CFR 47 FCC PART 15 SUBPART C
ISED RSS-247 ISSUE 2

CERTIFICATION TEST REPORT

For

WiFi Module

MODEL NUMBER: SI06

FCC ID: 2AFG6-SI06

IC: 22166-SI06

REPORT NUMBER: 4789609364.2-4

ISSUE DATE: November 12, 2020

Prepared for

Guangzhou Shirui Electronics Co Ltd
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Prepared by

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	11/12/2020	Initial Issue	

Summary of Test Results			
Clause	**Test Items**	**FCC/ISED Rules**	**Test Results**
1	6dB Bandwidth and 99% Occupied Bandwidth	FCC Part 15.247 (a) (2) RSS-247 Clause 5.2 (a) ISED RSS-Gen Clause 6.7	Pass
2	Conducted Output Power	FCC Part 15.247 (b) (3) RSS-247 Clause 5.4 (d)	Pass
3	Power Spectral Density	FCC Part 15.247 (e) RSS-247 Clause 5.2 (b)	Pass
4	Conducted Bandedge and Spurious Emission	FCC Part 15.247 (d) RSS-247 Clause 5.5	Pass
5	Radiated Bandedge and Spurious Emission	FCC Part 15.247 (d) FCC Part 15.209 FCC Part 15.205 RSS-247 Clause 5.5 RSS-GEN Clause 8.9	Pass
6	Conducted Emission Test for AC Power Port	FCC Part 15.207 RSS-GEN Clause 8.8	Pass
7	Antenna Requirement	FCC Part 15.203 RSS-GEN Clause 6.8	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:	Guangzhou Shirui Electronics Co Ltd
Address:	192 Kezhu Road, Scientech Park, guangzhou Economic Technology Development District Guangzhou China

Manufacturer Information

Company Name:	Guangzhou Shirui Electronics Co Ltd
Address:	192 Kezhu Road, Scientech Park, guangzhou Economic Technology Development District Guangzhou China

EUT Information

EUT Name:	WiFi Module
Model:	SI06
Sample Received Date:	August 27, 2020
Sample Status:	Normal
Sample ID:	3283003
Date of Tested:	August 27, 2020~ November 12, 2020

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 FCC PART 15 SUBPART C	PASS
ISED RSS-247 Issue 2	PASS
ISED RSS-GEN Issue 5	PASS

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Laboratory Manager

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, ANSI C63.10-2013, ISED RSS-247 Issue 2 and ISED RSS-GEN Issue 5.

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 Delcaration 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. The Company Number is 21320. **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

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)
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	WiFi Module		
Model	SI06		
Radio Technology	WLAN (IEEE 802.11b/g/n HT20/n 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, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT40: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)		
Power Supply	DC State	Rate Input:	DC 12 V
Wireless Module	SKI.WB8821CU.1		

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)	Maximum AVG EIRP (dBm)
b	2412 ~ 2462	1-11[11]	16.91	20.41
g	2412 ~ 2462	1-11[11]	15.27	18.77
n HT20	2412 ~ 2462	1-11[11]	14.35	17.85
n HT40	2422 ~ 2452	3-9[7]	14.18	17.68

5.4. TEST CHANNEL CONFIGURATION

IEEE Std. 802.11	Test Channel Number	Frequency
b	CH 1(Low Channel), CH 6(MID Channel), CH 11(High Channel)	2412 MHz, 2437 MHz, 2462 MHz
g	CH 1(Low Channel), CH 6(MID Channel), CH 11(High Channel)	2412 MHz, 2437 MHz, 2462 MHz
n HT20	CH 1(Low Channel), CH 6(MID Channel), CH 11(High Channel)	2412 MHz, 2437 MHz, 2462 MHz
n HT40	CH 3(Low Channel), CH 6(MID Channel), CH 9(High Channel)	2422 MHz, 2437 MHz, 2452 MHz

5.5. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band							
Test Software		MPtool					
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	default	default	default	/		
802.11g	1	default	default	default			
802.11n HT20	1	default	default	default			
802.11n HT40	1	/			default	default	default

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:

IEEE 802.11b / SISO – DBPSK / 1 Mbps
IEEE 802.11g / SISO – BPSK / 6 Mbps
IEEE 802.11n HT20 / SISO – BPSK / MCS0
IEEE 802.11n HT40 / SISO – BPSK / MCS0

Note: The EUT have two wireless modules, one is called module SKI.W7613E.1 and the other one called module SKI.WB8821CU.1.

