Certificate #7130.01

CE Radio Test Report

Project No.	:	2405G097
Equipment	:	Projector
Brand Name	:	XGIMI
Test Model	:	XN13A
Series Model	:	N/A
Applicant	:	XGIMI Technology Co., Ltd.
Address	:	Building No.4, Zone A, No.1129, Shijicheng Road, Chengdu High-tech Zone, Sichuan Pilot Free Trade Zone, China
Manufacturer	:	XGIMI Technology Co., Ltd.
Address	:	Building No.4, Zone A, No.1129, Shijicheng Road, Chengdu High-tech Zone, Sichuan Pilot Free Trade Zone, China
Factory	:	Yibin XGIMI Optoelectronic Co., Ltd.
Address	:	No. 2, West Section 4, Changjiang North Road, Lingang Economic Development Zone, Yibin City, Sichuan P.R. China
Date of Receipt	:	May 31, 2024
Date of Test	:	Jun. 06, 2024 ~ Jul. 11, 2024
Issued Date	:	Jul. 19, 2024
Report Version	:	R00
Test Sample	:	Engineering Sample No.: SSL2024053139 for radiated, SSL2024053135 for adaptivity and blocking, SSL2024053136 for others.
Standard(s)	:	ETSI EN 301 893 V2.1.1 (2017-05)

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

Prepared by : Sheldon Ou

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Approved by : Chay Cai

Chay Cai

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. BTL assumes no responsibility for the data provided by the customer, any statements, inferences or generalizations drawn by the customer or others from the reports issued by BTL.

The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the U.S. Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

BTL's laboratory quality assurance procedures are in compliance with the ISO/IEC 17025: 2017 requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.
Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-ETSP-4-2405G097	R00	Original Report.	Jul. 19, 2024	Valid

1. RF EMISSIONS MEASUREMENT

1.1 TEST FACILITY

The test facilities used to collect the test data in this report is **DG-CB15/TR15/TR17** at the location of No.3, Jinshagang 1st Road, Dalang, Dongguan City, Guangdong People's Republic of China.

1.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty figures shall be calculated according the methods described in the ETSI TR 100 028 and shall correspond to an expansion factor (coverage factor) k=1.96 or k=2(which provide confidence levels of respectively 95% and 95.45% in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).
Measurement Uncertainty for a Level of Confidence of 95.45%, $U=2\times u_c(y)$.

The BTL measurement uncertainty as below table:

Item	**Uncertainty**
Radio Frequency	2.7 ppm
RF Power, Conducted	1.3 dB
Power Density	1.4 dB
Temperature	0.8 °C
Humidity	2.2 %
Time	10 %
Spurious Emissions, Conducted	1.9 dB
Spurious Emissions, Radiated f ≤ 1GHz	3.50 dB
Spurious Emissions, Radiated 1GHz < f ≤ 18GHz	3.54 dB
Spurious Emissions, Radiated 18GHz < f ≤ 26.5GHz	4.00 dB

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By	Test Date
Centre frequencies	Normal & Extreme	50%	DC 12V	Complex Qin	Jun. 25, 2024
Occupied Channel Bandwidth	24°C	50%	DC 12V	Complex Qin	Jun. 25, 2024
RF output power	Normal & Extreme	52%	DC 12V	Alex Yin	Jun. 24, 2024
Power Density	24°C	50%	DC 12V	Complex Qin	Jun. 25, 2024
Transmitter unwanted emissions outside the 5 GHz RLAN bands	22-25°C	42-45%	AC 230V/50Hz	Meers Zhang	Jul. 01, 2024-Jul. 03, 2024
Transmitter unwanted emissions within the 5 GHz RLAN bands	24°C	50%	DC 12V	Complex Qin	Jun. 25, 2024
Receiver spurious emissions	22-25°C	42-45%	AC 230V/50Hz	Meers Zhang	Jul. 01, 2024-Jul. 03, 2024
Adaptivity	22°C	57%	DC 12V	Complex Qin	Jul. 09, 2024
Receiver Blocking	23°C	48%	DC 12V	Complex Qin	Jul. 04, 2024

1.4 TEST CHANNEL

IEEE 802.11a / IEEE 802.11n(HT20) / IEEE 802.11ac(VHT20)		
Test Channel	EUT Channel	Test Frequency
Low High	CH36	5180 MHz
	CH64	5320 MHz
	CH100	5500 MHz
	CH140	5700 MHz

IEEE 802.11n(HT40) / IEEE 802.11ac(VHT40)		
Test Channel	EUT Channel	Test Frequency
Low High	CH38	5190 MHz
	CH62	5310 MHz
	CH102	5510 MHz
	CH134	5670 MHz

IEEE 802.11ac(VHT80)		
Test Channel	EUT Channel	Test Frequency
Low High	CH42	5210 MHz
	CH58	5290 MHz
	CH106	5530 MHz
	CH122	5610 MHz

1.5 TEST METHODOLOGY AND RESULTS

Harmonised Standard ETSI EN 301 893					
Requirement			Requirement Conditionality		Observations
No	Description	Reference: Clause No	U/C	Condition	
1	Carrier frequencies	4.2.1	U	-	Pass
2	Nominal, and occupied channel bandwidth	4.2.2	U	-	Pass
3	RF output power	4.2.3	U	-	Pass
	Transmit Power Control (TPC)	4.2.3	C	1)Not required for channels whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz. 2)Not required for devices that operate at a maximum mean e.i.r.p. of 20 dBm when operating in 5250 MHz to 5350 MHz or 27 dBm when operating in 5470 MHz to 5725 MHz.	N/A
	Power Density	4.2.3	U	-	Pass
4	Transmitter unwanted emissions outside the 5 GHz RLAN bands	4.2.4.1	U	-	Pass
5	Transmitter unwanted emissions within the 5 GHz RLAN bands	4.2.4.2	U	-	Pass
6	Receiver spurious emissions	4.2.5	U	-	Pass
7	Adaptivity	4.2.7	U	-	Pass
8	Receiver Blocking	4.2.8	U	-	Pass
9	User Access Restrictions	4.2.9	U	-	Pass **Note 1**
10	Geo-location capability	4.2.10	C	Where implemented by the manufacturer.	N/A

Note:

1. No related options for DFS functions will be provided in the software interfaces.
   DFS functions can be changed only by telnet command. Before the shipment of the product the telnet will be closed so that it will be inaccessible for the end user.
2. U/C Indicates whether the requirement is unconditionally applicable (U) or is conditional upon the manufacturer's claimed functionality of the equipment (C).
3. “N/A” indicates that it does not apply to this device.

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Projector
Brand Name	XGIMI
Test Model	XN13A
Series Model	N/A
Model Difference(s)	N/A
Hardware Version	V06
Software Version	V0.0.75
Power Source	DC voltage supplied from AC adapter. Model: S065ARV2000325
Power Rating	I/P: 100-240V~ 50/60Hz 1.8A Max O/P: 5.0V⎓3.0A 15.0W or 9.0V⎓3.0A 27.0W or 12.0V⎓3.0A 36.0W or 15.0V⎓3.0A 45.0W or 20.0V⎓3.25A 65.0W
Operation Frequency Band(s)	5150 MHz ~ 5250 MHz 5250 MHz ~ 5350 MHz 5470 MHz ~ 5725 MHz
Modulation Type	IEEE 802.11a/n/ac: OFDM
Bit Rate of Transmitter	IEEE 802.11a: 54/48/36/24/18/12/9/6 Mbps IEEE 802.11n: up to 300 Mbps IEEE 802.11ac: up to 866.7 Mbps
Max. e.i.r.p.	IEEE 802.11a: 19.52 dBm (89.54 mW) IEEE 802.11n(HT20): 20.83 dBm (121.06 mW) IEEE 802.11n(HT40): 22.26 dBm (168.27 mW) IEEE 802.11ac(VHT20): 21.42 dBm (138.68 mW) IEEE 802.11ac(VHT40): 22.79 dBm (190.11 mW) IEEE 802.11ac(VHT80): 22.84 dBm (192.31 mW)

Note:
1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

IEEE 802.11a IEEE 802.11n(HT20) IEEE 802.11ac(VHT20)		IEEE 802.11n(HT40) IEEE 802.11ac(VHT40)		IEEE 802.11ac(VHT80)	
Band 1		Band 1		Band 1	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230		
44	5220				
48	5240				

IEEE 802.11a IEEE 802.11n(HT20) IEEE 802.11ac(VHT20)		IEEE 802.11n(HT40) IEEE 802.11ac(VHT40)		IEEE 802.11ac(VHT80)	
Band 2		Band 2		Band 2	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	54	5270	58	5290
56	5280	62	5310		
60	5300				
64	5320				

IEEE 802.11a IEEE 802.11n(HT20) IEEE 802.11ac(VHT20)		IEEE 802.11n(HT40) IEEE 802.11ac(VHT40)		IEEE 802.11ac(VHT80)	
Band 3		Band 3		Band 3	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	102	5510	106	5530
104	5520	110	5550	122	5610
108	5540	118	5590		
112	5560	126	5630		
116	5580	134	5670		
120	5600				
124	5620				
128	5640				
132	5660				
136	5680				
140	5700				

3. Table for Filed Antenna:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	ZTX	N/A	FPC	N/A	4.30
2	ZTX	N/A	FPC	N/A	5.99

Note:
This EUT supports CDD. Physically, the EUT provides two completed transmitters and receivers (2T2R).

4. The worst case for 1TX/2TX as follow:

Operating Mode / TX Mode	1TX	2TX
IEEE 802.11a	V (Ant. 1)	-
IEEE 802.11n(HT20)	-	V (Ant. 1+Ant. 2)
IEEE 802.11n(HT40)	-	V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT20)	-	V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT40)	-	V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT80)	-	V (Ant. 1+Ant. 2)

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Test	Clause	Test channels		
		Lower sub-band (5150 MHz to 5350 MHz)		Higher sub-band 5470 MHz to 5725 MHz
		5150 MHz to 5250 MHz	5250 MHz to 5350 MHz	
Centre frequencies	5.4.2	C7(see note 1)		C8(see note 1)
Occupied Channel Bandwidth	5.4.3	C7		C8
Power, power density	5.4.4	C1	C2	C3,C4
Transmitter unwanted emissions outside the 5 GHz RLAN bands	5.4.5	C7(see note 1)		C8(see note 1)
Transmitter unwanted emissions within the 5 GHz RLAN bands	5.4.6	C1	C2	C3,C4
Receiver spurious emissions	5.4.7	C7(see note 1)		C8(see note 1)
Transmit Power Control (TPC)	5.4.4	N/A(see note 2)	C2(see note 1)	C3,C4(see note 1)
Adaptivity	5.4.9	C9		
Receiver Blocking	5.4.10	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 withinthis band. For the Power Density testing, it is sufficient to only perform this test using the lowest 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 1 channel plan has been declared, testing of these specific requirements need only be performed using one of the declared channel plans.

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

(3) The measurements for RF Output Power are tested, because the modulation of IEEE 802.11n and IEEE 802.11ac are the same, and the power of IEEE 802.11ac(VHT20) mode and IEEE 802.11ac(VHT40) mode is worse than that of IEEE 802.11n(HT20) mode and IEEE 802.11n(HT40) mode, so only the worst cases are documented for other test items.

(4) For radiated spurious emissions below 1 GHz and receiver spurious emissions above 1 GHz test, the IEEE 802.11ac(VHT80) channel 42/106 are found to be the worst case and recorded.

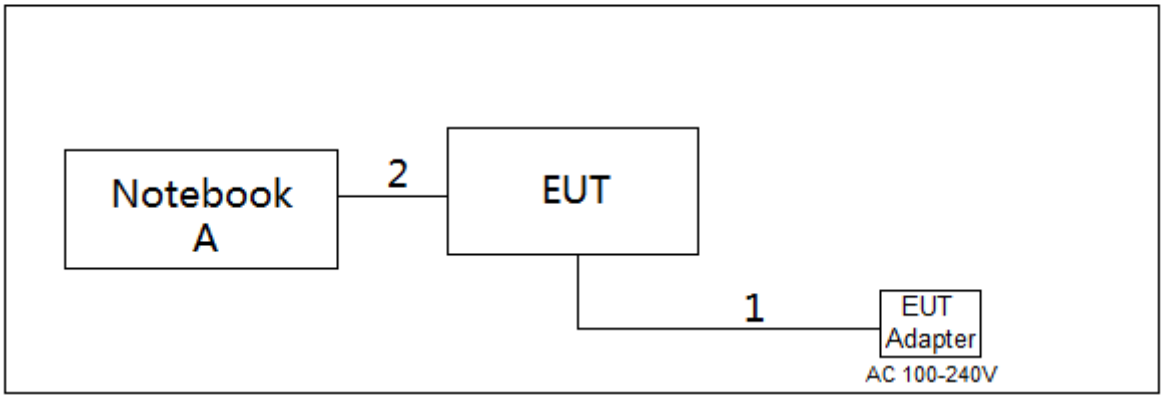
(5) For radiated spurious emissions above 18 GHz test, only tested the worst case and recorded.

2.3 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

Test Software Version	WIFI_customer_package_UIv2.06			
Frequency (MHz)	5180	5320	5500	5700
IEEE 802.11a	20	19	19	19
IEEE 802.11n(HT20)	1C	16	15	15
IEEE 802.11ac(VHT20)	1D	17	16	16
Frequency (MHz)	5190	5310	5510	5670
IEEE 802.11n(HT40)	1F	18	17	17
IEEE 802.11ac(VHT40)	20	19	18	18
Frequency (MHz)	5210	5290	5530	5610
IEEE 802.11ac(VHT80)	1E	17	16	16

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model No.	Series No.
A	Notebook	Huawei	NbDE-WFH9	N/A

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	DC Cable	NO	NO	1.5m
2	USB Cable	NO	NO	0.5m

2.6 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

2.7 CUSTOMER INFORMATION DESCRIPTION

1) The antenna gain is provided by the manufacturer.
2) Except for radiated spurious emissions, the results of all test items include cable losses. Part of the cable losses (0.5dB) are provided by the manufacturer, while the other parts of the cable losses are provided by the testing laboratory.

3. CENTRE FREQUENCIES

3.1 LIMIT

Clause	Test Item	Limit
4.2.1	Centre Frequencies	F(c) ±20ppm

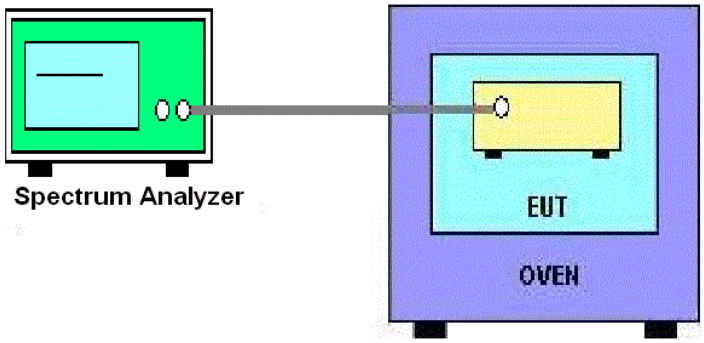
3.2 TEST PROCEDURES

Refer to ETSI EN 301 893, clause 5.4.2.2.1.

3.3 TEST SETUP LAYOUT

Normal Condition

Extreme Condition



3.4 TEST DEVIATION

There is no deviation with the original standard.

3.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously transmitting.

3.6 TEST RESULTS

Please refer to the Appendix A.

4. NOMINAL / OCCUPIED CHANNEL BANDWIDTH

4.1 LIMIT

The Nominal Channel Bandwidth for a single Operating Channel shall be 20 MHz.

Alternatively, equipment may implement a lower Nominal Channel Bandwidth with a minimum of 5 MHz, providing they still comply with the Nominal Centre Frequencies defined in clause 4.2.1 of EN 301 893 (20 MHz raster).

The Occupied Channel Bandwidth shall be between 80 % and 100 % of the Nominal Channel Bandwidth. In case of smart antenna systems (devices with multiple transmit chains) each of the transmit chains shall meet this requirement. The Occupied Channel Bandwidth might change with time/payload.

During a Channel Occupancy Time (COT), equipment may operate temporarily with an Occupied Channel Bandwidth of less than 80 % of its Nominal Channel Bandwidth with a minimum of 2 MHz.

4.2 TEST PROCEDURES

Refer to ETSI EN 301 893, clause 5.4.3.2.1.

4.3 TEST SETUP LAYOUT

4.4 TEST DEVIATION

There is no deviation with the original standard.

4.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously transmitting.

4.6 TEST RESULTS

Please refer to the Appendix B.

5. RF OUTPUT POWER

5.1 LIMIT

Mean e.i.r.p. Limits for RF Output Power at the Highest Power Level		
Frequency Range (MHz)	Mean e.i.r.p. Limit for P_H (dBm)	
	With TPC	Without TPC
5150 to 5350	23	20/23 (see note1)
5470 to 5725	30 (see note2)	27 (see note2)

Note:	
(1)	The applicable limit is 20 dBm, except for transmissions whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz, in which case the applicable limit is 23 dBm.
(2)	Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5250 MHz to 5350 MHz.

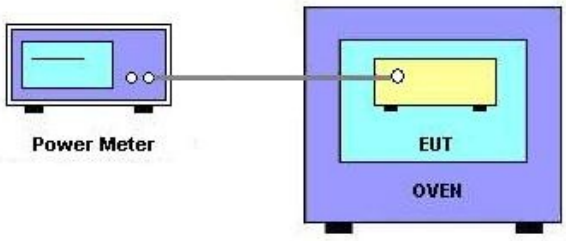
5.2 TEST PROCEDURES

Refer to ETSI EN 301 893, clause 5.4.4.2.1.

5.3 TEST SETUP LAYOUT

Normal Condition

Extreme Condition



5.4 TEST DEVIATION

There is no deviation with the original standard.

5.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously transmitting.

5.6 TEST RESULTS

Please refer to the Appendix C.

6. POWER DENSITY

6.1 LIMIT

Mean e.i.r.p. Limits for Power Density at the Highest Power Level		
Frequency Range (MHz)	Mean e.i.r.p. Density Limit (dBm/MHz)	
	With TPC	Without TPC
5150 to 5350	10	7/10 (see note1)
5470 to 5725	17 (see note2)	14 (see note2)

Note:	
(1)	The applicable limit is 7 dBm/MHz, except for transmissions whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz, in which case the applicable limit is 10 dBm/MHz.
(2)	Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5250 MHz to 5350 MHz.

6.2 TEST PROCEDURES

Refer to ETSI EN 301 893, clause 5.4.4.2.1.

6.3 TEST SETUP LAYOUT

6.4 TEST DEVIATION

There is no deviation with the original standard.

6.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously transmitting.

6.6 TEST RESULTS

Please refer to the Appendix D.

7. TRANSMITTER UNWANTED EMISSIONS (OUTSIDE THE 5 GHZ RLAN BANDS)

7.1 LIMIT

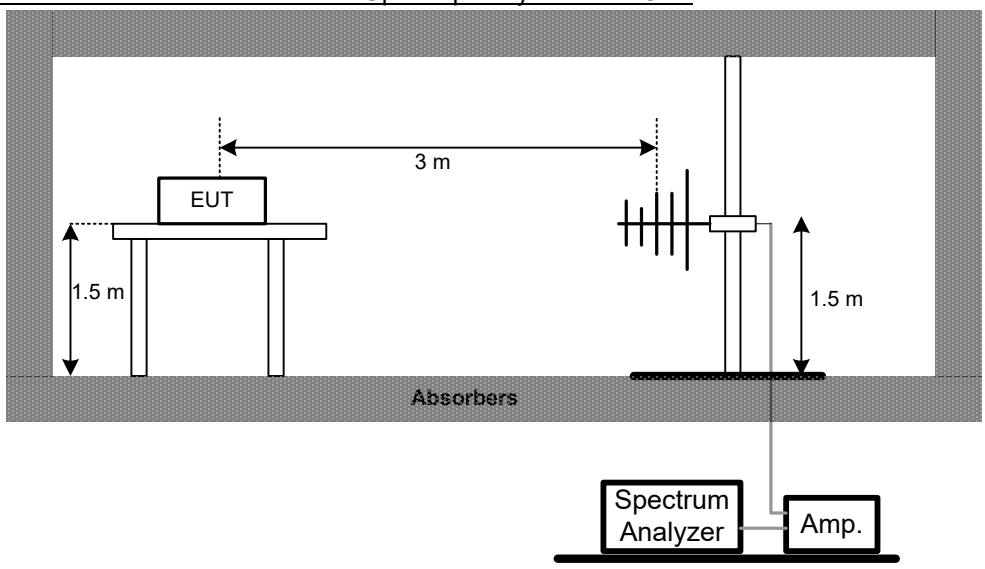
Clause	Test Item	Frequency(MHz)	Limit (dBm)
4.2.4.1	Transmitter Unwanted Emissions (Outside The 5 GHz RLAN Bands)	47 MHz to 74 MHz 87,5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	-54
		Other frequencies Below 1GHz	-36
		1GHz~26.5 GHz (Outside frequency ranges)	-30

7.2 TEST PROCEDURES

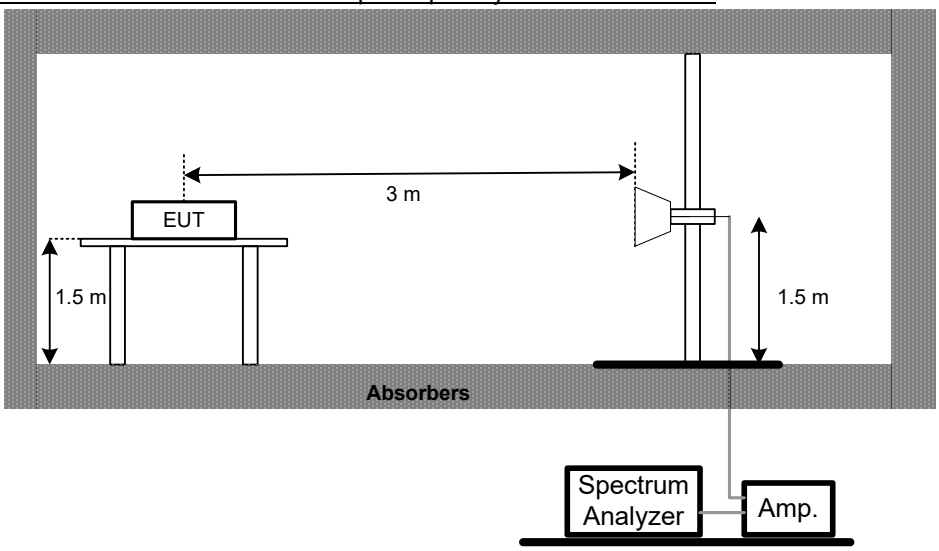
Refer to ETSI EN 301 893, clause 5.4.5.2.2.

7.3 TEST SETUP LAYOUT

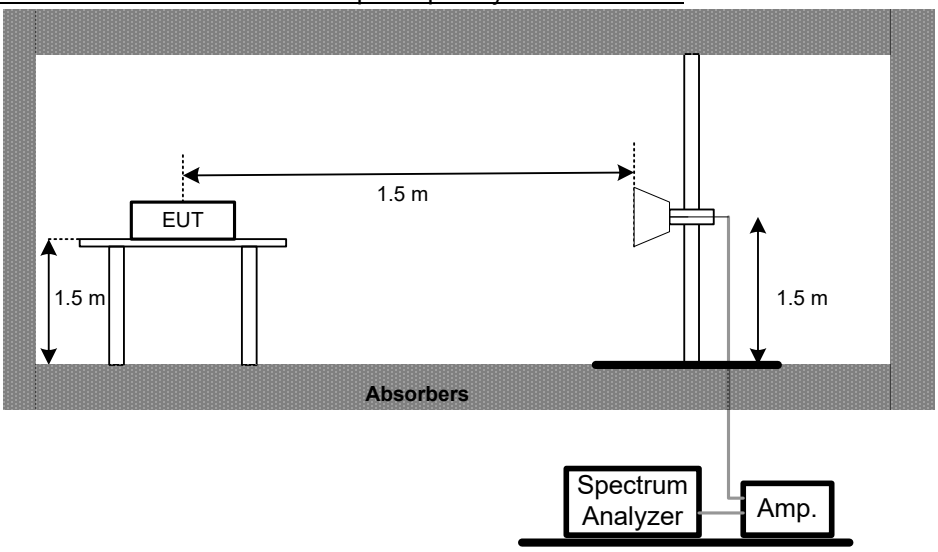
Emission Radiated Measurement Test Set-Up Frequency Below 1 GHz



Emission Radiated Measurement Test Set-Up Frequency 1 GHz to 18 GHz



Emission Radiated Measurement Test Set-Up Frequency Above 18 GHz



7.4 TEST DEVIATION

There is no deviation with the original standard.

7.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously transmitting.

7.6 TEST RESULTS (30MHZ TO 1000MHZ)

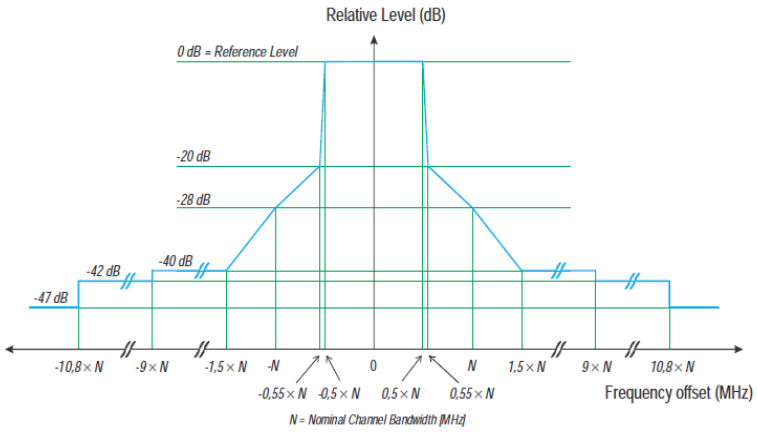
Please refer to the Appendix E.

