

## Broadband Radio Access Networks (BRAN) Test Report Template for testing to EN 301 893 V1.5.1 (R&TTE)

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# Contents

Intellectual Property Rights .....	5
Foreword.....	5
1 Scope .....	6
2 References .....	6
2.1 Normative references .....	6
2.2 Informative references.....	7
3 Definitions, symbols and abbreviations .....	7
3.1 Definitions.....	7
3.2 Symbols.....	7
3.3 Abbreviations .....	7
4 Cover page and notes .....	8
5 Application form .....	8
5.1 Information as required by EN 301 893 .....	8
5.2 Additional information provided by the submitter .....	16
5.3 List of ancillary and/or support equipment provided by the submitter.....	17
6 List of technical requirements to be tested.....	17
6.1 Transmitter parameters.....	18
6.2 Receiver parameters .....	18
7 List of conformance tests and related test frequencies.....	18
8 Test results.....	19
8.1 Results summary .....	19
8.1.1 Transmitter.....	20
8.1.2 Receiver .....	20
8.2 Test results.....	20
8.2.1 Carrier frequencies.....	20
8.2.1.1 Channel Bandwidth # 1 .....	20
8.2.1.1.1 Lower sub-band (5 150 MHz to 5 350 MHz).....	21
8.2.1.1.2 Higher Sub-band (5 470 MHz to 5 725 MHz).....	21
8.2.1.2 Channel Bandwidth # 2 .....	21
8.2.1.2.1 Lower sub-band (5 150 MHz to 5 350 MHz).....	22
8.2.1.2.2 Higher Sub-band (5 470 MHz to 5 725 MHz).....	22
8.2.2 Occupied Channel Bandwidth .....	23
8.2.2.1 Channel Bandwidth # 1 .....	23
8.2.2.2 Channel Bandwidth # 2.....	23
8.2.3 RF Output power, Transmit Power Control (TPC) and Power Density.....	23
8.2.3.1 TPC range 1 (or Power Setting 1) .....	24
8.2.3.1.1 Operating mode 1: Single antenna equipment or equipment with only 1 antenna active in this mode (see EN 301 893, clause 5.1.4.2.1) .....	24
8.2.3.1.2 Operating mode 2: Multiple antennas, no beam forming (see EN 301 893, clause 5.1.4.2.2).....	29
8.2.3.1.3 Operating mode 3: Multiple antennas, with beam forming (see EN 301 893, clause 5.1.4.2.3).....	32
8.2.3.2 TPC range 2 (or Power Setting 2) .....	36
8.2.4 Transmitter unwanted emissions outside the 5 GHz RLAN bands.....	36
8.2.4.1 Conducted Transmitter Spurious Emissions (see EN 301 893, clause 5.3.5.2).....	37
8.2.4.1.1 Lower Sub-band, test frequency F1, conducted testing .....	38
8.2.4.1.2 Lower Sub-band, test frequency F2, conducted testing .....	38
8.2.4.1.3 Higher Sub-band, test frequency F3, conducted testing .....	39
8.2.4.1.4 Higher Sub-band, test frequency F4, conducted testing .....	40
8.2.4.2 Radiated Transmitter Spurious Emissions (see EN 301 893, clause 5.3.5.1).....	41
8.2.4.2.1 Lower Sub-band, test frequency F1, radiated testing .....	41
8.2.4.2.2 Lower Sub-band, test frequency F2, radiated testing .....	42
8.2.4.2.3 Higher Sub-band, test frequency F3, radiated testing.....	42