Simultaneously transmission condition.

Condition	Technology				Support (YES/NO)
1 (Module SKI.W7613E.1)	WLAN(5G)				NO
2 (Module SKI.WB8821CU.1)	BT	BLE	WLAN(2.4G)	WLAN(5G)	NO

Co-Location condition.

Condition	Technology (Module SKI.W7613E.1)	Technology (Module SKI.WB8821CU.1)	Support (YES/NO)
1	WLAN (5G)	BT	YES
2	WLAN (5G)	BLE	YES
3	WLAN (5G)	WLAN (2.4G)	YES
4	WLAN (5G)	WLAN (5G)	YES

For the Co-Location test result please refer to test report 4789609364.2-16.

5.7. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna	Frequency (MHz)	Antenna Type	MAX Antenna Gain (dBi)
1	2412-2462	FPC antenna	3.50

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

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

5.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	P/N
1	PC	SEEWO	MT51A	MT51I14SI-2SD191007519XAG0006

Note: The PC was provided by the customer.

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	Ribbon cable	/	/	1.0	/

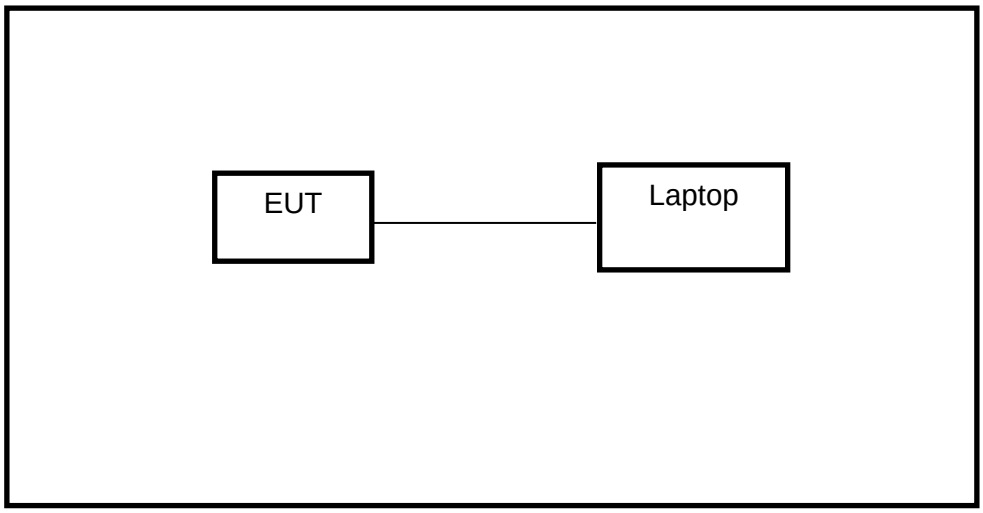
ACCESSORIES

Item	Accessory	Brand Name	Model Name	Description
/	/	/	/	/

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						
Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	EMI Test Receiver	R&S	ESR3	101961	Dec.05,2019	Dec.05,2020
☑	Two-Line V-Network	R&S	ENV216	101983	Dec.05,2019	Dec.05,2020
Software						
Used	Description			Manufacturer	Name	Version
☑	Test Software for Conducted disturbance			Farad	EZ-EMC	Ver. UL-3A1
Radiated Emissions						
Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Dec.06,2019	Dec.05,2020
☑	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Sep.17,2018	Sep.17,2021
☑	Preamplifier	HP	8447D	2944A09099	Dec.05,2019	Dec.05,2020
☑	EMI Measurement Receiver	R&S	ESR26	101377	Dec.05,2019	Dec.05,2020
☑	Horn Antenna	TDK	HRN-0118	130939	Sep.17,2018	Sep.17,2021
☑	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Aug.11,2018	Aug.11,2021
☑	Preamplifier	TDK	PA-02-0118	TRS-305-00067	Dec.05,2019	Dec.05,2020
☑	Preamplifier	TDK	PA-02-2	TRS-307-00003	Dec.05,2019	Dec.05,2020
☑	Loop antenna	Schwarzbeck	1519B	00008	Jan.07,2019	Jan.07,2022
