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Derivation of test points for radio transmission and reception User Equipment (UE) conformance test cases
(Release 16)

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Contents

Foreword

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

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

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- x the first digit:
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- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
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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”.

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 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_v1.zip"	RAN5#89-e
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.zip"	RAN5#82
6.2A.1.1 UE maximum output power for CA (2UL CA)	240	"38.521-1_TP analysis_6.2A.1_MOP"	RAN5#83
6.2A.2 Maximum power reduction (MPR) for CA	For inter-band CA:1440 For intra-band contiguous CA: 720 (contiguous RB allocation)	"38.521-1_TPanalysis_6.2A.2_MPR_v1.zip"	RAN5#88-e
6.2A.4 Configured transmitted power for CA	Inter-band CA:20 Intra-band contiguous CA (contiguous RB allocation): 20	"38.521-1_TPanalysis_6.2A.4_ConfigTP_v1.zip"	RAN5#88-e
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)	power class 3: 400 power class 2: 400	"38.521-1_TPanalysis_6.2.2_MPR_v3.zip"	RAN5#85
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_6.2D.4_ConfigTP.zip"	RAN5#82
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	TBD	"38.521-1_TPanalysis_6.3.3.2_OnOff_M_v2.zip"	RAN5#5-5G-NR Adhoc
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.zip	RAN5#83
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.zip"	RAN5#83
6.3A.4.1 Absolute	4	"38.521-1_TPanalysis_6.3A.4.1_Abs_PTol_CA.zip"	RAN5#89

power tolerance for CA (2UL CA)			
6.3A.4.2 Aggregate [Editor's note: shall say Relative] power tolerance for CA (2UL CA)	TBD	"38.521-1_TPanalysis_6.3A.4.2_Rel_PTol_CA.zip"	RAN5#89
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.zip"	RAN5#89
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_v2.zip"	RAN5#84
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	45	"38.521-1 TPanalysis_6.4.2.5_EVMequalizerSpectrumFlatness_BPSK.zip"	RAN5#81
6.4A.1.1 Frequency error for CA (2UL CA)	5	"38.521-1_TPanalysis on 6.4A.1.1_FreqErr.zip"	RAN5#82
6.4A.2.1.1 Error Vector Magnitude for CA (2UL CA)	168	"38.521-1_TPanalysis on 6.4A.2.1.1_EVM.zip"	RAN5#82
6.4A.2.2.1 Carrier leakage for CA (2UL CA)	2	"38.521-1_TPanalysis on 6.4A.2.2.1_CarrLeak.zip"	RAN5#82
6.4A.2.3.1 In-band emissions for CA (2UL CA)		"38.521-1_TPanalysis on 6.4A.2.2.1_IBE.zip"	RAN5#82
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_v2.zip"	RAN5#84
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_TPanalysis_6.4D.3_TAE_MIMO.zip"	RAN5#82
6.5.1 Occupied bandwidth	10	"38.521-1_TPanalysis_6.5.1_OccBW_v2.zip	RAN5#82
6.5.2.2 Spectrum Emission Mask	contiguous allocation: 144 (168[1], 160[2,3]) almost contiguous	"38.521-1_TPanalysis_6.2.2_MPR_6.5.2.2_SEM_6.5.2.4.1_NR_ACLR_v1.zip"	RAN5#89-e

