CA test case, similar Test Frequencies should be used for NR CA default case.

It is proposed that Low and High Range are tested as default for intra-band and mid range for inter-band. For CA combinations containing intra-band configuration in an inter-band CA configuration it is proposed that low and high range are tested for intra-band CA and mid channel for inter-band without intra-band component. It is also proposed that the fallback configurations from intra-band configuration to single carrier component do not need to be tested even if the test frequency would differ (e.g. XA-YC -> XA-YA fallback does not need to be tested even if YC is tested with low/high frequency and YA would be tested with mid frequency).

Table B.4-1: Void

Proposal 2a: Low range and high range for intra band CA and mid range for inter-band CA shall be selected for NR in *default* test cases 7.3A.1 to 7.3A.4 in general, but final selection is band dependent. For CA combinations containing intra-band configuration in an inter-band CA configuration low and high range shall be selected for intra-band CA and mid channel for inter-band without intra-band component. The fallback configurations from intra-band configuration to single carrier component do not need to be tested even if the test frequency would differ.

Proposal 2b: In the *additional* test case, one test frequency per exception is selected.

B.4A Frequency relation for exception requirements

Intra-band

No exceptions are applicable.

Inter-band

There are 4 different types of interference related to inter-band operation that results in refsens exception if the frequency relation of the exception is fulfilled.

Table B.4A-1: Exception types for inter-band (2 bands)

Exception types	Aggressor	Victim	Frequency relation
UL harmonic interference (HD)	Low band UL	High band DL	$a*f_{UL\_LB} = f_{DL\_HB}$
Receiver Harmonic Mixing (HM)	Low band DL LO and High band UL	Low band DL	$b*f_{DL\_LB} + c*f_{UL\_HB} = f_{DL\_LB}$
Intermodulation due to Dual uplink (IMD)	Low band UL and High band UL	DL	$a*f_{UL\_LB} + c*f_{UL\_HB} = f_{DL\_LB}$ or $a*f_{UL\_LB} + c*f_{UL\_HB} = f_{DL\_HB}$
Cross band isolation (CBI)	UL on other than victim band	DL	

The exception requirements for dual uplink intermodulation apply only for a specified test frequency setting per UL configuration in TS 38.101-1 [5].

More details on how the exception requirements were derived can be found in TR series 37.865 (Rel-15), TR 38.716 (Rel-16) and TR 38.717 (Rel-17). These TRs can be used to identify all the applicable requirements for a certain EN-DC configuration which are otherwise spread out over multiple sections in TS 38.101-1 [5].

Some terminology from the RAN4 TRs for EN-DC that is listed in clause D.2.3 are re-used here to calculate test frequency for avoiding the exceptions, namely:

BW_{INT}: Effective bandwidth of the interference falling into the victim band which is $|a|*BW_{LB}+|c|*BW_{HB}$, where a and c are factors from Table B.4A-1.

F_{INT}: Interference centre frequency within the victim band which is the offset from the frequency relation in Table B.4A-1. If $|F_{INT}| \geq (BW_{INT}+BW_{victim})/2$ the interference is not overlapping the victim carrier and exception requirements do not apply.

B.5 Test Channel Bandwidth selection

The objective is how to verify the NR CA reference sensitivity. In intra-band E-UTRA CA reference sensitivity testing, two extreme bandwidth combinations corresponding to Lowest NRB_agg Highest NRB_agg are selected. Highest NRB_agg is selected for inter band E-UTRA CA testing.

As a simplification the highest aggregated channel bandwidth is proposed to test NR CA reference sensitivity.

Proposal 3: Highest aggregated channel bandwidth combinations shall be selected for NR CA reference sensitivity measurement. (Highest NRB_agg).

B.6 Modulation selections

QPSK is used for both uplink and downlink modulations for E-UTRA reference sensitivity measurement which is the same as for E-UTRA standalone reference sensitivity testing. There is no particular reason to deviate from current E-UTRA configurations of modulation scheme selection. NR modulations shall also follow what is selected in standalone NR testing.

B.7 Examples

Example 1 (highest CC number has an exception that can be avoided):

- UE supports CA_XA-YA-ZA-RA (4DL CA)
  - CA_X-Y has an exception if testing Low+Low freq
  - CA_X-Y has no exception if testing Mid+Mid freq
  - Other bands pairs have no exception

Applicable Test cases for the example:

7.3A.1 2CC non-exception/“default”

Skip test (no fallback analysis required)

7.3B 3CC non-exception/“default”

Skip test (no fallback analysis required)

7.3A.3 4CC non-exception/“default”

Test CA_XA-YA-ZA-RA in Mid+Mid freq in bands X and Y respectively avoiding the exception

7.3A.1_1 2CC exception/“additional”

Test CA_X-Y in Low+Low freq

Example 2 (highest CC number has an exception that cannot be avoided):

- UE supports CA_XA-YA-ZA-RA (4DL CA)
  - CA_X-Y has an exception always (e.g. cross band isolation) with band Y being the victim
  - Other bands pairs have no exception

Applicable Test cases for the example:

7.3A.1 2CC non-exception/“default”

Skip test (no fallback analysis required)

7.3A.2 3CC non-exception/“default”

Skip test (no fallback analysis required)

7.3A.3 4CC non-exception/“default”

Test CA_XA-YA-ZA-RA and add exception in test requirements

Add test points for 3CC fallback avoiding the exception CA_YA-ZA-RA

7.3A.1_1 2CC exception/“additional”

Test CA_X-Y

B.8 Current test completion status per CA configuration

The completion status per EN-DC configuration is documented in clause 4.3.3.1.

B.9 Reference Sensitivity checklist for CA

The purpose of this annex is to facilitate the reference sensitivity test point analysis in TR 38.905 for NR CA configurations.

B.9.1 Checklist for two bands

1) Check if the 2 DL band configuration has reference sensitivity exceptions in the tables listed below:
   - UL Harmonic Distortion (HD), as defined in TS 38.101-1 [5], Table 7.3A.4-1.
   - RX Harmonic Mixing (HM), as defined in TS 38.101-1 [5], Table 7.3A.4-4 to Table 7.3A.4-4a.

- Intermodulation Distortion (IMD), as defined in TS 38.101-1 [5], Table 7.3A.5-1 to Table 7.3A.5-1a.
- Cross Band Isolation (CBI), as defined in TS 38.101-1 [5], Table 7.3A.6-1 to Table 7.3A.6-1b.

2) If reference sensitivity exceptions are found for two bands above:

- Add test frequencies for HD, HM and CBI to Table 4.1.3.1-6..

- Add two band test points to test case in TS 38.521-1 [2] Table 7.3A.1_1.4.1-1.

3) Add the result from the check to Table 4.1.3.1-2 for 2CC if they do not already exist.

- If there are no sensitivity exceptions then still add the band configuration to Table 4.1.3.1-2 with

NE: (Non-exception as defined in TS 38.101-1 [5], meaning single carrier NR requirements apply).

4) Add the 2 DL band configuration in TS 38.521-1 [2] Table 7.3A.1.5-1

B.9.2 Checklist for three bands

1) Check all three band fallback configurations in accordance to B.9.1.

2) Check for any 3DL/2UL IMD reference sensitivity exceptions in TS 38.101-1 [5], Table 7.3A.5-2 to Table 7.3A.5-2a.

3) If exceptions are found for three bands above:

- Add three band test points to test case in TS 38.521-1 [2] Table 7.3A.2_1.4.1-1.

4) Add the result from the check to Table 4.1.3.1.3-3 for the three bands if they not already exist.

- If there are no sensitivity exceptions then still add the band configuration to Table 4.1.3.1-3 with

NE: (Non-exception as defined in TS 38.101-1 [5], meaning single carrier NR requirements apply).

5) Add the 3 DL band configuration in TS 38.521-1 [2] Table 7.3A.2.5-1

B.9.3 Checklist for four bands and five bands

1) Check all two band and three band fall backs in accordance to B.9.1 and B.9.2 above.

No reference sensitivity exceptions exists for four bands and five bands in TS 38.101-1 [5].

Annex C: Principles for test point selection for FR2 NR CA reference sensitivity test cases

FFS

Annex D: Principles for test point selection for EN-DC reference sensitivity test cases

D.1 General

The purpose of this Annex is to describe the test point selection of NR and E-UTRA carriers for RX sensitivity testing within FR1. Considering the high number of EN-DC band combinations, the procedure has been developed to carefully reduce the number of test points. Since the objective of TS 38.521-3 [4] specification is providing conformance testing requirement for NR in the case of EN-DC scenarios, the number of E-UTRA test points can be reduced.

TS 38.521-3 [4] include exception test cases and non-exception test cases for inter-band EN-DC with FR1. The exceptional test cases must be tested as per configurations defined in TS 38.521-3 [4]. The procedure covers selection of both non-exceptional case and exception cases.

When no NR or E-UTRA exception or additional requirements exist, the E-UTRA anchor is configured such that it does not interfere with NR operation (based on TS 38.101-3 [7] clause 6.1 and 7.1). The EN-DC testing is performed in E-UTRA anchor-agnostic mode. NR is tested but in SA as per TS 38.521-1 [2].

General initial conditions to be used for NR RX sensitivity testing are:

Table D.1-1: Initial test condition for standalone NR RX sensitivity

Initial Conditions				
Test Environment as specified in TS 38.508-1 [5] subclause 4.1			Normal, TL/VL, TL/VH, TH/VL, TH/VH	
Test Frequencies as specified in TS 38.508-1 [5] subclause 4.3.1			Low range, Mid range, High range	
Test Channel Bandwidths as specified in TS 38.508-1 [5] subclause 4.3.1			Lowest, Mid, Highest	
Test SCS as specified in Table 5.3.5-1			Lowest supported SCS per test channel BW	
Test Parameters				
Test ID	**Downlink Configuration**		**Uplink Configuration**	
	Modulation	**RB allocation**	**Modulation**	**RB allocation**
1	CP-OFDM QPSK	Full RB (Note 1)	DFT-s-OFDM QPSK	REFERENCE SENSITIVITY (Note 2)

D.2 Requirements

D.2.1 Defined EN-DC configurations

Downlink EN-DC configurations in 38.101-3 V16.5.0 clause 5.5B are:
Currently defined downlink EN-DC configurations in 38.101-3 [7] V16.6.0 clause 5.5B are:

- Intra-band contiguous EN-DC configurations within a single band includes max 2 NR CCs and max 3 E-UTRA CC, but in total max 4 CCs.
- Intra-band non-contiguous EN-DC configurations within a single band does not include NR CA (max 1NR CC), only E-UTRA CA (max 3 E-UTRA CC)
- Inter-band EN-DC configurations include up to 6 bands and 8 CCs but for NR the maximum is:
  - 2 NR CCs in 1 band (nXC or nX(2A))
  - 4 NR CCs in 2 bands (nXA-nYA, nXA-nYC, nXA-nY(2A), nX(2A)-nY(2A))
- Combinations of intra-band contiguous EN-DC + inter-band E-UTRA/NR CA.
- Combinations of intra-band non-contiguous EN-DC + inter-band E-UTRA/NR CA.

Currently defined uplink EN-DC configurations in TS 38.101-3 [7] V16.6.0 clause 5.5B are:

- The UL configuration contains at least 1 E-UTRA CC and 1 NR CC, meaning 2 UL CC.
- 3 UL CC configurations are also defined only with intra-band contiguous CA on either E-UTRA or NR (DC_XA-nYC or DC_XC-nYA).

D.2.2 Definition of exception requirements

Before going into the test case details, the term “exception” needs to be clarified since it is different for EN-DC compared to SA. We can have the following situations:

1. EN-DC config without exception
   a. Anchor agnostic, only need to be tested for UE not supporting SA
2. EN-DC config with exception when the exception applies
   b. Need to be tested for all EN-DC UEs
3. EN-DC config with exception when the exception does not apply (single carrier requirement applies)
   c. Need to be tested for some exception types. Which exception types that need to this test coverage is defined in clause D.2.10.3.
   d. In some cases, it is not possible to avoid the exception.
   e. Anchor agnostic approach shall not be followed. It is important that E-UTRA aggressor is active to test performance when the interferer falls outside of the victim carrier

D.2.3 Reference sensitivity

Intra-band

Unlike for standalone NR, there are exceptions for intra-band operation, currently limited to band 3 for non-contiguous operation and band 71 for contiguous operation.

The exceptions in band 3 is due to 2UL intermodulation interference making it similar to the corresponding inter-band intermodulation case. This scenario did not happen in standalone NR mode due to that there is no UL CA defined for CA_n3(2A).

It can therefore be treated in the same way as inter-band intermodulation and added in the “additional” test case.

The intra-band contiguous exceptions are not expected to be very common. Currently only band 71 is affected, which can be added in the “additional” test case.

Inter-band

For both SA and NSA there are 4 different types of interference related to inter-band operation that results in refsens exception if the frequency relation of the exception is fulfilled.

Table D.2.3-1: Exception types for inter-band (2 bands)

Exception types	Aggressor	Victim	Frequency relation
UL harmonic interference (HD)	Low band UL	High band DL	$a*f_{UL\_LB} = f_{DL\_HB}$
Receiver Harmonic Mixing (HM)	Low band DL LO and High band UL	Low band DL	$b*f_{DL\_LB} + c*f_{UL\_HB} = f_{DL\_LB}$
Intermodulation due to Dual uplink (IMD)	Low band UL and High band UL	DL	$a*f_{UL\_LB} + c*f_{UL\_HB} = f_{DL\_LB}$ or $a*f_{UL\_LB} + c*f_{UL\_HB} = f_{DL\_HB}$
Cross band isolation (CBI)	UL on other than victim band	DL	

The exception requirements for dual uplink intermodulation apply only for a specified test frequency setting per UL configuration in TS 38.101-3 [7].

More details on how the exception requirements were derived can be found in TR 37.863 (Rel-15), TR 37.716 (Rel-16) and TR 37.817 (Rel-17). These TRs can be used to identify all the applicable requirements for a certain EN-DC configuration which are otherwise spread out over multiple sections in TS 38.101-3 [7]. Additionally, the TRs specify exactly which aggressors that contribute to the exception for IMD which is not defined in the TS. Some terminology from the mentioned TRs are re-used here to calculate test frequency for avoiding the exceptions, namely:

BW_{INT}: Effective bandwidth of the interference falling into the victim band which is |a|*BWLB+|c|*BWHB, where a and c are factors from Table D.2.3-1.

F_{INT}: Interference centre frequency within the victim band which is the offset from the frequency relation in Table D.2.3-1. If $|F_{INT|} \geq (BW_{INT}+BW_{victim})/2$ the interference is not overlapping the victim carrier and exception requirements do not apply.

It has been agreed that for SA tests all the interference types except intermodulation can be tested with 1UL. Doing the same for NSA would simplify the test cases and would also mean that the main interferer (the aggressor) can be tested with higher power.

Most other Rx requirements than reference sensitivity in intra-band contiguous EN-DC configuration require a configuration with 2UL however, meaning the "default" test cases need to be tested with 2UL active in this scenario

There are combinations of intra-band contiguous/non-contiguous EN-DC + inter-band E-UTRA/NR CA which are listed in the inter-band EN-DC configuration tables of T S38.101-3 [7]. These configurations do not add any exception requirements and are therefore proposed not to be tested unless they contain maximum number of NR CCs supported by the UE.

D.2.4 Rx requirements other than reference sensitivity

The requirements are in some cases referring back to standalone requirements in TS 36.101/ TS 38.101-1. In other cases, specific exceptions for EN-DC are defined in TS 38.101-3 [7]. This is summarized in Table 2.1.3-1.

Table D.2.4-1: Rx requirements

Clause	Title	Requirement		
		Intra-band contiguous	Intra-band non-contiguous	Inter-band
7.4B	Max input level	Exception with 2UL	Standalone	Standalone
7.5B	ACS	Exception with 2UL	Standalone	Standalone
7.6B.2	IBB	Exception with 2UL	Standalone	Standalone
7.6B.3	OOBB	Exception with 2UL	Standalone	Standalone (only 2 band needed)
7.6B.4	NBB	Exception with 2UL	Standalone	Standalone
7.7B	Spurious response	Exception with 2UL	Standalone	Standalone (only 2 band needed)
7.8B	Intermodulation	Exception with 2UL	Standalone	Standalone
7.9B	Rx spurious	Standalone	Standalone	Standalone

D.2.5 Test case structure and test coverage

As seen above, the EN-DC requirements are similar to the SA requirements from a structure point of view. Therefore, the same test case structure as for SA where test cases are separated into "default" and "additional" test cases can be considered for EN-DC which can greatly reduce complexity in TS 38.521-3[4] as well as reducing the need to complicated fallback test analysis. However, the additional complexity of EN-DC requirements means that a clear separation between exception ("additional") test cases and "default" test cases is not as straightforward.

The following principles are suggested for EN-DC Rx test cases:

1. Let the 2CC test cases cover all reference sensitivity exceptions. Include test coverage of reference sensitivity when exception is avoided.

2. The 2CC test cases always need to be tested even for UE supporting more CCs since some of the exceptions are not covered in >2CC test cases.

3. Let the 3CC-5CC test cases cover mainly non-exception testing (anchor agnostic), including EN-DC not affected by exceptions and EN-DC affected by exceptions. 2UL 3 band intermodulation exceptions are tested in the 3CC test. Exceptions that 2CC fallback cannot cover are tested in 3CC test.

4. Highest number of NR CCs per band combination supported in the UE need to be tested. Anchor agnostic testing unless the EN-DC configuration has an exception requirement. Only 1 E-UTRA CC need to be tested for intra-band non-contiguous EN-DC and inter-band EN-DC. Maximum number of E-UTRA CCs need to be tested for intra-band contiguous EN-DC (1 band). This is further explained in clause 3.2.6.