☑	High Pass Filter	Wi	WHKX10-2700-3000-18000-40SS	23	Dec.05,2019	Dec.05,2020
Software						
Used	Description			Manufacturer	Name	Version
☑	Test Software for Radiated disturbance			Farad	EZ-EMC	Ver. UL-3A1
Other instruments						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	Spectrum Analyzer	Keysight	N9030A	MY55410512	Dec.06,2019	Dec.05,2020
☑	Power sensor, Power Meter	R&S	OSP120	100921	Dec.06,2019	Dec.06,2020

7. ANTENNA PORT TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

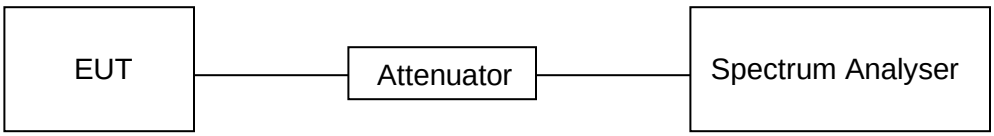
LIMITS

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	22.8 °C	Relative Humidity	67.3 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 12 V

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 ISED RSS-247 ISSUE 2			
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.

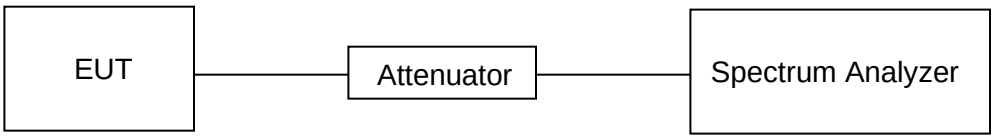
Connect the EUT to the spectrum analyser and use the following settings:

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: ≥3 × RBW For 99 % Occupied Bandwidth: ≥3 × 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	22.8 °C	Relative Humidity	67.3 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 12 V

RESULTS

Please refer to appendix A & B.

7.3. CONDUCTED OUTPUT POWER

LIMITS

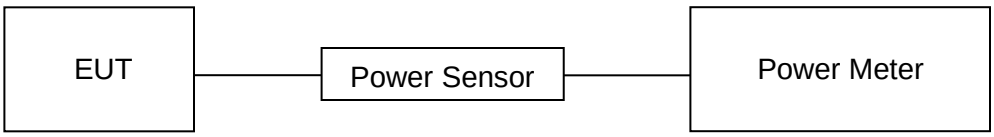
CFR 47 FCC Part15 (15.247) Subpart C ISED RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247(b)(3) ISED RSS-247 5.4 (d)	Conducted Output Power	1 watt or 30 dBm	2400-2483.5

TEST PROCEDURE

Refer to ANSI C63.10-2013 clause 11.9.

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	22.8 °C	Relative Humidity	67.3 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 12 V

RESULTS

Please refer to appendix C.

7.4. POWER SPECTRAL DENSITY

LIMITS

CFR 47 FCC Part15 (15.247) Subpart C ISED RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC §15.247 (e) ISED RSS-247 5.2 (b)	Power Spectral Density	8 dBm/3 kHz	2400-2483.5

TEST PROCEDURE

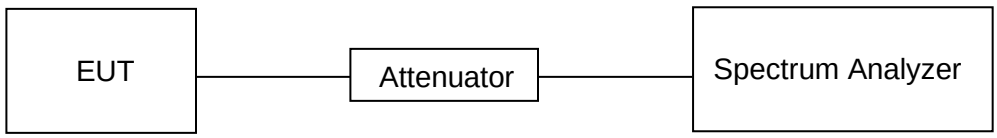
Refer to ANSI C63.10-2013 clause 11.10.

