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Technical Report

Broadband Radio Access Networks (BRAN) Test Report Template for testing to EN 301 893 (V1.3.1) (R&TTE)



Reference

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Foreword

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

1 Scope

It is expected that Test Report Templates from ETSI 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 [1] is in force, for manufacturers' self testing;
- in countries where the R&TTE Directive [1] is in force, for the purpose of third-party testing;
- in countries where the R&TTE Directive [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 [1] is not in force, for the purpose of third-party testing and Type Approval.

The present report recommends text and formatting to be used in Test Reports for equipment being assessed to EN 301 893 [2].

Other editions of EN 301 893 [2] may require a different format to cover additional or different test requirements than those contained in these edition. This will be the subject of further work.

2 References

For the purposes of this Technical Report (TR) the following references apply:

- [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).
- [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".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purpose of the present document, the terms and definitions given in EN 301 893 [2] and the following apply:

submitter: manufacturer, company or person that is submitting a product to be tested against the harmonized standard EN 301 893 [2]

3.2 Symbols

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

dB _i	antenna gain in decibels relative to an isotropic antenna
dB _m	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
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 (V1.3.1)".

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 [2], 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 [2], clause 5.3.1, the following information was provided by the submitter:

- a) The occupied channel bandwidth(s):

Channel Bandwidth 1:

Channel Bandwidth 2:

NOTE: Add more lines if the equipment has more channel Bandwidths.

- b) The DFS related operating mode(s) of the equipment:

- Master
- Slave with radar detection
- Slave without radar detection

NOTE: If the equipment has more than 1 operating mode, tick all that apply.

- c) The equipment can operate in ad-hoc mode:

- no ad-hoc operation
- ad-hoc operation in the frequency range 5 150 MHz to 5 250 MHz without DFS
- ad-hoc operation with DFS

NOTE: If more than 1 is applicable, tick all that apply.

- d) Operating Frequency Range(s):

Range 1: 5 150 MHz to 5 350 MHz and 5 470 MHz to 5 725 MHz

Range 2: 5 470 MHz to 5 725 MHz

Range 3: 5 150 MHz to 5 250 MHz (ad-hoc without DFS)

Range 4: other,.....

NOTE: If the equipment has more than 1 Operating Frequency Range, tick all that apply.

- e) TPC feature available:

- Yes
- No

- f) 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: The current template assumes the UUT has 2 TPC ranges. Add more sections similar to the ones below if the equipment has more 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

Lowest setting (P_{low}): dBm

Highest setting (P_{high}): dBm

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

Intended Antenna Assemblies:

Table 1: Intended Antenna Assemblies for this TPC range

Antenna Assembly name	Antenna Gain (dBi)	EIRP for P_{low} (dBm)	EIRP for P_{high} (dBm)
NOTE: Add more rows into the table if more antenna assemblies are intended for this TPC range.			

DFS Threshold level: dBm at the antenna connector

in front of the antenna

NOTE: For equipment with a maximum EIRP below 200 mW, the DFS threshold level shall be -62 dBm or less, for equipment with an EIRP of 200 mW or above, the DFS threshold level shall be -64 dBm or less. These levels assume a 0 dBi 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

Lowest setting (P_{low}): dBm

Highest setting (P_{high}): dBm

Intended Antenna Assemblies:

Table 2: Intended Antenna Assemblies for this TPC range

Antenna Assembly name	Antenna Gain (dBi)	EIRP for P_{low} (dBm)	EIRP for P_{high} (dBm)
NOTE: Add more rows into the table if more antenna assemblies are intended for this TPC range.			

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

- g) 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 1: 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 clause f) and g)

NOTE 2: 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: dBm TX out / EIRP

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

Intended Antenna Assemblies:

Table 3: Intended Antenna Assemblies for this power setting

Antenna Assembly name	Antenna Gain (dBi)	EIRP (dBm)

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

NOTE: For equipment with a maximum EIRP below 200 mW, the DFS threshold level shall be -62 dBm or less, for equipment with an EIRP of 200 mW or above, the DFS threshold level shall be -64 dBm or less. These levels assume a 0 dBi 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.

Power Setting 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)

Power level: dBm TX out / EIRP

Intended Antenna Assemblies:

Table 4: Intended Antenna Assemblies for this power setting

Antenna Assembly name	Antenna Gain (dBi)	EIRP (dBm)

DFS Threshold level: dBm at the antenna connector

in front of the antenna

h) The extreme operating temperature range that apply to the equipment:

-20°C to +55°C (Outdoor and Indoor usage)

0°C to +35°C (Indoor usage only)

Other:

The nominal voltages of the stand-alone radio equipment or the nominal voltages of the combined (host) equipment or test jig in case of plug-in devices.

Details provided are for the: stand-alone equipment

combined (or host) equipment

test jig

Supply Voltage AC mains State AC voltage

DC State DC voltage

State DC current

In case of DC, indicate the type of power source:

Internal Power Supply

External Power Supply or AC/DC adapter

Battery Nickel Cadmium

Alkaline

Nickel-Metal Hydride

Lithium-Ion

Lead acid (Vehicle regulated)

Other

- i) The test sequences used (see also EN 301 893 [2], clause 5.1.2)

.....

