TEST REPORT

Report No. .....:	**CTC2024287506**
Applicant .....:	**XonTel Technology Trd. Co. W.L.L**
Address.....:	Office 21 - Justice Tower - Ali Al Salem St. - Qibla - Kuwait City - State Of Kuwait
Manufacturer.....:	XonTel Technology Trd. Co. W.L.L
Address.....:	Office 21 - Justice Tower - Ali Al Salem St. - Qibla - Kuwait City - State Of Kuwait
Product Name .....:	**Prime Business Phone**
Trade Mark .....:	XonTel
Model/Type reference.....:	XT-24G
Listed Model(s) .....:	/
Standard .....:	**ETSI EN 301 893 V2.1.1: 2017-05**
Test Report Form No .....:	CTC-TR-056_A1
Master TRF.....:	Dated 2024-09-20
Date of receipt of test sample…:	Jan. 18, 2022
Date of testing……..:	Jan. 19, 2022 ~ Feb. 21, 2022
Date of issue……....:	Dec. 20, 2024
Result……:	**PASS**

Compiled by: (Printed name+signature)	Jim Jiang	Jim Jiang
Supervised by: (Printed name+signature)	Eric Zhang	Eric Zhang
Approved by: (Printed name+signature)	Totti Zhao	Totti Zhao

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1. TEST SUMMARY

1.1. Test Standards

The tests were performed according to following standards:
ETSI EN 301893 V2.1.1 (2017-05) – 5 GHz RLAN; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU.

1.2. Report version

Revised No.	Report No.	Date of issue	Description
01	CTC2024287506	Dec. 20, 2024	On the basis of the original report CTC20220136E11, update the applicant, manufacturer, trademark and model number., no testing involved.

1.3. Test Description

Standards requirement ETSI EN301 893			
Test Item	**Test require**	**Result**	**Test Engineer**
Centre Frequencies	Sub-clause 4.2.1	Pass	Alicia Liu
Nominal Channel Bandwidth and Occupied Channel Bandwidth	Sub-clause 4.2.2	Pass	Alicia Liu
RF Output Power, Transmit Power Control (TPC)	Sub-clause 4.2.3	Pass	Alicia Liu
Power Density	Sub-clause 4.2.3	Pass	Alicia Liu
Transmitter Unwanted Emissions Outside the 5 GHz RLAN Bands	Sub-clause 4.2.4.1	Pass	Alicia Liu
Transmitter Unwanted Emissions Within the 5 GHz RLAN Bands	Sub-clause 4.2.4.2	Pass	Alicia Liu
Receiver Spurious Emissions	Sub-clause 4.2.5	Pass	Alicia Liu
Dynamic Frequency Selection (DFS)	Sub-clause 4.2.6	N/A	N/A
Adaptivity (Channel Access Mechanism)	Sub-clause 4.2.7	Pass	Alicia Liu
Receiver Blocking	Sub-clause 4.2.8	Pass	Alicia Liu
User Access Restrictions	Sub-clause 4.2.9	Pass	Alicia Liu
Geo-location Capability	Sub-clause 4.2.10	N/A	N/A

Note:

1. The measurement uncertainty is not included in the test result.
2. N/A: This test item is not applicable for this device according to the technology characteristic of device.

1.4. Test Facility

Address of the report laboratory

CTC Laboratories, Inc.

Add: Room 101 of Building B, Room 107, 108, 207, 208 of Building A, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China

Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

A2LA-Lab Cert. No.: 4340.01

CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in th e identified field of testing.

Industry Canada（Registration No.: 9783A, CAB Identifier: CN0029）

CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Indus try Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

FCC (Registration No.: 951311, Designation Number CN1208)

CTC Laboratories, Inc. EMC Laboratory has been registered and fully described in a report filed with the (F CC) Federal Communications Commission. The acceptance letter from the FCC is maintained inour files. Registration 951311, Aug 26, 2017.

1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the CTC Laboratories, Inc. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Below is the best measurement capability for CTC Laboratories, Inc.

Test Items	Measurement Uncertainty	Notes
Maximum transmit power	±1.5dB	(1)
Power Spectral Density	±1.5dB	(1)
Duty Cycle, Tx-sequence, Tx-gap	±5%	(1)
Accumulated Transmit Time, Frequency Occupation and Hopping Sequence	±5%	(1)
Hopping Frequency Separation	±5%	(1)
Medium Utilization (MU) factor	±5%	(1)
Adaptively	±5%	(1)
Occupied Channel Bandwidth	±5%	(1)
Transmitter unwanted emissions in the out-of-band domain	±2.8dB	(1)
Transmitter unwanted emissions in the spurious domain	±2.8dB	(1)
Receiver spurious emissions	±2.8dB	(1)
Receiver Blocking	±2.8dB	(1)

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

1.6. Environmental conditions

Normal Condition	Temperature	15 °C to +35 °C
	Relative humidity	20 % to 75 %.
	Voltage	The equipment shall be the nominal voltage for which the equipment was designed.
Extreme Condition	Temperature	Measurements shall be made over the extremes of the operating temperature range as declared by the manufacturer.
	Voltage	Measurements shall be made over the extremes of the operating temperature range as declared by the manufacturer.

Normal Condition	V_N=Normal Voltage	DC 5.0V
	T_N=Normal Temperature	25 °C
Extreme Condition	V_L=Lower Voltage	DC 4.5V
	V_H=Higher Voltage	DC 5.5V
	T_L=Lower Temperature	0 °C
	T_H=Higher Temperature	45 °C

2. GENERAL INFORMATION

2.1. Client Information

Applicant:	XonTel Technology Trd. Co. W.L.L
Address:	Office 21 - Justice Tower - Ali Al Salem St. - Qibla - Kuwait City - State Of Kuwait
Manufacturer:	XonTel Technology Trd. Co. W.L.L
Address:	Office 21 - Justice Tower - Ali Al Salem St. - Qibla - Kuwait City - State Of Kuwait

2.2. General Description of EUT

Product Name:	Prime Business Phone
Trade Mark:	XonTel
Model/Type reference:	XT-24G
Listed Model(s):	/
Power supply:	5Vdc/2A from AC/DC Adapter 48Vdc/0.3A from POE
Adapter 1 Model:	F12W8-050200SPAV Input: 100-240V~ 50/60Hz 0.6A Output: 5Vdc/2A
Adapter 2 Model:	F12W8-050200SPAB Input: 100-240V~ 50/60Hz 0.6A Output: 5Vdc/2A
Adapter 3 Model:	F12W8-050200SPAS Input: 100-240V~ 50/60Hz 0.6A Output: 5Vdc/2A
Adapter Difference:	All these models are identical in the same PCB, Layout and electrical circuit, The only difference is plugs.
Hardware version:	V1.0
Software version:	T0.0.9.5.1
Technical Index RLAN	
Support Type:	☒ 802.11a ☒ 802.11n ☒ 802.11ac
Support Bandwidth:	802.11a ☒ 20MHz
	802.11n ☒ 20MHz ☒ 40MHz
	802.11ac ☒ 20MHz ☒ 40MHz ☒ 80MHz ☐ 160MHz
Operation Frequency:	☒ Lower Band: 5150-5250MHz ☐ Lower Band: 5250-5350MHz ☐ Higher Band: 5470-5725MHz
Modulation:	☒BPSK ☒QPSK ☒16QAM ☒64QAM
Transmit Operating Modes	☒ Single Antenna Equipment ☒ Equipment with only 1 antenna ☐ Equipment with diversity antennas but only 1 antenna active at any

	moment in time ☐ Smart Antenna Systems with 2 or more antennas, but operating in a (legacy) mode where only 1 antenna is used.
	☐ Smart Antenna Systems - Multiple Antennas without beam forming ☐ Single spatial stream/Standard throughput ☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 1 ☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 2
	☐ Smart Antenna Systems - Multiple Antennas with beam forming ☐ Single spatial stream/Standard throughput ☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 1 ☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 2
Antenna Type:	FPC Antenna
Antenna gain:	5.8dBi
In case of Smart Antenna Systems or Multiple Antenna Systems	The number of Receive chains:_____
	The number of Transmit chains: _____
	Equal power distribution among the transmit chains: ☐Yes ☐No
	In case of beamforming, the maximum (additional) beamforming gain: ____dB
TPC Deature Available:	☐ Yes ☒No
For Equipment Without a TPC Range:	☒5 150 MHz to 5 350 MHz and 5 470 MHz to 5 725 MHz (Indoor) Simultaneous transmissions in both sub-bands: ☐Yes ☒No ☐5 470 MHz to 5 725 MHz only (Outdoor only) Indicate whether the power levels specified are Transmitter Output Power levels or e.i.r.p. levels in case of integrated antenna equipment. Power levels are specified for: ☐ Tout ☒ EIRP
Additional information provided by the manufacturer	
Modulation	Can the transmitter operate un-modulated? ☒Yes ☐No
Duty Cycle	☒Continuous duty ☐Intermittent duty ☐ Continuous operation possible for testing purposes
About the UUT	☒ The equipment submitted are representative production models. ☐ If not, the equipment submitted are pre-production models? ☐ If pre-production equipment are 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.

Operation Frequency List:

Band (MHz)		20MHz Bandwidth		40MHz Bandwidth		80MHz Bandwidth	
		Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Lower sub-band 5150~5350	5150~5250	36	5180	38	5190	42	5210
		40	5200				
		44	5220	46	5230		
		48	5240				

Test Channel:

Clause	Test Item	Test Channel		
		Lower sub-band (5150-5350MHz)		Higher sub-band 5470-5725MHz
		5150-5250 MHz	5250-5350MHz	
5.4.2	Centre Frequencies	C7 (See note 1)		C8 (See note 1)
5.4.3	Occupied Channel Bandwidth	C7		C8
5.4.4	Power, Power density	C1	C2	C3, C4
5.4.5	Transmitter unwanted emissions outside 5 GHz RLAN bands	C7 (See note 1)		C8 (See note 1)
5.4.6	Transmitter unwanted emissions within 5 GHz RLAN bands	C1	C2	C3, C4
5.4.7	Receiver spurious emissions	C7 (See note 1)		C8 (See note 1)
5.4.4	Transmit Power Control (TPC)	n.a. (See note 2)	C2 (See note 1)	C3, C4 (See note 1)
5.4.8	DFS	n.a. (See note 2)	C5	C6 (See note 3)
5.4.9	Adaptivity	C9		
5.4.10	Receiver Blocking	C7		C8

C1,C3: The lowest declared channel for every declared nominal channel bandwidth within this band. For the power density testing, it is sufficient to only perform this test using the lowest nominal channel bandwidth.

C2,C4: The highest declared channel for every declared nominal channel bandwidth within this band. For the power density testing, it is sufficient to only perform this test using the lowest nominal channel bandwidth.

C5,C6: One channel out of the declared channels for this frequency range. If more than one nominal channel bandwidth has been declared for this sub-band, testing shall be performed using the lowest and highest nominal channel bandwidth.

C7,C8: One channel out of the declared channels for this sub-band. For *Occupied Channel Bandwidth*, testing shall be repeated for every declared *Nominal Channel Bandwidth* within this sub-band.

C9 One channel (in case of single-channel testing) or a group of channels (in case of multi-channel testing) out of the declared channels.

Note 1: In case of more than one channel plan has been declared, testing of these specific requirements need only be performed using one of the declared channel plans.

Note 2: Testing is not required for nominal channel bandwidths that fall completely within the frequency range 5150MHz to 5250MHz.

Note 3: Where the declared channel plan includes channels whose nominal channel bandwidth falls completely or partly within the 5 600 MHz to 5 650 MHz band, the tests for the Channel Availability Check (and where implemented, for the Off-Channel CAC) shall be performed on one of these channels in addition to a channel within the band 5 470 MHz to 5 600 MHz or within the band 5

650 MHz to 5 725 MHz.

2.3. EUT operation mode

The EUT has been tested under test mode condition. The Applicant provides software to control the EUT for staying in continuous transmitting and receiving mode for testing.

2.4. Measurement Instruments List

Tonscend JS0806-2 Test system					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	KEYSIGHT	N9020A	100231	Dec. 23, 2022
2	Spectrum Analyzer	Rohde & Schwarz	FUV40-N	101331	Mar. 15, 2022
3	MXG Vector Signal Generator	Agilent	N5182A	MY47420864	Dec. 23, 2022
4	Signal Generator	Agilent	E8257D	MY46521908	Dec. 23, 2022
5	Power Sensor	Agilent	U2021XA	MY5365004	Mar. 15, 2022
6	Power Sensor	Agilent	U2021XA	MY5365006	Mar. 15, 2022
7	High and low temperature box	ESPEC	MT3035	N/A	Mar. 24, 2022
8	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	102414	Dec. 23, 2022
9	300328 v2.2.2 test system	TONSCEND	v2.6	/	/

Radiated emission(3m chamber 2)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-1013	Jan. 12, 2023
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-647	Dec. 23, 2022
3	Spectrum Analyzer	R&S	FSU26	100105	Dec. 23, 2022
4	Spectrum Analyzer	R&S	FSV40-N	101331	Mar. 15, 2022
5	Pre-Amplifier	SONOMA	310	186194	Dec. 23, 2022
6	Low Noise Pre-Amplifier	EMCI	EMC051835	980075	Dec. 23, 2022
7	Test Receiver	R&S	ESCI7	100967	Dec. 23, 2022

Radiated emission(3m chamber 3)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-759	Nov. 09, 2022
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-647	Dec. 23, 2022
3	Test Receiver	Keysight	N9038A	MY56400071	Dec. 23, 2022
4	Broadband Premplifier	SCHWARZBECK	BBV9743B	259	Dec. 23, 2022
5	Mirowave Broadband Amplifier	SCHWARZBECK	BBV9718C	111	Dec. 23, 2022

Note: The cable loss has calculated in test result which connection between each test instruments.

3. TEST ITEM AND RESULTS

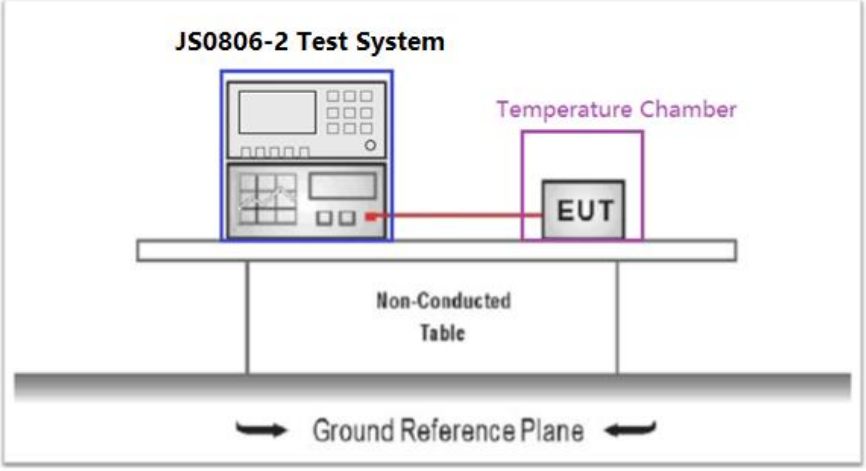
3.1. Centre Frequencies

Limit

ETSI EN 301 893 Sub-clause 4.2.1.3

The actual center frequency for any given channel declared by the manufacturer shall be maintained within the range fc ± 20 ppm.

Test Configuration



Test Procedure

Please refer to ETSI EN 301 893 Sub-clause 5.4.2.2.1.1 for the measurement method.

Test Mode

Continuous transmitting with modulation.

Test Results

Test Condition	Test Mode	Channel	Result[ppm]	Limit[ppm]	Verdict
NTNV	20MHz	5180	-4.46473	±20	PASS
	40MHz	5190	-4.38750	±20	PASS
	80MHz	5210	-4.37905	±20	PASS
LTNV	20MHz	5180	-4.26201	±20	PASS
	40MHz	5190	-4.20562	±20	PASS
	80MHz	5210	-4.09350	±20	PASS
HTNV	20MHz	5180	-4.52265	±20	PASS
	40MHz	5190	-4.42612	±20	PASS
	80MHz	5210	-4.41759	±20	PASS

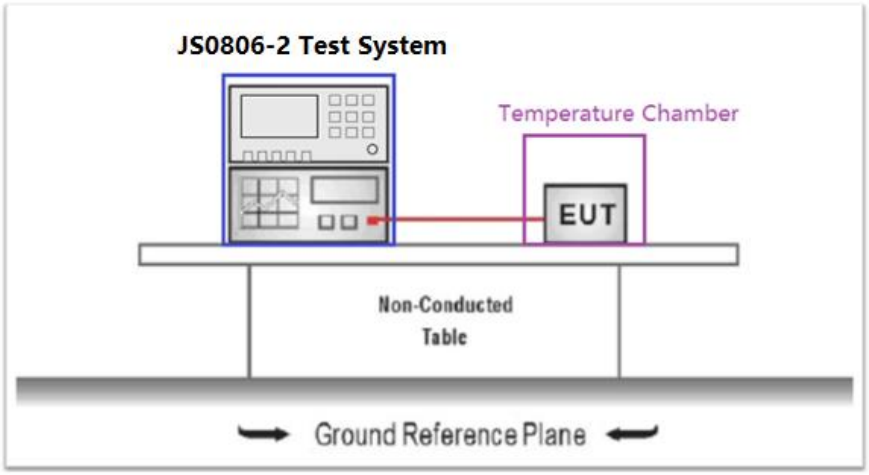
3.2. Occupied Channel Bandwidth

Limit

ETSI EN 301 893Sub-clause 4.2.2.2

The Occupied Channel Bandwidth shall be between 80 % and 100 % of the declared Nominal Channel Bandwidth.