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 kHz ≤ RBW ≤ 100 kHz
VBW	≥3 × 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	22.8 °C	Relative Humidity	67.3 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 12 V

RESULTS

Please refer to appendix D.

7.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

LIMITS

CFR 47 FCC Part15 (15.247) Subpart C ISED RSS-247 ISSUE 2		
Section	Test Item	Limit
CFR 47 FCC §15.247 (d) ISED RSS-247 5.5	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:

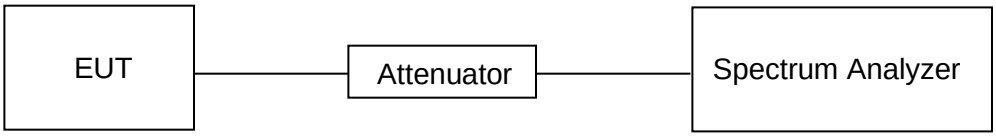
Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	100 kHz
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

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	≥3 × RBW
measurement points	≥span/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	22.8 °C	Relative Humidity	67.3 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 12 V

RESULTS

Please refer to appendix E & F.

8. RADIATED TEST RESULTS

LIMITS

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

Please refer to ISED RSS-GEN Clause 8.9 and Clause 8.10.

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

ISED General field strength limits at frequencies below 30 MHz

Table 6 – General field strength limits at frequencies below 30 MHz

Frequency	Magnetic field strength (H-Field) (µA/m)	Measurement distance (m)
9 - 490 kHz[Note 1]	6.37/F (F in kHz)	300
490 - 1705 kHz	63.7/F (F in kHz)	30
1.705 - 30 MHz	0.08	30

Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

ISED Restricted bands please refer to ISED RSS-GEN Clause 8.10

Table 7 – Restricted frequency bands[Note 1]		
MHz	MHz	GHz
0.090 - 0.110	149.9 - 150.05	9.0 - 9.2
0.495 - 0.505	156.52475 - 156.52525	9.3 - 9.5
2.1735 - 2.1905	156.7 - 156.9	10.6 - 12.7
3.020 - 3.026	162.0125 - 167.17	13.25 - 13.4
4.125 - 4.128	167.72 - 173.2	14.47 - 14.5
4.17725 - 4.17775	240 – 285	15.35 - 16.2
4.20725 - 4.20775	322 - 335.4	17.7 - 21.4
5.677 - 5.683	399.9 - 410	22.01 - 23.12
6.215 - 6.218	608 - 614	23.6 - 24.0
6.26775 - 6.26825	960 - 1427	31.2 - 31.8
6.31175 - 6.31225	1435 - 1626.5	36.43 - 36.5
8.291 - 8.294	1645.5 - 1646.5	Above 38.6
8.362 - 8.366	1660 - 1710	
8.37625 - 8.38675	1718.8 - 1722.2	
8.41425 - 8.41475	2200 - 2300	
12.29 - 12.293	2310 - 2390	
12.51975 - 12.52025	2483.5 - 2500	
12.57675 - 12.57725	2655 - 2900	
13.36 - 13.41	3260 – 3267	
16.42 - 16.423	3332 - 3339	
16.69475 - 16.69525	3345.8 - 3358	
16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	5350 - 5460	
73 - 74.6	7250 - 7750	
74.8 - 75.2	8025 – 8500	
108 – 138		