- j) Type of Equipment

- Stand-alone
- Combined Equipment (Equipment where the radio part is fully integrated within another type of equipment)
- Plug-in radio device (Equipment intended for a variety of host systems)
- Other

5.2 Additional information provided by the submitter

- a) Modulation:

ITU Class of emission:

Can the transmitter operate un-modulated? yes no

- b) Duty Cycle

The transmitter is intended for: Continuous duty
 Intermittent duty
 Continuous operation possible for testing purposes

- c) About the UUT

- The equipment submitted are representative production models.
- If not, the equipment submitted are pre-production models ?
- If pre-production equipment is submitted, the final production equipment will be identical in all respects with the equipment tested.
- If not, supply full details:

- The equipment submitted is CE marked:
- The CE marking does include the Class-II identifier (Alert Sign).
- The CE marking does include a 4 digit number referring to the Notified Body involved.

5.3 List of ancillary and/or support equipment provided by the submitter

Where possible, the information below should include a description, brand name, model number etc. for each of the equipment provided:

.....

6 List of technical requirements to be tested

The list of technical requirements called for in EN 301 893 [2] is given below.

6.1 Transmitter parameters

Table 5: Transmitter parameters

EN Clause	Transmitter parameters	EN 301 893 [2] Page number
4.2	Carrier Frequencies	13
4.3	RF Output power, Transmit Power Control (TPC) and power density	13
4.4	Transmitter unwanted emissions	14
4.4.1	Transmitter unwanted emissions outside the 5 GHz RLAN bands	14
4.4.2	Transmitter unwanted emissions within the 5 GHz RLAN bands	15
4.6	Dynamic Frequency Selection (DFS)	16
4.6.2.1	Channel Availability Check	17
4.6.2.2	In-Service Monitoring	18
4.6.2.3	Channel Shutdown	18
4.6.2.4	Non-Occupancy Period	18
4.6.2.5	Uniform Spreading	19

6.2 Receiver parameters

Table 6: Receiver parameters

EN Clause	Receiver parameters	Page number
4.5	Receiver spurious emissions	15

7 List of conformance tests and related test frequencies

Table 7 contains the test frequencies to be used for each of the conformance tests described in EN 301 893 [2], clause 5.

Table 7: Conformance tests and related test frequencies

Test	EN Clause	Frequencies for testing (MHz) (see EN 301 893 [2], table 1) (see note)		
		Lower Sub-band (5 150 MHz to 5 350 MHz)		Higher Sub-band 5 470 MHz to 5 725 MHz
		5 150 MHz to 5 250 MHz	5 250 MHz to 5 350 MHz	
Carrier Frequencies	5.3.2			
Power, Power Density	5.3.3			
Transmitter unwanted emissions	5.3.4 and 5.3.5	5 180	5 320	5 500, 5 700
Receiver unwanted emissions	5.3.6			
Transmit Power Control	5.3.3	n.a.	5 320	5 500, 5 700
Dynamic Frequency Selection (DFS)	5.3.7	n.a.	One channel within this frequency range.	One channel within this sub-band.
NOTE: For equipment which is not able to operate on all channels, the test frequencies to be used shall be the lowest and highest frequencies for each of the sub-band(s) declared by the manufacturer.				

8 Test results

8.1 Results summary

The following table summarizes the technical requirements defined in EN 301 893 [2] and the corresponding results for the tested UUT.

Full testing according to EN 301 893 [2] may not be required. If partial testing was performed, this should be indicated as "NT" in the relevant column of tables 8 and 9 below within the test report.

8.1.1 Transmitter

Table 8: Transmitter results summary

EN Clause	Transmitter parameters	P (Pass)	F (Fail)	NT (Not Tested)	Report page number
4.2	Carrier Frequencies				
4.3	RF Output power, Transmit Power Control (TPC) and power density				
4.4	Transmitter unwanted emissions				
4.4.1	Transmitter unwanted emissions outside the 5 GHz RLAN bands				
4.4.2	Transmitter unwanted emissions within the 5 GHz RLAN bands				
4.6	Dynamic Frequency Selection (DFS)				
4.6.2.1	Channel Availability Check				
4.6.2.2	In-Service Monitoring				
4.6.2.3	Channel Shutdown				
4.6.2.4	Non-Occupancy Period				
4.6.2.5	Uniform Spreading				

8.1.2 Receiver

Table 9: Receiver results summary

EN Clause	Receiver parameters	P	F	NT	Report page number
4.5	Receiver spurious emissions				

8.2 Test results

8.2.1 Carrier frequencies

8.2.1.1 Lower sub-band (5 150 MHz to 5 350 MHz)

Table 10: Carrier frequencies in the Lower sub-band - Test results

Test Conditions (see EN 301 893 [2], clause 5.3.2.1):						
Power Setting :		dBm		<input type="checkbox"/> EIRP	<input type="checkbox"/> Conducted	
Duty Cycle:		%		Test results		
Rel. Humidity:		%		Measured Frequency (MHz)	Delta Frequency (kHz)	20 ppm Limit (+/- kHz)
Test Frequency:		5 180 MHz				
T _{nom}	°C	V _{nom}	Vac/dc			
T _{min}	°C	V _{min}	Vac/dc			
		V _{max}	Vac/dc			
T _{max}	°C	V _{min}	Vac/dc			
		V _{max}	Vac/dc			
Test Frequency:		5 320 MHz				
T _{nom}	°C	V _{nom}	Vac/dc			
T _{min}	°C	V _{min}	Vac/dc			
		V _{max}	Vac/dc			
T _{max}	°C	V _{min}	Vac/dc			
		V _{max}	Vac/dc			
Measurement uncertainty:				Hz		