Test Configuration



Test Procedure

Please refer to ETSI EN 301 893 Sub-clause 5.4.3.2.1 for the measurement method.

Test Mode

Continuous transmitting with modulation.

Test Results

Test Mode	Channel	OCB[MHz]	Limit[MHz]	Verdict
802.11a	5180	16.376	16 to 20	PASS
802.11n(HT20)	5180	17.589	16 to 20	PASS
802.11n(HT40)	5190	36.084	32 to 40	PASS
802.11ac(VHT20)	5180	17.585	16 to 20	PASS
802.11ac(VHT40)	5190	36.093	32 to 40	PASS
802.11ac(VHT80)	5210	75.317	64 to 80	PASS

Test plot as follows:

802.11a_5180

802.11n(HT20)_5180

802.11n(HT40)_5190

802.11ac(VHT20)_5180

802.11ac(VHT40)_5190

802.11ac(VHT80)_5210


Keysight Spectrum Analyzer - Occupied BW
Center Freq 5.210000000 GHz
Center Freq: 5.210000000 GHz
Trig: Free Run
Avg|Hold: 10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 0.5 dB
10 dB/div
Ref 20.00 dBm
Mkr1 5.21496 GHz
-12.397 dBm
Center Freq
5.210000000 GHz
Center 5.21 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 160 MHz
#Sweep 1 s
CF Step
16.000000 MHz
Auto
Man
Freq Offset
0 Hz
Occupied Bandwidth
75.317 MHz
Total Power 12.4 dBm
Transmit Freq Error 64.704 kHz
% of OBW Power 99.00 %
x dB Bandwidth 78.77 MHz
x dB -26.00 dB
MSG
STATUS

3.3. RF Output Power

Limit

ETSI EN 301 893 Sub-clause 4.2.3.2.1

Limits for RF output power and Power Density at the highest power level

Table 2: Mean e.i.r.p. limits for RF output power and Power Density at the highest power level (P_H)

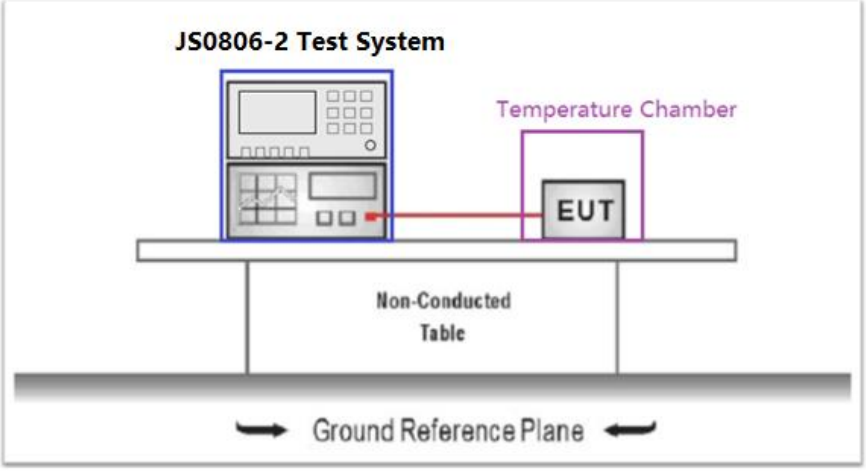
Frequency range (MHz)	Mean e.i.r.p. limit for P_H (dBm)		Mean e.i.r.p. density limit (dBm/MHz)	
	with TPC	without TPC	with TPC	without TPC
5 150 to 5 350	23	20/23 (see note 1)	10	7/10 (see note 2)
5 470 to 5 725	30 (see note 3)	27 (see note 3)	17 (see note 3)	14 (see note 3)
NOTE 1: The applicable limit is 20 dBm, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 23 dBm.				
NOTE 2: The applicable limit is 7 dBm/MHz, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 10 dBm/MHz.				
NOTE 3: Slave devices without a *Radar Interference Detection* function shall comply with the limits for the frequency range 5 250 MHz to 5 350 MHz.				

Limit for RF output power at the lowest power level (PL) of the TPC range

Table 3: Mean e.i.r.p. limits for RF Output Power at the lowest power level of the TPC range

Frequency range	Mean e.i.r.p. (dBm) limit for P_L
5 250 MHz to 5 350 MHz	17
5 470 MHz to 5 725 MHz	24 (see note)
NOTE: Slave devices without a *Radar Interference Detection* function shall comply with the limits for the band 5 250 MHz to 5 350 MHz.	

Test Configuration



Test Procedure

Please refer to ETSI EN 301 893 Sub-clause 5.4.4.2.1 for the measurement method.

Test Mode

Continuous transmitting with modulation.

Test Result

Test Condition	Test Mode	TPC	Channel	EIRP[dBm]	Limit[dBm]	Verdict
NTNV	802.11a	NA	5180	17.66	23	PASS
	802.11n(HT20)	NA	5180	17.53	23	PASS
	802.11n(HT40)	NA	5190	17.89	23	PASS
	802.11ac(VHT20)	NA	5180	18.02	23	PASS
	802.11ac(VHT40)	NA	5190	18.05	23	PASS
	802.11ac(VHT80)	NA	5210	18.17	23	PASS
LTNV	802.11a	NA	5180	17.60	23	PASS
	802.11n(HT20)	NA	5180	17.43	23	PASS
	802.11n(HT40)	NA	5190	17.92	23	PASS
	802.11ac(VHT20)	NA	5180	18.00	23	PASS
	802.11ac(VHT40)	NA	5190	18.11	23	PASS
	802.11ac(VHT80)	NA	5210	18.08	23	PASS
HTNV	802.11a	NA	5180	17.61	23	PASS
	802.11n(HT20)	NA	5180	17.48	23	PASS
	802.11n(HT40)	NA	5190	17.89	23	PASS
	802.11ac(VHT20)	NA	5180	18.05	23	PASS
	802.11ac(VHT40)	NA	5190	17.95	23	PASS
	802.11ac(VHT80)	NA	5210	18.20	23	PASS

3.4. Power Spectrum Density

Limit

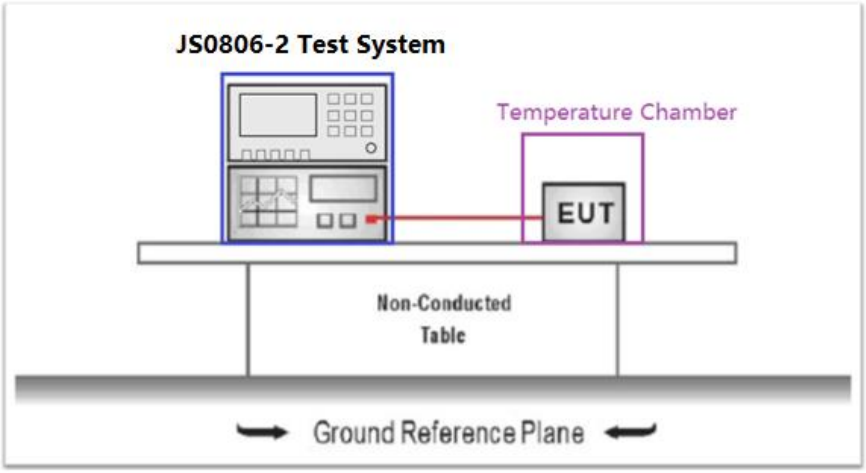
ETSI EN 301 893 Sub-clause 4.2.3.2.1

Table 2: Mean e.i.r.p. limits for RF output power and Power Density at the highest power level (P_H)

Frequency range (MHz)	Mean e.i.r.p. limit for P_H (dBm)		Mean e.i.r.p. density limit (dBm/MHz)	
	with TPC	without TPC	with TPC	without TPC
5 150 to 5 350	23	20/23 (see note 1)	10	7/10 (see note 2)
5 470 to 5 725	30 (see note 3)	27 (see note 3)	17 (see note 3)	14 (see note 3)

NOTE 1: The applicable limit is 20 dBm, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 23 dBm.
NOTE 2: The applicable limit is 7 dBm/MHz, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 10 dBm/MHz.
NOTE 3: Slave devices without a *Radar Interference Detection* function shall comply with the limits for the frequency range 5 250 MHz to 5 350 MHz.

Test Configuration



Test Procedure

Please refer to ETSI EN 301 893 Sub-clause 5.4.4.2.1 for the measurement method.

Test Mode

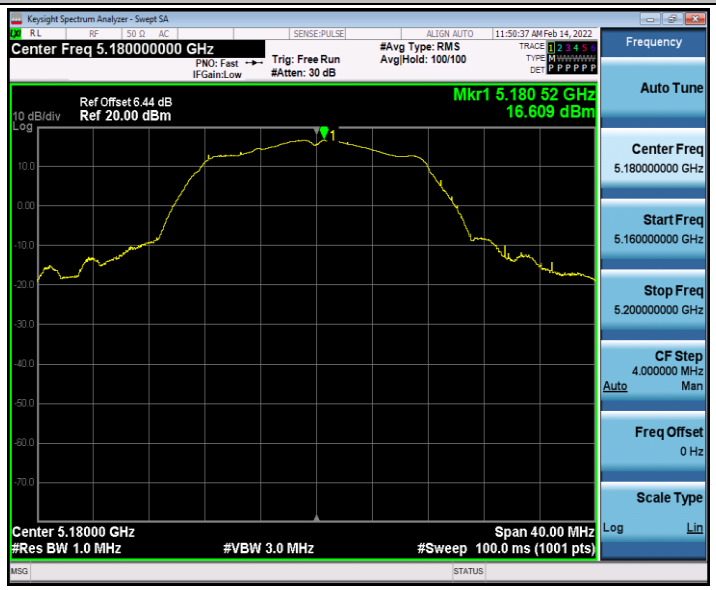
Continuous transmitting.

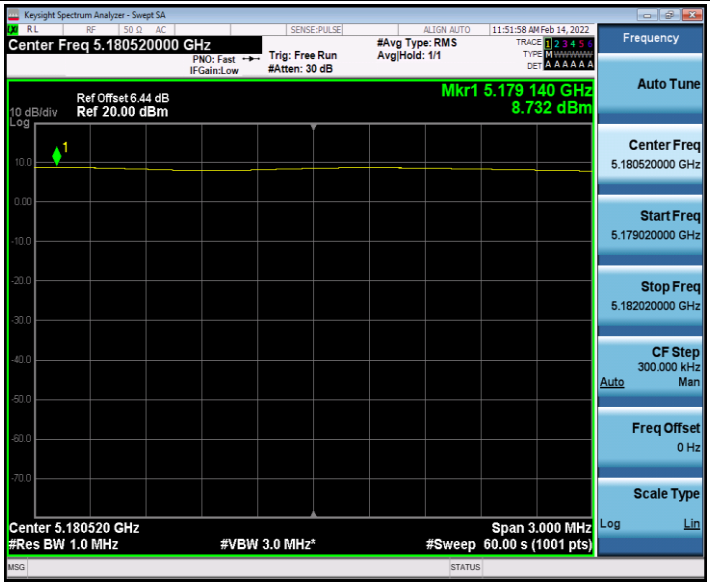
Test Result

Test Mode	Channel	PSD[dBm/MHz]	Limit[dBm/MHz]	Verdict
802.11a	5180	8.732	10	PASS
802.11n(HT20)	5180	8.145	10	PASS
802.11ac(VHT20)	5180	8.246	10	PASS

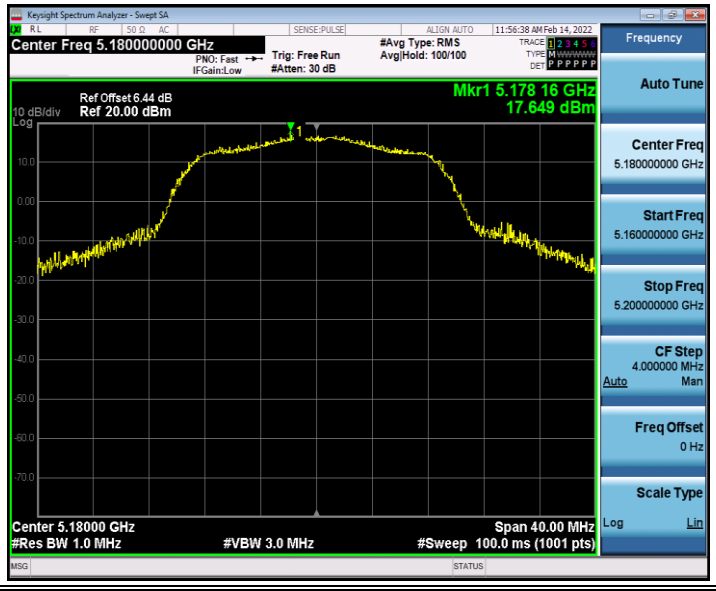
Test plot as follows:

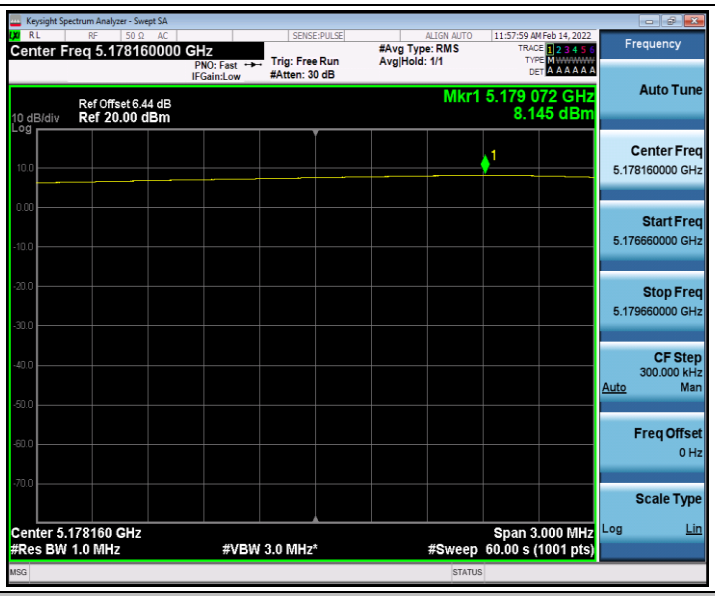
802.11a_5180



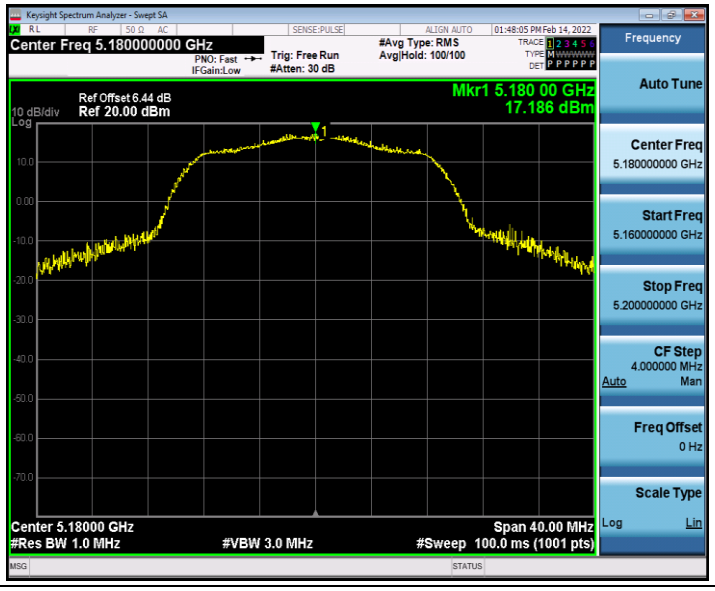


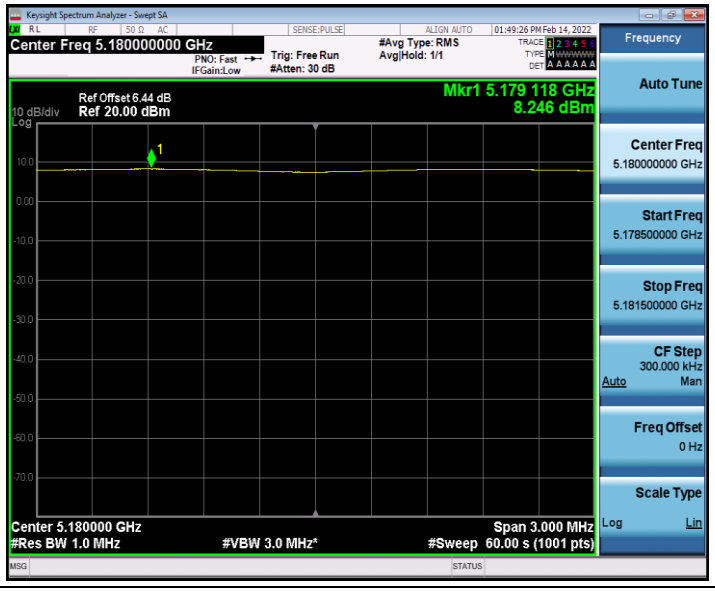
802.11n(HT20)_5180





802.11ac(VHT20)_5180





3.5. Transmitter Unwanted Emissions Outside the 5 GHz RLAN Bands

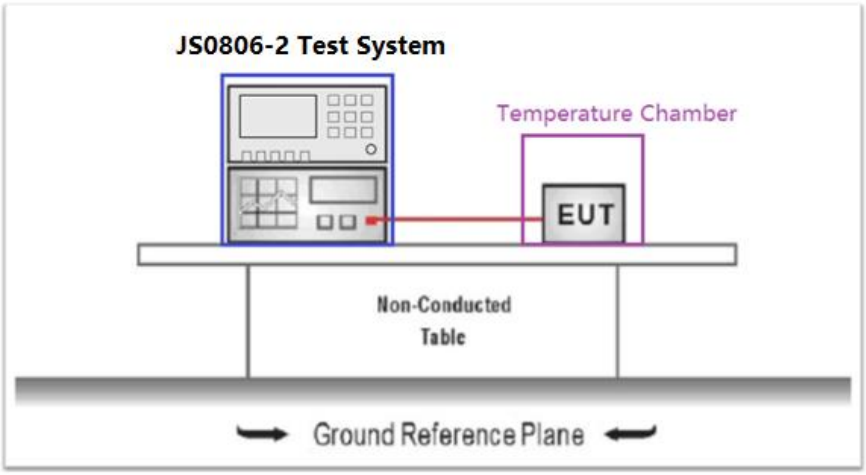
Limit

ETSI EN 301 893 Sub-clause 4.2.4.1.2

Table 4: Transmitter unwanted emission limits outside the 5 GHz RLAN bands

Frequency range	Maximum power	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 862 MHz	-54 dBm	100 kHz
862 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 5,15 GHz	-30 dBm	1 MHz
5,35 GHz to 5,47 GHz	-30 dBm	1 MHz
5,725 GHz to 26 GHz	-30 dBm	1 MHz

Test Configuration



Test Procedure

Please refer to ETSI EN 301 893 Sub-clause 5.4.5.2.1 for the measurement method.

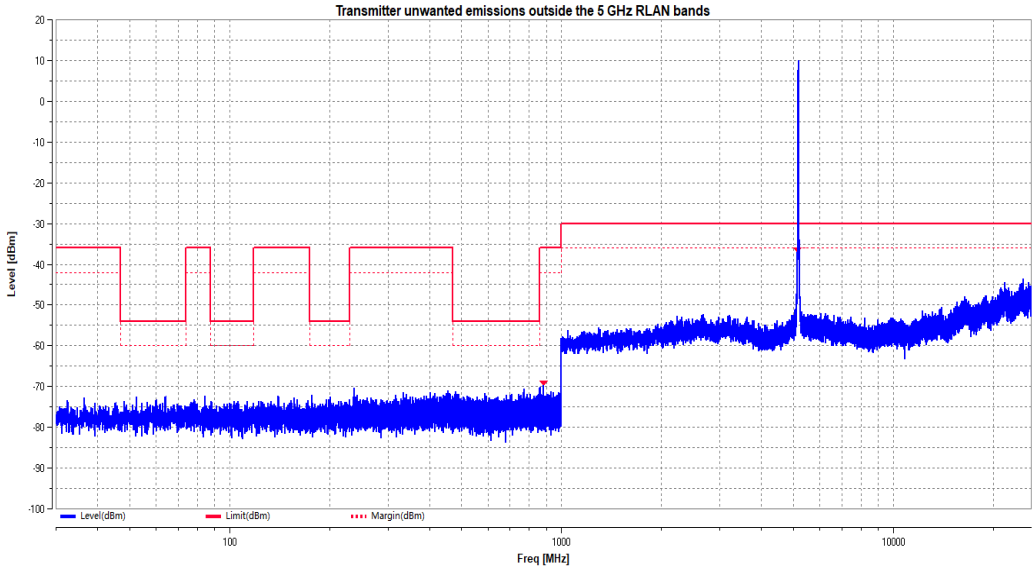
Test Mode

Continuous transmitting.

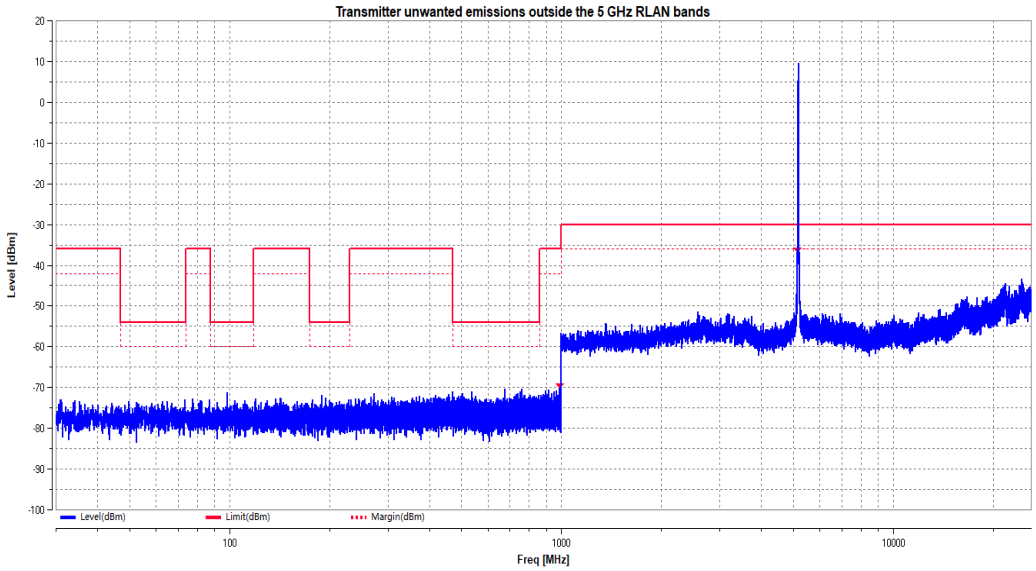
Test Result

Note: The signal which over the limit is the main wave signal.

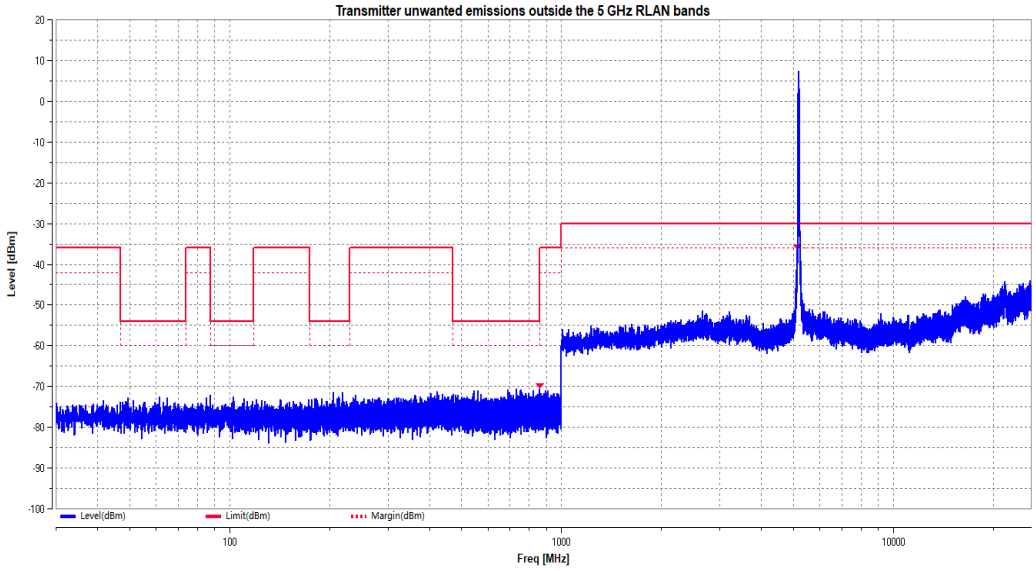
802.11a_5180



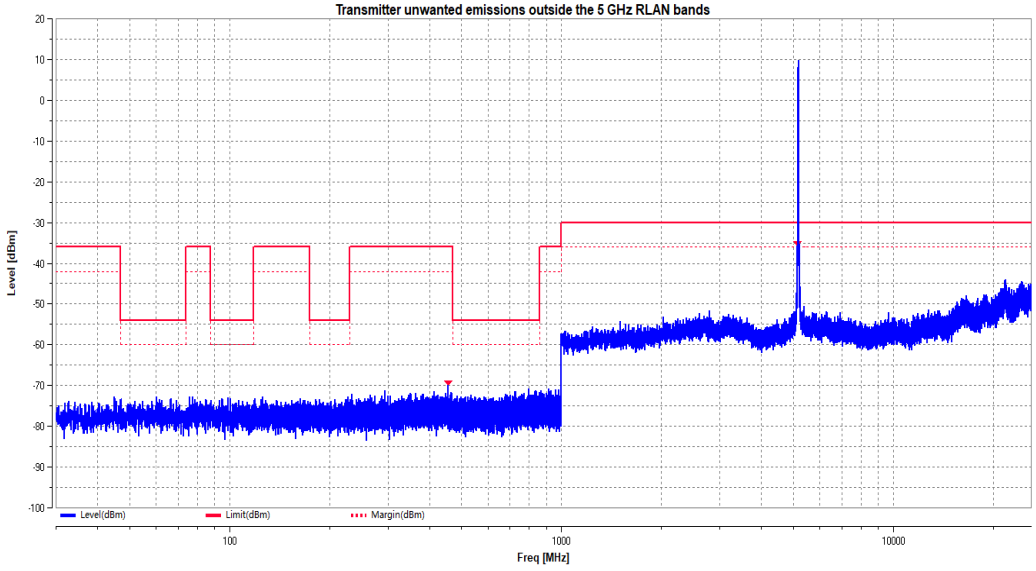
802.11n(HT20)_5180



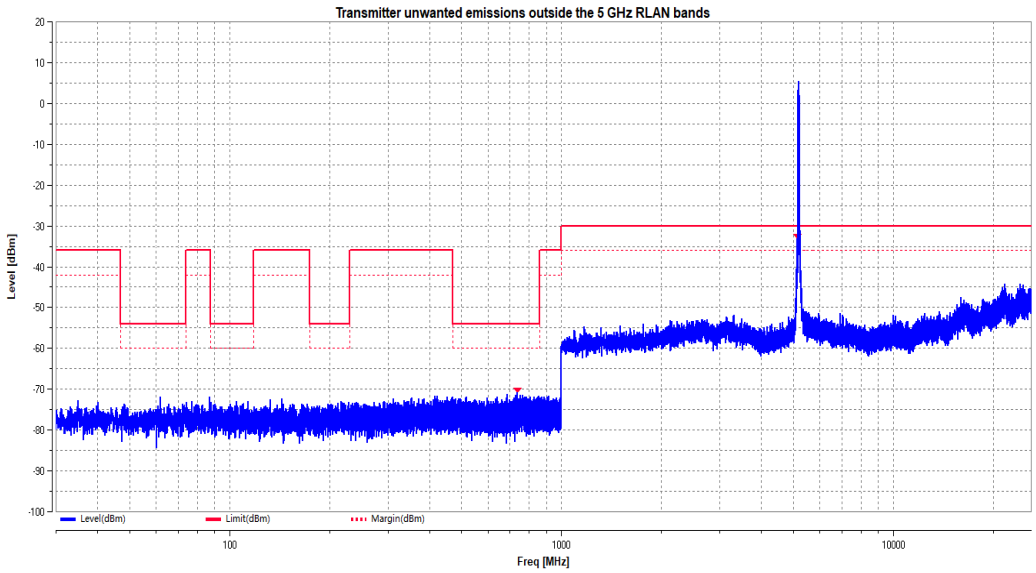
802.11n(HT40)_5190



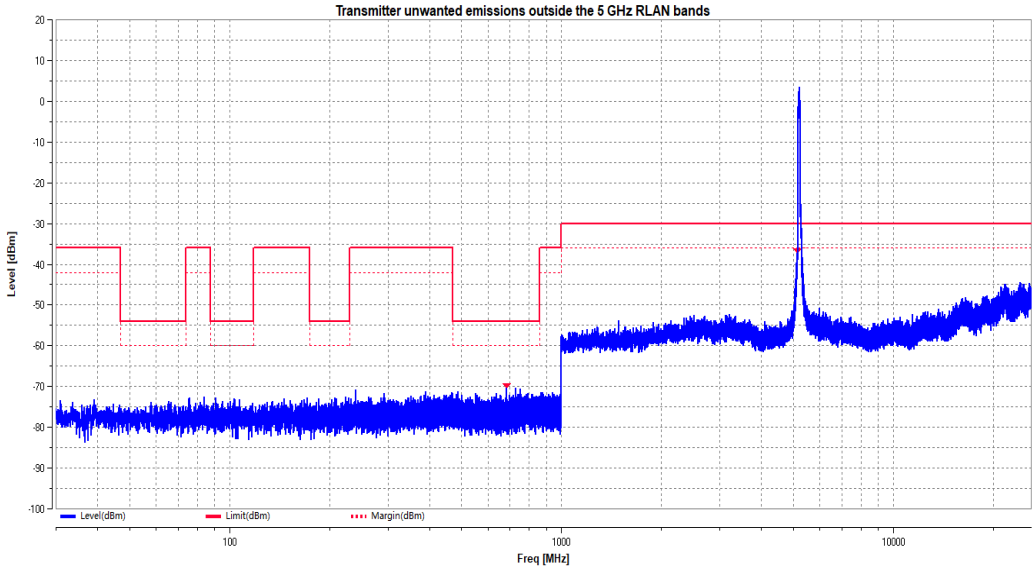
802.11ac(VHT20)_5180



802.11ac(VHT40)_5190



802.11ac(VHT80)_5210



3.6. Transmitter unwanted emissions in the spurious domain-Radiated measurements

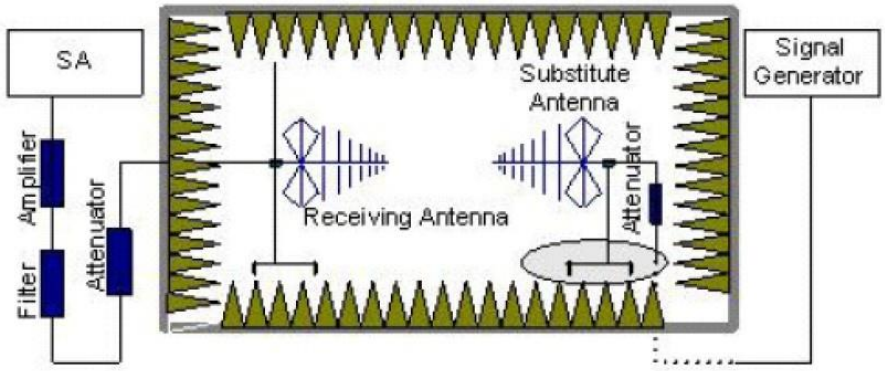
Limit

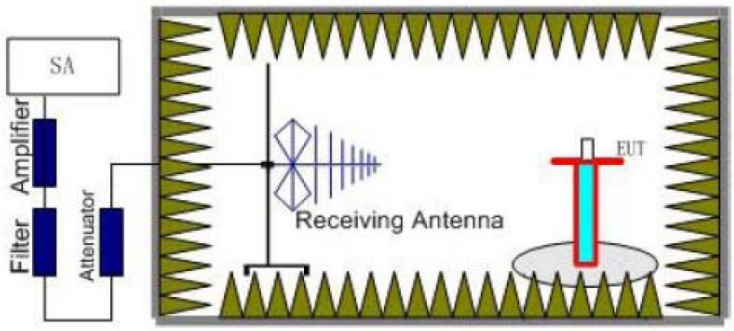
ETSI EN 301 893 Sub-clause 4.2.4.1.2

The transmitter unwanted emissions in the spurious domain shall not exceed the values given in the below table

Frequency range	Maximum power	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 862 MHz	-54 dBm	100 kHz
862 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 26GHz	-30 dBm	1 MHz

Test Configuration





Test Procedure

Please refer to ETSI EN 301 893 Sub-clause 5.4.5.2.1 for the measurement method.