8.2.4.2.4	Higher Sub-band, test frequency F4, radiated testing.....	43
8.2.5	Transmitter unwanted emissions within the 5 GHz RLAN bands .....	43
8.2.5.1	Channel Bandwidth #1: ..... MHz.....	43
8.2.5.2	Channel Bandwidth #2: ..... MHz.....	44
8.2.6	Receiver spurious emissions .....	45
8.2.6.1	Conducted Receiver Spurious Emissions (see EN 301 893, clause 5.3.7) .....	46
8.2.6.1.1	Lower Sub-band, conducted testing .....	46
8.2.6.1.2	Higher Sub-band, conducted testing.....	46
8.2.6.2	Radiated Receiver Spurious Emissions (see EN 301 893, clause 5.3.7) .....	47
8.2.6.2.1	Lower Sub-band, radiated testing).....	47
8.2.6.2.2	Higher Sub-band, radiated testing .....	47
8.2.7	Dynamic Frequency Selection (DFS) .....	48
8.2.7.1	Channel Availability Check (CAC) .....	48
8.2.7.1.1	Channel Availability Check Time .....	48
8.2.7.1.2	Interference Detection Threshold during the Channel Availability Check.....	49
8.2.7.3	Off-Channel CAC .....	49
8.2.7.3.1	Interference Detection Threshold during the Off-Channel CAC & Off-Channel CAC time .....	49
8.2.7.3.2	Off-Channel CAC Detection Probability ( $P_d$ ) for the band 5 600 MHz to 5 650 MHz .....	50
8.2.7.4	Interference Detection Threshold during In-Service Monitoring.....	51
8.2.7.5	Channel Shutdown and Non-Occupancy Period .....	52
8.2.7.5.1	The UUT is a Master device or a Slave device with or without a Radar Interference Detection function.....	53
8.2.7.5.2	The UUT is a Slave device with a Radar Interference Detection function.....	53
9	Test Set-Ups .....	54
10	Screen Plots / Screen Captures .....	54
11	Photographs of the equipment (UUT).....	54
History	.....	55

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## Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Broadband Radio Access Networks (BRAN).

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# 1 Scope

It is expected that the present document can be used as a Test Report Template that would be useful for national conformity assessment bodies and market surveillance authorities in countries where the R&TTE is in force, as well as for the assistance of manufacturers and test houses, although such a Report Template would remain voluntary.

As such, test Report Templates for testing against Harmonized Standards may be used:

- in countries where the R&TTE Directive [i.1] is in force, for manufacturers' self testing;
- in countries where the R&TTE Directive [i.1] is in force, for the purpose of third-party testing;
- in countries where the R&TTE Directive [i.1] is in force, for parameters that Administrations may wish to have tested by a third-party (e.g. in the case of market surveillance/enforcement);
- in countries where the R&TTE Directive [i.1] is not in force, for the purpose of third-party testing and Type Approval.

The present document recommends text and formatting to be used in Test Reports for equipment being assessed to version 1.5.1 of EN 301 893 [i.4].

Other editions of EN 301 893 [i.4] may require a different format to cover additional or different test requirements than those contained in the present document. This will be the subject of further work.

NOTE: TR 102 439 [i.5] contains text and formatting to be used in Test Reports for equipment being assessed to version 1.3.1 of EN 301 893 [i.2].

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# 2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
  - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
  - for informative references.

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NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

## 2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

Not applicable.

## 2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

- [i.1] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive).
- [i.2] ETSI EN 301 893 (V1.3.1): "Broadband Radio Access Networks (BRAN); 5 GHz high performance RLAN; Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive".
- [i.3] ETSI EN 301 893 (V1.4.1): "Broadband Radio Access Networks (BRAN); 5 GHz high performance RLAN; Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive".
- [i.4] ETSI EN 301 893 (V1.5.1): "Broadband Radio Access Networks (BRAN); 5 GHz high performance RLAN; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive".
- [i.5] ETSI TR 102 439 (V1.1.1): "Broadband Radio Access Networks (BRAN); Test Report Template for testing to EN 301 893 (V1.3.1) (R&TTE)".