	allocation: 24		
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_v1.zip"	RAN5#89-e
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_v2.zip"	RAN5#85
6.5.3.1General spurious emissions	27	"38.521-1_TP analysis_6.5.3.1_TX_Spurious_Emission_v1.zip"	RAN5#89-e
6.5.3.2Spurious emissions for UE co-existence	27	"38.521-1_TP analysis_6.5.3.1_TX_Spurious_Emission_v1.zip"	RAN5#89-e
6.5.3.3Additional 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.zip"	RAN5#80
6.5A.1.1 Occupied bandwidth for CA (2UL CA)	Inter-band: 2 Intra-band contiguous: 1	"38.521-1_TPanalysis_6.5A.1.1_OccBW_v1.zip"	RAN5#89-e
6.5A.2.2.1 Spectrum emission mask for CA (2UL CA)	112	"38.521-1_TPanalysis on 6.5A.2.2.1_SEM.zip"	RAN5#82
6.5A.2.4.1.1 NR ACLR for CA (2UL CA)	840	"38.521-1_TPanalysis on 6.5A.2.4.1.1_NR ACLR.zip"	RAN5#82
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)	24	"38.521-1_TPanalysis on 6.5A.3.1.1_Spurious.zip"	RAN5#82
6.5A.3.2.1 Spurious emissions for UE co-existence for CA (2UL CA)	3 for CA_n3A-n78A 4 for CA_n8A-n78A	"38.521-1_TPanalysis on 6.5A.3.2.1_SECoex.zip"	RAN5#82
6.5A.4.1 Transmit intermodulation for CA (2UL CA)	840	"38.521-1_TPanalysis on 6.5A.4.1_TxIM.zip"	RAN5#82
6.5D.1 Occupied bandwidth for UL-MIMO		38.521-1_TPanalysis_6.5.1_OBW_v2.zip	RAN5#82
6.5D.2.4.1NR ACLR for UL-MIMO		"38.521-1_TPanalysis_6.5.2.4_ACLR_v3.zip"	RAN5#82
6.5D.2.4.2UTRA ACLR for UL-MIMO	96 for NS_3U	"38.521-1_TPanalysis_6.5D.2.4.2_UTRA ALCR_NS_3U.zip"	RAN5#5-5G-NR Adhoc
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	Table 4.1.1.1-1	Table 4.1.1.1-1	RAN5#89-e

spurious emissions for UL-MIMO (Rel-16 onward)			
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	45	"38.521-1_TPanalysis_7.3_RefSense_v3.zip"	RAN5#5-5G-NR Adhoc
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		"38.521-1_TPanalysis_7.3_RefSense_v2.zip"	RAN5#82
7.4 Maximum input level	6	"38.521-1_TPanalysis_7.4_Maximun input level_v2.zip"	RAN5#82
7.4A Maximum input level for CA	2CC:2 3CC:2	"38.521-1_TP analysis 7.4A maxIL for CA_v1.zip"	RAN5#89-e
7.4D Maximum input level for UL-MIMO		"38.521-1_TPanalysis_7.4_Maximun input level_v2.zip"	RAN5#82
7.5 Adjacent Channel Selectivity	3	"38.521-1_TPanalysis_7.5_ACS_v2.zip"	RAN5#82
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		"38.521-1_TPanalysis_7.5_ACS_v2.zip"	RAN5#82
7.6.2 In Band Blocking	3	"38.521-1_TPanalysis_7.6.2_InB_Block_v2.zip"	RAN5#5-5G-NR Adhoc
7.6.3 Out-of-band blocking	3	"38.521-1_TPanalysis_7.6.3_OobBlocking_v2.zip"	RAN5#5-5G-NR Adhoc
7.6.4 Narrow band blocking	3	"38.521-1_TPanalysis_7.6.4_NarrowbBlocking_v2.zip"	RAN5#5-5G-NR Adhoc
7.6A.2 Inband blocking for CA 2CC: 3CC:1	1	"38.521-1_TP analysis 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_v2.zip"	RAN5#5-5G-NR Adhoc
7.6D.3 Out-of-band blocking for UL-MIMO	3	"38.521-1_TPanalysis_7.6.3_OobBlocking_v2.zip"	RAN5#5-5G-NR Adhoc
7.6D.4 Narrow band blocking for UL-MIMO	3	"38.521-1_TPanalysis_7.6.4_NarrowbBlocking_v2.zip"	RAN5#5-5G-NR Adhoc
7.7 Spurious response	3	"38.521-1_TPanalysis_7.7_Spurious response.zip"	RAN5#4-5G-NR Adhoc
7.7D Spurious response for UL-MIMO	3	"38.521-1_TPanalysis_7.6.3_OobBlocking_v2.zip"	RAN5#83
7.8.2 Wide band Intermodulation	3	"38.521-1_TPanalysis_7.8.2_WidebandIntermod_v2.zip"	RAN5#5-5G-NR Adhoc
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_v2.zip"	RAN5#5-5G-NR Adhoc
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 6.2C, 6.4C, 6.5C 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.

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 only 15 kHz SCS is supported for SUL bands, it's reasonable to select 15 kHz SCS for SUL carrier and 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.