7.7 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the Appendix F.

8. TRANSMITTER UNWANTED EMISSIONS(WITHIN THE 5 GHZ RLAN BANDS)

8.1 LIMIT

Clause	Test Item	Limit
4.2.4.2	Transmitter Unwanted Emissions (Within the 5 GHz RLAN bands)	

8.2 TEST PROCEDURES

Refer to ETSI EN 301 893, clause 5.4.6.2.1.

8.3 TEST SETUP LAYOUT

8.4 TEST DEVIATION

There is no deviation with the original standard.

8.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously transmitting.

8.6 TEST RESULTS

Please refer to the Appendix G.

9. RECEIVER SPURIOUS EMISSIONS

9.1 LIMIT

Clause	Test Item	Frequency(MHz)	Limit
4.2.5	Receiver spurious emissions	30-1000	-57dBm
		1000~26500	-47dBm

9.2 TEST PROCEDURES

Refer to ETSI EN 301 893, clause 5.4.7.2.2.

9.3 TEST SETUP LAYOUT

Please refer to clause 7.3.

9.4 TEST DEVIATION

There is no deviation with the original standard.

9.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously receiving.

9.6 TEST RESULTS (30 MHZ TO 1000 MHZ)

Please refer to the Appendix H.

9.7 TEST RESULTS (ABOVE 1000 MHZ)

Please refer to the Appendix I.

10. ADAPTIVITY (CHANNEL ACCESS MECHANISM)

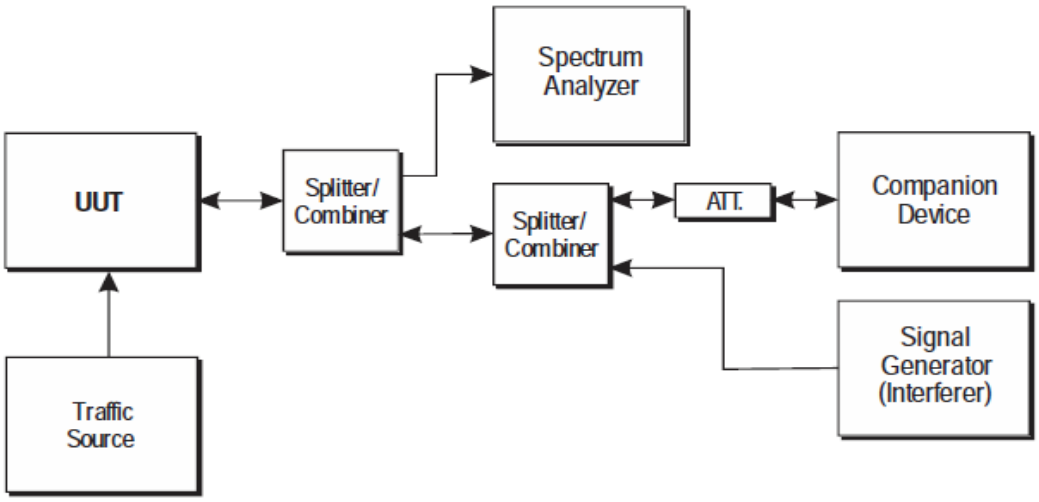
10.1 LIMIT

Refer to ETSI EN 301 893, clause 4.2.7

10.2 TEST PROCEDURES

Refer to ETSI EN 301 893, clause 5.4.9.3.2.

10.3 TEST SETUP



10.4 TEST DEVIATION

There is no deviation with the original standard.

10.5 EUT OPERATION DURING TEST

The measurements shall be performed during normal operation.

10.6 TEST RESULTS

Please refer to the Appendix J.

11. RECEIVER BLOCKING

11.1 LIMIT

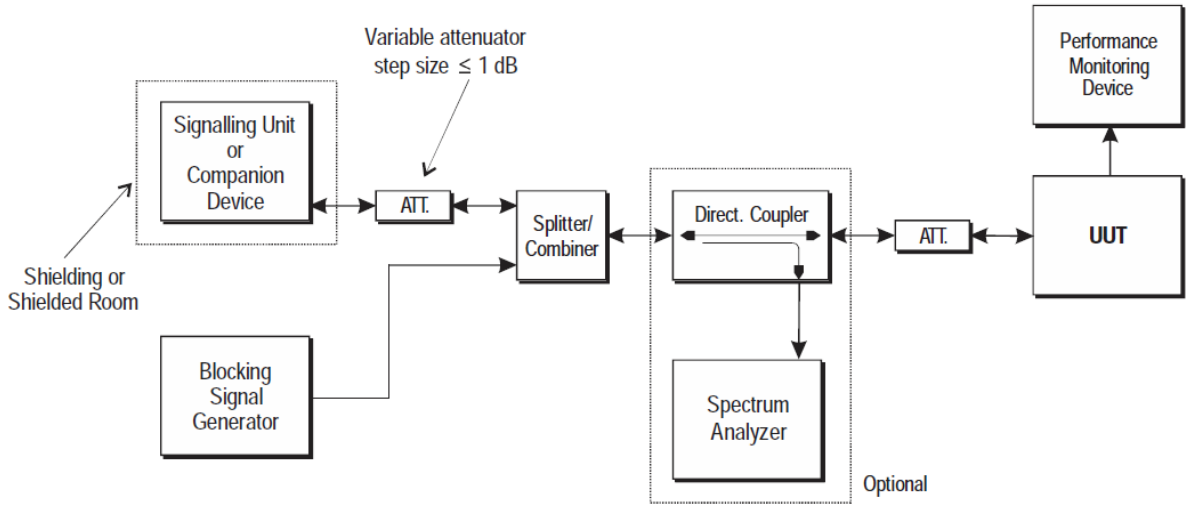
The minimum performance criterion shall be a PER of less than or equal to 10 %.

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.				

11.2 TEST PROCEDURES

Refer to ETSI EN 301 893, clause 5.4.10.2.1.

11.3 TEST SETUP



11.4 TEST DEVIATION

There is no deviation with the original standard.

11.5 EUT OPERATION DURING TEST

The measurements shall be performed during normal receiving.

11.6 TEST RESULTS

Please refer to the Appendix K.

12. MEASUREMENT INSTRUMENTS LIST

Centre Frequency					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Agilent	N9010A	MY54200164	Dec. 22, 2024
2	Cable	RegalWay	20210802 013	RWP50-402-SMS M-1M	N/A
3	Attenuator	Talent Microwave	TA10A0-S-26.5	N/A	N/A
4	Attenuator	Talent Microwave	TA10A0-S-26.5	N/A	N/A
5	DC Block	N/A	N/A	N/A	N/A
6	BTL TestSystem	BTL	TestSoftware	N/A	N/A
7	Desktop Constant Temperature Chamber	BTH	BTH-50C	20170306001	Jan. 19, 2025

Nominal / Occupied Channel Bandwidth & Power Density & Transmitter Unwanted Emissions Within The 5 GHz RLAN Bands					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Agilent	N9010A	MY54200164	Dec. 22, 2024
2	Cable	RegalWay	20210802 013	RWP50-402-SMS M-1M	N/A
3	Attenuator	Talent Microwave	TA10A0-S-26.5	N/A	N/A
4	Attenuator	Talent Microwave	TA10A0-S-26.5	N/A	N/A
5	DC Block	N/A	N/A	N/A	N/A
6	BTL TestSystem	BTL	TestSoftware	N/A	N/A

RF Output Power					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Table top type high and low temperature test chamber	CEPREI	CEEC-M64T-40	15-008	Dec. 22, 2024
2	Power Sensor	Agilent	U2021XA	MY53320006	May 31, 2025
3	Power Sensor	Agilent	U2021XA	MY53340001	May 31, 2025
4	Cable	Woke	20210802 001	RWP50-402-SMS M-1M	N/A
5	Cable	RegalWay	S02-181212-308	RWP50-402-SMS M-1M	N/A
6	BTL TestSystem	BTL	TestSoftware	N/A	N/A
7	Attenuator	Talent Microwave	TA10A2-S-18	N/A	N/A
8	Attenuator	Talent Microwave	TA10A2-S-18	N/A	N/A

Adaptivity					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Agilent	N9010A	MY54200164	Dec. 22, 2024
2	Data Acquisition Unit	Keysight	AD211	TW56183509	N/A
3	Shielding box	Jiachen	JC-PB2009	200917D0184A	N/A
4	Power divider	N/A	PD-2SF-2080	N/A	Dec. 22, 2024
5	Power Splitter	N/A	N/A	SZ201504789	Dec. 22, 2024
6	Power Splitter	Mini-Circuits	ZFRSC-183-S+	SFG32801811-2	May 31, 2025
7	Power divider	N/A	PD-2SF-2080	N/A	Dec. 22, 2024
8	Attenuator	Mini-Circuits	VAT-30+	N/A	Dec. 22, 2024
9	Attenuator	N/A	N/A	N/A	N/A
10	DC Block	N/A	N/A	N/A	N/A
11	DC Block	N/A	N/A	N/A	N/A
12	Gaming Router	Tplink	Archer GE800	N/A	N/A
13	Cable	RegalWay	20210802 013	RWP50-402-SMS M-1M	N/A
14	Cable	RegalWay	S02-1081212-050	RWP50-402-SMS M-1M	N/A
15	Cable	RegalWay	202108020 004	RWP50-402-SMS M-1M	N/A
16	Cable	RegalWay	20210802 021	RWP50-402-SMS M-1M	N/A
17	Cable	Woke	S02-181212-272	N/A	N/A
18	Cable	REBES	N/A	S02-1090322-018	N/A
19	MXG Vector Signal Generator	Agilent	N5182A	MY47420312	Jul. 07, 2025
20	BTL TestSystem	BTL	TestSoftware	N/A	N/A

Receiver Blocking					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Cable	RegalWay	20210802 013	RWP50-402-SMS M-1M	N/A
2	Cable	RegalWay	S02-1081212-050	RWP50-402-SMS M-1M	N/A
3	DC Block	N/A	N/A	N/A	N/A
4	DC Block	N/A	N/A	N/A	N/A
5	MXG Vector Signal Generator	Agilent	N5182A	MY47420312	Jul. 07, 2025
6	Power Splitter	N/A	N/A	SZ201504789	Dec. 22, 2024
7	wideband radio communication tester	R&S	CMW500	152372	Dec. 22, 2024

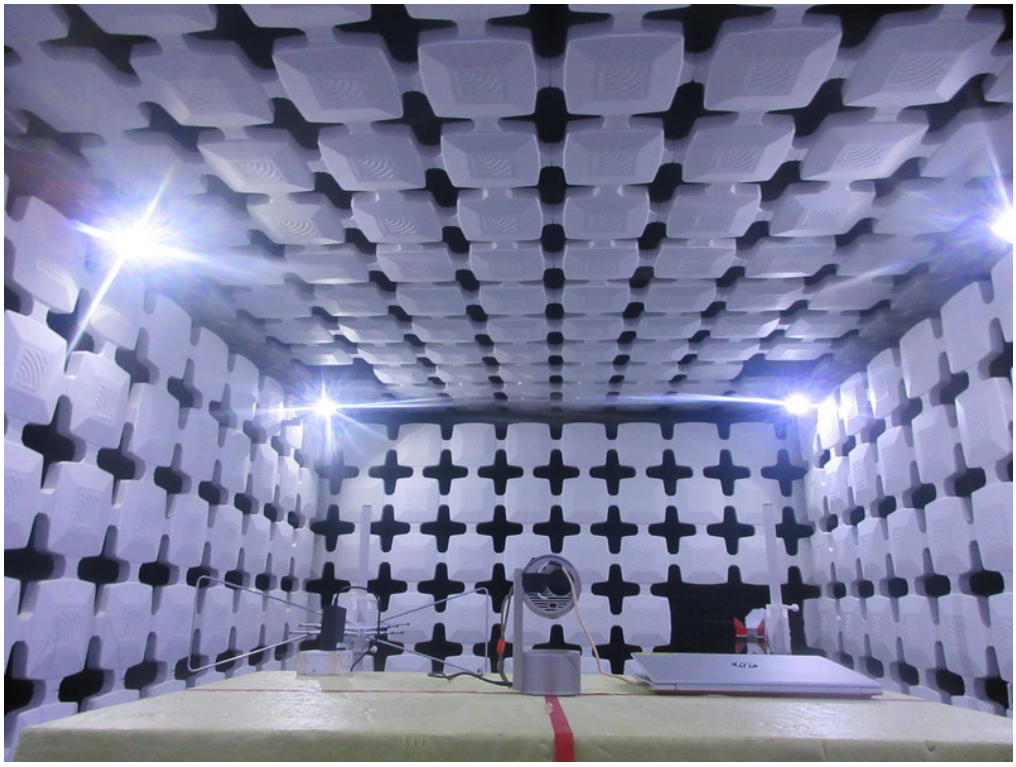
Transmitter and Receiver Spurious Emission (Radiated Measurement)_Below 1GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Preamplifier	EMC INSTRUMENT	EMC001330	980986	May 31, 2025
2	EXA Signal Analyzer	Keysight	N9010A	MY56480488	Dec. 22, 2024
3	Antenna	Schwarzbeck	VULB9160	9160-3231	Apr. 14, 2025
4	Attenuator	SHX	TS2-6dB-6G-A	16101103	Apr. 14, 2025
5	Cable	Talent microwave	L6-NMNM-10M	N/A	N/A
6	Cable	RegalWay	LMR400-NMRANM-0.8M	N/A	N/A
7	Controller	Innco Systems Gmbh	CO3000-4port	CO3000/1155/45430119/P	N/A
8	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

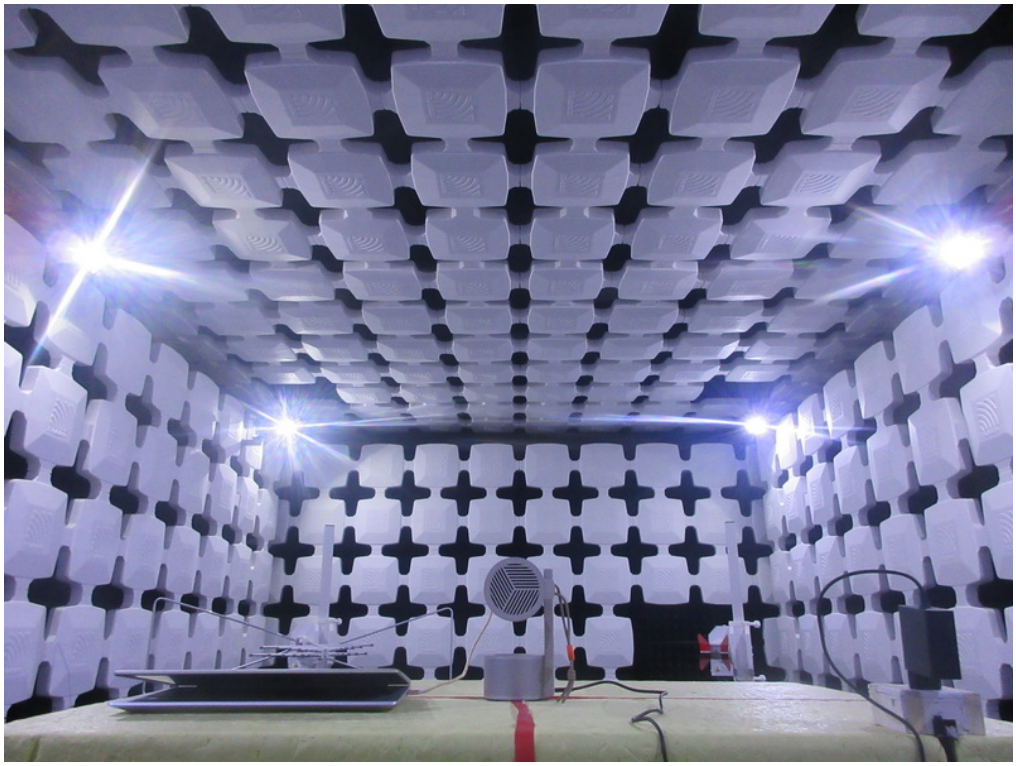
Transmitter and Receiver Spurious Emission (Radiated Measurement)_Above 1GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Pre-Amplifier	EMC INSTRUMENT	EMC184045SE	980409	Dec. 22, 2024
2	EXA Signal Analyzer	Keysight	N9010A	MY56480488	Dec. 22, 2024
3	DRG Horn Antenna	ETS	3116C	218942	Mar. 02, 2025
4	DRG Horn Antenna	ETS	3117-PA	221576	Jul. 07, 2024
5	Preamplifier	ETS	3117-PA	221576	May 31, 2025
6	Cable	Talent microwave	A81-SMAMSMAM-12.5M	N/A	N/A
7	Cable	RegalWay	RWLP50-4.0A-SMRANMRA-2M	N/A	N/A
8	Cable	Tonscend	HF160-KMKM-5.00M	N/A	N/A
9	Cable	Tonscend	HF160-KMKM-0.5M	N/A	N/A
10	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
11	Controller	Innco Systems Gmbh	CO3000-4port	CO3000/1155/45430119/P	N/A
12	Attenuator	Talent Microwave	TA10A0-S-26.5	N/A	N/A
13	Filter	STI	STI15-9969	N/A	May 31, 2025

Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

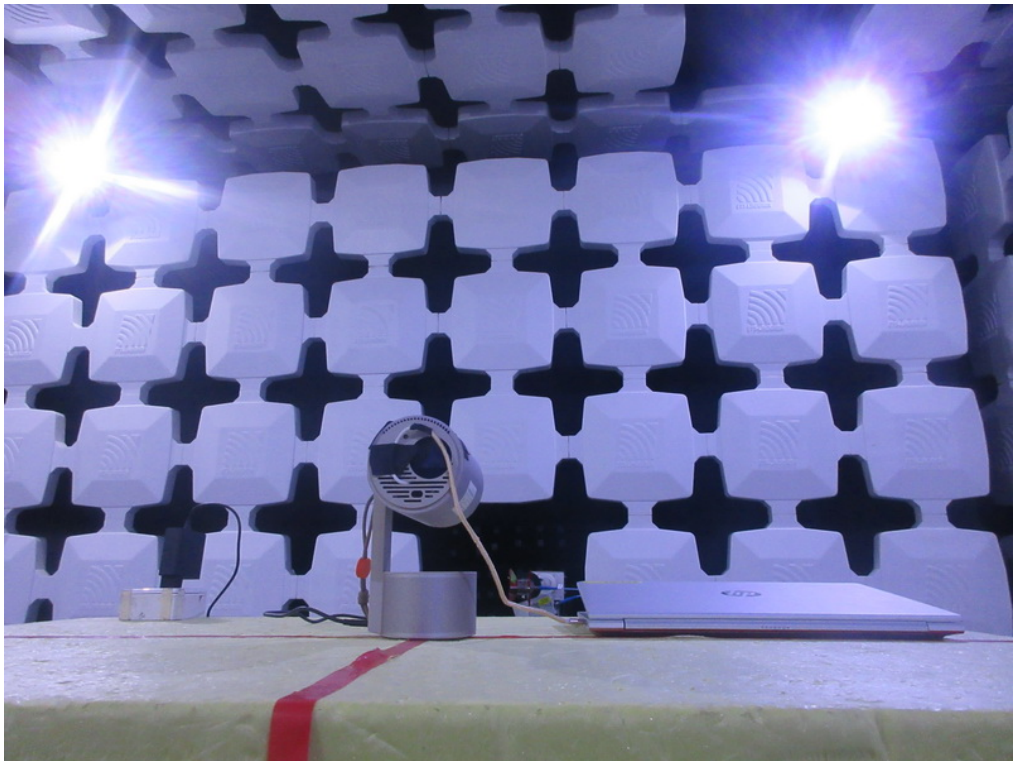
13. EUT TEST PHOTO

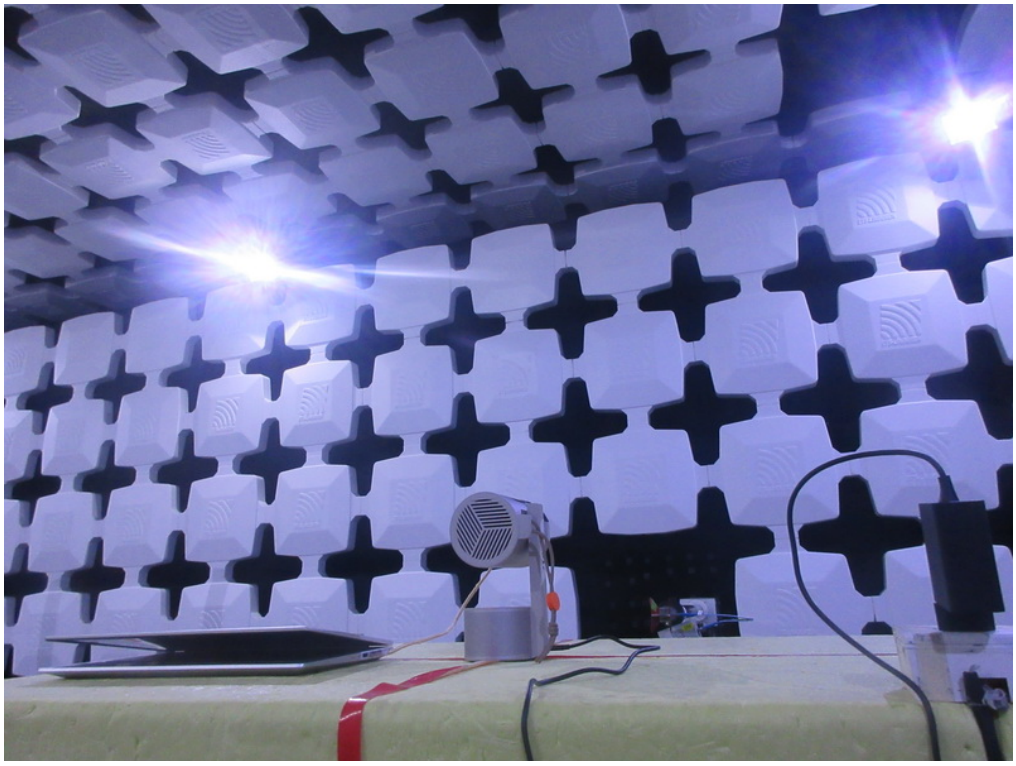
Radiated Emissions Test Photos_Below 18GHz





Radiated Emissions Test Photos_Above 18GHz





APPENDIX A - CENTRE FREQUENCIES

Test Mode: IEEE 802.11a Mode			
Test Conditions		Measurement Frequency (MHz)	
		5180MHz	5500MHz
T nom(°C)	24	5179.9540	5499.9660
T min(°C)	0	5180.0300	5500.0100
T max(°C)	40	5179.9400	5499.9520
Max. Deviation Frequency		-0.0600	-0.0480
Max. Frequency Error (ppm)		-11.58	-8.73
Limit (ppm)		±20.00	
Result		Pass	

APPENDIX B - NOMINAL / OCCUPIED CHANNEL BANDWIDTH

Test Mode: IEEE 802.11a Mode			
Test Conditions		Occupied Channel Bandwidth (MHz)	
		5180MHz	5500MHz
T nom (°C)	24	16.37	16.34
Limits		16~20	
Result		Pass	

Test Mode: IEEE 802.11ac(VHT20) Mode			
Test Conditions		Occupied Channel Bandwidth (MHz)	
		5180MHz	5500MHz
T nom (°C)	24	17.54	17.55
Limits		16~20	
Result		Pass	

Test Mode: IEEE 802.11ac(VHT40) Mode			
Test Conditions		Occupied Channel Bandwidth (MHz)	
		5190MHz	5510MHz
T nom (°C)	24	35.94	35.99
Limits		32~40	
Result		Pass	

Test Mode: IEEE 802.11ac(VHT80) Mode			
Test Conditions		Occupied Channel Bandwidth (MHz)	
		5210MHz	5530MHz
T nom (°C)	24	75.44	75.53
Limits		64~80	
Result		Pass	

APPENDIX C - RF OUTPUT POWER

Test Mode: IEEE 802.11a Mode at the Highest Power Level					
Test Conditions		e.i.r.p. (dBm)			
		5180MHz	5320MHz	5500MHz	5700MHz
T nom (°C)	22	19.20	17.17	17.44	17.28
T min (°C)	0	19.52	17.51	17.71	17.59
T max (°C)	40	18.97	16.90	17.12	17.07
Max. e.i.r.p.		19.52	17.51	17.71	
Limits		23	20	20	
Result		Pass			

Test Mode: IEEE 802.11n(HT20) Mode at the Highest Power Level					
Test Conditions		e.i.r.p. (dBm)			
		5180MHz	5320MHz	5500MHz	5700MHz
T nom (°C)	22	20.61	18.11	17.85	17.72
T min (°C)	0	20.83	18.39	18.07	18.05
T max (°C)	40	20.31	17.84	17.54	17.37
Max. e.i.r.p.		20.83	18.39	18.07	
Limits		23	20	20	
Result		Pass			

Test Mode: IEEE 802.11n(HT40) Mode at the Highest Power Level					
Test Conditions		e.i.r.p. (dBm)			
		5190MHz	5310MHz	5510MHz	5670MHz
T nom (°C)	22	22.04	19.02	18.59	18.68
T min (°C)	0	22.26	19.34	18.83	19.02
T max (°C)	40	21.79	18.78	18.28	18.40
Max. e.i.r.p.		22.26	19.34	19.02	
Limits		23	20	20	
Result		Pass			