8.2.1.2 Higher Sub-band (5 470 MHz to 5 725 MHz)

Table 11: Carrier frequencies in the Higher sub-band - Test results

Test Conditions (see clause EN 301 893 [2], clause 5.3.2.1):						
Power Setting :		dBm		<input type="checkbox"/> EIRP	<input type="checkbox"/> Conducted	
Duty Cycle:		%		Test results		
Rel. Humidity:		%		Measured Frequency (MHz)	Delta Frequency (kHz)	20 ppm Limit (± kHz)
Test Frequency:		5 500 MHz				
T _{nom}	°C	V _{nom}	Vac/dc			
T _{min}	°C	V _{min}	Vac/dc			
		V _{max}	Vac/dc			
T _{max}	°C	V _{min}	Vac/dc			
		V _{max}	Vac/dc			
Test Frequency:		5 700 MHz				
T _{nom}	°C	V _{nom}	Vac/dc			
T _{min}	°C	V _{min}	Vac/dc			
		V _{max}	Vac/dc			
T _{max}	°C	V _{min}	Vac/dc			
		V _{max}	Vac/dc			
Measurement uncertainty:				Hz		

8.2.2 RF Output power, Transmit Power Control (TPC) and power density

If the equipment has multiple power levels or TPC ranges, additional clauses similar to clauses 8.2.2.1, 8.2.2.2 and 8.2.2.3 will need to be added to the report.

8.2.2.1 RF output power at the highest power level (see EN 301 893, clause 5.3.3.2.1.1)

8.2.2.1.1 Lower Sub-band (5 150 MHz to 5 350 MHz)

Table 12: RF Output power at the highest power level in the Lower Sub-band - Test results

Test Conditions (see clause EN 301 893 [2], clause 5.3.3.1):						
Antenna gain:		dBi		(see EN 301 893 [2], clause 5.3.3.2.1.2 Step 2 b)		
Power Setting :		dBm		<input type="checkbox"/> EIRP	<input type="checkbox"/> Conducted	
Duty Cycle:		%		Test results		
Rel. Humidity:		%				
Test Frequency:		5 180 MHz		Measured Power (dBm) (see note 1)	EIRP (dBm)	EIRP Limit (dBm) (see note 2)
T_{nom}	°C	V_{nom}	Vac/dc			
T_{min}	°C	V_{min}	Vac/dc			
		V_{max}	Vac/dc			
T_{max}	°C	V_{min}	Vac/dc			
		V_{max}	Vac/dc			
Test Frequency:		5 320 MHz				
T_{nom}	°C	V_{nom}	Vac/dc			
T_{min}	°C	V_{min}	Vac/dc			
		V_{max}	Vac/dc			
T_{max}	°C	V_{min}	Vac/dc			
		V_{max}	Vac/dc			
Measurement uncertainty:						dB
NOTE 1: For radiated power measurements (EIRP), ignore this column and fill in the data directly into the column for EIRP.						
NOTE 2: For the applicable EIRP, see EN 301 893 [2] clause 4.3.2.1.						

8.2.2.1.2 Higher Sub-band (5 470 MHz to 5 725 MHz)

Table 13: RF Output power at the highest power level in the Higher Sub-band - Test results

Test Conditions (see clause EN 301 893 [2], clause 5.3.3.1):							
Antenna gain:		dBi		(see EN 301 893 [2], clause 5.3.3.2.1.2 Step 2 b)			
Power Setting :		dBm		<input type="checkbox"/> EIRP		<input type="checkbox"/> Conducted	
Duty Cycle:		%		Test results			
Rel. Humidity:		%		Measured Power (dBm) (see note 1)	EIRP (dBm)	EIRP Limit (dBm) (see note 2)	Margin (dB)
Test Frequency:		5 500 MHz					
T_{nom}	°C	V_{nom}	Vac/dc				
T_{min}	°C	V_{min}	Vac/dc				
		V_{max}	Vac/dc				
T_{max}	°C	V_{min}	Vac/dc				
		V_{max}	Vac/dc				
Test Frequency:		5 700 MHz					
T_{nom}	°C	V_{nom}	Vac/dc				
T_{min}	°C	V_{min}	Vac/dc				
		V_{max}	Vac/dc				
T_{max}	°C	V_{min}	Vac/dc				
		V_{max}	Vac/dc				
Measurement uncertainty:							dB
NOTE 1: For radiated power measurements (EIRP), ignore this column and fill in the data directly into the column for EIRP.							
NOTE 2: For the applicable EIRP limit, see EN 301 893 [2] clause 4.3.2.1. If the UUT is a Slave device without a Radar Interference Detection function, the maximum EIRP within this band is 200 mW for devices with TPC, and 100 mW for devices without TPC.							

8.2.2.2 RF output power at the lowest power level of the TPC range see EN 301 893, clause 5.3.3.2.1.2)

This clause has only to be completed if the equipment has a TPC feature.