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	640	RAN5#86e
6.2C.5 UE additional maximum output power reduction for SUL	Table 4.1.1.1-1	RAN5#87e
6.3C.1 Minimum output power for SUL	45	RAN5#87e
6.3C.3 Transmit ON/OFF time mask for SUL	45	RAN5#87e
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
6.5C.1 Occupied bandwidth for SUL	18	RAN5#86e
6.5C.2.2 Spectrum Emission Mask for SUL	108 for PC3 108 for PC2	RAN5#86e
6.5C.2.3 Additional spectrum emission mask for SUL	27	RAN5#86e
6.5C.2.4.1 NR ACLR for SUL	640 for PC3 640 for PC2	RAN5#86e
6.5C.2.4.2 UTRA ACLR for SUL	Table 4.1.1.1-1	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

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	15	RAN5#84
7.6C.2 Inband Blocking for SUL	3	RAN5#87e
7.6C.3 Out-of-band blocking for SUL	3	RAN5#87e

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.

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 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	6.2.3: 80 40 for SUL testing			"38.521-1_TPanalysis_6.2.3_AMPR_NS_03.zip"	RAN5#85
NS_04	6.2.3: 220 6.2D.3: 112 6.5D.3.3:112			"38.521-1_TPanalysis_6.2.3_AMPR_NS_04_v2.zip"	RAN5#5-5G-NR Adhoc
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			"38.521-1_TPanalysis_6.2.3_AMPR_NS_05_v2.zip"	RAN5#86
NS_17	6.5.3.3: 4			"38.521-1_TPanalysis_6.5.3.3_TX_Additional_Spurious_Emission_NS_17.zip"	RAN5#88-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			"38.521-1_TPanalysis_6.2.3_AMPR_NS_21.zip"	RAN5#89-e
NS_24	6.2.3: 300			"38.521-1_TPanalysis_6.2.3_AMPR_NS_24.zip"	RAN5#87
NS_27	6.2.3: 252			"38.521-1_TPanalysis_6.2.3_AMPR_NS_27.zip"	RAN5#87
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			"38.521-1_TPanalysis_6.2.3_AMPR_6.5.3.3_ASE_NS_44.zip"	RAN5#89-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			"38.521-1_TPanalysis_6.2.3_AMPR_NS_47.zip"	RAN5#87
NS_48	192			"38.521-1_TPanalysis_6.2.3_AMPR_NS_48.zip"	RAN5#88-e
NS_100	72			"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. Testing all possible combinations would lead to too excessive testing and the combinations that are realistic should therefore be prioritized. This selection is documented in table 4.1.1.1-1.

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 CA_n8-n78	NS_100	NS_01	24	N/A	"38.521-1_TP analysis 6.2A.3 NS_100+NS_01.zip"	RAN5#87-e
CA_n8-n78	NS_43	NS_01	12	N/A	"38.521-1_TP analysis 6.2A.3 NS_43+NS_01.zip"	RAN5#88-e
CA_n8-n78	NS_43U	NS_01	12	N/A	"38.521-1_TP analysis 6.2A.3 NS_43U+NS_01.zip"	RAN5#88-e
Note 1: As per TS 38.101.						

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

- Test the minimum Total power backoff value
- Test the maximum Total power backoff value
- Test the maximum unbalanced Total power backoff among CCs (max $P_{CMAX,c}$ difference).

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

4.1.3 Test point analysis per NR CA configuration

4.1.3.1 Reference Sensitivity test cases for FR1 NR CA

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.

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

CA config	Justification	Comments
CA_n1A-n78A	38.521-1_TpAnalysisSpur(CA_n1A-n78A)v2.zip	Added at RAN5#88e
CA_n3A-n78A	TpAnalysisSpur(n3A-n78A).zip	Added at RAN5#82
CA_n8A-n78A	TpAnalysisSpur(n8A-n78A).zip	Added at RAN5#82
CA_n41A-n79A	TpAnalysisSpur(n41A-n79A).zip	Added at RAN5#83