Test Mode: IEEE 802.11ac(VHT20) Mode at the Highest Power Level					
Test Conditions		e.i.r.p. (dBm)			
		5180MHz	5320MHz	5500MHz	5700MHz
T nom (°C)	22	21.07	18.60	18.29	18.13
T min (°C)	0	21.42	18.85	18.63	18.37
T max (°C)	40	20.81	18.36	17.96	17.79
Max. e.i.r.p.		21.42	18.85	18.63	
Limits		23	20	20	
Result		Pass			

Test Mode: IEEE 802.11ac(VHT40) Mode at the Highest Power Level					
Test Conditions		e.i.r.p. (dBm)			
		5190MHz	5310MHz	5510MHz	5670MHz
T nom (°C)	22	22.45	19.49	19.25	19.33
T min (°C)	0	22.79	19.76	19.53	19.63
T max (°C)	40	22.13	19.23	18.95	19.08
Max. e.i.r.p.		22.79	19.76	19.63	
Limits		23	20	20	
Result		Pass			

Test Mode: IEEE 802.11ac(VHT80) Mode at the Highest Power Level					
Test Conditions		e.i.r.p. (dBm)			
		5210MHz	5290MHz	5530MHz	5610MHz
T nom (°C)	22	22.49	19.45	19.23	19.26
T min (°C)	0	22.84	19.78	19.47	19.58
T max (°C)	40	22.19	19.16	18.97	18.94
Max. e.i.r.p.		22.84	19.78	19.58	
Limits		23	20	20	
Result		Pass			

Note:
1) e.i.r.p. = Conducted output power + G (Ant Gain)
2) Conducted output power = Measure result + Cable loss

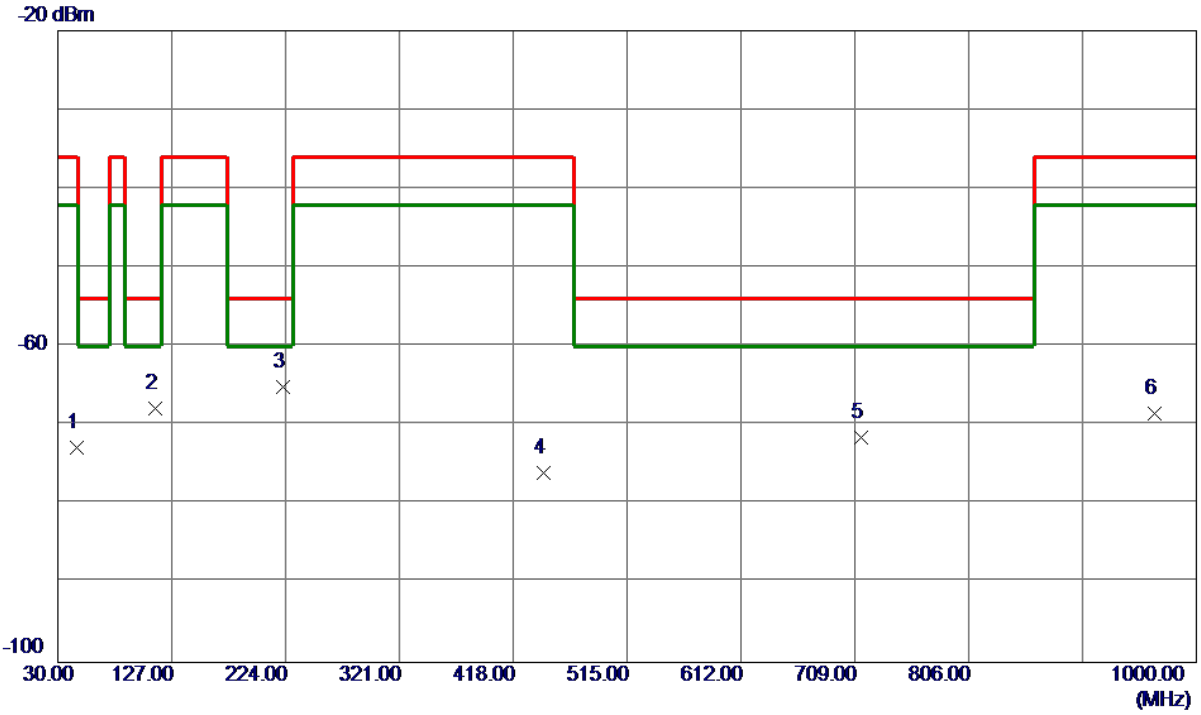
APPENDIX D - POWER DENSITY

Test Mode: IEEE 802.11a Mode					
Test Conditions		Spectral Power Density e.i.r.p. (dBm / MHz)			
		5180MHz	5320MHz	5500MHz	5700MHz
T nom (°C)	24	9.97	6.40	6.64	6.34
Limits		10	7	7	
Result		Pass			

Test Mode: IEEE 802.11ac(VHT20) Mode					
Test Conditions		Spectral Power Density e.i.r.p. (dBm / MHz)			
		5180MHz	5320MHz	5500MHz	5700MHz
T nom (°C)	24	9.75	6.74	6.49	6.55
Limits		10	7	7	
Result		Pass			

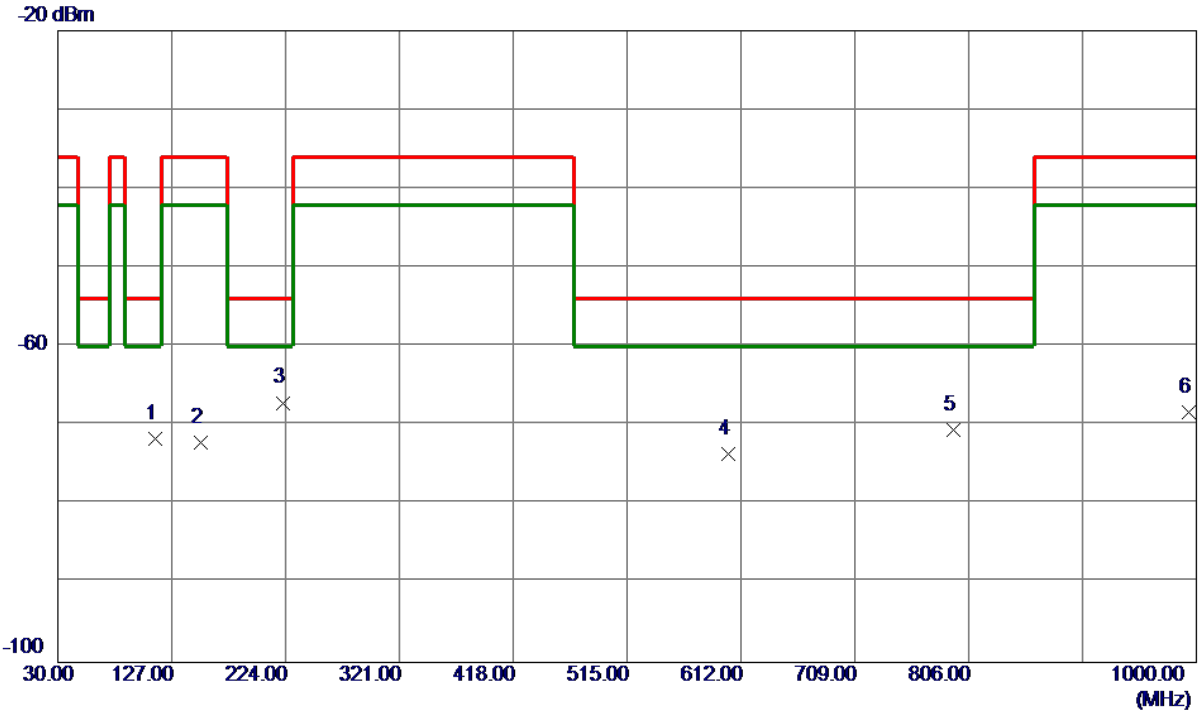
APPENDIX E - TRANSMITTER UNWANTED EMISSIONS OUTSIDE THE 5 GHZ RLAN BANDS (30MHZ TO 1000MHZ)

Test Mode	TX Mode IEEE 802.11ac(VHT80)_5210MHz	Polarization	Vertical



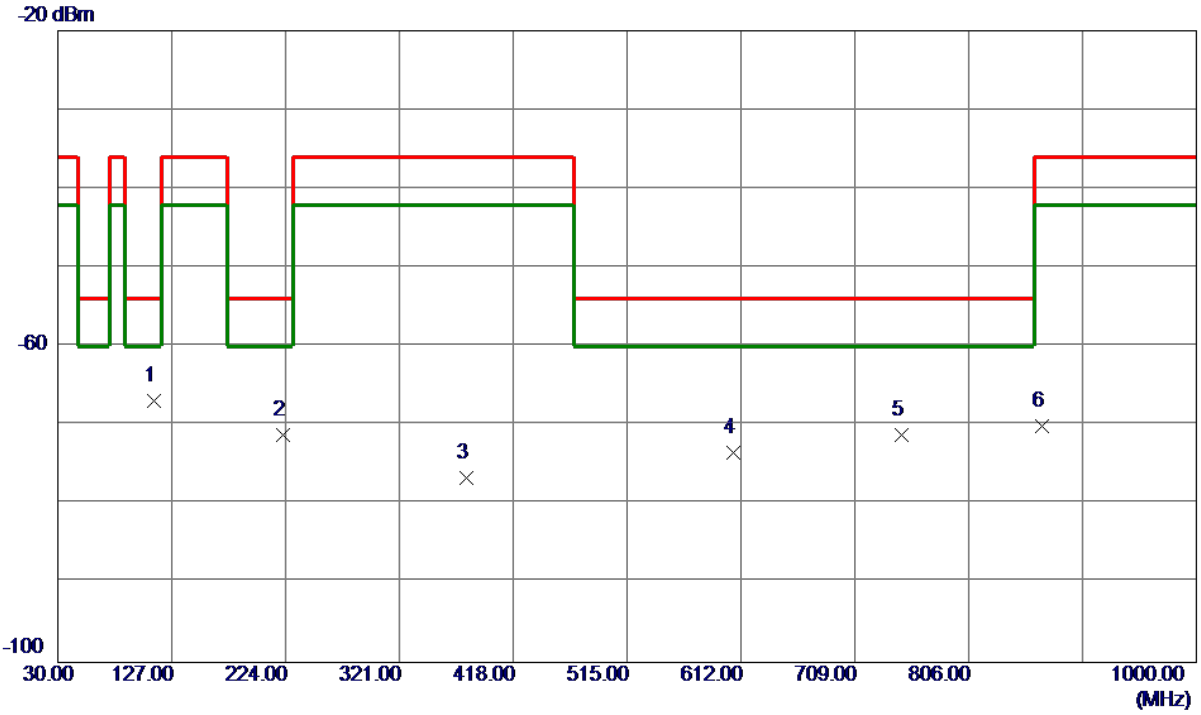
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	45.8110	-73.26	0.47	-72.79	-36.00	-36.79	RMS	
2	113.0320	-64.39	-3.42	-67.81	-54.00	-13.81	RMS	
3 *	221.8660	-62.35	-2.82	-65.17	-54.00	-11.17	RMS	
4	443.9960	-78.35	2.28	-76.07	-36.00	-40.07	RMS	
5	714.0440	-78.00	6.41	-71.59	-54.00	-17.59	RMS	
6	964.5950	-78.05	9.56	-68.49	-36.00	-32.49	RMS	

Test Mode	TX Mode IEEE 802.11ac(VHT80)_5210MHz	Polarization	Horizontal



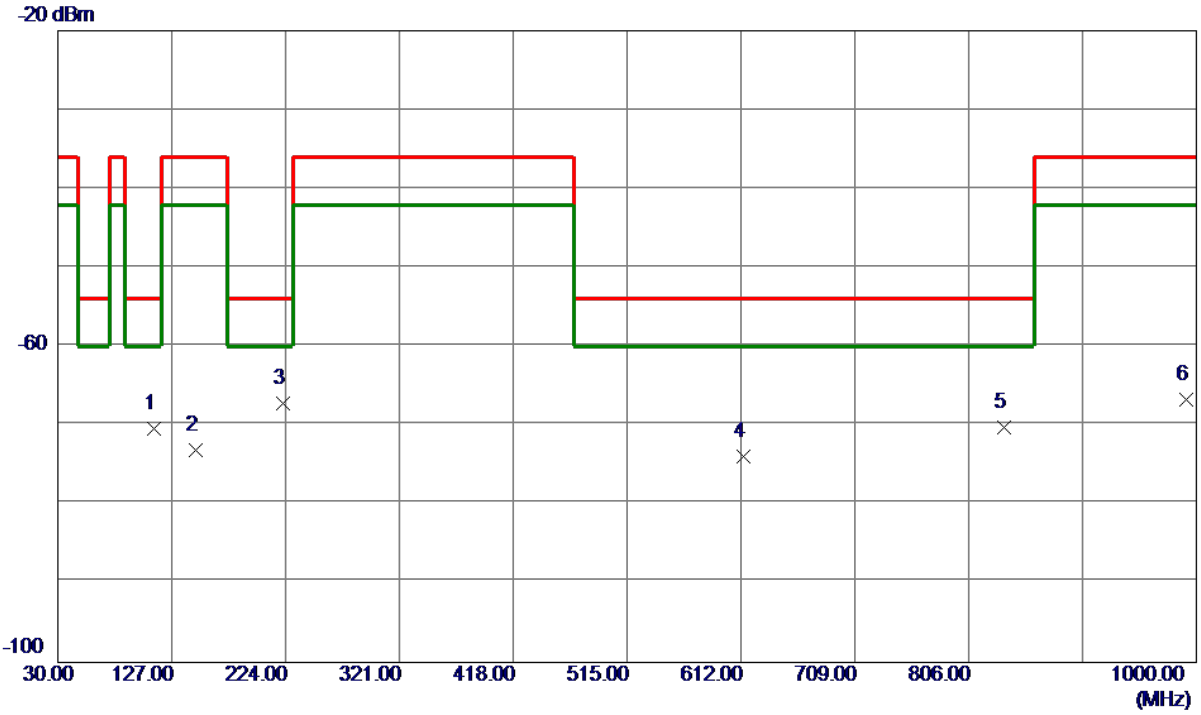
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	112.6440	-67.69	-4.06	-71.75	-54.00	-17.75	RMS	
2	152.1230	-73.13	0.93	-72.20	-36.00	-36.20	RMS	
3 *	221.8660	-64.91	-2.21	-67.12	-54.00	-13.12	RMS	
4	601.7180	-78.39	4.74	-73.65	-54.00	-19.65	RMS	
5	792.6140	-78.15	7.65	-70.50	-54.00	-16.50	RMS	
6	993.3070	-78.49	10.11	-68.38	-36.00	-32.38	RMS	

Test Mode	TX Mode IEEE 802.11ac(VHT80)_5530MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	112.3530	-63.41	-3.48	-66.89	-54.00	-12.89	RMS	
2	221.8660	-68.41	-2.82	-71.23	-54.00	-17.23	RMS	
3	378.6180	-77.56	0.98	-76.58	-36.00	-40.58	RMS	
4	605.5979	-78.36	4.98	-73.38	-54.00	-19.38	RMS	
5	749.2550	-77.96	6.74	-71.22	-54.00	-17.22	RMS	
6	868.6620	-77.69	7.65	-70.04	-36.00	-34.04	RMS	

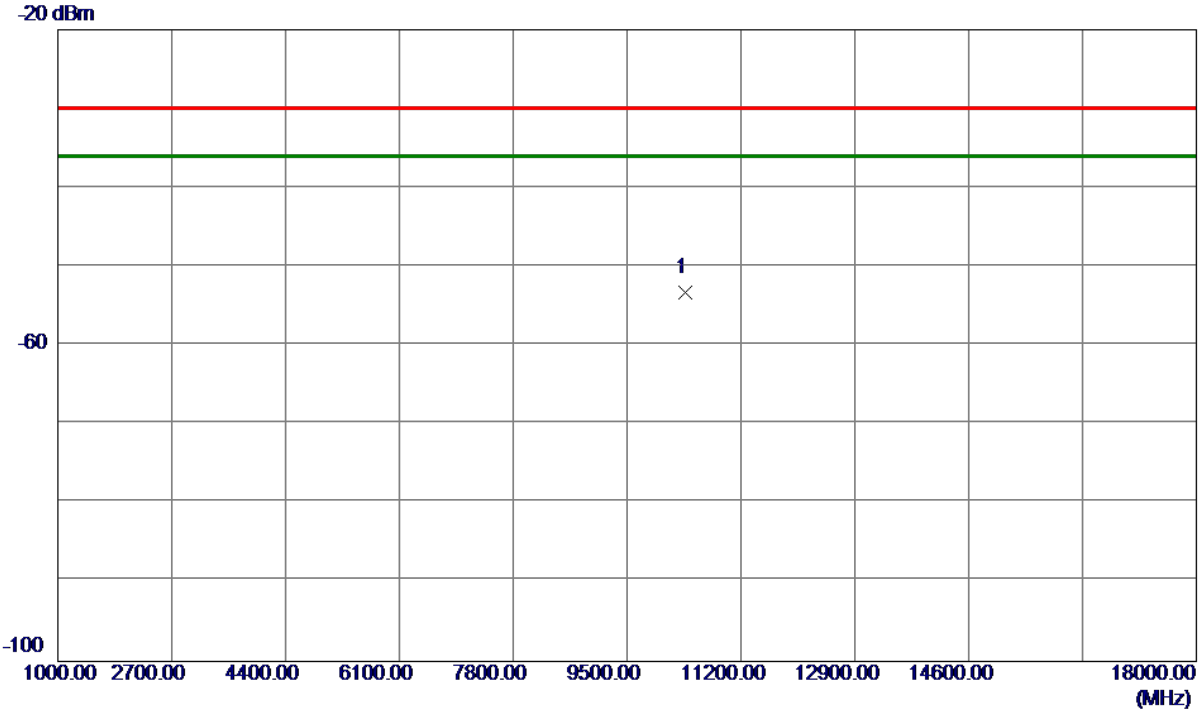
Test Mode	TX Mode IEEE 802.11ac(VHT80)_5530MHz	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	111.4800	-66.20	-4.25	-70.45	-54.00	-16.45	RMS	
2	147.2730	-74.14	1.06	-73.08	-36.00	-37.08	RMS	
3 *	221.8660	-65.01	-2.21	-67.22	-54.00	-13.22	RMS	
4	614.1340	-78.85	4.93	-73.92	-54.00	-19.92	RMS	
5	836.4580	-77.88	7.70	-70.18	-54.00	-16.18	RMS	
6	991.1730	-76.85	10.08	-66.77	-36.00	-30.77	RMS	

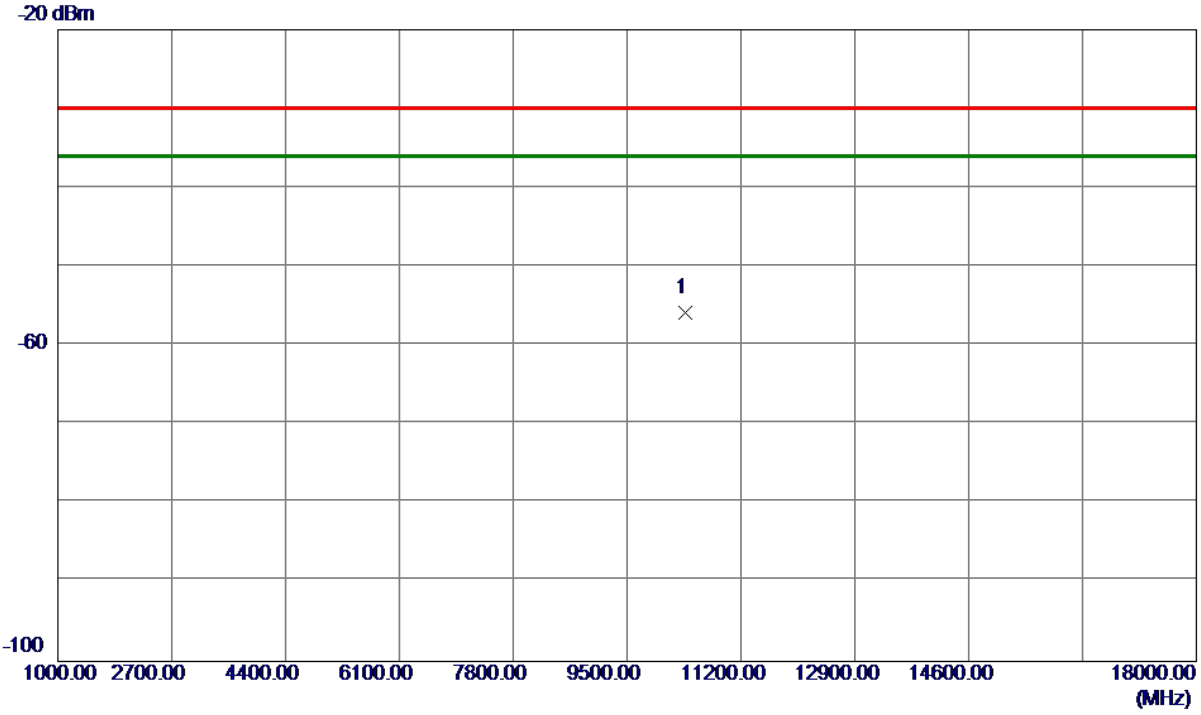
APPENDIX F - TRANSMITTER UNWANTED EMISSIONS OUTSIDE THE 5 GHZ RLAN BANDS (ABOVE 1000MHZ)

Test Mode	TX Mode IEEE 802.11a_5180MHz	Polarization	Vertical



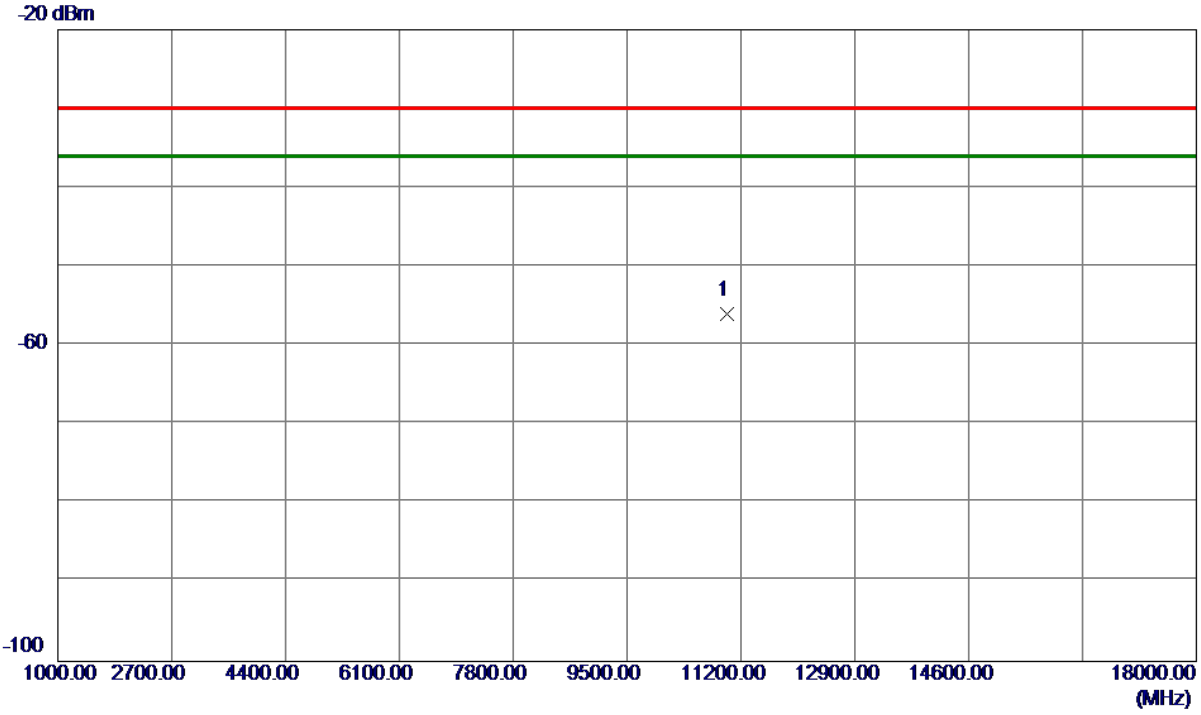
No.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	10361.9000	-60.18	6.93	-53.25	-30.00	-23.25	RMS	

Test Mode	TX Mode IEEE 802.11a_5180MHz	Polarization	Horizontal



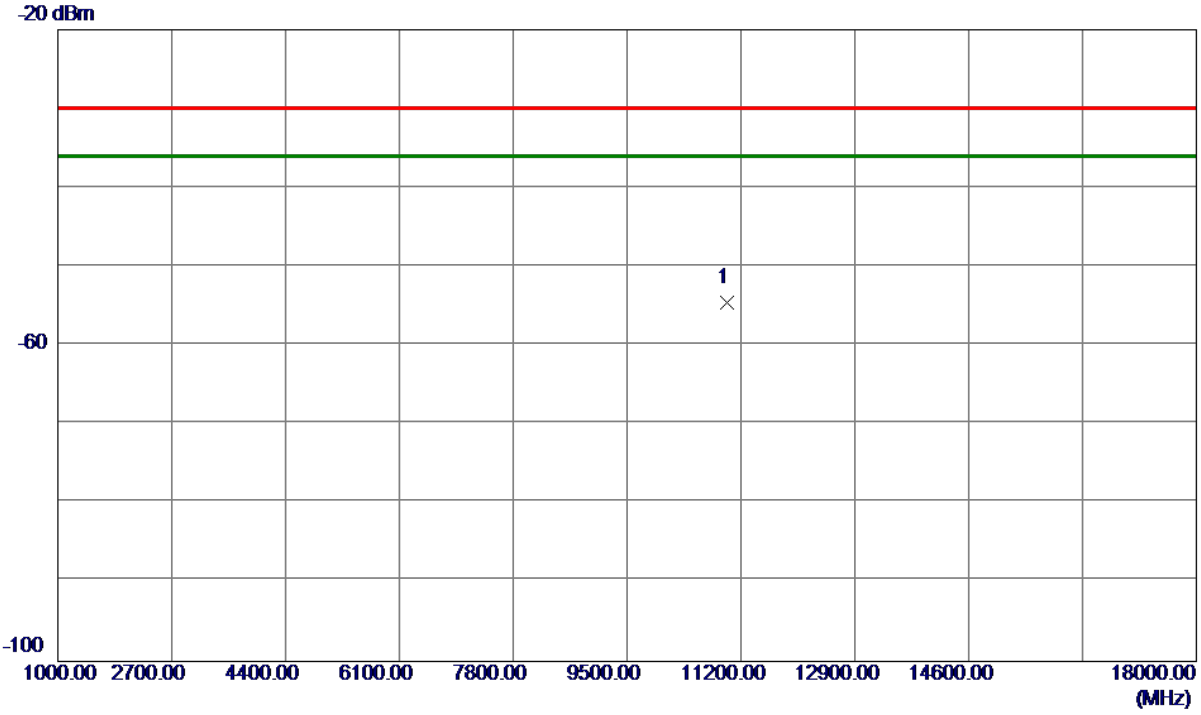
No.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	10361.9000	-62.91	7.12	-55.79	-30.00	-25.79	RMS	