8.2.2.2.1 Lower Sub-band (5 150 MHz to 5 350 MHz)

Table 14: RF Output power at the lowest power level in the Lower Sub-band - Test results

Test Conditions (see clause EN 301 893 [2], clause 5.3.3.1):							
Antenna gain:		dBi		(see EN 301 893 [2], clause 5.3.3.2.1.2 Step 2 b)			
Power Setting :		dBm		<input type="checkbox"/> EIRP		<input type="checkbox"/> Conducted	
Duty Cycle:		%		Test results			
Rel. Humidity:		%		Measured Power (dBm)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)
Test Frequency:		5 180 MHz					
T_{nom}	°C	V_{nom}	Vac/dc				
T_{min}	°C	V_{min}	Vac/dc				
		V_{max}	Vac/dc				
T_{max}	°C	V_{min}	Vac/dc				
		V_{max}	Vac/dc				
Test Frequency:		5 320 MHz					
T_{nom}	°C	V_{nom}	Vac/dc				
T_{min}	°C	V_{min}	Vac/dc				
		V_{max}	Vac/dc				
T_{max}	°C	V_{min}	Vac/dc				
		V_{max}	Vac/dc				
Measurement uncertainty:							dB
NOTE 1: For radiated power measurements (EIRP), ignore this column and fill in the data directly into the column for EIRP.							
NOTE 2: For the applicable EIRP, see EN 301 893 [2] clause 4.3.2.1.							

8.2.2.2.2 Higher Sub-band (5 470 MHz to 5 725 MHz)

Table 15: RF Output power at the lowest power level in the Higher Sub-band - Test results

Test Conditions (see clause EN 301 893 [2], clause 5.3.3.1):							
Antenna gain:		dBi		(see EN 301 893 [2], clause 5.3.3.2.1.2 Step 2 b)			
Power Setting :		dBm		<input type="checkbox"/> EIRP		<input type="checkbox"/> Conducted	
Duty Cycle:		%		Test results			
Rel. Humidity:		%		Measured Power (dBm)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)
Test Frequency:		5 500 MHz					
T_{nom}	°C	V_{nom}	Vac/dc				
T_{min}	°C	V_{min}	Vac/dc				
		V_{max}	Vac/dc				
T_{max}	°C	V_{min}	Vac/dc				
		V_{max}	Vac/dc				
Test Frequency:		5 700 MHz					
T_{nom}	°C	V_{nom}	Vac/dc				
T_{min}	°C	V_{min}	Vac/dc				
		V_{max}	Vac/dc				
T_{max}	°C	V_{min}	Vac/dc				
		V_{max}	Vac/dc				
Measurement uncertainty:							dB
NOTE 1: For radiated power measurements (EIRP), ignore this column and fill in the data directly into the column for EIRP.							
NOTE 2: For the applicable EIRP, see EN 301 893 [2] clause 4.3.2.1. If the UUT is a Slave device without a Radar Interference Detection function, the maximum EIRP at the lowest power level when operating in this band is 50 mW.							

8.2.2.3 Power density at the highest power level (see EN 301 893, clause 5.3.3.2.1.3)

This clause has only to be completed when operating at the highest power level. For devices with TPC, power density is not tested when operating at the lowest power level.

Table 16: Power Density at the highest power level - Test results

Test Conditions (see clause EN 301 893 [2], clauses 5.3.3.1 and 5.3.3.2.1.3):						
Antenna gain:	dBi	(see EN 301 893 [2], clause 5.3.3.2.1.3 Step 4)				
Power Setting :	dBm	<input type="checkbox"/> EIRP	<input type="checkbox"/> Conducted			
Duty Cycle:	%	Test results				
Rel. Humidity:	%	Measured Frequency (MHz) (see note 1)	Measured Power Density (dBm) (see note 2)	EIRP Density (dBm/MHz)	EIRP Density Limit (dBm/MHz) (see note 3)	Margin (dB)
Ambient Temp.:	°C					
Test Frequency:	5 180 MHz					
	5 320 MHz					
	5 500 MHz					
	5 700 MHz					
Measurement uncertainty:					dB	
NOTE 1: See EN 301 893 [2] clause 5.3.3.2.1.3, step 3.						
NOTE 2: For radiated power measurements (EIRP), ignore this column and fill in the data directly into the column for EIRP.						
NOTE 3: For the applicable EIRP density limit, see EN 301 893 [2] clause 4.3.2.1. If the UUT is a Slave device without a Radar Interference Detection function, the maximum EIRP density within the band 5 470 to 5 725 MHz is 10 dBm/MHz for devices with TPC, and 7 dBm/MHz for devices without TPC.						

8.2.3 Transmitter unwanted emissions outside the 5 GHz RLAN bands

8.2.3.1 Conducted Transmitter Spurious Emissions (see EN 301 893, clause 5.3.4.1)

Depending on the option chosen, performing conducted spurious emissions may not be required. See EN 301 893 [2] clause 5.3.4.1.

8.2.3.1.1 Lower Sub-band, test frequency is 5 180 MHz, conducted testing

Table 17: Conducted Transmitter Spurious Emissions - Test results for 5 180 MHz

Test Frequency:		5 180 MHz			
Test Conditions (see clause EN 301 893 [2], clause 5.3.4.1):					
Power Setting: (see note)		dBm	<input type="checkbox"/> EIRP	<input type="checkbox"/> Conducted	
Duty Cycle:		%			
Rel. Humidity:		%			
Ambient Temp.:		°C	Test results		
Start Frequency (MHz)	Stop Frequency (MHz)	Res. Bandwidth (kHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
30	47	100		-36	
47	74	100		-54	
74	87,5	100		-36	
87,5	118	100		-54	
118	174	100		-36	
174	230	100		-54	
230	470	100		-36	
470	862	100		-54	
862	1 000	100		-36	
1 000	5 150	1 000		-30	
5 350	5 470	1 000		-30	
5 725	26 500	1 000		-30	
Measurement uncertainty:				dB	
NOTE: The UUT shall be configured to operate at the highest stated power level. See EN 301 893 [2] clause 5.3.4.1.					