Note 1: Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

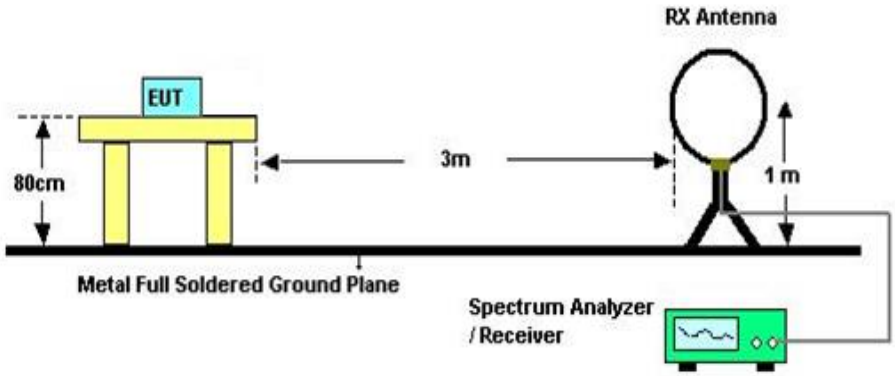
FCC Restricted bands of operation refer to FCC §15.205 (a):

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: [1]Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2]Above 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 11.11.

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.

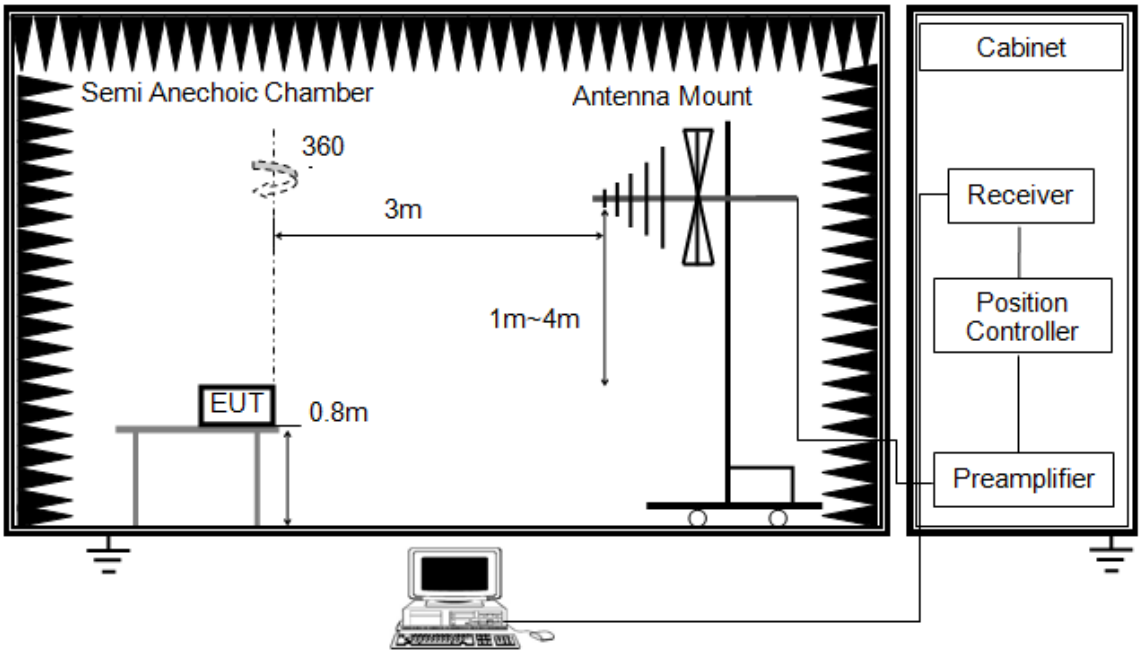
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1 m height antenna tower.

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 30 m 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.

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 11.11.