Test Mode	TX Mode IEEE 802.11a_5500MHz	Polarization	Vertical



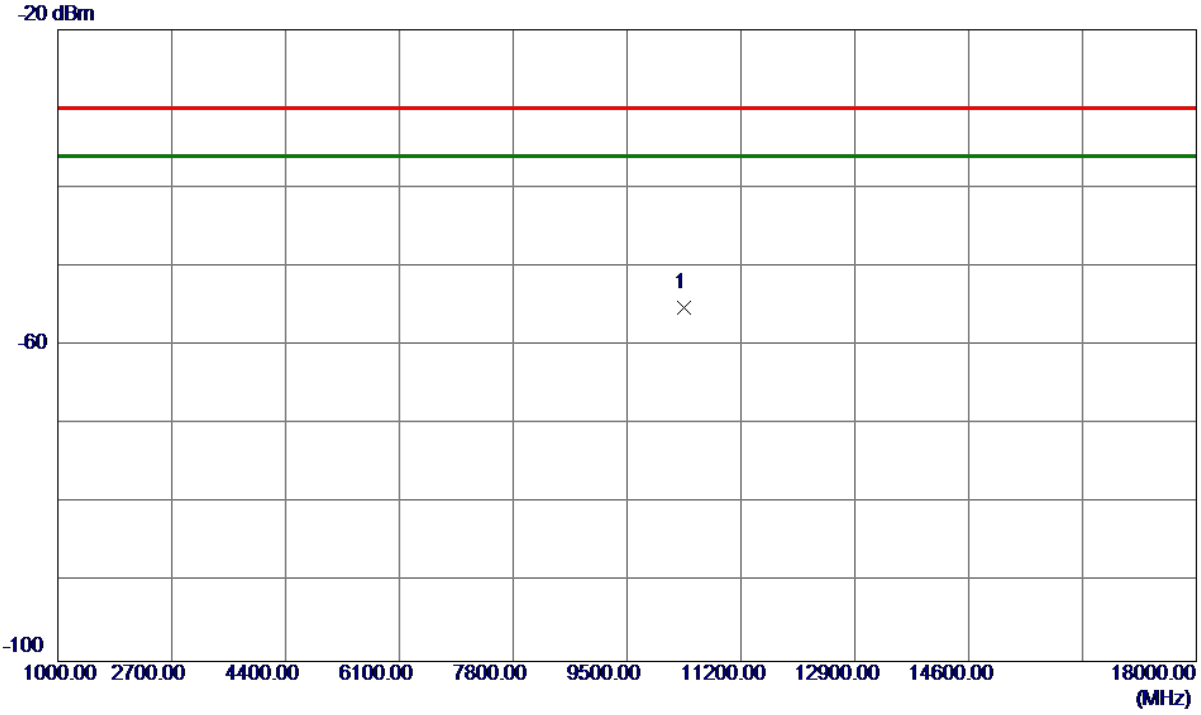
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	11001.1000	-64.04	7.96	-56.08	-30.00	-26.08	RMS	

Test Mode	TX Mode IEEE 802.11a_5500MHz	Polarization	Horizontal



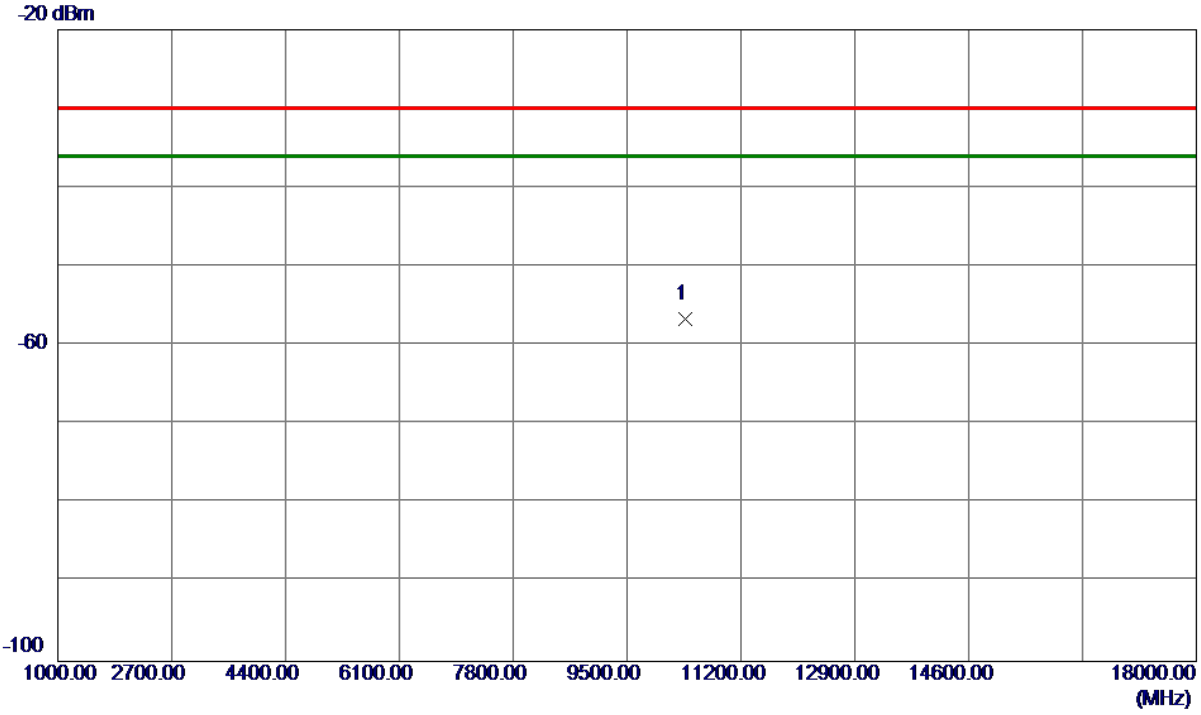
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	10996.8500	-63.17	8.57	-54.60	-30.00	-24.60	RMS	

Test Mode	TX Mode IEEE 802.11ac(VHT20)_5180MHz	Polarization	Vertical



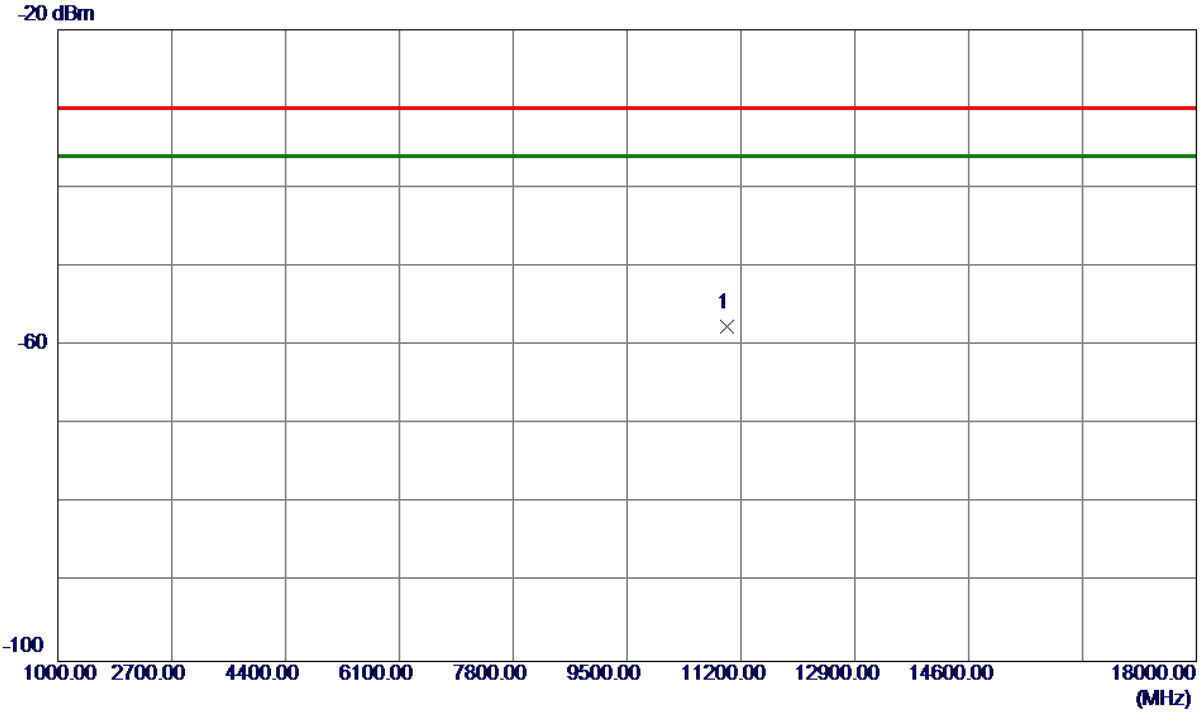
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	10358.5000	-62.08	6.93	-55.15	-30.00	-25.15	RMS	

Test Mode	TX Mode IEEE 802.11ac(VHT20)_5180MHz	Polarization	Horizontal



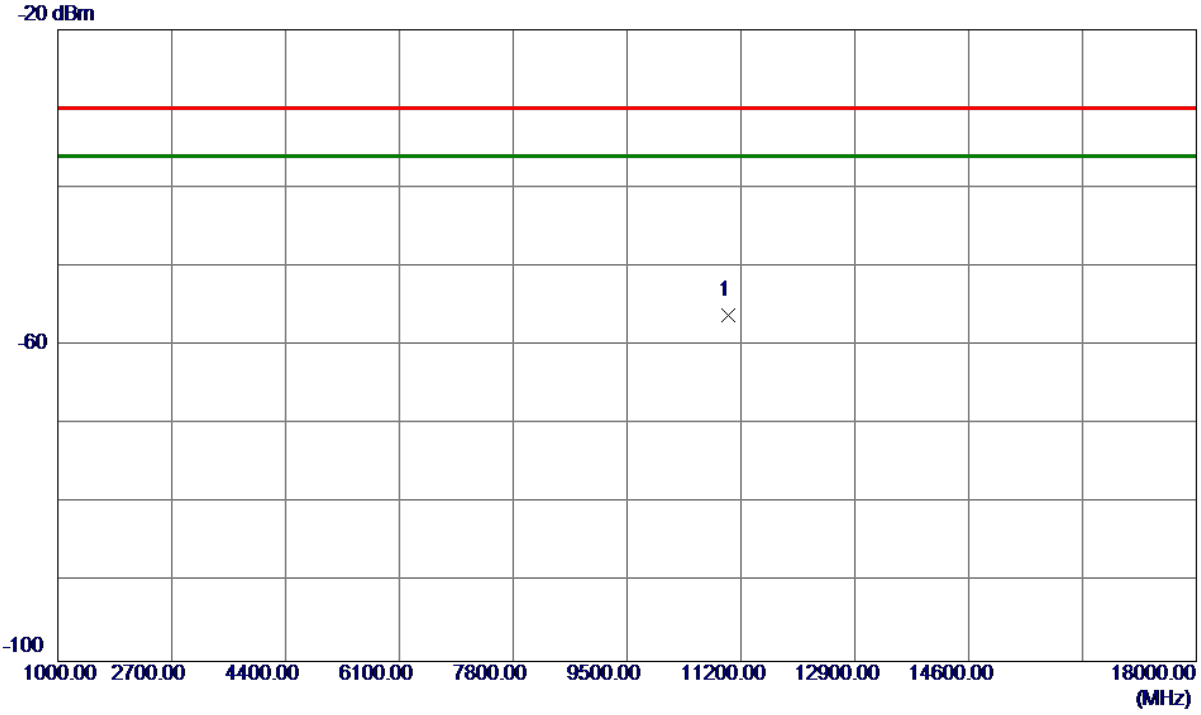
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	10362.7500	-63.76	7.12	-56.64	-30.00	-26.64	RMS	

Test Mode	TX Mode IEEE 802.11ac(VHT20)_5500MHz	Polarization	Vertical



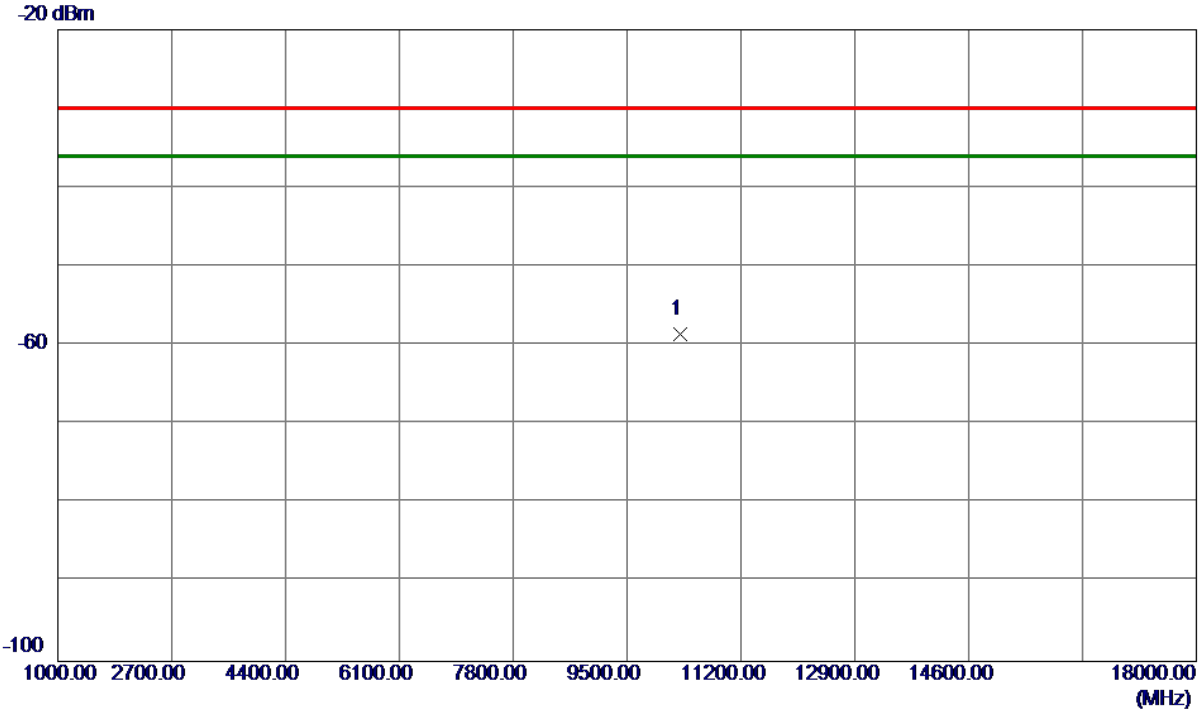
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	11001.1000	-65.64	7.96	-57.68	-30.00	-27.68	RMS	

Test Mode	TX Mode IEEE 802.11ac(VHT20)_5500MHz	Polarization	Horizontal



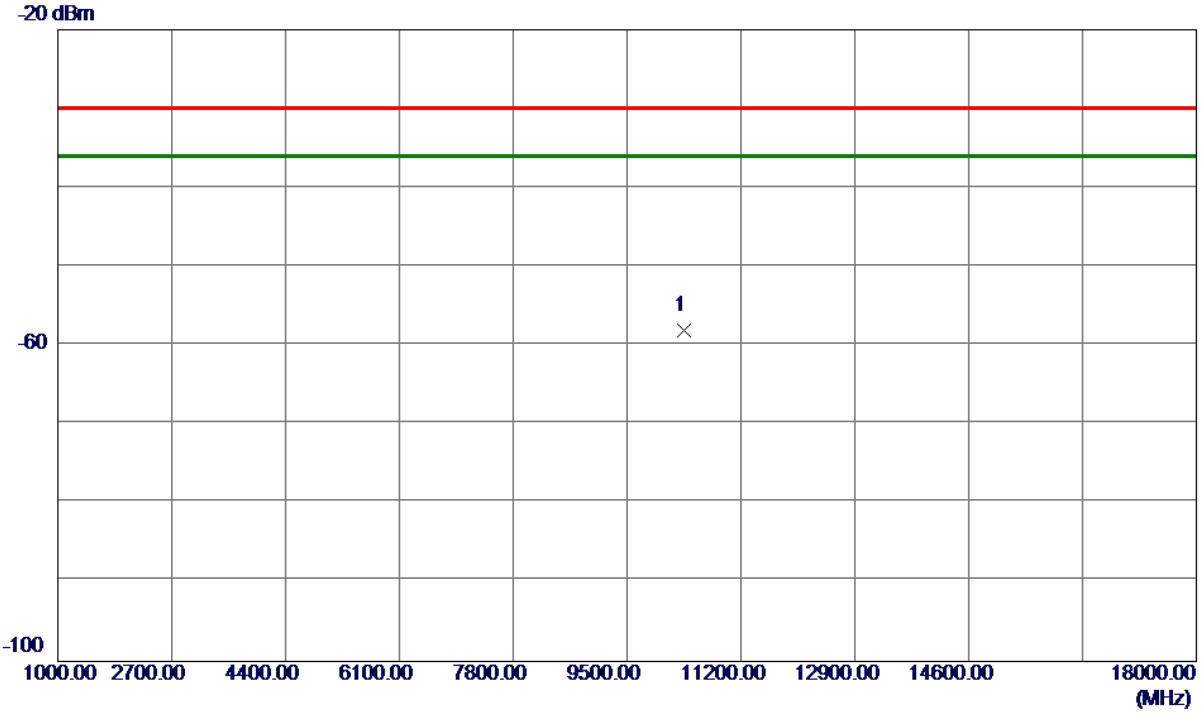
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	11006.2000	-64.81	8.59	-56.22	-30.00	-26.22	RMS	

Test Mode	TX Mode IEEE 802.11ac(VHT40)_5190MHz	Polarization	Vertical



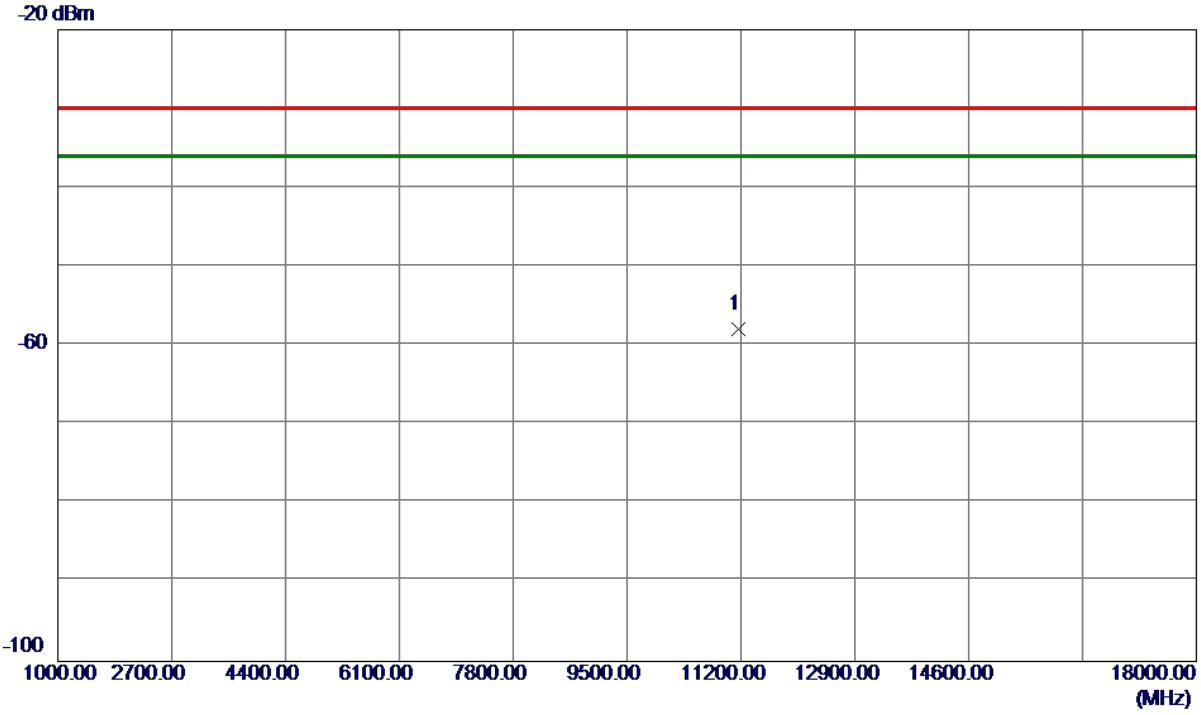
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	10294.7500	-65.42	6.91	-58.51	-30.00	-28.51	RMS	

Test Mode	TX Mode IEEE 802.11ac(VHT40)_5190MHz	Polarization	Horizontal



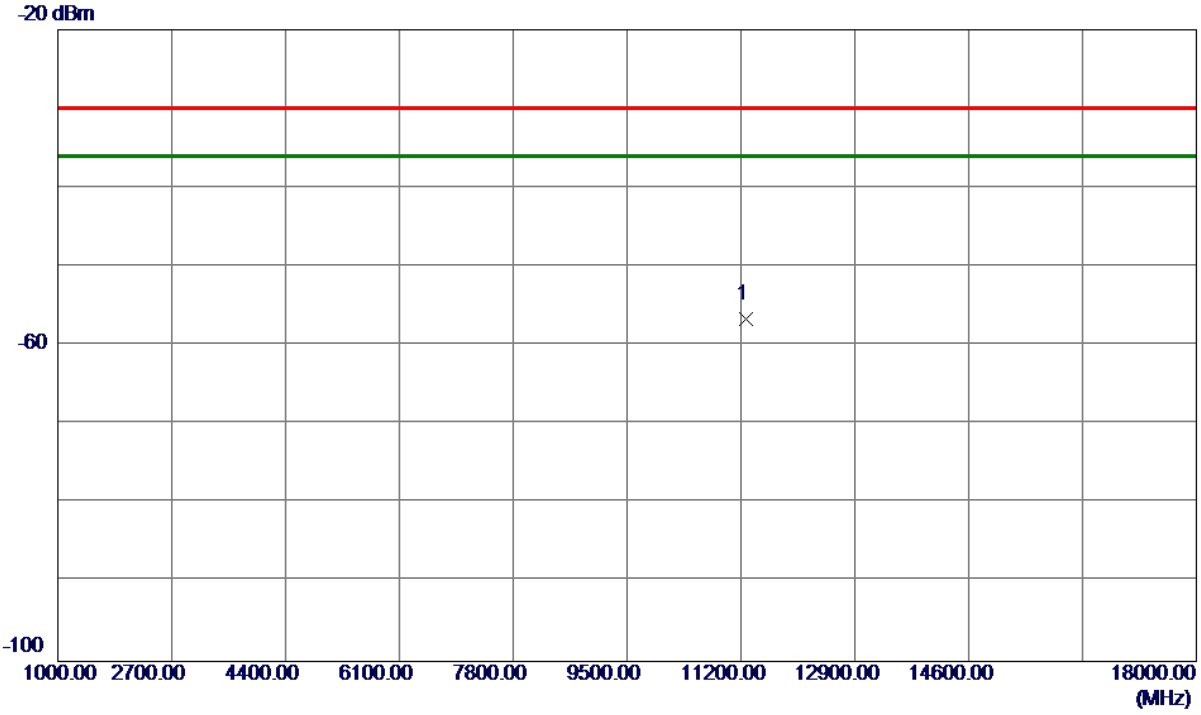
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	10352.5500	-65.17	7.11	-58.06	-30.00	-28.06	RMS	

