



CFR 47 FCC PART 15 SUBPART C

CERTIFICATION TEST REPORT

For

IP CAMERA

**MODEL NUMBER: DH-IPC-WF22; DH-IPC-WF42; DH-IPC-WF22C; DH-IPC-WF42C;
DH-IPC-HFW1230DT-STW; DH-IPC-HFW1430DT-STW; IPC-HFW1230DT-STW; IPC-
HFW1430DT-STW; N21BF42-W; N41BF42-W; IPC-HFW1230DT-STW-0280B; IPC-
HFW1230DT-STW-0360B; IPC-HFW1430DT-STW-0280B; IPC-HFW1430DT-STW-
0360B**

FCC ID: SVNDH-IPC-WFX2

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Prepared for

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	08/26/2021	Initial Issue	
V1	11/17/2021	Add series model as 5.1 Description of EUT	



Summary of Test Results			
Clause	Test Items	FCC Rules	Test Results
1	6dB Bandwidth	FCC Part 15.247 (a) (2)	Pass
2	Conducted Output Power	FCC Part 15.247 (b) (3)	Pass
3	Power Spectral Density	FCC Part 15.247 (e)	Pass
4	Conducted Bandedge and Spurious Emission	FCC Part 15.247 (d)	Pass
5	Radiated Bandedge and Spurious Emission	FCC Part 15.247 (d) FCC Part 15.209 FCC Part 15.205	Pass
6	Conducted Emission Test for AC Power Port	FCC Part 15.207	Pass
7	Antenna Requirement	FCC Part 15.203	Pass
Note: 1. This test report is only published to and used by the applicant, and it is not for evidence purpose in China. 2. The measurement result for the sample received is <Pass> according to < CFR 47 FCC PART 15 SUBPART C >< ISED RSS-247 > when <Accuracy Method> decision rule is applied.			



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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: Zhejiang Dahua Vision Technology Co., Ltd
Address: No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China

Manufacturer Information

Company Name: Zhejiang Dahua Vision Technology Co., Ltd
Address: No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China

EUT Information

EUT Name: IP CAMERA
Model Name: DH-IPC-WF22
Series Model: DH-IPC-WF42; DH-IPC-WF22C; DH-IPC-WF42C; DH-IPC-HFW1230DT-STW; DH-IPC-HFW1430DT-STW; IPC-HFW1230DT-STW; IPC-HFW1430DT-STW; N21BF42-W; N41BF42-W; IPC-HFW1230DT-STW-0280B; IPC-HFW1230DT-STW-0360B; IPC-HFW1430DT-STW-0280B; IPC-HFW1430DT-STW-0360B
Model difference: Only the model name is different.
Sample Received Date: July 29, 2021
Sample Status: Normal
Sample ID: 4168477
Date of Tested: August 2, 2021 ~ August 25, 2021

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 FCC PART 15 SUBPART C	PASS

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, CFR 47 FCC Part 2, CFR 47 FCC Part 15 and ANSI C63.10-2013.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	A2LA (Certificate No.: 4102.01) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA. FCC (FCC Designation No.: CN1187) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules ISED (Company No.: 21320) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. Body Identifier (CABID) is CN0046. VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B, the VCCI registration No. is C-20012 and T-20011
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Note 1: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

Note 2: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

Note 3: For below 30 MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30 MHz had been correlated to measurements performed on an OFS.



4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognize national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Conduction emission	3.62 dB
Radiated Emission (Included Fundamental Emission) (9 kHz ~ 30 MHz)	2.2 dB
Radiated Emission (Included Fundamental Emission) (30 MHz ~ 1 GHz)	4.00 dB
Radiated Emission (Included Fundamental Emission) (1 GHz to 26 GHz)	5.78 dB (1 GHz ~ 18 GHz)
	5.23 dB (18 GHz ~ 26 GHz)
Duty Cycle	±0.028%
DTS and 99% Occupied Bandwidth	±0.0196%
Maximum Conducted Output Power	±0.686 dB
Maximum Power Spectral Density Level	±0.743 dB
Conducted Band-edge Compliance	±1.328 dB
Conducted Unwanted Emissions In Non-restricted Frequency Bands	±0.746 dB (9 kHz ~ 1 GHz)
	±1.328dB (1 GHz ~ 26 GHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	



5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name	IP CAMERA
Model Name	DH-IPC-WF22
Series Model	DH-IPC-WF42; DH-IPC-WF22C; DH-IPC-WF42C; DH-IPC-HFW1230DT-STW; DH-IPC-HFW1430DT-STW; IPC-HFW1230DT-STW; IPC-HFW1430DT-STW; N21BF42-W; N41BF42-W; IPC-HFW1230DT-STW-0280B; IPC-HFW1230DT-STW-0360B; IPC-HFW1430DT-STW-0280B; IPC-HFW1430DT-STW-0360B
Model difference	Only the model name is different.
Radio Technology	IEEE802.11b/g/n HT20/HT40
Operation frequency	IEEE 802.11b: 2412MHz—2462MHz IEEE 802.11g: 2412MHz—2462MHz IEEE 802.11n HT20: 2412MHz—2462MHz IEEE 802.11n HT40: 2422MHz—2452MHz
Modulation	IEEE 802.11b: DSSS(CCK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK,BPSK)
Rating	AC 120V, 60Hz

5.2. CHANNEL LIST

Channel List for 802.11b/g/n (20 MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	4	2427	7	2442	10	2457
2	2417	5	2432	8	2447	11	2462
3	2422	6	2437	9	2452	/	/

Channel List for 802.11n (40 MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	5	2432	7	2442	9	2452
4	2427	6	2437	8	2447	/	/

**5.3. MAXIMUM OUTPUT POWER**

IEEE Std. 802.11	Frequency (MHz)	Channel Number	Maximum Conducted AVG Output Power (dBm)
b	2412 ~ 2462	1-11[11]	13.76
g	2412 ~ 2462	1-11[11]	14.22
n HT20	2412 ~ 2462	1-11[11]	16.83
n HT40	2422 ~ 2452	3-9[7]	14.63

5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
WiFi TX(802.11b)	CH 1, CH 6, CH 11/ Low, Middle, High	2412MHz, 2437MHz, 2462MHz
WiFi TX(802.11g)	CH 1, CH 6, CH 11/ Low, Middle, High	2412MHz, 2437MHz, 2462MHz
WiFi TX(802.11n HT20)	CH 1, CH 6, CH 11/ Low, Middle, High	2412MHz, 2437MHz, 2462MHz
WiFi TX(802.11n HT40)	CH 1, CH 6, CH 11/ Low, Middle, High	2422MHz, 2437MHz, 2452MHz

5.5. THE WORSE CASE POWER SETTING PARAMETER

The Worst Case Power Setting Parameter under 2400 ~ 2483.5MHz Band							
Test Software		SecureCRT					
Modulation Mode	Transmit Antenna Number	Test Software setting value					
		NCB: 20MHz			NCB: 40MHz		
		CH 1	CH 6	CH 11	CH 3	CH 6	CH 9
802.11b	1	25	25	25	/		
	2	25	25	25			
802.11g	1	40	40	40			
	2	40	40	40			
802.11n HT20	1	40	41	42			
	2	40	41	42			
802.11n HT40	1	/			46	46	46
	2				46	46	46

Note: Antenna 1 and antenna 2 use the same power setting for both SISO and MIMO modes.



5.6. THE WORSE CASE CONFIGURATIONS

The EUT was tested in the following configuration(s):

Controlled in test mode using a software application on the EUT supplied by customer. The application was used to enable a continuous transmission and to select the mode, test channels, bandwidth, data rates as required.

Test channels referring to section 5.4.

Maximum power setting referring to section 5.5.

Worst case Data Rates declared by the customer:

802.11b mode: 1 Mbps

802.11g mode: 6 Mbps

802.11n HT20 mode: MCS0

802.11n HT40 mode: MCS0

The measured additional path loss was included in any path loss calculations for all RF cable used during tested.

The EUT has 2 separate antennas which correspond to 2 separate antenna ports. Core 0 and Core 1 correspond to antenna 1 and antenna 2 respectively.

The measured additional path loss was included in any path loss calculations for all RF cable used during tested.

Conducted output power, power spectral density tests separately on each port with all supported SISO & MIMO port combinations.

Duty cycle and 6dB DTS bandwidth/occupied channel bandwidth tests, only SISO mode and one chain were tested since the duty cycle and bandwidth does not change depending on chains used.

Conducted bandedge and spurious emissions tests were performed with SISO mode, as this port was found to have the worst case in terms of power settings amongst all supported possible SISO & MIMO port combinations.

Radiated emissions tests were performed with the MIMO modes. These were found to be the worst modulation scheme with regards to emissions after preliminary investigations and, as this mode emits the highest conducted output power level, it was deemed to be the worst case.

**5.7. DESCRIPTION OF AVAILABLE ANTENNAS**

Antenna	Frequency (MHz)	Antenna Type	MAX Antenna Gain (dBi)
1	2412-2462	IFA Antenna	1.43
2	2412-2462	IFA Antenna	1.43

Note: Directional gain= $G_{ANT} + 10 \log(N_{ANT}) = 1.43 + 3.01 = 4.44$

G_{ANT} : Average of the Antenna Gain

N_{ANT} : Antenna numbers

Note: The value of the antenna gain was declared by customer.

Test Mode	Transmit and Receive Mode	Description
IEEE 802.11b	☒ 2TX, 2RX	ANT 1 and ANT 2 can be used as transmitting/receiving antenna.
IEEE 802.11g	☒ 2TX, 2RX	ANT 1 and ANT 2 can be used as transmitting/receiving antenna.
IEEE 802.11n HT20	☒ 2TX, 2RX	ANT 1 and ANT 2 can be used as transmitting/receiving antenna.
IEEE 802.11n HT40	☒ 2TX, 2RX	ANT 1 and ANT 2 can be used as transmitting/receiving antenna.



5.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	Remarks
1	laptop	Lenovo	TP00094A	/
2	UART	/	/	/

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	/	/	1m	/

ACCESSORIES

Item	Accessory	Brand Name	Model Name	Description
1	Switching Power Supply	/	ADS-12AM-12 12012EPCU	Input: AC100~240V,50/60Hz,0.3A Output: 12Vdc,1A, 12W

TEST SETUP

The EUT can work in engineering mode with a software through a laptop.

SETUP DIAGRAM FOR TESTS





6. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
EMI Test Receiver	R&S	ESR3	101961	Nov. 12, 2020	Nov. 11, 2021
Two-Line V-Network	R&S	ENV216	101983	Nov. 12, 2020	Nov. 11, 2021
Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Nov. 12, 2020	Nov. 11, 2021
Software					
Description			Manufacturer	Name	Version
Test Software for Conducted Emissions			Farad	EZ-EMC	Ver. UL-3A1

Radiated Emissions					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Nov. 12, 2020	Nov. 11, 2021
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130959	April 24, 2020	April 23, 2023
Preamplifier	HP	8447D	2944A09099	Nov. 12, 2020	Nov. 11, 2021
EMI Measurement Receiver	R&S	ESR26	101377	Nov. 12, 2020	Nov. 11, 2021
Horn Antenna	TDK	HRN-0118	130939	Sept. 17, 2018	Sept. 17, 2021
Preamplifier	TDK	PA-02-0118	TRS-305-00067	Nov. 20, 2020	Nov. 19, 2021
Horn Antenna	Schwarzbeck	BBHA9170	#697	July 20, 2021	July 19, 2024
Preamplifier	TDK	PA-02-2	TRS-307-00003	Nov. 12, 2020	Nov. 11, 2021
Preamplifier	TDK	PA-02-3	TRS-308-00002	Nov. 12, 2020	Nov. 11, 2021
Loop antenna	Schwarzbeck	1519B	00008	Jan.17, 2019	Jan.17,2022
Preamplifier	TDK	PA-02-001-3000	TRS-302-00050	Nov. 12, 2020	Nov. 11, 2021
Preamplifier	Mini-Circuits	ZX60-83LN-S+	SUP01201941	Nov. 20, 2020	Nov. 19, 2021
High Pass Filter	Wi	WHKX10-2700-3000-18000-40SS	23	Nov. 12, 2020	Nov. 11, 2021
Band Reject Filter	Wainwright	WRCJV8-2350-2400-2483.5-2533.5-40SS	4	Nov. 12, 2020	Nov. 11, 2021



Software					
Description		Manufacturer	Name	Version	
Test Software for Radiated Emissions		Farad	EZ-EMC	Ver. UL-3A1	
Tonsend RF Test System					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
Wideband Radio Communication Tester	R&S	CMW500	155523	Nov.20,2020	Nov.19,2021
PXA Signal Analyzer	Keysight	N9030A	MY55410512	Nov.20,2020	Nov.19,2021
MXG Vector Signal Generator	Keysight	N5182B	MY56200284	Nov.20,2020	Nov.19,2021
MXG Vector Signal Generator	Keysight	N5172B	MY56200301	Nov.20,2020	Nov.19,2021
DC power supply	Keysight	E3642A	MY55159130	Nov.24,2020	Nov.23,2021
Software					
Description	Manufacturer	Name		Version	
Tonsend SRD Test System	Tonsend	JS1120-3 RF Test System		2.6.77.0518	

Other Instruments					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Dual Channel Power Meter	Keysight	N1912A	MY55416024	Nov. 20, 2020	Nov. 19, 2021
Power Sensor	Keysight	USB Wideband Power Sensor	MY5100022	Nov. 20, 2020	Nov. 19, 2021



7. ANTENNA PORT TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

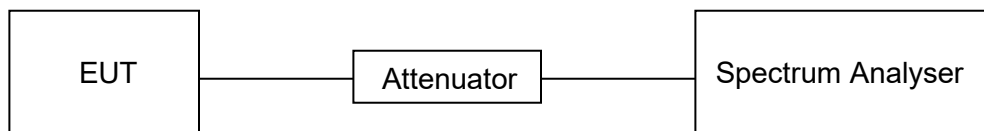
LIMITS

None; for reporting purposes only

PROCEDURE

Refer to ANSI C63.10-2013 clause 11.6 Zero – Span Spectrum Analyzer method.

TEST SETUP



TEST ENVIRONMENT

Temperature	25.1 °C	Relative Humidity	58 %
Atmosphere Pressure	101 kPa	Test Voltage	AC120 V,60 Hz

RESULTS

Please refer to appendix G.

**7.2. 6 dB DTS BANDWIDTH AND 99 % OCCUPIED BANDWIDTH****LIMITS**

CFR 47 FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247(a)(2) ISED RSS-247 5.2 (a)	6 dB Bandwidth	≥ 500 kHz	2400-2483.5
ISED RSS-Gen Clause 6.7	99 % Occupied Bandwidth	For reporting purposes only.	2400-2483.5

TEST PROCEDURE

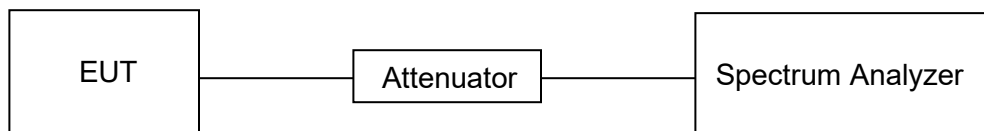
Refer to ANSI C63.10-2013 clause 11.8 for DTS bandwidth and clause 6.9 for Occupied Bandwidth.

Connect the EUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Frequency Span	Between 1.5 times and 5.0 times the OBW
Detector	Peak
RBW	For 6 dB Bandwidth: 100 kHz For 99 % Occupied Bandwidth: 1 % to 5 % of the occupied bandwidth
VBW	For 6 dB Bandwidth: $\geq 3 \times$ RBW For 99 % Occupied Bandwidth: $\geq 3 \times$ RBW
Trace	Max hold
Sweep	Auto couple

a) Use the 99 % power bandwidth function of the instrument, allow the trace to stabilize and report the measured bandwidth.

b) Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

**TEST SETUP****TEST ENVIRONMENT**

Temperature	25.1 °C	Relative Humidity	58 %
Atmosphere Pressure	101 kPa	Test Voltage	AC120 V,60 Hz

RESULTS

Please refer to appendix A & B.



7.3. CONDUCTED OUTPUT POWER

LIMITS

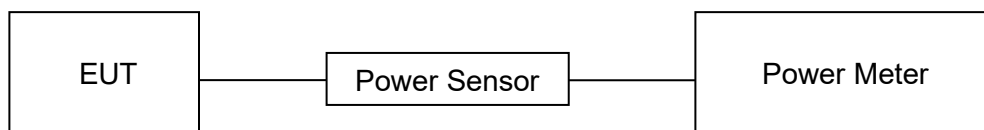
CFR 47 FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247(b)(3)	AVG Output Power	1 watt or 30 dBm	2400-2483.5

TEST PROCEDURE

Connect the EUT to a low loss RF cable from the antenna port to the power sensor (video bandwidth is greater than the occupied bandwidth).

Measure peak emission level, the indicated level is the average output power, after any corrections for external attenuators and cables.

TEST SETUP



TEST ENVIRONMENT

Temperature	24.3 °C	Relative Humidity	57 %
Atmosphere Pressure	101 kPa	Test Voltage	AC120 V,60 Hz

RESULTS

Please refer to appendix C.



7.4. POWER SPECTRAL DENSITY

LIMITS

CFR 47 FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC §15.247 (e)	Power Spectral Density	8 dBm/3 kHz	2400-2483.5

TEST PROCEDURE

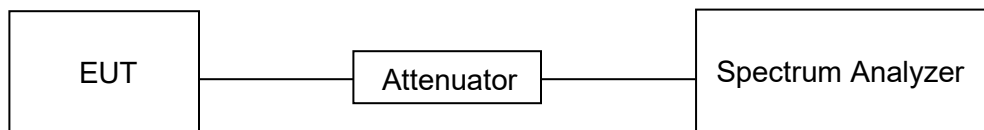
Connect the EUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	RMS
RBW	$3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
VBW	$\geq 3 \times \text{RBW}$
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST SETUP



TEST ENVIRONMENT

Temperature	25.1 °C	Relative Humidity	58 %
Atmosphere Pressure	101 kPa	Test Voltage	AC120 V,60 Hz

RESULTS

Please refer to appendix D.



7.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

LIMITS

CFR 47 FCC Part15 (15.247) Subpart C		
Section	Test Item	Limit
CFR 47 FCC §15.247 (d)	Conducted Bandedge and Spurious Emissions	at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

TEST PROCEDURE

Refer to ANSI C63.10-2013 clause 11.11 and 11.13.

Connect the EUT to the spectrum analyser and use the following settings for reference level measurement:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	100 kHz
VBW	$\geq 3 \times \text{RBW}$
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

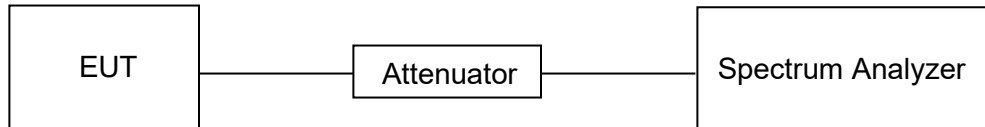
Allow trace to fully stabilize and use the peak marker function to determine the maximum PSD level.

Change the settings for emission level measurement:

Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100 kHz
VBW	$\geq 3 \times \text{RBW}$
measurement points	$\geq \text{span}/\text{RBW}$
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum PSD level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11.

TEST SETUP



TEST ENVIRONMENT

Temperature	25.1 °C	Relative Humidity	58 %
Atmosphere Pressure	101 kPa	Test Voltage	AC120 V,60 Hz

RESULTS

Please refer to appendix E & F.

8. RADIATED TEST RESULTS

LIMITS

Please refer to CFR 47 FCC §15.205 and §15.209.



Radiation Disturbance Test Limit for FCC (Class B) (9 kHz ~ 1 GHz)

Emissions radiated outside of the specified frequency bands above 30 MHz			
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m	
		Quasi-Peak	
30 - 88	100	40	
88 - 216	150	43.5	
216 - 960	200	46	
Above 960	500	54	
Above 1000	500	Peak	Average
		74	54

FCC Emissions radiated outside of the specified frequency bands below 30 MHz		
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30

FCC Restricted bands of operation refer to FCC §15.205 (a):

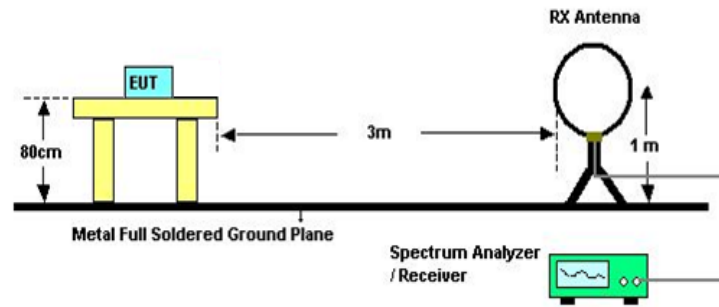
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

Note: ¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

²Above 38.6c

TEST SETUP AND PROCEDURE

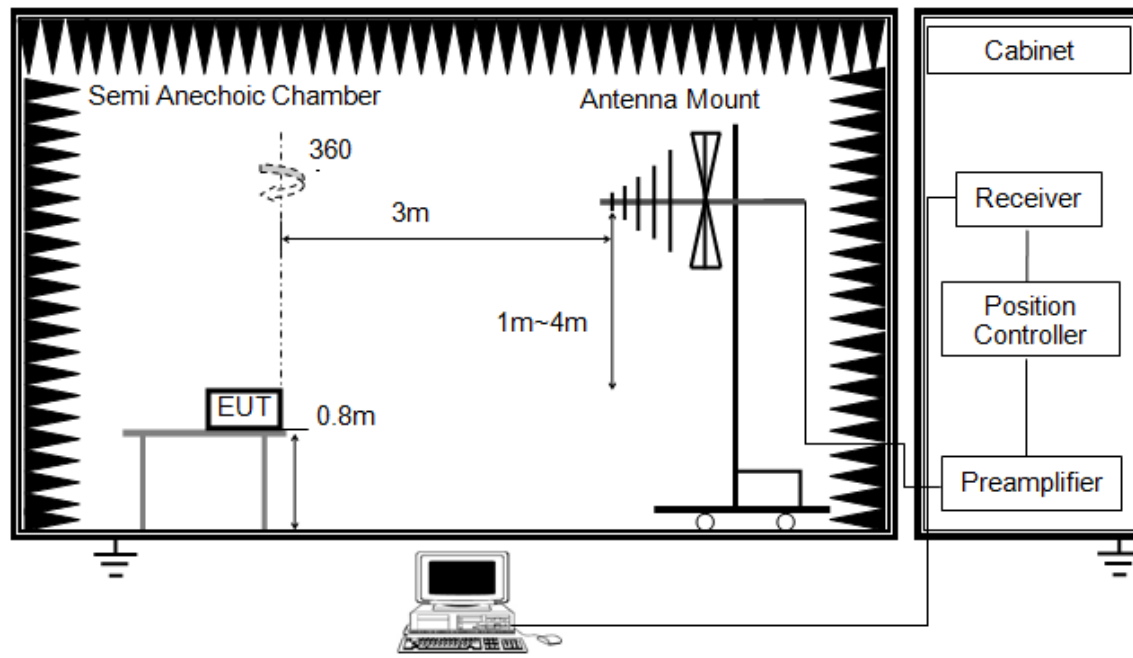
Below 30 MHz



The setting of the spectrum analyser

RBW	200 Hz (From 9 kHz to 0.15 MHz) / 9 kHz (From 0.15 MHz to 30 MHz)
VBW	200 Hz (From 9 kHz to 0.15 MHz) / 9 kHz (From 0.15 MHz to 30 MHz)
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.4.
2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80cm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1 m height antenna tower.
5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz Radiated emission limits in these three bands are based on measurements employing an average detector.
6. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak and average detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak and average detector and reported.
7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site based on KDB 414788.
8. The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω. For example, the measurement frequency X KHz resulted in a level of Y dBuV/m, which is equivalent to $Y-51.5 = Z$ dBuA/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.
Below 1 GHz and above 30 MHz

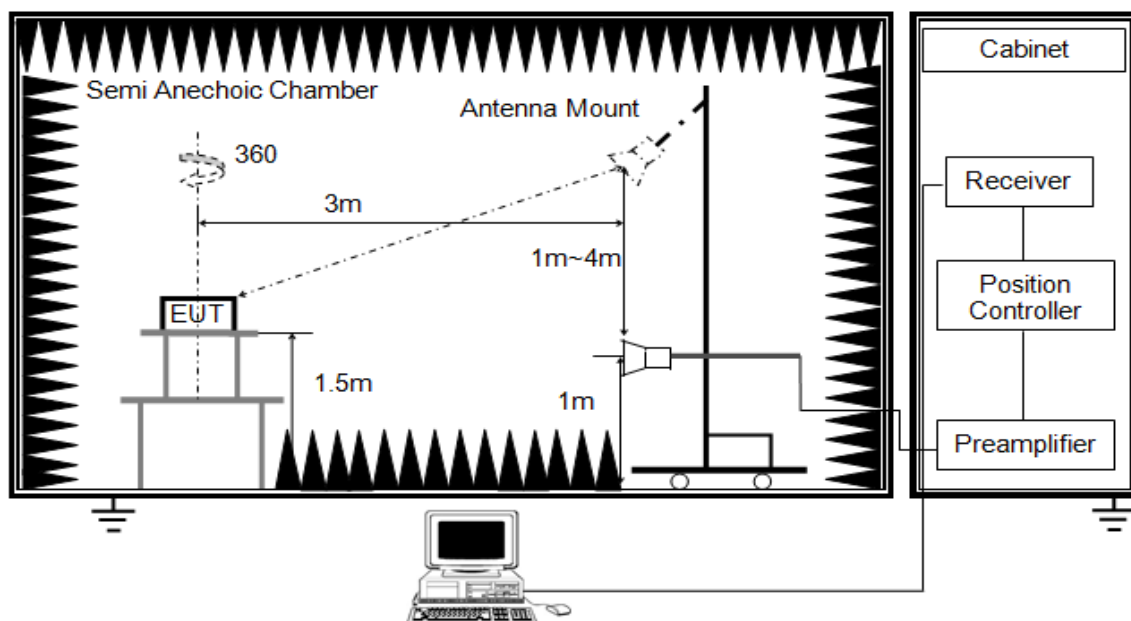


The setting of the spectrum analyser

RBW	120 kHz
VBW	300 kHz
Sweep	Auto
Detector	Peak/QP
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.5.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80 cm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

Above 1 GHz

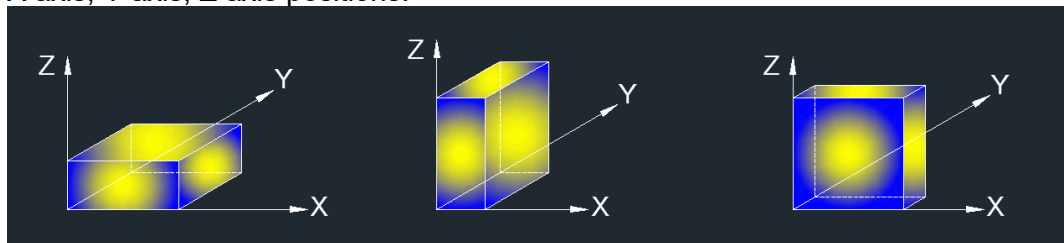


The setting of the spectrum analyser

RBW	1 MHz
VBW	PEAK: 3 MHz AVG: see note 6
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.6.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 1.5 m above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement above 1 GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.
6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 7.1. ON TIME AND DUTY CYCLE.