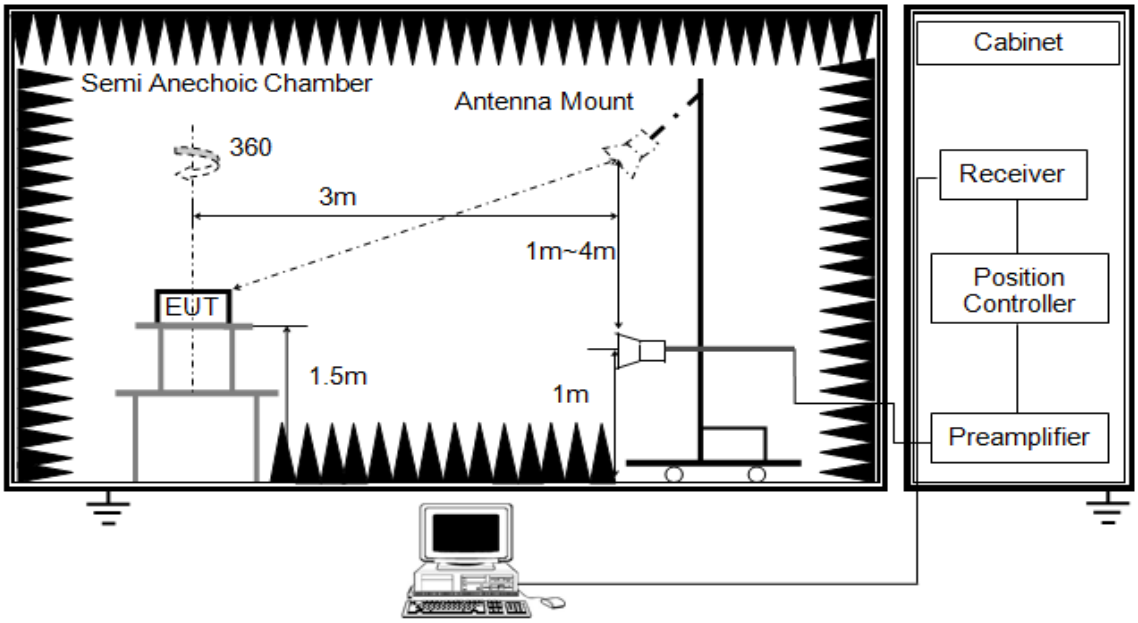
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations 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 11.11 and 11.12.

2. The EUT was arranged to its worst case and then tune the antenna tower (1.5 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.

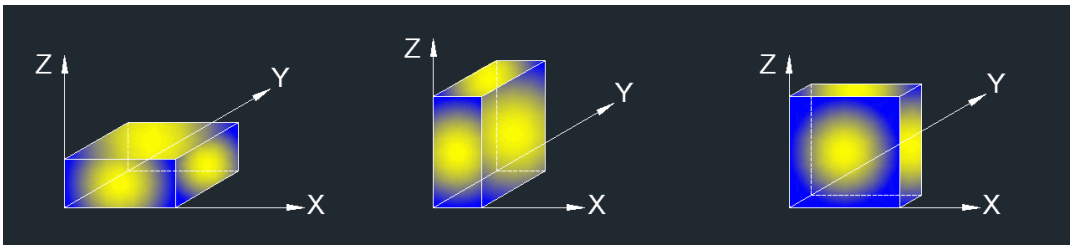
3. The EUT was placed on a turntable with 1.5 m above ground.

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.

Note 2: The EUT was fully exercised with external accessories during the test. In the case of multiple accessory external ports, an external accessory shall be connected to one of each type of port.

TEST ENVIRONMENT

Temperature	23.5 °C	Relative Humidity	58 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 12 V