Test Mode

Continuous transmitting.

Test Result

Note:

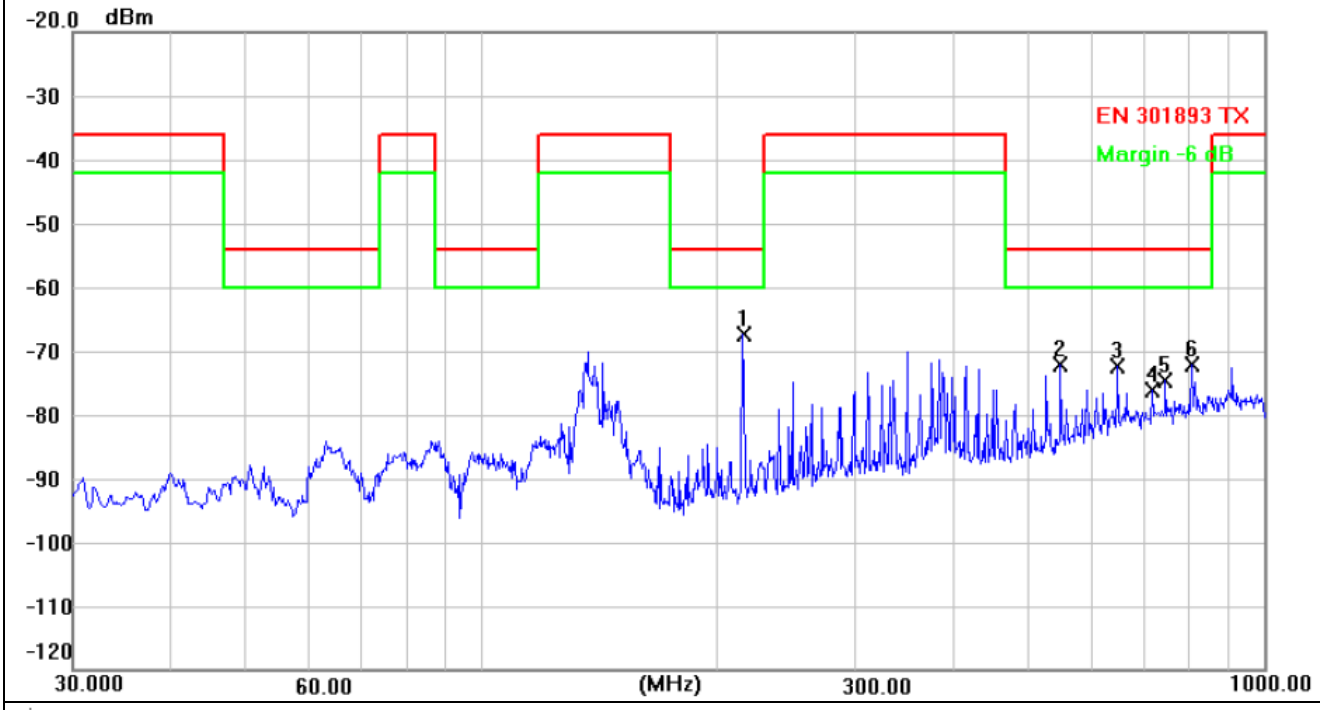
1. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, and test data recorded in this report.
2. Pre-scan all bandwidth found the 20MHz CH36 which it is worse case, so only show the test data for

worse case.

3. 18GHz ~ 26GHz(5 times the carrier frequency)
The EUT was pre-scanned the frequency band (18GHz~26GHz), found the radiated level (Background noise) lower than the limit, so don't show on the report.

(1) Below 1G

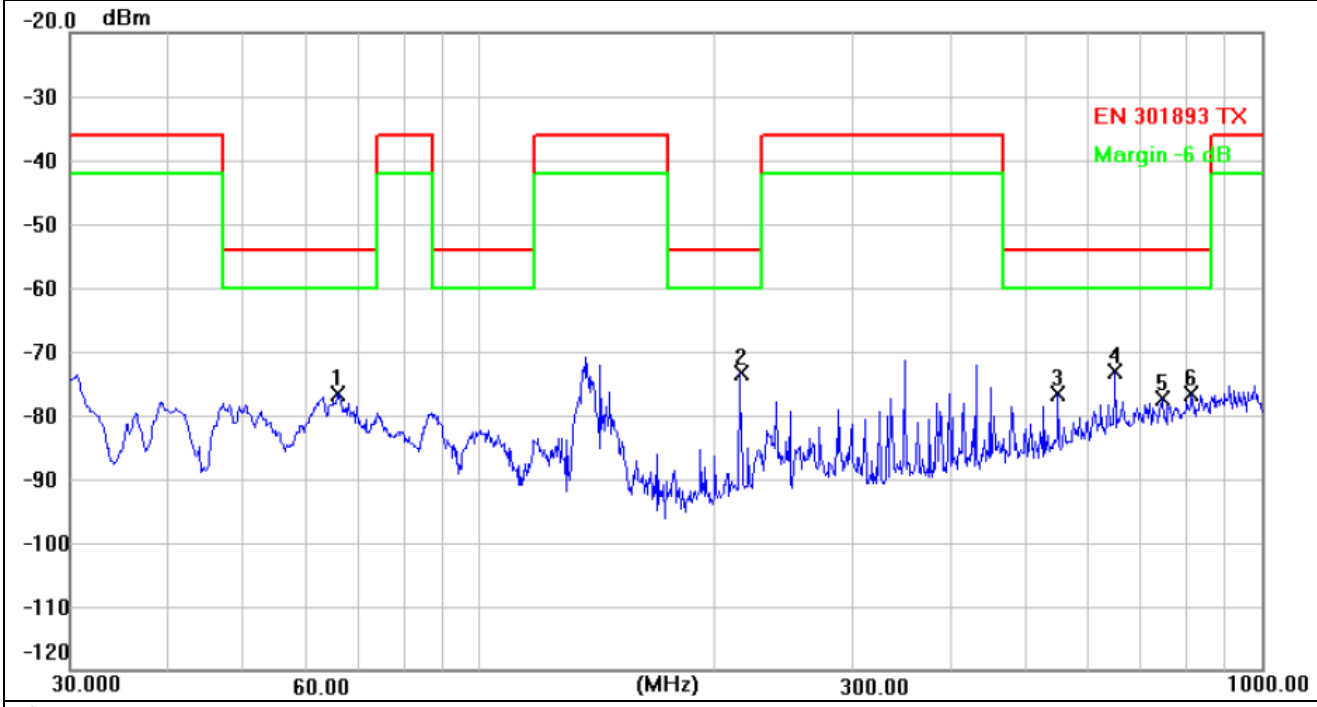
Test Channel:	CH36	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1 *	215.9167	-51.76	-15.62	-67.38	-54.00	-13.38	peak
2	549.9200	-64.20	-7.94	-72.14	-54.00	-18.14	peak
3	650.1533	-66.31	-6.11	-72.42	-54.00	-18.42	peak
4	719.9933	-70.82	-5.25	-76.07	-54.00	-22.07	peak
5	750.0633	-69.82	-4.82	-74.64	-54.00	-20.64	peak
6	809.8800	-68.27	-3.96	-72.23	-54.00	-18.23	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Test Channel:	CH36	Polarity:	Vertical

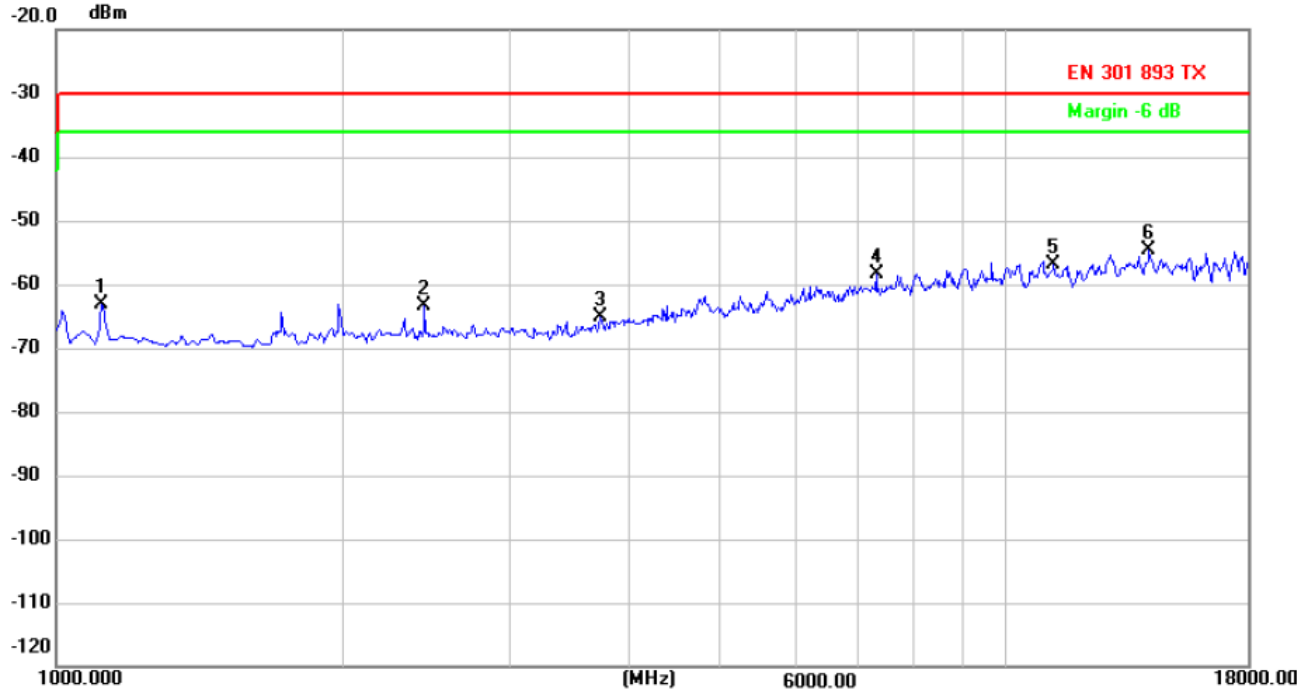


No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1	66.2132	-59.12	-17.51	-76.63	-54.00	-22.63	peak
2	215.9167	-57.74	-15.62	-73.36	-54.00	-19.36	peak
3	549.9200	-68.76	-7.94	-76.70	-54.00	-22.70	peak
4 *	650.1533	-67.03	-6.11	-73.14	-54.00	-19.14	peak
5	750.0633	-72.60	-4.82	-77.42	-54.00	-23.42	peak
6	814.7300	-72.79	-3.89	-76.68	-54.00	-22.68	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

(2) Above 1G

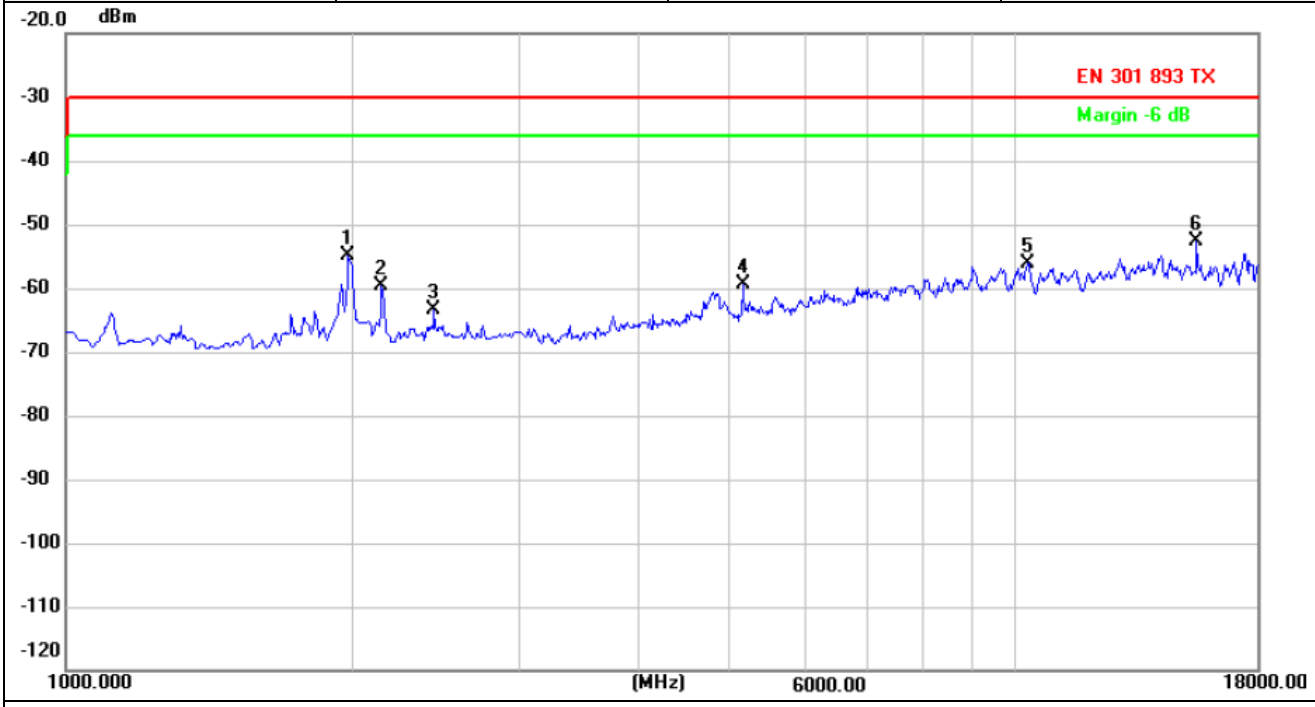
Test Channel:	CH36	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1	1119.000	-50.98	-12.24	-63.22	-30.00	-33.22	peak
2	2445.000	-55.50	-7.86	-63.36	-30.00	-33.36	peak
3	3737.000	-59.15	-5.88	-65.03	-30.00	-35.03	peak
4	7307.000	-59.81	1.51	-58.30	-30.00	-28.30	peak
5	11251.000	-60.52	3.74	-56.78	-30.00	-26.78	peak
6 *	14192.000	-58.75	4.02	-54.73	-30.00	-24.73	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Test Channel:	CH36	Polarity:	Vertical



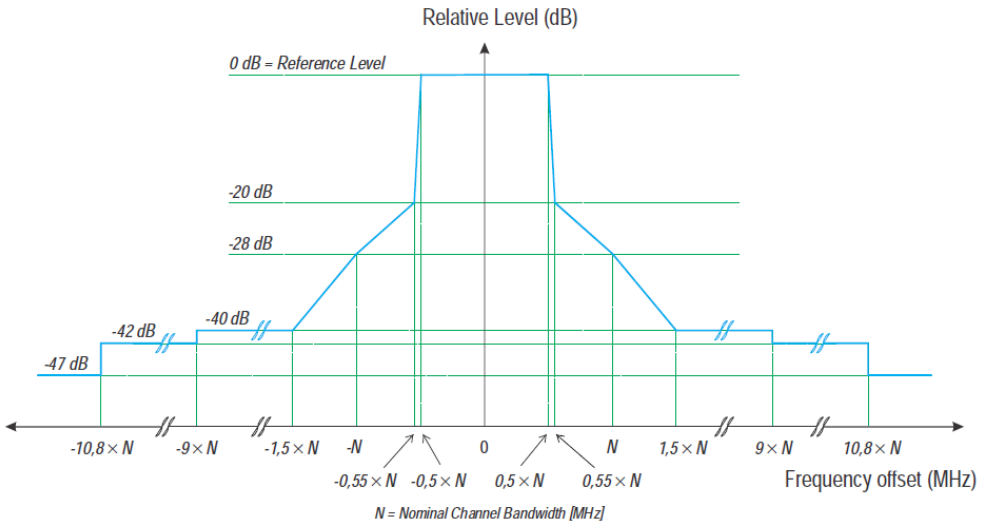
No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1	1986.000	-45.01	-9.94	-54.95	-30.00	-24.95	peak
2	2156.000	-50.56	-9.16	-59.72	-30.00	-29.72	peak
3	2445.000	-55.60	-7.86	-63.46	-30.00	-33.46	peak
4	5165.000	-57.57	-1.89	-59.46	-30.00	-29.46	peak
5	10316.000	-59.41	3.25	-56.16	-30.00	-26.16	peak
6 *	15535.000	-55.99	3.45	-52.54	-30.00	-22.54	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

3.7. Transmitter Unwanted Emission Within 5GHz R-LAN Bands

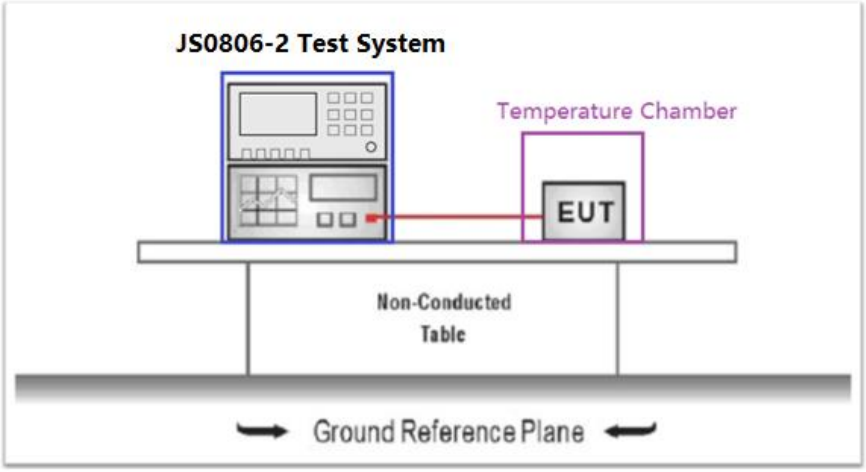
Limit

ETSI EN 301 893Sub-clause 4.2.4.2.2



NOTE: dBc is the spectral density relative to the maximum spectral power density of the transmitted signal.