X axis, Y axis, Z axis positions:



Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

TEST ENVIRONMENT

Temperature	24.5 °C	Relative Humidity	64 %
Atmosphere Pressure	101 kPa	Test Voltage	AC120 V,60 Hz

RESULTS



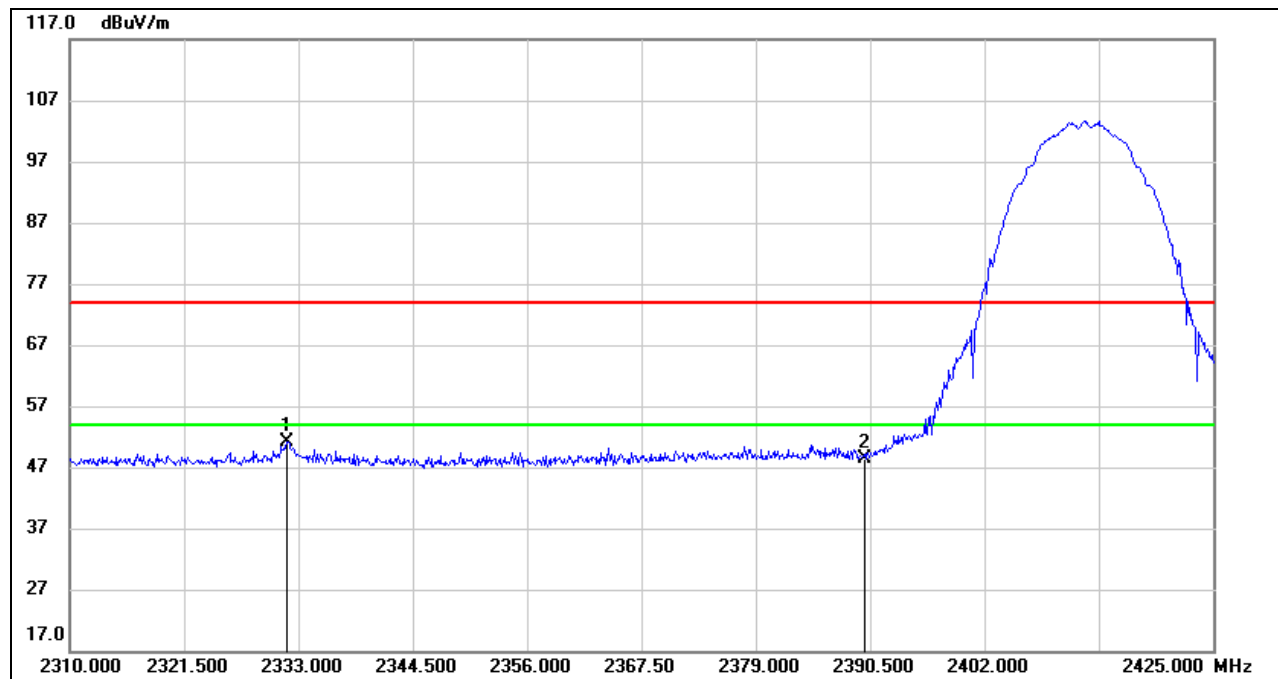
8.1. RESTRICTED BANDEDGE

8.1.1. 802.11b SISO MODE

ANTENNA 1 TEST RESULTS (WORST CASE)

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

PEAK



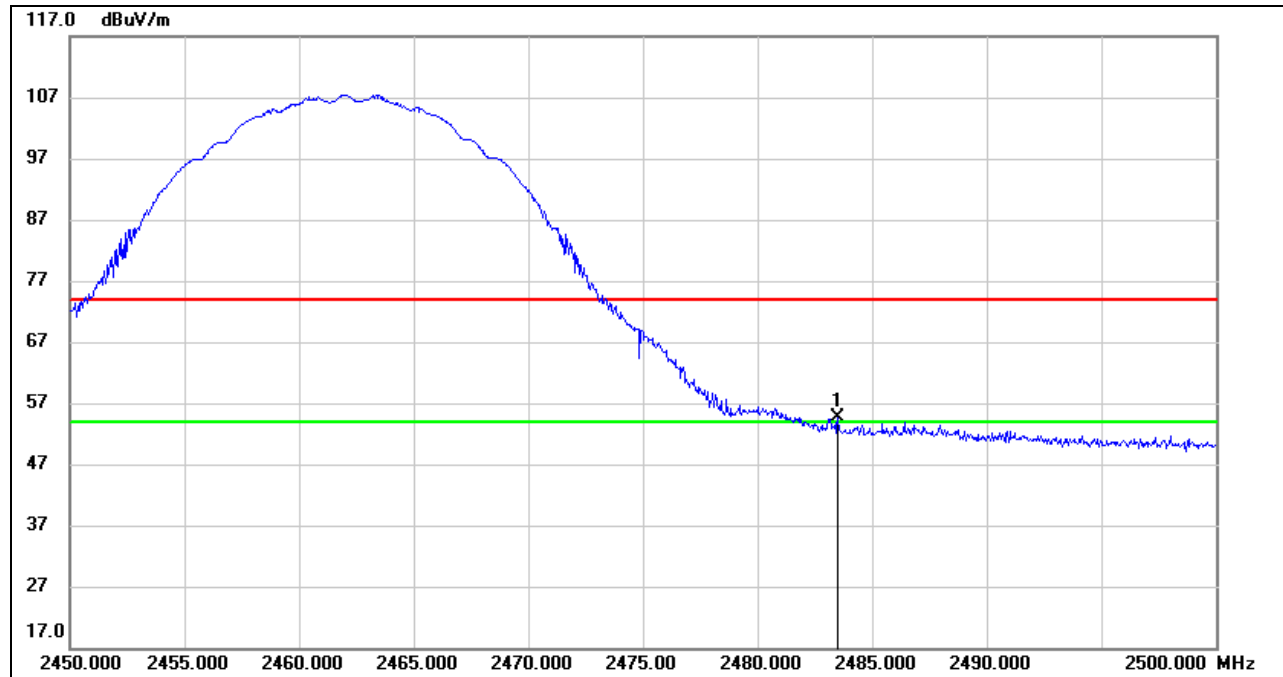
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2331.850	18.32	32.91	51.23	74.00	-22.77	peak
2	2390.000	15.14	33.35	48.49	74.00	-25.51	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

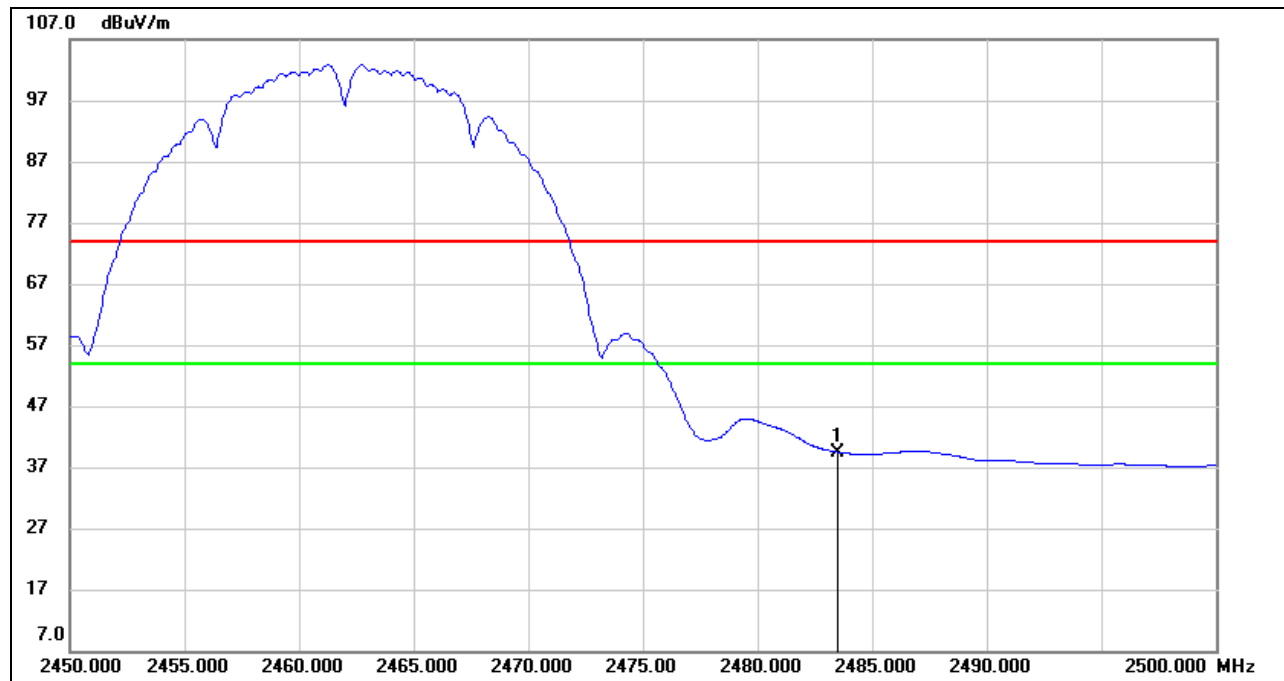
4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)****PEAK**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	20.87	33.71	54.58	74.00	-19.42	peak

- Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

AVG

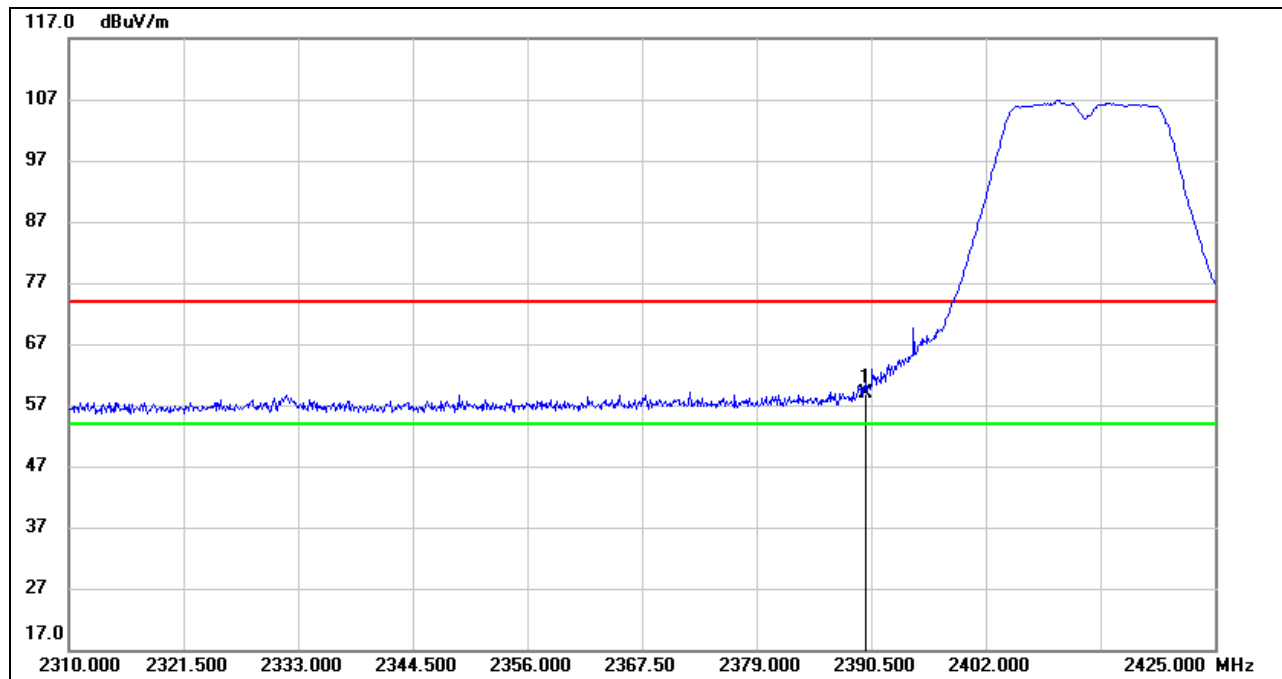


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	5.74	33.71	39.45	54.00	-14.55	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
4. For the transmitting duration, please refer to clause 7.1.
5. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Note: Horizontal and Vertical have been tested, only the worst data was recorded in the report.

Note: Both antennas have been tested, only the worst data was recorded in the report.

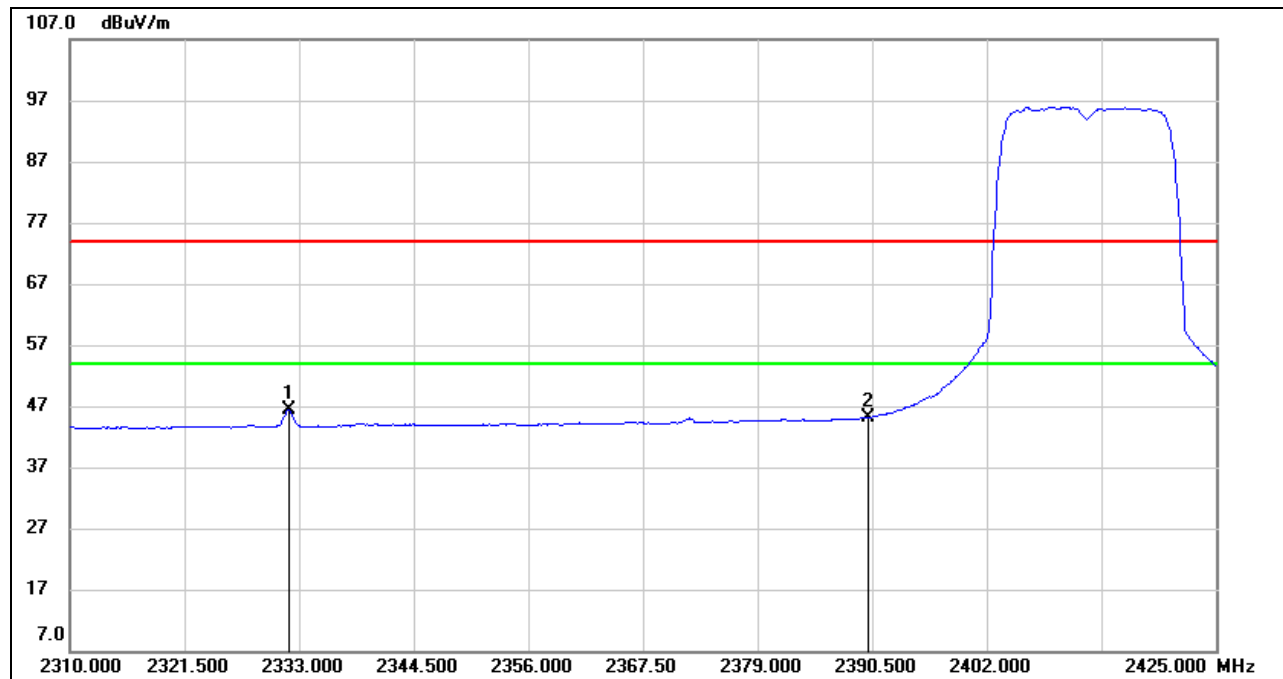
**8.1.2. 802.11g SISO MODE****ANTENNA 1 TEST RESULTS (WORST CASE)****RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)****PEAK**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	25.61	33.35	58.96	74.00	-15.04	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

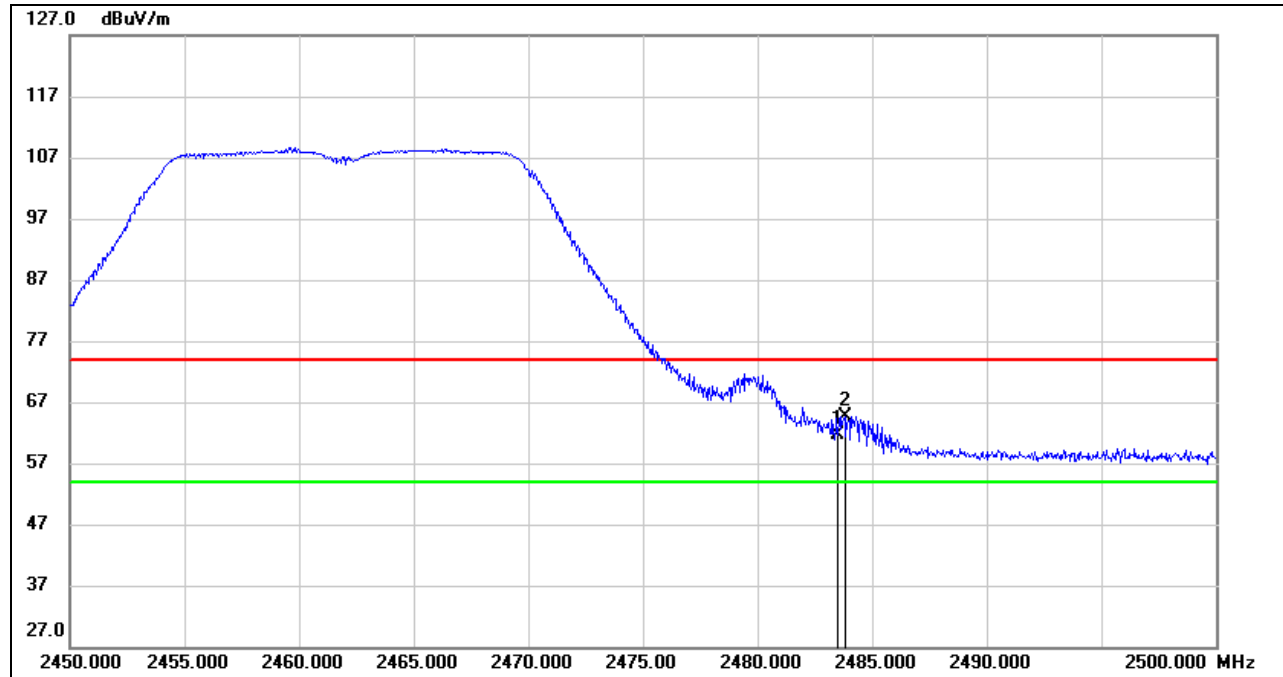


AVG



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2331.965	13.44	32.91	46.35	54.00	-7.65	AVG
2	2390.000	11.88	33.35	45.23	54.00	-8.77	AVG

- Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
4. For the transmitting duration, please refer to clause 7.1.
5. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)****PEAK**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	27.81	33.71	61.52	74.00	-12.48	peak
2	2483.800	31.01	33.71	64.72	74.00	-9.28	peak

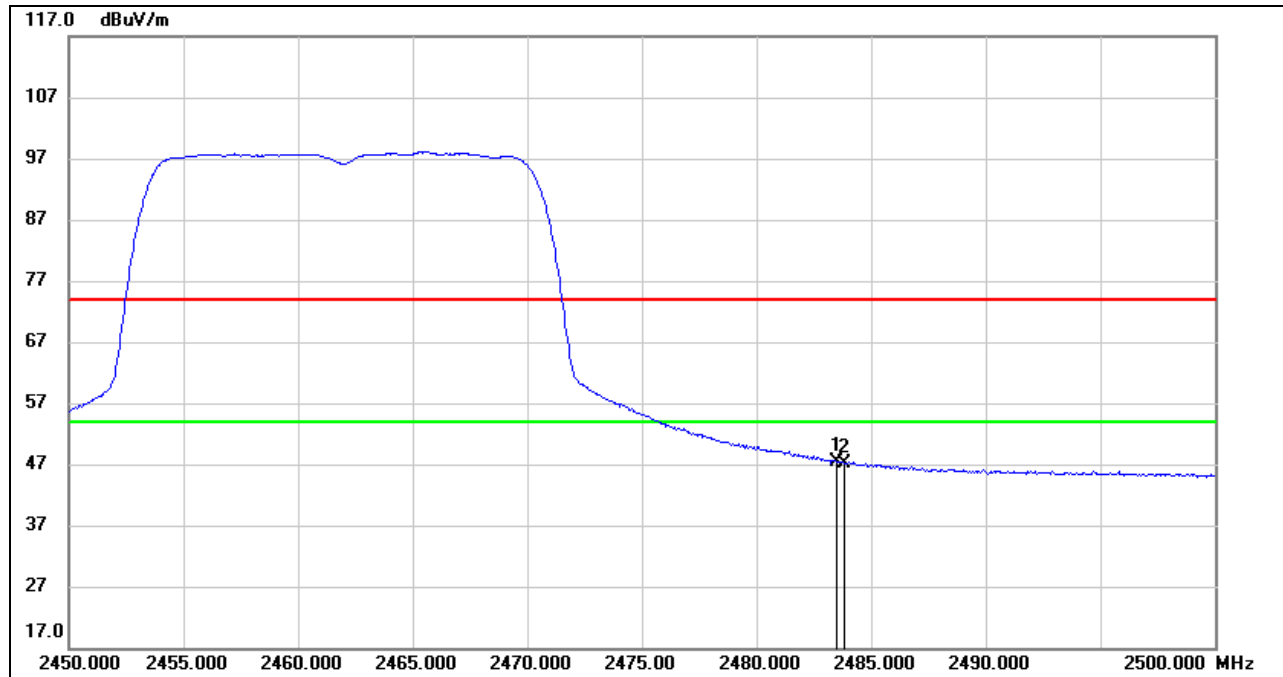
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

AVG



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	13.66	33.71	47.37	54.00	-6.63	AVG
2	2483.800	13.42	33.71	47.13	54.00	-6.87	AVG

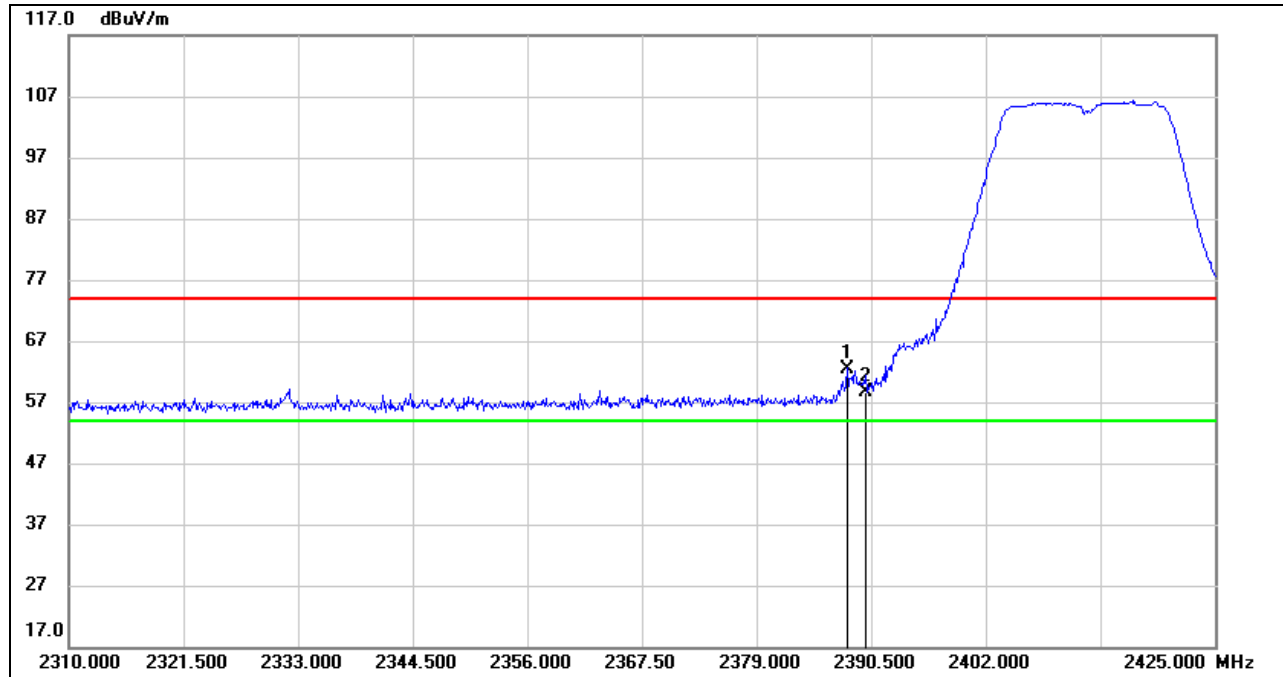
- Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
4. For the transmitting duration, please refer to clause 7.1.
5. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Note: Horizontal and Vertical have been tested, only the worst data was recorded in the report.
Note: Both antennas have been tested, only the worst data was recorded in the report.