5. Since requirements for 3UL and 2UL for the Rel-16 EN-DC configurations are the same there is no technical reason to test receiver requirements with 3UL configured. This may change in Rel-17 but will not have an impact on structure if we can add 3UL as new test points in existing tests.

6. The test configuration shall be with 1UL or 2UL active depending on the exception type as indicated in Table D.2.5-1.

Table D.2.5-1: UL configuration to test

Exception type	Intra-band contiguous EN-DC	Intra-band non-contiguous EN-DC	Inter-band EN-DC
Intra-band contiguous (band 71)	2UL[1]	-	-
Intra-band non-contiguous (band 3)	-	2UL[1]	-
UL harmonics, Rx mixing, cross band isolation	-	-	1UL
2UL Intermodulation	-	-	2UL[1]
EN-DC config w/o exception	2UL[2]	1UL (anchor agnostic)[3]	1UL (anchor agnostic)
NOTE 1: Exception requirements apply only with 2UL and apply only for one test frequency/BW setting. NOTE 2: Other than refsens requirements in this configuration mandate 2UL NOTE 3: Requirements in this configuration mandate 2UL (TS 38.101-3, 7.1) unless UE supports only single UL. However, there is no Rel-16 configuration w/o exception where 2UL is supported meaning only 1UL is configured in the test case			

7. Void

8. Other than reference sensitivity test cases should use the MSD=0 test points defined in reference sensitivity test case, or minimum achievable MSD. This is currently ensured by using anchor agnostic configuration for inter-band EN-DC, but other solutions are not precluded.

9. Test cases need to be defined from 2 up to 5 CCs for Rel-16. The number of CCs may increase in Rel-17. The reason for not needing more than 5CC is that it is sufficient to test max number of NR CCs as well as all defined exceptions.

D.2.6 EN-DC configurations to test

D.2.6.1 Lower order fallbacks

In E-UTRA specifications, the lower order CA fallback cases are important in the test point analysis. If requirements are the same in the lower order fallback, then the fallback can be skipped to save test time. The same principle can be applied for EN-DC, but there is a need to keep in mind that this is only for CA fallback and not EN-DC fallback. Additionally, lower order CA fallbacks can be split into E-UTRA CA fallbacks and NR CA fallbacks.

EN-DC fallback

EN-DC fallback does not need to be handled since this would mean falling back to pure E-UTRA operation, which is covered by TS 36.521-1 test cases.

E-UTRA CA fallback

Since it has been agreed to use anchor agnostic approach for EN-DC test cases (TS 38.521-3 [4], clause 4.6), it is enough to test with 1 E-UTRA CC unless more CCs are needed to test an exception requirement in TS 38.101-3 [7].

There are exception requirements in TS 38.101-3 [7]for intra-band-contiguous EN-DC (not reference sensitivity, but other Rx requirements as shown in clause D.2.3) meaning the maximum number of E-UTRA CCs need to be tested in this scenario.

E-UTRA CA fallback in intra-band contiguous EN-DC can result in change of EN-DC config from contiguous to non-contiguous (e.g. DC_(n)41DA -> DC_41C_n41A). This change means requirements are different, but since the non-contiguous requirement is same as the standalone requirement it does not need to be tested.

E-UTRA CA fallback in inter-band contiguous EN-DC can result in change of EN-DC config to intra-band contiguous (e.g. DC_1A-(n)41AA->DC_(n)41AA). This change means requirements are different, implying that both EN-DC config types may need to be tested. See clause D.2.6.2.

NR CA fallback

As shown in clause D.2.1, the maximum number of NR CCs for Rel-16 is 4, which only occurs in inter-band EN-DC (2 NR bands). The fallback to 2-3 NR CCs (2 bands) don't need to be tested since requirements are still the same. The fallback to single NR band with 1CC may need to be tested in the cases where the 2CC configuration had a reference sensitivity exception that is avoided in the higher order case.

Table D.2.6.1-1: EN-DC configurations requiring testing and max number of CCs

Clause number	Title	Requirement coverage	EN-DC configuration type		
			Intra-band cont EN-DC	Intra-band non-cont EN-DC	Inter-band EN-DC
7.3B.2.1	Reference sensitivity for Intra-band Contiguous EN-DC (2 CCs)	1. Band n71 exceptions 2. standalone NR requirements	Yes	-	-
7.3B.2.2	Reference sensitivity for Intra-band non-contiguous EN-DC (2 CCs)	1. Band n3 exceptions 2. standalone NR requirements	-	Yes	-
7.3B.2.3	Reference sensitivity for Inter-band EN-DC within FR1 (2 CCs)	1. UL harmonics, harmonic mixing, cross band isolation, 2UL intermodulation (2 band) 2. standalone NR requirements	-	-	Yes
7.3B.2.3_1.1	Reference sensitivity for EN-DC within FR1 (3 CCs)	1. standalone NR requirements, 2. 2UL intermodulation (3 band)	Yes (2E-UTRA+1NR, Note 1)	-	Yes (1E-UTRA+2NR, 2E-UTRA+1NR, Note 2)
7.3B.2.3_1.2	Reference sensitivity for EN-DC within FR1 (4 CCs)	standalone NR requirements	Yes (3E-UTRA+1NR, Note 1)	-	Yes (1E-UTRA+3NR, Note 4)
7.3B.2.3_1.2	Reference sensitivity for EN-DC within FR1 (5 CCs)	standalone NR requirements	-	-	Yes (1E-UTRA+4NR, Note 4)
NOTE 1: This is needed for other than refsens Rx test case that refers back to refsens test config table NOTE 2: For EN-DC configs affected by 2UL intermodulation, 2E-UTRA+1NR may need to be tested when E-UTRA CC1 is aggressor and E-UTRA CC2 is victim or when E-UTRA CC1 and CC2 are aggressors and NR CC is victim) NOTE 3: Void NOTE 4: Test of max number of NR CCs. Anchor agnostic testing.					

D.2.6.2 EN-DC configurations requiring testing and max number of CCs

There is an issue in only requiring highest CC number to be tested, since this rule can only be applied within one EN-DC configuration type. For example, if the UE supports 3E-UTRA+1NR intra-band contiguous EN-DC and 1E-UTRA+2NR inter-band EN-DC, both configurations need to be tested for sufficient test coverage of core requirements. Another problem is that highest CC number to test within Inter-band EN-DC is not easy to determine it shall include 1 or 2 E-UTRA CCs, not more.

D.2.6.3 Test coverage

As explained in clause D.2.1 only certain configurations are specified in TS 38.101-3 [7].

Additionally, some configurations may not need to be tested for reasons like:

1) To test an exception, it is sufficient to test with fewer CCs ("No test needed" in tables below)

2) No exception requirement exists ("N/A" in tables below)

3) No such configuration is defined in TS 38.101-3[7] clause 5.5B ("N/A" in tables below)

For configurations that need to be tested, anchor agnostic approach can be used for E-UTRA when testing a non-exception requirement. In other cases, the E-UTRA carrier need to be fully configured.

The different cases that may happen for 3CC and 4CC configurations, and the proposed test coverage are listed in the tables below where the following general rules have been applied:

- Harmonic exceptions are only tested in the 2CC test and need not be considered in >2CC test cases. 2CC test cases are always run.
- Any inter-band EN-DC configuration with more than 2 E-UTRA bands will not be tested.
- Any inter-band EN-DC configuration with more than 1 E-UTRA CC per band will not be tested.

Table D.2.6.3-1: 3CC test coverage

EN-DC type	E-UTRA CA	NR CA	Notation	Test coverage		
				Non-exception test points (NOTE 4)	Exception test points (NOTE 5)	
				No exception	UL harmonics, harmonic mixing, cross band isolation	2UL intermodulation

Intra-band contiguous EN-DC (1 band)	No	Yes	DC_(n)XAB	N/A	N/A	N/A
	Yes	No	DC_(n)XCA	Test needed due to other than refsens exception in intra-band EN-DC	N/A	N/A
Intra-band non-contiguous EN-DC (1 band)	Yes (cont)	No	DC_XC_nXA	No test needed. Only 2CC need to be tested	N/A	N/A
	Yes (non-cont)	No	DC_XA-XA_nXA DC_XA_(n)XAA	No test needed. Only 2CC need to be tested	N/A	N/A
	No	Yes (cont)	Note 1	N/A	N/A	N/A
	No	Yes (non-cont)	Note 1	N/A	N/A	N/A
Inter-band EN-DC	No	Yes (intra-cont)	DC_XA_nYC	Test needed (if max NR CC) – anchor agnostic	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested
	No	Yes (intra-non-cont)	DC_XA_nY(2A)	Test needed (if max NR CC) – anchor agnostic	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested
	No	Yes (inter)	DC_XA_nYA-nZA	Test needed (if max NR CC) – anchor agnostic	Test needed (if exception involving 2 NR bands). 2CC need to be tested	Test needed (if IMD 3 band). 2CC need to be tested
	Yes (intra-cont)	No	DC_XC_nYA	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested
	Yes (intra-non-cont)	No	DC_XA-XA_nYA	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested
	Yes (inter)	No	DC_XA-YA_nZA	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested	Test needed if IMD(3 band). 2CC need to be tested.
Inter-band + Intra-band contiguous EN-DC (2 band)	No	Yes	DC_(n)XAA-nYA	Test needed (if max NR CC) – anchor agnostic	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested
	Yes	No	DC_XA-(n)YAA	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested
Inter-band + Intra-band non-contiguous EN-DC (2 band)	No	Yes	DC_XA_nXA-nYA	Test needed (if max NR CC) – anchor agnostic	Test needed (if exception involving 2 NR bands). 2CC need to be tested	No test needed. Only 2CC need to be tested
	Yes	No	DC_XA-YA_nYA	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested

NOTE 1: No such config in TS 38.101-3 [7] V16.5.0
NOTE 2: CC BW class C is indicated in the table. The same rules apply to BW class B
NOTE 3: Different test coverage is indicated by colour coding in this table.
NOTE 4: Applicable to both EN-DC configurations not affected by any exception and EN-DC configurations affected by exceptions, corresponding to Table 7.3B.2.3_1.1.4.1-0 in TS 38.521-3.
NOTE 5: Only applicable to EN-DC configurations affected by exceptions, including UL harmonics, harmonic mixing, cross band isolation and 2UL intermodulation, corresponding to Table 7.3B.2.3_1.1.4.1-1 in TS 38.521-3.

Table D.2.6.3-2: 4CC test coverage

EN-DC type	E-UTRA CA	NR CA	Notation	Test coverage	
				Non-exception test points (NOTE 4)	Exception test points (NOTE 5)

				No exception	**UL harmonics, harmonic mixing, cross band isolation**	**2UL intermodulation**
Intra-band contiguous EN-DC (1 band)	No	Yes	NOTE 1	N/A	N/A	N/A
	Yes	No	DC_(n)XDA	Test needed due to other than refsens exception in intra-band EN-DC	N/A	N/A
Intra-band non-contiguous EN-DC (1 band)	Yes (cont)	No	DC_XD_nXA	No test needed. Only 2CC need to be tested	N/A	N/A
	Yes (non-cont)	No	NOTE 1	N/A	N/A	N/A
	No	Yes (cont)	NOTE 1	N/A	N/A	N/A
	No	Yes (non-cont)	NOTE 1	N/A	N/A	N/A
Inter-band EN-DC	No	Yes (cont)	NOTE 1	N/A	N/A	N/A
	No	Yes	DC_XA_nY(2A)-nZA	Test needed (if max NR CC) – anchor agnostic	No test needed. Only 2CC need to be tested	No test needed. 2CC need to be tested. 3CC need to be tested if IMD(3 band)
	No	Yes	DC_XA_nYA-nZC	Test needed (if max NR CC) – anchor agnostic	No test needed. Only 2CC need to be tested	No test needed. 2CC need to be tested. 3CC need to be tested if IMD(3 band)
	Yes (all types)	No	DC_XD_nYA, DC_XA-YC_nZA, DC_XA-XA-YA_nZA, DC_XA-YA-ZA_nRA	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested	No test needed. 2CC need to be tested. 3CC need to be tested if IMD(3 band)
	Yes (all types)	Yes (cont)	DC_XC_nYC, DC_XA-XA_nYC, DC_XA-YA_nYC	No test needed. 3CC need to be tested if max NR CC	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested
		Yes (non-cont)	DC_XC_nY(2A), DC_XA-YA_nY(2A)	No test needed. 3CC need to be tested if max NR CC	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested
		Yes (inter)	DC_XC_nYA-nZA, DC_XA-XA_nYA-nZA, DC_XA-YA_nZA-nRA	No test needed. 3CC need to be tested if max NR CC	No test needed. Only 2CC need to be tested	No test needed. 2CC need to be tested. 3CC need to be tested if IMD(3 band)
Inter-band + Intra-band contiguous EN-DC (2-3 band)	No	Yes	NOTE 1	N/A	N/A	N/A
	Yes	No	DC_XA-YA_(n)ZAA, DC_XC_(n)YAA	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested
	Yes	Yes	DC_(n)XCA-nYA	No test needed. 3CC need to be tested if max NR CC	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested
Inter-band + Intra-band non-contiguous EN-DC (2-3 band)	No	Yes	NOTE 1	N/A	N/A	N/A
	Yes	No	DC_XA-YA-ZA_nZA	No test needed. Only 2CC need to be tested	No test needed. Only 2CC need to be tested	No test needed. 2CC need to be tested. 3CC need to be tested if IMD(3 band)
	Yes	Yes	DC_XA-YA_nYA-nZA	No test needed. 3CC need to be tested if max NR CC	No test needed. Only 2CC need to be tested	No test needed. 2CC need to be tested. 3CC need to be tested if IMD(3 band)

NOTE 1: No such config in TS 38.101-3 [7] V16.5.0
NOTE 2: 2CC BW class C is indicated in the table. The same rules apply to BW class B
NOTE 3: Different test coverage is indicated by colour coding in this table.
NOTE 4: Applicable to both EN-DC configurations not affected by any exception and EN-DC configurations affected by exceptions, corresponding to Table 7.3B.2.3_1.2.4.1-1.
NOTE 5: Only applicable to EN-DC configurations affected by exceptions, including UL harmonics, harmonic mixing, cross band isolation and 2UL intermodulation.

D.2.7 Test Environment

The test environment for FR1 EN-DC RX sensitivity measurement is Normal, TL/VL, TL/VH, TH/VL, TH/VH (same as for NR CA).

D.2.8 Test Frequencies selections for EN-DC

In E-UTRA DL CA and UL CA reference sensitivity testing, Low range and High range are selected for intra-band CA testing. Mid-range is selected for inter band E-UTRA CA testing.

In standalone NR CA reference sensitivity testing, Low and High Range are tested as default for intra-band and Mid-range for inter-band. For CA combinations containing intra-band configuration in an inter-band CA configuration, low and high range are tested for intra-band CA and mid channel for inter-band without intra-band component.

The same principle shall apply for EN-DC testing.

Table D.2.8-1: Void

For EN-DC configurations affected by IMD exceptions where the exception is avoided, the test frequency and bandwidth are FFS.

D.2.9 Test EN-DC channel bandwidth

D.2.9.1 Test point selection EN-DC configuration without exception

Follow similar arguments for frequency selection, for regular inter-band EN-DC and intra-band non-contiguous testing, the NR channel bandwidths shall follow what is specified in SA scenario. Since the objective is to test NR performance, it is sufficient to select 5 MHz channel bandwidth for E-UTRA carrier, which is common for all E-UTRA bands.

For intra-band contiguous EN-DC testing, the highest bandwidth is selected for E-UTRA carrier and NR carrier, respectively.

D.2.9.2 Test point selection EN-DC configuration with exception

For inter-band EN-DC configuration with exception requirement due to UL harmonics, Rx mixing and cross band isolation, the highest channel bandwidth shall be tested for E-UTRA and NR carrier.

For inter-band EN-DC configuration with exception requirement due to 2UL intermodulation, the test channel bandwidth selection for both NR and E-UTRA are EN-DC combo dependent. There are fixed channel bandwidth pairs required for these exceptional test scenarios.

For intra-band EN-DC configuration with exception requirement, the test channel bandwidth selection for both NR and E-UTRA are EN-DC combo dependent. There are fixed channel bandwidth pairs required for these exceptional test scenarios.

Only 5 MHz channel bandwidth shall be employed by E-UTRA band, Lowest, Mid, Highest channel bandwidth shall be selected for NR carrier for EN-DC non- exceptional testing.

D.2.10 RB allocation and RB location selections

D.2.10.1 Test point selection EN-DC configuration without exception

Following the E-UTRA anchor-agnostic proposed in R5-185916 [6], E-UTRA operation does not interfere with NR connection, 0 RB were proposed for both UL and DL channels for non-exceptional test scenarios.

There is no reason to deviate from current NR configurations for RB allocation selection employed in standalone testing.

D.2.10.2 Test point selection EN-DC configuration with exception when exception applies

For EN-DC inter-band and intra-band EN-DC exceptional test scenarios, the RB allocation for both NR and E-UTRA are selected as specified in TS 38.101-3 [7] for the EN-DC band combination.

Based on the E-UTRA anchor-agnostic approach, 0 RB shall be used for both UL and DL channels for non-exceptional test scenarios. RB allocation for NR carrier in inter-band EN-DC non- exceptional testing shall follow what is selected for standalone testing.

D.2.10.3 Test point selection EN-DC configuration with exception when exception does not apply

According to the test principle outlined in clause D.2.5, there is a need to verify the UE performance when the exception is avoided and MSD=0 dB applies. Detailed background can be found in [9].

The calculation of test frequency for avoiding exceptions is presented in clause 2.5. The UL configuration also need to be determined and may be with one or two simultaneous UL CCs depending on the scenario.