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_v2.zip”	RAN5#5-5G-NR Adhoc
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.zip”	RAN5#89-e
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 for CA”	RAN5#84
6.3.1 Minimum output power	9	“38.521-2_TP analysis_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
6.3.4.3 Relative power tolerance	FFS	“38.521-2_TPanalysis_6.3.4.3_RelPtol.zip”	RAN5#82
6.3.4.4 Aggregate power tolerance	PUCCH: 6 PUSCH: 6	“38.521-2_TPanalysis_6.3.4.4_AggPtol.zip”	RAN5#82
6.3A.1.1 Minimum output power for CA (2UL CA)	4	“38.521-2_TP analysis_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_TP analysis_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_TP analysis_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_TP analysis_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_TP analysis_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_TP analysis_6.3A.4.2.1_AbsPCTol_CA.zip	RAN5#85
6.3D.1 Minimum output power for UL MIMO	9	“38.521-2_TP analysis_6.3.1_MinOP_v2.zip“	RAN5#84
6.3D.3.4 SRS time mask for UL-MIMO	18	“38.521-2_TP analysis_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
6.4.2.2 Carrier leakage	3	“38.521-2_TPanalysis_6.4.2.2_CarrLeak_v2.zip”	RAN5#89-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_TPanalysis_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_TPanalysis_6.4.2.4_6.4.2.5_EVMequalizerSpectrumFlatness.zip”	RAN5#3-5G-NR Adhoc
6.4A.1 Frequency error for CA	1	“38.521-2_TPanalysis_6.4A.1_FreqErr_CA.zip”	RAN5#87-e
6.4A.2.2 Carrier leakage for CA	2	“38.521-2_TPanalysis_6.4A.2.2_CarrLeak_CA_v2.zip”	RAN5#89-e
6.5.1 Occupied Bandwidth	12	“38.521-2_TPanalysis_6.5.1_OccBW_v2.zip”	RAN5#89-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.zip”	RAN5#2-5G-NR Adhoc RAN5#79 RAN5#80 RAN5#89-e
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.zip”	RAN5#2-5G-NR Adhoc RAN5#89-e
6.5.3.1 Spurious emissions	2	“38.521-2_TPanalysis_6.5.3_TxSpurious_v2.zip”	RAN5#84
6.5.3.2 Spurious emissions UE band co-existence	2	“38.521-2_TPanalysis_6.5.3_TxSpurious_v2.zip”	RAN5#84
6.5.3.3 Additional spurious emission	2	“38.521-2_TPanalysis_6.2.3_AMPR_NS_201.zip”	RAN5#84
6.5A.2.1 Spectrum Emission Mask for CA	30	“38.521-2_TPanalysis_6.5A.2.1_SEM_CA.zip”	RAN5#89-e
6.5A.2.2 Adjacent channel leakage ratio for CA	52	“38.521-2_TPanalysis_6.5A.2.2_ACLR_CA.zip”	RAN5#89-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	3	"38.521-2_TPanalysis_7.4_Maximun input level.zip"	RAN5#81
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_201	6.2.3: 2 6.5.3.3: 2	"38.521-2_TPanalysis_6.2.3_AMPR_NS_201_v2.zip"	RAN5#86-e

4.2.3 Test point analysis per NR CA configuration

4.2.3.1 Reference Sensitivity test cases for FR2 NR CA

FFS

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.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	Same as 6.2B.2.1	Same as 6.2B.2.1	RAN5#85
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: 90 -UE supporting DPS: 140	"38.521-3_TPanalysis_6.2B.4.1.3_ConfiguredTP_Inter_B_within_FR1_v2.zip"	RAN5#86-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.zip"	RAN5#83
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	304	"38.521-3_TPanalysis_6.2B.2.1_MPR_6.5B.2.1_SEM_6.5B.2.	RAN5#87-e

intra-band contiguous EN-DC		1.3_ACLR.zip”	
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.3.1 Spurious Emissions for intra-band contiguous EN-DC	12	38.521-3_TP_analysis_6.5B.3_TX_SpurEmission_EN-DC_V2“.zip”	RAN5#88e
6.5B.3.2 Spurious emission for intra-band non-contiguous EN-DC	12	38.521-3_TP_analysis_6.5B.3_TX_SpurEmission_EN-DC_V2“.zip	RAN5#88e
6.5B.3.3 Spurious Emissions for Inter-band EN-DC within FR1	24	“38.521-3_TP_analysis_38.905_6.5B.3_TX_SpurEmission_EN-DC.zip”	RAN5#82
6.5B.3.3.2 Spurious Emissions band UE co-existence for Inter-band within FR1	Note 1	“38.521-3_TP_analysis_38.905_6.5B.3.3.2_TX_SpurEmission_EN-DC.zip”	RAN5#87-e
Note 1: The maximum number of test point is 24 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_TP analysis_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_TPanalysis_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_TPanalysis_7.4B.2_MaxIL_Intra_B_noncontig.zip"	RAN5#82
7.5B.1 Adjacent Channel Selectivity for intra-band contiguous EN-DC (2 CCs)	Same as Table 7.3B.2.1.4.1-1, test case 7.3B.2.1.	Same as Table 7.3B.2.1.4.1-1, test case 7.3B.2.1.	RAN5#85
7.6B.2.1 Inband blocking for intra-band contiguous EN-DC in FR1 (2 CCs)	2	"38.521-3_TPanalysis_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_TPanalysis_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_TPanalysis_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_TPanalysis_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