8.1.3. 802.11n HT20 MIMO MODE

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

PEAK

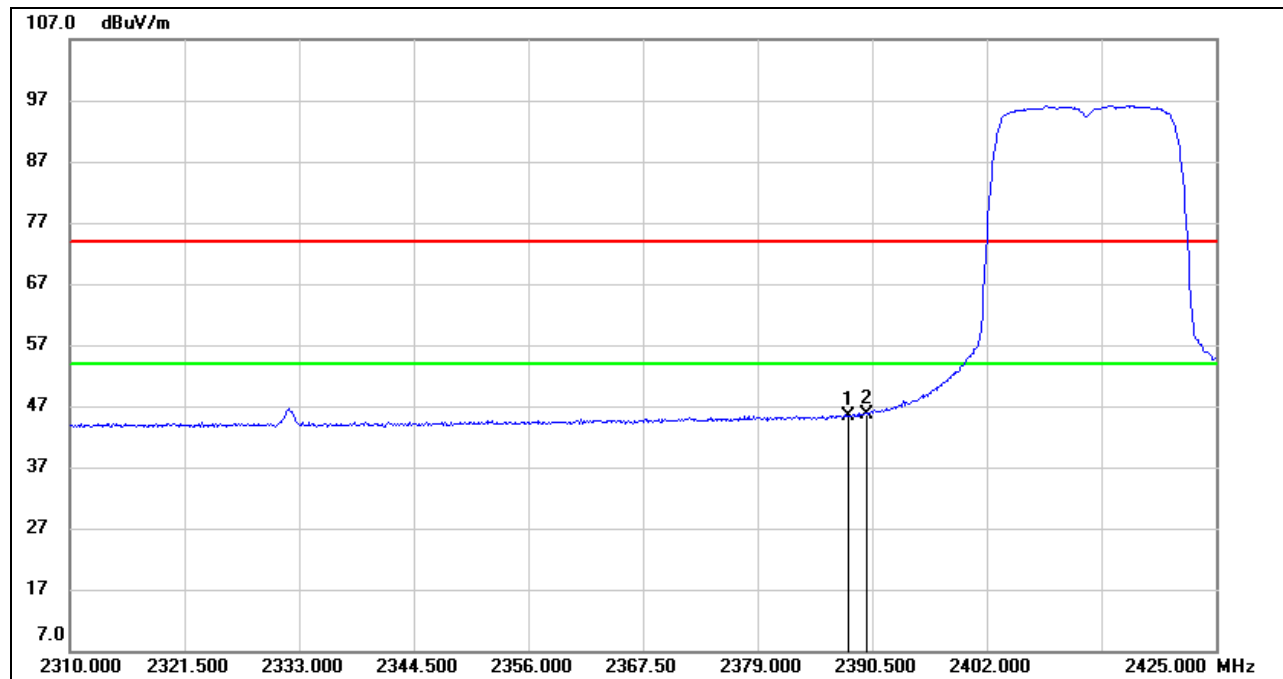


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.085	29.16	33.34	62.50	74.00	-11.50	peak
2	2390.000	25.36	33.35	58.71	74.00	-15.29	peak

Note: 1. Measurement = Reading Level + Correct Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Peak: Peak detector.
 4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

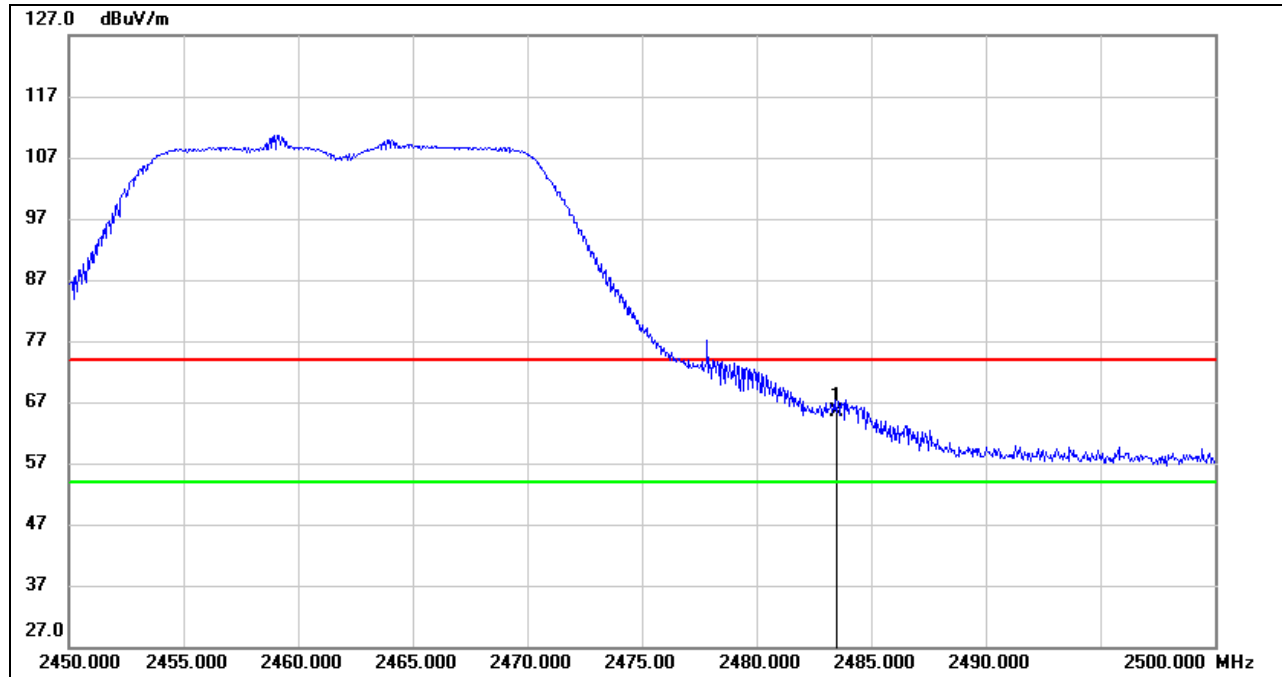


AVG



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.085	11.95	33.34	45.29	54.00	-8.71	AVG
2	2390.000	12.36	33.35	45.71	54.00	-8.29	AVG

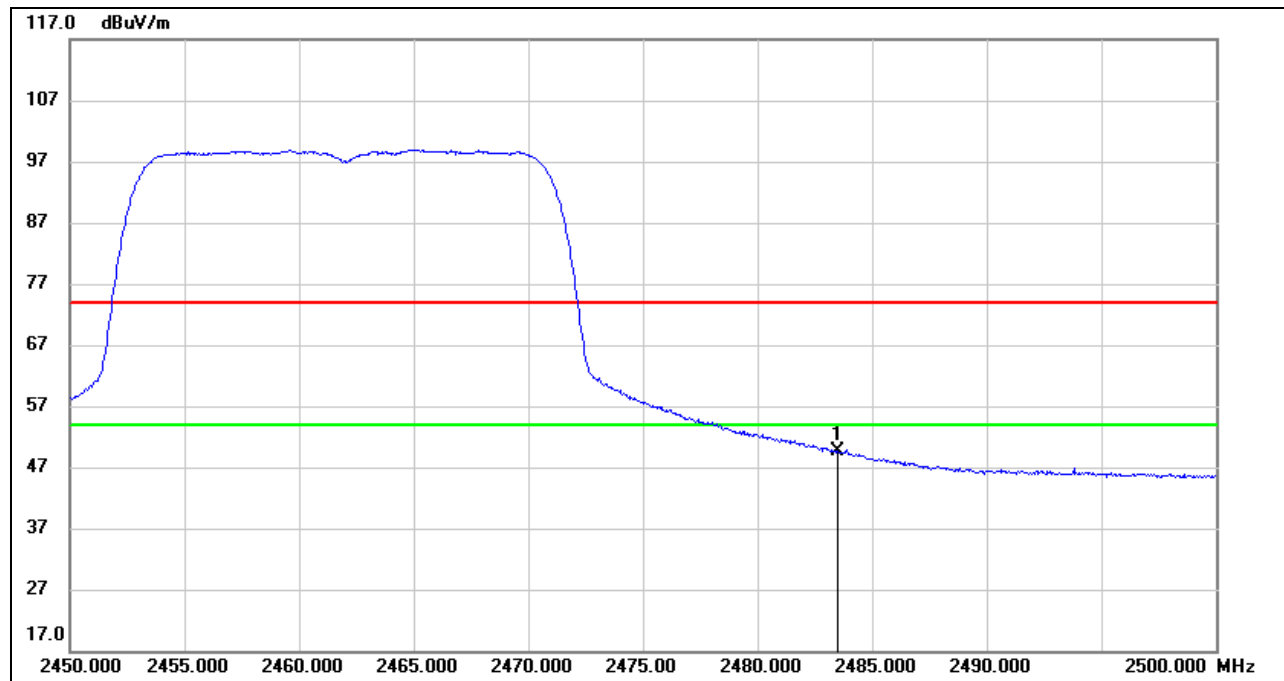
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
4. For the transmitting duration, please refer to clause 7.1.
5. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)****PEAK**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	31.63	33.71	65.34	74.00	-8.66	peak

- Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

AVG

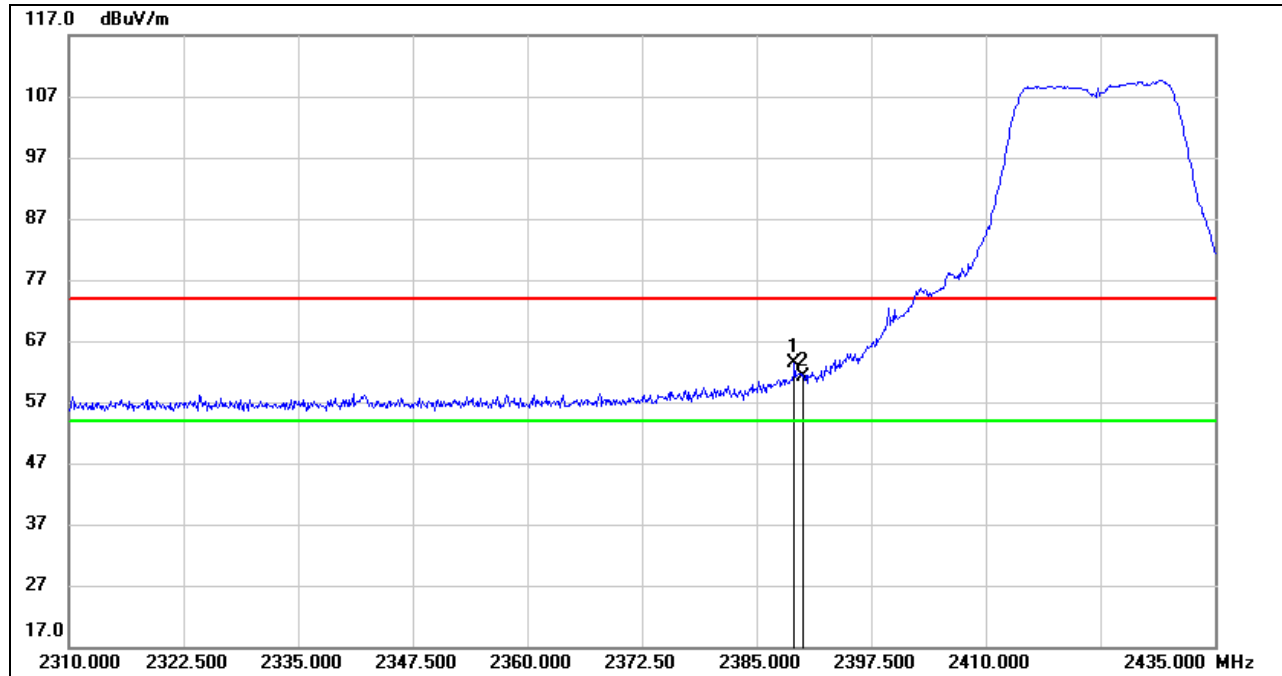


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	15.82	33.71	49.53	54.00	-4.47	AVG

- Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
4. For the transmitting duration, please refer to clause 7.1.
5. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Note: Horizontal and Vertical have been tested, only the worst data was recorded in the report.

Note: Both antennas have been tested, only the worst data was recorded in the report.

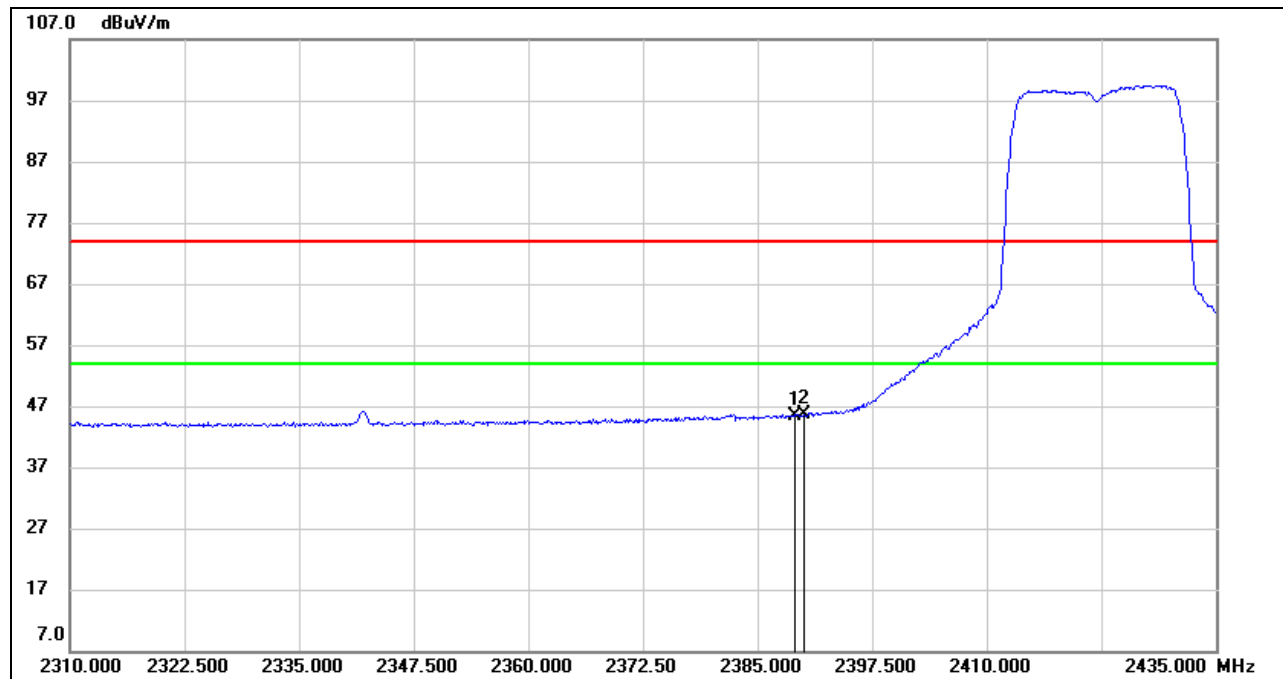
**8.1.4. 802.11n HT40 MIMO MODE****RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)****PEAK**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.125	29.97	33.35	63.32	74.00	-10.68	peak
2	2390.000	27.80	33.35	61.15	74.00	-12.85	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

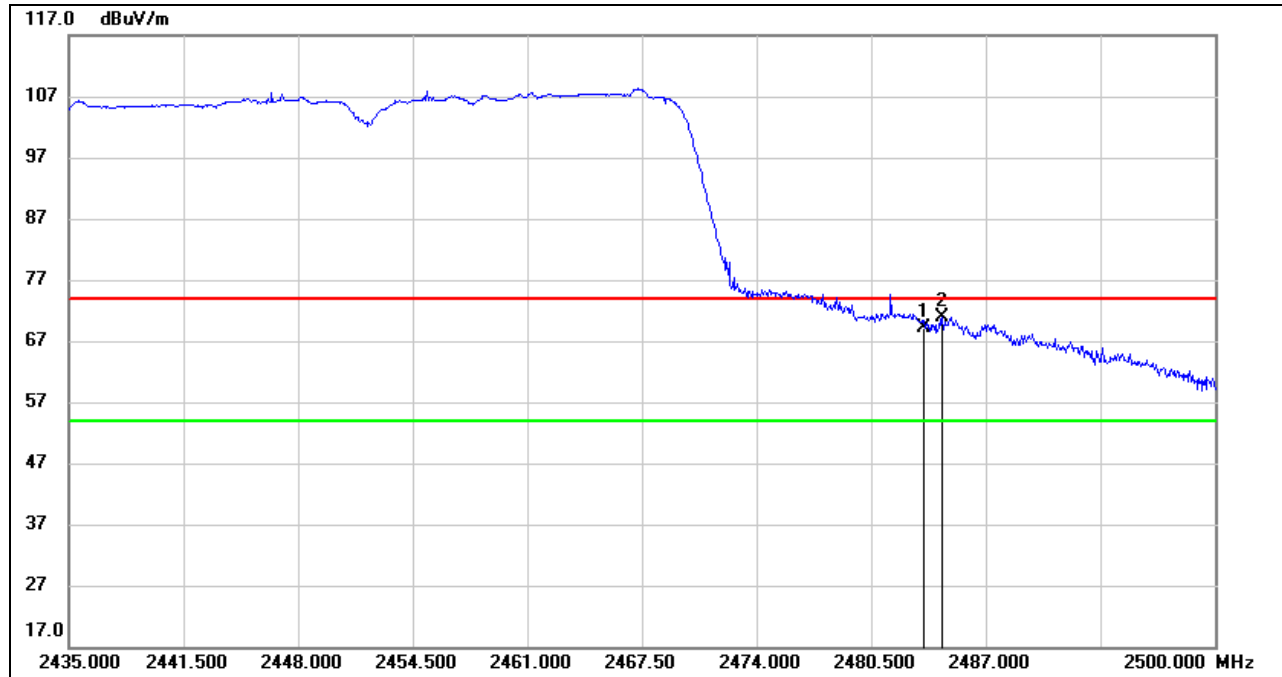


AVG



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.125	12.05	33.35	45.40	54.00	-8.60	AVG
2	2390.000	12.22	33.35	45.57	54.00	-8.43	AVG

- Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
4. For the transmitting duration, please refer to clause 7.1.
5. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)****PEAK**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	35.47	33.71	69.18	74.00	-4.82	peak
2	2484.530	37.16	33.71	70.87	74.00	-3.13	peak

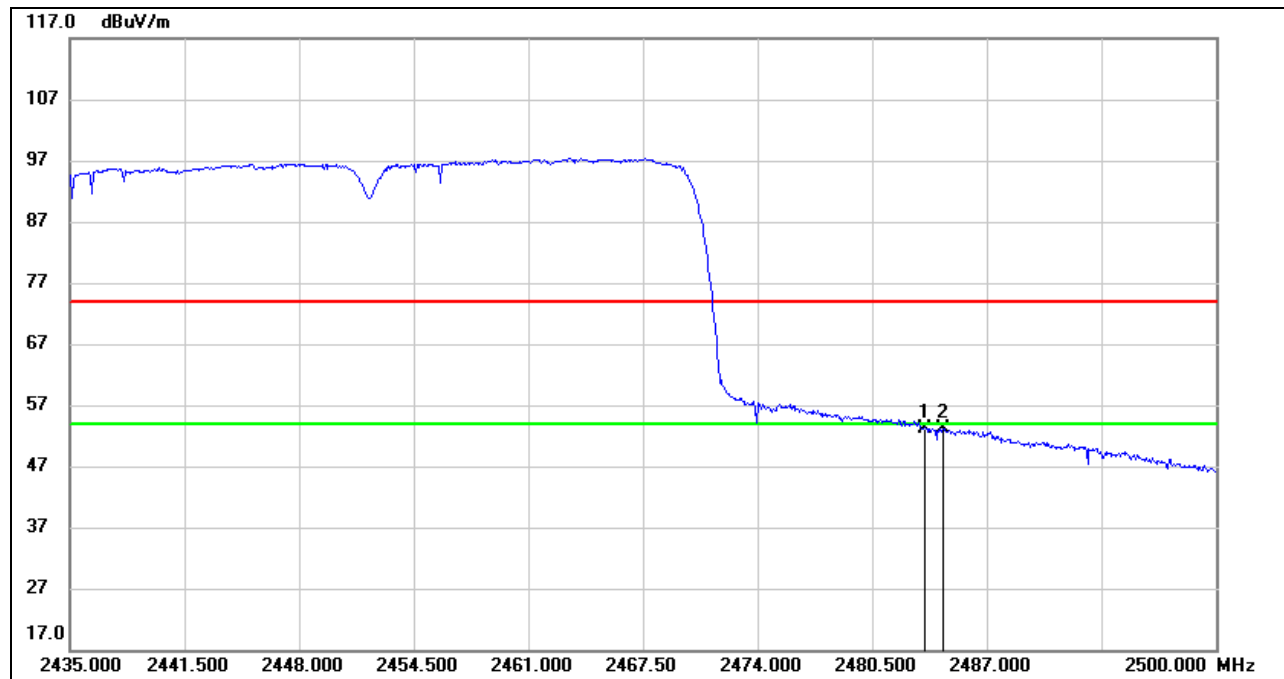
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

AVG



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	19.48	33.71	53.19	54.00	-0.81	AVG
2	2484.530	19.38	33.71	53.09	54.00	-0.91	AVG

- Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
4. For the transmitting duration, please refer to clause 7.1.
5. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Note: Horizontal and Vertical have been tested, only the worst data was recorded in the report.

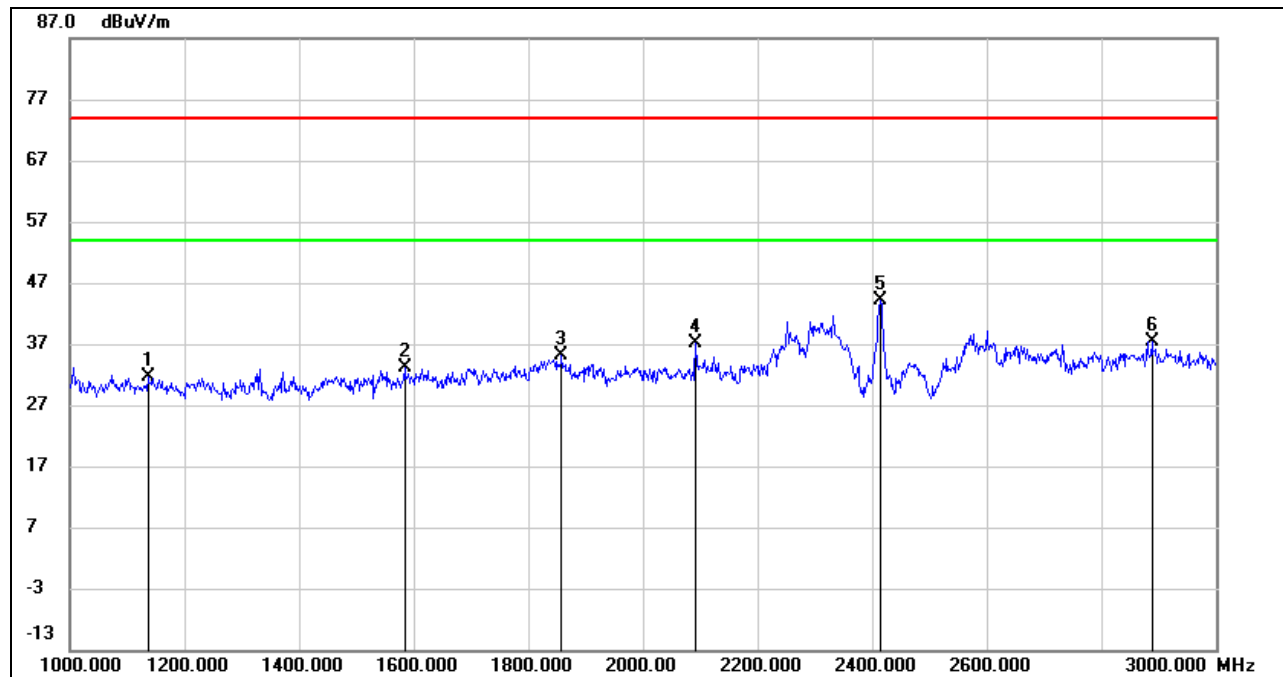
Note: Both antennas have been tested, only the worst data was recorded in the report.



8.2. SPURIOUS EMISSIONS (1 GHz ~ 3 GHz)

8.2.1. 802.11n HT20 MIMO MODE

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1136.000	44.83	-13.31	31.52	74.00	-42.48	peak
2	1584.000	44.70	-11.66	33.04	74.00	-40.96	peak
3	1858.000	45.25	-10.09	35.16	74.00	-38.84	peak
4	2092.000	46.76	-9.66	37.10	74.00	-36.90	peak
5	2414.000	52.52	-8.36	44.16	74.00	-29.84	peak
6	2888.000	43.57	-6.13	37.44	74.00	-36.56	peak

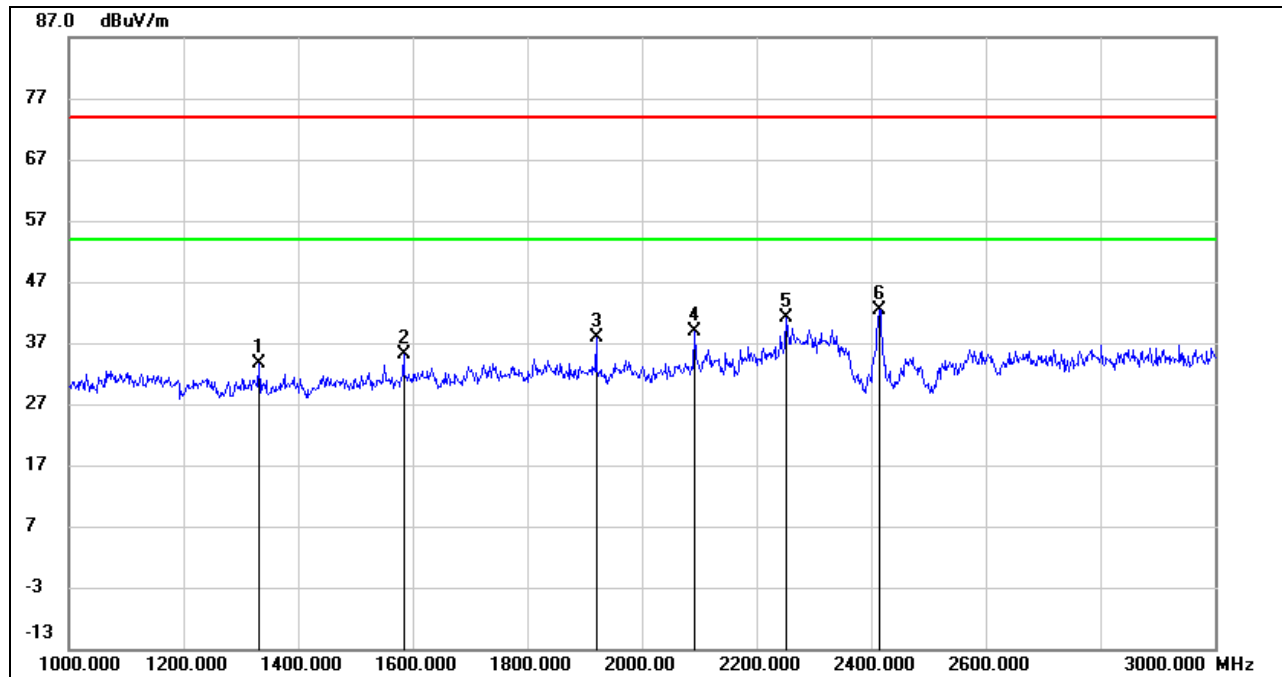
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1332.000	46.43	-12.80	33.63	74.00	-40.37	peak
2	1584.000	46.79	-11.66	35.13	74.00	-38.87	peak
3	1920.000	47.93	-10.13	37.80	74.00	-36.20	peak
4	2092.000	48.57	-9.66	38.91	74.00	-35.09	peak
5	2252.000	49.89	-8.88	41.01	74.00	-32.99	peak
6	2414.000	50.80	-8.36	42.44	74.00	-31.56	peak

Note: 1. Measurement = Reading Level + Correct Factor.