For HD and HM exceptions when the victim band is TDD there is no need from an interference point of view to have UL active on the victim band, meaning this can be verified with 1UL. The same can apply for EN-DC configurations where single switched Tx is allowed. In the case of FDD victim band when 2UL Is mandatory, both UL CCs should be active since this represents the worst case.

For CBI exceptions the requirements are defined in two different ways depending on the EN-DC configuration:

1. Exception applies for any frequency separation as long as aggressor UL is active. In this case, the only way to avoid the exception is to not have UL active on the aggressor band. The test point then becomes very similar to the standalone test and then does not need to be tested for a SA and NSA capable UE. Therefore, CBI exception avoiding could not be tested for this kind of combinations.

2. Exception applies only if separation is small. Just like for HD and HM exceptions, the exception can be avoided by configuring a larger separation with aggressor signal still active.

For 2-band IMD exceptions, the exception is avoided by changing the frequency of one of the CCs such that the intermodulation does not overlap with the victim CC anymore. In the case of multiple IMD affecting the same victim band, only the worst case IMD may be tested. However, in TS 38.101-3[7], there is no general criteria in which REFSENS can be fulfilled with MSD=0 for the EN-DC combinations which have MSD exceptions due to IMD interference (2 UL active). The 2-band IMD exception avoiding testing is still FFS in TS 38.521-3[4].

For 3-band IMD exceptions there are a separate set of IMD depending on the UL configuration (selecting 2UL among 3 bands gives two cases). Within a UL configuration, the same test point selection as for 2-band IMD can be used.

D.2.11 Modulation scheme selections

The modulation scheme for both non-exceptional and exceptional EN-DC intra-band and inter-band test scenarios are selected as:

- For E-UTRA: QPSK (same as used for E-UTRA reference sensitivity testing in TS 36-521-1 [9])

- For NR: Use same modulation scheme as used for NR standalone testing.

D.2.12 Current test completion status per EN-DC configuration

The completion status per EN-DC configuration is documented in clause 4.3.3.1.

Annex E: Change history

Change history							
Date	**Meeting**	**TDoc**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**New version**
2017-09	RAN5#76	R5-174704	-	-	-	Draft skeleton TR 38.905	0.0.1
2018-04	RAN5#2-5G-NR Adhoc	R5-181954	-	-	-	Agreed Text Proposal in RAN5#2-5G-NR Adhoc: **R5-181889**, " TP to update TR 38.905 with information on test point analysis " Agreed Test Point Analysis in RAN5#78: **R5-180885**, "Discussion on test point selection for NR Occupied Bandwidth in FR1" **R5-180886**, "Discussion on test point selection for NR SEM in FR1" **R5-180887**, "Discussion on test point selection for NR ACLR in FR1" **R5-181524**, "Discussion on test point selection for Absolute Power Tolerance in FR1" **R5-181525**, "Discussion on test point selection for Aggregate Power Tolerance in FR1" Agreed Test Point Analysis in RAN5#2-5G-NR Adhoc: **R5-182019**, "Discussion of NR FR1 Test Point for TX Spurious Emission test cases " **R5-182024**, "Discussion on test point selection for NR Frequency Error in FR1" **R5-181830**, "Discussion on test point selection for Maximum Output Power in FR1" **R5-181831**, "Discussion on test point selection for Minimum Output Power in FR1**R5-181832**, "Discussion on test point selection for General ON/OFF Time Mask in FR1" **R5-181879**, "Discussion on test point selection for NR In-Band in FR1" **R5-181880**, "Discussion on test point selection for NR ACS in FR1" **R5-182025**, "Discussion on test point selection for NR Frequency Error in FR1" **R5-181905**, "Discussion on test point selection for NR Occupied Bandwidth in FR2" **R5-182030**, "Discussion on test point selection for NR ACLR in FR2" **R5-182042**, "Discussion on test point selection for NR In-Band blocking in FR2" **R5-182044**, "Discussion on test point selection for NR ACS in FR2"	0.1.0
2018-05	RAN5#79	R5-183078	-	-	-	Document title corrected. Agreed Text Proposal in RAN WG5#79: **R5-183963**, "Test Point analysis for FR1 RefSens test case"	0.2.0
2018-08	RAN5#80	R5-185134	-	-	-	**R5-184923**, "Test Point analysis for FR2 RefSense test case" **R5-184961**, "TP for updating TR 38.905 with FR2 Frequency Error test point analysis" **R5-185307**, "TP for updating TR38.905 with FR1 AMPR test point analyses with NS_35" **R5-185309**, "Test Point analysis for FR1 Configured Output Power for SUL" **R5-185311**, "TP for updating TR 38.905 with FR1 Carrier Leakage test point analysis" **R5-185314**, "TP for updating TR 38.905 with FR1 EVM equalizer spectrum flatness test point analysis" **R5-185316**, "TP for updating TR 38.905 with FR1 Frequency Error test point analysis" **R5-185412**, "TP for updating TR 38.905 with EVM test point analysis" **R5-185491**, "Test Point analysis for FR2 TxSpurious test case" **R5-185215**, "TP for updating TR 38.905 with FR2 SEM test point analysis" **R5-185334**, "Discussion of LTE Test point selection for EN-DC with FR1 Tx Spurious emission Test" **R5-185301**, "Discussion on test point selection for NR Out-of-band in FR1" **R5-185423**, "Discussion on Uplink configuration for NR Transmit Intermodulation in FR1" **R5-185216**, "TP for updating TR38.905 with UE AMPR for NS_04 Intra-band contiguous EN-DC" **R5-185319**, "TP for updating TR 38.905 with FR1 In-band Emissions test point analysis"	1.0.0
2018-09	RAN#81	-	-	-	-	raised to v15.0.0 with editorial changes only	15.0.0
2018-12	RAN#82	R5-186454	0016	-	F	TP analysis for test case 6.5.2.4.2	15.1.0
2018-12	RAN#82	R5-186455	0017	-	F	TP analysis for EN-DC test case 6.2B.2.3	15.1.0

2018-12	RAN#82	R5-186609	0018	-	F	TP_analysis for TX spurious emission UE co-existence for intra-band contiguous EN-DC with FR1	15.1.0
2018-12	RAN#82	R5-186610	0019	-	F	TP analysis for Reference sensitivity for Intra-band Contiguous EN-DC with FR1	15.1.0
2018-12	RAN#82	R5-186611	0020	-	F	TP analysis for Reference sensitivity for Inter-band EN-DC with FR1	15.1.0
2018-12	RAN#82	R5-186674	0021	-	F	Test point analysis for AMPR Intra-band contiguous EN-DC in FR1 for NS_35	15.1.0
2018-12	RAN#82	R5-186710	0022	-	F	TP analysis for test case 6.2B.2.4, UE Maximum Output Power reduction for Inter-Band EN-DC including FR2	15.1.0
2018-12	RAN#82	R5-186791	0028	-	F	TP analysis OBW intraband contiguous EN-DC	15.1.0
2018-12	RAN#82	R5-186792	0029	-	F	TP analysis SEM intraband contiguous EN-DC	15.1.0
2018-12	RAN#82	R5-187035	0031	-	F	Update test points analysis for multiple FR1 test cases	15.1.0
2018-12	RAN#82	R5-187396	0037	-	F	Update of TR 38.905 with SA FR1 A-MPR test point analyses, NS_04	15.1.0
2018-12	RAN#82	R5-188240	0039	1	F	Update of TR 38.905 with EN-DC A-MPR test point analyses, NS_04	15.1.0
2018-12	RAN#82	R5-188227	0041	1	F	Test Point analysis for FR2 Maximum Output Power	15.1.0
2018-12	RAN#82	R5-187489	0042	-	F	TP analysis for FR1 test case 6.3.4.3, relative power tolerance	15.1.0
2018-12	RAN#82	R5-187582	0043	-	F	Discussion on test point selection for EVM in FR2	15.1.0
2018-12	RAN#82	R5-187583	0044	-	F	Discussion on test point selection for Carrier Leakage in FR2	15.1.0
2018-12	RAN#82	R5-187584	0045	-	F	Update of test point selection for EVM equalizer spectrum flatness in FR1	15.1.0
2018-12	RAN#82	R5-187587	0046	-	F	Discussion on test point selection for In-band Emissions in FR2	15.1.0
2018-12	RAN#82	R5-187589	0047	-	F	Discussion on test point selection for EVM equalizer spectrum flatness in FR2	15.1.0
2018-12	RAN#82	R5-187593	0048	-	F	Discussion on test point selection for EVM equalizer spectrum flatness for Pi/2 BPSK in FR1	15.1.0
2018-12	RAN#82	R5-187806	0023	1	F	Test Point analysis for FR1 7.4 Maximum input level	15.1.0
2018-12	RAN#82	R5-187808	0035	1	F	TP analysis for receiver spurious emission tests for FR1 SA	15.1.0
2018-12	RAN#82	R5-187809	0036	1	F	TP analysis for wideband intermodulation tests for FR1 SA	15.1.0
2018-12	RAN#82	R5-187817	0033	1	F	TP analysis for receiver spurious emission tests for FR1 inter-band EN-DC	15.1.0
2018-12	RAN#82	R5-187818	0034	1	F	TP analysis for wideband intermodulation tests for FR1 inter-band EN-DC	15.1.0
2018-12	RAN#82	R5-187836	0025	1	F	Test Point analysis for FR2 7.4 Maximum input level	15.1.0
2018-12	RAN#82	R5-187907	0024	1	F	Test Point analysis for FR1 MPR test case	15.1.0
2019-03	RAN#83	R5-191257	0077	-	F	Test Point analysis for TC 6.3.3.4 PRACH time mask in FR1	15.2.0
2019-03	RAN#83	R5-191260	0078	-	F	Test Point analysis for NR Narrow band in FR1	15.2.0
2019-03	RAN#83	R5-191261	0079	-	F	Test Point analysis for NR spurious response in FR1	15.2.0
2019-03	RAN#83	R5-191337	0081	-	F	Adding test case 6.2B.2.1 to 38.905	15.2.0
2019-03	RAN#83	R5-191678	0086	-	F	Addition of TP analysis of FR2 6.3.1 Minimum output power	15.2.0
2019-03	RAN#83	R5-191811	0087	-	F	Test Point analysis update for FR2 TxSpurious test case	15.2.0
2019-03	RAN#83	R5-191855	0091	-	F	TP_analysis_38.905_6.5.3.1_TX_SpurEmission	15.2.0
2019-03	RAN#83	R5-192002	0104	-	F	Adding test case 7.4B.1 to 38.905	15.2.0
2019-03	RAN#83	R5-192003	0105	-	F	Adding test case 7.4B.2 to 38.905	15.2.0
2019-03	RAN#83	R5-192007	0106	-	F	Adding test case 6.2B.1.1 to 38.905	15.2.0
2019-03	RAN#83	R5-192008	0107	-	F	Adding test case 6.2B.1.2 to 38.905	15.2.0
2019-03	RAN#83	R5-192009	0108	-	F	Adding test case 6.2B.1.3 to 38.905	15.2.0
2019-03	RAN#83	R5-192239	0116	-	F	TP analysis of FR1 time alignment error for UL MIMO	15.2.0
2019-03	RAN#83	R5-192401	0085	1	F	Addition of TP analysis of FR1 6.2.4 Configured transmitted power	15.2.0
2019-03	RAN#83	R5-192404	0099	1	F	TP analysis for FR1 6.5A.2.4.1.1 NR ACLR for CA (2UL CA)	15.2.0
2019-03	RAN#83	R5-192405	0100	1	F	TP analysis for FR1 6.5A.2.4.2.1 UTRA ACLR for CA (2UL CA)	15.2.0
2019-03	RAN#83	R5-192406	0103	1	F	TP analysis for FR1 6.5A.4.1 Transmit intermodulation for CA (2UL CA)	15.2.0
2019-03	RAN#83	R5-192410	0110	1	F	Update of TP analysis of FR1 6.3.1 Minimum Output Power	15.2.0
2019-03	RAN#83	R5-192444	0113	1	F	Addition of TP analysis for EN-DC 6.2B.4.1.3 Configured transmitted power inter-band within FR1	15.2.0
2019-03	RAN#83	R5-192449	0080	1	F	Adding FR2 test case 6.3.4.3 to 38.905	15.2.0
2019-03	RAN#83	R5-192546	0082	1	F	Test Point analysis for FR1 6.3.3.6 SRS time mask	15.2.0
2019-03	RAN#83	R5-192568	0095	1	F	TP analysis for FR1 6.4A.2.1.1 Error Vector Magnitude for CA (2UL CA)	15.2.0
2019-03	RAN#83	R5-192569	0094	1	F	TP analysis for FR1 6.4A.1.1 Frequency error for CA (2UL CA)	15.2.0
2019-03	RAN#83	R5-192571	0096	1	F	TP analysis for FR1 6.4A.2.2.1 Carrier leakage for CA (2UL CA)	15.2.0
2019-03	RAN#83	R5-192572	0097	1	F	TP analysis for FR1 6.4A.2.3.1 In-band emissions for CA (2UL CA)	15.2.0
2019-03	RAN#83	R5-192573	0098	1	F	TP analysis for FR1 6.5A.2.2.1 Spectrum emission mask for CA (2UL CA)	15.2.0
2019-03	RAN#83	R5-192574	0101	1	F	TP analysis for FR1 6.5A.3.1.1 General spurious emissions for CA (2UL CA)	15.2.0
2019-03	RAN#83	R5-192575	0102	1	F	TP analysis for FR1 6.5A.3.2.1 Spurious emissions for UE co-existence for CA (2UL CA)	15.2.0
2019-03	RAN#83	R5-192582	0109	1	F	Add Tp analysis statements for MIMO tests	15.2.0
2019-03	RAN#83	R5-192599	0084	1	F	Update of TP analysis of FR1 6.2.1 MOP	15.2.0
2019-03	RAN#83	R5-192624	0115	1	F	TP_analysis_38.905_6.5B.3_TX_SpurEmission	15.2.0