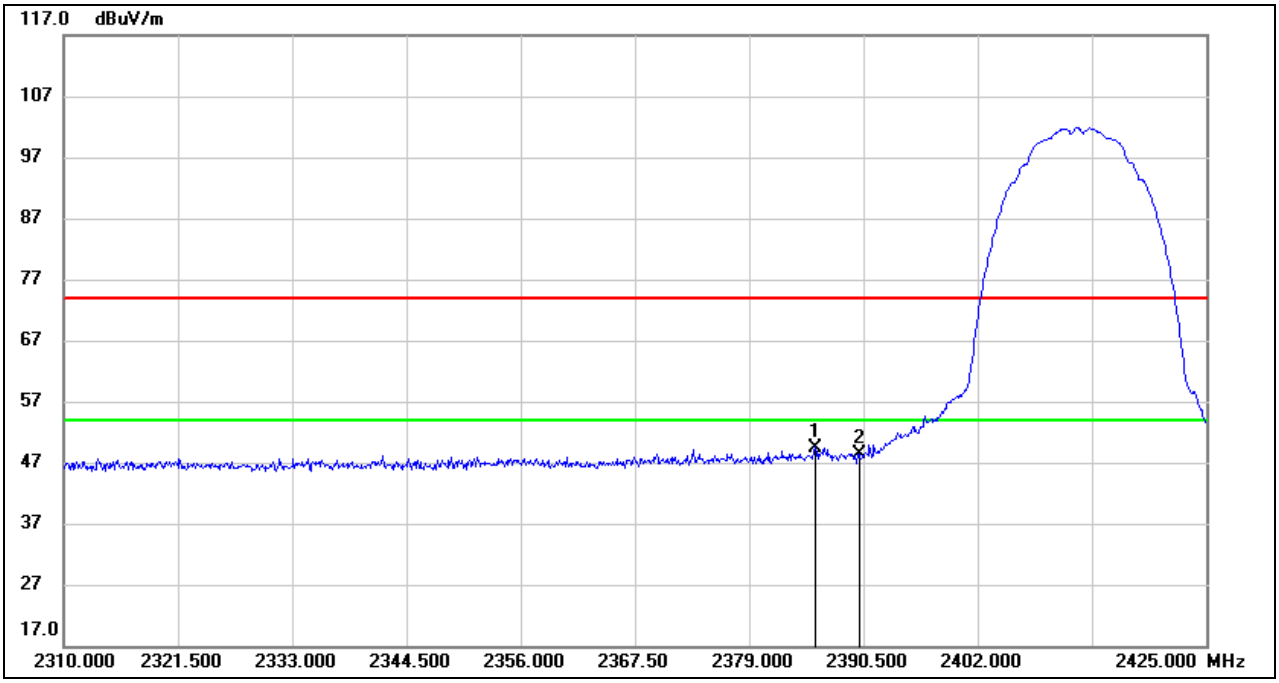
RESULTS

8.1. RESTRICTED BANDEDGE

8.1.1. 802.11b MODE

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

PEAK

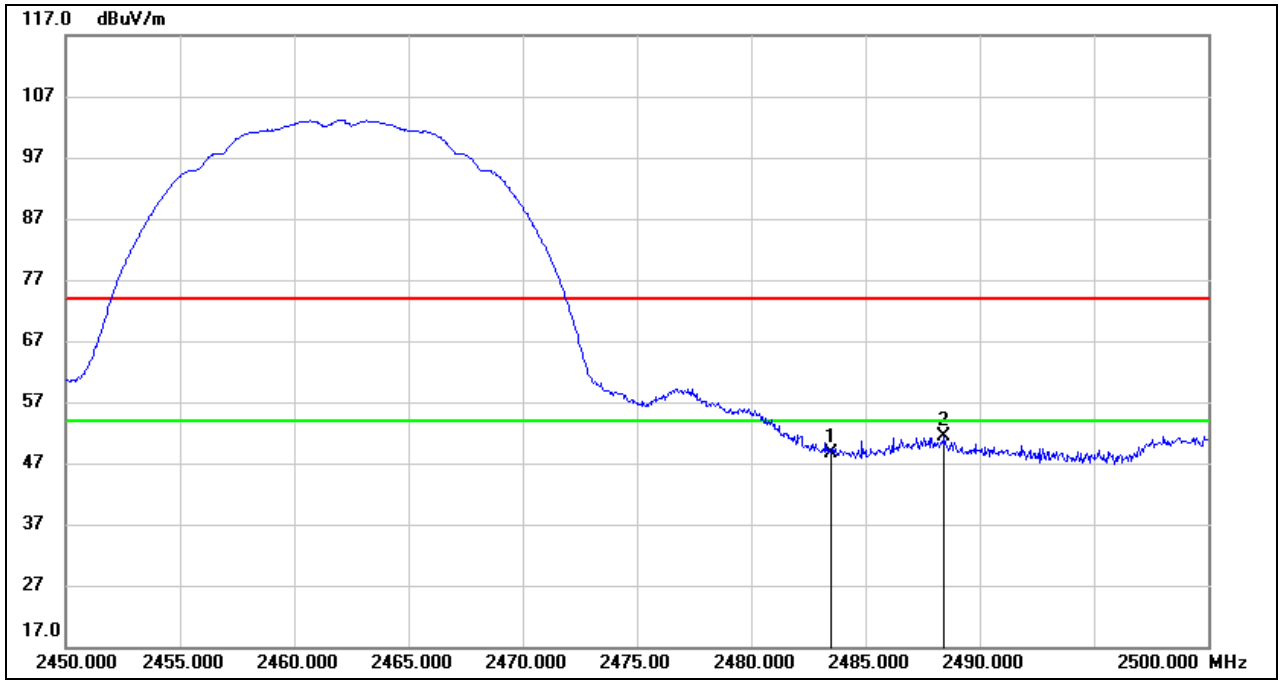


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2385.670	37.57	11.93	49.50	74.00	-24.50	peak
2	2390.000	36.51	11.96	48.47	74.00	-25.53	peak