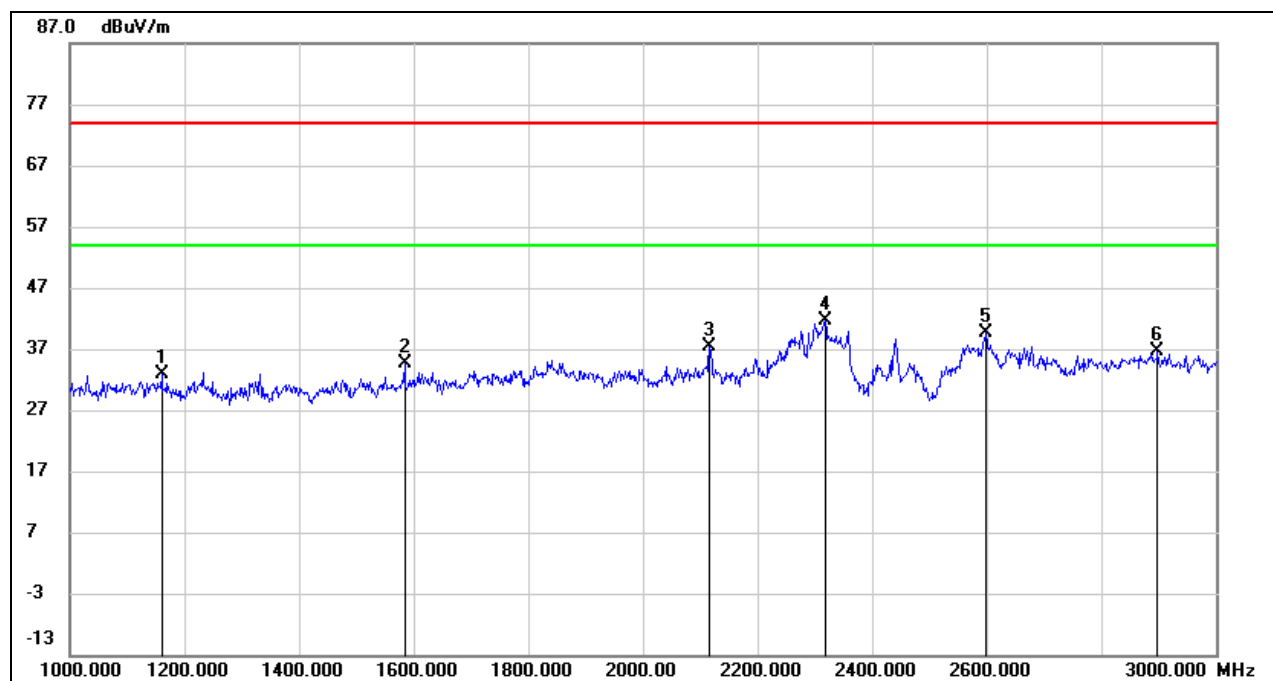
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1160.000	45.94	-13.18	32.76	74.00	-41.24	peak
2	1584.000	46.22	-11.66	34.56	74.00	-39.44	peak
3	2116.000	46.81	-9.53	37.28	74.00	-36.72	peak
4	2318.000	50.26	-8.66	41.60	74.00	-32.40	peak
5	2598.000	47.62	-7.88	39.74	74.00	-34.26	peak
6	2898.000	42.64	-6.09	36.55	74.00	-37.45	peak

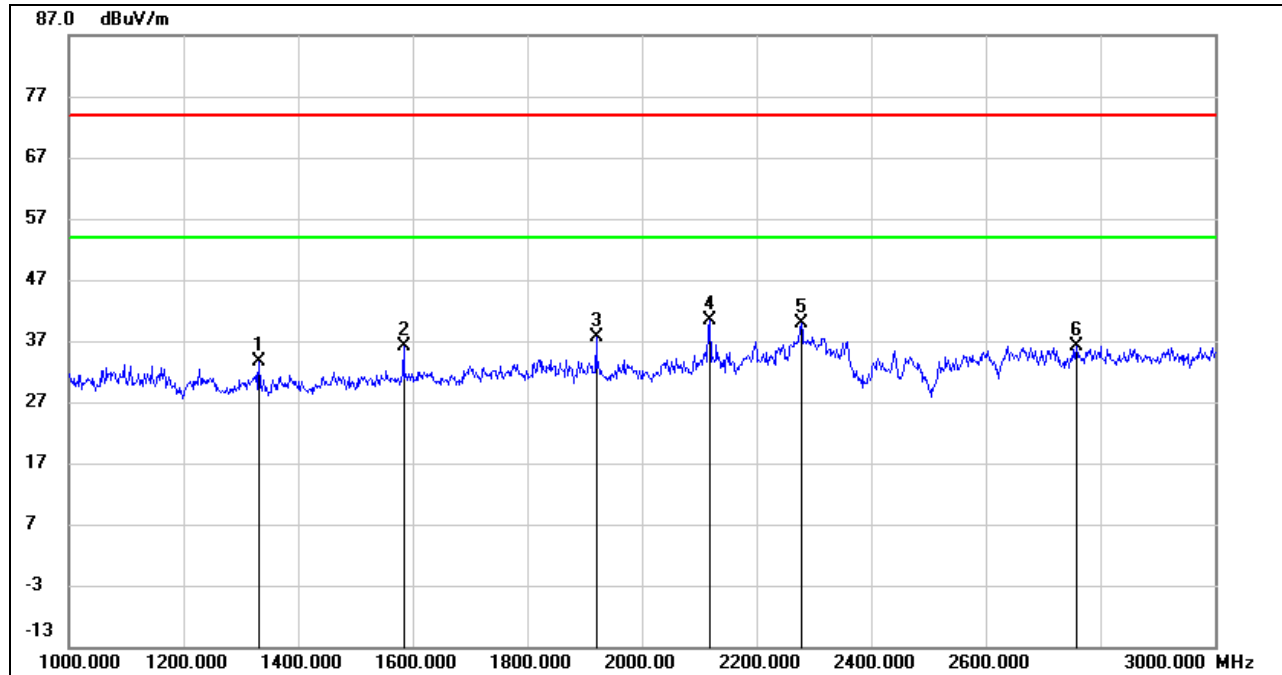
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1332.000	46.50	-12.80	33.70	74.00	-40.30	peak
2	1584.000	47.86	-11.66	36.20	74.00	-37.80	peak
3	1920.000	47.83	-10.13	37.70	74.00	-36.30	peak
4	2118.000	49.99	-9.52	40.47	74.00	-33.53	peak
5	2278.000	48.68	-8.79	39.89	74.00	-34.11	peak
6	2758.000	43.02	-6.82	36.20	74.00	-37.80	peak

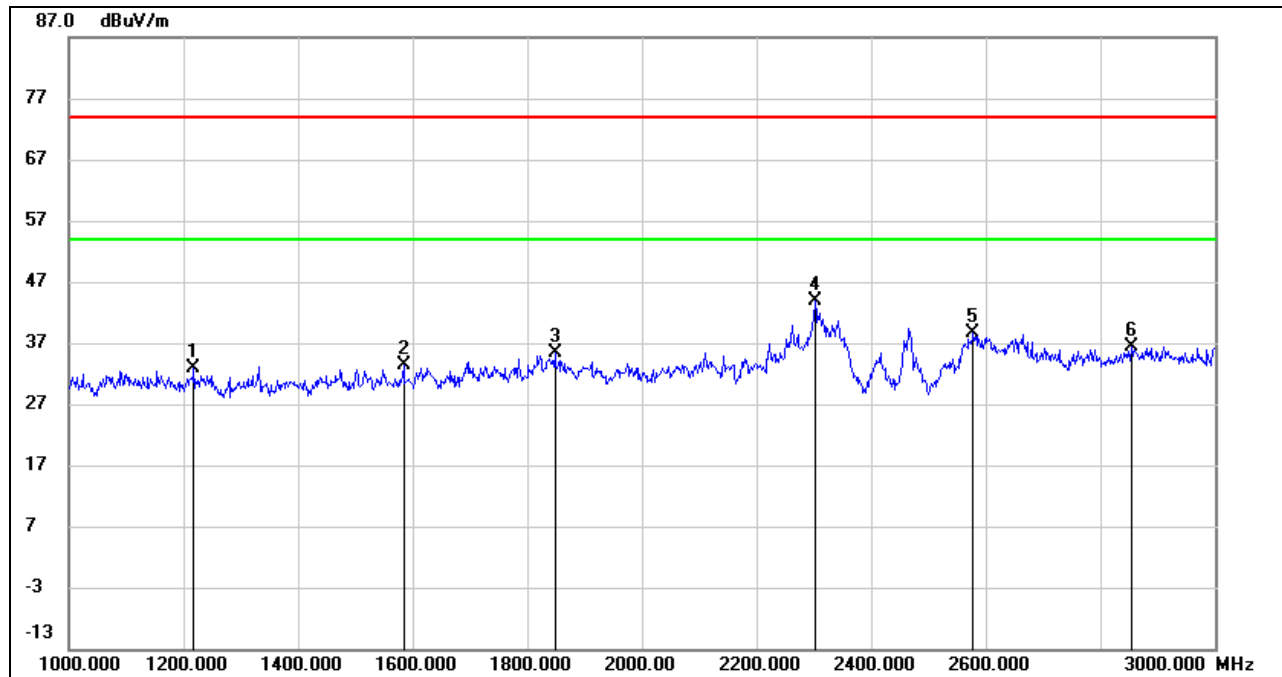
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1218.000	45.74	-12.97	32.77	74.00	-41.23	peak
2	1584.000	44.98	-11.66	33.32	74.00	-40.68	peak
3	1848.000	45.36	-10.09	35.27	74.00	-38.73	peak
4	2302.000	52.65	-8.72	43.93	74.00	-30.07	peak
5	2578.000	46.46	-7.95	38.51	74.00	-35.49	peak
6	2854.000	42.61	-6.30	36.31	74.00	-37.69	peak

Note: 1. Measurement = Reading Level + Correct Factor.

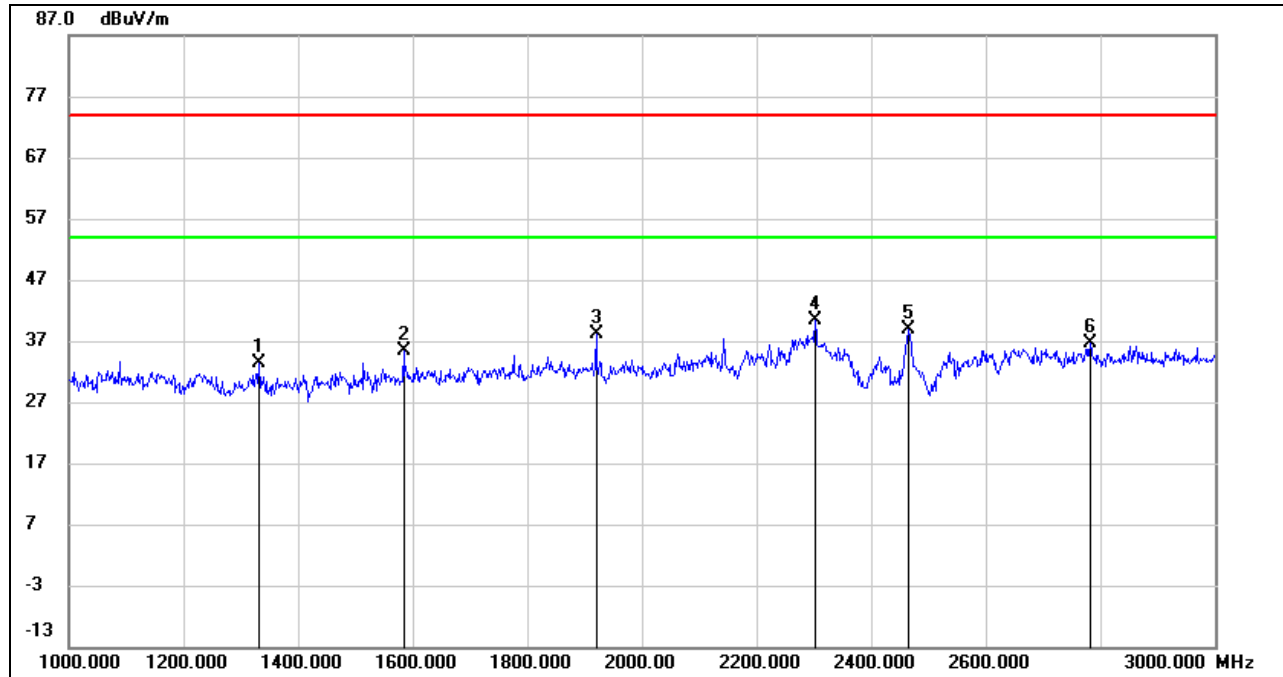
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1332.000	46.07	-12.80	33.27	74.00	-40.73	peak
2	1584.000	47.02	-11.66	35.36	74.00	-38.64	peak
3	1920.000	48.15	-10.13	38.02	74.00	-35.98	peak
4	2302.000	49.17	-8.72	40.45	74.00	-33.55	peak
5	2464.000	47.19	-8.27	38.92	74.00	-35.08	peak
6	2782.000	43.33	-6.67	36.66	74.00	-37.34	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

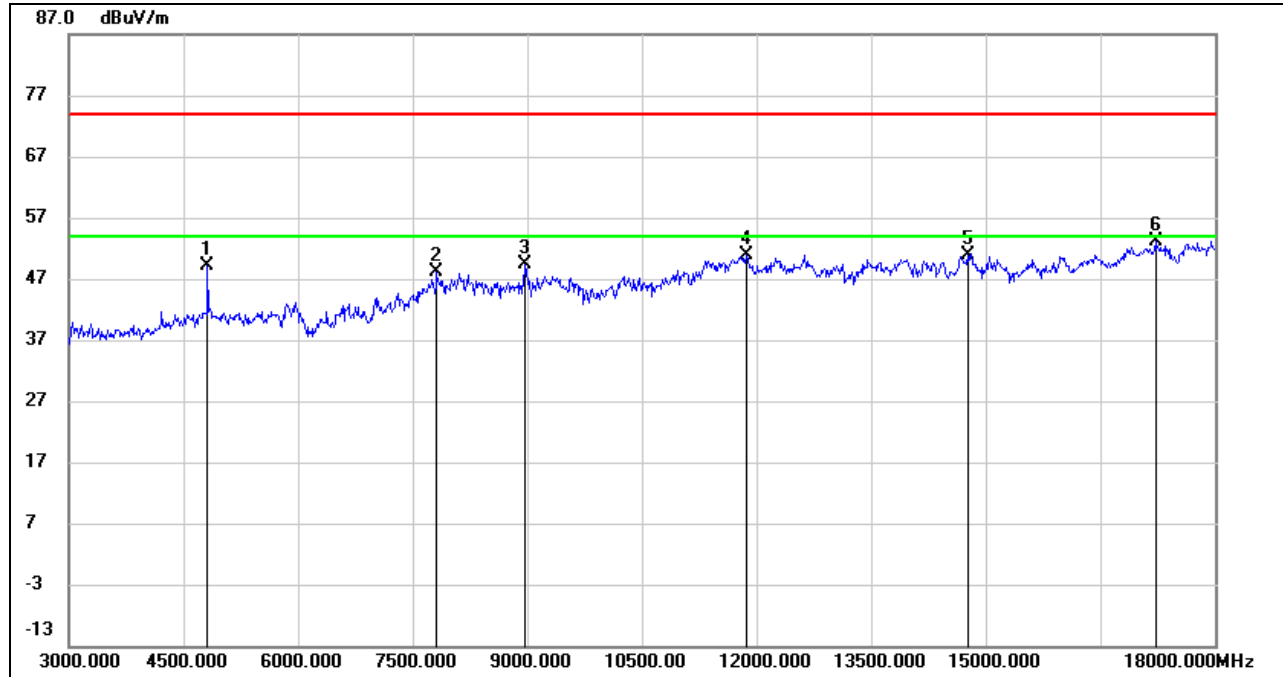
Note: All the modes and channels had been tested, but only the worst data was recorded in the report.

8.3. SPURIOUS EMISSIONS (3 GHz ~ 18 GHz)

8.3.1. 802.11b SISO MODE

ANTENNA 1 TEST RESULTS (WORST CASE)

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4815.000	47.85	1.38	49.23	74.00	-24.77	peak
2	7815.000	38.94	9.28	48.22	74.00	-25.78	peak
3	8970.000	38.67	10.70	49.37	74.00	-24.63	peak
4	11865.000	35.41	15.42	50.83	74.00	-23.17	peak
5	14760.000	32.93	17.90	50.83	74.00	-23.17	peak
6	17220.000	31.09	22.12	53.21	74.00	-20.79	peak

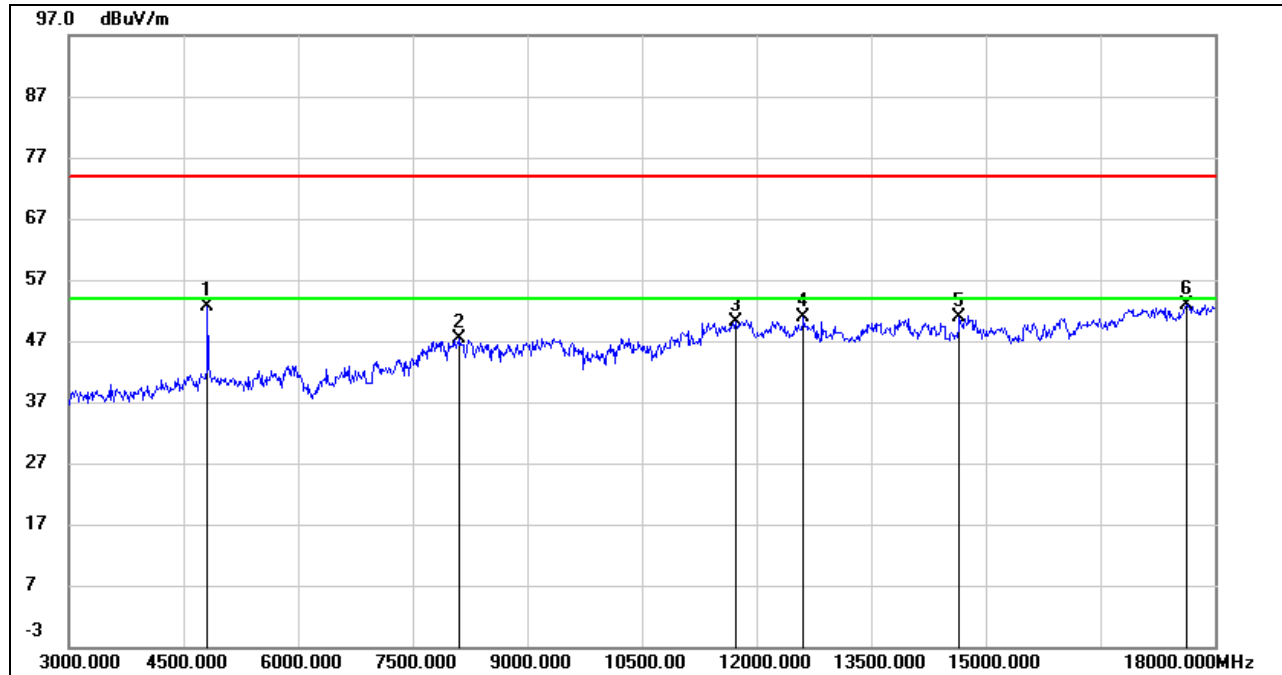
Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4815.000	51.17	1.38	52.55	74.00	-21.45	peak
2	8115.000	37.21	10.13	47.34	74.00	-26.66	peak
3	11730.000	34.84	15.32	50.16	74.00	-23.84	peak
4	12615.000	35.06	15.75	50.81	74.00	-23.19	peak
5	14655.000	33.23	17.54	50.77	74.00	-23.23	peak
6	17625.000	30.07	22.92	52.99	74.00	-21.01	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

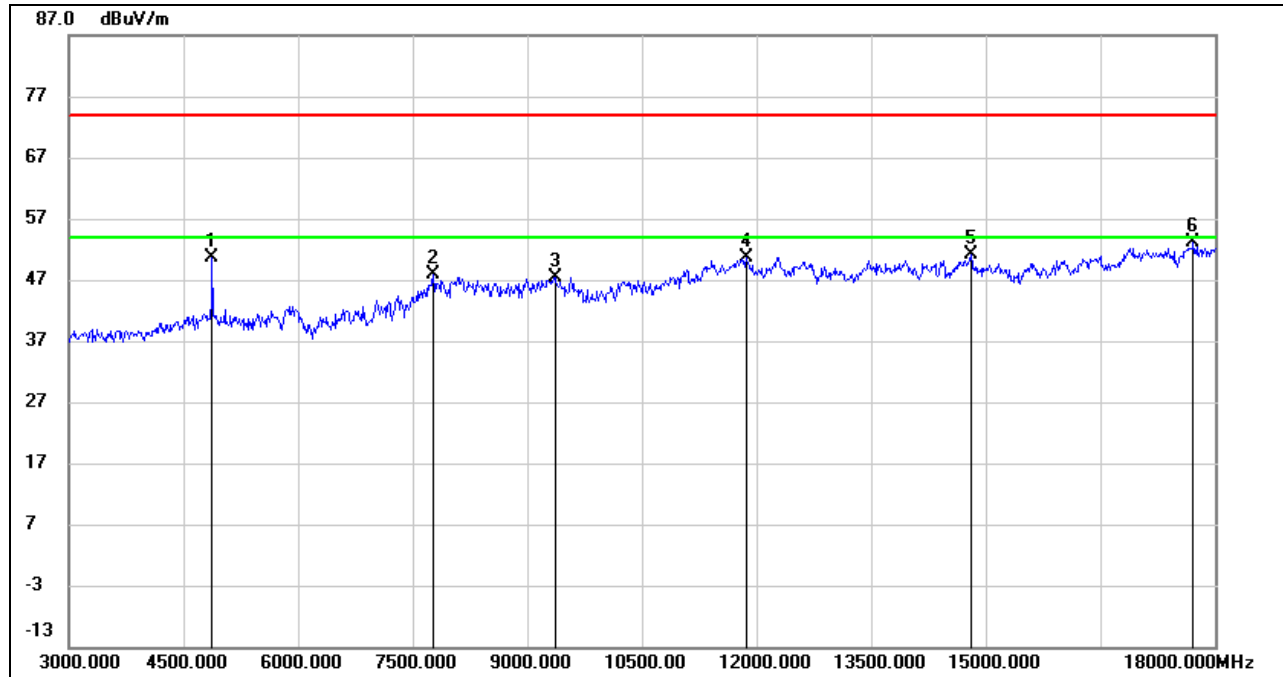
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

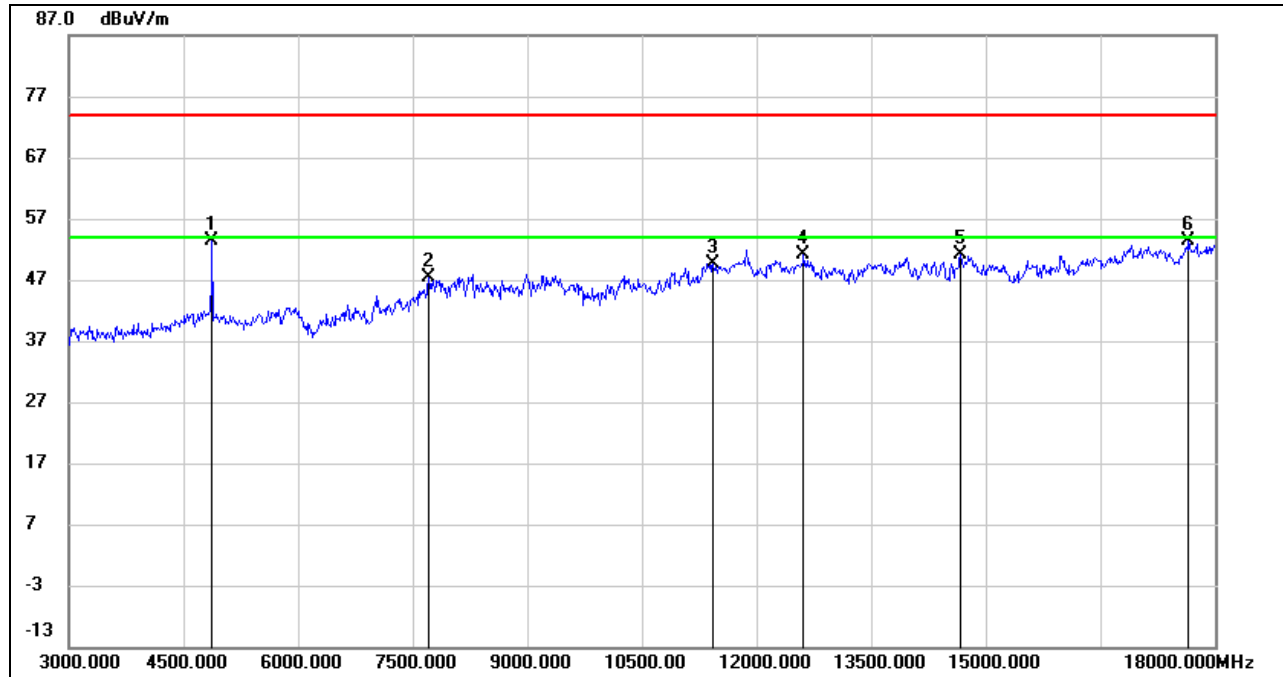
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4875.000	49.20	1.32	50.52	74.00	-23.48	peak
2	7770.000	38.74	9.09	47.83	74.00	-26.17	peak
3	9360.000	36.73	10.75	47.48	74.00	-26.52	peak
4	11865.000	35.31	15.42	50.73	74.00	-23.27	peak
5	14805.000	33.13	18.00	51.13	74.00	-22.87	peak
6	17715.000	29.53	23.56	53.09	74.00	-20.91	peak

- Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4875.000	52.02	1.32	53.34	74.00	-20.66	peak
2	7710.000	38.80	8.54	47.34	74.00	-26.66	peak
3	11430.000	34.88	14.72	49.60	74.00	-24.40	peak
4	12615.000	35.49	15.75	51.24	74.00	-22.76	peak
5	14670.000	33.46	17.59	51.05	74.00	-22.95	peak
6	17655.000	30.31	23.14	53.45	74.00	-20.55	peak

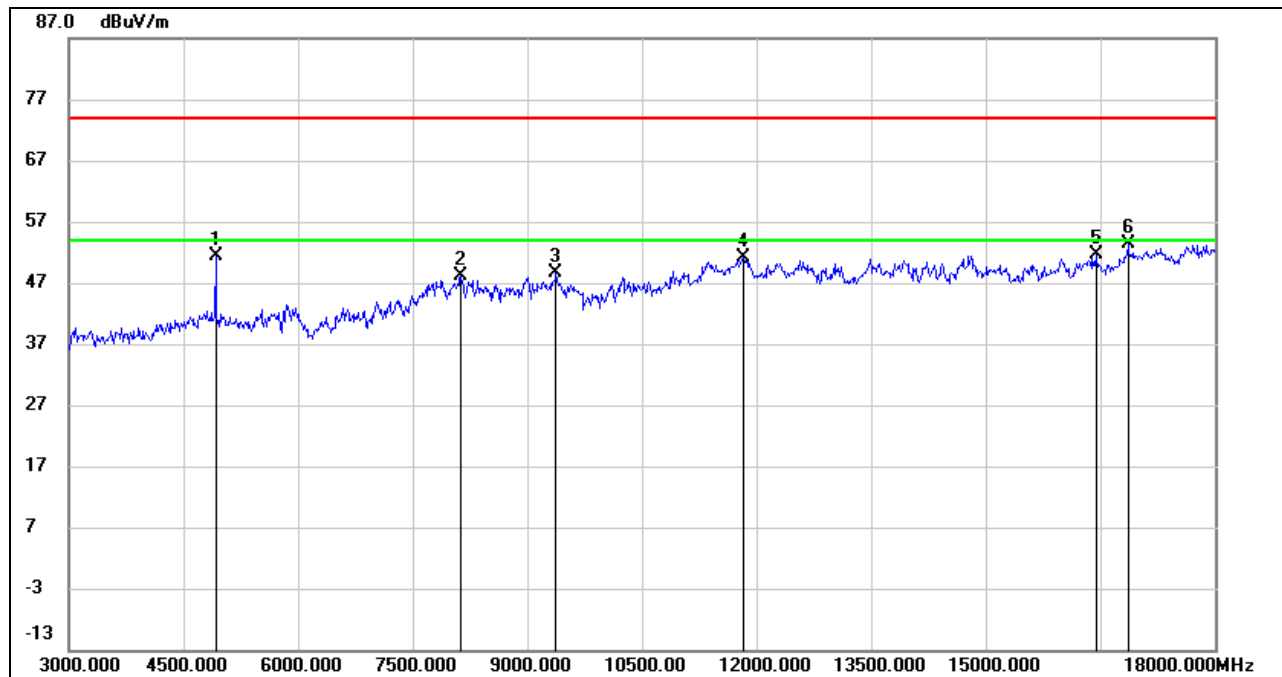
Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4920.000	49.85	1.45	51.30	74.00	-22.70	peak
2	8130.000	37.99	10.06	48.05	74.00	-25.95	peak
3	9375.000	37.92	10.83	48.75	74.00	-25.25	peak
4	11820.000	35.91	15.29	51.20	74.00	-22.80	peak
5	16440.000	31.96	19.68	51.64	74.00	-22.36	peak
6	16860.000	32.24	21.22	53.46	74.00	-20.54	peak