4.3.2 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

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	Added at RAN5#89-e
DC_1A_n78A	38.521-3_TpAnalysisSpur(DC_1A_n78A).zip	Added at RAN5#88-e
DC_2A_n5A	38.521-3_TpAnalysisSpur(DC_2A_n5A).zip	Added at RAN5#89-e
DC_2A_n66A	38.521-3_TpAnalysisSpur(DC_2A_n66A).zip	Added at RAN5#88-e
DC_2A_n78A	38.521-3_TpAnalysisSpur(DC_2A_n78A).zip	Added at RAN5#88-e
DC_3A_n1A	38.521-3_TpAnalysisSpur(DC_3A_n1A).zip	Added at RAN5#88-e
DC_3A_n7A	38.521-3_TpAnalysisSpur(DC_3A_n7A).zip	Added at RAN5#88-e
DC_3A_n41A	38.521-3_TpAnalysisSpur(DC_3A-n41A)_v1.zip	Added at RAN5#86-e
DC_3A_n78A	38.521-3_TpAnalysisSpur(DC_3A_n78A).zip	Added at RAN5#88-e
DC_3A_n79A	38.521-3_TpAnalysisSpur(DC_3A-n79A).zip	Added at RAN5#83
DC_5A_n66A	38.521-3_TpAnalysisSpur(DC_5A_n66A)_v1.zip	Added at RAN5#88-e
DC_5A_n78A	38.521-3_TpAnalysisSpur(DC_5A_n78A)_v1.zip	Added at RAN5#88-e
DC_7A_n1A	38.521-3_TpAnalysisSpur(DC_7A_n1A).zip	Added at RAN5#88-e
DC_7A_n66A	38.521-3_TpAnalysisSpur(DC_7A_n66A).zip	Added at RAN5#88-e
DC_7A_n78A	38.521-3_TpAnalysisSpur(DC_7A_n78A).zip	Added at RAN5#88-e
DC_8A_n1A	38.521-3_TpAnalysisSpur(DC_8A_n1A).zip	Added at RAN5#88-e
DC_8A_n41A	38.521-3_TpAnalysisSpur(DC_8A-n41A)_v1.zip	Added at RAN5#86-e
DC_8A_n78A	38.521-3_TpAnalysisSpur(DC_8A_n78A).zip	Added at RAN5#89-e
DC_12A_n66A	38.521-3_TpAnalysisSpur(DC_12A_n66A).zip	Added at RAN5#89-e
DC_12A_n78A	38.521-3_TpAnalysisSpur(DC_12A_n78A).zip	Added at RAN5#88-e
DC_13A_n66A	38.521-3_TpAnalysisSpur(DC_13A_n66A).zip	Added at RAN5#89-e
DC_20A_n3A	38.521-3_TpAnalysisSpur(DC_20A-n3A).zip	Added at RAN5#89-e
DC_28A_n3A	38.521-3_TpAnalysisSpur(DC_28A_n3A).zip	Added at RAN5#88-e
DC_30A_n5A	38.521-3_TpAnalysisSpur(DC_30A_n5A).zip	Added at RAN5#89-e
DC_39A_n41A	38.521-3_TpAnalysisSpur(DC_39A-n41A).zip	Added at RAN5#83
DC_39A_n79A	38.521-3_TpAnalysisSpur(DC_39A-n79A).zip	Added at RAN5#83
DC_40A_n1A	38.521-3_TpAnalysisSpur(DC_40A_n1A).zip	Added at RAN5#88-e
DC_40A_n41A	38.521-3_TpAnalysisSpur(DC_40A-n41A).zip	Added at RAN5#83
DC_40A_n78A	38.521-3_TpAnalysisSpur(DC_40A_n78A).zip	Added at RAN5#88-e
DC_41A_n79A	38.521-3_TpAnalysisSpur(DC_41A-n79A).zip	Added at RAN5#83
DC_66A_n2A	38.521-3_TpAnalysisSpur(DC_66A_n2A).zip	Added at RAN5#88-e
DC_66A_n5A	38.521-3_TpAnalysisSpur(DC_66A-n5A).zip	Added at RAN5#87-e
DC_66A_n78A	38.521-3_TpAnalysisSpur(DC_66A_n78A)_v1.zip	Added at RAN5#88-e

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.

Annex B: 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-	16.2.0

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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	16.6.0

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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