Test Mode	TX Mode IEEE 802.11ac(VHT40)_5510MHz	Polarization	Vertical



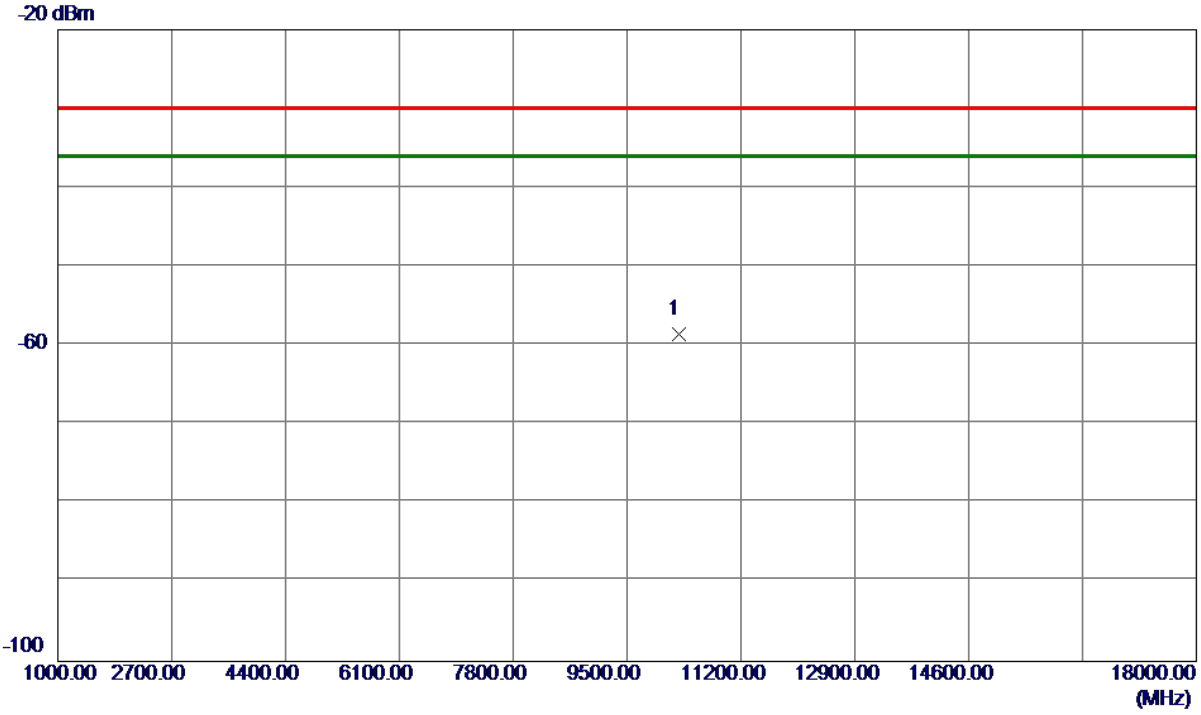
No.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	11164.3000	-66.35	8.37	-57.98	-30.00	-27.98	RMS	

Test Mode	TX Mode IEEE 802.11ac(VHT40)_5510MHz	Polarization	Horizontal



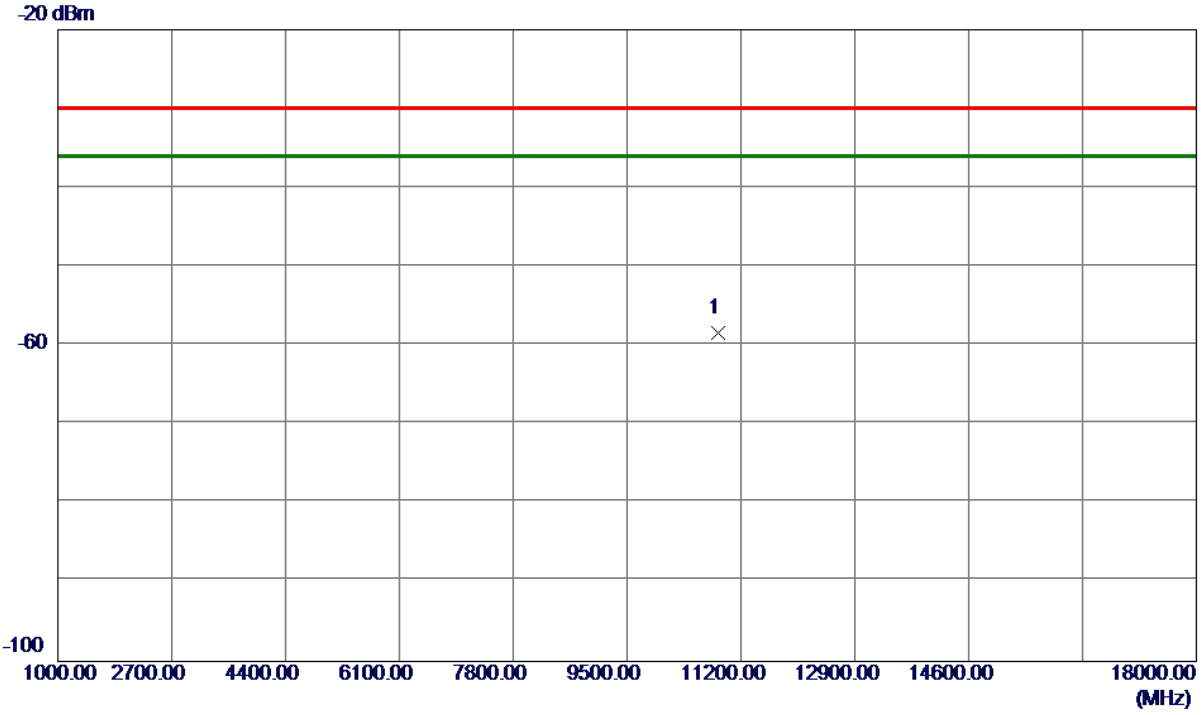
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	11275.6500	-65.71	9.03	-56.68	-30.00	-26.68	RMS	

Test Mode	TX Mode IEEE 802.11ac(VHT80)_5210MHz	Polarization	Vertical



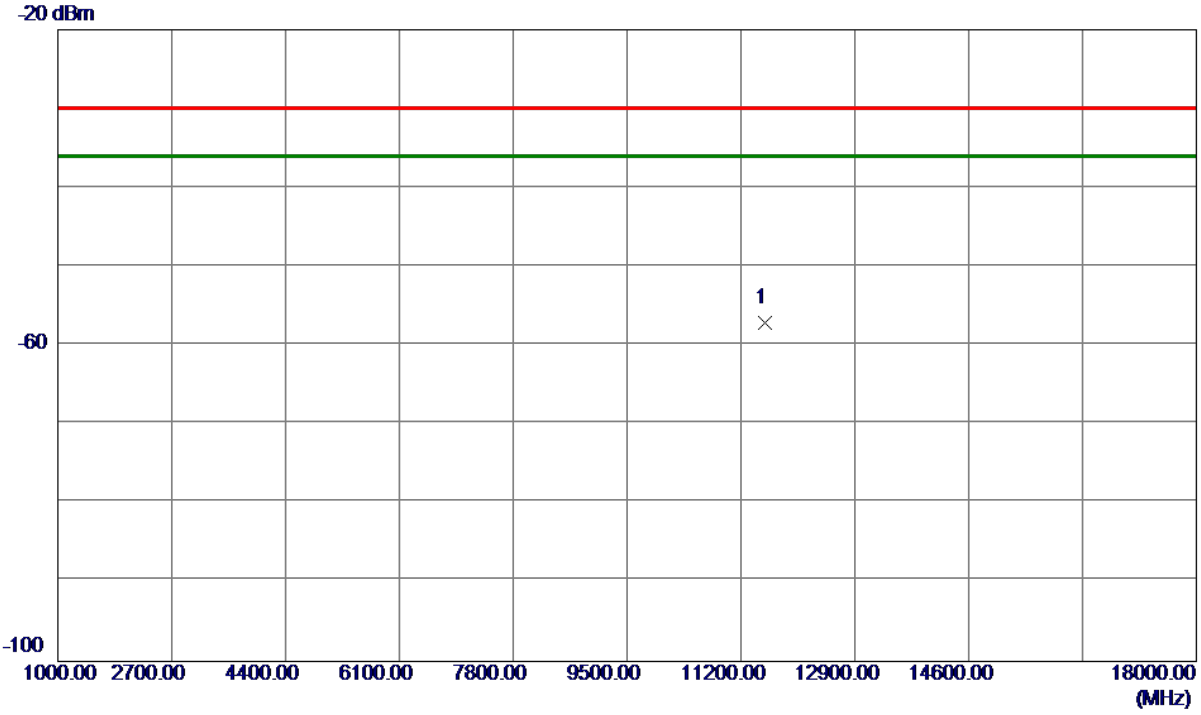
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	10265.0000	-65.42	6.90	-58.52	-30.00	-28.52	RMS	

Test Mode	TX Mode IEEE 802.11ac(VHT80)_5210MHz	Polarization	Horizontal



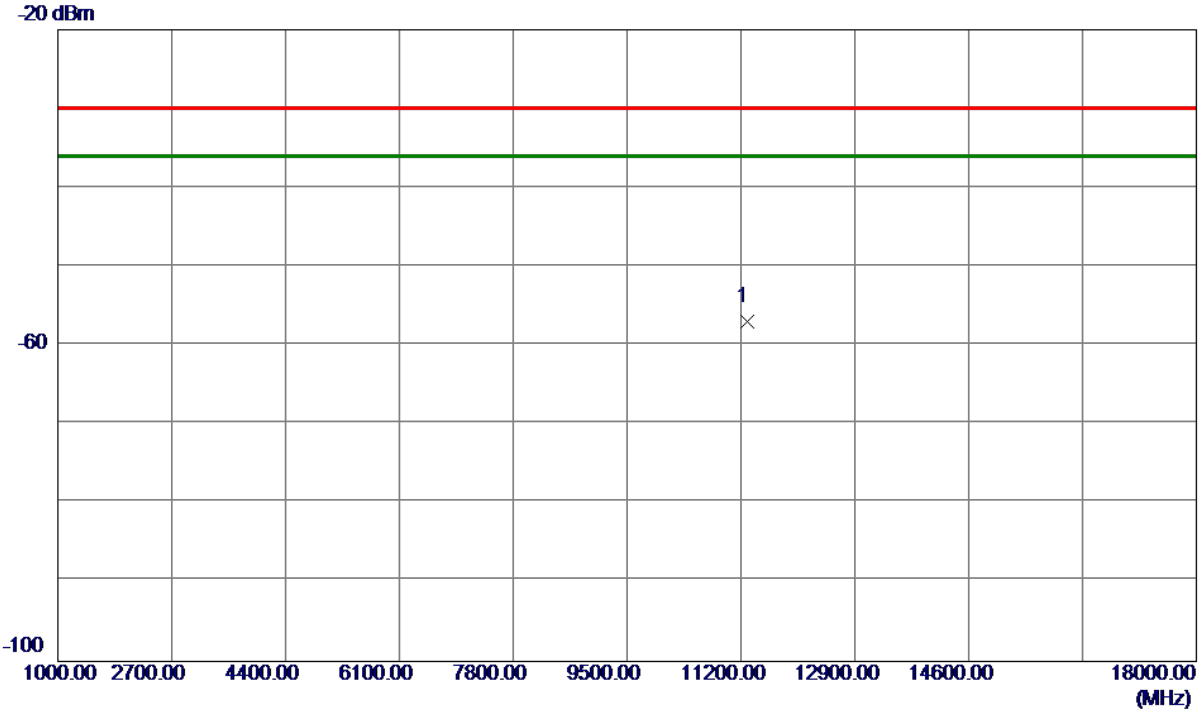
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	10863.4000	-66.56	8.19	-58.37	-30.00	-28.37	RMS	

Test Mode	TX Mode IEEE 802.11ac(VHT80)_5530MHz	Polarization	Vertical



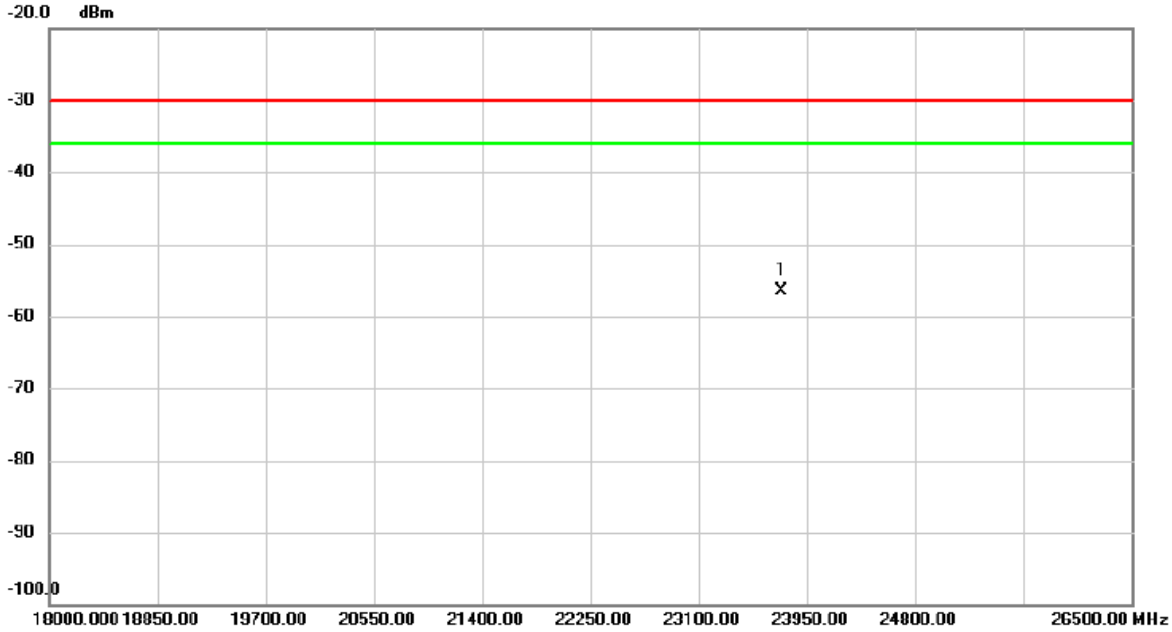
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	11556.1500	-66.48	9.31	-57.17	-30.00	-27.17	RMS	

Test Mode	TX Mode IEEE 802.11ac(VHT80)_5530MHz	Polarization	Horizontal



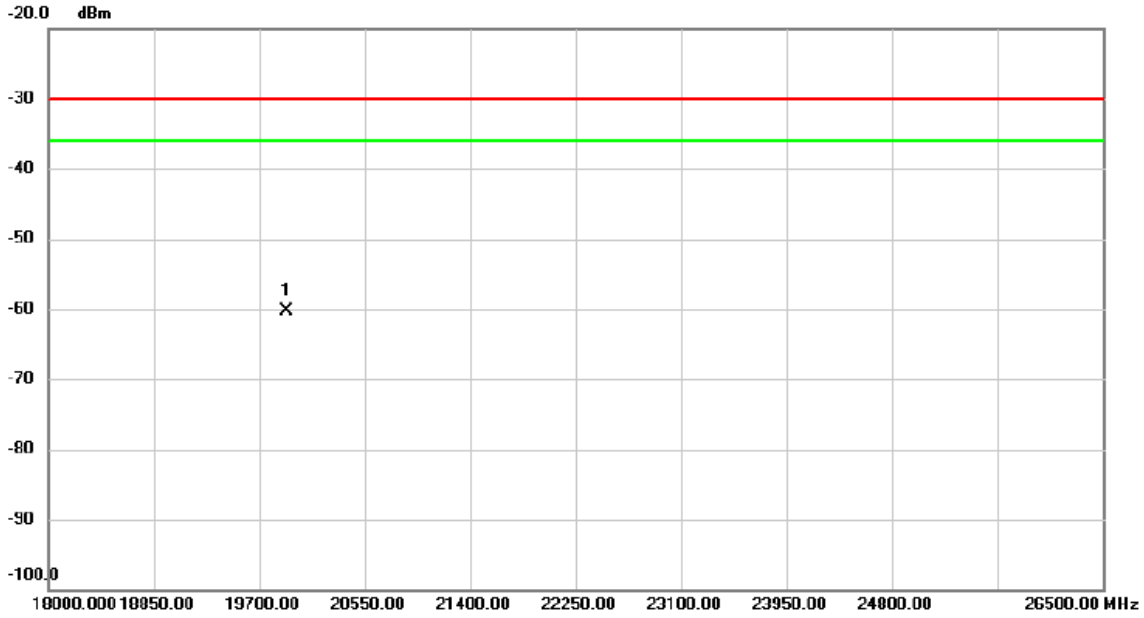
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	11285.0000	-66.04	9.05	-56.99	-30.00	-26.99	RMS	

Test Mode	TX Mode IEEE 802.11ac(VHT80)_5210MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	23751.950	-67.14	10.73	-56.41	-30.00	-26.41	RMS	

Test Mode	TX Mode IEEE 802.11ac(VHT80)_5210MHz	Polarization	Horizontal



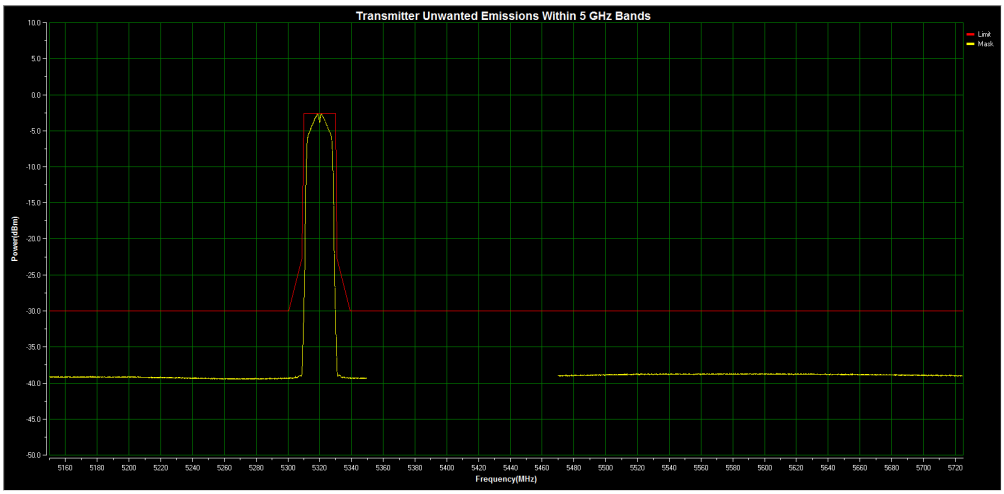
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	19925.675	-66.00	5.61	-60.39	-30.00	-30.39	RMS	

APPENDIX G - TRANSMITTER UNWANTED EMISSIONS WITHIN THE 5 GHZ RLAN BANDS

Test Mode :	IEEE 802.11a_5180MHz

Note:
The MASK is only applicable within the 5150MHz to 5350MHz and 5470MHz to 5725MHz. 5350MHz to 5470MHz is applicable within the Radiation spurious,so the waveform is not displayed in the test data.

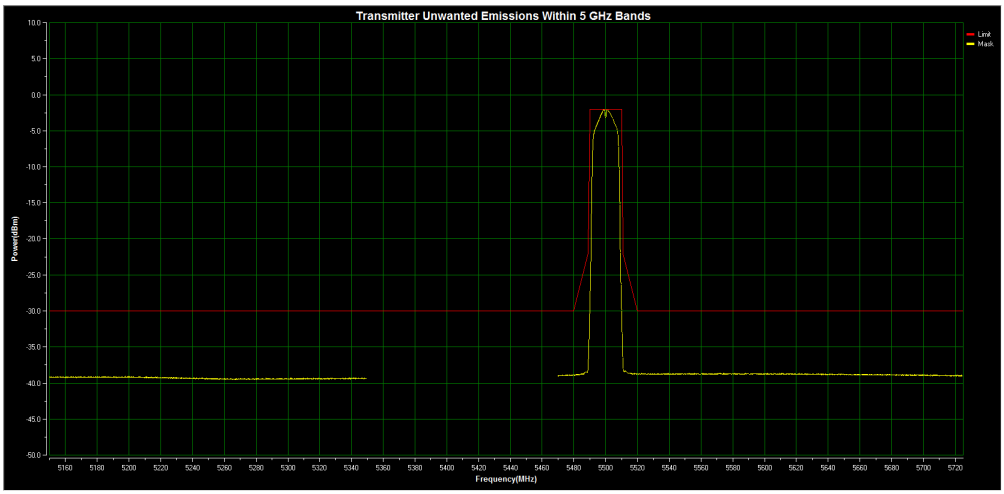
Test Mode :	IEEE 802.11a_5320MHz



Test Result:Pass

Note:
The MASK is only applicable within the 5150MHz to 5350MHz and 5470MHz to 5725MHz. 5350MHz to 5470MHz is applicable within the Radiation spurious,so the waveform is not displayed in the test data.

Test Mode :	IEEE 802.11a_5500MHz



Note:
The MASK is only applicable within the 5150MHz to 5350MHz and 5470MHz to 5725MHz. 5350MHz to 5470MHz is applicable within the Radiation spurious,so the waveform is not displayed in the test data.

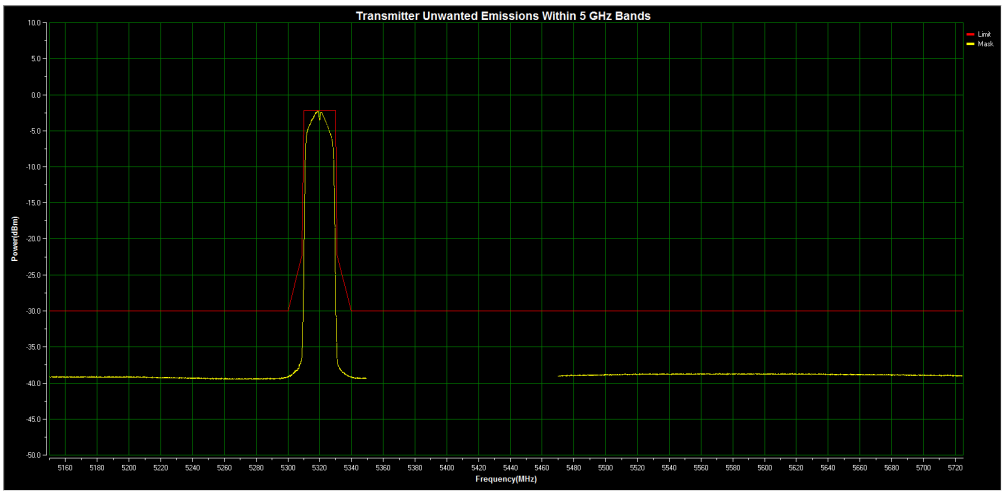
Test Mode :	IEEE 802.11a_5700MHz

Note:
The MASK is only applicable within the 5150MHz to 5350MHz and 5470MHz to 5725MHz. 5350MHz to 5470MHz is applicable within the Radiation spurious,so the waveform is not displayed in the test data.

Test Mode :	IEEE 802.11ac(VHT20)_5180MHz

Note:
The MASK is only applicable within the 5150MHz to 5350MHz and 5470MHz to 5725MHz. 5350MHz to 5470MHz is applicable within the Radiation spurious,so the waveform is not displayed in the test data.

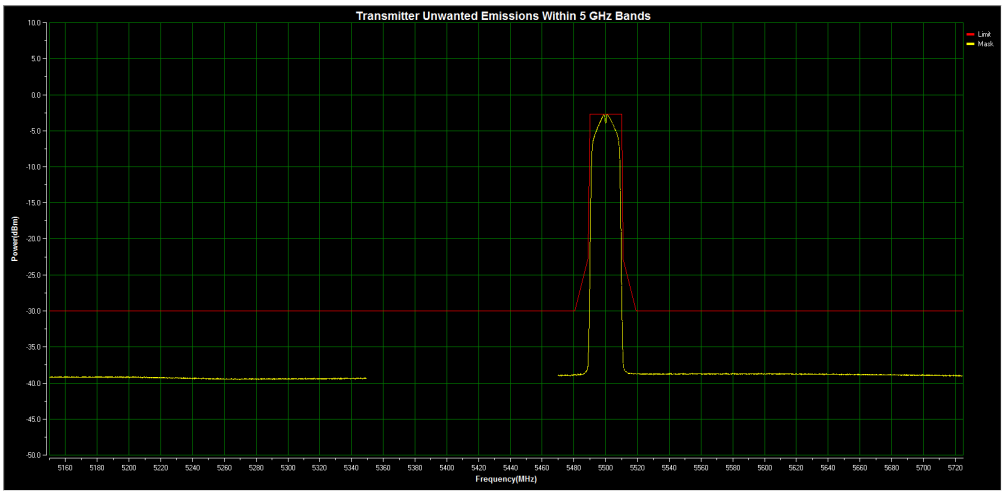
Test Mode :	IEEE 802.11ac(VHT20)_5320MHz



Test Result:Pass

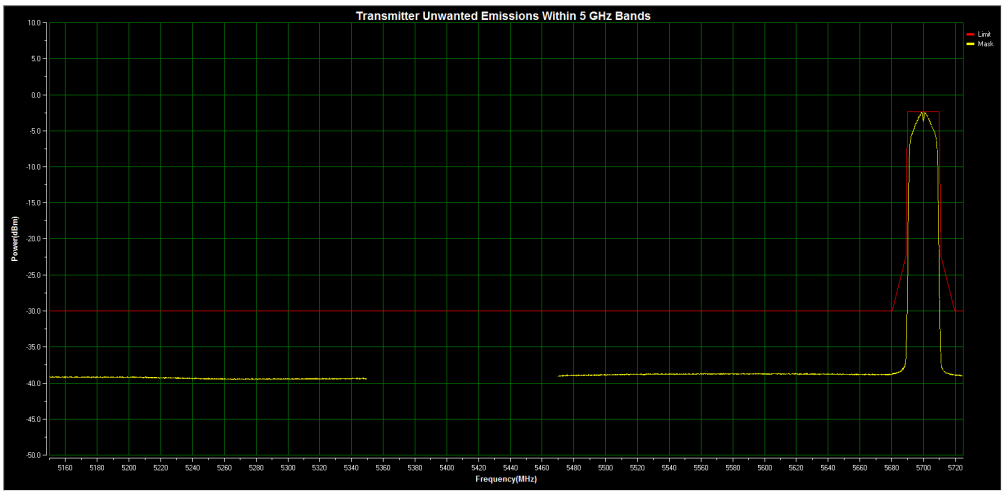
Note:
The MASK is only applicable within the 5150MHz to 5350MHz and 5470MHz to 5725MHz. 5350MHz to 5470MHz is applicable within the Radiation spurious,so the waveform is not displayed in the test data.