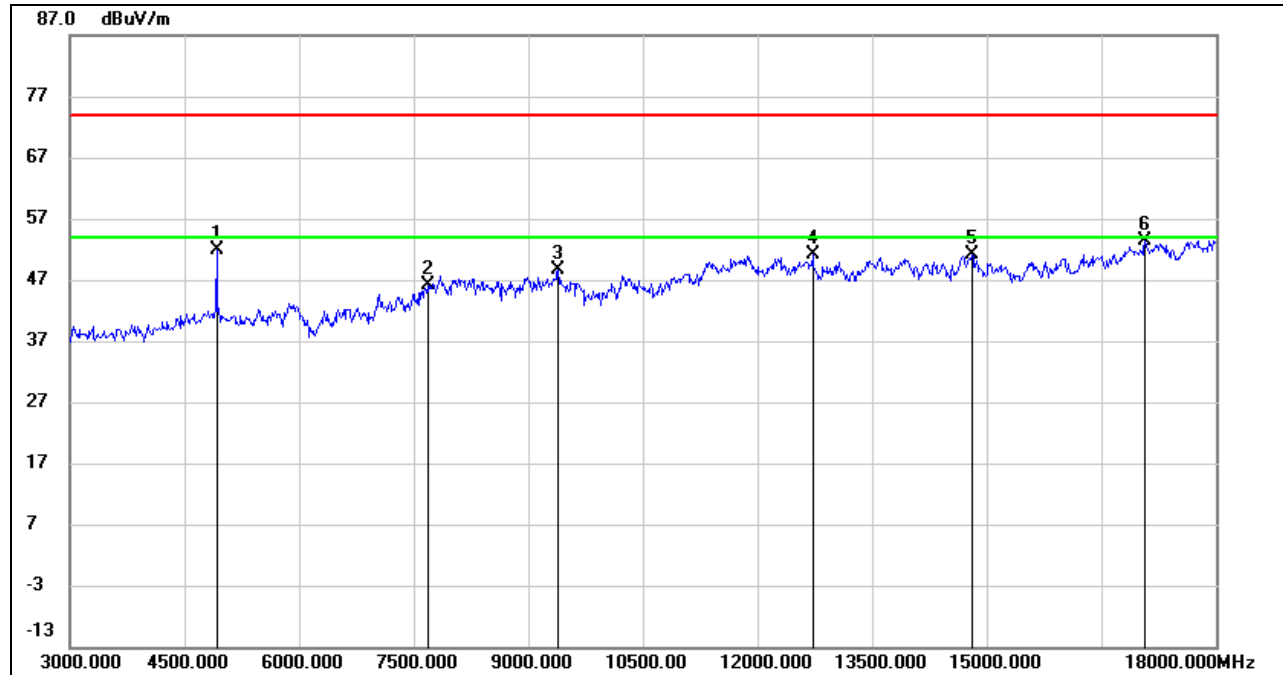
Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4920.000	50.53	1.45	51.98	74.00	-22.02	peak
2	7680.000	37.79	8.34	46.13	74.00	-27.87	peak
3	9390.000	37.71	10.92	48.63	74.00	-25.37	peak
4	12720.000	35.46	15.70	51.16	74.00	-22.84	peak
5	14805.000	33.20	18.00	51.20	74.00	-22.80	peak
6	17070.000	31.69	21.71	53.40	74.00	-20.60	peak

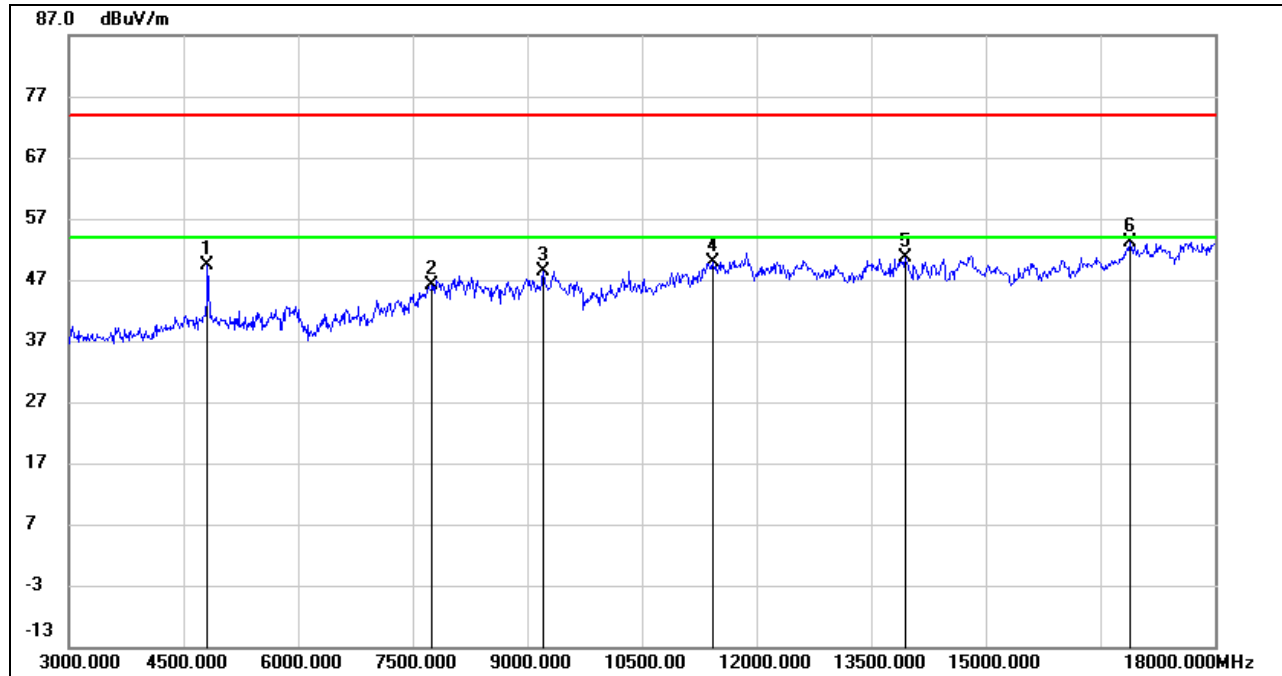
Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**8.3.2. 802.11g SISO MODE****ANTENNA 1 TEST RESULTS (WORST CASE)****HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4815.000	47.91	1.38	49.29	74.00	-24.71	peak
2	7755.000	37.27	8.94	46.21	74.00	-27.79	peak
3	9210.000	38.50	9.95	48.45	74.00	-25.55	peak
4	11430.000	35.22	14.72	49.94	74.00	-24.06	peak
5	13950.000	32.93	17.60	50.53	74.00	-23.47	peak
6	16890.000	31.73	21.49	53.22	74.00	-20.78	peak

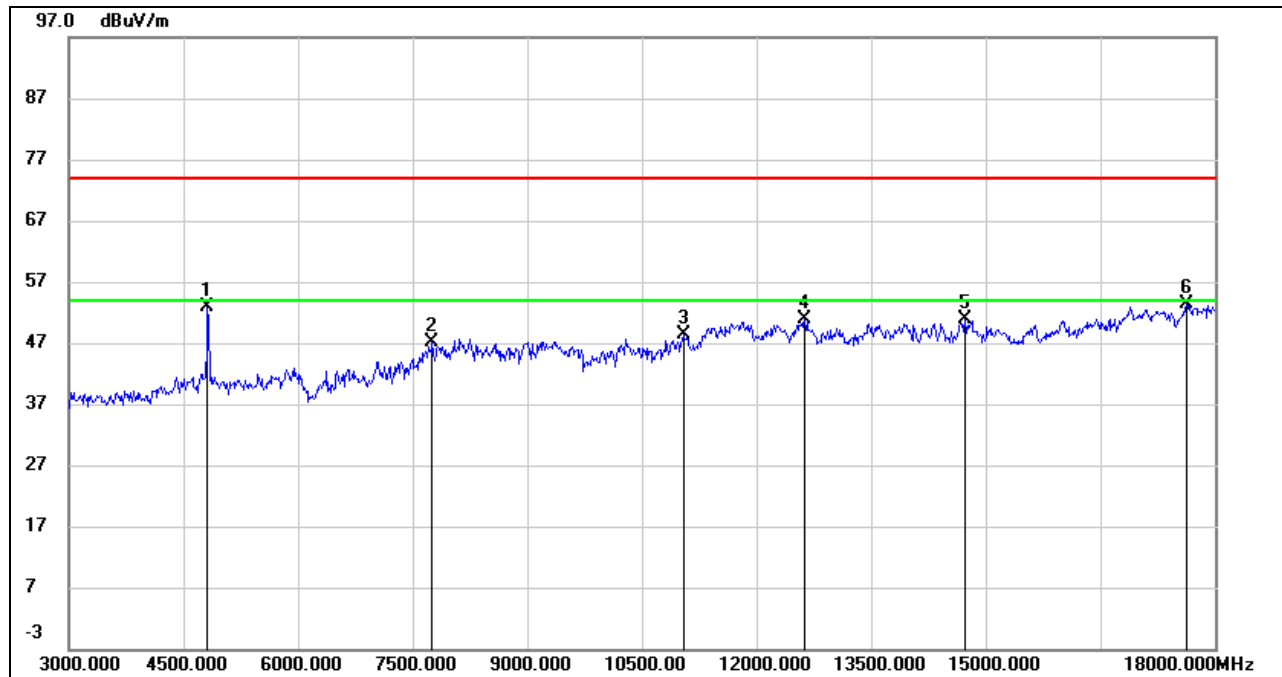
Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4815.000	51.47	1.38	52.85	74.00	-21.15	peak
2	7755.000	38.23	8.94	47.17	74.00	-26.83	peak
3	11040.000	34.92	13.51	48.43	74.00	-25.57	peak
4	12630.000	35.15	15.72	50.87	74.00	-23.13	peak
5	14730.000	32.98	17.79	50.77	74.00	-23.23	peak
6	17625.000	30.57	22.92	53.49	74.00	-20.51	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

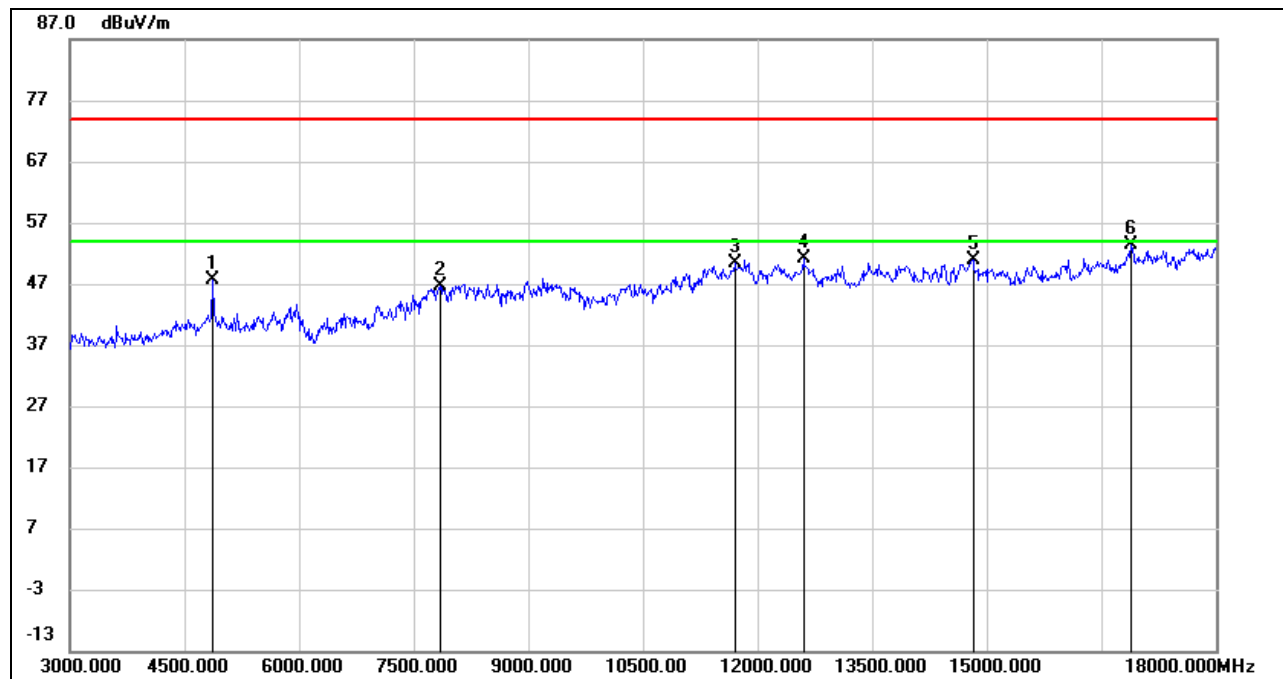
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4860.000	46.41	1.33	47.74	74.00	-26.26	peak
2	7845.000	37.48	9.14	46.62	74.00	-27.38	peak
3	11700.000	35.11	15.35	50.46	74.00	-23.54	peak
4	12600.000	35.27	15.78	51.05	74.00	-22.95	peak
5	14820.000	33.07	17.91	50.98	74.00	-23.02	peak
6	16890.000	31.93	21.49	53.42	74.00	-20.58	peak

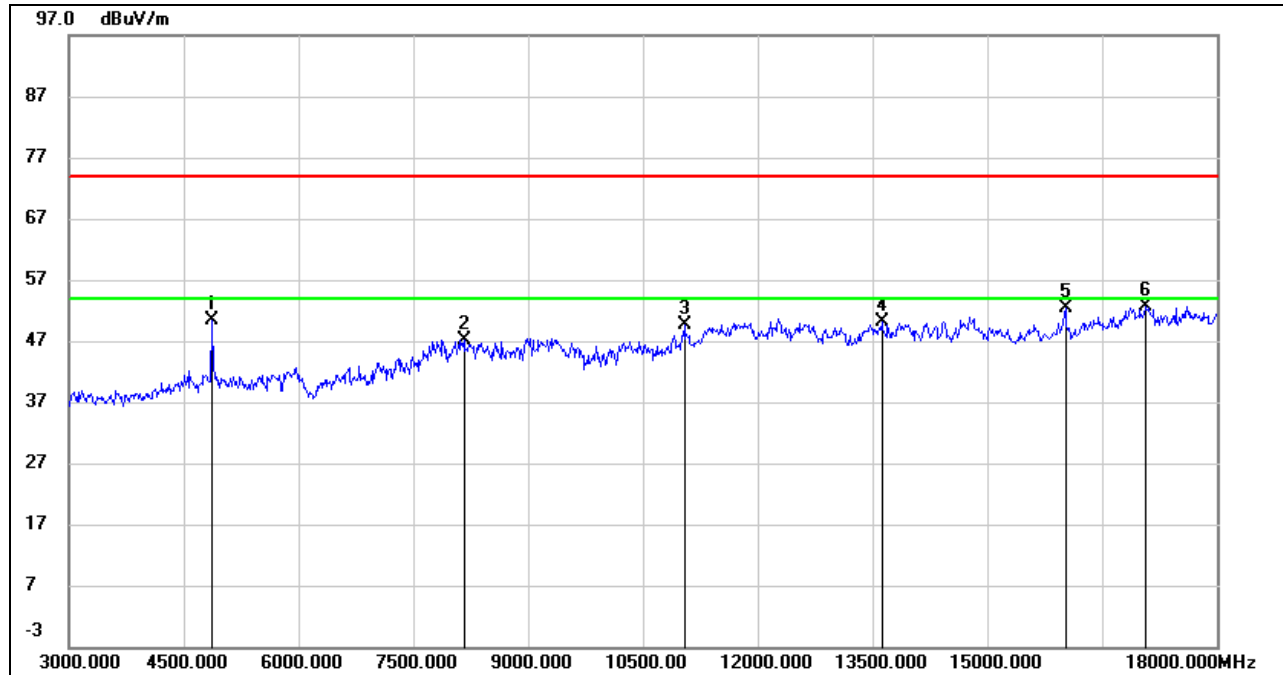
Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4860.000	48.93	1.33	50.26	74.00	-23.74	peak
2	8160.000	37.19	9.96	47.15	74.00	-26.85	peak
3	11040.000	36.14	13.51	49.65	74.00	-24.35	peak
4	13620.000	33.04	17.19	50.23	74.00	-23.77	peak
5	16020.000	33.94	18.41	52.35	74.00	-21.65	peak
6	17070.000	30.94	21.71	52.65	74.00	-21.35	peak

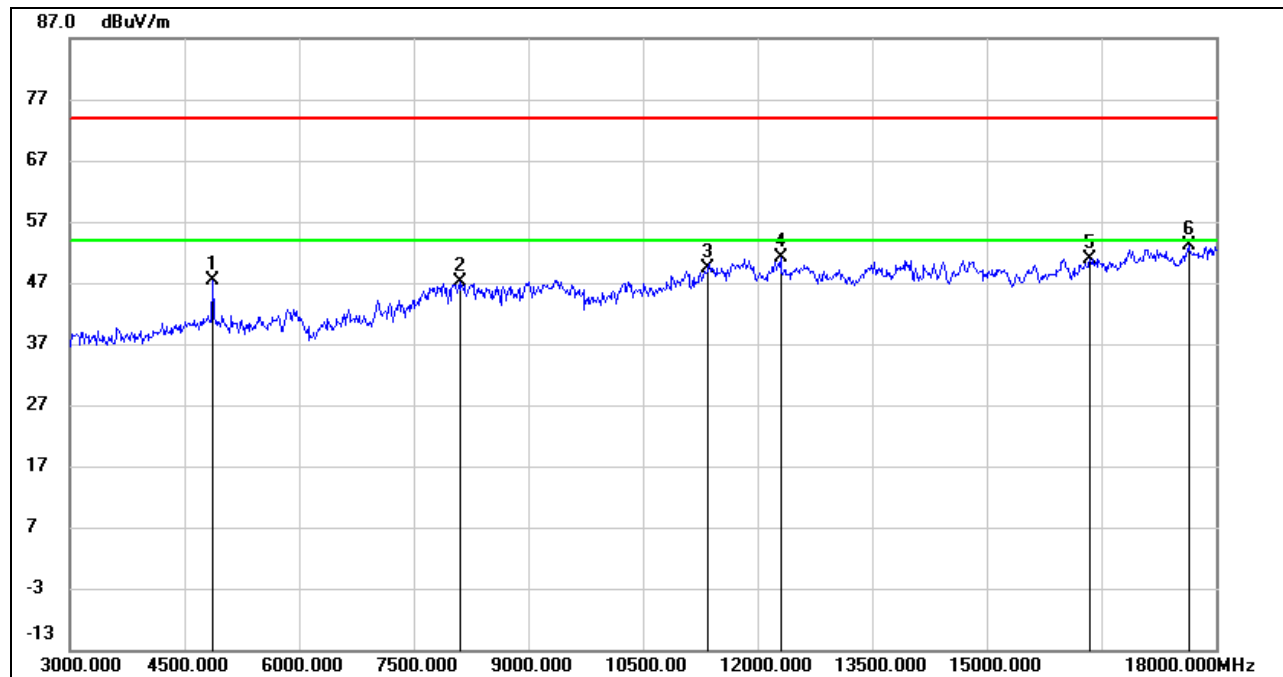
Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4860.000	46.10	1.33	47.43	74.00	-26.57	peak
2	8115.000	37.00	10.13	47.13	74.00	-26.87	peak
3	11355.000	34.98	14.34	49.32	74.00	-24.68	peak
4	12300.000	35.02	16.09	51.11	74.00	-22.89	peak
5	16350.000	31.32	19.65	50.97	74.00	-23.03	peak
6	17640.000	30.10	23.03	53.13	74.00	-20.87	peak

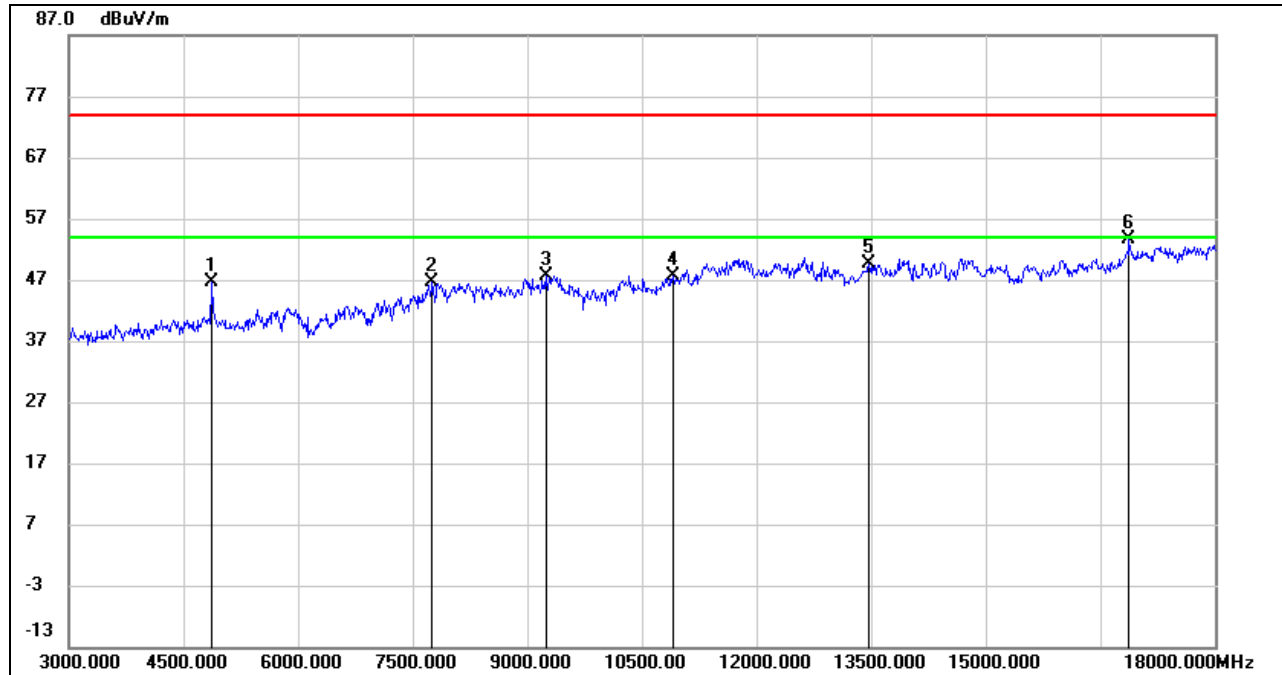
Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4875.000	45.27	1.32	46.59	74.00	-27.41	peak
2	7755.000	37.78	8.94	46.72	74.00	-27.28	peak
3	9240.000	37.56	10.10	47.66	74.00	-26.34	peak
4	10905.000	34.35	13.35	47.70	74.00	-26.30	peak
5	13470.000	32.60	17.15	49.75	74.00	-24.25	peak
6	16875.000	32.24	21.35	53.59	74.00	-20.41	peak

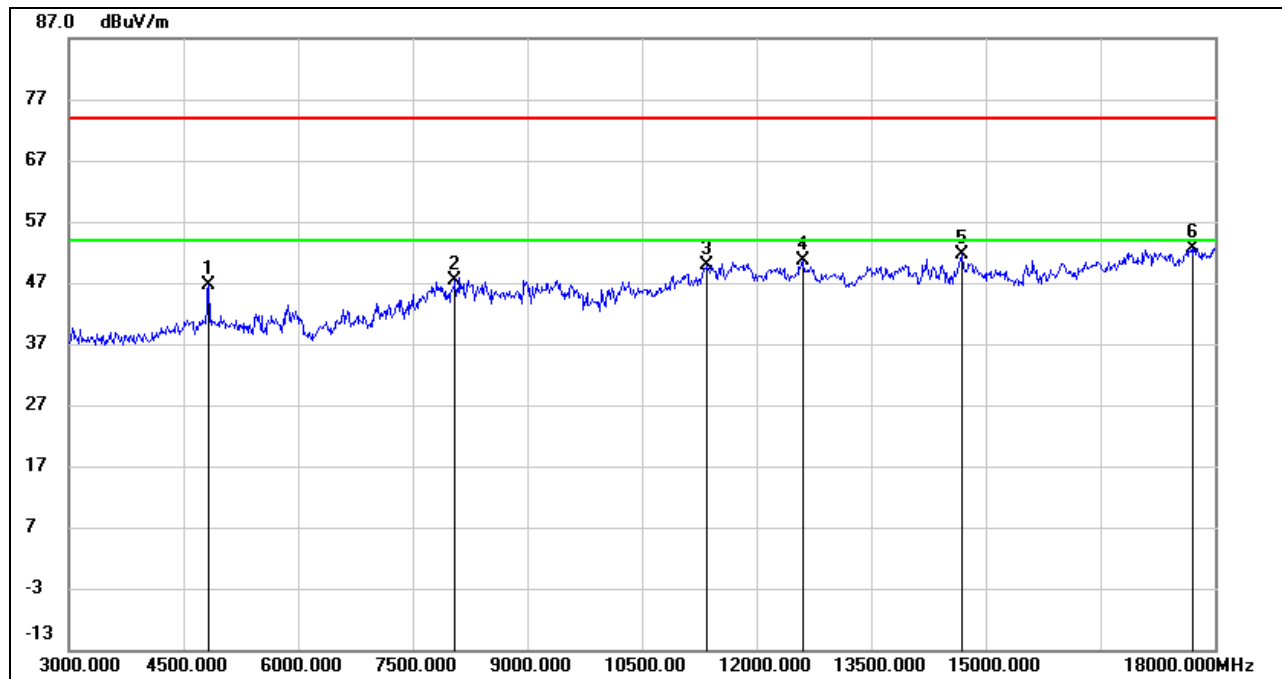
Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**8.3.3. 802.11n HT20 MIMO MODE****HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4830.000	45.31	1.37	46.68	74.00	-27.32	peak
2	8055.000	37.86	9.48	47.34	74.00	-26.66	peak
3	11355.000	35.54	14.34	49.88	74.00	-24.12	peak
4	12600.000	34.74	15.78	50.52	74.00	-23.48	peak
5	14685.000	33.97	17.64	51.61	74.00	-22.39	peak
6	17715.000	29.16	23.56	52.72	74.00	-21.28	peak

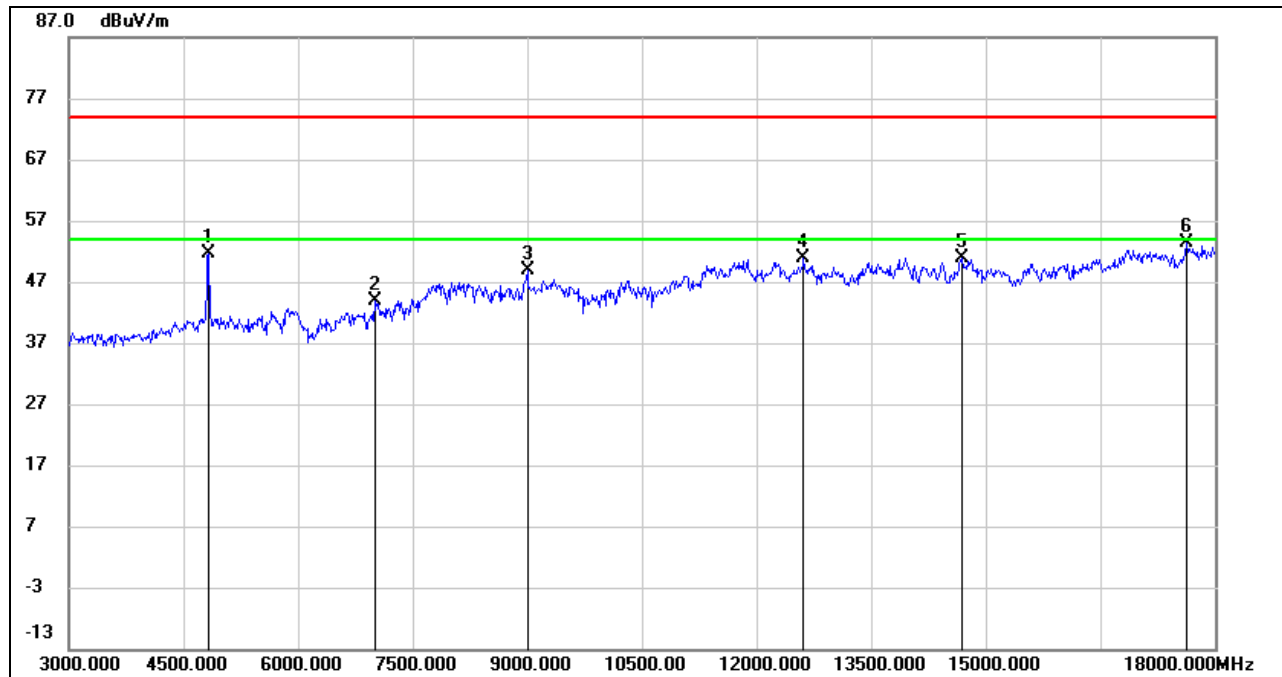
Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