2019-03	RAN#83	R5-192647	0092	1	F	Addition of Test Point analysis of FR2 6.3.4.4 Aggregate power tolerance	15.2.0
2019-03	RAN#83	R5-192684	0073	1	F	TP analysis for FR1 Rx 7.9A.1 Spurious Emission for 2DL CA	15.2.0
2019-03	RAN#83	R5-192691	0111	1	F	Addition of TP analysis for EN-DC 6.2B.4.1.1 Configured transmitted power Intra-band contiguous	15.2.0
2019-03	RAN#83	R5-192692	0112	1	F	Addition of TP analysis for EN-DC 6.2B.4.1.2 Configured transmitted power Intra-band non-contiguous	15.2.0
2019-03	RAN#83	R5-192846	0114	2	F	Introduction of new section for Tp analysis of Tx spurious	15.2.0
2019-06	RAN#84	R5-193543	0137	-	F	Additional TT analysis for 38.521-3 MPR intra-band contiguous	15.3.0
2019-06	RAN#84	R5-193808	0147	-	F	Addition of TP analysis for power control for UL-MIMO	15.3.0
2019-06	RAN#84	R5-193916	0148	-	F	Update of TP analysis of 6.2D.3 A-MPR for UL-MIMO	15.3.0
2019-06	RAN#84	R5-193919	0149	-	F	Add SA FR1 RF 6.5D.2.4.2 to 38.905	15.3.0
2019-06	RAN#84	R5-194010	0151	-	F	Test Point analysis update for FR2 TxSpurious UE coexistence test case	15.3.0
2019-06	RAN#84	R5-194168	0152	-	F	Updating Annex A; Derivation documents	15.3.0
2019-06	RAN#84	R5-194169	0153	-	F	Update of test points analysis for NS_35 A-MPR FR1 test case	15.3.0
2019-06	RAN#84	R5-194170	0154	-	F	Test point analysis for A-MPR Intra-band contiguous EN-DC; NS_04	15.3.0
2019-06	RAN#84	R5-194257	0155	-	F	TP analysis for Asymmetric CH BWs in Reference Sensitivity Requirements in FR1	15.3.0
2019-06	RAN#84	R5-194402	0158	-	F	Test Point analysis for EN-DC In-band emissions for intra-band contiguous	15.3.0
2019-06	RAN#84	R5-194459	0160	-	F	Update to TP analysis for FR2 Maximum Output Power	15.3.0
2019-06	RAN#84	R5-194904	0142	1	F	Addition of TP analysis for 38.521-1 7.6D.3	15.3.0
2019-06	RAN#84	R5-194907	0163	1	F	Addition of TP analysis for 38.521-1 6.3A.3	15.3.0
2019-06	RAN#84	R5-194909	0164	1	F	Addition of TP analysis for 38.521-1 6.3A.1 FR1	15.3.0
2019-06	RAN#84	R5-194913	0165	-	F	Addition of TP analysis for ACS for 2DL CA in FR1	15.3.0
2019-06	RAN#84	R5-194914	0166	-	F	Addition of TP analysis for FR1 MOP for CA	15.3.0
2019-06	RAN#84	R5-194927	0162	1	F	Addition of test frequency selection of spurious co-existence inter-band for DC 3-n79	15.3.0
2019-06	RAN#84	R5-194931	0141	1	F	Addition of TP analysis for 38.521-1 7.6D.2	15.3.0
2019-06	RAN#84	R5-194932	0143	1	F	Addition of TP analysis for 38.521-1 7.6D.4	15.3.0
2019-06	RAN#84	R5-194933	0144	1	F	Addition of TP analysis for 38.521-1 7.8D.2	15.3.0
2019-06	RAN#84	R5-194959	0167	-	F	Addition of TP analysis for UL-MIMO cases of 6.3D.1 and 6.3D.3	15.3.0
2019-06	RAN#84	R5-194961	0157	1	F	TP analysis for FR2 Tx 6.3A.1.1 Minimum output power for CA 2UL CA	15.3.0
2019-06	RAN#84	R5-194963	0161	1	F	Update SCS test points for FR2 ACS and Inband blocking test cases	15.3.0
2019-06	RAN#84	R5-195146	0138	1	F	Addition of TP analysis for SA FR2 6.2.2	15.3.0
2019-06	RAN#84	R5-195148	0139	1	F	Addition of TP analysis for SA FR2 6.3.2	15.3.0
2019-06	RAN#84	R5-195190	0145	1	F	TPanalysis of 7.7D Spurious response for UL-MIMO	15.3.0
2019-06	RAN#84	R5-193730	0146	-	F	Addition of test frequency selection of 6.5A.3.2 for Rel-16 CA_n41A-n79A	16.0.0
2019-06	RAN#84	R5-195055	0150	1	F	Addition of test frequency selection of 6.5B.3.3.2 spurious co-existence inter-band for Rel-16 DC configurations	16.0.0
2019-09	RAN#85	R5-196435	0184	-	F	Update of TP analysis of FR2 minimum output power to add UL MIMO	16.1.0
2019-09	RAN#85	R5-196445	0185	-	F	Correction of 4.5 to add DC_3A-n41	16.1.0
2019-09	RAN#85	R5-197315	0175	1	F	Addition of TP analysis for FR1 MPR for CA	16.1.0
2019-09	RAN#85	R5-197317	0176	1	F	Addition of TP analysis for FR1 ConfigTP for CA	16.1.0
2019-09	RAN#85	R5-197320	0179	1	F	Addition of TP analysis of FR1 6.4D.2.1 EVM for UL MIMO	16.1.0
2019-09	RAN#85	R5-197322	0180	1	F	Addition of TP analysis of FR1 6.4D.2.2 Carrier leakage for UL MIMO	16.1.0
2019-09	RAN#85	R5-197323	0181	1	F	Addition of TP analysis of FR1 6.4D.2.3 Inband emission for UL MIMO	16.1.0
2019-09	RAN#85	R5-197325	0182	1	F	Addition of TP analysis of FR1 6.4D.2.4 EVM equalizer spectrum flatness for UL MIMO	16.1.0
2019-09	RAN#85	R5-197326	0186	1	F	Test Point analysis for Occupied bandwidth for 2UL CA in FR1	16.1.0
2019-09	RAN#85	R5-197524	0187	1	F	TP_analysis_38.905_7.3A._CA_ref_sensitivity	16.1.0
2019-09	RAN#85	R5-197589	0168	1	F	New addition of TP analysis for MOP & MOP Spherical Coverage for UL CA in SA FR2	16.1.0
2019-09	RAN#85	R5-197590	0169	1	F	New addition of TP analysis for Carrier leakage for UL CA in SA FR2	16.1.0
2019-09	RAN#85	R5-197591	0170	1	F	Adding test case 6.5B.2.1.3 to 38.905	16.1.0
2019-09	RAN#85	R5-197592	0173	1	F	Addition of TP analysis of FR2 6.6 Beam Correspondence	16.1.0
2019-09	RAN#85	R5-197593	0174	1	F	Test Point analysis update for FR2 Tx Spurious test case	16.1.0
2019-09	RAN#85	R5-197594	0177	1	F	Addition of TP analysis of FR1 Maximum input level for CA	16.1.0
2019-09	RAN#85	R5-197595	0178	1	F	Addition of TP analysis of FR1 6.4D.1 Frequency error for UL MIMO	16.1.0
2019-09	RAN#85	R5-197596	0183	1	F	Addition of TP analysis of FR2 6.2A.2 MPR for 2 UL CA	16.1.0
2019-09	RAN#85	R5-197597	0191	1	F	Addition of TP analysis for FR2 AMPR with NS_201	16.1.0
2019-09	RAN#85	R5-197628	0192	2	F	Updates of TP analysis for EN-DC MPR test case 6.2.B.2.1	16.1.0
2019-12	RAN#86	R5-198384	0203		F	Addition of TP analysis of FR2 6.6 Beam Correspondence v1	16.2.0
2019-12	RAN#86	R5-198392	0205		F	Addition of TP analysis of FR2 6.3D.3.4 SRS time mask for UL-MIMO	16.2.0
2019-12	RAN#86	R5-198490	0206		F	TPanalysis of TC 7.5B.1 ACS for intra-band contiguous EN-DC 2CCs	16.2.0

2019-12	RAN#86	R5-198523	0208		F	Test points analysis for NS_03 A-MPR FR1 test case	16.2.0
2019-12	RAN#86	R5-198527	0210		F	Test points analysis for NS_43 and NS_43U A_MPR FR1 test case	16.2.0
2019-12	RAN#86	R5-199326	0209	1	F	Test points analysis for NS_05 and NS_05U A_MPR FR1 test case	16.2.0
2019-12	RAN#86	R5-199327	0211	1	F	Test points analysis for NS_100 A_MPR FR1 test case	16.2.0
2019-12	RAN#86	R5-199328	0200	1	F	Addition of test point analysis for SA FR1 TC 7.6A.3 Out-of-band blocking for CA	16.2.0
2019-12	RAN#86	R5-199372	0197	1	F	Update of test point analysis for SA FR2 TC 6.2.2	16.2.0
2019-12	RAN#86	R5-199410	0199	1	F	Update of test point analysis for SA FR1 TC 6.2.2 to add almost contiguous allocation test points	16.2.0
2019-12	RAN#86	R5-199487	0202	1	F	Addition of test point analysis for SA FR1 TC 7.8A Wide band Intermodulation for CA	16.2.0
2019-12	RAN#86	R5-199488	0201	1	F	Addition of test point analysis for SA FR1 TC 7.6A.4 Narrow band blocking for CA	16.2.0
2019-12	RAN#86	R5-199489	0207	1	F	Addition of TP analysis for ACS for 3DL CA in FR1	16.2.0
2019-12	RAN#86	R5-199501	0198	1	F	Update of test point analysis for SA FR1 TC 6.5.2.4.2	16.2.0
2019-12	RAN#86	R5-199507	0196	1	F	TP analysis for test case 6.2B.2.2, UE Maximum Output Power reduction for Intra-Band Non-Contiguous EN-DC	16.2.0
2019-12	RAN#86	R5-199509	0194	1	F	TP analysis for MOP for EN-DC	16.2.0
2019-12	RAN#86	R5-199549	0204	1	F	Addition to TP analysis of FR2 TC 6.3A.4.2.1 Absolute Power Control for CA	16.2.0
2020-03	RAN#87	R5-200402	0215	-	F	Updating TP of MOP for inter-band EN-DC	16.3.0
2020-03	RAN#87	R5-200412	0221	-	F	Editorial change of replacing zip file of FR2 6.3.1 by v2	16.3.0
2020-03	RAN#87	R5-200419	0222	-	F	Update of test point analysis for 7.6A.3 Out-of-band blocking for CA	16.3.0
2020-03	RAN#87	R5-200459	0223	-	F	Update of test point analysis for 7.6A.4 Narrow band blocking for CA	16.3.0
2020-03	RAN#87	R5-200460	0224	-	F	Update of test point analysis for 7.8A Wide band Intermodulation for CA	16.3.0
2020-03	RAN#87	R5-200574	0226	-	F	Addition of Test point selection for FR1 in SUL test cases	16.3.0
2020-03	RAN#87	R5-200603	0227	-	F	Test Point analysis for FR2 ref sens for CA	16.3.0
2020-03	RAN#87	R5-200758	0229	-	F	Correction of NS_05 test points analysis	16.3.0
2020-03	RAN#87	R5-200762	0231	-	F	Test points analysis for NS_38 A-MPR FR1 test case	16.3.0
2020-03	RAN#87	R5-200764	0232	-	F	Test points analysis for NS_39 A-MPR FR1 test case	16.3.0
2020-03	RAN#87	R5-200766	0233	-	F	Test points analysis for NS_43 A-MPR FR1 test case	16.3.0
2020-03	RAN#87	R5-200768	0234	-	F	Test points analysis for NS_43U A-MPR FR1 test case	16.3.0
2020-03	RAN#87	R5-200799	0236	-	F	Updated test point analysis for FR2 A-MPR test case	16.3.0
2020-03	RAN#87	R5-200815	0237	-	F	Update of Test Point Analysis for UE Coexistence for DC_3A-n41A and DC_8A-n41A	16.3.0
2020-03	RAN#87	R5-200990	0238	1	F	Addition of TP analysis for FR1 In-band blocking for CA	16.3.0
2020-03	RAN#87	R5-201182	0216	1	F	Updating TP of configured output power for inter-band EN-DC	16.3.0
2020-03	RAN#87	R5-201184	0218	1	F	Updating TP of configured output power for intra-band contiguous EN-DC	16.3.0
2020-03	RAN#87	R5-201186	0220	1	F	Updating TP of configured output power for intra-band non-contiguous EN-DC	16.3.0
2020-03	RAN#87	R5-201237	0230	1	F	Test points analysis for NS_37 A-MPR FR1 test case	16.3.0
2020-03	RAN#87	R5-201239	0235	1	F	Test points analysis for NS_18 A-MPR FR1 test case	16.3.0
2020-06	RAN#88	R5-201746	0242	-	F	Addition of Number of test points for FR1 in SUL test cases	16.4.0
2020-06	RAN#88	R5-201747	0243	-	F	Addition of TP analysis for FR1 A-MPR for CA	16.4.0
2020-06	RAN#88	R5-201765	0246	-	F	Test points analysis for NS_27 A_MPR FR1 test case	16.4.0
2020-06	RAN#88	R5-201767	0247	-	F	Test points analysis for NS_40 A_MPR FR1 test case	16.4.0
2020-06	RAN#88	R5-201773	0250	-	F	Test points analysis for NS_47 A_MPR FR1 test case	16.4.0
2020-06	RAN#88	R5-201871	0253	-	F	Update of test points analysis in UE co-existence for inter-band EN-DC	16.4.0
2020-06	RAN#88	R5-201872	0254	-	F	Update of Test Point Analysis for UE Co-existence for DC_5A-n66A	16.4.0
2020-06	RAN#88	R5-201873	0255	-	F	Update of Test Point Analysis for UE Co-existence for DC_5A-n78A	16.4.0
2020-06	RAN#88	R5-201874	0256	-	F	Update of Test Point Analysis for UE Co-existence for DC_66A-n5A	16.4.0
2020-06	RAN#88	R5-201875	0257	-	F	Update of Test Point Analysis for UE Co-existence for DC_66A-n78A	16.4.0
2020-06	RAN#88	R5-201929	0258	-	F	Cleanup in 38.905	16.4.0
2020-06	RAN#88	R5-201931	0260	-	F	Combined TP analysis for MPR, ACLR and SEM intra-band contiguous EN-DC test cases	16.4.0
2020-06	RAN#88	R5-202029	0261	-	F	Introduction of test point analysis for 2CCs EN-DC TCs in FR1 in 7.6B Blocking characteristics for DC and 7.7B Spurious response for DC	16.4.0
2020-06	RAN#88	R5-202111	0262	-	F	NS_24 TP analysis to TR 38.905	16.4.0
2020-06	RAN#88	R5-202524	0267	-	F	TP_analysis_6.5.3.3_TX_Additional_SpurEmission_NS_43	16.4.0
2020-06	RAN#88	R5-202755	0248	1	F	Test points analysis for NS_41 A_MPR FR1 test case	16.4.0
2020-06	RAN#88	R5-202756	0249	1	F	Test points analysis for NS_42 A_MPR FR1 test case	16.4.0
2020-06	RAN#88	R5-202757	0264	1	F	TP_analysis_6.5.3.3_TX_Additional_SpurEmission_NS_05	16.4.0
2020-06	RAN#88	R5-202918	0239	1	F	Test Point analysis for FR2 Frequency Error for CA	16.4.0
2020-06	RAN#88	R5-202926	0266	1	F	Addition of TPanalysis 6.5A.3.2.1_SECoex for CA_n1A-n78A	16.4.0
2020-06	RAN#88	R5-202932	0244	1	F	Addition of TP analysis for FR1 Maximum input level for 3DL CA	16.4.0
2020-06	RAN#88	R5-202933	0245	1	F	Addition of TP analysis for FR1 In-band blocking for 3DL CA	16.4.0
2020-06	RAN#88	R5-202952	0251	1	F	Updating TP of MOP for intra-band contiguous EN-DC	16.4.0

2020-06	RAN#88	R5-202953	0252	1	F	Updating TP of MOP for intra-band non-contiguous EN-DC	16.4.0
2020-06	RAN#88	R5-202954	0259	1	F	Combined TP analysis for MPR, NR ACLR and SEM FR1 test cases	16.4.0
2020-06	RAN#88	R5-202955	0263	1	F	Updated TP analysis for 7.3A Reference sensitivity for CA	16.4.0
2020-09	RAN#89	R5-203642	0269	-	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_40A_n1A	16.5.0
2020-09	RAN#89	R5-203643	0270	-	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_40A_n78A	16.5.0
2020-09	RAN#89	R5-203751	0275	-	F	Editorial correction to references to EN-DC configurations	16.5.0
2020-09	RAN#89	R5-204720	0299	1	F	Add_TP_analysis_table for TX_spurious_emission	16.5.0
2020-09	RAN#89	R5-204726	0278	1	F	Addition of test point analysis in Tx spurious emissions	16.5.0
2020-09	RAN#89	R5-204727	0273	1	F	Updating TP analysis for 6.2A.2-MPR for CA	16.5.0
2020-09	RAN#89	R5-204728	0279	1	F	Update of test point analysis of MOP for intra-band contiguous EN-DC	16.5.0
2020-09	RAN#89	R5-204789	0271	1	F	Update of TP analysis for NS_43 and NS_01 in FR1 A-MPR for CA	16.5.0
2020-09	RAN#89	R5-204790	0272	1	F	Update of TP analysis for NS_43U and NS_01 in FR1 A-MPR for CA	16.5.0
2020-09	RAN#89	R5-204791	0280	1	F	Updating test point analysis for DC_1A-n78A for spurious emissions UE co-existence	16.5.0
2020-09	RAN#89	R5-204792	0281	1	F	Updating test point analysis for DC_2A-n66A for spurious emissions UE co-existence	16.5.0
2020-09	RAN#89	R5-204793	0282	1	F	Updating test point analysis for DC_2A-n78A for spurious emissions UE co-existence	16.5.0
2020-09	RAN#89	R5-204794	0283	1	F	Updating test point analysis for DC_3A-n7A for spurious emissions UE co-existence	16.5.0
2020-09	RAN#89	R5-204795	0284	1	F	Updating test point analysis for DC_3A-n78A for spurious emissions UE co-existence	16.5.0
2020-09	RAN#89	R5-204796	0285	1	F	Updating test point analysis for DC_7A-n78A for spurious emissions UE co-existence	16.5.0
2020-09	RAN#89	R5-204797	0292	1	F	Correction to test point analysis for spurious emissions UE co-existence for a few inter-band EN-DC configurations	16.5.0
2020-09	RAN#89	R5-204817	0286	1	F	Updating test point analysis for DC_3A-n1A for spurious emissions UE co-existence	16.5.0
2020-09	RAN#89	R5-204818	0287	1	F	Updating test point analysis for DC_7A-n1A for spurious emissions UE co-existence	16.5.0
2020-09	RAN#89	R5-204819	0288	1	F	Updating test point analysis for DC_7A-n66A for spurious emissions UE co-existence	16.5.0
2020-09	RAN#89	R5-204820	0289	1	F	Updating test point analysis for DC_8A-n1A for spurious emissions UE co-existence	16.5.0
2020-09	RAN#89	R5-204821	0290	1	F	Updating test point analysis for DC_12A-n78A for spurious emissions UE co-existence	16.5.0
2020-09	RAN#89	R5-204822	0291	1	F	Updating test point analysis for DC_28A-n3A for spurious emissions UE co-existence	16.5.0
2020-09	RAN#89	R5-204829	0293	1	F	Addition of test point analysis for AMPR NS_48	16.5.0
2020-09	RAN#89	R5-204838	0274	1	F	Updating TP analysis for 6.2A.4-Configured output power for CA	16.5.0
2020-09	RAN#89	R5-204948	0295	1	F	Addition of Test Point analysis for FR2 Transmit OFF Power for CA	16.5.0
2020-09	RAN#89	R5-204949	0298	1	F	TP analysis 6.5B.3 TX SpurEmission EN-DC V2	16.5.0
2020-09	RAN#89	R5-204950	0300	1	F	Updated TP analysis for 7.3B Reference sensitivity for EN-DC in FR1	16.5.0
2020-09	RAN#89	R5-204959	0301	1	F	Update of TPanalysis 6.5A.3.2.1_SECoex for CA_n1A-n78A	16.5.0
2020-09	RAN#89	R5-204963	0276	1	F	Update test point analysis for A-MPR NS_18 with CBW being 30MHz	16.5.0
2020-09	RAN#89	R5-204964	0294	1	F	Addition of test point analysis for additional spurious emission with NS_17	16.5.0
2020-09	RAN#89	R5-204982	0268	2	F	Updated TP analysis for 7.3A	16.5.0
2020-12	RAN#90	R5-205264	0303	-	F	Addition of Test Point analysis for 6.3A.4.1	16.6.0
2020-12	RAN#90	R5-205265	0304	-	F	Addition of Test Point analysis for 6.3A.4.2	16.6.0
2020-12	RAN#90	R5-205267	0305	-	F	Addition of Test Point analysis for 6.3A.4.3	16.6.0
2020-12	RAN#90	R5-205558	0309	-	F	Adding test point analysis for A-MPR test of band n30 with NS_21	16.6.0
2020-12	RAN#90	R5-205619	0312	-	F	Addition of TP Analysis for TC 6.5A.2.1 Spectrum Emission Mask for CA in FR2	16.6.0
2020-12	RAN#90	R5-205630	0313	-	F	Addition of TP Analysis for TC 6.5A.2.2 Adjacent channel leakage ratio for CA in FR2	16.6.0
2020-12	RAN#90	R5-205780	0318	-	F	Addition of test point analysis for DC_2A_n5A in Tx spurious emissions cases	16.6.0
2020-12	RAN#90	R5-205781	0319	-	F	Addition of test point analysis for DC_8A_n78A in Tx spurious emissions cases	16.6.0
2020-12	RAN#90	R5-205782	0320	-	F	Addition of test point analysis for DC_12A_n66A in Tx spurious emissions cases	16.6.0
2020-12	RAN#90	R5-205783	0321	-	F	Addition of test point analysis for DC_30A_n5A in Tx spurious emissions cases	16.6.0
2020-12	RAN#90	R5-205785	0322	-	F	Addition of test point analysis for DC_13A_n66A in Tx spurious emissions cases	16.6.0
2020-12	RAN#90	R5-205885	0329	-	F	Addition of test point analysis for A-MPR NS_46	16.6.0