Test Mode :	IEEE 802.11ac(VHT20)_5500MHz



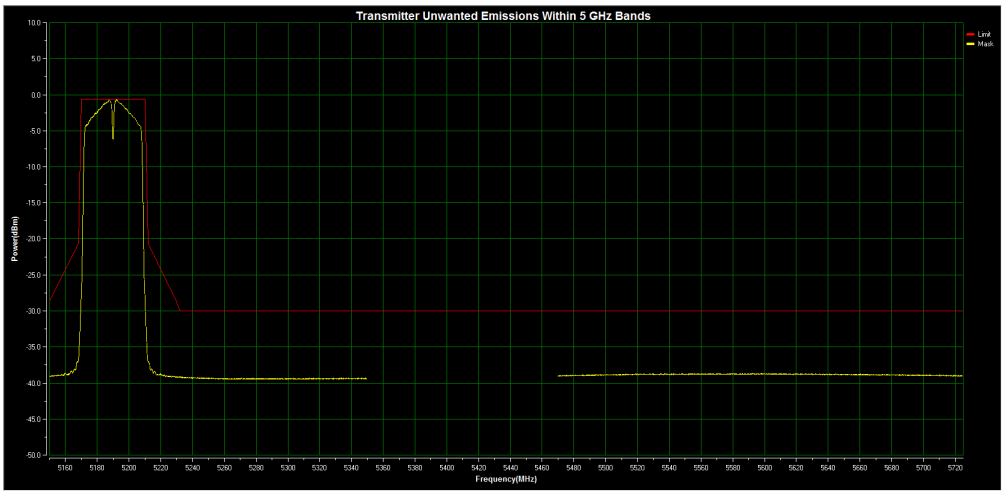
Note:
The MASK is only applicable within the 5150MHz to 5350MHz and 5470MHz to 5725MHz. 5350MHz to 5470MHz is applicable within the Radiation spurious,so the waveform is not displayed in the test data.

Test Mode :	IEEE 802.11ac(VHT20)_5700MHz



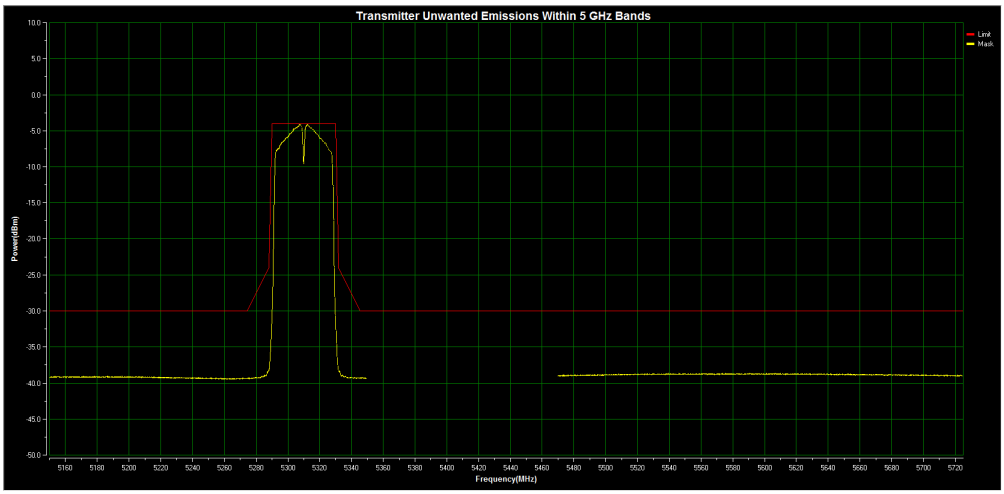
Note:
The MASK is only applicable within the 5150MHz to 5350MHz and 5470MHz to 5725MHz. 5350MHz to 5470MHz is applicable within the Radiation spurious,so the waveform is not displayed in the test data.

Test Mode :	IEEE 802.11ac(VHT40)_5190MHz



Note:
The MASK is only applicable within the 5150MHz to 5350MHz and 5470MHz to 5725MHz. 5350MHz to 5470MHz is applicable within the Radiation spurious,so the waveform is not displayed in the test data.

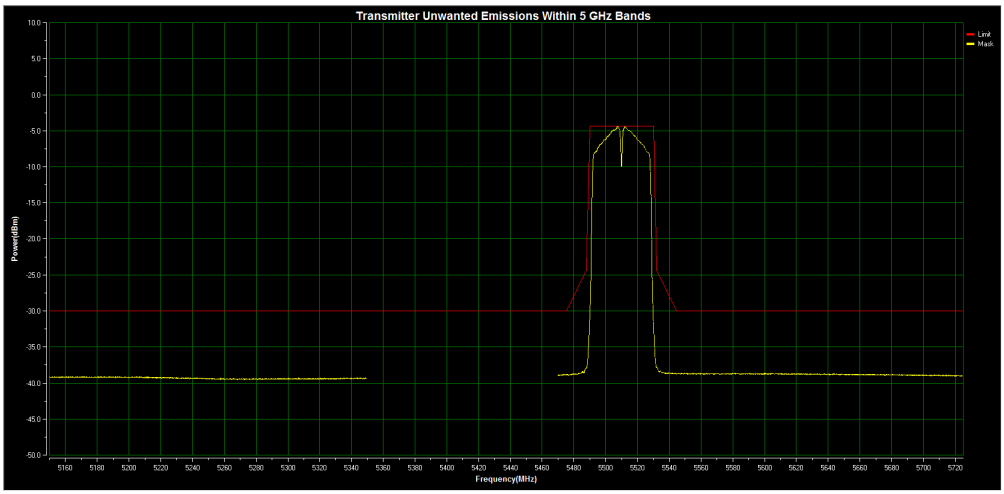
Test Mode :	IEEE 802.11ac(VHT40)_5310MHz



Test Result:Pass

Note:
The MASK is only applicable within the 5150MHz to 5350MHz and 5470MHz to 5725MHz. 5350MHz to 5470MHz is applicable within the Radiation spurious,so the waveform is not displayed in the test data.

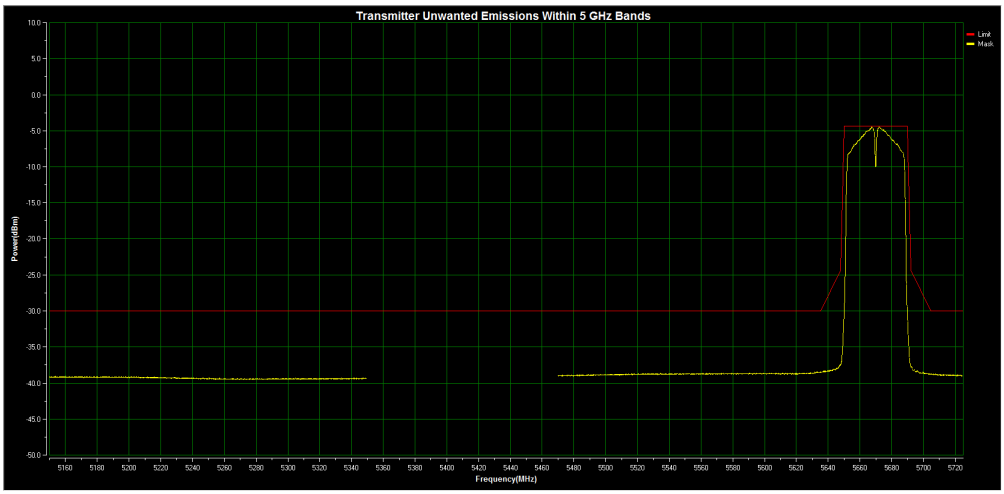
Test Mode :	IEEE 802.11ac(VHT40)_5510MHz



Test Result:Pass

Note:
The MASK is only applicable within the 5150MHz to 5350MHz and 5470MHz to 5725MHz. 5350MHz to 5470MHz is applicable within the Radiation spurious,so the waveform is not displayed in the test data.

Test Mode :	IEEE 802.11ac(VHT40)_5670MHz



Note:
The MASK is only applicable within the 5150MHz to 5350MHz and 5470MHz to 5725MHz. 5350MHz to 5470MHz is applicable within the Radiation spurious,so the waveform is not displayed in the test data.

Test Mode :	IEEE 802.11ac(VHT80)_5210MHz

Test Result:Pass

Note:
The MASK is only applicable within the 5150MHz to 5350MHz and 5470MHz to 5725MHz. 5350MHz to 5470MHz is applicable within the Radiation spurious,so the waveform is not displayed in the test data.

Test Mode :	IEEE 802.11ac(VHT80)_5290MHz

Note:
The MASK is only applicable within the 5150MHz to 5350MHz and 5470MHz to 5725MHz. 5350MHz to 5470MHz is applicable within the Radiation spurious,so the waveform is not displayed in the test data.

Test Mode :	IEEE 802.11ac(VHT80)_5530MHz

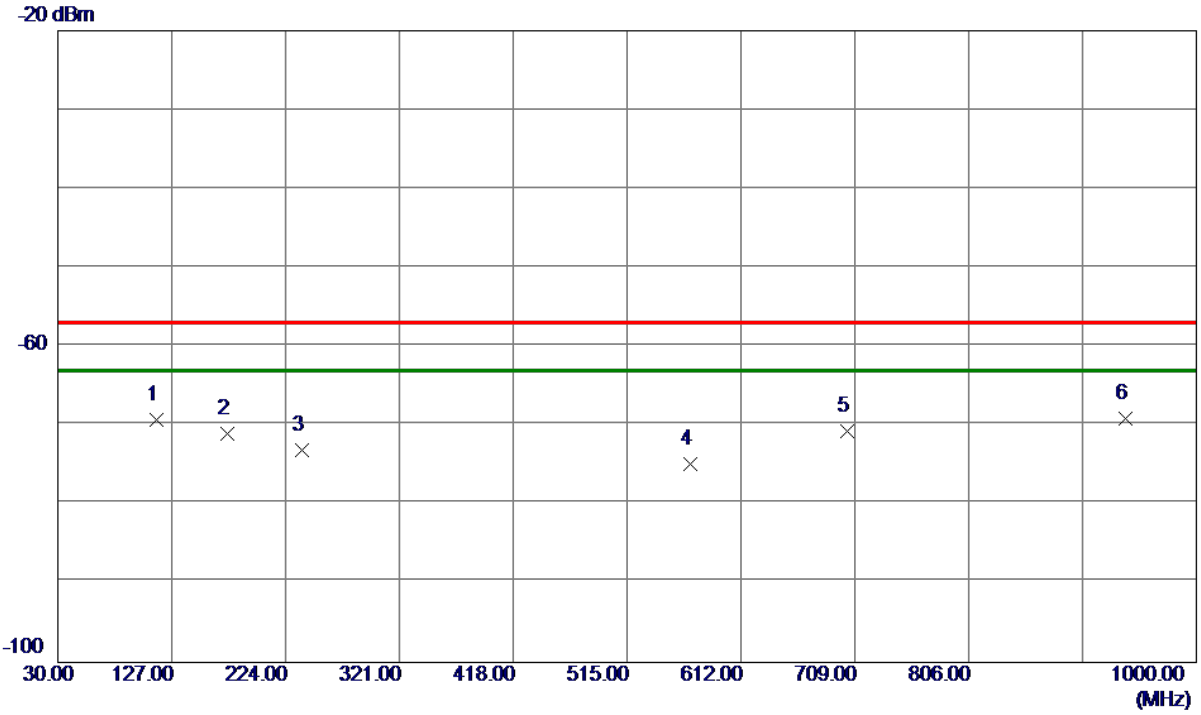
Note:
The MASK is only applicable within the 5150MHz to 5350MHz and 5470MHz to 5725MHz. 5350MHz to 5470MHz is applicable within the Radiation spurious,so the waveform is not displayed in the test data.

Test Mode :	IEEE 802.11ac(VHT80)_5610MHz

Note:
The MASK is only applicable within the 5150MHz to 5350MHz and 5470MHz to 5725MHz. 5350MHz to 5470MHz is applicable within the Radiation spurious,so the waveform is not displayed in the test data.

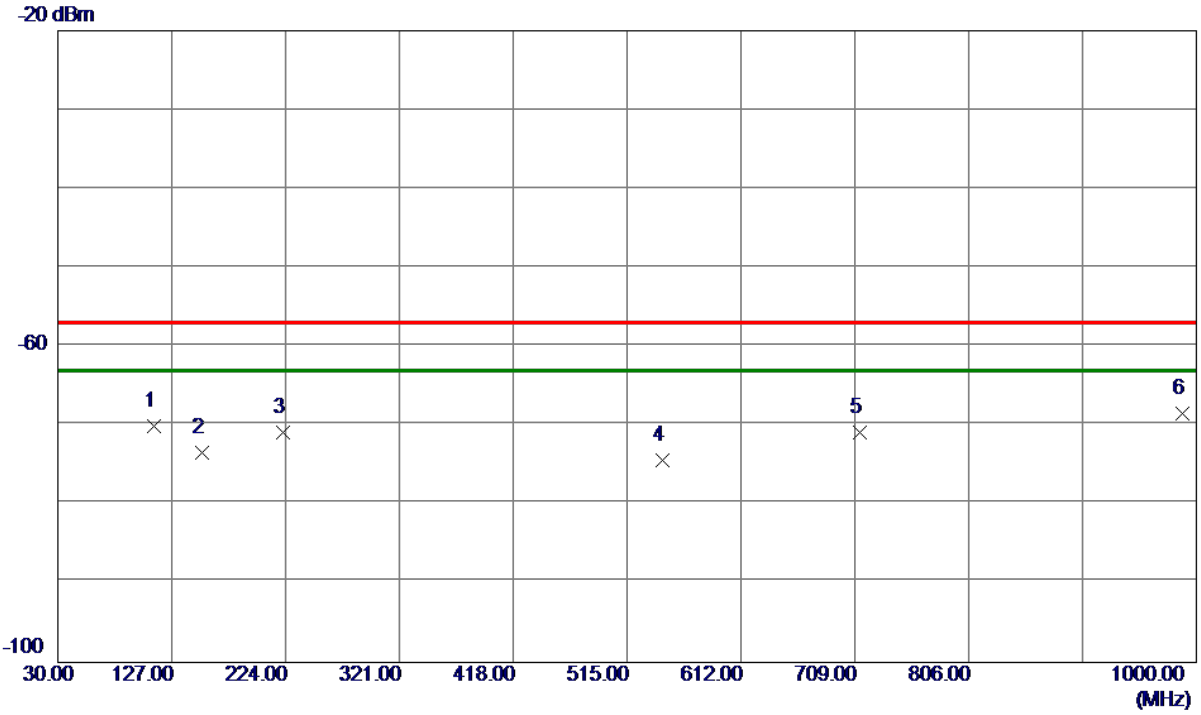
APPENDIX H - RECEIVER SPURIOUS EMISSIONS (30MHZ TO 1000MHZ)

Test Mode	RX Mode IEEE 802.11ac(VHT80)_5210MHz	Polarization	Vertical



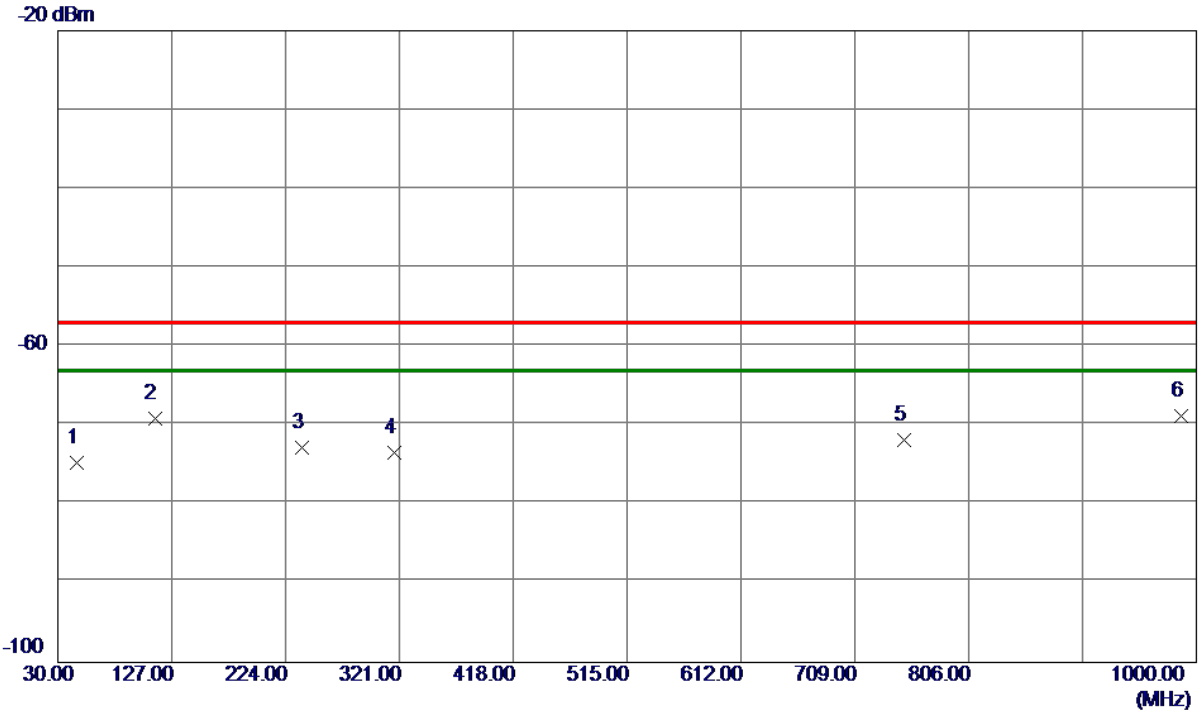
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	114.1960	-66.02	-3.32	-69.34	-57.00	-12.34	RMS	
2	174.2390	-69.89	-1.22	-71.11	-57.00	-14.11	RMS	
3	237.6770	-71.26	-1.93	-73.19	-57.00	-16.19	RMS	
4	568.9320	-79.12	4.21	-74.91	-57.00	-17.91	RMS	
5	702.5979	-77.07	6.30	-70.77	-57.00	-13.77	RMS	
6 *	939.2780	-78.27	9.23	-69.04	-57.00	-12.04	RMS	

Test Mode	RX Mode IEEE 802.11ac(VHT80)_5210MHz	Polarization	Horizontal



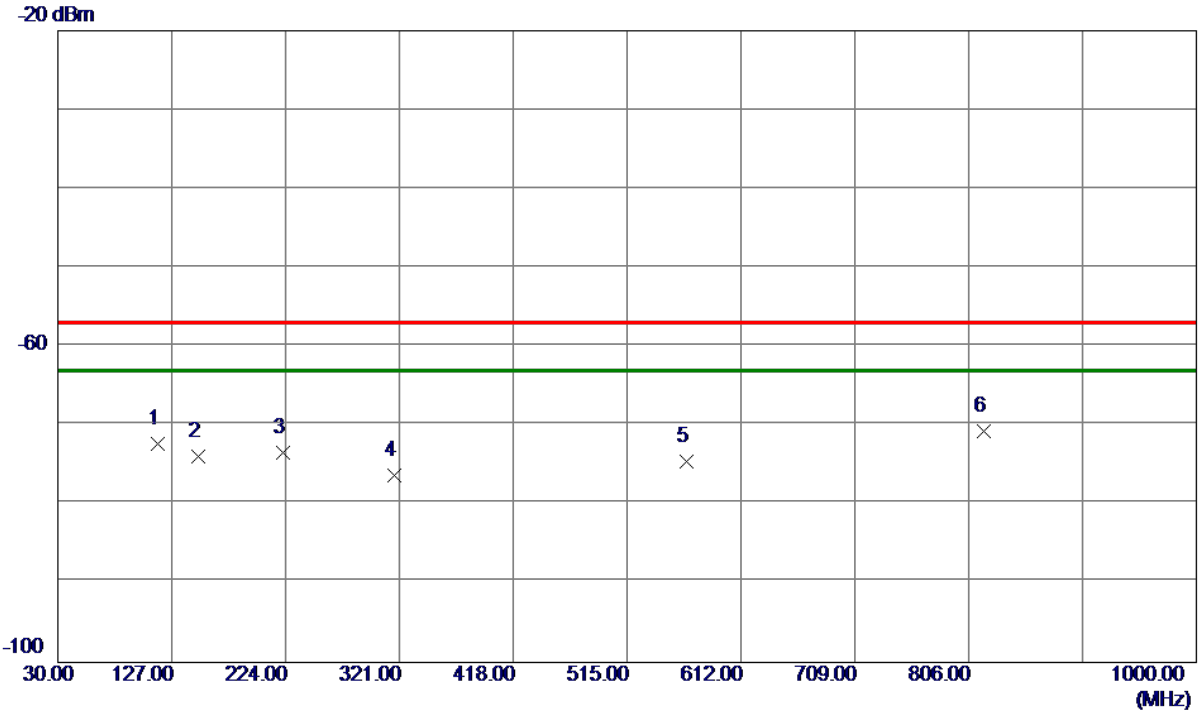
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	112.1590	-65.91	-4.14	-70.05	-57.00	-13.05	RMS	
2	153.3839	-74.18	0.79	-73.39	-57.00	-16.39	RMS	
3	221.8660	-68.68	-2.21	-70.89	-57.00	-13.89	RMS	
4	544.9729	-78.32	3.85	-74.47	-57.00	-17.47	RMS	
5	712.9770	-77.08	6.21	-70.87	-57.00	-13.87	RMS	
6 *	987.6810	-78.47	10.04	-68.43	-57.00	-11.43	RMS	

Test Mode	RX Mode IEEE 802.11ac(VHT80)_5530MHz	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	46.3930	-75.14	0.40	-74.74	-57.00	-17.74	RMS	
2	112.4500	-65.60	-3.47	-69.07	-57.00	-12.07	RMS	
3	237.6770	-70.94	-1.93	-72.87	-57.00	-15.87	RMS	
4	316.9260	-73.05	-0.37	-73.42	-57.00	-16.42	RMS	
5	751.3890	-78.58	6.78	-71.80	-57.00	-14.80	RMS	
6 *	987.2930	-78.35	9.62	-68.73	-57.00	-11.73	RMS	

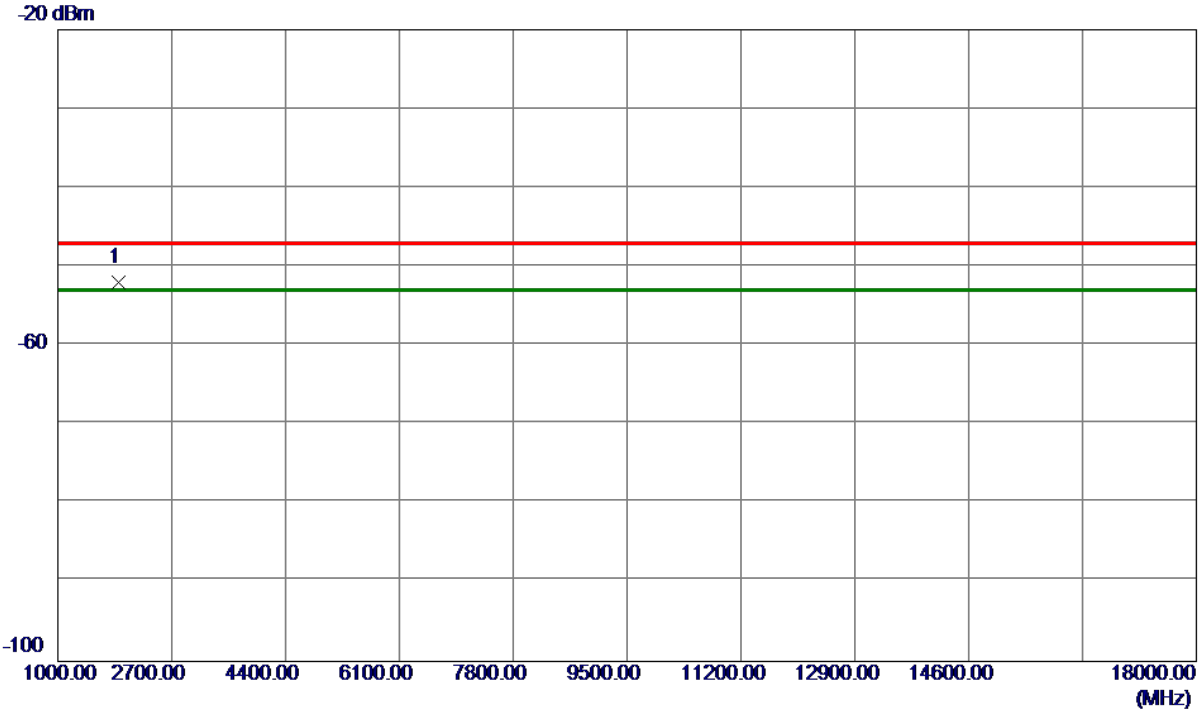
Test Mode	RX Mode IEEE 802.11ac(VHT80)_5530MHz	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	114.6810	-68.65	-3.73	-72.38	-57.00	-15.38	RMS	
2	150.0859	-75.03	1.15	-73.88	-57.00	-16.88	RMS	
3	221.8660	-71.22	-2.21	-73.43	-57.00	-16.43	RMS	
4	316.9260	-75.72	-0.56	-76.28	-57.00	-19.28	RMS	
5	565.5370	-78.71	4.19	-74.52	-57.00	-17.52	RMS	
6 *	818.5130	-78.55	7.78	-70.77	-57.00	-13.77	RMS	