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## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purpose of the present document, the terms and definitions given in EN 301 893 [i.4] and the following apply:

**submitter:** manufacturer, company or person that is submitting a product to be tested against the harmonized standard EN 301 893 [i.4]

### 3.2 Symbols

For the purposes of the present document, the following symbols apply:

dB <sub>i</sub>	antenna gain in decibels relative to an isotropic antenna
dB <sub>m</sub>	dB relative to 1 milliwatt
GHz	GigaHertz
Hz	Hertz
kHz	kiloHertz
MHz	MegaHertz

### 3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AC	Alternating Current
CE	Communauté Européenne (European Community)
DC	Direct Current
EIRP	Equivalent Isotropically Radiated Power
ITU	International Telecommunications Union
NCB	Nominal Channel Bandwidth
OCB	Occupied Channel Bandwidth
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency

Tx                      Transmitter  
 UUT                    Unit Under Test

## 4 Cover page and notes

The title page should include the following title:

- "Test Report to EN 301 893 [i.4] (V1.5.1)".

In addition, the title page should contain the following information:

- 1) Name of the laboratory performing the test.
- 2) Test report reference number and revision number if applicable.
- 3) The name of the manufacturer.
- 4) The name of the submitter (if different from the manufacturer).
- 5) Equipment identification, including brand name, model number, etc.
- 6) Test Report date.

Additional information to be provided in the report:

- 7) Equipment serial number.
- 8) Test dates.
- 9) Hardware and/or software identification (including version numbers and modification state).
- 10) Authorization Signatures.
- 11) A list of the test equipment, ancillary equipment and supporting equipment used during the tests.
- 12) Deviations from the standard test procedures (e.g. test procedures defined by Notified Bodies).

## 5 Application form

The information contained in this clause should be provided by the submitter prior to the testing. It contains product information as required by EN 301 893 [i.4], clause 5.3.1 as well as other information which will assist the test engineer in determining which tests have to be performed as well as the relevant test configurations and conditions.

This application should form part of the final test report.

### 5.1 Information as required by EN 301 893

In accordance with EN 301 893 [i.4], clause 5.3.1, the following information was provided by the submitter:

**a) The Channel Plan(s):**

**Channel Plan 1:**

- Nominal Channel Bandwidth 1: ..... MHz

The associated centre frequencies:

- Nominal Channel Bandwidth 2: ..... MHz

The associated centre frequencies:

NOTE 1: Add more lines if the equipment has more channel Bandwidths for this Channel Plan.



**Channel Plan 2:**

- Nominal Channel Bandwidth 1: ..... MHz

The associated centre frequencies:

- Nominal Channel Bandwidth 2: ..... MHz

The associated centre frequencies:

NOTE 2: Add more lines if the equipment has more Channel Plans.

**b) The different transmit operating modes:**

1. Operating mode 1: Single Antenna Equipment
- a) Equipment with only 1 antenna
- b) Equipment with 2 diversity antennas but only 1 antenna active at any moment in time
- c) Smart Antenna Systems with 2 or more antennas, but operating in a (legacy) mode where only 1 antenna is used. (e.g. IEEE 802.11a legacy mode in smart antenna systems)
2. Operating mode 2: Smart Antenna Systems - Multiple Antennas without beam forming
- a) Single spatial stream (e.g. IEEE 802.11a legacy mode) using Channel Bandwidth 1
- b) High Throughput (more than 1 spatial stream) using Channel Bandwidth 1
- c) High Throughput (more than 1 spatial stream) using Channel Bandwidth 2

NOTE 3: Add more options if applicable for this operating mode (e.g. for other Channel Bandwidths)

3. Operating mode 3: Smart Antenna Systems - Multiple Antennas with beam forming
- a) Single spatial stream (e.g. IEEE 802.11a legacy mode) using Channel Bandwidth 1
- b) High Throughput (more than 1 spatial stream) using Channel Bandwidth 1
- c) High Throughput (more than 1 spatial stream) using Channel Bandwidth 2

NOTE 4: Add more options if applicable for this operating mode (e.g. for other Channel Bandwidths)

**c) In case of Smart Antenna Systems:**

The number of Receive chains: .....

The number of Transmit chains: .....

Equal power distribution among the transmit chains:  Yes  No

In case of beam forming, the maximum beam forming gain: ..... dB

NOTE 5: Beam forming gain does not include the basic gain of a single antenna.