2020-12	RAN#90	R5-206037	0333	-	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_20A_n3A	16.6.0
2020-12	RAN#90	R5-206729	0332	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_1A_n3A	16.6.0
2020-12	RAN#90	R5-206752	0302	1	F	Addition of test point analysis for A-MPR NS_45	16.6.0
2020-12	RAN#90	R5-206769	0325	1	F	Update of test point analysis for Tx spurious emissions in NR FR1	16.6.0
2020-12	RAN#90	R5-206853	0328	1	F	Update to test point analysis for A-MPR NS_18 with 30MHz	16.6.0
2020-12	RAN#90	R5-206854	0314	1	F	Updating TP analysis for OBW for CA	16.6.0
2020-12	RAN#90	R5-206855	0316	1	F	Updating TP analysis for Maximum input level for 3DL CA	16.6.0
2020-12	RAN#90	R5-206856	0317	1	F	Updating TP analysis for Inband blocking for 3DL CA	16.6.0
2020-12	RAN#90	R5-206857	0323	1	F	Update of test point analysis for MPR, SEM and ACLR in NR FR1	16.6.0
2020-12	RAN#90	R5-206858	0324	1	F	Update of test point analysis for MOP in FR1	16.6.0
2020-12	RAN#90	R5-206873	0310	1	F	Restructuring of TR 38.905.	16.6.0
2020-12	RAN#90	R5-206874	0311	1	F	Combined TP analysis for FR2 test cases MPR, ACLR and SEM	16.6.0
2020-12	RAN#90	R5-206875	0331	1	F	Update of TPA for in-band emission and carrier leakage TCs	16.6.0
2020-12	RAN#90	R5-206876	0336	1	F	Update of test point analysis for occupied bandwidth in FR2	16.6.0
2020-12	RAN#90	R5-206893	0315	1	F	Updating TP analysis for REFSENS for CA	16.6.0
2020-12	RAN#90	R5-206917	0330	1	F	Updated TP analysis for 7.3B Reference sensitivity for EN-DC in FR1	16.6.0
2021-03	RAN#91	R5-210383	0343	-	F	Correct a typo of 6.3A.4.2	16.7.0
2021-03	RAN#91	R5-210512	0344	-	F	Introduction of test point analysis for SA FR2 7.4A Maximum input level for CA	16.7.0
2021-03	RAN#91	R5-210740	0347	-	F	Updating TP analysis of FR1 A-MPR for NS_48	16.7.0
2021-03	RAN#91	R5-210742	0348	-	F	Adding TP analysis of FR1 A-MPR for NS_49	16.7.0
2021-03	RAN#91	R5-210743	0349	-	F	Resubmitting TP analysis of FR1 A-MPR for NS_44	16.7.0
2021-03	RAN#91	R5-210791	0353	-	F	Adding TP selection for 6.4C.2 Transmit modulation quality for SUL	16.7.0
2021-03	RAN#91	R5-210900	0354	-	F	Updating TP analysis for Spurious Emissions for CA in FR1	16.7.0
2021-03	RAN#91	R5-210905	0356	-	F	Updating TP analysis for FR1 REFSENS for SUL testing	16.7.0
2021-03	RAN#91	R5-210963	0362	-	F	Spur emission TP analysis R16 DC_5A_n2A	16.7.0
2021-03	RAN#91	R5-211018	0368	-	F	TP analysis for test case 6.5D.2_1.4.2, UTRA ACLR for UL MIMO (Rel-16 onward)	16.7.0
2021-03	RAN#91	R5-211134	0380	-	F	TP analysis for ULFPTx in MPR test case	16.7.0
2021-03	RAN#91	R5-211230	0389	-	F	NS_12, NS_13, NS_14, NS_15 TP analysis to 38.905	16.7.0
2021-03	RAN#91	R5-211733	0340	1	F	Updated TP analysis for 7.3B Reference sensitivity for EN-DC in FR1	16.7.0
2021-03	RAN#91	R5-211734	0341	1	F	TP analysis for 38.521-3 test case 6.5B.2.2.1 SEM Intra-band non-contiguous	16.7.0
2021-03	RAN#91	R5-211735	0342	1	F	TP analysis for 38.521-3 test case 6.5B.2.2.3 ACLR Intra-band non-contiguous	16.7.0
2021-03	RAN#91	R5-211736	0345	1	F	Update of test point analysis for FR2 UL CA frequency error test cases	16.7.0
2021-03	RAN#91	R5-211737	0369	1	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_8A_n77A	16.7.0
2021-03	RAN#91	R5-211738	0370	1	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_11A_n77A	16.7.0
2021-03	RAN#91	R5-211739	0371	1	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_11A_n78A	16.7.0
2021-03	RAN#91	R5-211740	0372	1	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_11A_n79A	16.7.0
2021-03	RAN#91	R5-211741	0373	1	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_25A_n41A	16.7.0
2021-03	RAN#91	R5-211742	0374	1	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_26A_n41A	16.7.0
2021-03	RAN#91	R5-211743	0375	1	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_26A_n77A	16.7.0
2021-03	RAN#91	R5-211744	0376	1	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_26A_n78A	16.7.0
2021-03	RAN#91	R5-211745	0377	1	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_26A_n79A	16.7.0
2021-03	RAN#91	R5-211746	0378	1	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_41A_n77A	16.7.0
2021-03	RAN#91	R5-211747	0379	1	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_41A_n78A	16.7.0
2021-03	RAN#91	R5-211748	0388	1	F	Test Point analysis update for FR2 Tx additional spurious emission test case	16.7.0
2021-03	RAN#91	R5-211774	0337	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_7A_n3A	16.7.0
2021-03	RAN#91	R5-211775	0338	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_8A_n3A	16.7.0
2021-03	RAN#91	R5-211776	0339	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_20A_n1A	16.7.0
2021-03	RAN#91	R5-211777	0361	1	F	Spur emission TP analysis R16 DC_2A_n41A	16.7.0
2021-03	RAN#91	R5-211778	0363	1	F	Spur emission TP analysis R16 DC_13A_n2A	16.7.0

2021-03	RAN#91	R5-211779	0364	1	F	Spur emission TP analysis R16 DC_48A_n5A	16.7.0
2021-03	RAN#91	R5-211780	0365	1	F	Spur emission TP analysis R16 DC_48A_n66A	16.7.0
2021-03	RAN#91	R5-211781	0366	1	F	Spur emission TP analysis R16 DC_66A_n41A	16.7.0
2021-03	RAN#91	R5-211809	0350	1	F	Adding TP analysis for Rel-16 DMRS in A-MPR test case	16.7.0
2021-03	RAN#91	R5-211810	0351	1	F	Update of TP analysis for EVM equalizer spectrum flatness for half Pi BPSK	16.7.0
2021-03	RAN#91	R5-211811	0352	1	F	Update of TP analysis for FR1 SUL test cases	16.7.0
2021-03	RAN#91	R5-211893	0346	1	F	Update of test point analysis for FR2 MPR, SEM and ACLR test cases	16.7.0
2021-03	RAN#91	R5-211894	0359	1	F	Addition of reference sensitivity test point analyses for FR1 NR CA and EN-DC	16.7.0
2021-03	RAN#91	R5-211895	0360	1	F	Moving of principles for reference sensitivity test point selection from attachments to annexes	16.7.0
2021-03	RAN#91	R5-211897	0382	1	F	TP analysis for DC_8A_n77A	16.7.0
2021-03	RAN#91	R5-211898	0383	1	F	TP analysis for DC_11A_n79A	16.7.0
2021-03	RAN#91	R5-211899	0384	1	F	TP analysis for DC_26A_n41A	16.7.0
2021-03	RAN#91	R5-211900	0385	1	F	TP analysis for DC_26A_n77A and DC_26A_n78A	16.7.0
2021-03	RAN#91	R5-211901	0386	1	F	TP analysis for DC_26A_n79A	16.7.0
2021-03	RAN#91	R5-211902	0387	1	F	TP analysis for DC_41A_n77A and DC_41A_n78A	16.7.0
2021-03	RAN#91	R5-211906	0390	1	F	Reference sensitivity TP analysis for DC_1A-28A_n3A	16.7.0
2021-03	RAN#91	R5-211907	0391	1	F	Reference sensitivity analysis for DC_3A-7A_n1A	16.7.0
2021-03	RAN#91	R5-211908	0392	1	F	Reference sensitivity TP analysis for DC_7A-20A_n1A	16.7.0
2021-03	RAN#91	R5-211909	0393	1	F	Reference sensitivity TP analysis for DC_7A-28A_n3A	16.7.0
2021-03	RAN#91	R5-211914	0358	1	F	Adding TP analysis for NR test case-Time mask for UL carrier switching	16.7.0
2021-03	RAN#91	-	-	-	-	Administrative release upgrade to match the release of TS 38.508-1, TS 38.508-2 and TS 38.521-1 which were upgraded at RAN#91 to Rel-17 due to Rel-17 relevant CRs	17.0.0
2021-06	RAN#92	R5-212519	0397	-	F	Update of test point analysis for FR2 Occupied Bandwidth for UL MIMO test case	17.1.0
2021-06	RAN#92	R5-212524	0400	-	F	Spurious emission TP analysis for Rel-15 EN-DC configuration DC_66A_n71A	17.1.0
2021-06	RAN#92	R5-212929	0405	-	F	Addition of TP analysis of V2X MPR, SEM and ACLR non-concurrent	17.1.0
2021-06	RAN#92	R5-212930	0406	-	F	Addition of TP analysis of 6.3E.1 V2X minimum output power non-concurrent	17.1.0
2021-06	RAN#92	R5-212982	0407	-	F	Addition of TP analysis for CA_n28A-n41A in Tx Spurious Emission cases	17.1.0
2021-06	RAN#92	R5-212990	0409	-	F	Updating TP analysis for UTRA ACLR MIMO testing for band n1	17.1.0
2021-06	RAN#92	R5-213024	0411	-	F	Correction to test points selection for intra-band EN-DC spurious emissions testing	17.1.0
2021-06	RAN#92	R5-213053	0421	-	F	TP analysis for 6.2.4 updated for eMIMO	17.1.0
2021-06	RAN#92	R5-213114	0428	-	F	Correction of test coverage clause numbering	17.1.0
2021-06	RAN#92	R5-213946	0396	1	F	Introduction of test point analysis for FR2 CA Error Vector Magnitude test case	17.1.0
2021-06	RAN#92	R5-213947	0401	1	F	Spurious emission TP analysis for Rel-15 EN-DC configuration DC_2A_n71A	17.1.0
2021-06	RAN#92	R5-213948	0403	1	F	Addition of test points analysis for NS_06 FR1 test cases	17.1.0
2021-06	RAN#92	R5-213949	0413	1	F	Correction to test points selection for inter-band EN-DC co-existence spurious emissions testing	17.1.0
2021-06	RAN#92	R5-213950	0414	1	F	Update of TP analysis for general spurious emissions for DC_3A_n7A	17.1.0
2021-06	RAN#92	R5-213951	0415	1	F	Update of TP analysis for general spurious emissions for DC_3A_n78A	17.1.0
2021-06	RAN#92	R5-213952	0416	1	F	Update of TP analysis for general spurious emissions for DC_8A_n77A	17.1.0
2021-06	RAN#92	R5-213953	0417	1	F	Update of TP analysis for general spurious emissions for DC_12A_n66A	17.1.0
2021-06	RAN#92	R5-213954	0418	1	F	Update of TP analysis for general spurious emissions for DC_26A_n41A	17.1.0
2021-06	RAN#92	R5-213955	0419	1	F	Update of TP analysis for general spurious emissions for DC_26A_n79A	17.1.0
2021-06	RAN#92	R5-213956	0420	1	F	Update of TP analysis for general spurious emissions for DC_30A_n5A	17.1.0
2021-06	RAN#92	R5-213957	0422	1	F	Update of test point analysis for FR2 MPR SEM and ACLR UL-MIMO test cases	17.1.0
2021-06	RAN#92	R5-213958	0423	1	F	TP analysis for DC_11A_n77A	17.1.0
2021-06	RAN#92	R5-213959	0424	1	F	TP analysis for DC_11A_n78A	17.1.0
2021-06	RAN#92	R5-213960	0425	1	F	TP analysis for DC_25A_n41A	17.1.0
2021-06	RAN#92	R5-213961	0426	1	F	TP analysis for DC_42A_n77A	17.1.0
2021-06	RAN#92	R5-213962	0427	1	F	General TP analysis update for NR CA refsens	17.1.0
2021-06	RAN#92	R5-214070	0402	1	F	Correction of power control in 38.905	17.1.0
2021-06	RAN#92	R5-214071	0429	1	F	Test Point analysis for FR2 Tx spurious emission CA test case	17.1.0

2021-06	RAN#92	R5-214073	0398	1	F	Spurious emission TP analysis for Rel-16 EN-DC configuration DC_14A_n2A	17.1.0
2021-06	RAN#92	R5-214074	0399	1	F	Spurious emission TP analysis for Rel-16 EN-DC configuration DC_14A_n66A	17.1.0
2021-06	RAN#92	R5-214093	0412	1	F	Correction to test points selection for inter-band EN-DC general spurious emissions testing	17.1.0
2021-09	RAN#93	R5-214245	0431	-	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_1A_n77A	17.2.0
2021-09	RAN#93	R5-214246	0432	-	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_1A_n79A	17.2.0
2021-09	RAN#93	R5-214247	0433	-	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_3A_n28A	17.2.0
2021-09	RAN#93	R5-214248	0434	-	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_3A_n77A	17.2.0
2021-09	RAN#93	R5-214249	0435	-	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_7A_n28A	17.2.0
2021-09	RAN#93	R5-214250	0436	-	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_19A_n77A	17.2.0
2021-09	RAN#93	R5-214251	0437	-	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_19A_n78A	17.2.0
2021-09	RAN#93	R5-214252	0438	-	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_19A_n79A	17.2.0
2021-09	RAN#93	R5-214253	0439	-	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_20A_n28A	17.2.0
2021-09	RAN#93	R5-214255	0441	-	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_21A_n77A	17.2.0
2021-09	RAN#93	R5-214256	0442	-	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_21A_n78A	17.2.0
2021-09	RAN#93	R5-214257	0443	-	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_21A_n79A	17.2.0
2021-09	RAN#93	R5-214258	0444	-	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_28A_n77A	17.2.0
2021-09	RAN#93	R5-214260	0446	-	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_28A_n79A	17.2.0
2021-09	RAN#93	R5-214261	0447	-	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_42A_n77A	17.2.0
2021-09	RAN#93	R5-214262	0448	-	F	Update of spurious emission TP analysis for Rel-15 EN-DC configuration DC_1A_n78A	17.2.0
2021-09	RAN#93	R5-214263	0449	-	F	Update of spurious emission TP analysis for Rel-15 EN-DC configuration DC_3A_n79A	17.2.0
2021-09	RAN#93	R5-214264	0450	-	F	Update of spurious emission TP analysis for Rel-15 EN-DC configuration DC_5A_n66A	17.2.0
2021-09	RAN#93	R5-214265	0451	-	F	Update of spurious emission TP analysis for Rel-15 EN-DC configuration DC_5A_n78A	17.2.0
2021-09	RAN#93	R5-214266	0452	-	F	Update of spurious emission TP analysis for Rel-15 EN-DC configuration DC_7A_n78A	17.2.0
2021-09	RAN#93	R5-214267	0453	-	F	Update of spurious emission TP analysis for Rel-15 EN-DC configuration DC_11A_n77A	17.2.0
2021-09	RAN#93	R5-214268	0454	-	F	Update of spurious emission TP analysis for Rel-15 EN-DC configuration DC_11A_n78A	17.2.0
2021-09	RAN#93	R5-214269	0455	-	F	Update of spurious emission TP analysis for Rel-15 EN-DC configuration DC_11A_n79A	17.2.0
2021-09	RAN#93	R5-214271	0457	-	F	Update of spurious emission TP analysis for Rel-15 EN-DC configuration DC_26A_n77A	17.2.0
2021-09	RAN#93	R5-214272	0458	-	F	Update of spurious emission TP analysis for Rel-15 EN-DC configuration DC_26A_n78A	17.2.0
2021-09	RAN#93	R5-214273	0459	-	F	Update of spurious emission TP analysis for Rel-15 EN-DC configuration DC_39A_n79A	17.2.0
2021-09	RAN#93	R5-214274	0460	-	F	Update of spurious emission TP analysis for Rel-15 EN-DC configuration DC_41A_n77A	17.2.0
2021-09	RAN#93	R5-214275	0461	-	F	Update of spurious emission TP analysis for Rel-15 EN-DC configuration DC_41A_n78A	17.2.0
2021-09	RAN#93	R5-214276	0462	-	F	Update of spurious emission TP analysis for Rel-15 EN-DC configuration DC_41A_n79A	17.2.0
2021-09	RAN#93	R5-214277	0463	-	F	Update of spurious emission TP analysis for Rel-15 EN-DC configuration DC_66A_n5A	17.2.0
2021-09	RAN#93	R5-214278	0464	-	F	Update of spurious emission TP analysis for Rel-15 EN-DC configuration DC_66A_n78A	17.2.0
2021-09	RAN#93	R5-214315	0465	-	F	Update of spurious emission TP analysis for Rel-16 EN-DC configuration DC_40A_n1A	17.2.0
2021-09	RAN#93	R5-214316	0466	-	F	Update of spurious emission TP analysis for Rel-16 EN-DC configuration DC_40A_n78A	17.2.0
2021-09	RAN#93	R5-214385	0467	-	F	Introduction of NR FR2 Test Points For Aggregate power tolerance for CA	17.2.0