8.2.3.1.2 Lower Sub-band, test frequency is 5 320 MHz, conducted testing

Table 18: Conducted Transmitter Spurious Emissions - Test results for 5 320 MHz

Test Frequency:		5 320 MHz			
Test Conditions (see clause EN 301 893 [2], clause 5.3.4.1):					
Power Setting: (see note)		dBm	<input type="checkbox"/> EIRP	<input type="checkbox"/> Conducted	
Duty Cycle:		%			
Rel. Humidity:		%			
Ambient Temp.:		°C	Test results		
Start Frequency (MHz)	Stop Frequency (MHz)	Res. Bandwidth (kHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
30	47	100		-36	
47	74	100		-54	
74	87,5	100		-36	
87,5	118	100		-54	
118	174	100		-36	
174	230	100		-54	
230	470	100		-36	
470	862	100		-54	
862	1 000	100		-36	
1 000	5 150	1 000		-30	
5 350	5 470	1 000		-30	
5 725	26 500	1 000		-30	
Measurement uncertainty:				dB	
NOTE: The UUT shall be configured to operate at the highest stated power level. See EN 301 893 [2] clause 5.3.4.1.					

8.2.3.1.3 Higher Sub-band, test frequency is 5 500 MHz, conducted testing

Table 19: Conducted Transmitter Spurious Emissions - Test results for 5 500 MHz

Test Frequency: 5 500 MHz					
Test Conditions (see clause EN 301 893 [2], clause 5.3.4.1):					
Power Setting: (see note)		dBm		<input type="checkbox"/> EIRP	<input type="checkbox"/> Conducted
Duty Cycle:		%			
Rel. Humidity:		%			
Ambient Temp.:		°C		Test results	
Start Frequency (MHz)	Stop Frequency (MHz)	Res. Bandwidth (kHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
30	47	100		-36	
47	74	100		-54	
74	87,5	100		-36	
87,5	118	100		-54	
118	174	100		-36	
174	230	100		-54	
230	470	100		-36	
470	862	100		-54	
862	1 000	100		-36	
1 000	5 150	1 000		-30	
5 350	5 470	1 000		-30	
5 725	26 500	1 000		-30	
Measurement uncertainty:					dB
NOTE: The UUT shall be configured to operate at the highest stated power level. See EN 301 893 [2] clause 5.3.4.1.					

8.2.3.1.4 Higher Sub-band, test frequency is 5 700 MHz, conducted testing

Table 20: Conducted Transmitter Spurious Emissions - Test results for 5 700 MHz

Test Frequency: 5 700 MHz					
Test Conditions (see clause EN 301 893 [2], clause 5.3.4.1):					
Power Setting: (See note)		dBm		<input type="checkbox"/> EIRP	<input type="checkbox"/> Conducted
Duty Cycle:		%			
Rel. Humidity:		%			
Ambient Temp.:		°C		Test results	
Start Frequency (MHz)	Stop Frequency (MHz)	Res. Bandwidth (kHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
30	47	100		-36	
47	74	100		-54	
74	87,5	100		-36	
87,5	118	100		-54	
118	174	100		-36	
174	230	100		-54	
230	470	100		-36	
470	862	100		-54	
862	1 000	100		-36	
1 000	5 150	1 000		-30	
5 350	5 470	1 000		-30	
5 725	26 500	1 000		-30	
Measurement uncertainty:					dB
NOTE: The UUT shall be configured to operate at the highest stated power level. See EN 301 893 [2] clause 5.3.4.1.					

8.2.3.2 Radiated Transmitter Spurious Emissions (see EN 301 893, clause 5.3.4.1)

8.2.3.2.1 Lower Sub-band, test frequency is 5 180 MHz, radiated testing

Table 21: Radiated Transmitter Spurious Emissions - Test results for 5 180 MHz

Test Frequency:		5 180 MHz			
Test Conditions (see clause EN 301 893 [2], clause 5.3.4.1):					
Power Setting: (See note)		dBm		<input type="checkbox"/> EIRP	<input type="checkbox"/> Conducted
Duty Cycle:		%			
Rel. Humidity:		%			
Ambient Temp.:		°C		Test results	
Start Frequency (MHz)	Stop Frequency (MHz)	Res. Bandwidth (kHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
30	47	100		-36	
47	74	100		-54	
74	87,5	100		-36	
87,5	118	100		-54	
118	174	100		-36	
174	230	100		-54	
230	470	100		-36	
470	862	100		-54	
862	1 000	100		-36	
1 000	5 150	1 000		-30	
5 350	5 470	1 000		-30	
5 725	26 500	1 000		-30	
Measurement uncertainty:				dB	
NOTE: The UUT shall be configured to operate at the highest stated power level. See EN 301 893 [2] clause 5.3.4.1.					