Test Configuration



Test Procedure

Please refer to ETSI EN 301 893 Sub-clause 5.4.6.2.1 for the measurement method.

Test Mode

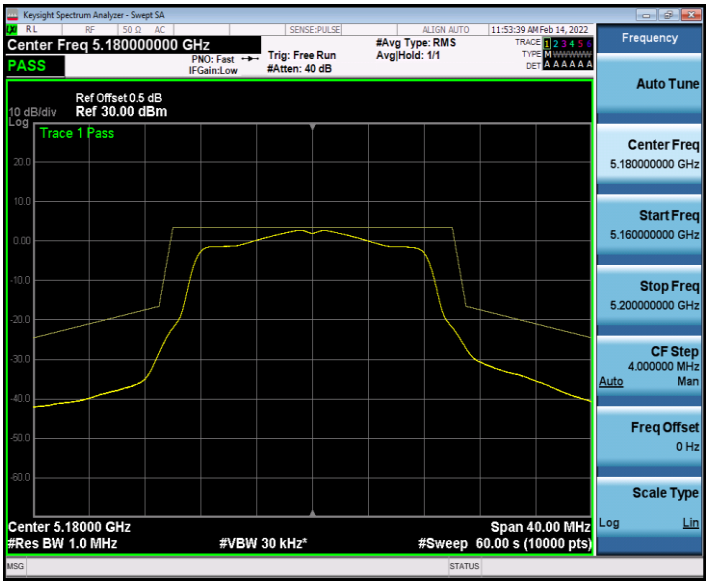
Continuous transmitting.

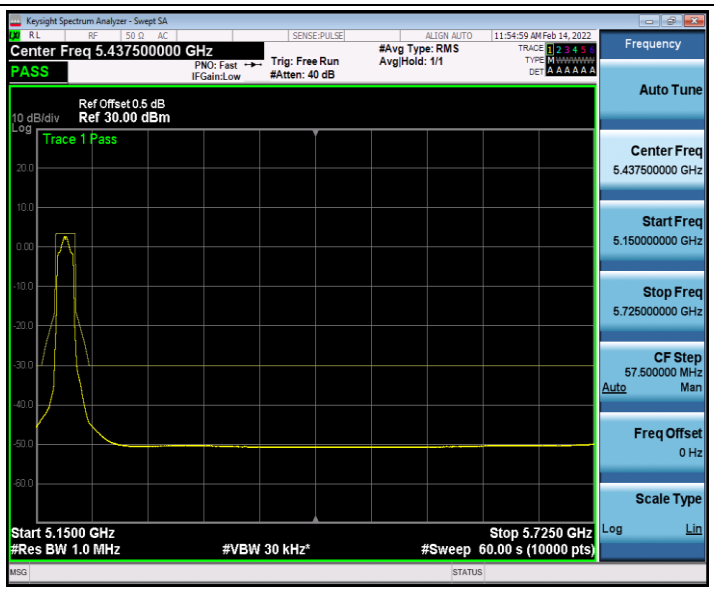
Test Result

Test Mode	Channel	Result [dBm]	Limit[dBm]	Verdict
802.11a	5180	See test graph	See test graph	PASS
802.11n(HT20)	5180	See test graph	See test graph	PASS
802.11n(HT40)	5190	See test graph	See test graph	PASS
802.11ac(VHT20)	5180	See test graph	See test graph	PASS
802.11ac(VHT40)	5190	See test graph	See test graph	PASS
802.11ac(VHT80)	5210	See test graph	See test graph	PASS

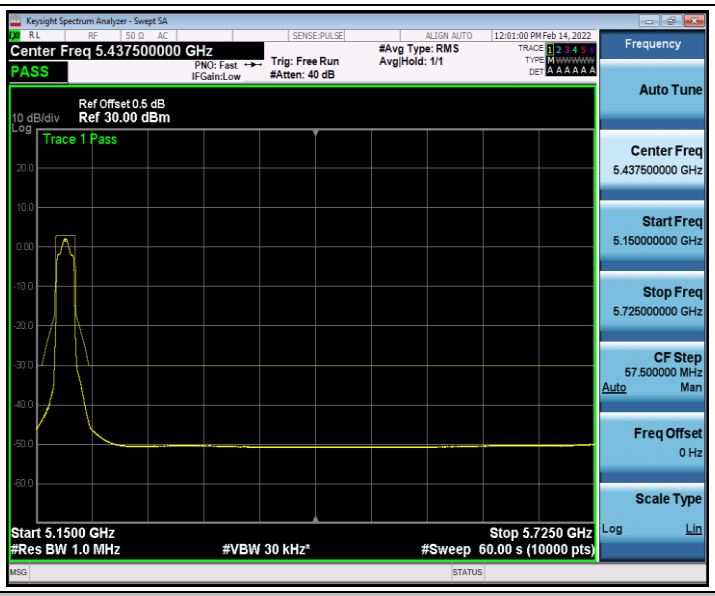
Test plot as follows:

802.11a_5180

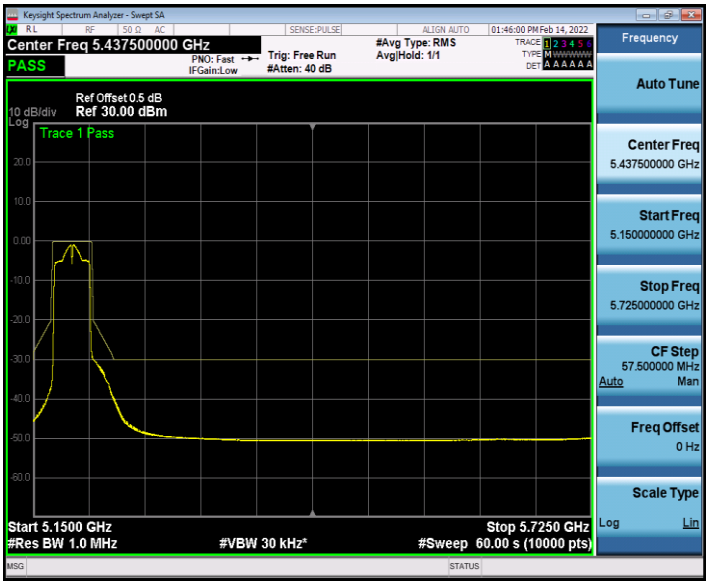




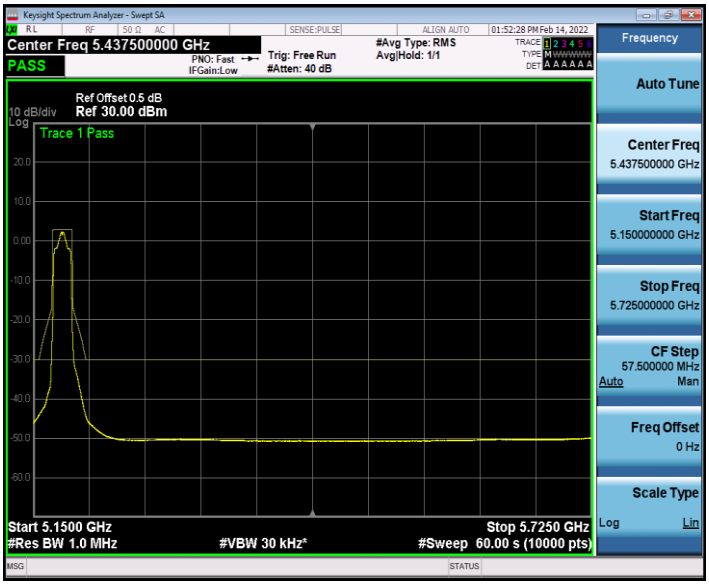
802.11n(HT20)_5180



802.11n(HT40)_5190



802.11ac(VHT20)_5180



802.11ac(VHT40)_5190

802.11ac(VHT80)_5210

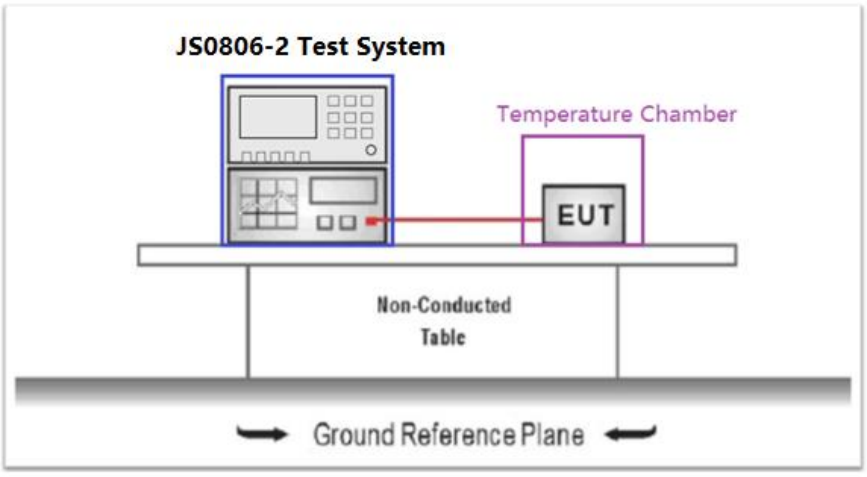
3.8. Receiver Spurious Emissions

Limit

ETSI EN 301 893 Sub-clause 4.2.5.2

Frequency range	Maximum power	Measurement bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 26 GHz	-47 dBm	1 MHz

Test Configuration



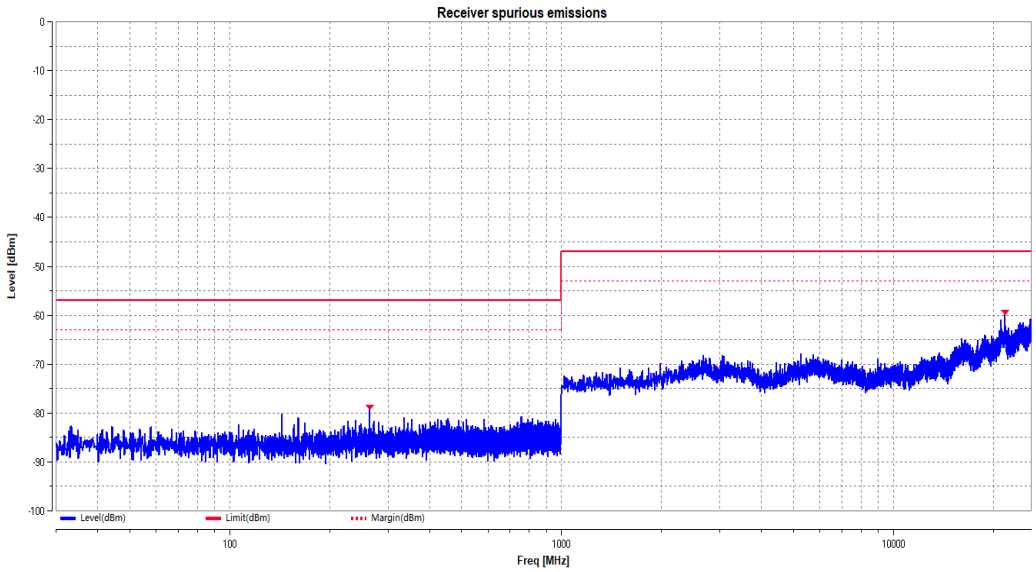
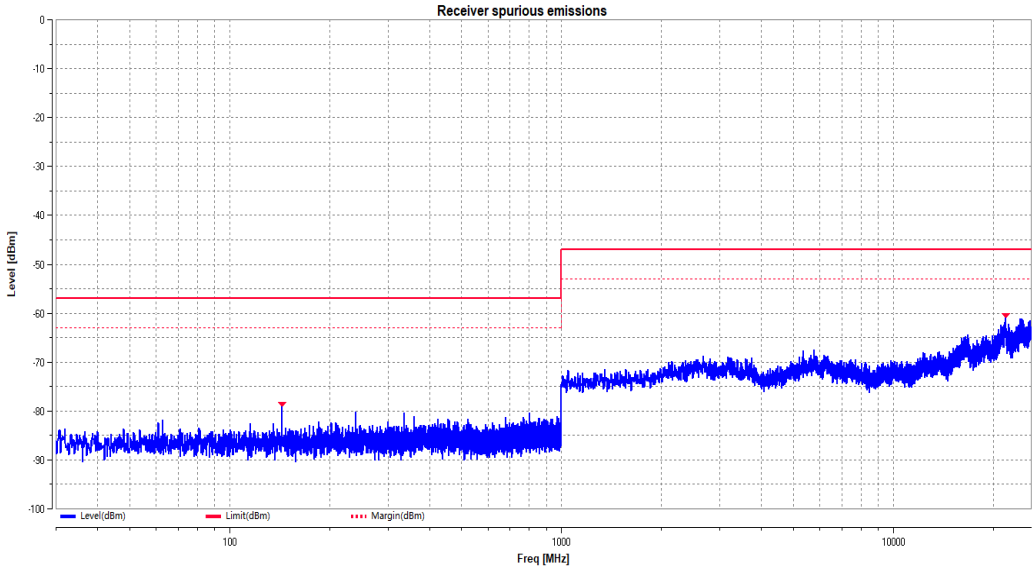
Test Procedure

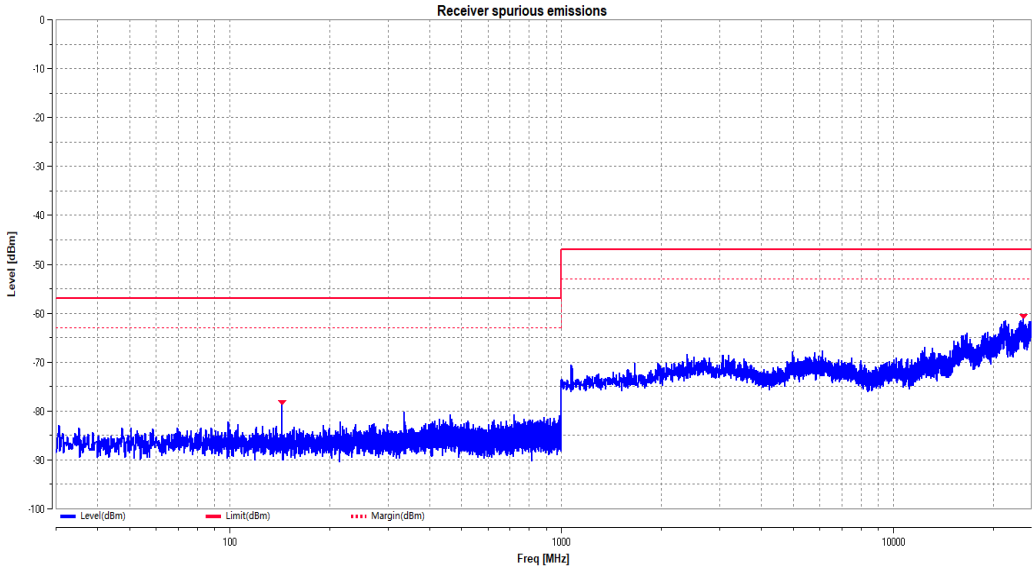
Please refer to ETSI EN 301 893 Sub-clause 5.4.6.2.1 for the measurement method.