2021-09	RAN#93	R5-214721	0468	-	F	Adding TP analysis for test case 6.5D.1_1	17.2.0
2021-09	RAN#93	R5-214907	0469	-	F	Introduction of test point analysis for FR2 Time alignment error for UL MIMO test case	17.2.0
2021-09	RAN#93	R5-215076	0473	-	F	Addition of TP analysis of V2X MPR, SEM and ACLR non-concurrent with SL-MIMO	17.2.0
2021-09	RAN#93	R5-215077	0474	-	F	Addition of TP analysis of V2X minimum output power for non-concurrent with SL-MIMO	17.2.0
2021-09	RAN#93	R5-215164	0475	-	F	Addition of test points analysis for NS_06 power class 1 test cases	17.2.0
2021-09	RAN#93	R5-215219	0479	-	F	Update of TP analysis for general spurious emissions for DC_12A_n78A	17.2.0
2021-09	RAN#93	R5-215220	0480	-	F	Update of TP analysis for general spurious emissions for DC_28A_n3A	17.2.0
2021-09	RAN#93	R5-215229	0483	-	F	Correction to TP analysis for in-band emission for intra-band contiguous EN-DC	17.2.0
2021-09	RAN#93	R5-215236	0484	-	F	Addition of reference sensitivity TP analysis for DC_1A_n28A-n78A	17.2.0
2021-09	RAN#93	R5-215237	0485	-	F	Addition of reference sensitivity TP analysis for DC_1A-3A_n28A	17.2.0
2021-09	RAN#93	R5-215238	0486	-	F	Addition of reference sensitivity TP analysis for DC_1A-7A_n28A	17.2.0
2021-09	RAN#93	R5-215239	0487	-	F	Addition of reference sensitivity TP analysis for DC_3A-7A_n28A	17.2.0
2021-09	RAN#93	R5-215293	0492	-	F	Updating Test point analysis for DC_3A-20A_n28A	17.2.0
2021-09	RAN#93	R5-215302	0495	-	F	Updating TP analysis for Relative power tolerance for CA	17.2.0
2021-09	RAN#93	R5-215304	0496	-	F	Updating TP analysis for Aggregate power tolerance for CA	17.2.0
2021-09	RAN#93	R5-215306	0497	-	F	Updating TP analysis for Occupied bandwidth for CA	17.2.0
2021-09	RAN#93	R5-215327	0498	-	F	TP analysis for FR2 General ON OFF time mask	17.2.0
2021-09	RAN#93	R5-215336	0499	-	F	Correction to TP analysis for FR1 A-SPR with NS_17	17.2.0
2021-09	RAN#93	R5-215543	0502	-	F	Update_TP_analysis for Rel_16_DC_14A_n2A	17.2.0
2021-09	RAN#93	R5-215545	0503	-	F	Update_TP_analysis for Rel_16_DC_13A_n2A	17.2.0
2021-09	RAN#93	R5-215547	0504	-	F	Update_TP_analysis for Rel_15_DC_2A_n71A	17.2.0
2021-09	RAN#93	R5-215550	0505	-	F	Update_TP_analysis for Rel_15_DC_66A_n71A	17.2.0
2021-09	RAN#93	R5-215919	0440	1	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_20A_n78A	17.2.0
2021-09	RAN#93	R5-215920	0456	1	F	Update of spurious emission TP analysis for Rel-15 EN-DC configuration DC_25A_n41A	17.2.0
2021-09	RAN#93	R5-215921	0471	1	F	Addition of TP analysis for spurious emissions for DC_28A_n78A	17.2.0
2021-09	RAN#93	R5-216014	0430	1	F	Introduction of spurious emission TP analysis for Rel-15 EN-DC configuration DC_1A_n28A	17.2.0
2021-09	RAN#93	R5-216017	0477	1	F	Update of TP analysis for general spurious emissions for DC_3A_n41A	17.2.0
2021-09	RAN#93	R5-216018	0481	1	F	Update of TP analysis for general spurious emissions for DC_39A_n41A	17.2.0
2021-09	RAN#93	R5-216019	0482	1	F	Update of TP analysis for general spurious emissions for DC_40A_n41A	17.2.0
2021-09	RAN#93	R5-216020	0507	1	F	Update of spurious emission TP analysis for Rel-16 EN-DC configuration DC_8A_n41A	17.2.0
2021-09	RAN#93	R5-216056	0472	1	F	Addition of TP for REFSENS for inter-band EN-DC 2CC and 3CC combos	17.2.0
2021-09	RAN#93	R5-216057	0488	1	F	Correction to TP analysis for reference sensitivity per EN-DC configuration	17.2.0
2021-09	RAN#93	R5-216058	0489	1	F	Correction to Annex D Principles for test point selection for EN-DC reference sensitivity test cases	17.2.0
2021-09	RAN#93	R5-216059	0490	1	F	Updating Test point analysis for DC_3A_n28A-n78A	17.2.0
2021-09	RAN#93	R5-216060	0491	1	F	Updating Test point analysis for DC_7A_n28A-n78A	17.2.0
2021-09	RAN#93	R5-216061	0493	1	F	Updating Test point analysis for DC_7A-20A_n28A	17.2.0
2021-09	RAN#93	R5-216062	0501	1	F	Defining TP analysis for MPR, SEM and ACLR for FR2 UL MIMO	17.2.0
2021-09	RAN#93	R5-216064	0500	1	F	Update_TP_analysis for Rel_16_DC_14A_n66A	17.2.0
2021-09	RAN#93	R5-216068	0494	1	F	Updating TP analysis for Absolute power tolerance for CA	17.2.0
2021-09	RAN#93	R5-216109	0506	1	F	TP analysis for ref sensitivity DC_48A_n66A	17.2.0
2021-09	RAN#93	R5-216142	0476	1	F	Correction to IE and UE capability for low PAPR DMRS in test point analysis	17.2.0
2021-12	RAN#94	R5-216513	0508	-	F	TP analysis update for FR1 6.2.3 AMPR NS_27	17.3.0
2021-12	RAN#94	R5-216516	0509	-	F	TP analysis update for IBNC EN-DC 6.2B.2.2_MPR 6.5B.2.2.1_SEM 6.5B.2.2.3_ACLR	17.3.0
2021-12	RAN#94	R5-216547	0511	-	F	TP analysis for FR2 DL 256QAM to Maximum input level	17.3.0
2021-12	RAN#94	R5-216548	0512	-	F	TP analysis for FR2 DL 256QAM to Maximum input level for CA	17.3.0
2021-12	RAN#94	R5-217164	0515	-	F	TP analysis for ref sensitivity for DC_66A_n2A	17.3.0
2021-12	RAN#94	R5-217165	0516	-	F	TP analysis for ref sensitivity for DC_66A_n78A	17.3.0
2021-12	RAN#94	R5-217166	0517	-	F	TP analysis for ref sensitivity for DC_66A_n71A	17.3.0
2021-12	RAN#94	R5-217190	0520	-	F	Test Point analysis for FR2 Tx spur emission coex CA test case	17.3.0
2021-12	RAN#94	R5-217301	0521	-	F	Addition of reference sensitivity TP analysis for DC_1A-20A_n28A	17.3.0
2021-12	RAN#94	R5-217302	0522	-	F	Addition of reference sensitivity TP analysis for DC_3A_n78C	17.3.0
2021-12	RAN#94	R5-217303	0523	-	F	Addition of reference sensitivity TP analysis for DC_20A_n28A-n78A	17.3.0
2021-12	RAN#94	R5-217306	0524	-	F	Editorial correction to Annex 2.10.3 test point selection EN-DC reference sensitivity	17.3.0

2021-12	RAN#94	R5-217307	0525	-	F	Update of TP analysis for general spurious emissions for DC_8A_n78A	17.3.0
2021-12	RAN#94	R5-217561	0526	-	F	Update of test point analysis for carrier leakage in FR2	17.3.0
2021-12	RAN#94	R5-217604	0527	-	F	Addition of TP analysis of V2X MOP 6.2E.1.x	17.3.0
2021-12	RAN#94	R5-218200	0532	-	F	TP analysis for ref sensitivity for DC_41A_n77A and DC_41A_n78A	17.3.0
2021-12	RAN#94	R5-218276	0513	1	F	Update_TP_analysis for Rel_16_DC_14A_n2A	17.3.0
2021-12	RAN#94	R5-218277	0514	1	F	Update_TP_analysis for Rel_16_DC_14A_n66A	17.3.0
2021-12	RAN#94	R5-218306	0528	1	F	Addition of TP analysis of V2X MPR 6.2E.2.x	17.3.0
2021-12	RAN#94	R5-218364	0510	1	F	Addition of TP analysis of A-MPR and ASE for NS_56	17.3.0
2021-12	RAN#94	R5-218409	0531	1	F	Update of test point analysis for relative power tolerance in FR2	17.3.0
2021-12	RAN#94	R5-218445	0518	1	F	TP analysis for ref sensitivity for DC_2A_n71A	17.3.0
2021-12	RAN#94	R5-218446	0519	1	F	TP analysis for ref sensitivity for DC_5A_n66A	17.3.0
2021-12	RAN#94	R5-218447	0530	1	F	TP analysis update for A-MPR and A-Spurious test cases	17.3.0
2021-12	RAN#94	R5-218487	0529	1	F	Update of TR 38.905 with EN DC A MPR test point analyses, NS_04	17.3.0
2022-03	RAN#95	R5-220321	0537	-	F	Adding Reference sensitivity Test point analysis for Rel-16 inter-band EN-DC FR1 two band combinations	17.4.0
2022-03	RAN#95	R5-220363	0541	-	F	Update TP analysis for Rel-17 DC_2A_n77A	17.4.0
2022-03	RAN#95	R5-220364	0542	-	F	Update TP analysis for Rel-17 DC_5A_n77A	17.4.0
2022-03	RAN#95	R5-220365	0543	-	F	Update TP analysis for Rel-17 DC_13A_n77A	17.4.0
2022-03	RAN#95	R5-220366	0544	-	F	Update TP analysis for Rel-17 DC_66A_n77A	17.4.0
2022-03	RAN#95	R5-220377	0545	-	F	Introduction of reference sensitivity test point analysis for DC_1A-n7A	17.4.0
2022-03	RAN#95	R5-220378	0546	-	F	Introduction of reference sensitivity test point analysis for DC_28A_n7A	17.4.0
2022-03	RAN#95	R5-220379	0547	-	F	Introduction of reference sensitivity test point analysis for DC_1A_n5A	17.4.0
2022-03	RAN#95	R5-220381	0548	-	F	Introduction of reference sensitivity test point analysis for DC_3A_n5A	17.4.0
2022-03	RAN#95	R5-220383	0549	-	F	Introduction of reference sensitivity test point analysis for DC_7A-n5A	17.4.0
2022-03	RAN#95	R5-220385	0550	-	F	Introduction of reference sensitivity test point analysis for DC_7A_n28A	17.4.0
2022-03	RAN#95	R5-220388	0552	-	F	Introduction of reference sensitivity test point analysis for DC_7A_n5A-n78A	17.4.0
2022-03	RAN#95	R5-220389	0553	-	F	Introduction of reference sensitivity test point analysis for DC_28A_n7A-n78A	17.4.0
2022-03	RAN#95	R5-221748	0555	1	F	Addition of Test Point analysis for FR1 Spurious emission for UE co-existence for DC_19_n1	17.4.0
2022-03	RAN#95	R5-221749	0556	1	F	Addition of Test Point analysis for FR1 Spurious emission for UE co-existence for DC_21_n1	17.4.0
2022-03	RAN#95	R5-220794	0558	-	F	TP analysis for 6.2D.1 for ULFPTx	17.4.0
2022-03	RAN#95	R5-220982	0561	-	F	Update of test point analysis for Adjacent Channel Selectivity for EN-DC within FR1	17.4.0
2022-03	RAN#95	R5-221115	0562	-	F	Updating TP analysis for FR1 AMPR for CA_n41A-n79A testing	17.4.0
2022-03	RAN#95	R5-221123	0563	-	F	Updating TP analysis for FR1 MPR for intra-band CA test case	17.4.0
2022-03	RAN#95	R5-221125	0564	-	F	Updating TP analysis for FR1 Absolute power tolerance CA test case	17.4.0
2022-03	RAN#95	R5-221127	0565	-	F	Updating TP analysis for FR1 ACLR for intra-band CA test case	17.4.0
2022-03	RAN#95	R5-221129	0566	-	F	Updating TP analysis for FR1 SEM for intra-band CA test case	17.4.0
2022-03	RAN#95	R5-221313	0573	-	F	TP analysis for ref sensitivity for DC_2A_n78A	17.4.0
2022-03	RAN#95	R5-221320	0575	-	F	TP analysis for ref sensitivity for 4 Rel-17 ENDC combos	17.4.0
2022-03	RAN#95	R5-221327	0577	-	F	TP analysis for ref sensitivity for DC_2A_n66A	17.4.0
2022-03	RAN#95	R5-221602	0580	-	F	Correction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_8A_n3A	17.4.0
2022-03	RAN#95	R5-221603	0581	-	F	Correction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_20A_n3A	17.4.0
2022-03	RAN#95	R5-221631	0583	-	F	Update of spurious emission TP analysis for DC_3A_n41A	17.4.0
2022-03	RAN#95	R5-221632	0584	-	F	Update of spurious emission TP analysis for DC_8A_n41A	17.4.0
2022-03	RAN#95	R5-221633	0585	-	F	Update of spurious emission TP analysis for DC_25A_n41A	17.4.0
2022-03	RAN#95	R5-221634	0582	-	F	Update of spurious emission TP analysis for DC_26A_n41A	17.4.0
2022-03	RAN#95	R5-221635	0586	-	F	Update of spurious emission TP analysis for DC_39A_n41A	17.4.0
2022-03	RAN#95	R5-221636	0587	-	F	Update of spurious emission TP analysis for DC_40A_n41A	17.4.0
2022-03	RAN#95	R5-221750	0574	1	F	Update_TP_analysis for EVM	17.4.0
2022-03	RAN#95	R5-221751	0576	1	F	Test Point analysis for FR2 Tx spur emission UL MIMO tests	17.4.0
2022-03	RAN#95	R5-221752	0578	1	F	Addition of reference sensitivity checklist for CA reference sensitivity test point analysis	17.4.0
2022-03	RAN#95	R5-221753	0579	1	F	Modification of test point analysis clause for FR1 NR CA	17.4.0
2022-03	RAN#95	R5-221774	0533	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_8A_n20A	17.4.0
2022-03	RAN#95	R5-221775	0534	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_20A_n7A	17.4.0
2022-03	RAN#95	R5-221776	0535	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_28A_n5A	17.4.0