**d) TPC feature available:**

- Yes
- No

- e) If the equipment has a TPC range:** the lowest and highest power level (or lowest and highest EIRP level in case of integrated antenna equipment), intended antenna assemblies and corresponding operating frequency range for the TPC range (or for each of the TPC ranges if more than one is implemented).

NOTE 6: The current template assumes the UUT has 2 TPC ranges. Add more sections similar to the ones below if the equipment has more than 2 TPC ranges.

**TPC range 1:**

Applicable Frequency Range:

 5 150 MHz to 5 350 MHz and 5 470 MHz to 5 725 MHz (Indoor) 5 470 MHz to 5 725 MHz only (Outdoor only)Applicable power levels (see note):  Tx out  EIRP

NOTE 7: Indicate whether the power levels specified are Transmitter Output Power levels or EIRP levels in case of integrated antenna equipment.

**Table 1: Power levels for TPC range 1**

Operating Mode #	Lowest setting ( $P_{low}$ ): (dBm)		Highest setting ( $P_{high}$ ): (dBm)	
	Per active Tx chain	Total for all active Tx chains	Per active Tx chain	Total for all active Tx chains
Mode 1				
Mode 2				
Mode 3				

Beam forming possible:  Yes  No

Intended Antenna Assemblies:

**Table 2: Intended Antenna Assemblies for TPC range 1**

Ant. #	Antenna Assembly name	Operating Mode	Antenna Gain (dBi)	Beam forming gain (dB)	EIRP for $P_{low}$ (dBm)	EIRP for $P_{high}$ (dBm)
1		Mode 1		0		
		Mode 2		0		
		Mode 3				
2		Mode 1		0		
		Mode 2		0		
		Mode 3				
3		Mode 1		0		
		Mode 2		0		
		Mode 3				
4		Mode 1		0		
		Mode 2		0		
		Mode 3				
5		Mode 1		0		
		Mode 2		0		
		Mode 3				

NOTE 1: Add more rows into the table if more antenna assemblies are intended for this TPC range.  
NOTE 2: The values for EIRP should represent the total EIRP for the system, taking all active Tx chains into account.  
NOTE 3: For equipment that is intended to be used with a variety of antennas, as a minimum, the antennas with the lowest and highest gain should be listed in table 2 above.

**DFS Threshold level:** ..... dBm  at the antenna connector  
 in front of the antenna

NOTE 8: According to EN 301 893 [i.4], for equipment with a maximum EIRP Spectral Density of 10 dBm/MHz, the DFS threshold level shall be -62 dBm or less. This level assumes a 0 dBi antenna gain. For devices employing different EIRP spectral density and/or a different receive antenna gain G (dBi), the DFS threshold level at the receiver input follows the following relationship:

$$\text{DFS Detection Threshold (dBm)} = -62 + 10 \cdot \text{EIRP Spectral Density (dBm/MHz)} + G \text{ (dBi)}$$

However, the DFS threshold level shall not be lower than -64 dBm assuming a 0 dBi receive antenna gain. To define the applicable threshold level at the (temporary) antenna connector, the gain of the antenna (in dBi) shall be added to the threshold level. If more than one antenna is intended for this TPC range or power setting, the antenna gain of the antenna with the lowest gain shall be used.

### TPC range 2:

Applicable Frequency Range:

- 5 150 MHz to 5 350 MHz and 5 470 MHz to 5 725 MHz (Indoor)  
 5 470 MHz to 5 725 MHz only (Outdoor only)

Applicable power levels:  Tx out  EIRP

**Table 3: Power levels for TPC range 2**

Operating Mode #	Lowest setting ( $P_{\text{low}}$ ): (dBm)		Highest setting ( $P_{\text{high}}$ ): (dBm)	
	Per active Tx chain	Total for all active Tx chains	Per active Tx chain	Total for all active Tx chains
Mode 1				
Mode 2				
Mode 3				

Beam forming possible:  Yes  No

Intended Antenna Assemblies:

Table 4: Intended Antenna Assemblies for TPC range 2

Ant. #	Antenna Assembly name	Operating Mode #	Antenna Gain (dBi)	Beam forming gain (dB)	EIRP for P <sub>low</sub> (dBm)	EIRP for P <sub>high</sub> (dBm)
1		Mode 1		0		
		Mode 2		0		
		Mode 3				
2		Mode 1		0		
		Mode 2		0		
		Mode 3				
3		Mode 1		0		
		Mode 2		0		
		Mode 3				
4		Mode 1		0		
		Mode 2		0		
		Mode 3				
5		Mode 1		0		
		Mode 2		0		
		Mode 3				

NOTE 1: Add more rows into the table if more antenna assemblies are intended for this TPC range.  
NOTE 2: The values for EIRP should represent the total EIRP for the system, taking all active Tx chains into account.  
NOTE 3: For equipment that is intended to be used with a variety of antennas, as a minimum, the antennas with the lowest and highest gain should be listed in table 2 above.

**DFS Threshold level:** ..... dBm  at the antenna connector  
 in front of the antenna

See also the note under table 2.

- f) If the equipment has no TPC feature**, the maximum transmitter output power level (or maximum EIRP level in case of integrated antenna equipment), the intended antenna assemblies, the corresponding operating frequency range and the corresponding DFS threshold level. If the equipment has multiple power levels and corresponding antenna assemblies, than this information should be provided for each of the stated power levels.

NOTE 9: The manufacturer may decide to declare that his equipment can operate with and without a TPC feature in which case he may provide details under both clauses e) and f)

NOTE 10: The current template assumes the UUT has 2 power settings. Add more sections similar to the ones below if the equipment has more power levels.

**Power Setting 1:**

Applicable Frequency Range:

5 150 MHz to 5 350 MHz and 5 470 MHz to 5 725 MHz (Indoor)

5 470 MHz to 5 725 MHz only (Outdoor only)

Power level:  TX out  EIRP

NOTE 11: Indicated whether the power levels specified are Transmitter Output Power levels or EIRP levels in case of integrated antenna equipment.

**Table 5: Power levels for Power Setting 1**

Operating Mode #	Power Level: (dBm)	
	Per active Tx chain	Total for all active Tx chains
Mode 1		
Mode 2		
Mode 3		

Beam forming possible:  Yes  No

Intended Antenna Assemblies:

**Table 6: Intended Antenna Assemblies for Power Setting 1**

Ant. #	Antenna Assembly name	Operating Mode	Antenna Gain (dBi)	Beam forming gain (dB)	EIRP (dBm)
		Mode 1			
		Mode 2			
		Mode 3			
		Mode 1			
		Mode 2			
		Mode 3			

NOTE 1: Add more rows into the table if more antenna assemblies are intended for this power setting.  
 NOTE 2: The values for EIRP should represent the total EIRP for the system, taking all active Tx chains into account.  
 NOTE 3: For equipment that is intended to be used with a variety of antennas, as a minimum, the antennas with the lowest and highest gain should be listed in table 2 above.

DFS Threshold level: ..... dBm  at the antenna connector

in front of the antenna

NOTE 12: According to EN 301 893 [i.4], for equipment with a maximum EIRP Spectral Density of 10 dBm/MHz, the DFS threshold level shall be -62 dBm or less. This level assumes a 0 dBi antenna gain. For devices employing different EIRP spectral density and/or a different receive antenna gain G (dBi) the DFS threshold level at the receiver input follows the following relationship:

$$\text{DFS Detection Threshold (dBm)} = -62 + 10 \cdot \text{EIRP Spectral Density (dBm/MHz)} + G \text{ (dBi)}$$

However, the DFS threshold level shall not be lower than -64 dBm assuming a 0 dBi receive antenna gain. To define the applicable threshold level at the (temporary) antenna connector, the gain of the antenna (in dBi) shall be added to the threshold level. If more than one antenna is intended for this TPC range or power setting, the antenna gain of the antenna with the lowest gain shall be used.