Test Mode

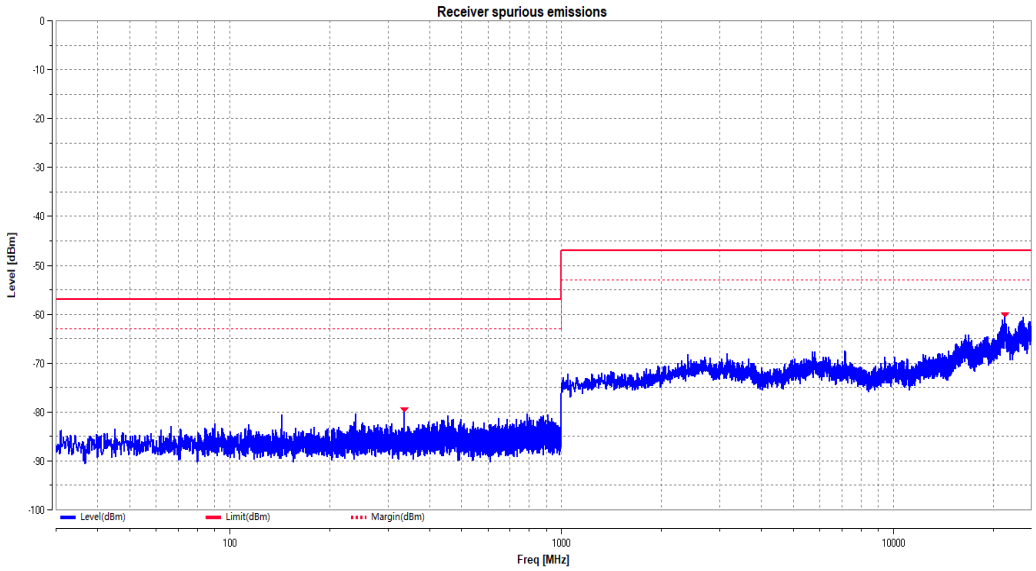
Continuous receiving.

Test Result

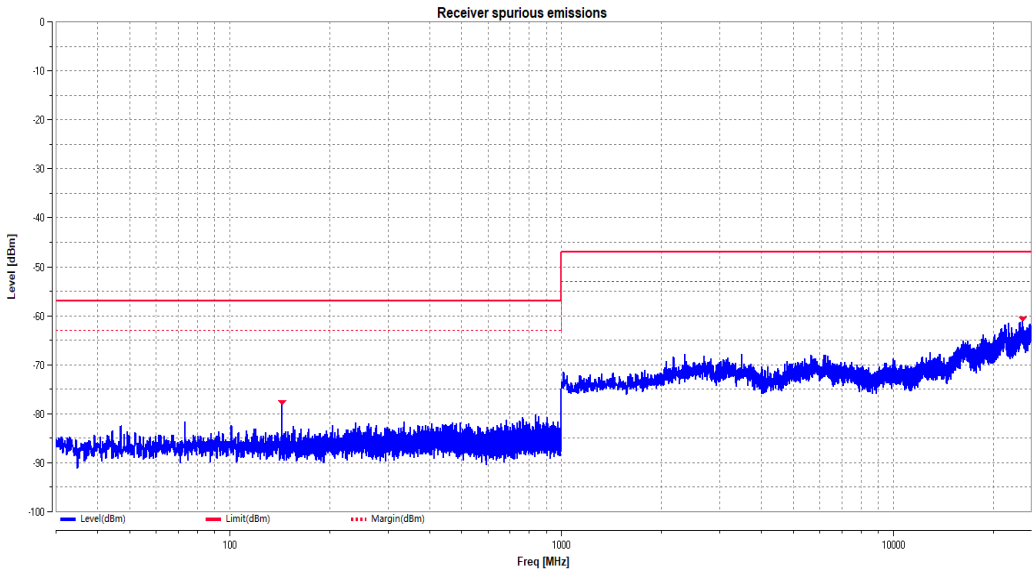
802.11a_5180

802.11n(HT20)_5180

802.11n(HT40)_5190



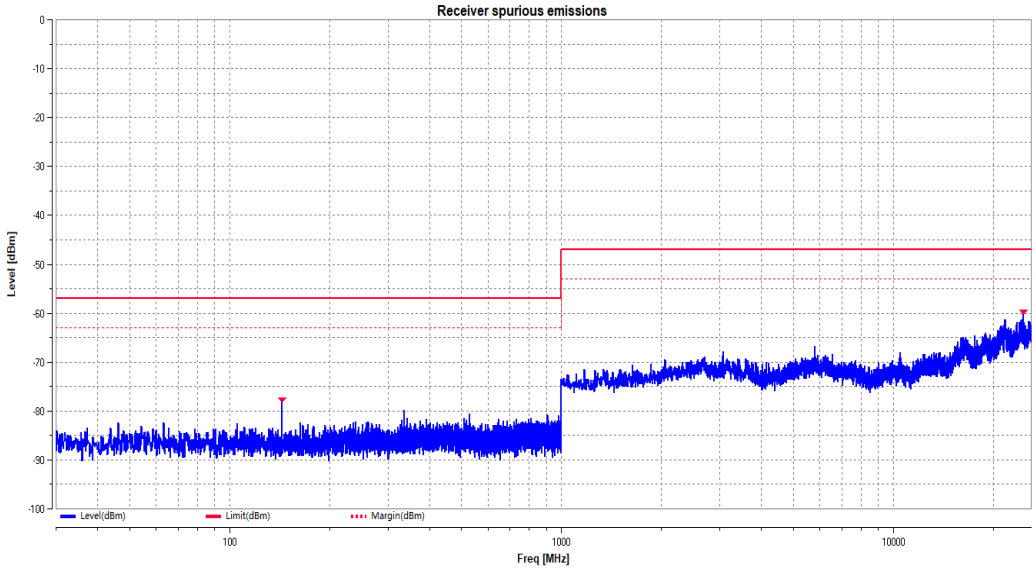
802.11ac(VHT20)_5180



802.11ac(VHT40)_5190



802.11ac(VHT80)_5210


Receiver spurious emissions
Level [dBm]
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Level(dBm)
Limit(dBm)
Margin(dBm)
100
1000
10000
Freq [MHz]

3.9. Receiver spurious emissions-Radiated measurements

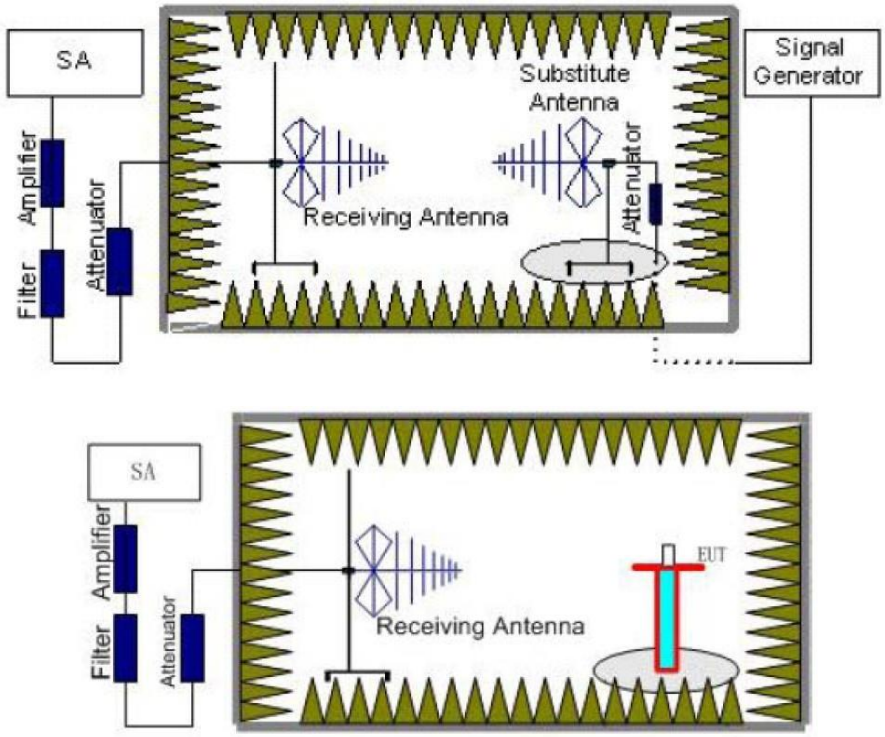
Limit

ETSI EN 301 893 Sub-clause 4.2.5.2

The spurious emissions of the receiver shall not exceed the values given in the below table

Frequency range	Maximum power	Measurement bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 26 GHz	-47 dBm	1 MHz

Test Configuration



Test Procedure

Please refer to ETSI EN 301 893 Sub-clause 5.4.6.2.1 for the measurement method.

Test Mode

Continuous receiving.

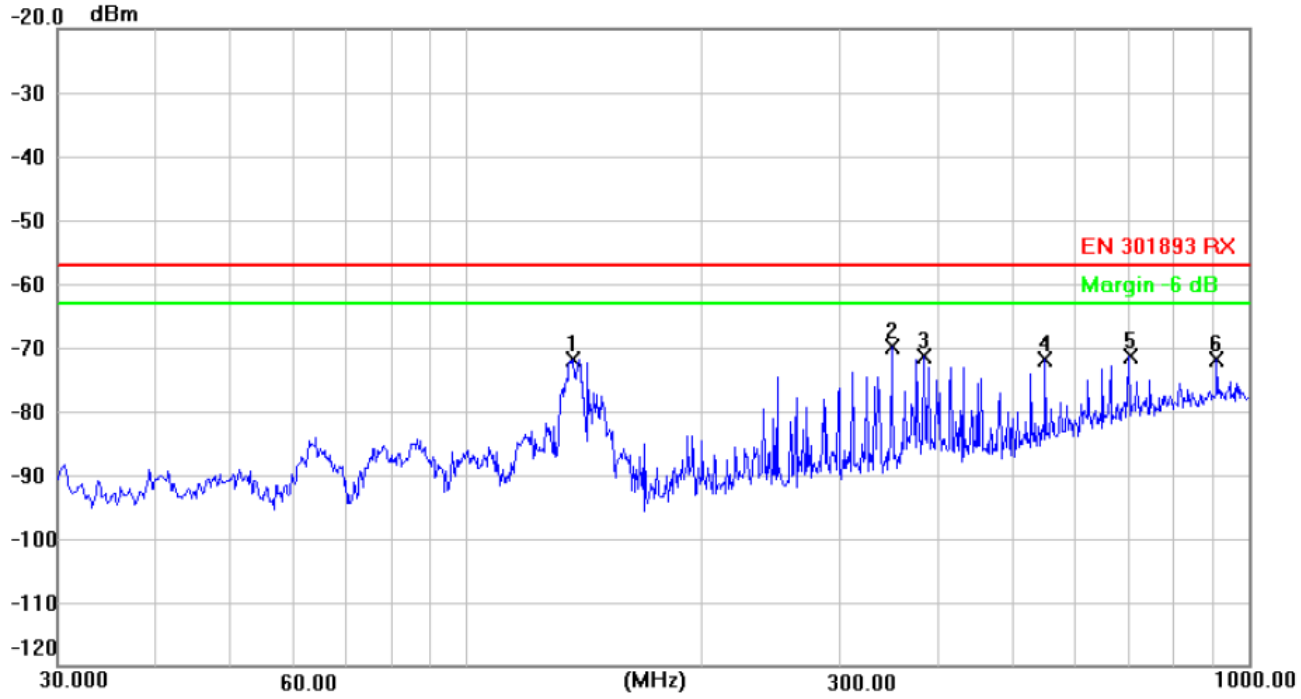
Test Result

Note:

1. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, and test data recorded in this report.
2. Pre-scan all bandwidth found the 20MHz CH36 which it is worse case, so only show the test data for worse case.
3. 18GHz ~ 26GHz(5 times the carrier frequency)
   The EUT was pre-scanned the frequency band (18GHz~26GHz), found the radiated level (Background noise) lower than the limit, so don’t show on the report.

(1) Below 1G

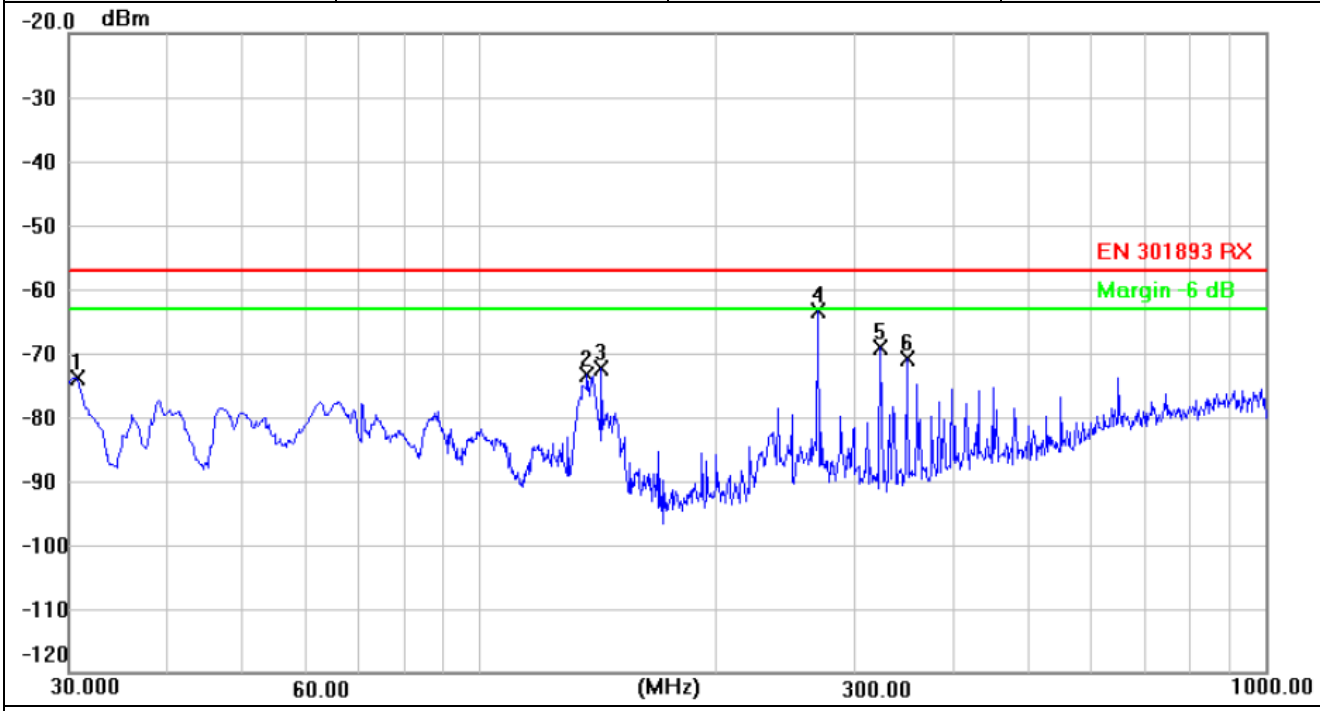
Test Channel:	CH36	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1	136.7000	-51.92	-19.84	-71.76	-57.00	-14.76	peak
2 *	350.1000	-57.61	-12.30	-69.91	-57.00	-12.91	peak
3	384.0500	-60.00	-11.45	-71.45	-57.00	-14.45	peak
4	549.9200	-63.96	-7.94	-71.90	-57.00	-14.90	peak
5	701.8867	-65.97	-5.52	-71.49	-57.00	-14.49	peak
6	912.0533	-69.44	-2.52	-71.96	-57.00	-14.96	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Test Channel:	CH36	Polarity:	Vertical