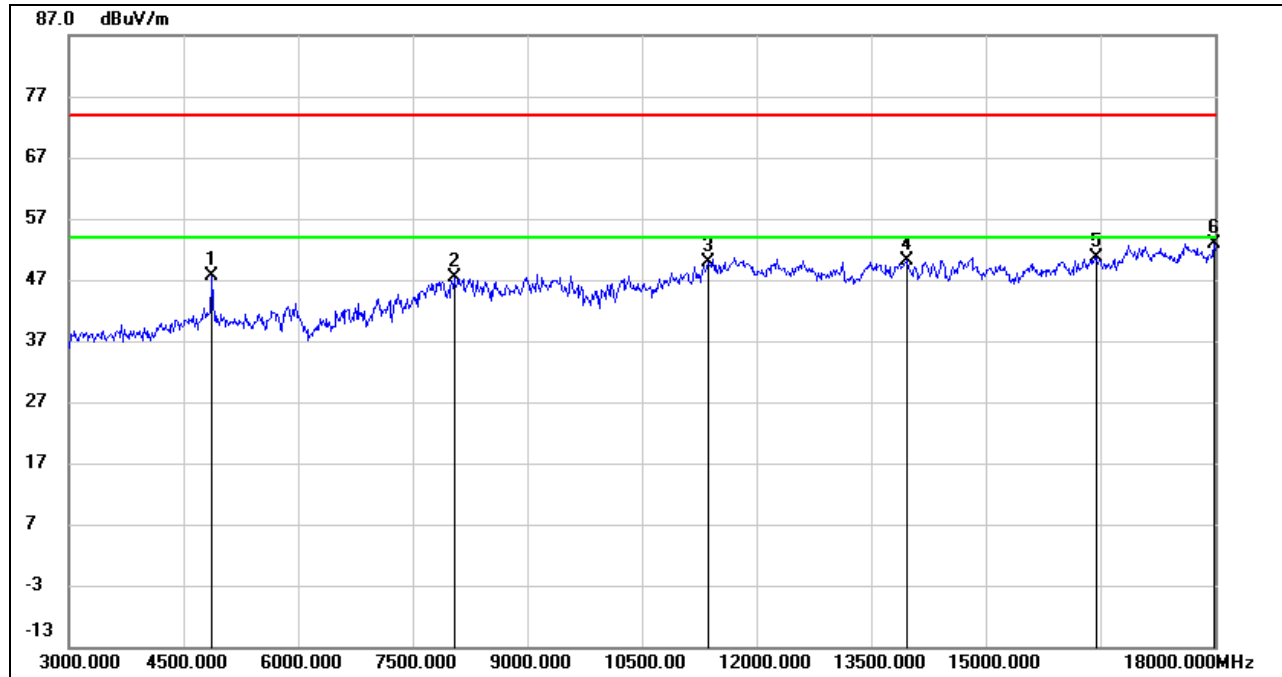
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4830.000	50.19	1.37	51.56	74.00	-22.44	peak
2	7005.000	36.40	7.60	44.00	74.00	-30.00	peak
3	9000.000	37.53	11.27	48.80	74.00	-25.20	peak
4	12615.000	35.16	15.75	50.91	74.00	-23.09	peak
5	14685.000	33.31	17.64	50.95	74.00	-23.05	peak
6	17625.000	30.52	22.92	53.44	74.00	-20.56	peak

- Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4875.000	46.25	1.32	47.57	74.00	-26.43	peak
2	8040.000	38.13	9.25	47.38	74.00	-26.62	peak
3	11370.000	35.32	14.49	49.81	74.00	-24.19	peak
4	13965.000	32.60	17.62	50.22	74.00	-23.78	peak
5	16440.000	30.90	19.68	50.58	74.00	-23.42	peak
6	17985.000	28.72	24.21	52.93	74.00	-21.07	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

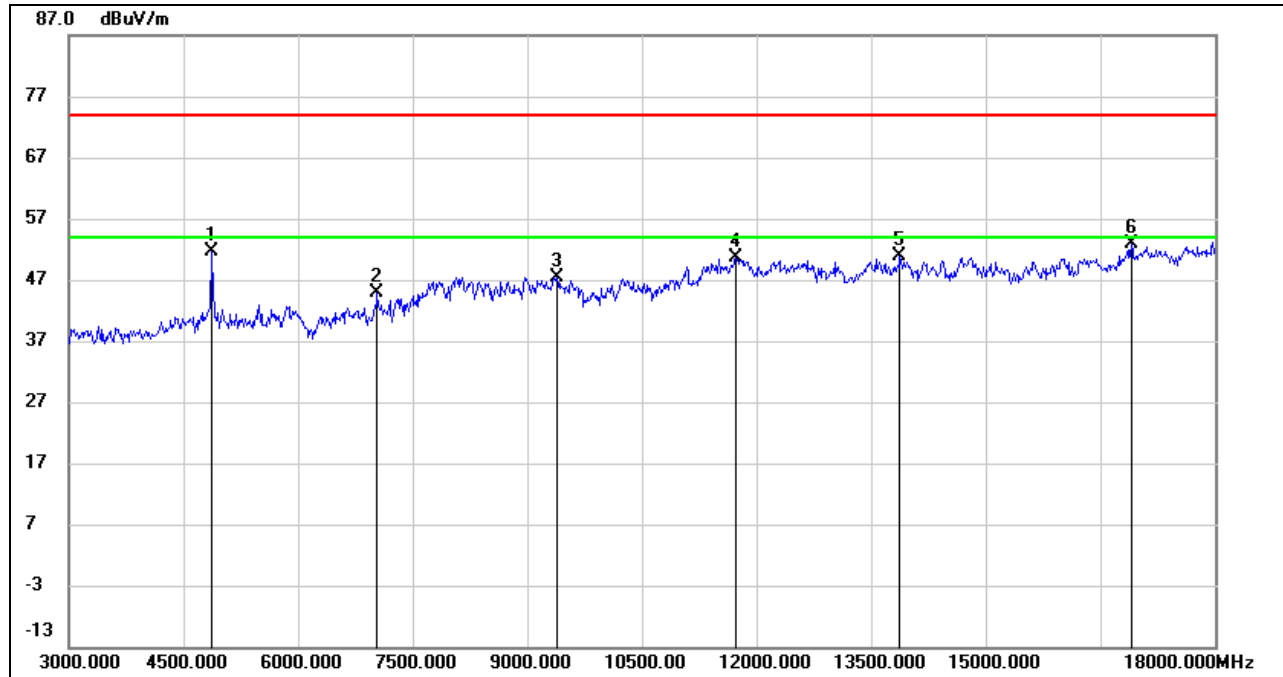
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4860.000	50.23	1.33	51.56	74.00	-22.44	peak
2	7035.000	37.23	7.62	44.85	74.00	-29.15	peak
3	9390.000	36.43	10.92	47.35	74.00	-26.65	peak
4	11730.000	35.23	15.32	50.55	74.00	-23.45	peak
5	13875.000	33.43	17.55	50.98	74.00	-23.02	peak
6	16905.000	31.45	21.55	53.00	74.00	-21.00	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

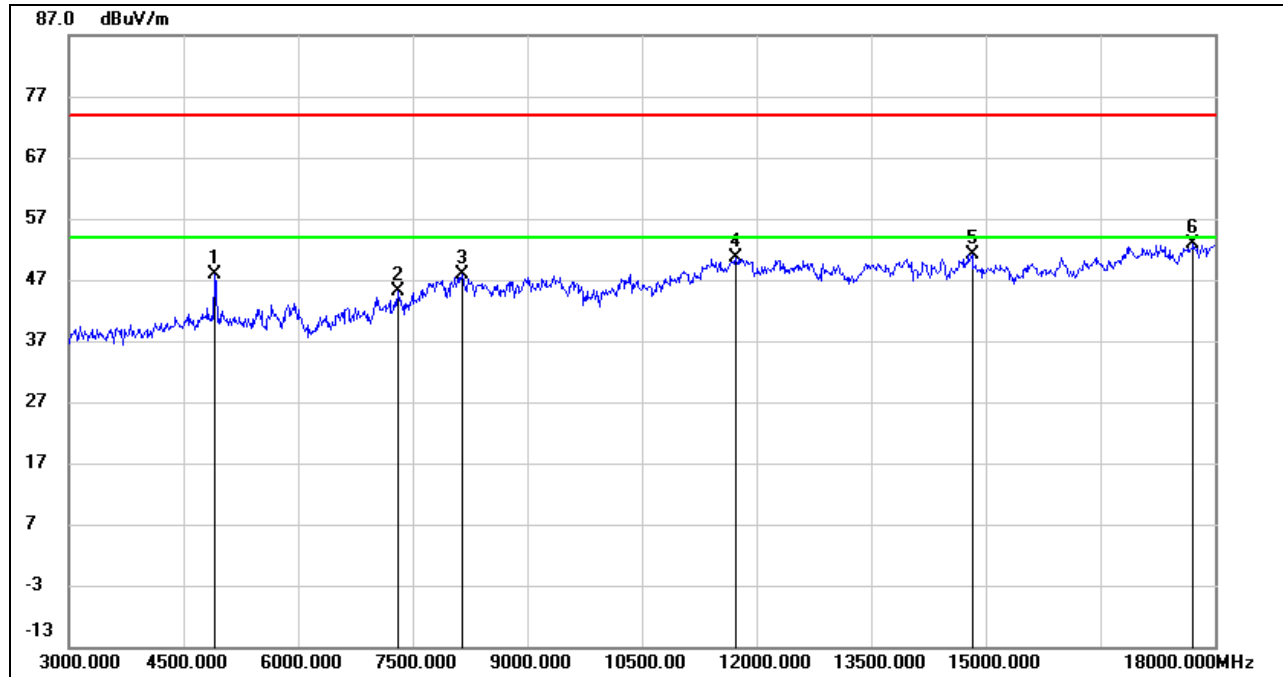
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4905.000	46.50	1.33	47.83	74.00	-26.17	peak
2	7305.000	37.96	7.14	45.10	74.00	-28.90	peak
3	8145.000	37.85	10.01	47.86	74.00	-26.14	peak
4	11730.000	35.33	15.32	50.65	74.00	-23.35	peak
5	14820.000	33.21	17.91	51.12	74.00	-22.88	peak
6	17715.000	29.34	23.56	52.90	74.00	-21.10	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

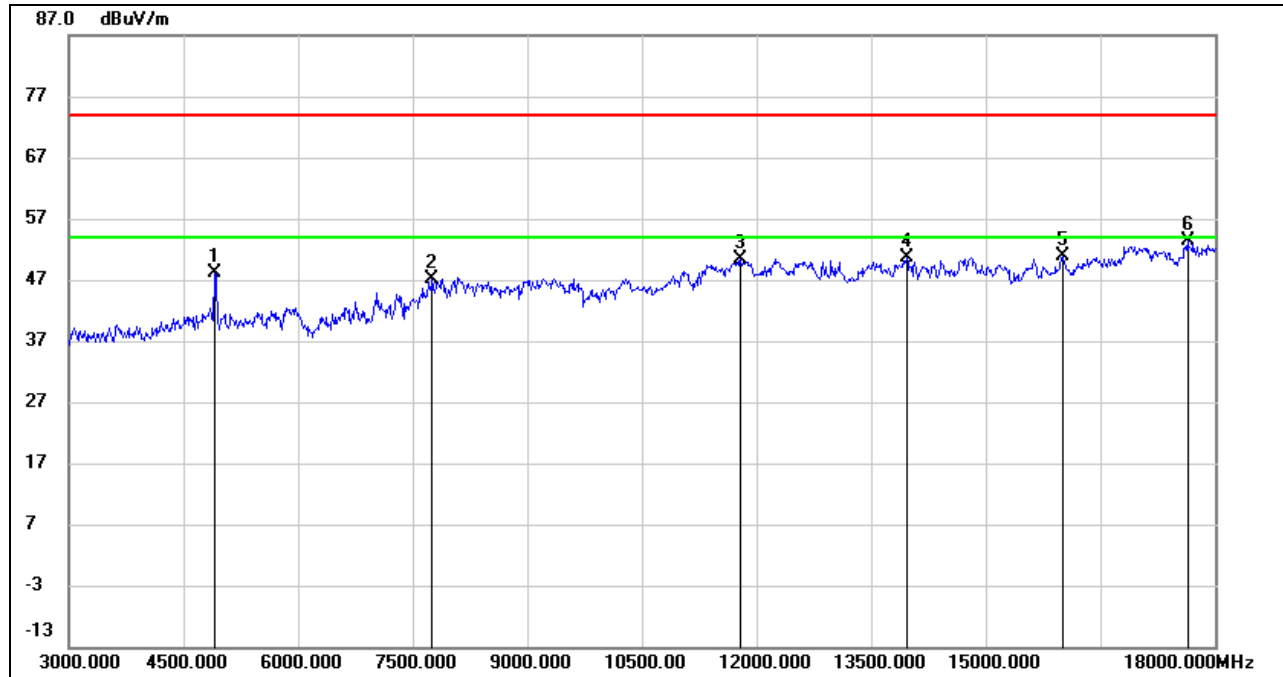
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4905.000	46.85	1.33	48.18	74.00	-25.82	peak
2	7755.000	38.24	8.94	47.18	74.00	-26.82	peak
3	11790.000	35.15	15.26	50.41	74.00	-23.59	peak
4	13965.000	32.92	17.62	50.54	74.00	-23.46	peak
5	16005.000	32.34	18.42	50.76	74.00	-23.24	peak
6	17640.000	30.45	23.03	53.48	74.00	-20.52	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

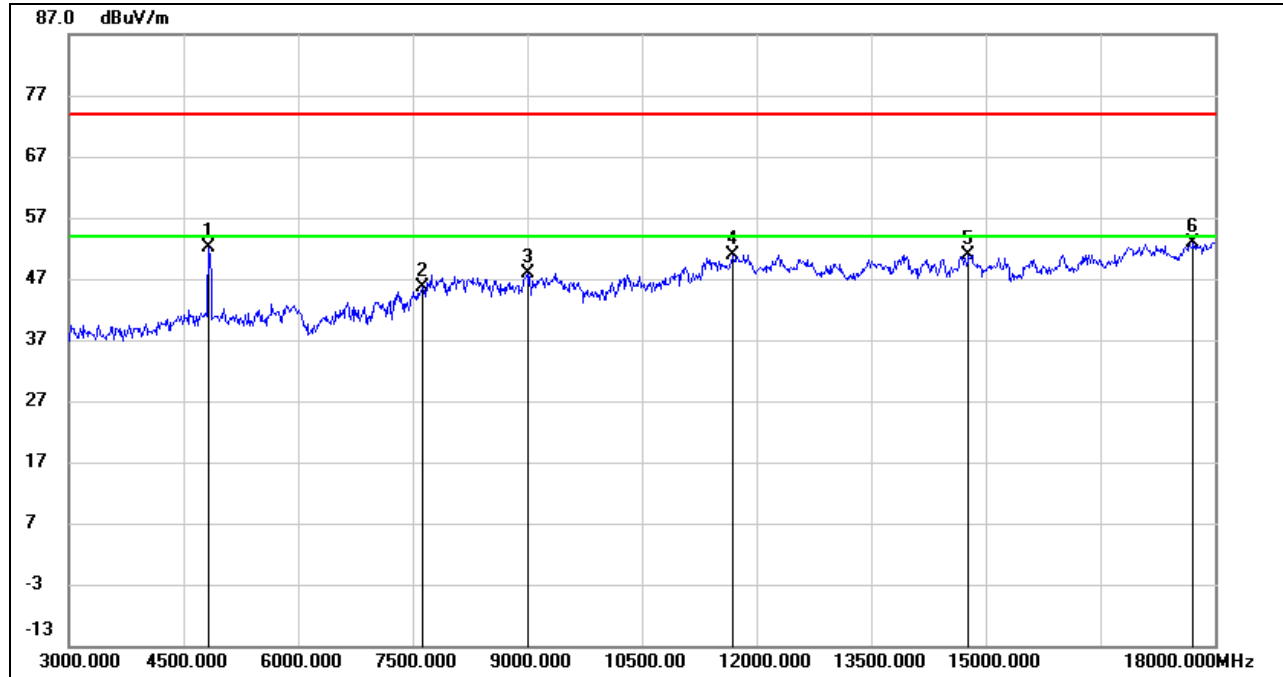
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

Note: All the modes and channels had been tested, but only the worst data was recorded in the report.

8.3.4. 802.11n HT40 MIMO MODE

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4830.000	50.76	1.37	52.13	74.00	-21.87	peak
2	7620.000	37.65	8.06	45.71	74.00	-28.29	peak
3	9000.000	36.61	11.27	47.88	74.00	-26.12	peak
4	11685.000	35.58	15.26	50.84	74.00	-23.16	peak
5	14775.000	32.99	17.95	50.94	74.00	-23.06	peak
6	17715.000	29.39	23.56	52.95	74.00	-21.05	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

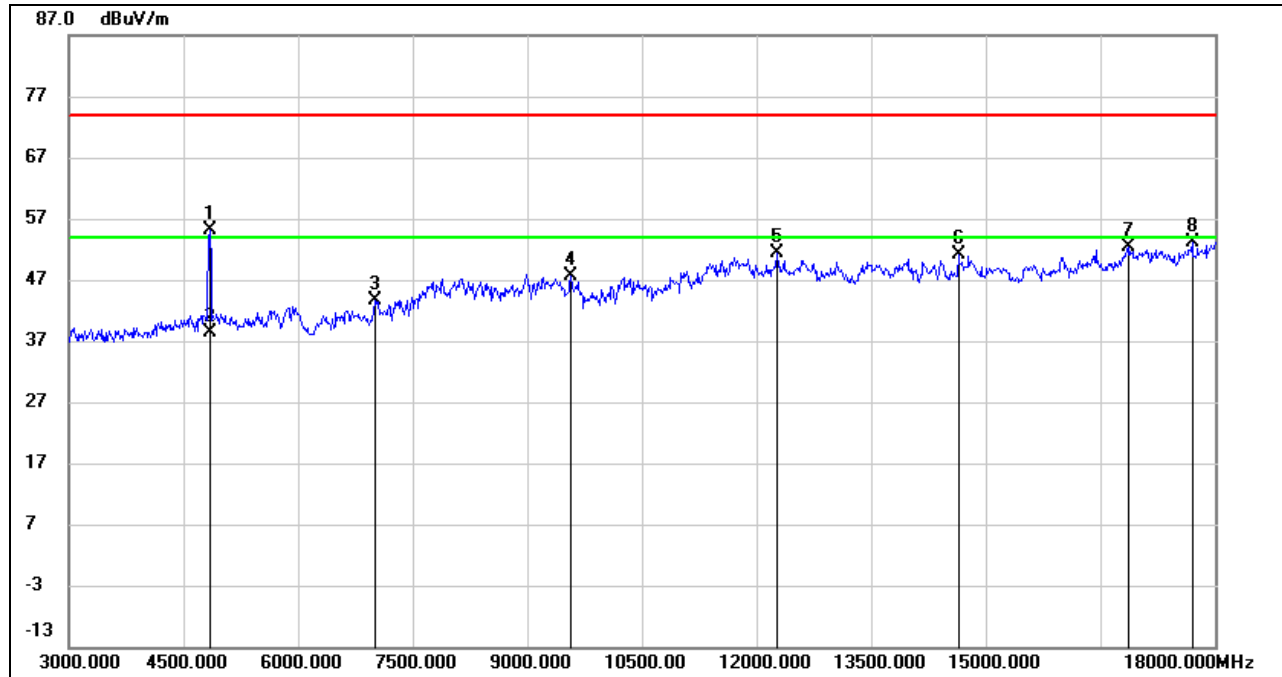
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4845.000	53.69	1.35	55.04	74.00	-18.96	peak
2	4845.000	36.92	1.35	38.27	54.00	-15.73	AVG
3	7005.000	36.01	7.60	43.61	74.00	-30.39	peak
4	9570.000	36.84	10.88	47.72	74.00	-26.28	peak
5	12270.000	35.35	16.04	51.39	74.00	-22.61	peak
6	14640.000	33.66	17.50	51.16	74.00	-22.84	peak
7	16875.000	31.09	21.35	52.44	74.00	-21.56	peak
8	17700.000	29.64	23.47	53.11	74.00	-20.89	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

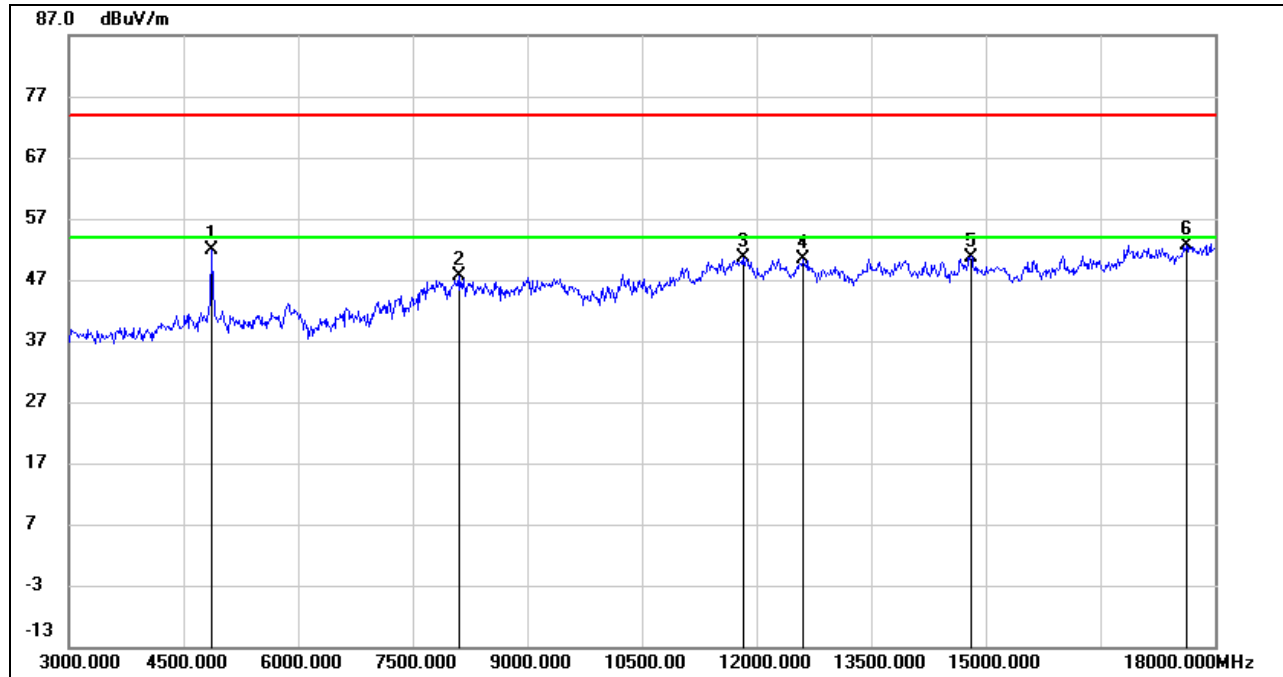
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4860.000	50.57	1.33	51.90	74.00	-22.10	peak
2	8115.000	37.55	10.13	47.68	74.00	-26.32	peak
3	11820.000	35.37	15.29	50.66	74.00	-23.34	peak
4	12615.000	34.72	15.75	50.47	74.00	-23.53	peak
5	14805.000	32.75	18.00	50.75	74.00	-23.25	peak
6	17625.000	29.70	22.92	52.62	74.00	-21.38	peak

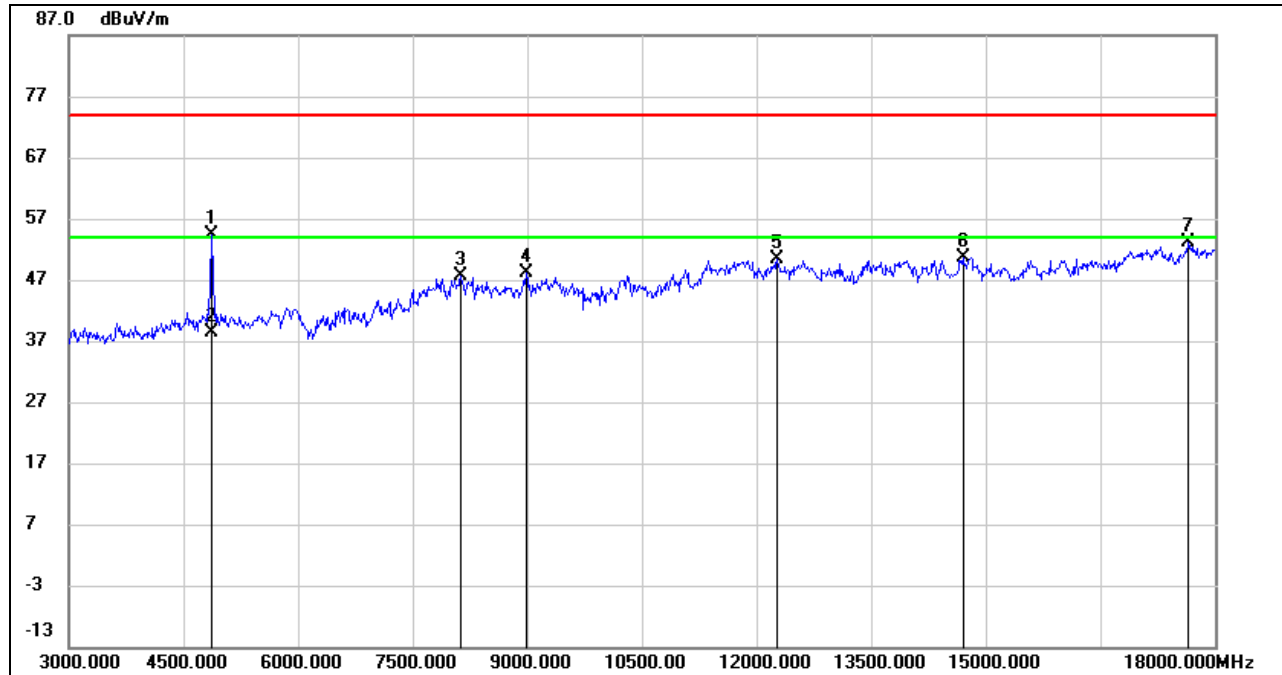
Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4860.000	53.12	1.33	54.45	74.00	-19.55	peak
2	4860.000	37.03	1.33	38.36	54.00	-15.64	AVG
3	8130.000	37.53	10.06	47.59	74.00	-26.41	peak
4	8985.000	37.03	10.99	48.02	74.00	-25.98	peak
5	12270.000	34.31	16.04	50.35	74.00	-23.65	peak
6	14700.000	33.02	17.69	50.71	74.00	-23.29	peak
7	17655.000	29.87	23.14	53.01	74.00	-20.99	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