8.2.3.2.2 Lower Sub-band, test frequency is 5 320 MHz, radiated testing

Table 22: Radiated Transmitter Spurious Emissions - Test results for 5 320 MHz

Test Frequency:		5 320 MHz			
Test Conditions (see clause EN 301 893 [2], clause 5.3.4.1):					
Power Setting: (See note)		dBm		<input type="checkbox"/> EIRP	<input type="checkbox"/> Conducted
Duty Cycle:		%			
Rel. Humidity:		%			
Ambient Temp.:		°C		Test results	
Start Frequency (MHz)	Stop Frequency (MHz)	Res. Bandwidth (kHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
30	47	100		-36	
47	74	100		-54	
74	87,5	100		-36	
87,5	118	100		-54	
118	174	100		-36	
174	230	100		-54	
230	470	100		-36	
470	862	100		-54	
862	1 000	100		-36	
1 000	5 150	1 000		-30	
5 350	5 470	1 000		-30	
5 725	26 500	1 000		-30	
Measurement uncertainty:				dB	
NOTE: The UUT shall be configured to operate at the highest stated power level. See EN 301 893 [2] clause 5.3.4.1.					

8.2.3.2.3 Higher Sub-band, test frequency is 5 500 MHz, radiated testing

Table 23: Radiated Transmitter Spurious Emissions - Test results for 5 500 MHz

Test Frequency:		5 500 MHz			
Test Conditions (see clause EN 301 893 [2], clause 5.3.4.1):					
Power Setting: (See note)		dBm		<input type="checkbox"/> EIRP	<input type="checkbox"/> Conducted
Duty Cycle:		%			
Rel. Humidity:		%			
Ambient Temp.:		°C		Test results	
Start Frequency (MHz)	Stop Frequency (MHz)	Res. Bandwidth (kHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
30	47	100		-36	
47	74	100		-54	
74	87,5	100		-36	
87,5	118	100		-54	
118	174	100		-36	
174	230	100		-54	
230	470	100		-36	
470	862	100		-54	
862	1 000	100		-36	
1 000	5 150	1 000		-30	
5 350	5 470	1 000		-30	
5 725	26 500	1 000		-30	
Measurement uncertainty:				dB	
NOTE: The UUT shall be configured to operate at the highest stated power level. See EN 301 893 [2] clause 5.3.4.1.					

8.2.3.2.4 Higher Sub-band, test frequency is 5 700 MHz, radiated testing

Table 24: Radiated Transmitter Spurious Emissions - Test results for 5 700 MHz

Test Frequency:		5 700 MHz			
Test Conditions (see clause EN 301 893 [2], clause 5.3.4.1):					
Power Setting: (See note)		dBm		<input type="checkbox"/> EIRP	<input type="checkbox"/> Conducted
Duty Cycle:		%			
Rel. Humidity:		%			
Ambient Temp.:		°C		Test results	
Start Frequency (MHz)	Stop Frequency (MHz)	Res. Bandwidth (kHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
30	47	100		-36	
47	74	100		-54	
74	87,5	100		-36	
87,5	118	100		-54	
118	174	100		-36	
174	230	100		-54	
230	470	100		-36	
470	862	100		-54	
862	1 000	100		-36	
1 000	5 150	1 000		-30	
5 350	5 470	1 000		-30	
5 725	26 500	1 000		-30	
Measurement uncertainty:				dB	
NOTE: The UUT shall be configured to operate at the highest stated power level. See EN 301 893 [2] clause 5.3.4.1.					

8.2.4 Transmitter unwanted emissions within the 5 GHz RLAN bands

Table 25: Transmitter unwanted emissions within the 5 GHz RLAN bands - Test results

Test Conditions (see clause EN 301 893 [2], clause 5.3.5.1):		
Power Setting: (see note 1)	dBm	<input type="checkbox"/> EIRP <input type="checkbox"/> Conducted
Duty Cycle:	%	
Rel. Humidity:	%	Test Results
Ambient Temp.:	°C	The equipment complies with the spectrum mask given in EN 301 893 [2], clause 4.4.2
Test Frequency (MHz)	Result (Yes/No)	Plot nr (see note 2)
5 180		
5 300		
5 500		
5 700		
Measurement uncertainty:		dB
NOTE 1: The UUT shall be configured to operate at the highest stated power level. See EN 301 893 [2] clause 5.3.5.1.		
NOTE 2: A screen capture or a plot shall be provided. Add a reference to the page where this can be found within this report.		

8.2.5 Receiver spurious emissions

Depending of the option chosen, performing conducting spurious emissions may not be required. See EN 301 893 [2] clause 5.3.6.1.

8.2.5.1 Conducted Receiver Spurious Emissions (see EN 301 893, clause 5.3.6.)

8.2.5.1.1 Lower Sub-band, conducted testing

Table 26: Conducted Receiver Spurious Emissions - Test results for the Lower Sub-band.

Test Conditions (see clause EN 301 893 [2], clause 5.3.6.1):					
Rel. Humidity:		%			
Ambient Temp.:		°C			
Test Frequency:			Test results		
5 180 MHz					
Start Frequency (MHz)	Stop Frequency (MHz)	Res. Bandwidth (kHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
30	1 000	100		-57	
1 000	26 500	1 000		-47	
Test Frequency:			Test results		
5 320 MHz					
Start Frequency (MHz)	Stop Frequency (MHz)	Res. Bandwidth (kHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
30	1 000	100		-57	
1 000	26 500	1 000		-47	
Measurement uncertainty:				dB	

8.2.5.1.2 Higher Sub-band, conducted testing

Table 27: Conducted Receiver Spurious Emissions - Test results for the Higher Sub-band.