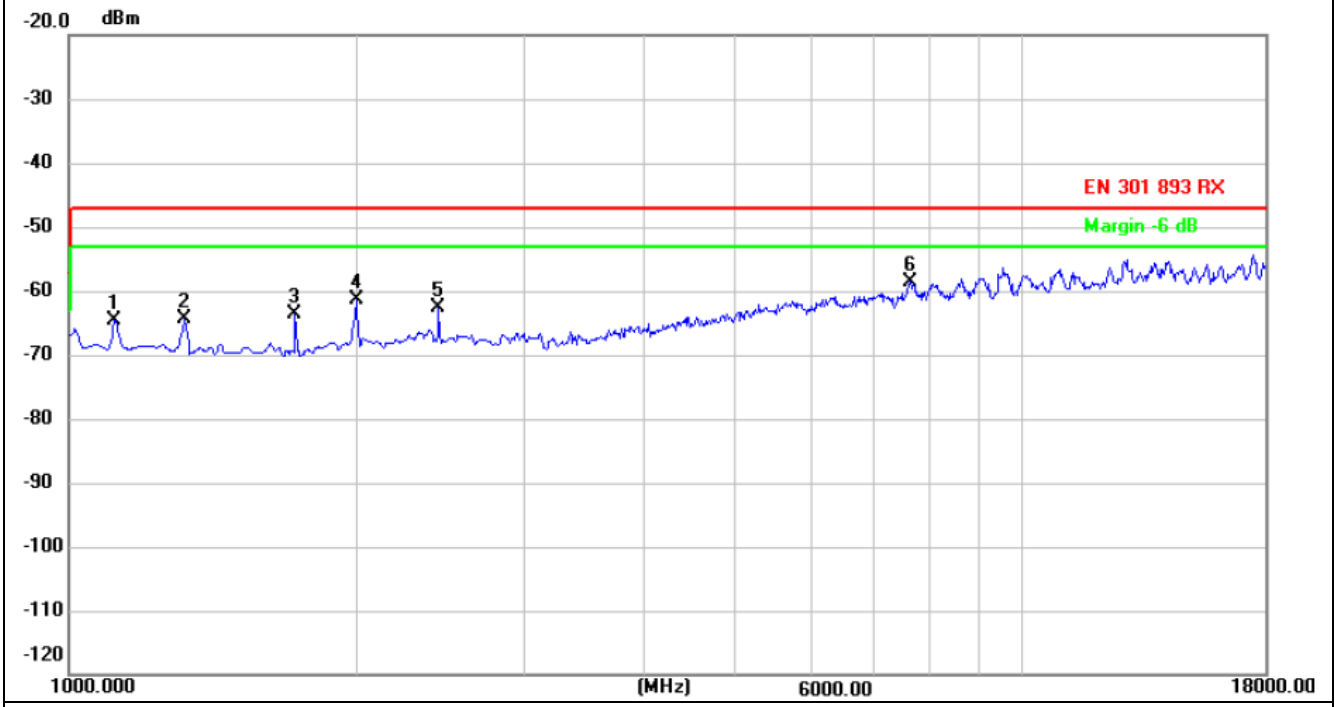


No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1	30.6467	-57.75	-16.02	-73.77	-57.00	-16.77	peak
2	137.3466	-53.38	-19.88	-73.26	-57.00	-16.26	peak
3	142.8432	-52.50	-19.88	-72.38	-57.00	-15.38	peak
4 *	269.9133	-49.14	-14.20	-63.34	-57.00	-6.34	peak
5	323.9100	-56.16	-12.94	-69.10	-57.00	-12.10	peak
6	350.1000	-58.55	-12.30	-70.85	-57.00	-13.85	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

(2) Above 1G

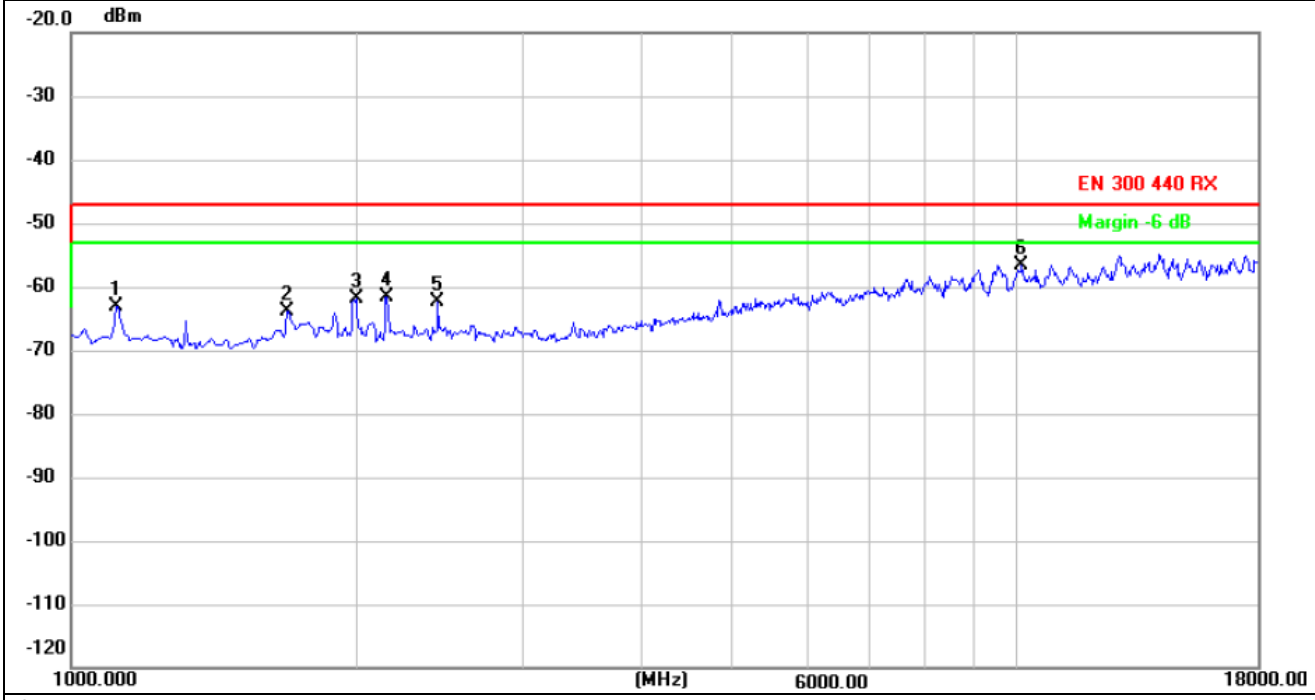
Test Channel:	CH36	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1	1119.000	-52.32	-12.24	-64.56	-47.00	-17.56	peak
2	1323.000	-52.71	-11.55	-64.26	-47.00	-17.26	peak
3	1731.000	-52.54	-11.02	-63.56	-47.00	-16.56	peak
4	2003.000	-51.62	-9.86	-61.48	-47.00	-14.48	peak
5	2445.000	-54.70	-7.86	-62.56	-47.00	-15.56	peak
6 *	7647.000	-60.68	2.02	-58.66	-47.00	-11.66	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Test Channel:	CH36	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1	1119.000	-50.81	-12.24	-63.05	-47.00	-16.05	peak
2	1697.000	-52.80	-11.06	-63.86	-47.00	-16.86	peak
3	2003.000	-52.03	-9.86	-61.89	-47.00	-14.89	peak
4	2157.260	-52.49	-9.16	-61.65	-47.00	-14.65	peak
5	2445.000	-54.51	-7.86	-62.37	-47.00	-15.37	peak
6 *	10146.000	-60.00	3.41	-56.59	-47.00	-9.59	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

3.10. Adaptivity

Limit

ETSI EN 301893 Sub-clause 4.2.7.3

This requirement applies to all equipment within the scope of the present document.

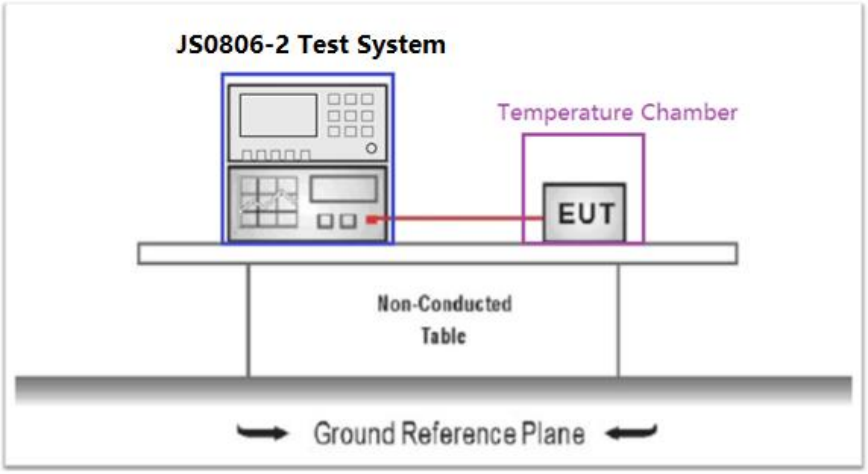
The present document defines 2 types of Adaptive equipment: Frame Based Equipment and Load Based Equipment.

Whilst the mechanisms described in this clause define conditions under which the equipment may transmit, transmissions are only allowed providing they are not prohibited by any of the DFS requirements in clause 4.7.

Short Control Signaling Transmissions

If implemented, Short Control Signalling Transmissions of Adaptive equipment shall have a maximum duty cycle of 5 % within an observation period of 50ms.

Test Configuration



Test Procedure

Please refer to ETS EN 301 893 Sub-clause 5.4.9.2.2 for the measurement method.

Test Mode

Normal operation.

Test Result

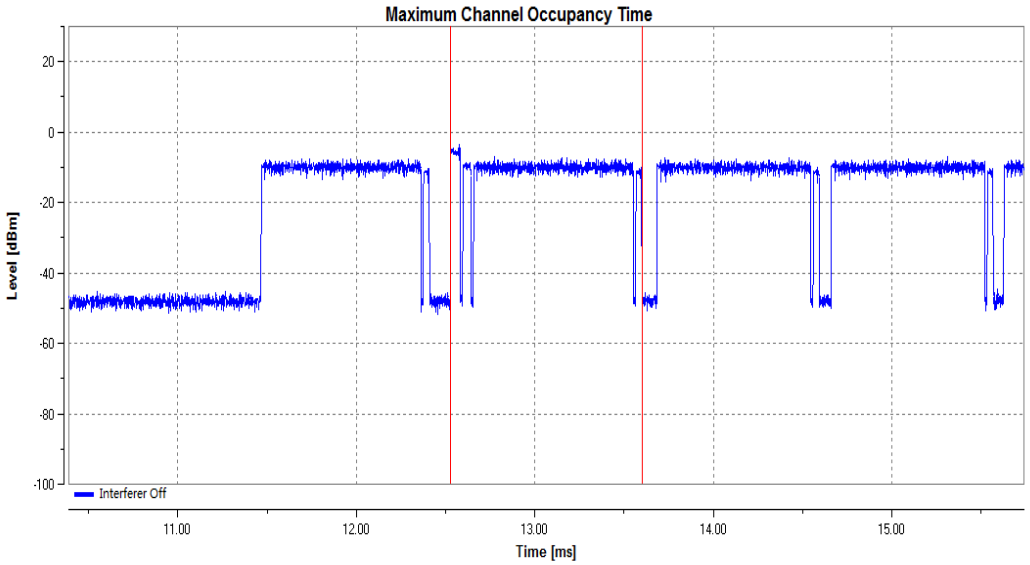
Only show the test data for worse case.

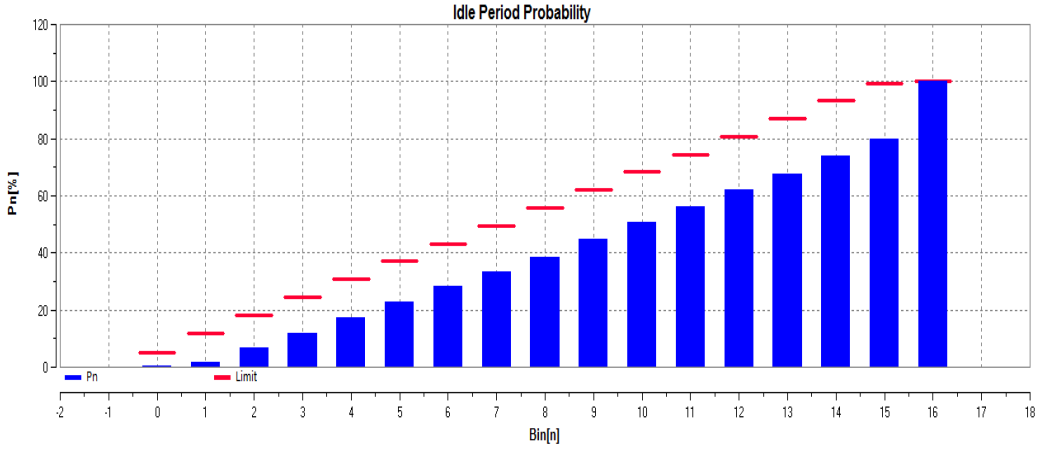
Test Mode	Channel	Priority Class	COT Num [n]	Max. COT [ms]	Limit [ms]	Min.Idle Time[ms]	Limit [ms]	Idle Period probability	Verdict
802.11a	5180	2	10000	1.070	6.000	0.029	0.027	See the graph	PASS

Test Mode	Channel	Interference Type	Add Interference Time [ms]	Interference Level [dBm/MHz]	Max. Short Control number [n]	Limit [n]	Max. Short Control Time [ms]	Limit [ms]	Verdict
802.11a	5180	AWGN	2100	-71.20	3	50	1.80	2.5	PASS
		OFDM	2100	-71.20	4	50	1.70	2.5	PASS
		LTE	2100	-71.20	3	50	1.70	2.5	PASS

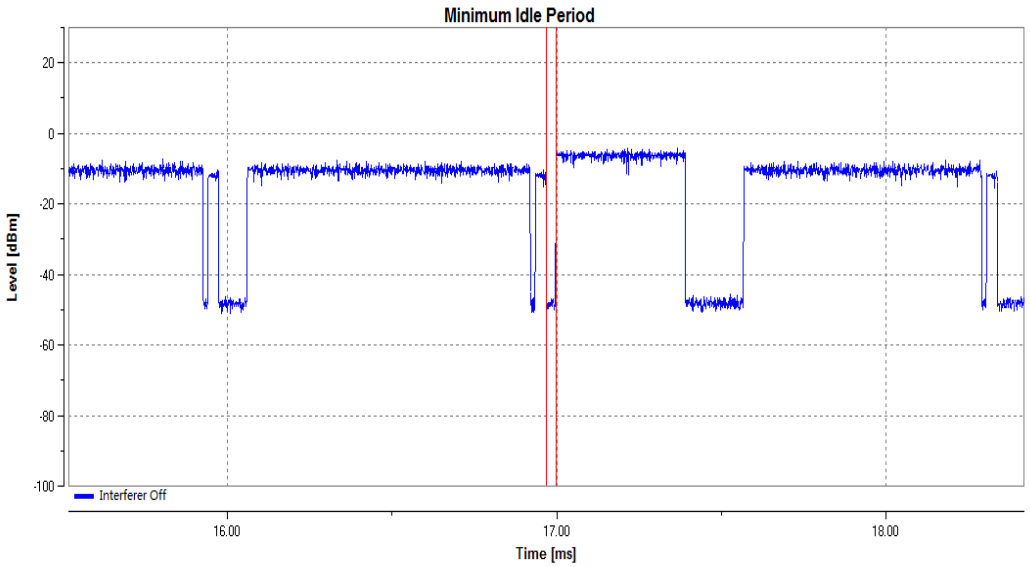
Test Graphs:

802.11a_5180

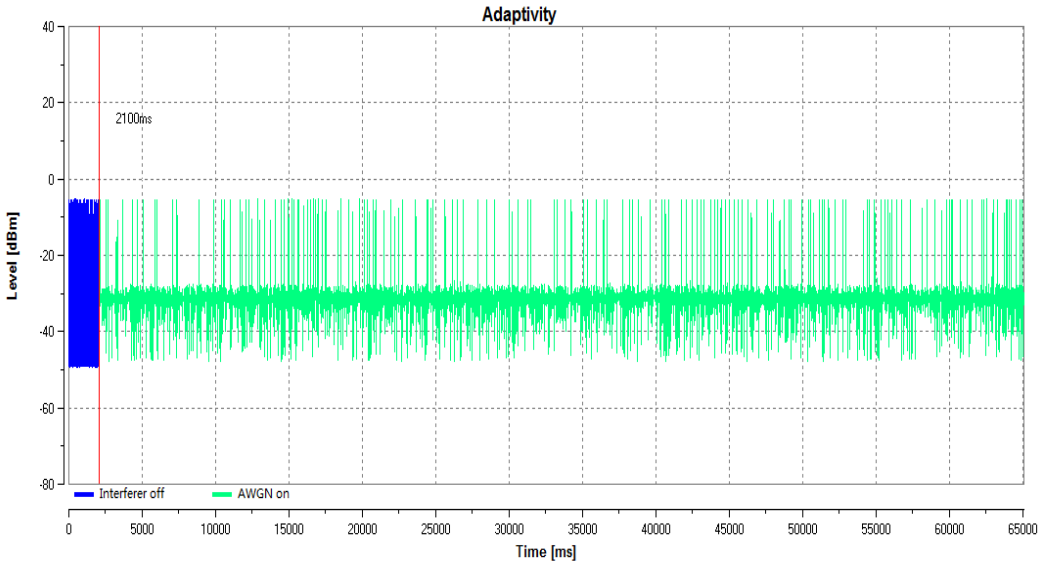


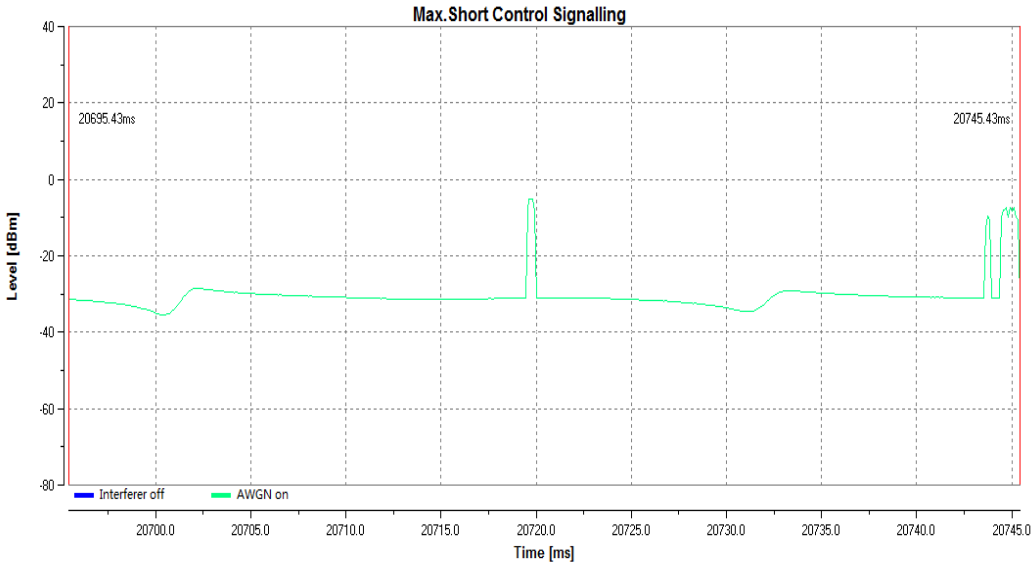


n	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
B[n]	44	104	544	494	558	537	537	519	496	666	555	546	597	549	628	596	2029
P[n]	0.44	1.48	6.92	11.86	17.44	22.81	28.18	33.37	38.33	44.99	50.55	56.01	61.98	67.47	73.75	79.71	100
Limit	5	12	18.25	24.5	30.75	37	43.25	49.5	55.75	62	68.25	74.5	80.75	87	93.25	99.5	100

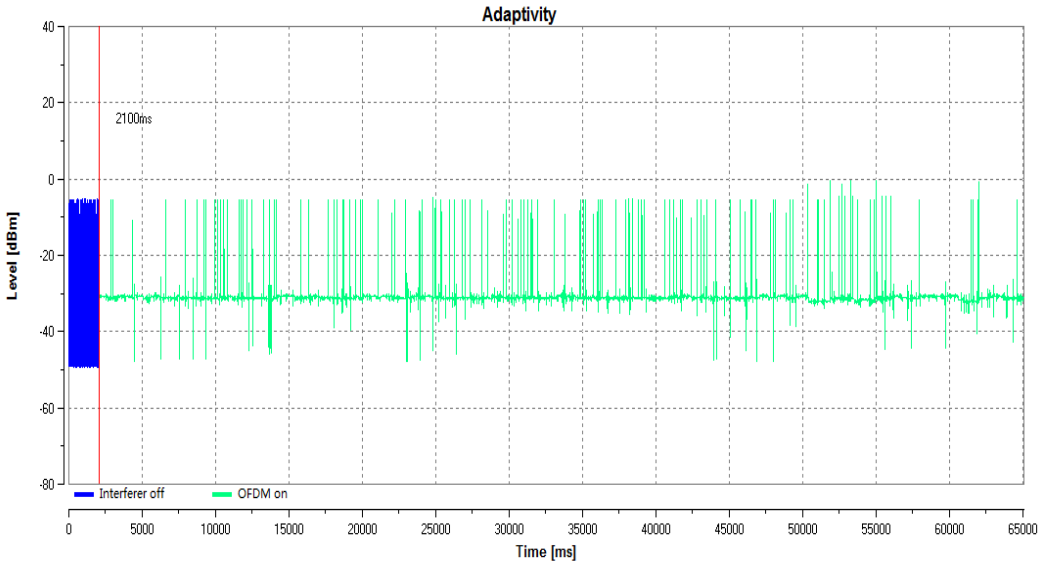


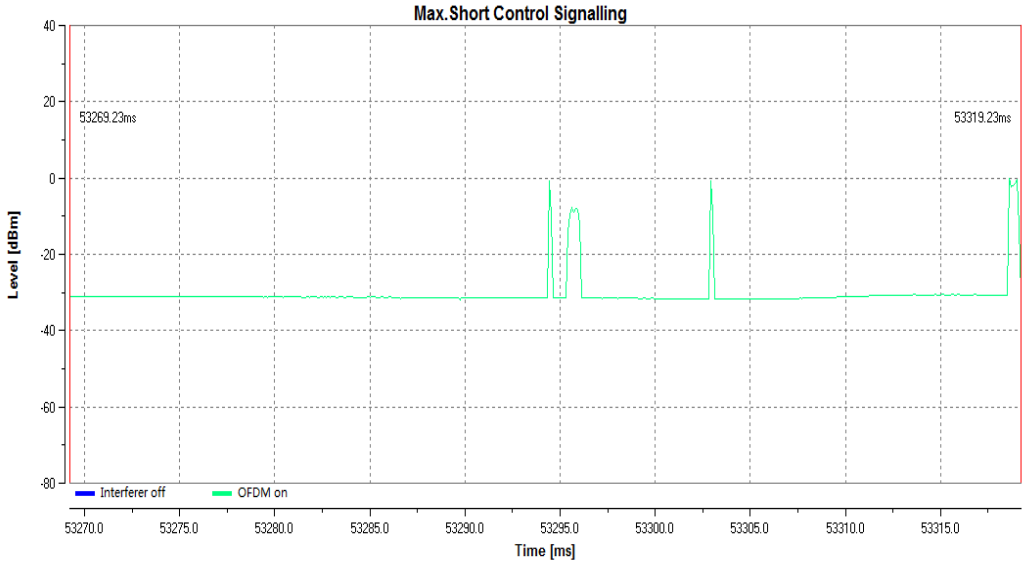
802.11a_5180



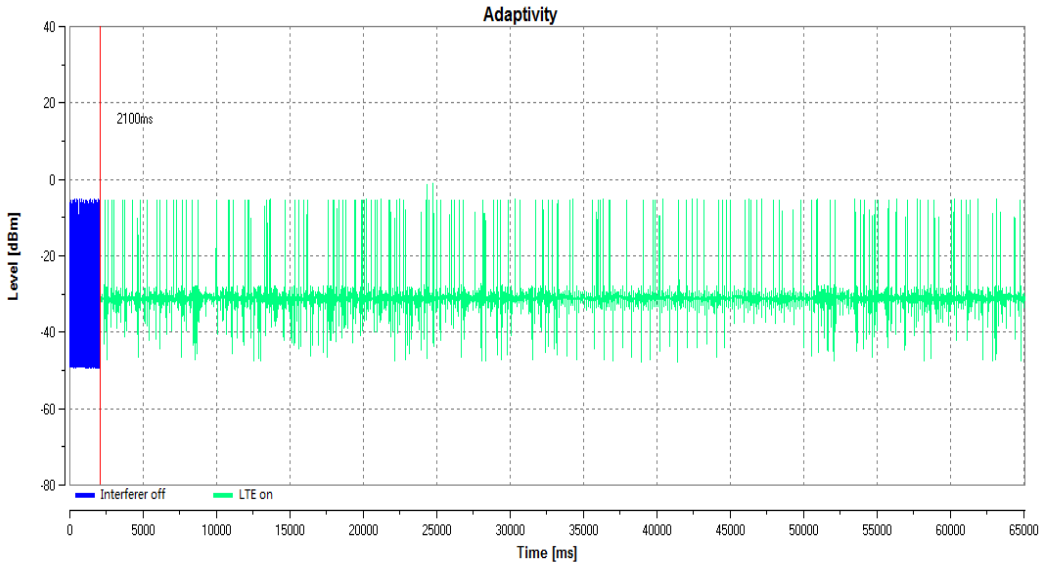


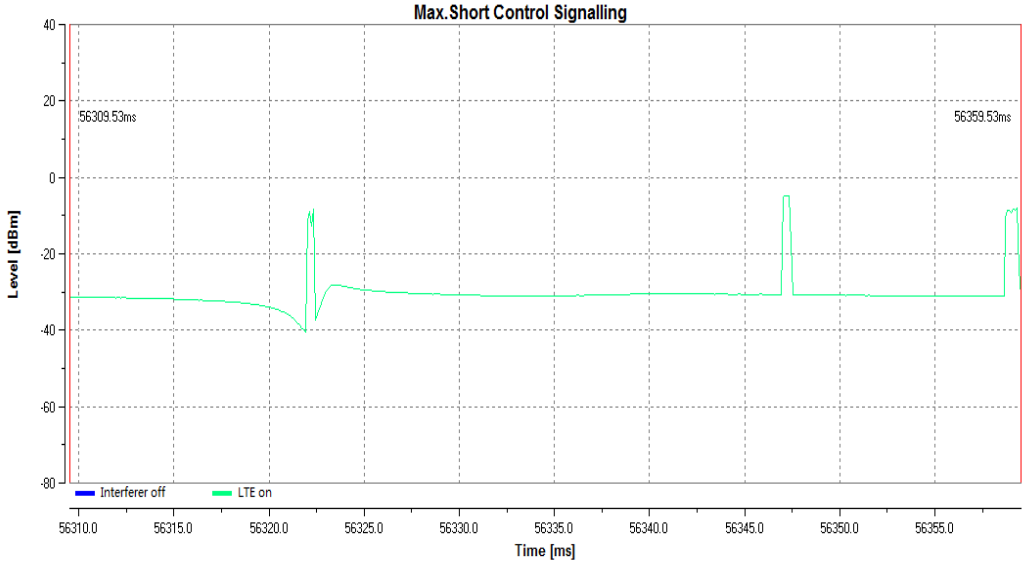
802.11a_5180





802.11a_5180





3.11. Recover Blocking

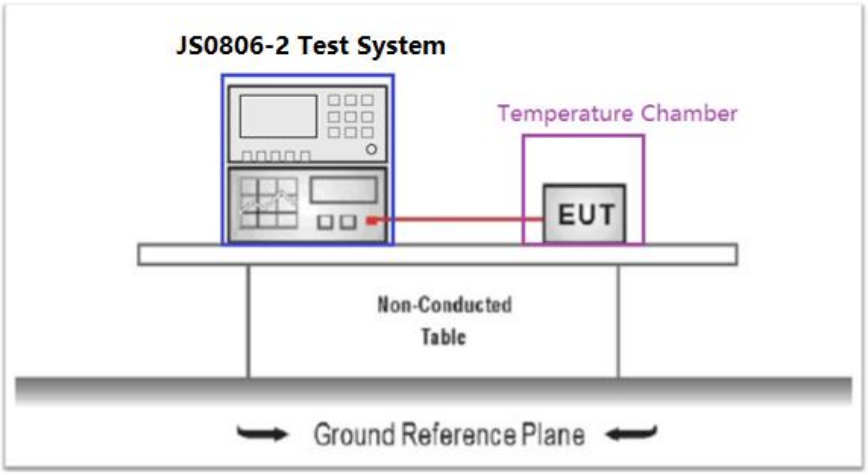
Limit

ETSI EN 301 893 Sub-clause 4.2.8.4

Performance Criteria: The minimum performance criterion shall be a PER less than or equal to 10 %. The manufacturer may declare alternative performance criteria as long as that is appropriate for the intended use of the equipment

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 2)		Type of blocking signal
		Master or Slave with radar detection (see table D.2, note 2)	Slave without radar detection (see table D.2, note 2)	
Pmin + 6 dB	5 100	-53	-59	Continuous Wave
Pmin + 6 dB	4 900 5 000 5 975	-47	-53	Continuous Wave
NOTE 1: P_{min} is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined clause 4.2.8.3 in the absence of any blocking signal. NOTE 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the same levels should be used at the antenna connector irrespective of antenna gain.				

Test Configuration



Test Procedure

Please refer to ETSI EN 301 893 Sub-clause 5.4.10.2.1 for the measurement method.

Test Mode

Normal operation.

Test Result

Mode	Bandwidth	Frequency (MHz)	Wanted signal power (dBm)	Blocking signal Frequency (MHz)	Blocking signal power (dBm)	Test PER(%)	Limit(%)	Result
802.11ac	20MHz	5180.00	-89.31	4900	-53.00	2.0	<10	Pass
				5000	-53.00	1.8		
				5100	-59.00	2.3		
				5975	-53.00	1.5		
		5320.00	-89.31	4900	-53.00	2.5		
				5000	-53.00	1.6		
				5100	-59.00	1.8		
				5975	-53.00	2.8		
802.11ac	40MHz	5190.00	-89.31	4900	-53.00	2.0		
				5000	-53.00	1.2		
				5100	-59.00	1.5		
				5975	-53.00	2.7		
		5310.00	-89.31	4900	-53.00	2.4		
				5000	-53.00	1.4		
				5100	-59.00	2.1		
				5975	-53.00	2.8		
802.11ac	80MHz	5210.00	-89.31	4900	-53.00	2.5		
				5000	-53.00	2.4		
				5100	-59.00	3.1		
				5975	-53.00	2.6		
		5290.00	-89.31	4900	-53.00	3.2		
				5000	-53.00	2.7		
				5100	-59.00	2.6		
				5975	-53.00	2.4		

3.12. User Access Restrictions

Requirement

The equipment shall be so constructed that settings (hardware and/or software) related to DFS shall not be accessible to the user if changing those settings result in the equipment no longer being compliant with the DFS requirements

Test Results

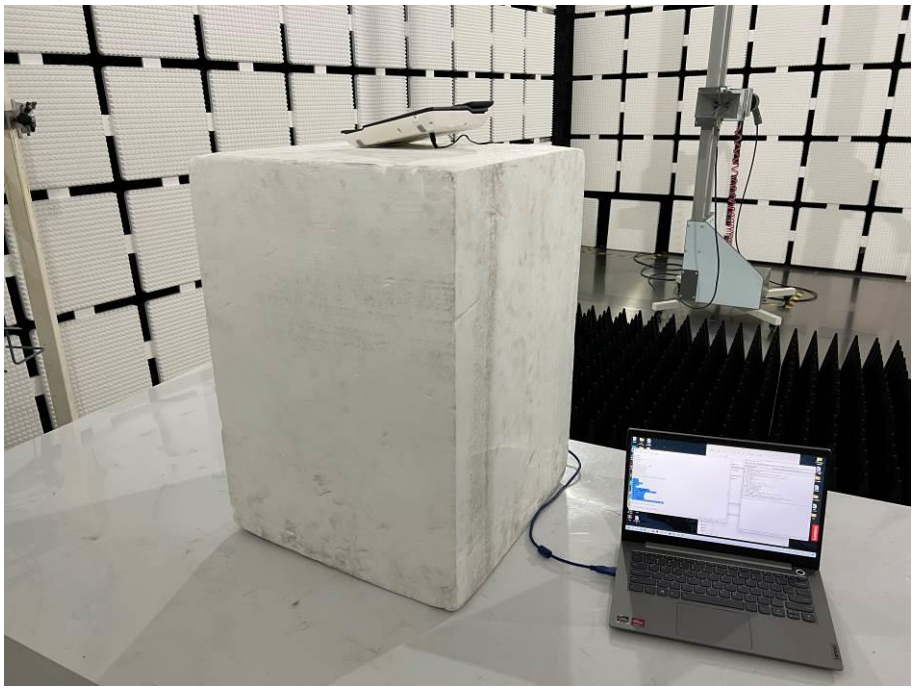
Note: supplied by the manufacturer.

The equipment constructed that settings (hardware and / or software) compliant requirements.

4. EUT TEST PHOTOS

Radiated Measurements

Below 1GHz



Above 1GHz

**********THE END**********