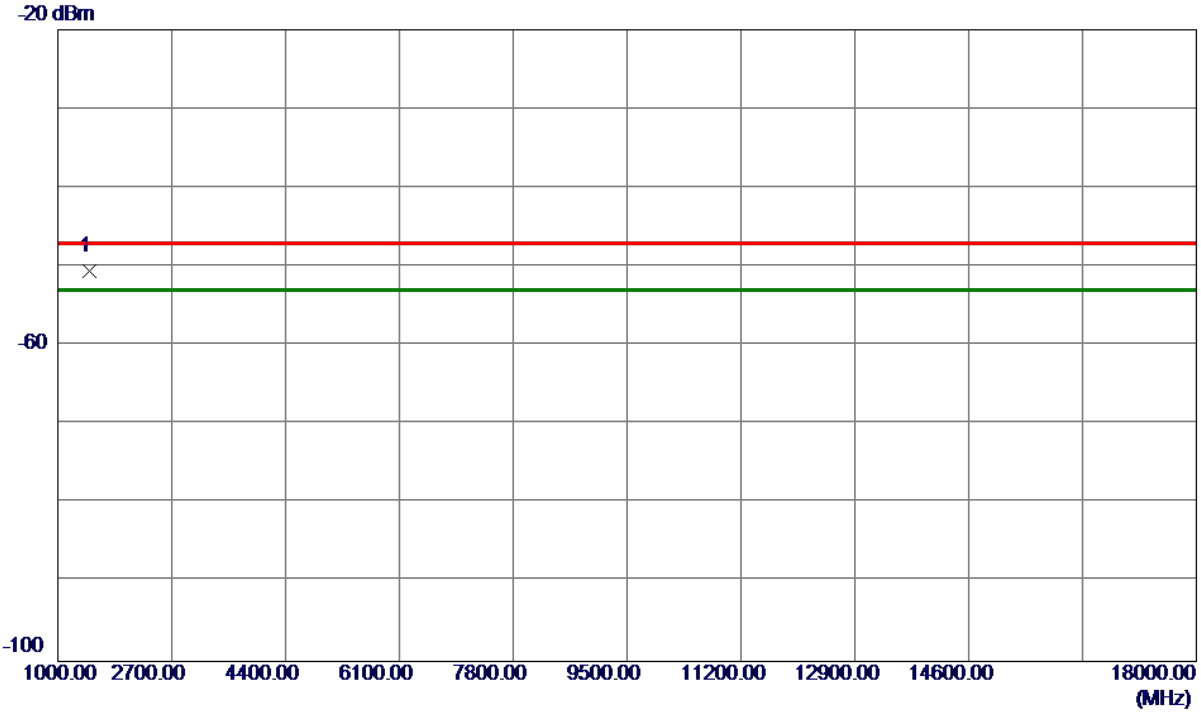
APPENDIX I - RECEIVER SPURIOUS EMISSIONS (ABOVE 1000MHZ)

Test Mode	RX Mode IEEE 802.11ac(VHT80)_5210MHz	Polarization	Vertical



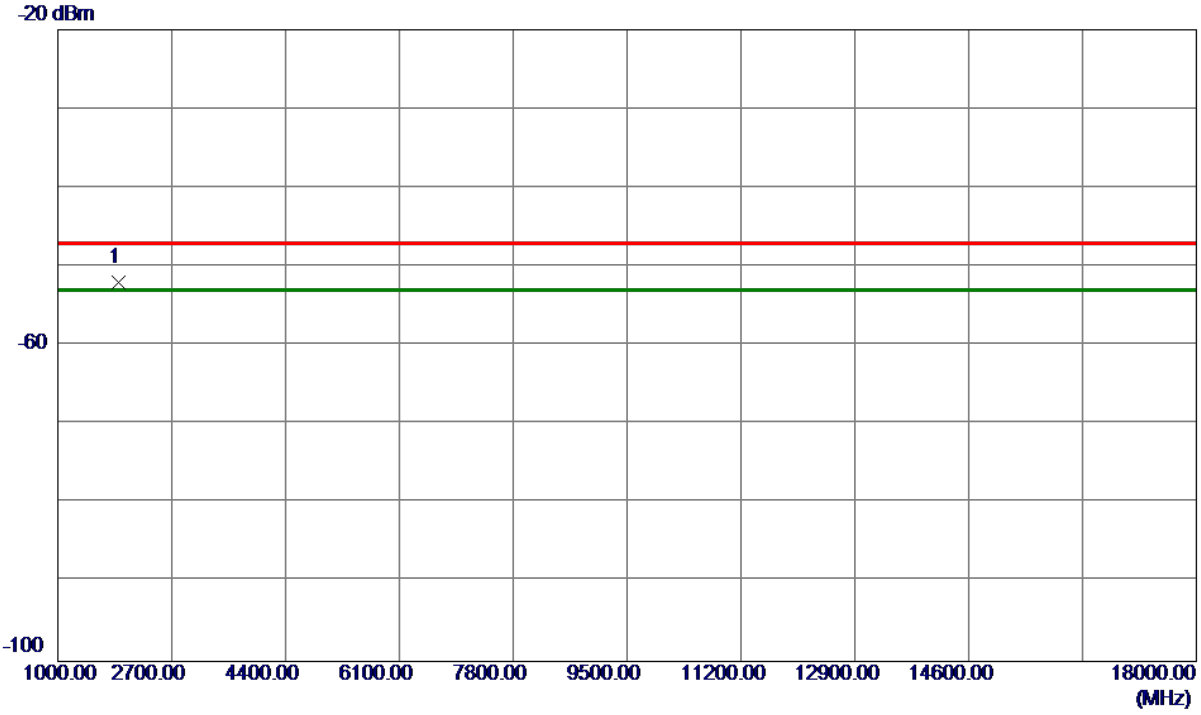
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	1915.4500	-47.49	-4.44	-51.93	-47.00	-4.93	RMS	

Test Mode	RX Mode IEEE 802.11ac(VHT80)_5210MHz	Polarization	Horizontal



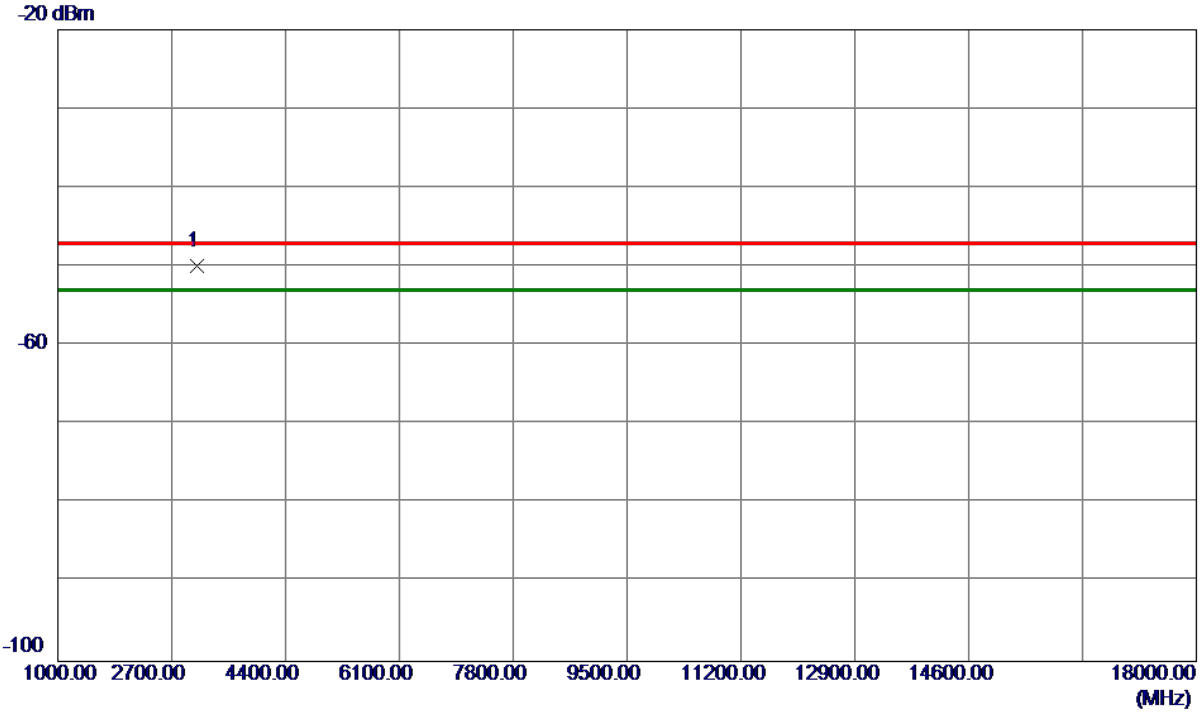
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	1463.2500	-42.42	-8.08	-50.50	-47.00	-3.50	RMS	

Test Mode	RX Mode IEEE 802.11ac(VHT80)_5530MHz	Polarization	Vertical



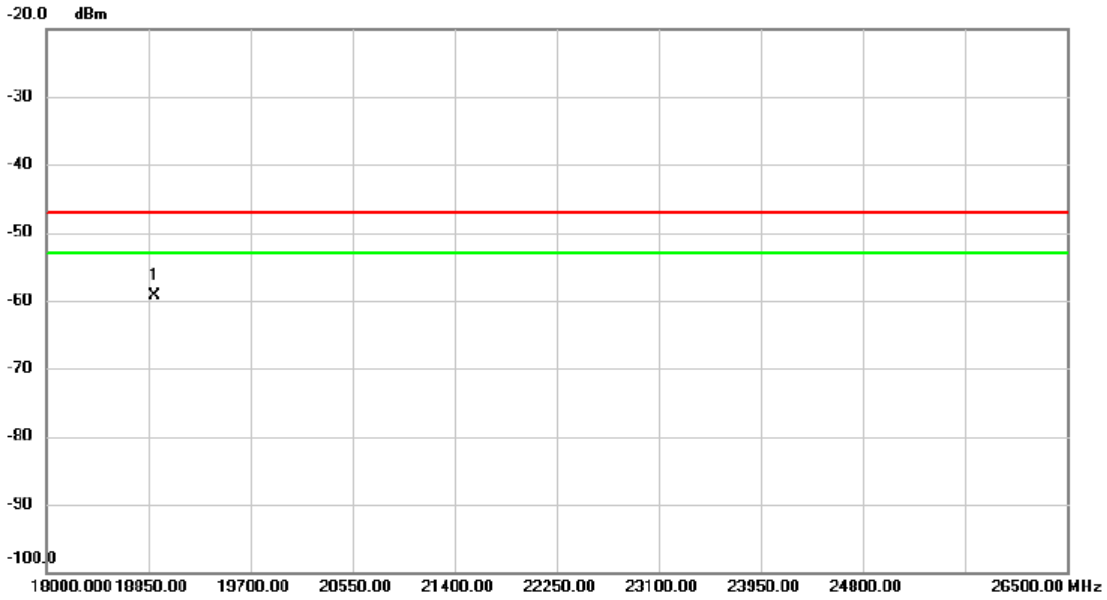
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	1907.8000	-47.50	-4.53	-52.03	-47.00	-5.03	RMS	

Test Mode	RX Mode IEEE 802.11ac(VHT80)_5530MHz	Polarization	Horizontal



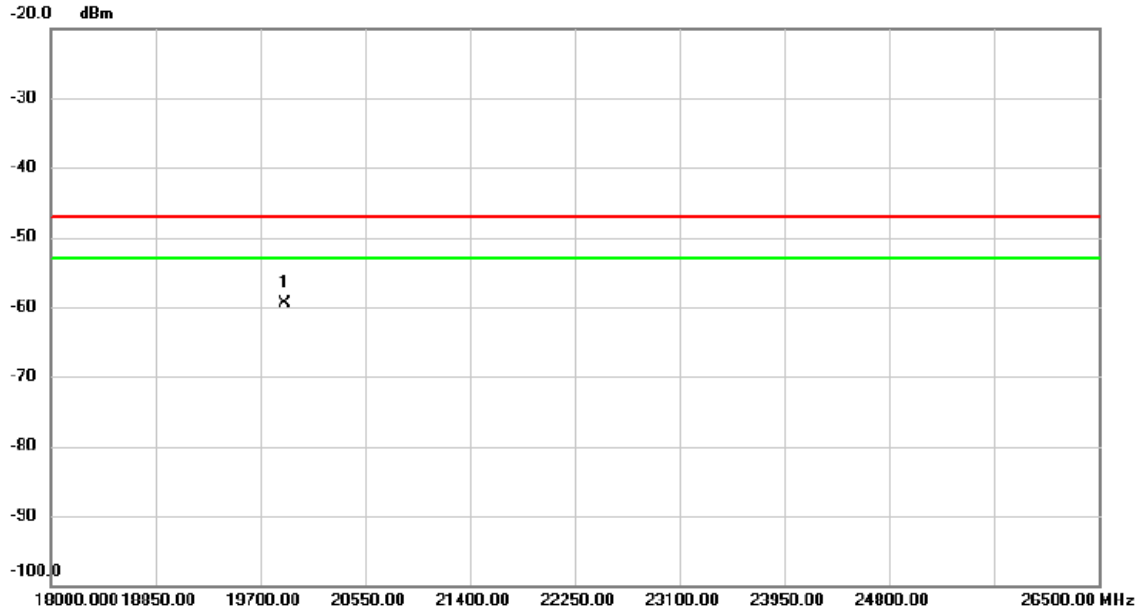
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	3075.7000	-50.47	0.52	-49.95	-47.00	-2.95	RMS	

Test Mode	RX Mode IEEE 802.11ac(VHT80)_5210MHz	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	18897.600	-65.69	6.32	-59.37	-47.00	-12.37	RMS	

Test Mode	RX Mode IEEE 802.11ac(VHT80)_5210MHz	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	19899.750	-65.13	5.57	-59.56	-47.00	-12.56	RMS	

APPENDIX J - ADAPTIVITY

EUT Operational Mode	Frame Based Equipment	
	Load Based Equipment (CCA using 'energy detect')	√
	Load Based Equipment (CCA not using any of the mechanisms referenced)	

Clause	Test Parameter	Remark	Pass/Fail
4.2.7.3.1	Adaptive (Frame Based Equipment)	Not Applicable	N/A
4.2.7.3.2	Adaptive (Load Based Equipment)	Applicable	Pass
4.2.7.3.3	Short Control Signalling Transmissions	Applicable	Pass

Test Mode:	TX Mode_ IEEE 802.11ac(VHT20)_5180MHz,IEEE 802.11ac(VHT40)_5190MHz

Channel Occupancy Time and Priority Class Measured Results		
Freq.(MHz)	Channel Occupancy Time (ms)	Priority Class
5180	5.597	2
5190	2.925	3

Adaptivity Results				
Detection Threshold Level			-70.7 dBm/MHz	
Interference Signal	Freq.(MHz)		Short Control Signalling Transmissions (ms)	Number of Short Control Signalling Transmissions
AWGN	AC20	5180	0	0
OFDM		5180	0	0
LTE		5180	0	0
AWGN	AC40	5180	0	0
		5200	0	0
Limit			2.5	≤ 50
Result			Pass	

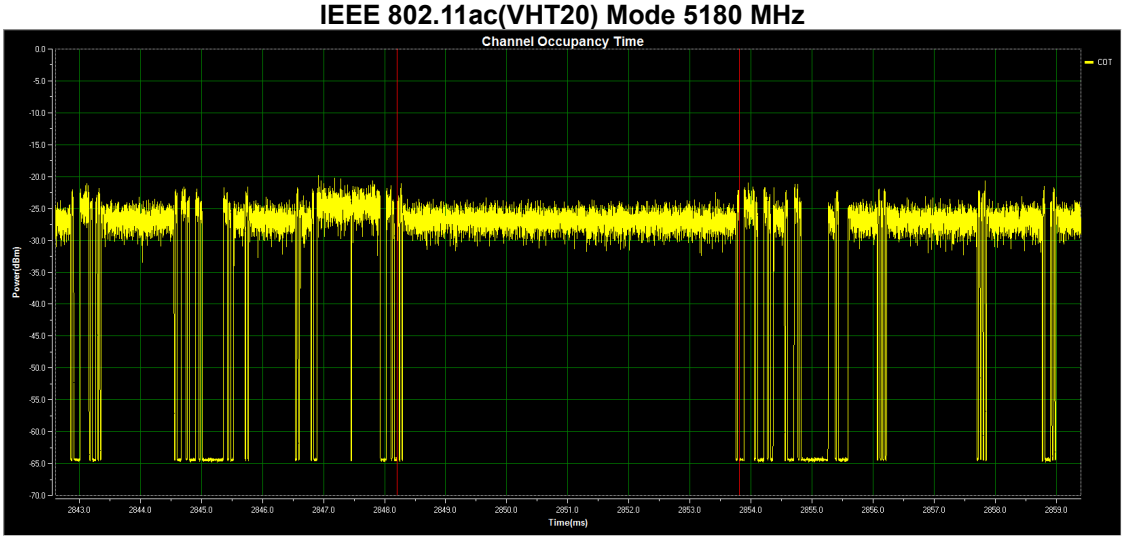
Note:
1. For an EUT with a non-zero dBi antenna gain, the final interference detection threshold level T_L at the port of the radio module in a conducted test setup shall be adjusted by the gain of the bypassed antenna and is calculated using below formulas:

Threshold Level =-75 dBm/MHz +EUT Antenna Gain.

2. Short Control Signalling Transmissions = 50 (ms) * Duty cycle (%)

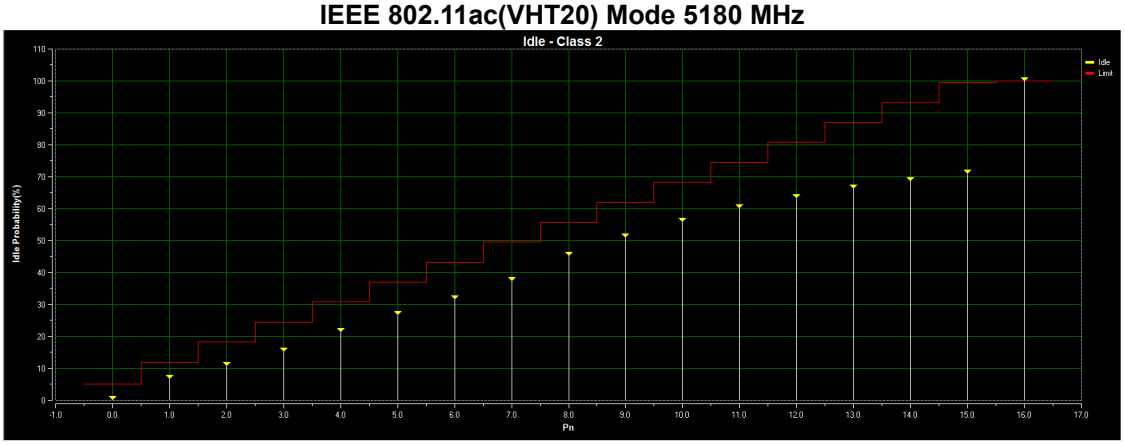
Single Channel device test results

IEEE 802.11ac(VHT20) Mode 5180 MHz



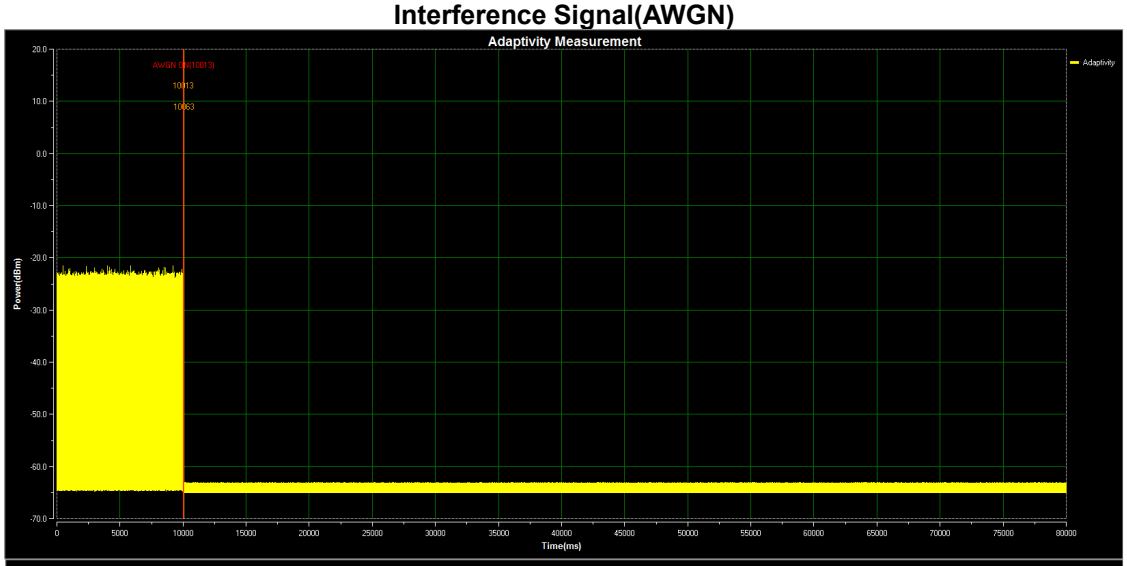
COT Number:10012	Idle Number:9921
Maximum COT(ms):5.597	Minimum Idle Time(us):27

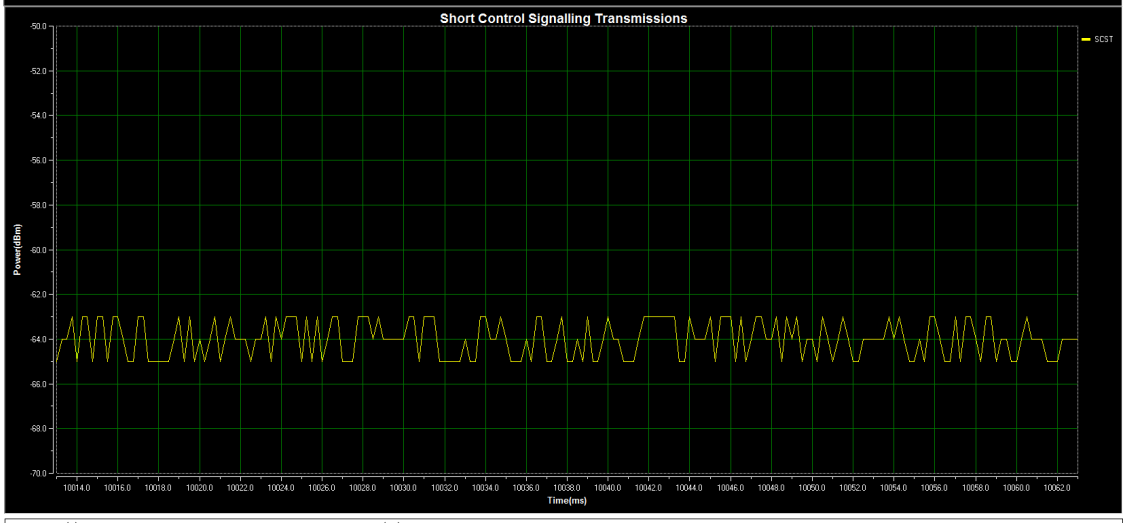
IEEE 802.11ac(VHT20) Mode 5180 MHz



Pn	Idle Num	Result(%)	Limit(%)	Status
0	12	0.121	5	Pass
1	670	6.874	12	Pass
2	402	10.926	18.25	Pass
3	433	15.291	24.5	Pass
4	611	21.449	30.75	Pass
5	537	26.862	37	Pass
6	486	31.761	43.25	Pass
7	567	37.476	49.5	Pass
8	768	45.217	55.75	Pass
9	590	51.164	62	Pass
10	485	56.053	68.25	Pass
11	409	60.175	74.5	Pass
12	328	63.482	80.75	Pass
13	295	66.455	87	Pass
14	218	68.652	93.25	Pass
15	229	70.961	99.5	Pass
16	2881	100	100	Pass

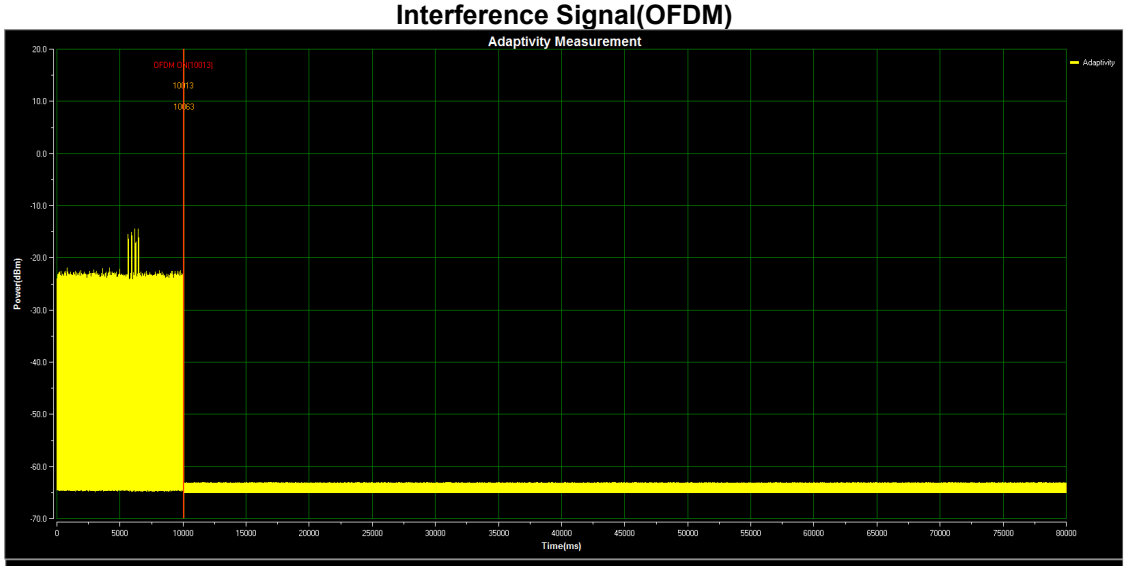
IEEE 802.11ac(VHT20) Mode 5180 MHz
Interference Signal(AWGN)