Test Conditions (see clause EN 301 893 [2], clause 5.3.6.1):					
Rel. Humidity:		%			
Ambient Temp.:		°C			
Test Frequency:			Test results		
Start Frequency (MHz)	Stop Frequency (MHz)	Res. Bandwidth (kHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
5 500 MHz					
30	1 000	100		-57	
1 000	26 500	1 000		-47	
Test Frequency:			Test results		
Start Frequency (MHz)	Stop Frequency (MHz)	Res. Bandwidth (kHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
5 700 MHz					
30	1 000	100		-57	
1 000	26 500	1 000		-47	
Measurement uncertainty:					dB

8.2.5.2 Radiated Receiver Spurious Emissions (see EN 301 893, clause 5.3.6)

8.2.5.2.1 Lower Sub-band, radiated testing)

Table 28: Radiated Receiver Spurious Emissions - Test results for the Lower Sub-band

Test Conditions (see clause EN 301 893 [2], clause 5.3.6.1):					
Rel. Humidity:		%			
Ambient Temp.:		°C			
Test Frequency:			Test results		
Start Frequency (MHz)	Stop Frequency (MHz)	Res. Bandwidth (kHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
5 180 MHz					
30	1 000	100		-57	
1 000	26 500	1 000		-47	
Test Frequency:			Test results		
Start Frequency (MHz)	Stop Frequency (MHz)	Res. Bandwidth (kHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
5 320 MHz					
30	1 000	100		-57	
1 000	26 500	1 000		-47	
Measurement uncertainty:					dB

8.2.5.2.2 Higher Sub-band, radiated testing

Table 29: Radiated Receiver Spurious Emissions - Test results for the Higher Sub-band

Test Conditions (see clause EN 301 893 [2], clause 5.3.6.1):					
Rel. Humidity:		%			
Ambient Temp.:		°C			
Test Frequency:	5 500 MHz		Test results		
Start Frequency (MHz)	Stop Frequency (MHz)	Res. Bandwidth (kHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
30	1 000	100		-57	
1 000	26 500	1 000		-47	
Test Frequency:	5 700 MHz		Test results		
Start Frequency (MHz)	Stop Frequency (MHz)	Res. Bandwidth (kHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
30	1 000	100		-57	
1 000	26 500	1 000		-47	
Measurement uncertainty:					dB

8.2.6 Dynamic Frequency Selection (DFS)

8.2.6.1 Channel Availability Check (CAC)

This test is only applicable on a Master device.

The test method is described in EN 301 893 [2], clauses 5.3.7.2.1.1.1 and 5.3.7.2.1.1.2.

Table 30: Channel Availability Check - Test results

Test Conditions (see clause EN 301 893 [2], clause 5.3.7.1):							
Antenna gain:		dBi	(see EN 301 893 [2], clause 5.3.7.2.1, paragraph 3)				
Power Setting:		dBm	<input type="checkbox"/> EIRP	<input type="checkbox"/> Conducted			
Duty Cycle:		%	Test results				
Rel. Humidity:		%					
Ambient Temp.:		°C	Radar Test Signal (#)	Timing of radar burst (within the 60 seconds CAC time)	DFS triggered (Yes/No)	Set-up (page #) (note 4)	Timing Plot (page #) (note 5)
Test Frequency: (see note 1)	MHz	1	Within 0 to 2 second window (see note 2)				
			Within 58 to 60 second window (see note 3)				
	MHz	1	Within 0 to 2 second window (see note 2)				
			Within 58 to 60 second window (see note 3)				
Measurement uncertainty:						[n.a.]	
NOTE 1: According to EN 301 893 [2] clause 5.1.3, DFS testing shall be performed on one channel within the range 5 250 MHz to 5 350 MHz and one channel within 5 470 MHz to 5 725 MHz range. The choice of the channel is at the discretion of the test house.							
NOTE 2: See EN 301 893 [2] clause 5.3.7.2.1.1.1.							
NOTE 3: See EN 301 893 [2] clause 5.3.7.2.1.1.2.							
NOTE 4: Specify the page number that contains the set-up diagram used for this test.							
NOTE 5: Specify the page number that contains the Timing Plot for this test.							

8.2.6.2 Interference Detection Threshold during the Channel Availability Check

This test is only applicable on a Master device.

The test method is described in EN 301 893 [2], clause 5.3.7.2.1.2.

Table 31: Interference Detection Threshold during the Channel Availability Check - Test results

Test Conditions (see clause EN 301 893 [2], clause 5.3.7.1):						
Antenna gain:		dBi (see EN 301 893 [2], clause 5.3.7.2.1, paragraph 3)				
Power Setting :		dBm <input type="checkbox"/> EIRP <input checked="" type="checkbox"/> Conducted				
Set-up (page #)						
Duty Cycle:		%				
Rel. Humidity:		%				
Ambient Temp.:		°C				
		Radar Test Signal (#)	Radar signal configuration used (see note 3)	Nr of times DFS was triggered (# out of 20)	Detection Probability (%)	Timing Plot (page #) (see note 1)
Test Frequency: (see note 2)	MHz	1				
		2				
		3				
		4				
		5				
		6				
	MHz	1				
		2				
		3				
		4				
		5				
		6				
Measurement uncertainty:					[n.a.]	
NOTE 1: Although testing has to be repeated 20 times, only one timing plot or analyser screen capture from a successful DFS trigger is necessary.						
NOTE 2: According to EN 301 893 [2] clause 5.1.3, DFS testing shall be performed on one channel within the range 5 250 MHz to 5 350 MHz and one channel within 5 470 MHz to 5 725 MHz range. The choice of the channel is at the discretion of the test house.						
NOTE 3: State the Radar signal configuration used from EN 301 893 [2], table D.4, by specifying the values chosen for the Pulse Width (in µSec), the Pulse Repetition Frequency (in pps) and the Pulses per Burst separated by commas. (e.g. 1,300,10)						

8.2.6.3 Interference Detection Threshold during In-Service Monitoring

This test is applicable on a Master device and a Slave device with a Radar Interference Detection function.