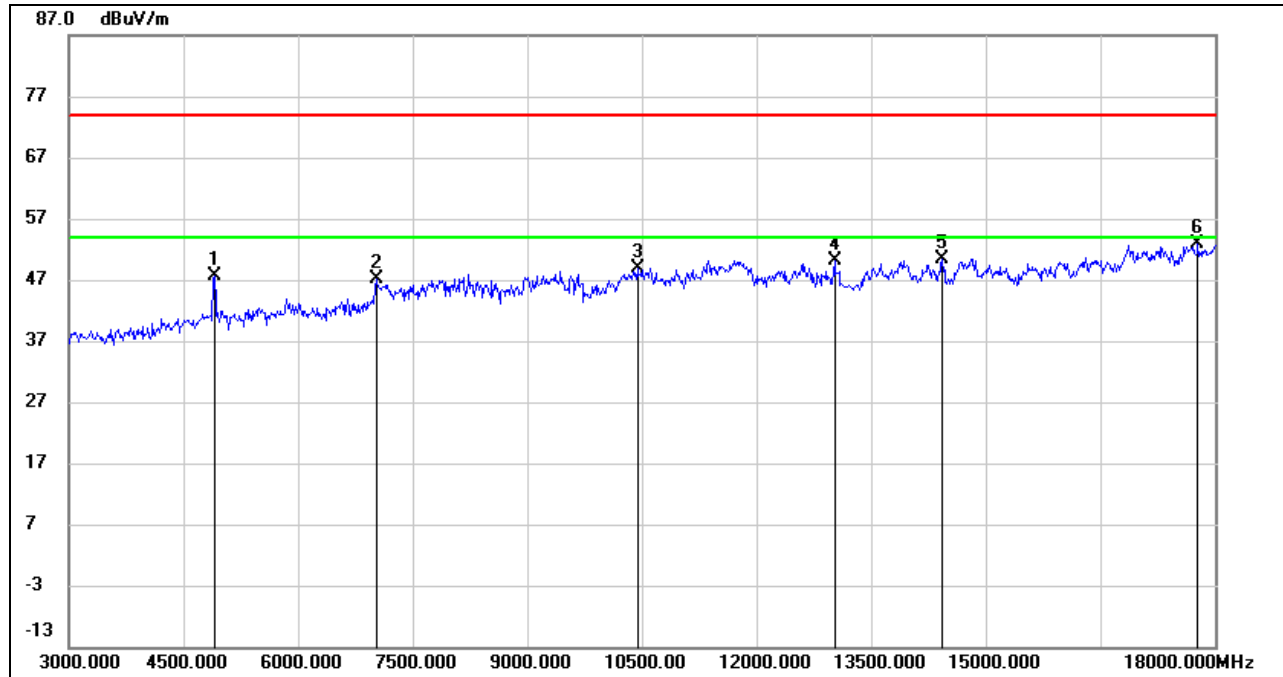
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4905.000	46.26	1.33	47.59	74.00	-26.41	peak
2	7020.000	39.44	7.61	47.05	74.00	-26.95	peak
3	10440.000	36.70	12.28	48.98	74.00	-25.02	peak
4	13020.000	34.03	16.02	50.05	74.00	-23.95	peak
5	14430.000	33.01	17.34	50.35	74.00	-23.65	peak
6	17775.000	28.87	23.91	52.78	74.00	-21.22	peak

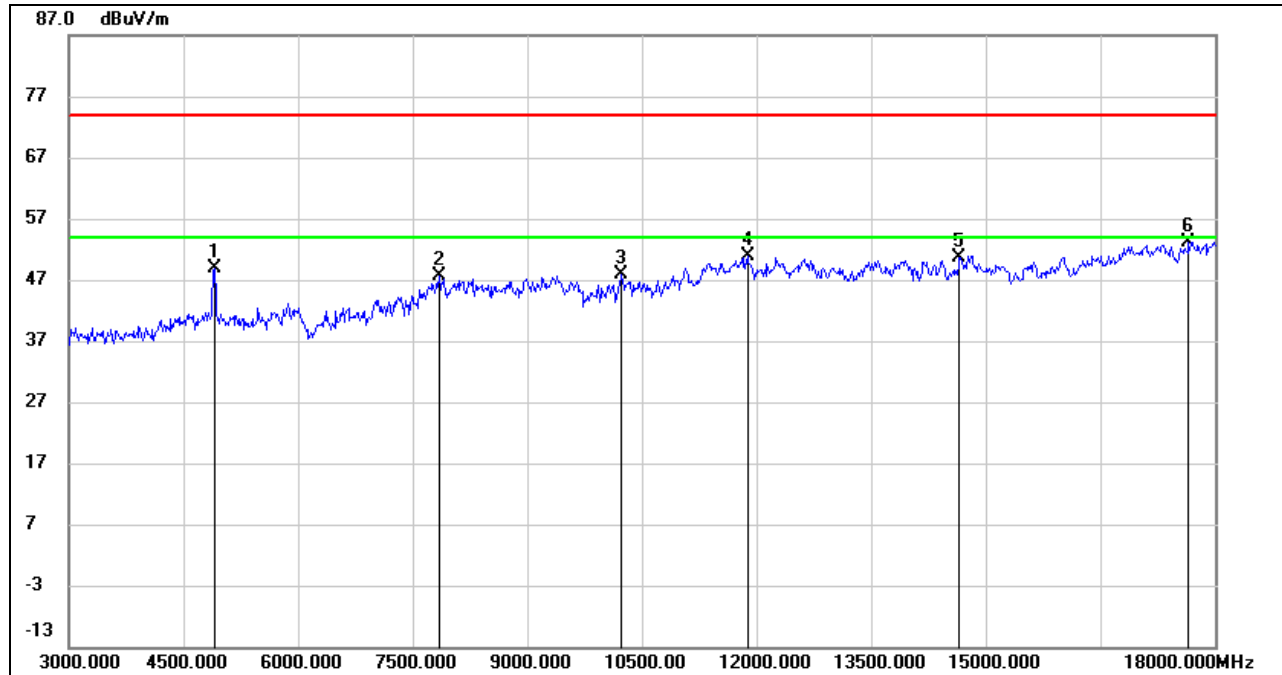
Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4905.000	47.65	1.33	48.98	74.00	-25.02	peak
2	7845.000	38.40	9.14	47.54	74.00	-26.46	peak
3	10230.000	36.27	11.58	47.85	74.00	-26.15	peak
4	11880.000	35.32	15.46	50.78	74.00	-23.22	peak
5	14655.000	33.21	17.54	50.75	74.00	-23.25	peak
6	17655.000	30.07	23.14	53.21	74.00	-20.79	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

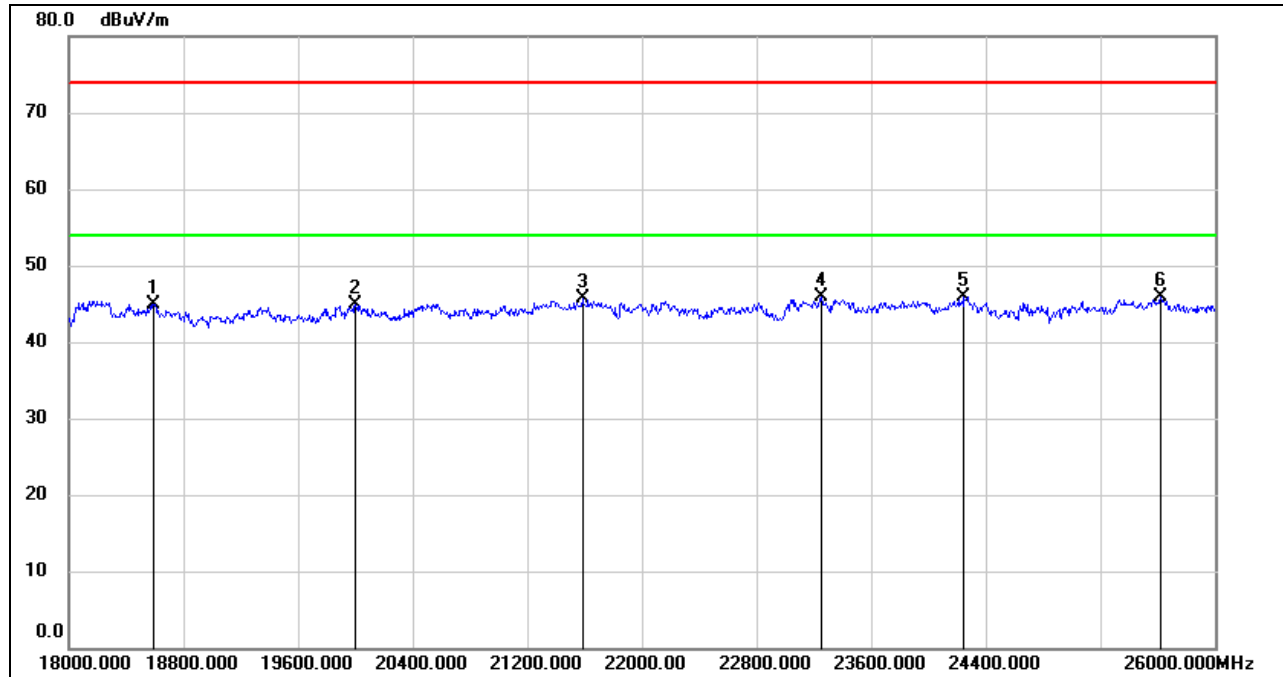
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

Note: All the modes and channels had been tested, but only the worst data was recorded in the report.

8.4. SPURIOUS EMISSIONS (18 GHz ~ 26 GHz)

8.4.1. 802.11n H20 MIMO MODE

SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)

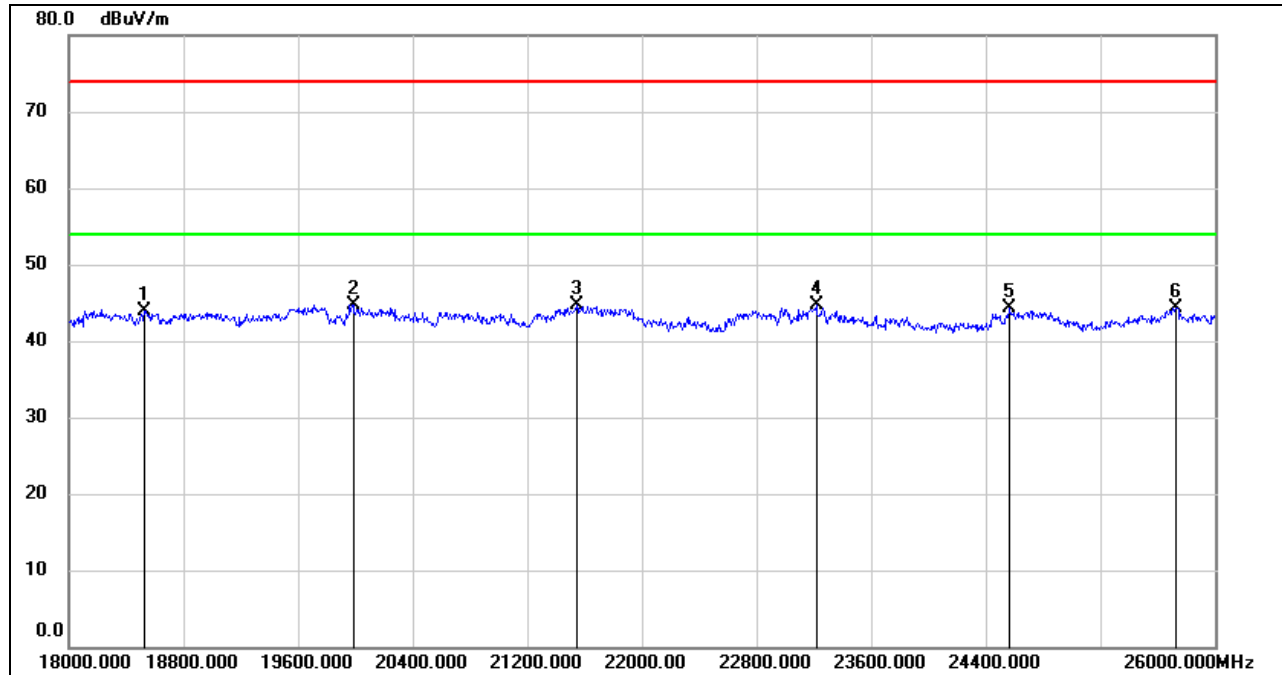


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18592.000	50.25	-5.31	44.94	74.00	-29.06	peak
2	20000.000	50.31	-5.45	44.86	74.00	-29.14	peak
3	21584.000	50.19	-4.56	45.63	74.00	-28.37	peak
4	23256.000	49.22	-3.35	45.87	74.00	-28.13	peak
5	24248.000	48.82	-2.83	45.99	74.00	-28.01	peak
6	25616.000	47.18	-1.24	45.94	74.00	-28.06	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

**SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18528.000	49.11	-5.26	43.85	74.00	-30.15	peak
2	19984.000	50.21	-5.44	44.77	74.00	-29.23	peak
3	21544.000	49.26	-4.63	44.63	74.00	-29.37	peak
4	23216.000	48.01	-3.38	44.63	74.00	-29.37	peak
5	24568.000	46.60	-2.33	44.27	74.00	-29.73	peak
6	25728.000	45.11	-0.72	44.39	74.00	-29.61	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

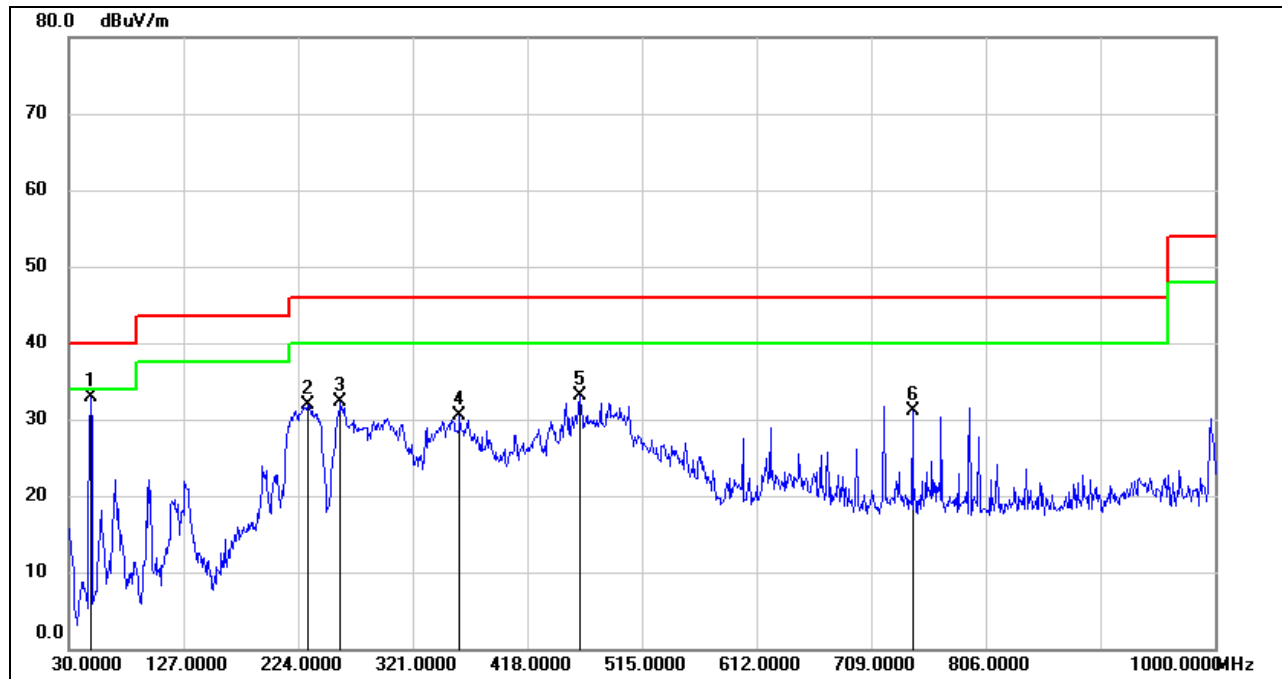
Note: All the modes and channels have been tested, but only the worst data was recorded in the report.



8.5. SPURIOUS EMISSIONS (30 MHz ~ 1 GHz)

8.5.1. 802.11n HT20 MIMO MODE

SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)

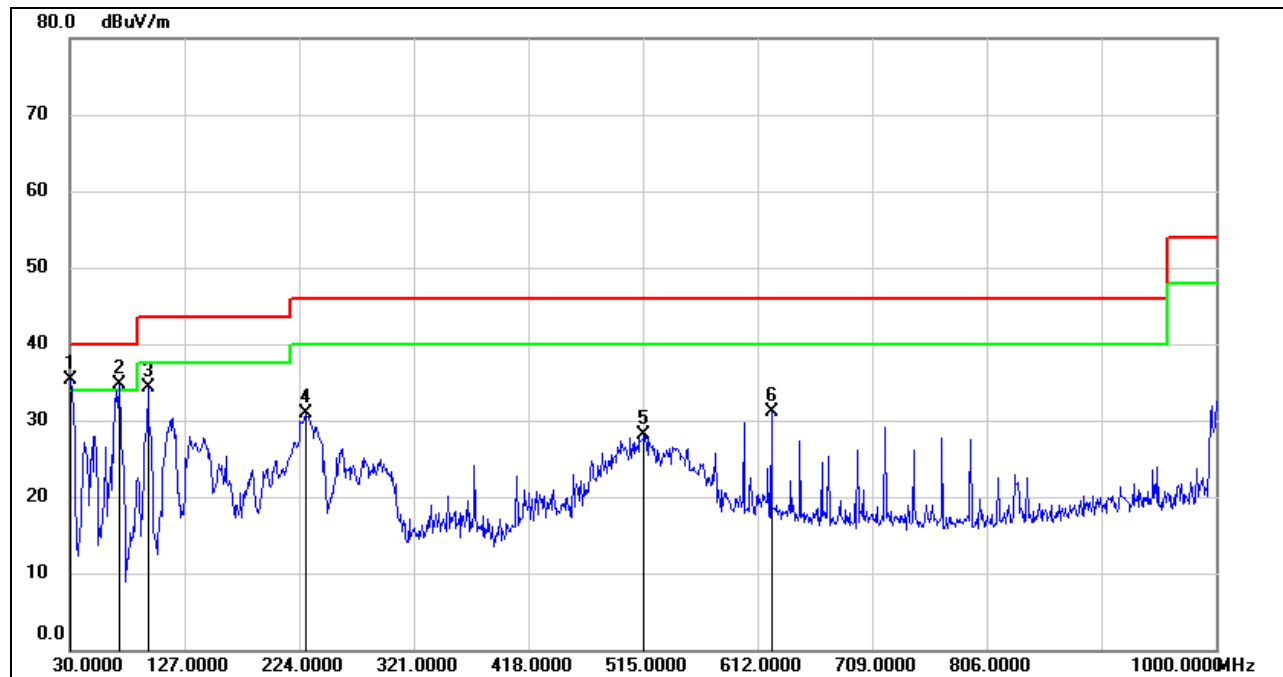


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	48.4300	53.54	-20.63	32.91	40.00	-7.09	QP
2	232.7300	50.60	-18.79	31.81	46.00	-14.19	QP
3	259.8900	50.89	-18.55	32.34	46.00	-13.66	QP
4	360.7700	44.57	-14.08	30.49	46.00	-15.51	QP
5	462.6200	45.22	-12.09	33.13	46.00	-12.87	QP
6	743.9200	38.93	-7.92	31.01	46.00	-14.99	QP

Note: 1. Result Level = Read Level + Correct Factor.

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

**SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.9700	54.25	-19.04	35.21	40.00	-4.79	QP
2	71.7100	55.44	-20.70	34.74	40.00	-5.26	QP
3	95.9600	55.82	-21.44	34.38	43.50	-9.12	QP
4	229.8200	49.53	-18.65	30.88	46.00	-15.12	QP
5	515.9699	39.20	-11.15	28.05	46.00	-17.95	QP
6	623.6400	40.46	-9.33	31.13	46.00	-14.87	QP

Note: 1. Result Level = Read Level + Correct Factor.

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto

Note: All the modes and channels have been tested, but only the worst data was recorded in the report.

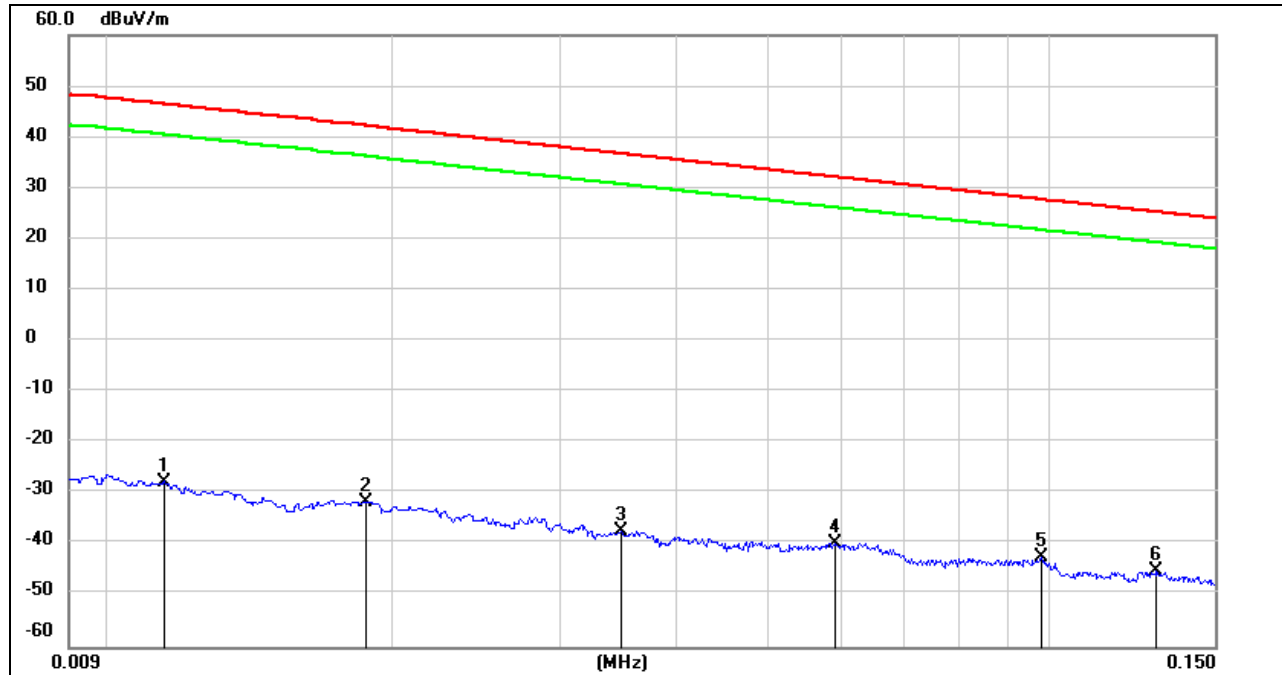


8.6. SPURIOUS EMISSIONS BELOW 30 MHz

8.6.1. 802.11n H20 MIMO MODE

SPURIOUS EMISSIONS (HIGH CHANNEL, LOOP ANTENNA FACE ON TO THE EUT, WORST-CASE CONFIGURATION)

9 kHz~ 150 kHz

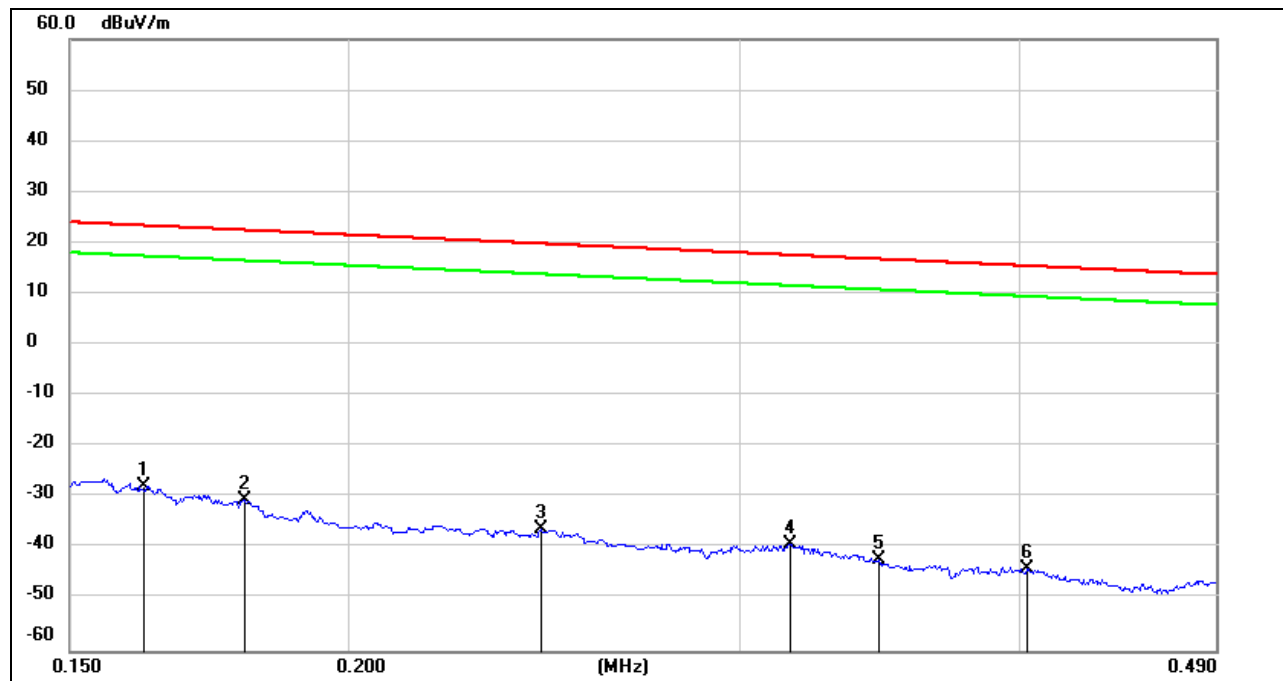


No.	Frequency	Reading	Correct	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.0114	73.50	-101.40	-27.9	46.46	-79.40	-5.04	-74.36	peak
2	0.0187	69.70	-101.35	-31.65	42.16	-83.15	-9.34	-73.81	peak
3	0.0349	64.03	-101.41	-37.38	36.75	-88.88	-14.75	-74.13	peak
4	0.0589	61.81	-101.52	-39.71	32.2	-91.21	-19.30	-71.91	peak
5	0.0981	59.27	-101.78	-42.51	27.77	-94.01	-23.73	-70.28	peak
6	0.1300	56.43	-101.70	-45.27	25.33	-96.77	-26.17	-70.60	peak

Note: 1. Measurement = Reading Level + Correct Factor

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

150 kHz ~ 490 kHz

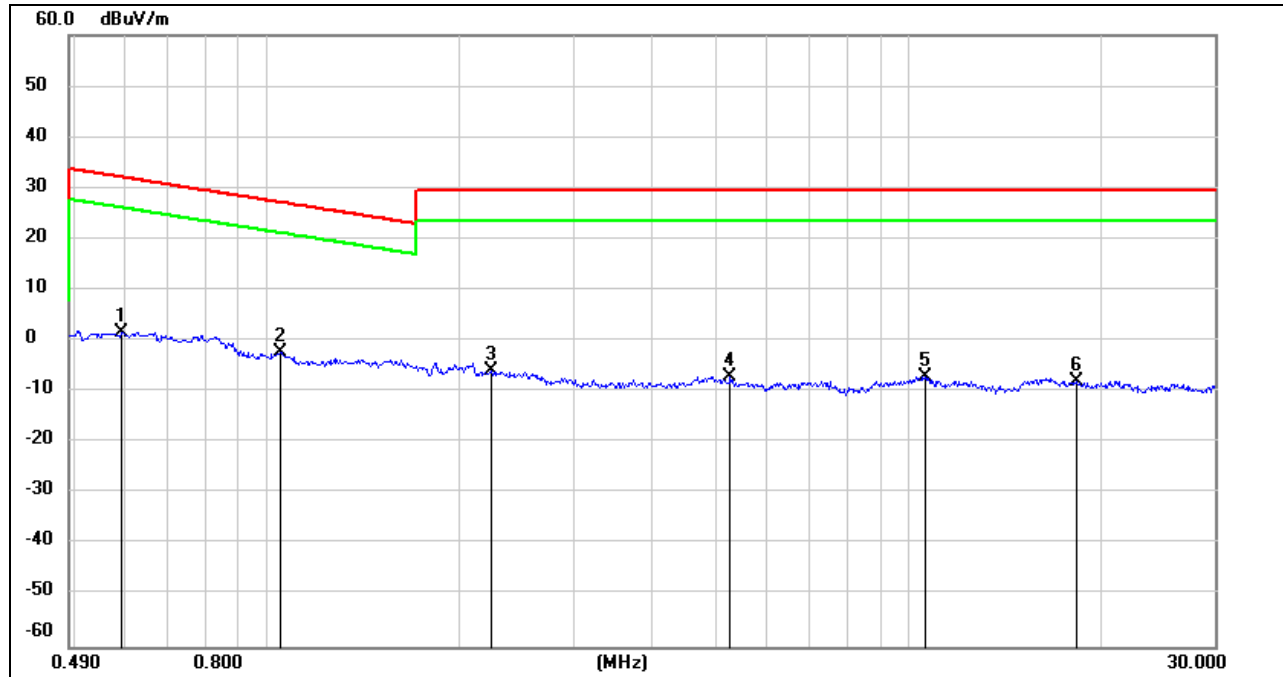
No.	Frequency	Reading	Correct	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.1621	73.92	-101.65	-27.73	23.41	-79.23	-28.09	-51.14	peak
2	0.1800	71.15	-101.68	-30.53	22.5	-82.03	-29.00	-53.03	peak
3	0.2442	65.53	-101.79	-36.26	19.85	-87.76	-31.65	-56.11	peak
4	0.3159	62.67	-101.87	-39.2	17.61	-90.70	-33.89	-56.81	peak
5	0.3462	59.74	-101.90	-42.16	16.81	-93.66	-34.69	-58.97	peak
6	0.4032	57.97	-101.96	-43.99	15.49	-95.49	-36.01	-59.48	peak

Note: 1. Measurement = Reading Level + Correct Factor

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

490 kHz ~ 30 MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	FCC Result (dBuV/m)	FCC Limit (dBuV/m)	ISED Result (dBuA/m)	ISED Limit (dBuA/m)	Margin (dB)	Remark
1	0.5917	63.74	-62.08	1.66	32.16	-49.84	-19.34	-30.50	peak
2	1.0443	60.03	-62.25	-2.22	27.23	-53.72	-24.27	-29.45	peak
3	2.2364	55.80	-61.76	-5.96	29.54	-57.46	-21.96	-35.50	peak
4	5.2705	54.54	-61.45	-6.91	29.54	-58.41	-21.96	-36.45	peak
5	10.6119	53.82	-60.82	-7	29.54	-58.50	-21.96	-36.54	peak
6	18.2545	52.93	-60.90	-7.97	29.54	-59.47	-21.96	-37.51	peak

Note: 1. Measurement = Reading Level + Correct Factor

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

Note: All the modes and channels had been tested, but only the worst data was recorded in the report.