2022-03	RAN#95	R5-221777	0536	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_40A_n79A	17.4.0
2022-03	RAN#95	R5-221778	0551	1	F	Introduction of reference sensitivity test point analysis for DC_7A_n78A	17.4.0
2022-03	RAN#95	R5-221779	0567	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_1A_n5A	17.4.0
2022-03	RAN#95	R5-221780	0568	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_1A_n7A	17.4.0
2022-03	RAN#95	R5-221781	0569	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_3A_n5A	17.4.0
2022-03	RAN#95	R5-221782	0570	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_7A_n5A	17.4.0
2022-03	RAN#95	R5-221783	0571	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_28A_n7A	17.4.0
2022-03	RAN#95	R5-221829	0557	1	F	TP analysis for 6.2E.2.2 MPR for concurrent operation	17.4.0
2022-03	RAN#95	R5-221841	0559	1	F	TP analysis for 6.2D.2 for ULFPTx	17.4.0
2022-06	RAN#96	R5-222187	0588	-	F	Correction of Number of test points for V2X SEM and V2X ACLR in 38.521-1	17.5.0
2022-06	RAN#96	R5-222188	0589	-	F	Correction of Justification in attachment for UL MIMO MPR and ACLR in 38.521-1	17.5.0
2022-06	RAN#96	R5-222189	0590	-	F	Correction of test points analysis of 2UL CA ACLR test case in 38.521-1	17.5.0
2022-06	RAN#96	R5-222420	0602	-	F	Update of R17 Reference Sensitivity test point analysis for FR1 NR CA	17.5.0
2022-06	RAN#96	R5-222429	0603	-	F	Test point analysis update for FR1 test case 6.3A.4.1.1	17.5.0
2022-06	RAN#96	R5-222574	0606	-	F	Addition of test analysis for several CA combinations	17.5.0
2022-06	RAN#96	R5-222682	0613	-	F	Update of test points analysis for CA_n1A-n3A refsens test case	17.5.0
2022-06	RAN#96	R5-222733	0614	-	F	Update for 38.521-1_TPanalysis_7.3_RefSense	17.5.0
2022-06	RAN#96	R5-222734	0615	-	F	Update TpAnalysisSpur_DC_14A_n2A	17.5.0
2022-06	RAN#96	R5-222735	0616	-	F	Update TpAnalysisSpur_DC_14A_n66A	17.5.0
2022-06	RAN#96	R5-222831	0617	-	F	Addition of test point analysis for 6.2B.1.3_1 Maximum Output Power	17.5.0
2022-06	RAN#96	R5-222886	0619	-	F	Update to TP analysis of A-MPR to add ULFPTx	17.5.0
2022-06	RAN#96	R5-222903	0620	-	F	Addition of TP analysis for FR1 RedCap requirements	17.5.0
2022-06	RAN#96	R5-222915	0621	-	F	Removing test case 6.5D.1_1 Occupied bandwidth for UL MIMO (Rel-16 onward) from 38.905	17.5.0
2022-06	RAN#96	R5-222927	0622	-	F	Addition of test point analysis for new test case 6.2G.1	17.5.0
2022-06	RAN#96	R5-222928	0623	-	F	Addition of test point analysis for new test cases 6.2G.2 and 6.5G.2.3.1	17.5.0
2022-06	RAN#96	R5-222929	0624	-	F	Addition of test point analysis for new test case 6.2G.3	17.5.0
2022-06	RAN#96	R5-223017	0625	-	F	Update of test point analysis for MPR, SEM and NR ACLR for UL MIMO	17.5.0
2022-06	RAN#96	R5-223050	0626	-	F	Update of test points analysis per CA configuration Table	17.5.0
2022-06	RAN#96	R5-223682	0591	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_1A_n8A	17.5.0
2022-06	RAN#96	R5-223683	0592	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_7A_n8A	17.5.0
2022-06	RAN#96	R5-223684	0593	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_8A_n28A	17.5.0
2022-06	RAN#96	R5-223685	0594	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_20A_n8A	17.5.0
2022-06	RAN#96	R5-223686	0595	1	F	Introduction of reference sensitivity test point analysis for DC_1A-20A_n8A	17.5.0
2022-06	RAN#96	R5-223687	0596	1	F	Introduction of reference sensitivity test point analysis for DC_1A-28A_n5A	17.5.0
2022-06	RAN#96	R5-223688	0597	1	F	Introduction of reference sensitivity test point analysis for DC_3A-7A_n5A	17.5.0
2022-06	RAN#96	R5-223689	0598	1	F	Introduction of reference sensitivity test point analysis for DC_3A-8A_n28A	17.5.0
2022-06	RAN#96	R5-223690	0599	1	F	Introduction of reference sensitivity test point analysis for DC_7A-8A_n3A	17.5.0
2022-06	RAN#96	R5-223691	0600	1	F	Introduction of reference sensitivity test point analysis for DC_7A-20A_n8A	17.5.0
2022-06	RAN#96	R5-223692	0601	1	F	Introduction of reference sensitivity test point analysis for DC_7A-28A_n5A	17.5.0
2022-06	RAN#96	R5-223696	0628	1	F	Update_TP_analysis for AMPR NS_27	17.5.0
2022-06	RAN#96	R5-223732	0627	1	F	Updating A-MPR and A-SE TP analysis for NS_48	17.5.0
2022-06	RAN#96	R5-223745	0607	1	F	Tx spurious emission TP analysis for Rel-17 CA_n24-n41	17.5.0
2022-06	RAN#96	R5-223746	0608	1	F	Tx spurious emission TP analysis for Rel-17 CA_n24-n48	17.5.0
2022-06	RAN#96	R5-223747	0609	1	F	Tx spurious emission TP analysis for Rel-17 CA_n24-n77	17.5.0
2022-06	RAN#96	R5-223771	0618	1	F	Addition of test point analysis for 6.2B.4.1.3_1 Configured Output Power	17.5.0
2022-06	RAN#96	R5-223867	0604	1	F	Updating TP analysis for MPR, SEM and ACLR for FR2	17.5.0

2022-09	RAN#97	R5-224158	0631	-	F	Introduction of reference sensitivity test point analysis for DC_3A-7A-20A_n8A	17.6.0
2022-09	RAN#97	R5-224207	0633	-	F	Adding test point analysis for A_MPR NS_27 with 30 MHz channel bandwidth	17.6.0
2022-09	RAN#97	R5-224254	0634	-	F	Correction of test points analysis of some Rx test cases in 38.521-1 for the addition of test points for asymmetric channel bandwidths and UL-MIMO	17.6.0
2022-09	RAN#97	R5-224792	0640	-	F	Addition of test point analysis for TxD test cases	17.6.0
2022-09	RAN#97	R5-224872	0646	-	F	A-MPR TP analysis for Rel-17 CA_n24-n48	17.6.0
2022-09	RAN#97	R5-224873	0647	-	F	A-MPR TP analysis for Rel-17 CA_n24-n77	17.6.0
2022-09	RAN#97	R5-224886	0649	-	F	TP analysis for additional spurious emission for NS_14	17.6.0
2022-09	RAN#97	R5-224901	0657	-	F	General rule for TP selection for NR_U test cases	17.6.0
2022-09	RAN#97	R5-224938	0658	-	F	Editorial corrections to the timeline for introduction of test points	17.6.0
2022-09	RAN#97	R5-224940	0659	-	F	Introduction of reference sensitivity test point analysis for DC_2A-66A_n41A	17.6.0
2022-09	RAN#97	R5-224944	0660	-	F	Update of spurious emission TP analysis for Rel-16 EN-DC configuration DC_2A_n41A	17.6.0
2022-09	RAN#97	R5-224945	0661	-	F	Update of spurious emission TP analysis for Rel-16 EN-DC configuration DC_7A_n3A	17.6.0
2022-09	RAN#97	R5-224947	0662	-	F	Update of spurious emission TP analysis for Rel-16 EN-DC configuration DC_8A_n41A	17.6.0
2022-09	RAN#97	R5-224948	0663	-	F	Update of spurious emission TP analysis for Rel-16 EN-DC configuration DC_13A_n2A	17.6.0
2022-09	RAN#97	R5-224949	0664	-	F	Update of spurious emission TP analysis for Rel-16 EN-DC configuration DC_20A_n1A	17.6.0
2022-09	RAN#97	R5-224951	0665	-	F	Update of spurious emission TP analysis for Rel-16 EN-DC configuration DC_48A_n5A	17.6.0
2022-09	RAN#97	R5-224953	0666	-	F	Update of spurious emission TP analysis for Rel-16 EN-DC configuration DC_48A_n66A	17.6.0
2022-09	RAN#97	R5-224955	0667	-	F	Update of spurious emission TP analysis for Rel-16 EN-DC configuration DC_66A_n41A	17.6.0
2022-09	RAN#97	R5-224959	0668	-	F	Editorial corrections to spurious emission test cases for DC_8A_n3A, DC_8A_n20A and DC_20A_n3A	17.6.0
2022-09	RAN#97	R5-224965	0669	-	F	Incorrect TP analysis revision for test case 6.2D.2	17.6.0
2022-09	RAN#97	R5-225065	0670	-	F	Updating test point selection criteria for FR1 SUL test cases	17.6.0
2022-09	RAN#97	R5-225074	0671	-	F	Adding TP analysis for new FR1 test case 6.3C.3.2	17.6.0
2022-09	RAN#97	R5-225076	0672	-	F	Updating TP analysis for FR1 test case 6.3A.3.1_1	17.6.0
2022-09	RAN#97	R5-225108	0673	-	F	Editorial correction for DC_1A_n5A	17.6.0
2022-09	RAN#97	R5-225711	0630	1	F	Introduction of spurious emission TP analysis for Rel-16 EN-DC configuration DC_3A_n8A	17.6.0
2022-09	RAN#97	R5-225712	0635	1	F	Update TP analysis for Rel-16 CA_n2A_n77A	17.6.0
2022-09	RAN#97	R5-225713	0636	1	F	Update TP analysis for Rel-16 CA_n5A_n77A	17.6.0
2022-09	RAN#97	R5-225714	0637	1	F	Update TP analysis for Rel-16 CA_n66A_n77A	17.6.0
2022-09	RAN#97	R5-225715	0638	1	F	TP analysis for ref sensitivity for Rel-16 NR CA combos	17.6.0
2022-09	RAN#97	R5-225716	0650	1	F	Update Spurious emission TP R16 DC_5A_n2A	17.6.0
2022-09	RAN#97	R5-225737	0643	1	F	Tx Spurious emissions test point analysis for many UL CA combos	17.6.0
2022-09	RAN#97	R5-225738	0644	1	F	Test point analysis for reference sensitivity for many 4CA combos	17.6.0
2022-09	RAN#97	R5-225739	0645	1	F	A-MPR TP analysis for Rel-17 CA_n24-n41	17.6.0
2022-09	RAN#97	R5-225745	0629	1	F	Test point analysis for test 6.2.4_1 Configured transmitted power with Power Boost	17.6.0
2022-09	RAN#97	R5-225746	0641	1	F	Update TP analysis for AMPR NS_05 and NS_05U	17.6.0
2022-09	RAN#97	R5-225749	0632	1	F	Introduction of spurious emission TP analysis for CA_n48A-n70A	17.6.0
2022-09	RAN#97	R5-225779	0642	1	F	Update to MPR for CA TP analysis to add PC2 requirements	17.6.0
2022-09	RAN#97	R5-225825	0648	1	F	Ref sensitivity TP selection for DC_2A_n41A	17.6.0
2022-09	RAN#97	R5-225826	0651	1	F	Ref sensitivity TP selection for DC_1A_n77A	17.6.0
2022-09	RAN#97	R5-225827	0652	1	F	Ref sensitivity TP selection for DC_3A_n77A	17.6.0
2022-09	RAN#97	R5-225828	0653	1	F	Ref sensitivity TP selection for DC_8A_n78A	17.6.0
2022-09	RAN#97	R5-225829	0654	1	F	Ref sensitivity TP selection for DC_5A_n78A	17.6.0
2022-09	RAN#97	R5-225830	0655	1	F	Ref sensitivity TP selection for DC_8A_n79A	17.6.0
2022-09	RAN#97	R5-225831	0656	1	F	Ref sensitivity TP selection for DC_21A_n79A	17.6.0
2022-09	RAN#97	R5-225832	0674	1	F	Updated TP analysis MPR for CA in FR2	17.6.0
2022-12	RAN#98	R5-226298	0679		F	Addition of NS_03U in Table 4.1.2.1-1 and correction of number of test points for NS_03 and NS_100	17.7.0
2022-12	RAN#98	R5-226519	0683		F	Addition of refsence sensitivity test point analysis for three bands within FR1	17.7.0
2022-12	RAN#98	R5-226521	0684		F	Update of spurious emission TP analysis for Rel-15 NR CA configuration CA_n3A-n78A	17.7.0
2022-12	RAN#98	R5-226522	0685		F	Update of spurious emission TP analysis for Rel-15 NR CA configuration CA_n8A-n78A	17.7.0
2022-12	RAN#98	R5-226585	0689		F	Ref sense TP analysis for DC_30A_n66A	17.7.0
2022-12	RAN#98	R5-226589	0693		F	Update test frequency for DC_5A_n77A	17.7.0
2022-12	RAN#98	R5-226701	0695		F	Addition of CA_n41-n66/- in sensitivity test case config table.	17.7.0

2022-12	RAN#98	R5-226830	0706		F	Update of spurious emission TP analysis for Rel-16 NR CA configuration CA_n66A-n77A	17.7.0
2022-12	RAN#98	R5-227228	0718		F	Update of spurious emission TP analysis for Rel-17 NR CA configuration CA_n48A-n71A	17.7.0
2022-12	RAN#98	R5-227294	0720		F	Editorial corrections on TpAnalysisSpur filename	17.7.0
2022-12	RAN#98	R5-227711	0676	1	F	Spur_TpAnalysis for CA_n2A_n5A	17.7.0
2022-12	RAN#98	R5-227712	0677	1	F	Spur_TpAnalysis for CA_n2A_n48A	17.7.0
2022-12	RAN#98	R5-227713	0694	1	F	Ref_sense_TpAnalysis for CA_n2A_n5A	17.7.0
2022-12	RAN#98	R5-227714	0682	1	F	Update TP analysis for reference sensitivity frequency selections	17.7.0
2022-12	RAN#98	R5-227715	0686	1	F	Introduction of spurious emissions TP analysis for 18A_n77A	17.7.0
2022-12	RAN#98	R5-227716	0687	1	F	Introduction of spurious emissions TP analysis for 18A_n78A	17.7.0
2022-12	RAN#98	R5-227717	0688	1	F	Addition of refsence sensitivity test point analysis for 18A_n77A and 18A_n78A	17.7.0
2022-12	RAN#98	R5-227718	0696	1	F	Update of spurious emission TP analysis for Rel-16 NR CA configuration CA_n1A-n78A	17.7.0
2022-12	RAN#98	R5-227719	0697	1	F	Introduction of spurious emission TP analysis for Rel-16 NR CA configuration CA_n1A-n79A	17.7.0
2022-12	RAN#98	R5-227720	0698	1	F	Update of spurious emission TP analysis for Rel-16 NR CA configuration CA_n28A-n41A	17.7.0
2022-12	RAN#98	R5-227721	0699	1	F	Update of spurious emission TP analysis for Rel-16 NR CA configuration CA_n2A-n77A	17.7.0
2022-12	RAN#98	R5-227722	0700	1	F	Introduction of spurious emission TP analysis for Rel-16 NR CA configuration CA_n39A-n41A	17.7.0
2022-12	RAN#98	R5-227723	0701	1	F	Introduction of spurious emission TP analysis for Rel-16 NR CA configuration CA_n3A-n41A	17.7.0
2022-12	RAN#98	R5-227724	0702	1	F	Update of spurious emission TP analysis for Rel-16 NR CA configuration CA_n41A-n79A	17.7.0
2022-12	RAN#98	R5-227725	0703	1	F	Update of spurious emission TP analysis for Rel-16 NR CA configuration CA_n48A-n66A	17.7.0
2022-12	RAN#98	R5-227726	0704	1	F	Update of spurious emission TP analysis for Rel-16 NR CA configuration CA_n5A-n77A	17.7.0
2022-12	RAN#98	R5-227727	0719	1	F	Introduction of CA_n48A-n77A and CA_n71A-n77A test point analyses	17.7.0
2022-12	RAN#98	R5-227895	0680	1	F	Update TP analysis of reference sensitivity for CA_n66A-n77A	17.7.0
2022-12	RAN#98	R5-227897	0681	1	F	Update TP analysis for ref sensitivity for Rel-16 NR CA combos	17.7.0
2022-12	RAN#98	R5-227904	0709	1	F	Updating TP analysis for NS_49	17.7.0
2022-12	RAN#98	R5-227907	0692	1	F	Update test frequency for DC_48A_n66A	17.7.0
2022-12	RAN#98	R5-227909	0710	1	F	Test point analysis for mpr-PowerBoost tests 6.4.2.1_1, 6.5.2.1_1, 6.5.3.1_1, 6.5.3.2_1 and 6.5.3.3_1	17.7.0
2022-12	RAN#98	R5-227912	0711	1	F	Updating TP analysis for 6.2G.2 to add power class 3	17.7.0
2022-12	RAN#98	R5-227914	0690	1	F	Ref sense TP analysis for DC_66A_n5A	17.7.0
2022-12	RAN#98	R5-227915	0691	1	F	Ref sense TP analysis for DC_12A_n66A	17.7.0
2023-03	RAN#99	R5-230215	0724	-	F	Correction of TP analysis for FR2 ACLR for SCS 60 kHz	17.8.0
2023-03	RAN#99	R5-230281	0725	-	F	Update reference sensitivity test cases for three bands configurations of CA_n2A-n5A-n77A, CA_n2A-n66A-n77A, and CA_n5A-n66A-n77A	17.8.0
2023-03	RAN#99	R5-230320	0728	-	F	Addition of reference sensitivity test point analysis for new EN-DC comb within FR1	17.8.0
2023-03	RAN#99	R5-230944	0744	-	F	Addition of reference sensitivity test point analysis for DC_1A_n28A	17.8.0
2023-03	RAN#99	R5-230945	0745	-	F	Addition of reference sensitivity test point analysis for DC_8A_n41A	17.8.0
2023-03	RAN#99	R5-230946	0746	-	F	Addition of reference sensitivity test point analysis for DC_12A_n78A	17.8.0
2023-03	RAN#99	R5-230947	0747	-	F	Addition of reference sensitivity test point analysis for DC_2A-66A_n5A	17.8.0
2023-03	RAN#99	R5-231241	0750	-	F	Test point analysis update for A-MPR test for NS_21	17.8.0
2023-03	RAN#99	R5-231311	0754	-	F	Updated TP analysis for DC_25A_n41A	17.8.0
2023-03	RAN#99	R5-231608	0727	1	F	Addition of reference sensitivity test point analysis for new 3CC EN-DC comb within FR1	17.8.0
2023-03	RAN#99	R5-231609	0738	1	F	Ref sensitivity TP selection for DC_71A_n66A DC_14A_n2A and DC_12A_n2A	17.8.0
2023-03	RAN#99	R5-231610	0742	1	F	Adding Spurious emission TP for DC_71A_n66A	17.8.0
2023-03	RAN#99	R5-231611	0743	1	F	Adding Spurious emission TP for DC_12A_n2A	17.8.0
2023-03	RAN#99	R5-231612	0739	1	F	Update Ref sensitivity TP selection for DC_21A_n79A	17.8.0
2023-03	RAN#99	R5-231613	0740	1	F	Ref sensitivity TP selection for DC_71A_n2A	17.8.0
2023-03	RAN#99	R5-231614	0741	1	F	Adding Spurious emission TP for DC_71A_n2A	17.8.0
2023-03	RAN#99	R5-231615	0748	1	F	Update of spurious emission TP analysis for CA_n1A-n8A	17.8.0
2023-03	RAN#99	R5-231616	0752	1	F	Reference sensitivity TP analysis for DC_66A_n41A	17.8.0
2023-03	RAN#99	R5-231620	0733	1	F	Adding TP for CA AMPR CA_NS_04	17.8.0
2023-03	RAN#99	R5-231621	0734	1	F	Merging TP analysis of CA MPR, ACLR and SEM	17.8.0
2023-03	RAN#99	R5-231622	0735	1	F	Adding TP for CA spurious emission for PC2 and PC3 intra-band contiguous	17.8.0
2023-03	RAN#99	R5-231623	0731	1	F	Update to TP analysis of 6.2.3 NS_27	17.8.0
2023-03	RAN#99	R5-231624	0736	1	F	Adding TP for CA spurious emission co-existence for PC2 and PC3 intra-band contiguous	17.8.0