The test method is described in EN 301 893 [2], clause 5.3.7.2.1.3.

Table 32: Interference Detection Threshold during the In-Service Monitoring - Test results

Test Conditions (see clause EN 301 893 [2], clause 5.3.7.1):							
Antenna gain:		dBi	(see EN 301 893 [2], clause 5.3.7.2.1, paragraph 3)				
Power Setting :		dBm	<input type="checkbox"/> EIRP	<input type="checkbox"/> Conducted			
Set-up (page #)							
Duty Cycle:		%	Test results				
Rel. Humidity:		%					
Ambient Temp.:		°C	Radar Test Signal (#)	Radar signal configuration used (see note 3)	Nr of times DFS was triggered (# out of 20)	Detection Probability (%)	Timing Plot (page #) (see note 1)
Test Frequency: (see note 2)	MHz	1					
		2					
		3					
		4					
		5					
		6					
	MHz	1					
		2					
		3					
		4					
		5					
		6					
Measurement uncertainty:						[n.a.]	
NOTE 1: Although testing has to be repeated 20 times, only one timing plot or analyser screen capture from a successful DFS trigger is necessary.							
NOTE 2: According to EN 301 893 [2] clause 5.1.3, DFS testing shall be performed on one channel within the range 5 250 MHz to 5 350 MHz and one channel within 5 470 MHz to 5 725 MHz range. The choice of the channel is at the discretion of the test house.							
NOTE 3: State the Radar signal configuration used from EN 301 893 [2], table D.4, by specifying the values chosen for the Pulse Width (in µSec), the Pulse Repetition Frequency (in pps) and the Pulses per Burst separated by commas. (e.g. 1,300,10).							

8.2.6.4 Channel Shutdown and Non-Occupancy Period

This test is applicable on a Master device and a Slave device. If the UUT is a Slave device with a Radar Interference Detection function, additional tests are required. See EN 301 893 [2], clause 4.6.2.

The test method is described in EN 301 893 [2], clause 5.3.7.2.1.4.

8.2.6.4.1 The UUT is a Master device or a Slave device with or without a Radar Interference Detection function

Table 33: Channel Shutdown and Non-Occupancy Period - Test results

Test Conditions (see clause EN 301 893 [2] clause 5.3.7.1):						
Antenna gain:	dBi	(see EN 301 893 [2], clause 5.3.7.2.1, paragraph 3)				
Power Setting :	dBm	<input type="checkbox"/> EIRP	<input type="checkbox"/> Conducted			
Set-up (page #):						
Duty Cycle:	%	Test results				
Rel. Humidity:	%					
Ambient Temp.:	°C	Radar Test Signal (#)	Channel Closing Transmission Time (ms)	Channel Move Time (s)	Non-Occupancy Period (min) (see note 1)	Timing Plot (page #)
Test Frequency: (see note 2)	MHz	1				
	MHz	1				
Measurement uncertainty:						%
NOTE 1: The Non-Occupancy Period (NOP) is only applicable on a Master device. There is no need to verify the NOP for a period longer than 30 minutes which is the minimum time required. If the NOP is shorter than 30 minutes, indicate the exact time, if the NOP is longer than 30 minutes just mention '>30' as the result.						
NOTE 2: According to EN 301 893 [2] clause 5.1.3, DFS testing shall be performed on one channel within the range 5 250 MHz 5 350 MHz and one channel within 5 470 MHz 5 725 MHz range. The choice of the channel is at the discretion of the test house.						

8.2.6.4.2 The UUT is a Slave device with a Radar Interference Detection function

See EN 301 893 [2], clause 5.3.7.2.1.4 g) which requires additional testing to be done in case the UUT is a Slave device with a Radar Interference Detection function.

Table 34: Channel Shutdown (Slave with Radar Detection) - Test results

Test Conditions (see clause EN 301 893 [2], clause 5.3.7.1):						
Antenna gain:	dBi	(see EN 301 893 [2], clause 5.3.7.2.1, paragraph 3)				
Power Setting :	dBm	<input type="checkbox"/> EIRP	<input type="checkbox"/> Conducted			
Set-up (page #):						
Duty Cycle:	%	Test results				
Rel. Humidity:	%					
Ambient Temp.:	°C	Radar Test Signal (#)	Channel Closing Transmission Time (ms)	Channel Move Time (s)	Timing Plot (page #)	
Test Frequency: (see note)	MHz	1				
	MHz	1				
Measurement uncertainty:						%
NOTE: According to EN 301 893 [2] clause 5.1.3, DFS testing shall be performed on one channel within the range 5 250 MHz to 5 350 MHz and one channel within 5 470 MHz to 5 725 MHz range. The choice of the channel is at the discretion of the test house.						

9 Test Set-Ups

Where required by EN 301 893 [2], a description of the different test set-ups should be included in this clause.

10 Screen Plots / Screen Captures

This clause is for the inclusion of DFS timing plots as referenced in the results tables. The inclusion of spurious emissions plots is not mandatory.

11 Photographs of the equipment (UUT)

Photographs of the equipment may be included in this clause.

History

Document history		
V1.1.1	August 2006	Publication