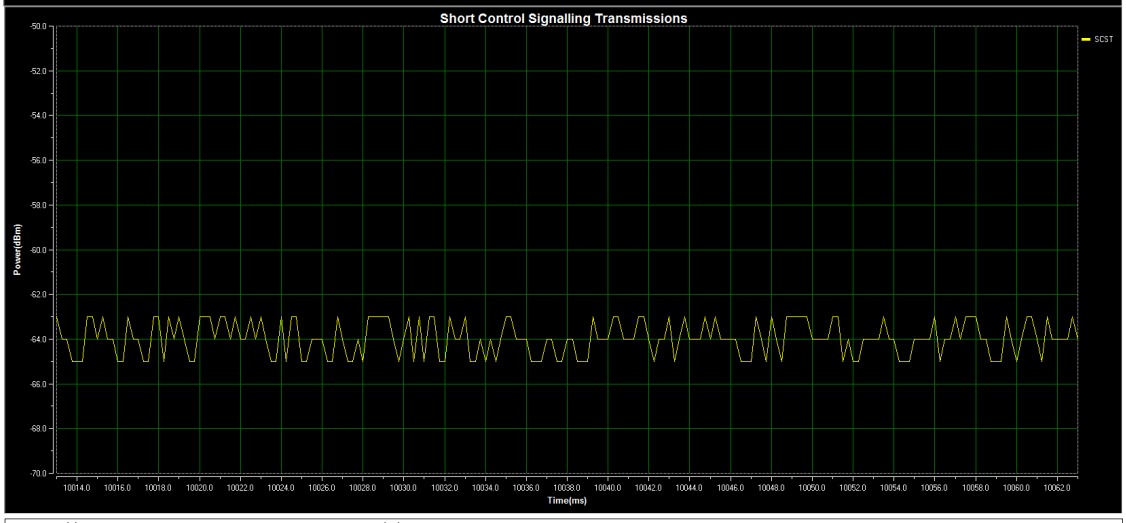




Duty Cycle(%):0.00 Short Control Signalling Transmissions Time(ms):0.00
Test Result:Pass

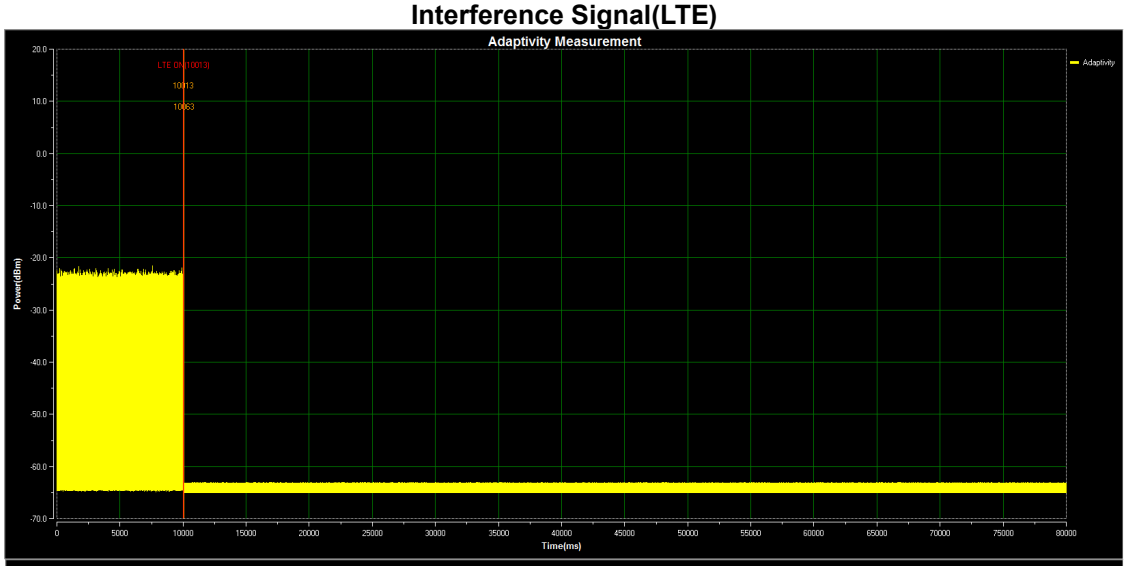
IEEE 802.11ac(VHT20) Mode 5180 MHz
Interference Signal(OFDM)

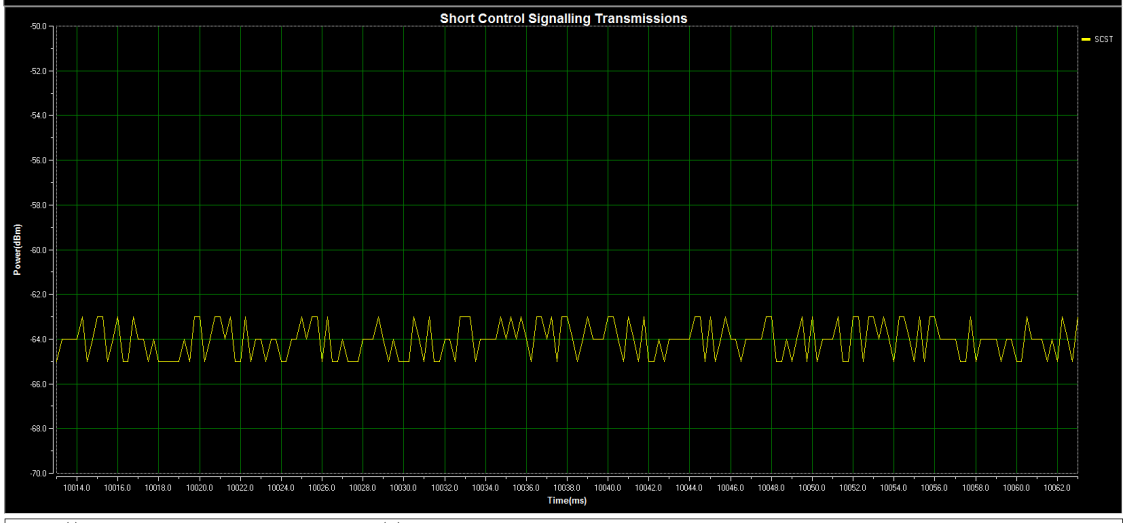




Duty Cycle(%):0.00 Short Control Signalling Transmissions Time(ms):0.00
Test Result:Pass

IEEE 802.11ac(VHT20) Mode 5180 MHz
Interference Signal(LTE)



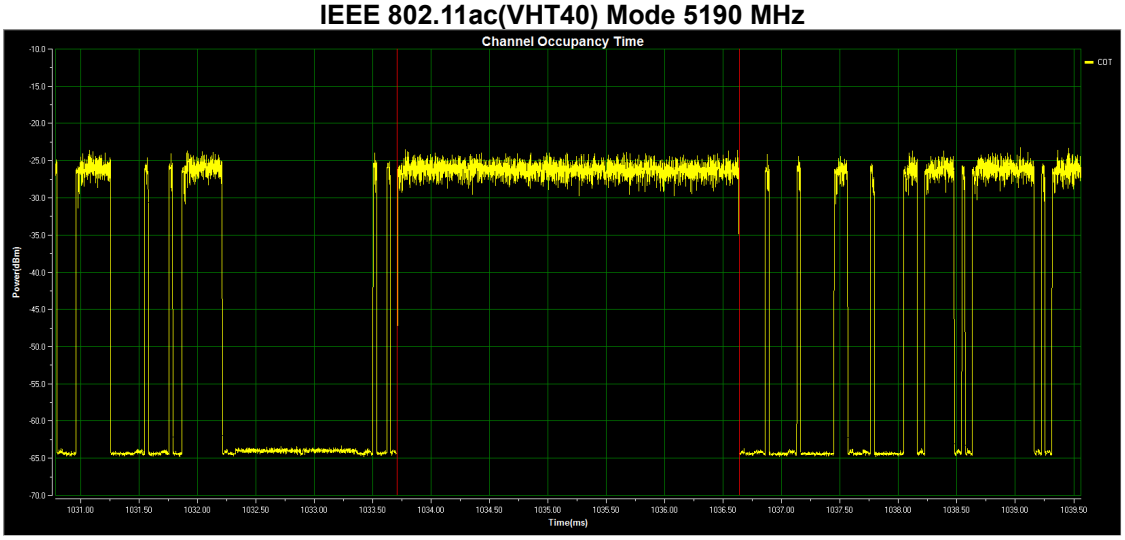


Duty Cycle(%):0.00 Short Control Signalling Transmissions Time(ms):0.00
Test Result:Pass

Multi-Channel device test results

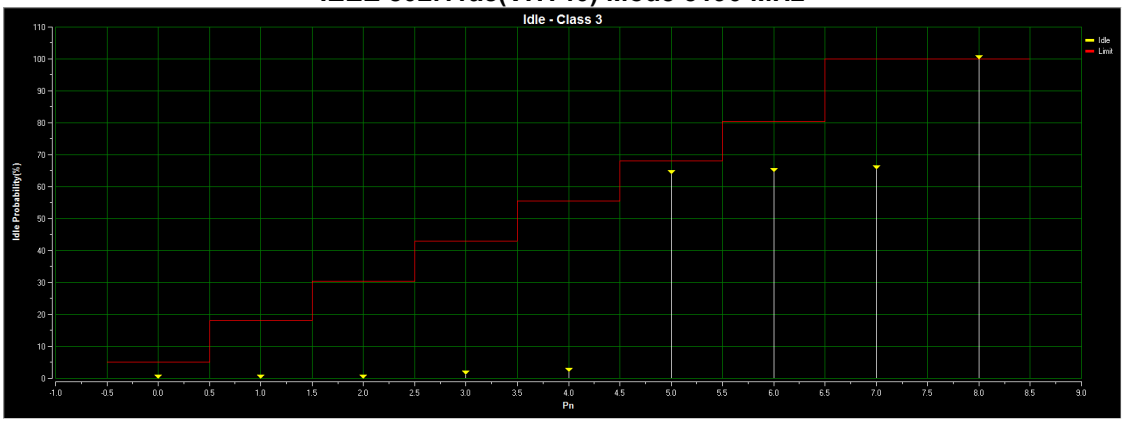
Option 2:
The EUT is set to a channel bandwidth of 40MHz with the primary operating channel 5180MHz. One additional adjacent 20MHz operating channel that constructs the full 40 MHz channel bandwidth is located at 5200 MHz. Data traffic is started and then an interfering signal is injected into the EUT at 5200 MHz.

IEEE 802.11ac(VHT40) Mode 5190 MHz



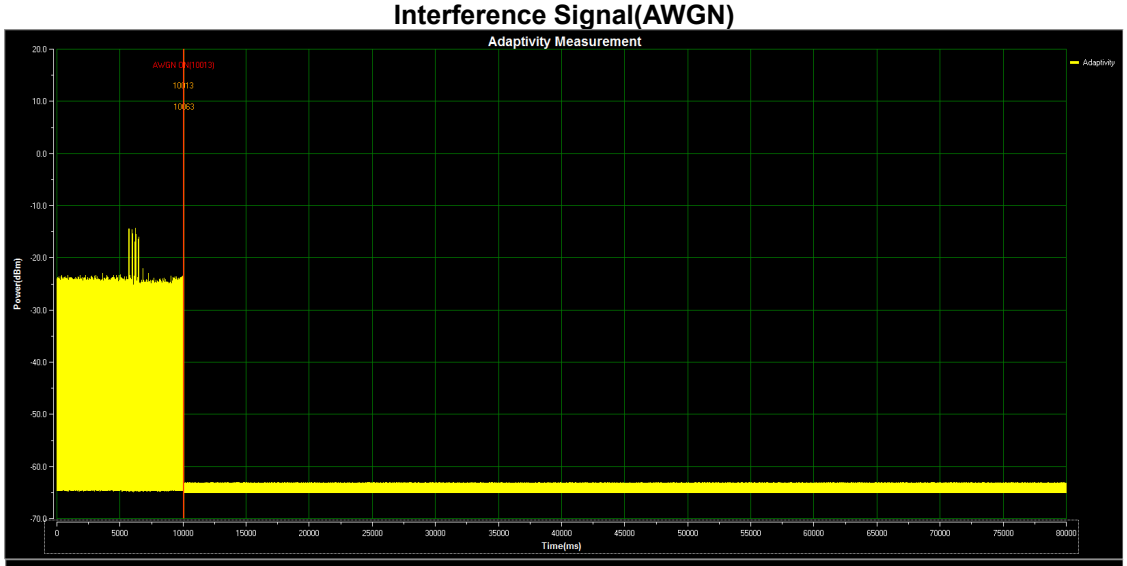
COT Number:10209	Idle Number:10184
Maximum COT(ms):2.925	Minimum Idle Time(us):28

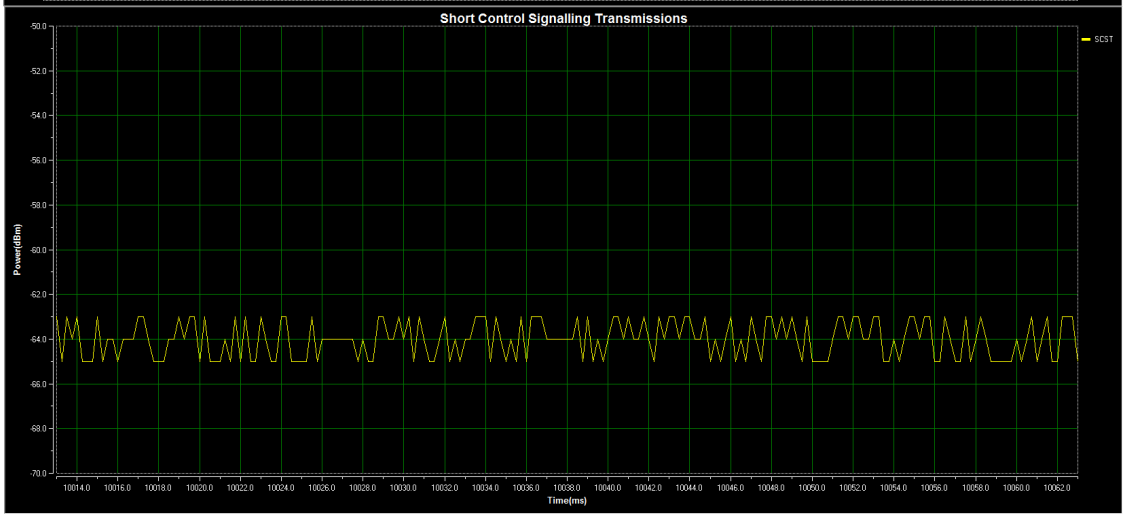
IEEE 802.11ac(VHT40) Mode 5190 MHz



Pn	Idle Num	Result(%)	Limit(%)	Status
0	0	0	5	Pass
1	2	0.02	18	Pass
2	2	0.039	30.5	Pass
3	128	1.296	43	Pass
4	76	2.042	55.5	Pass
5	6319	64.091	68	Pass
6	61	64.69	80.5	Pass
7	82	65.495	100	Pass
8	3514	100	100	Pass

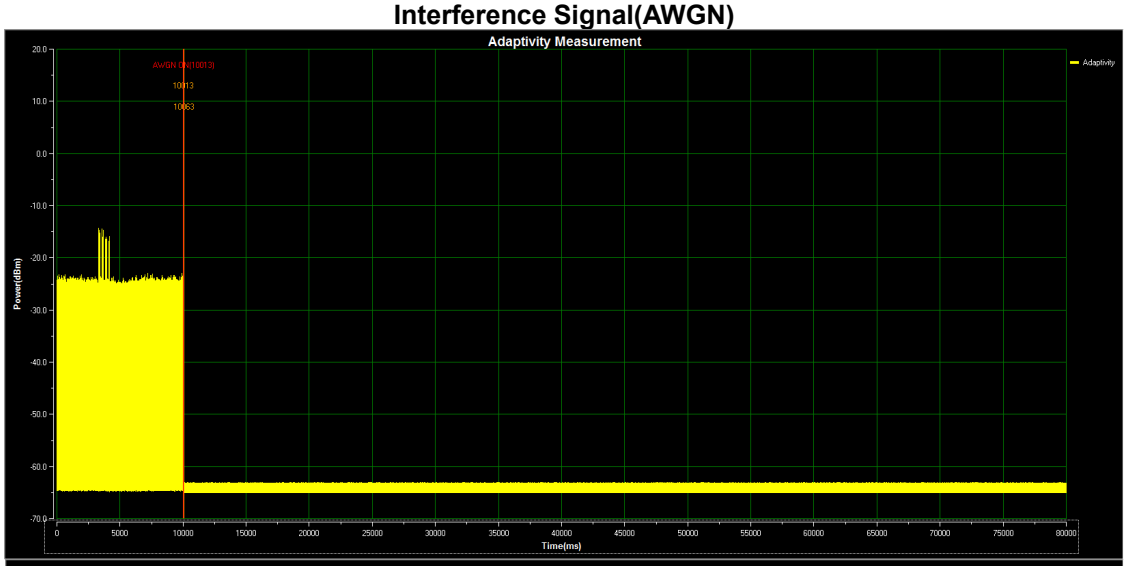
IEEE 802.11ac(VHT40) Mode 5180 MHz
Interference Signal(AWGN)

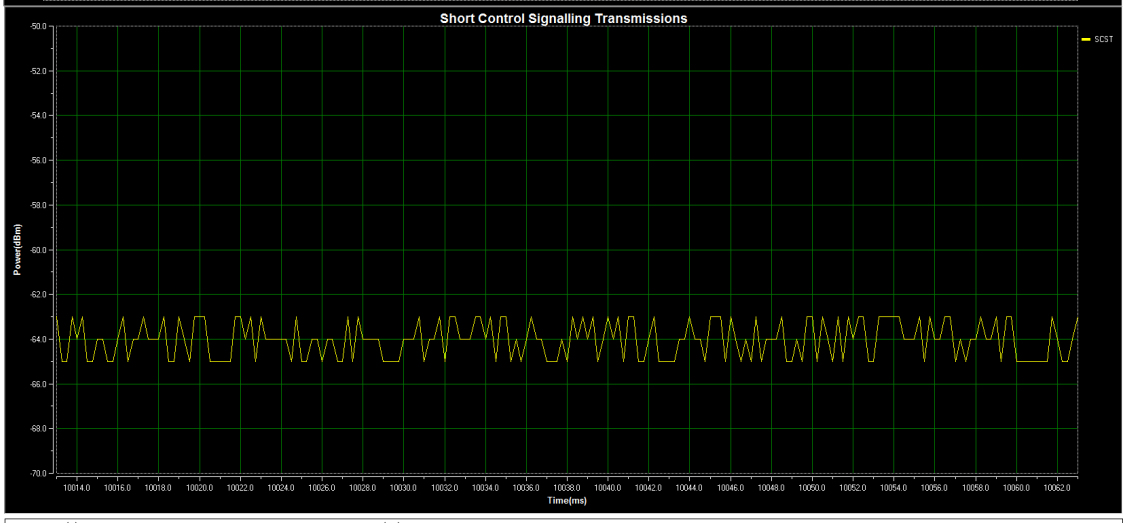




Duty Cycle(%):0.00 Short Control Signalling Transmissions Time(ms):0.00
Test Result:Pass

IEEE 802.11ac(VHT40) Mode 5200 MHz
Interference Signal(AWGN)





Duty Cycle(%):0.00 Short Control Signalling Transmissions Time(ms):0.00
Test Result:Pass

APPENDIX K - RECEIVER BLOCKING

Receiver Blocking Result						
P_{min}(dBm)	89					
Modulation Mode	Operation Freq. (MHz)	Wanted Signal Mean Power from Companion Device (dBm) P_{min} + 6 dB	Blocking Signal Freq. (MHz)	Receiver Blocking Power (dBm)	PER (%)	Blocking Signal Level at which the Performance Criteria is no longer met(dBm) **(See Note)**
IEEE 802.11a 6 Mbps	5180	95	5100	-59	0.40	-31
			4900	-53	0.00	-24
			5000	-53	0.00	-23
			5975	-53	0.00	-20
Limit	PER(Packet Error Rate) ≤ 10%					N/A
Result	Pass					Record Only

Receiver Blocking Result						
P_{min}(dBm)	89					
Modulation Mode	Operation Freq. (MHz)	Wanted Signal Mean Power from Companion Device (dBm) P_{min} + 6 dB	Blocking Signal Freq. (MHz)	Receiver Blocking Power (dBm)	PER (%)	Blocking Signal Level at which the Performance Criteria is no longer met(dBm) **(See Note)**
IEEE 802.11a 6 Mbps	5700	95	5100	-59	0.00	-22
			4900	-53	0.00	-21
			5000	-53	0.20	-21
			5975	-53	0.00	-23
Limit	PER(Packet Error Rate) ≤ 10%					N/A
Result	Pass					Record Only

Note:
The performance criteria had been met, the level of the blocking signal at the UUT were further increased in steps of 1 dB until the level whereby the performance criteria were no longer met.

APPENDIX L - INFORMATION AS REQUIRED BY EN 301 893 V2.1.1, CLAUSE 5.4.1

In accordance with ETSI EN 301 893, clause 5.4.1, the following information is provided by the manufacturer.

a) The Nominal Channel Bandwidth(s):

Nominal Channel Bandwidth 1: 20 MHz

Nominal Channel Bandwidth 2: 40 MHz

Nominal Channel Bandwidth 3: 80 MHz

The associated centre frequencies: in clause 1.4 of the test report.

b) For Load Based Equipment that supports multi-channel operation:

☒ The LBE equipment supports Option 1 as described in clause 4.2.7.3.2.3

☐ The LBE equipment supports Option 2 as described in clause 4.2.7.3.2.3

• The (maximum) number of channels used for multi-channel operation: 18

• These channels are adjacent channels: ☒ Yes ☐ No

• In case of non-adjacent channels, whether or not these channels are in different sub-bands:

☐ Yes ☐ No

• for LBE equipment implementing option 1 (see clause 4.2.7.3.2.3), the number of channels used for multi-channel operation when performing the test described in clause 5.4.9.3.2.3.1: 4

In case of multi-channel operation, further information defining the channels used for these simultaneous transmissions may be required.

c) The different transmit operating modes (see clause 5.3.3.2) (tick all that apply):

☐ **Operating mode 1:** Single Antenna Equipment

☐ a) Equipment with only 1 antenna

☐ b) Equipment with 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.

☒ **Operating mode 2:** Smart Antenna Systems - Multiple Antennas without beamforming

☒ a) Single spatial stream/Standard throughput

☒ b) High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 1

☒ c) High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 2

☒ d) High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 3

☐ e) High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 4

☐ **Operating mode 3:** Smart Antenna Systems - Multiple Antennas with beamforming

☐ a) Single spatial stream/Standard throughput

☐ b) High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 1

☐ c) High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 2

☐ d) High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 3

☐ e) High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 4

d) In case of Smart Antenna Systems or multiple antenna systems:

• The number of Receive chains:__2__

• The number of Transmit chains:__2__

• Equal power distribution among the transmit chains: ☒ Yes ☐ No

• In case of beamforming, the maximum (additional) beamforming gain:__N/A__dB

NOTE: Beamforming gain does not include the basic gain of a single antenna (assembly).

e) TPC feature available: ☐ Yes ☒ No

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

☐Master

☐Slave with radar detection

☒Slave without radar detection

i) User access restrictions (please check box below to confirm):

☒the equipment is constructed to comply with the requirements contained in clause 4.2.9 in ETSI EN 301 893 V2.1.1.

j) For equipment with Off-Channel CAC functionality:

The equipment has an *"Off-Channel CAC"* function: ☐Yes ☒No

If yes, specify the *"Off-Channel CAC Time"*

• For channels outside the 5 600 MHz to 5 650 MHz range:_____hours

• If applicable, for channels (partially) within the 5 600 MHz to 5 650 MHz range:_____ hours

k) 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

l) 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, please specify:_____

If the equipment has more than one Operating Frequency Range, tick all that apply.

m) The extreme operating temperature and supply voltage range that apply to the equipment:

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

☐0 °C to +35 °C (Indoor usage only)

☒Other: 0°C to 40°C .

The supply voltages of the stand-alone radio equipment or the supply 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: Minimum: … Nominal: ... Maximum: ...

☒DC State DC voltage: Minimum: 10.8V Nominal: 12V Maximum: 13.2V

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

☐Other_____

n) The test sequence/test software used (see also ETSI EN 301 893 (V2.1.1), clause 5.3.1.2):

WIFI_customer_package_UIv2.06

o) 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____

p) Adaptivity (Channel Access Mechanism):

☐Frame Based Equipment

☒Load Based Equipment

r) With regards to Adaptivity for Load Based Equipment:

☐ The Load Based Equipment operates as a Supervising Device

☒ The Load Based Equipment operates as a Supervised Device

☐ The Load Based Equipment can operate as a Supervising and as a Supervised Device

☐ The Load Based Equipment makes use of note 1 in table 7 or note 1 in table 8 of ETSI EN 301 893 V2.1.1

The Priority Classes implemented by the Load Based Equipment

- When operating as a Supervising Device

☐ Priority Class 4 (Highest priority)

☐ Priority Class 3

☐ Priority Class 2

☐ Priority Class 1 (Lowest priority)

- When operating as a Supervised Device

☐ Priority Class 4 (Highest priority)

☐ Priority Class 3

☐ Priority Class 2

☐ Priority Class 1 (Lowest priority)

☐ The Load Based Equipment operates as an Initiating Device

☒ The Load Based Equipment operates as an Responding Device

☐ The Load Based Equipment can operate as an Initiating Device and as a Responding Device

With regard to Energy Detection Threshold, the Load Based Equipment has implemented either option 1 of clause 4.2.7.3.2.5 of ETSI EN 301 893 V2.1.1 or option 2 of clause 4.2.7.3.2.5 of ETSI EN 301 893 V2.1.1:

☒ Option 1

☐ Option 2

Specify which protocol has been implemented:

☒ IEEE 802.11™

☐ Other:____

s) The equipment supports a geo-location capability as defined in clause 4.2.10 of ETSI EN 301 893 V2.1.1:

☐ Yes

☒ No

End of Test Report