9. AC POWER LINE CONDUCTED EMISSIONS

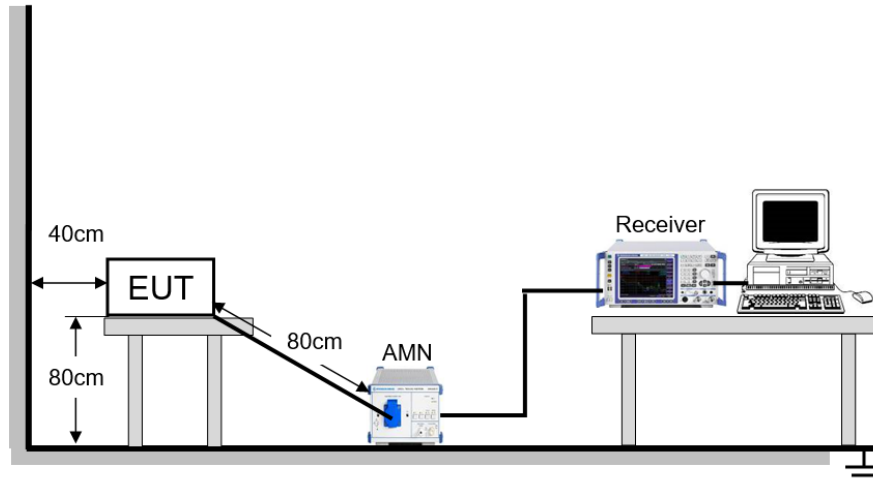
LIMITS

Please refer to CFR 47 FCC §15.207 (a).

FREQUENCY (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

TEST SETUP AND PROCEDURE

Refer to ANSI C63.10-2013 clause 6.2.



The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

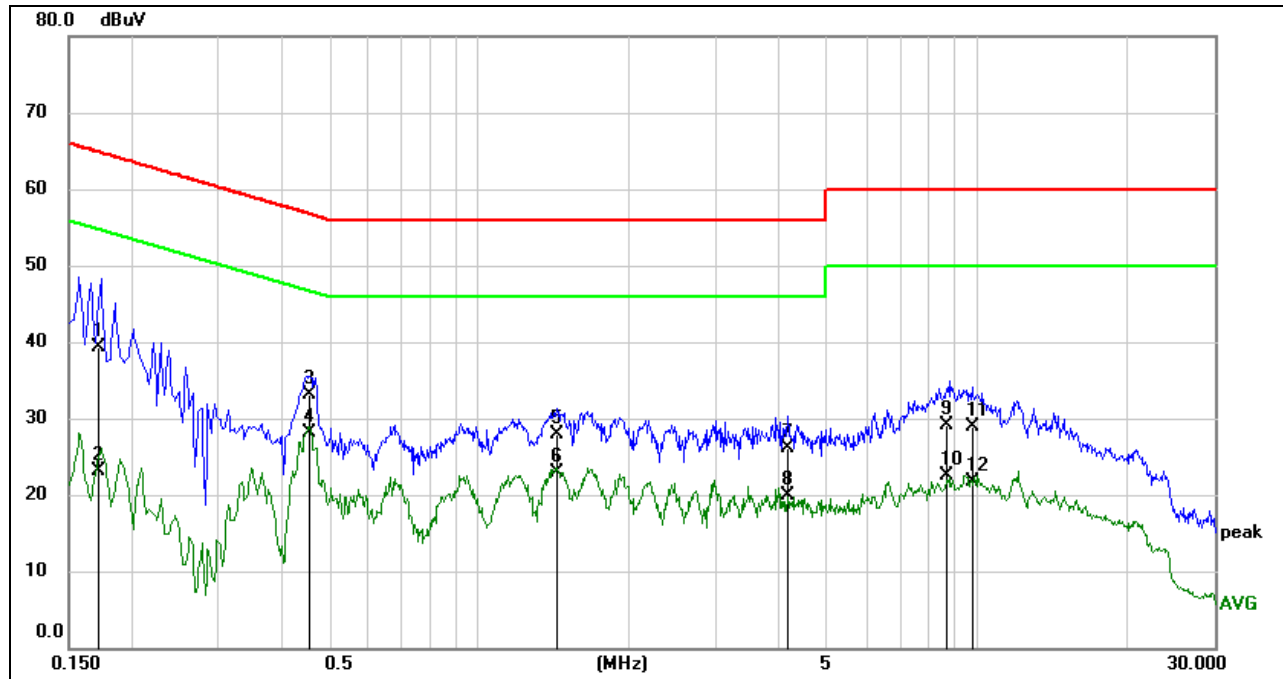
**TEST ENVIRONMENT**

Temperature	25.3 °C	Relative Humidity	65.3 %
Atmosphere Pressure	101 kPa	Test Voltage	AC120 V,60 Hz

RESULTS

9.1. 802.11n HT20 MIMO MODE

LINE L RESULTS (HIGH CHANNEL, WORST-CASE CONFIGURATION)



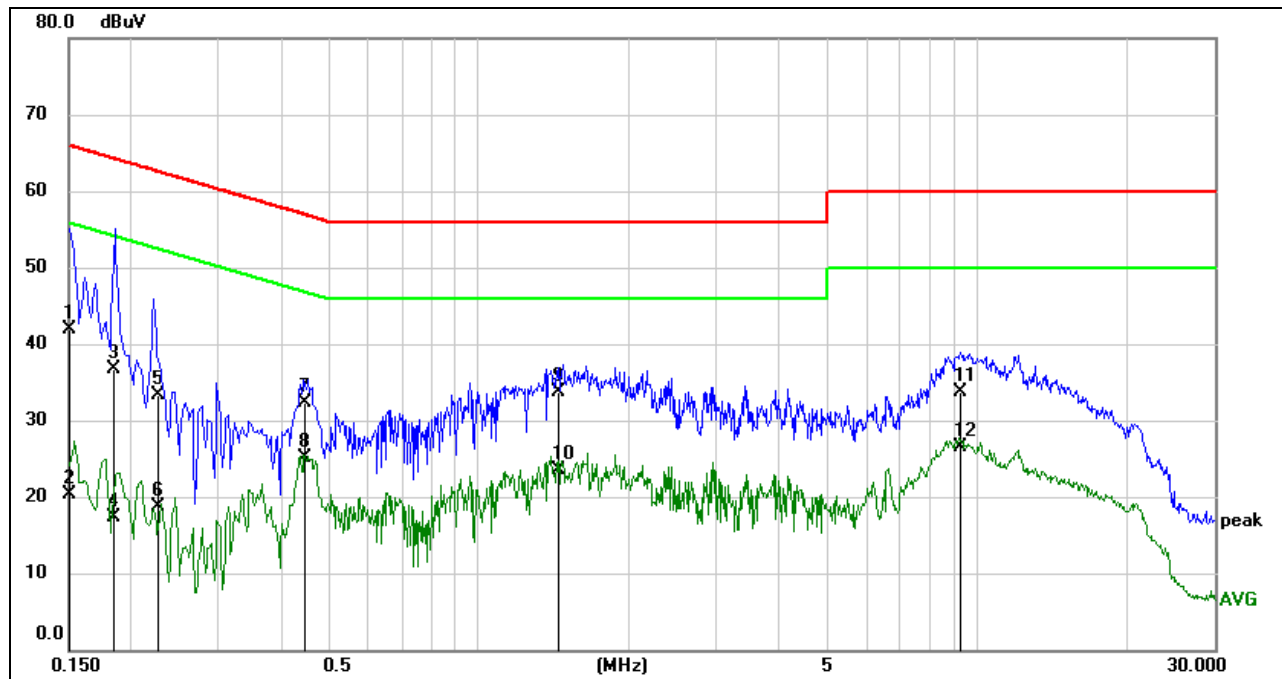
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1716	29.72	9.59	39.31	64.88	-25.57	QP
2	0.1716	13.53	9.59	23.12	54.88	-31.76	AVG
3	0.4575	23.60	9.60	33.20	56.74	-23.54	QP
4	0.4575	18.59	9.60	28.19	46.74	-18.55	AVG
5	1.4396	18.33	9.62	27.95	56.00	-28.05	QP
6	1.4396	13.28	9.62	22.90	46.00	-23.10	AVG
7	4.1596	16.54	9.60	26.14	56.00	-29.86	QP
8	4.1596	10.32	9.60	19.92	46.00	-26.08	AVG
9	8.7600	19.58	9.61	29.19	60.00	-30.81	QP
10	8.7600	12.82	9.61	22.43	50.00	-27.57	AVG
11	9.7999	19.27	9.62	28.89	60.00	-31.11	QP
12	9.7999	12.06	9.62	21.68	50.00	-28.32	AVG

Note: 1. Result = Reading +Correct Factor.

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).

4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

**LINE N RESULTS (HIGH CHANNEL, WORST-CASE CONFIGURATION)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1510	32.30	9.59	41.89	65.94	-24.05	QP
2	0.1510	10.75	9.59	20.34	55.94	-35.60	AVG
3	0.1842	27.12	9.59	36.71	64.29	-27.58	QP
4	0.1842	7.77	9.59	17.36	54.29	-36.93	AVG
5	0.2269	23.67	9.59	33.26	62.56	-29.30	QP
6	0.2269	9.04	9.59	18.63	52.56	-33.93	AVG
7	0.4498	22.77	9.60	32.37	56.88	-24.51	QP
8	0.4498	15.59	9.60	25.19	46.88	-21.69	AVG
9	1.4400	24.15	9.62	33.77	56.00	-22.23	QP
10	1.4400	13.87	9.62	23.49	46.00	-22.51	AVG
11	9.2798	24.06	9.62	33.68	60.00	-26.32	QP
12	9.2798	16.94	9.62	26.56	50.00	-23.44	AVG

Note: 1. Result = Reading +Correct Factor.

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).

4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

Note: All the modes and channels have been tested, but only the worst data was recorded in the report.



10. ANTENNA REQUIREMENTS

APPLICABLE REQUIREMENTS

Please refer to FCC §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Please refer to FCC §15.247(b)(4)

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RESULTS

Complies



11. Appendix

11.1. Appendix A: DTS Bandwidth

11.1.1. Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	10.120	2406.920	2417.040	0.5	PASS
	Ant2	2412	10.120	2406.960	2417.080	0.5	PASS
	Ant1	2437	10.160	2431.920	2442.080	0.5	PASS
	Ant2	2437	10.160	2431.920	2442.080	0.5	PASS
	Ant1	2462	9.640	2456.960	2466.600	0.5	PASS
	Ant2	2462	10.080	2456.960	2467.040	0.5	PASS
11G	Ant1	2412	16.440	2403.800	2420.240	0.5	PASS
	Ant2	2412	16.440	2403.800	2420.240	0.5	PASS
	Ant1	2437	16.440	2428.760	2445.200	0.5	PASS
	Ant2	2437	16.480	2428.760	2445.240	0.5	PASS
	Ant1	2462	16.400	2453.800	2470.200	0.5	PASS
	Ant2	2462	16.440	2453.760	2470.200	0.5	PASS
11N20MIMO	Ant1	2412	17.640	2403.200	2420.840	0.5	PASS
	Ant2	2412	17.640	2403.200	2420.840	0.5	PASS
	Ant1	2437	17.600	2428.200	2445.800	0.5	PASS
	Ant2	2437	17.680	2428.160	2445.840	0.5	PASS
	Ant1	2462	17.640	2453.160	2470.800	0.5	PASS
	Ant2	2462	17.680	2453.160	2470.840	0.5	PASS
11N40MIMO	Ant1	2422	35.840	2404.000	2439.840	0.5	PASS
	Ant2	2422	36.320	2403.920	2440.240	0.5	PASS
	Ant1	2437	36.080	2418.760	2454.840	0.5	PASS
	Ant2	2437	36.000	2419.000	2455.000	0.5	PASS
	Ant1	2452	35.760	2434.080	2469.840	0.5	PASS
	Ant2	2452	36.240	2433.760	2470.000	0.5	PASS



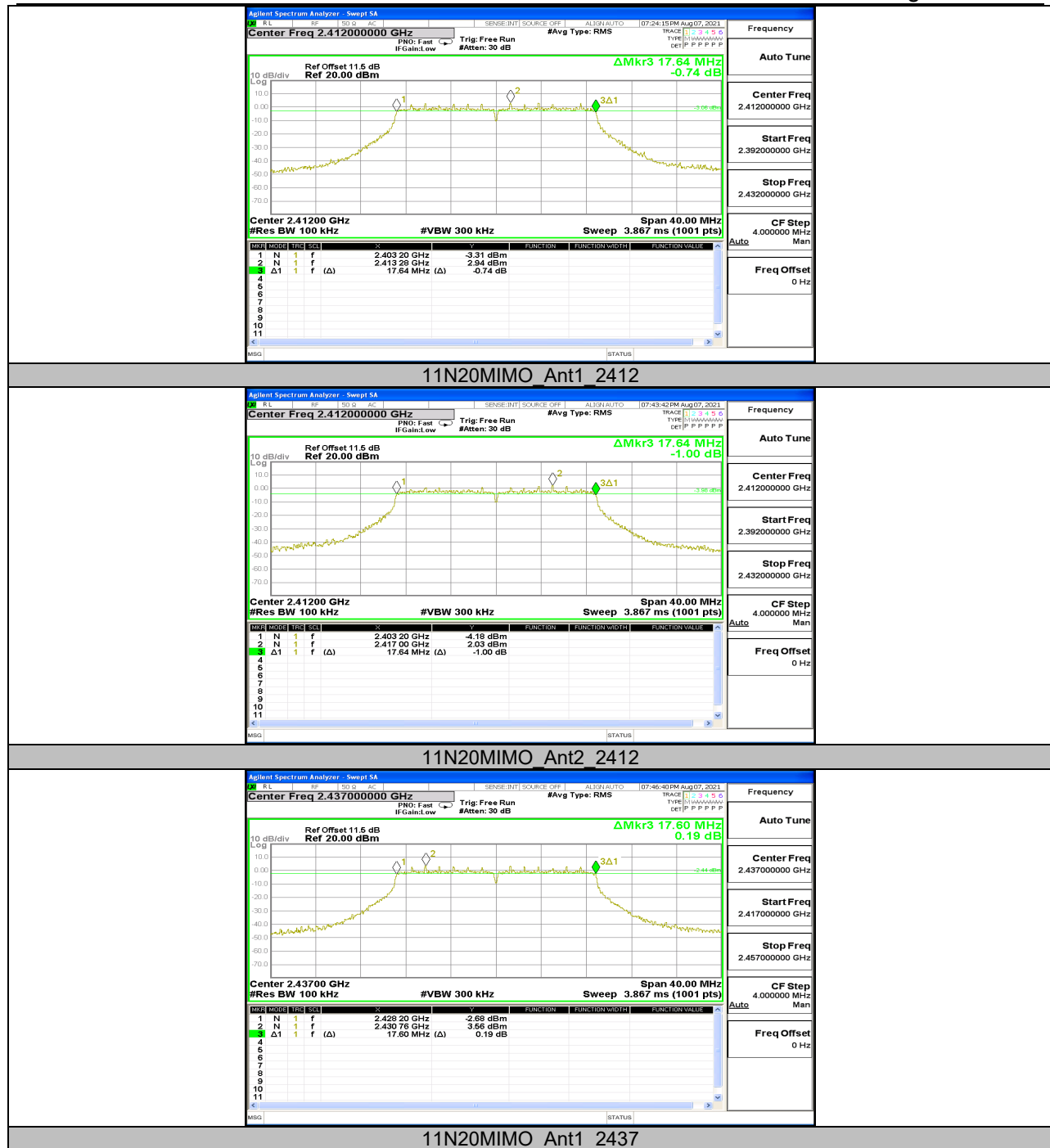
11.1.2. Test Graphs

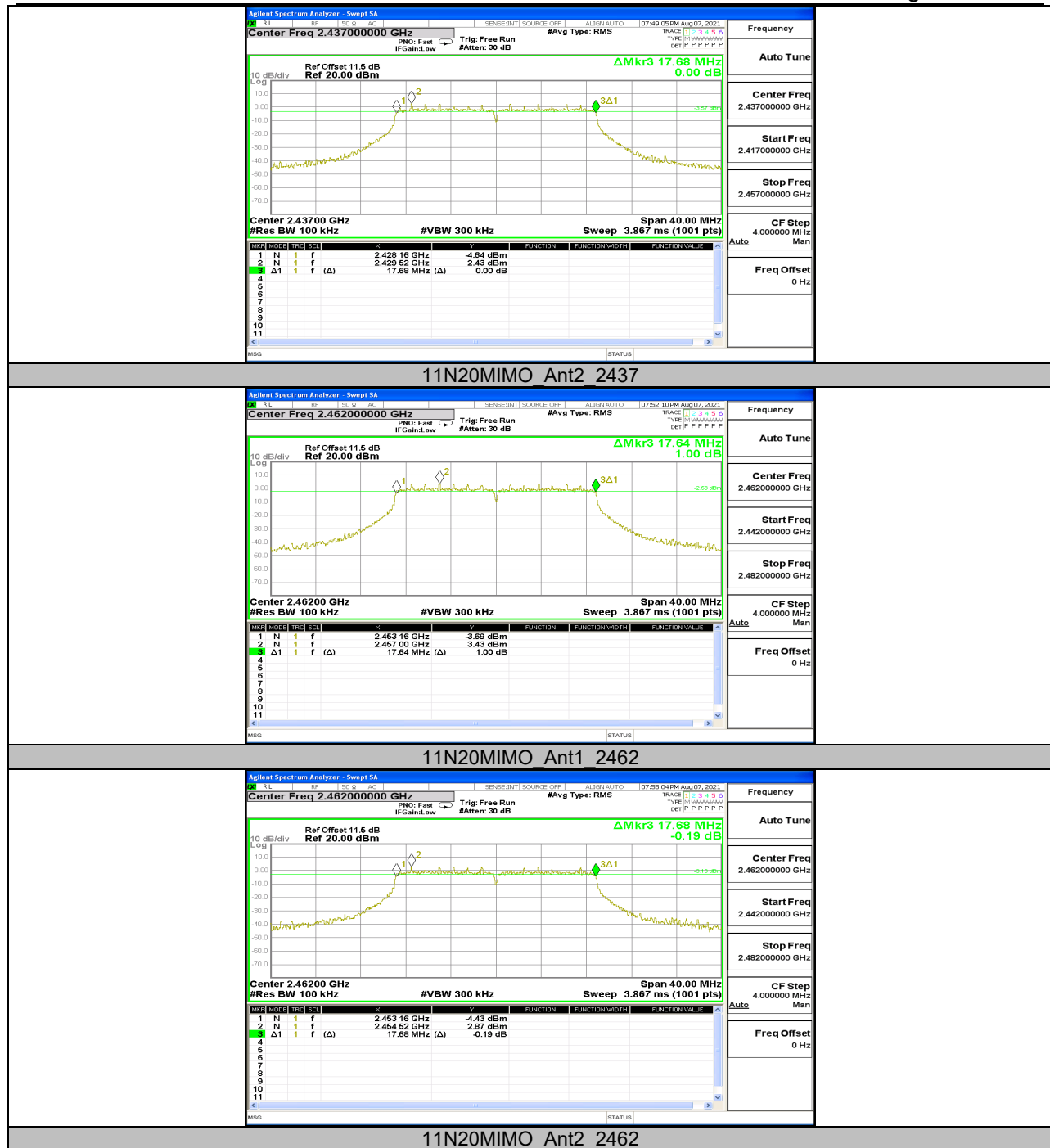
















11.2. Appendix B: Occupied Channel Bandwidth

11.2.1. Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Verdict
11B	Ant1	2412	15.017	2404.479	2419.496	PASS
	Ant2	2412	15.037	2404.437	2419.474	PASS
	Ant1	2437	15.012	2429.475	2444.487	PASS
	Ant2	2437	15.039	2429.440	2444.479	PASS
	Ant1	2462	15.021	2454.461	2469.482	PASS
	Ant2	2462	15.036	2454.436	2469.472	PASS
11G	Ant1	2412	17.198	2403.398	2420.596	PASS
	Ant2	2412	17.216	2403.434	2420.650	PASS
	Ant1	2437	17.110	2428.465	2445.575	PASS
	Ant2	2437	17.067	2428.493	2445.560	PASS
	Ant1	2462	17.222	2453.399	2470.621	PASS
	Ant2	2462	16.944	2453.556	2470.500	PASS
11N20MIMO	Ant1	2412	18.222	2402.951	2421.173	PASS
	Ant2	2412	18.252	2402.893	2421.145	PASS
	Ant1	2437	18.194	2427.855	2446.049	PASS
	Ant2	2437	18.243	2427.834	2446.077	PASS
	Ant1	2462	18.107	2452.936	2471.043	PASS
	Ant2	2462	18.152	2452.916	2471.068	PASS
11N40MIMO	Ant1	2422	36.137	2403.967	2440.104	PASS
	Ant2	2422	36.223	2403.915	2440.138	PASS
	Ant1	2437	36.195	2418.934	2455.129	PASS
	Ant2	2437	36.264	2418.893	2455.157	PASS
	Ant1	2452	36.129	2433.933	2470.062	PASS
	Ant2	2452	36.254	2433.886	2470.140	PASS



11.2.2. Test Graphs

















**11.3. Appendix C: Maximum conducted output power****11.3.1. Test Result**

Test Mode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	13.76	<=30	PASS
	Ant2	2412	12.84	<=30	PASS
	Ant1	2437	13.67	<=30	PASS
	Ant2	2437	12.76	<=30	PASS
	Ant1	2462	13.51	<=30	PASS
	Ant2	2462	12.48	<=30	PASS
11G	Ant1	2412	14.22	<=30	PASS
	Ant2	2412	13.66	<=30	PASS
	Ant1	2437	14.04	<=30	PASS
	Ant2	2437	12.93	<=30	PASS
	Ant1	2462	13.77	<=30	PASS
	Ant2	2462	12.83	<=30	PASS
11N20MIMO	Ant1	2412	13.76	<=30	PASS
	Ant2	2412	12.69	<=30	PASS
	total	2412	16.27	<=30	PASS
	Ant1	2437	14.11	<=30	PASS
	Ant2	2437	12.91	<=30	PASS
	total	2437	16.56	<=30	PASS
	Ant1	2462	14.17	<=30	PASS
	Ant2	2462	13.44	<=30	PASS
11N40MIMO	total	2462	16.83	<=30	PASS
	Ant1	2422	12.32	<=30	PASS
	Ant2	2422	10.79	<=30	PASS
	total	2422	14.63	<=30	PASS
	Ant1	2437	12.07	<=30	PASS
	Ant2	2437	10.73	<=30	PASS
	total	2437	14.46	<=30	PASS
	Ant1	2452	12.17	<=30	PASS
	Ant2	2452	10.76	<=30	PASS
	total	2452	14.53	<=30	PASS

Note: 1. Conducted Power=Meas. Level+ Correction Factor

2. The Duty Cycle Factor (refer to section 7.1) had already compensated to the test data.

11.4. Appendix D: Maximum power spectral density

11.4.1. Test Result

TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-8.33	≤8	PASS
		2437	-8.79	≤8	PASS
		2462	-9.77	≤8	PASS
11G	Ant1	2412	-9.87	≤8	PASS
		2437	-11.12	≤8	PASS
		2462	-11.92	≤8	PASS
11N20MIMO	Ant1	2412	-11.21	≤8	PASS
	Ant2	2412	-12.16	≤8	PASS
	total	2412	-8.65	≤8	PASS
	Ant1	2437	-10.68	≤8	PASS
	Ant2	2437	-11.81	≤8	PASS
	total	2437	-8.20	≤8	PASS
	Ant1	2462	-10.51	≤8	PASS
	Ant2	2462	-10.52	≤8	PASS
	total	2462	-7.50	≤8	PASS
11N40MIMO	Ant1	2422	-12.36	≤8	PASS
	Ant2	2422	-13.79	≤8	PASS
	total	2422	-10.01	≤8	PASS
	Ant1	2437	-13.6	≤8	PASS
	Ant2	2437	-14.9	≤8	PASS
	total	2437	-11.19	≤8	PASS
	Ant1	2452	-13.52	≤8	PASS
	Ant2	2452	-14.46	≤8	PASS
	total	2452	-10.95	≤8	PASS

Note: For 802.11b & g modes, both antennas had been tested, only the worst data was recorded in the report.