2023-03	RAN#99	R5-231625	0732	1	F	Adding 45MHz PC2 TP analysis to 6.2.3 NS_49	17.8.0
2023-03	RAN#99	R5-231633	0749	1	F	Addition of CA_n41A-n71A.	17.8.0
2023-03	RAN#99	R5-231833	0737	2	F	NTN test point analysis	17.8.0
2023-03	RAN#99	R5-231865	0753	1	F	Clarifications and alignment of REFSENS TP analysis for EN-DC and NR CA	17.8.0
2023-03	RAN#99	R5-231879	0729	1	F	Addition of spurious emissions TP analysis for 1A_n41A and 41A_n28A	17.8.0
2023-03	RAN#99	R5-231880	0730	1	F	Addition of spurious emissions TP analysis for 21A_n28A	17.8.0
2023-06	RAN#100	R5-232114	0755	-	F	Introduction of MOP test point analysis for CA_n28A-n78A	17.9.0
2023-06	RAN#100	R5-232115	0756	-	F	Introduction of spurious emission TP analysis for CA_n28A-n78A	17.9.0
2023-06	RAN#100	R5-232116	0757	-	F	Introduction of reference sensitivity test point analysis for CA_n28A-n78A	17.9.0
2023-06	RAN#100	R5-232347	0759	-	F	TP analysis updated for NTN maximum input level test case 7.4	17.9.0
2023-06	RAN#100	R5-232424	0763	-	F	Addition of spurious emission TP analysis for CA_n1A-n3A	17.9.0
2023-06	RAN#100	R5-232608	0766	-	F	Ref sensitivity TP selection for DC_7A_n66A DC_7A_n77A and DC_66A_n25A	17.9.0
2023-06	RAN#100	R5-232707	0768	-	F	Addition of reference sensitivity test point analysis for n3A-n77A	17.9.0
2023-06	RAN#100	R5-232709	0769	-	F	Addition of reference sensitivity test point analysis for n28A-n77A	17.9.0
2023-06	RAN#100	R5-232718	0770	-	F	Addition of reference sensitivity test point analysis for DC_21A_n28A	17.9.0
2023-06	RAN#100	R5-232876	0775	-	F	Editorial in Table 4.1.3.1-2	17.9.0
2023-06	RAN#100	R5-232878	0776	-	F	Addition of CA_n41A-n66A-n71A in sensitivity test case config table.	17.9.0
2023-06	RAN#100	R5-232976	0778	-	F	Introduction of TP analysis for A-MPR - New NR band n13	17.9.0
2023-06	RAN#100	R5-233094	0780	-	F	Updating TP analysis for Transmit ON/OFF time mask for CA	17.9.0
2023-06	RAN#100	R5-233171	0782	-	F	Addition of Test Point Analysis for CA_NS_202	17.9.0
2023-06	RAN#100	R5-233256	0783	-	F	TP Analysis for FR2 RF test case involving EIRP with UL-Gaps	17.9.0
2023-06	RAN#100	R5-233512	0762	1	F	Correction to spurious emissions TP analysis for 21A_n28A	17.9.0
2023-06	RAN#100	R5-233513	0767	1	F	Spur_TpAnalysis for CA_n5A_n48A	17.9.0
2023-06	RAN#100	R5-233514	0764	1	F	TP analysis for NR NTN configured transmission power tests	17.9.0
2023-06	RAN#100	R5-233518	0760	1	F	TP analysis update for FR2 2 UL CA Tx tests to support PHR method	17.9.0
2023-06	RAN#100	R5-233519	0765	1	F	Ref sensitivity TP selection for DC_38A_n78A DC_18A_n77A and DC_19A_n77A	17.9.0
2023-06	RAN#100	R5-233521	0761	1	F	FR1 MPR - ACLR - SEM - TP analysis update for almost contiguous RB allocation	17.9.0
2023-06	RAN#100	R5-233522	0772	1	F	Correction to test point analysis for FR1 test cases	17.9.0
2023-06	RAN#100	R5-233523	0777	1	F	Clarification/improvement of clause B9.	17.9.0
2023-06	RAN#100	R5-233526	0779	1	F	Updating REFSENS exception test frequency selection for CA_n7A-n78A	17.9.0
2023-06	RAN#100	R5-233528	0773	2	F	TP analysis for PC2 PC3 n39 A-MPR and A-SE	17.9.0
2023-06	RAN#100	R5-233530	0781	1	F	Correction of test point analysis for CA_n66A-n71A	17.9.0
2023-06	RAN#100	R5-233713	0758	1	F	Update inter-band NR CA reference sensitivity exception cases due to UL PC2	17.9.0
2023-09	RAN#101	R5-233948	0784	-	F	Introduction of spurious emission TP analysis for CA_n20A-n78A	17.10.0
2023-09	RAN#101	R5-234200	0789	-	F	Update reference sensitivity test cases for additional three bands configurations	17.10.0
2023-09	RAN#101	R5-234204	0790	-	F	Update reference sensitivity test cases for a few PC2 three band configurations	17.10.0
2023-09	RAN#101	R5-234450	0792	-	F	Test point analysis for reference sensitivity for several NR CA combos	17.10.0
2023-09	RAN#101	R5-234590	0795	-	F	Update 38.521-1_TPanalysis_6.5.4_TxIm_v3 for NR-U	17.10.0
2023-09	RAN#101	R5-234630	0798	-	F	TP analysis for NR NTN AMPR tests	17.10.0
2023-09	RAN#101	R5-234728	0800	-	F	Introduction of TP analysis of CA_n3A_n41A Ref Sense exception	17.10.0
2023-09	RAN#101	R5-234730	0801	-	F	Introduction of TP analysis of CA_n28A-n41A-n79A Ref Sense exception	17.10.0
2023-09	RAN#101	R5-234839	0803	-	F	Addition of TP analysis of SE-coex for intra-band non-contiguous CA	17.10.0
2023-09	RAN#101	R5-234846	0804	-	F	Addition of TP analysis of spurious emission co-existence for CA_n28-n79	17.10.0
2023-09	RAN#101	R5-234849	0805	-	F	Addition of TP analysis of 6.3A.3.3 2Tx-2Tx UL switching for inter-band CA	17.10.0
2023-09	RAN#101	R5-235015	0807	-	F	Addition of spurious emission TP analysis for CA_n3A-n8A	17.10.0
2023-09	RAN#101	R5-235041	0808	-	F	Updating test frequency selection for REFSENS exception testing for CA	17.10.0
2023-09	RAN#101	R5-235620	0793	1	F	Introduction of spurious emission TP analysis for Rel-16 NR CA configuration CA_n5A-n66A.	17.10.0
2023-09	RAN#101	R5-235622	0809	1	F	Updating REFSENS test point selection for CA_n39A-n41A	17.10.0
2023-09	RAN#101	R5-235626	0802	1	F	Update TP analysis of Ref sense exception of NR CA PC2 configs	17.10.0
2023-09	RAN#101	R5-235632	0794	1	F	Update 38.905 for NR-U	17.10.0
2023-09	RAN#101	R5-235649	0791	1	F	Addition of spurious emissions TP analysis for new NRCA comb within FR1	17.10.0
2023-09	RAN#101	R5-235680	0813	1	F	TP analysis for NTN TC 6.3.3 on Tx on-off time mask	17.10.0
2023-09	RAN#101	R5-235682	0814	1	F	TP analysis for NTN TC 6.5.2.4 on ACLR	17.10.0
2023-09	RAN#101	R5-235684	0815	1	F	TP analysis for NTN TC 6.5.2.2 on Spectrum emission mask	17.10.0

2023-09	RAN#101	R5-235848	0785	1	F	Introduction of reference sensitivity test point analysis for CA_n20A-n78A	17.10.0
2023-09	RAN#101	R5-235855	0817	1	F	TP analysis for FR2 RF phase continuity test	17.10.0
2023-09	RAN#101	R5-235856	0786	1	F	Update TP analysis for 7.4	17.10.0
2023-09	RAN#101	R5-235857	0787	1	F	Update TP analysis for 7.4A	17.10.0
2023-09	RAN#101	R5-235858	0799	1	F	TP analysis update for NTN	17.10.0
2023-09	RAN#101	R5-235937	0816	1	F	TP analysis for FR1 RF phase continuity test	17.10.0
2023-09	RAN#101	R5-234619	0796	-	F	Updates to TP analyses for spurious emissions UE coexistence for CA combinations as part of the introduction of LTE TDD Band 54	18.0.0
2023-09	RAN#101	R5-235860	0797	1	F	Updates and additions to TP analyses for spurious emissions UE coexistence for EN-DC combinations as part of the introduction of LTE TDD Band 54	18.0.0
2023-12	RAN#102	R5-236074	0818	-	F	Introduction of reference sensitivity test point analysis for CA_n1A-n3A-n28A-n78A	18.1.0
2023-12	RAN#102	R5-236081	0820	-	F	Introduction of spurious emission TP analysis for CA_n25A-n66A, CA_n25A-n77A, CA_n25A-n78A, CA_n66A-n78A	18.1.0
2023-12	RAN#102	R5-236251	0824	-	F	Removal of technical content in TR 38.905 v17.10.0 and substitution with pointer to the next Release	18.1.0
2023-12	RAN#102	R5-236287	0825	-	F	Addition of inter-band NR CA reference sensitivity PC2 exception cases	18.1.0
2023-12	RAN#102	R5-236356	0826	-	F	Test point analysis for several EN-DC and NR CA combos for spurious emissions	18.1.0
2023-12	RAN#102	R5-236371	0827	-	F	Update reference sensitivity test cases for additional three bands ENDC configurations	18.1.0
2023-12	RAN#102	R5-236377	0828	-	F	Update test point analysis clause for additional NR CA band configurations	18.1.0
2023-12	RAN#102	R5-236482	0832	-	F	Updated TP analysis for NR-U test cases SEM, MPR and ACLR	18.1.0
2023-12	RAN#102	R5-236504	0834	-	F	Addition of REFSENS TP analysis for 2CC EN-DC for n79 in PC2	18.1.0
2023-12	RAN#102	R5-236632	0836	-	F	Update to TP analysis for FR2 CA_NS_202	18.1.0
2023-12	RAN#102	R5-236953	0838	-	F	Update reference sensitivity test cases for CA_n1A-n3A-n78A	18.1.0
2023-12	RAN#102	R5-237049	0839	-	F	Updating TP analysis for Configured output power for CA	18.1.0
2023-12	RAN#102	R5-237052	0840	-	F	Updating TP analysis for Minimum output power for CA	18.1.0
2023-12	RAN#102	R5-237054	0841	-	F	Updating TP analysis for Frequency error testing for intra-band UL CA	18.1.0
2023-12	RAN#102	R5-237056	0842	-	F	Updating TP analysis for Spurious emission for CA	18.1.0
2023-12	RAN#102	R5-237059	0843	-	F	Updating TP analysis for FR1 test case Transmit intermodulation for CA	18.1.0
2023-12	RAN#102	R5-237061	0844	-	F	Updating TP analysis for FR1 test case EVM for CA	18.1.0
2023-12	RAN#102	R5-237065	0846	-	F	Updating TP analysis for FR1 test case Inband emissions for CA	18.1.0
2023-12	RAN#102	R5-237070	0847	-	F	Updating TP analysis for AMPR for CA testing for NS_17 NS_47	18.1.0
2023-12	RAN#102	R5-237615	0821	1	F	Addition of reference sensitivity and spurious emissions TP analysis for new R16 NR CA comb within FR1	18.1.0
2023-12	RAN#102	R5-237617	0819	1	F	Introduction of reference sensitivity test point analysis for CA_n25A-n66A-n77(2A) and CA_n25A-n66A-n78(2A)	18.1.0
2023-12	RAN#102	R5-237619	0822	1	F	Addition of reference sensitivity TP analysis for new R17 NR CA comb within FR1	18.1.0
2023-12	RAN#102	R5-237622	0829	1	F	Remove Editors Notes and made the necessary changes for Table 4.1.3.1-3	18.1.0
2023-12	RAN#102	R5-237630	0845	1	F	Updating TP analysis for FR1 test case Carrier Leakage for CA	18.1.0
2023-12	RAN#102	R5-237633	0835	1	F	TP analyze 6.2F.3 shared spectrum access NS_28 and NS_29	18.1.0
2023-12	RAN#102	R5-237635	0833	1	F	Addition of REFSENS TP analysis for 3CC EN-DC for n78 and n79	18.1.0
2023-12	RAN#102	R5-237901	0849	1	F	TP analysis for FR2 CA_NS_203	18.1.0
2023-12	RAN#102	R5-237930	0823	1	F	Test point analysis for NR NTN test cases from 7.5 to 7.9	18.1.0
2023-12	RAN#102	R5-237931	0848	1	F	Adding Test point analysis for NR NTN frequency error test case	18.1.0
2023-12	RAN#102	R5-237935	0837	1	F	Addition of test point analysis for FR1 CA with UL MIMO test cases	18.1.0
2024-03	RAN#103	R5-240234	0850	-	F	Update reference sensitivity test cases for CA_n1A-n8A-n78A	18.2.0
2024-03	RAN#103	R5-240308	0852	-	F	Updating test principle for AMPR for inter-band UL CA	18.2.0
2024-03	RAN#103	R5-240318	0853	-	F	Updating test points for FR1 REFSENS for SUL test case	18.2.0
2024-03	RAN#103	R5-240324	0854	-	F	Addition of reference sensitivity and spurious emissions TP analysis for new R16 NR CA combos within FR1	18.2.0
2024-03	RAN#103	R5-240325	0855	-	F	Addition of reference sensitivity and spurious emissions TP analysis for new R17 NR CA combos within FR1	18.2.0
2024-03	RAN#103	R5-240462	0859	-	F	Introduction of reference sensitivity test point analysis for CA_n66A-n71A-n77(2A) and CA_n66A-n71A-n78(2A)	18.2.0
2024-03	RAN#103	R5-240464	0860	-	F	Introduction of spurious emission TP analysis for CA_n71A-n78A	18.2.0
2024-03	RAN#103	R5-240674	0861	-	F	Addition of reference sensitivity TP analysis for new PC2 EN-DC combos within FR1	18.2.0
2024-03	RAN#103	R5-240776	0862	-	F	Introduction of reference sensitivity test point analysis for CA_n1A-n28A-n78A and CA_n3A-n28A-n78A	18.2.0
2024-03	RAN#103	R5-240778	0863	-	F	Introduction of spurious emission TP analysis for CA_n1A_n28A	18.2.0
2024-03	RAN#103	R5-240858	0864	-	F	Addition of TP analysis for NR-U test case 6.3F.4.3	18.2.0
2024-03	RAN#103	R5-240859	0865	-	F	Addition of TP analysis for NR-U test case 6.2F.4, Configured transmitted power for shared spectrum	18.2.0

2024-03	RAN#103	R5-240891	0868	-	F	Update reference sensitivity test cases for additional band configurations	18.2.0
2024-03	RAN#103	R5-241000	0870	-	F	TP analysis for AMPR, ASEM and ASE for V2X	18.2.0
2024-03	RAN#103	R5-241006	0871	-	F	Test points analysis for FR1 AMPR test case with NS_47 and PC 1.5	18.2.0
2024-03	RAN#103	R5-241008	0872	-	F	Addition of test point analysis for R17 FR1 enhancement test cases	18.2.0
2024-03	RAN#103	R5-241743	0880	1	F	Updates to TP analysis for FR2 RF phase continuity test	18.2.0
2024-03	RAN#103	R5-241744	0881	1	F	Updates to TP analysis for FR1 RF phase continuity test	18.2.0
2024-03	RAN#103	R5-241748	0869	1	F	Update reference sensitivity test cases for additional band configurations with PC2 UL	18.2.0
2024-03	RAN#103	R5-241749	0874	1	F	Addition of REFSENS TP analysis for DC_19A_n78A and DC_19A_n77A in PC2	18.2.0
2024-03	RAN#103	R5-241750	0876	1	F	Addition of REFSENS TP analysis for 3CC EN-DC for n78 and n79 in PC2	18.2.0
2024-03	RAN#103	R5-241765	0851	1	F	Addition of test points analysis for ATG test cases in 38.521-1	18.2.0
2024-03	RAN#103	R5-241777	0858	1	F	Correction to reference sensitivity test point analysis for CA_n28A-n78A	18.2.0
2024-03	RAN#103	R5-241778	0866	1	F	Test point analysis of EN-DC spurious emissions for DC_2A_n66A and DC_30A_n66A	18.2.0
2024-03	RAN#103	R5-241903	0878	1	F	Update of TP analysis for Spurious emissions test cases for FR1 UL CA	18.2.0
2024-03	RAN#103	R5-241908	0877	1	F	Update of test point selection for 4DL CA configurations	18.2.0
2024-03	RAN#103	R5-242014	0879	1	F	Description of ephemeris calculation process	18.2.0

History

Document history		
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