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



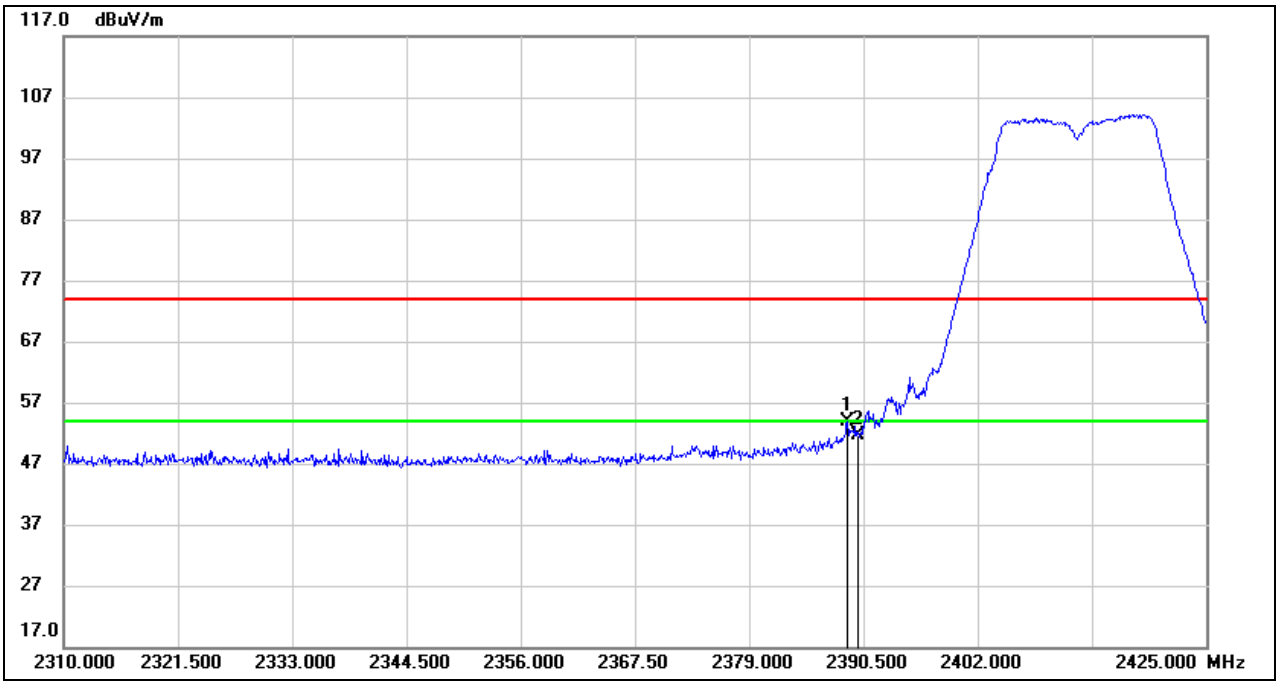
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	36.23	12.38	48.61	74.00	-25.39	peak
2	2488.450	38.92	12.39	51.31	74.00	-22.69	peak

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

8.1.2. 802.11g MODE

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

PEAK

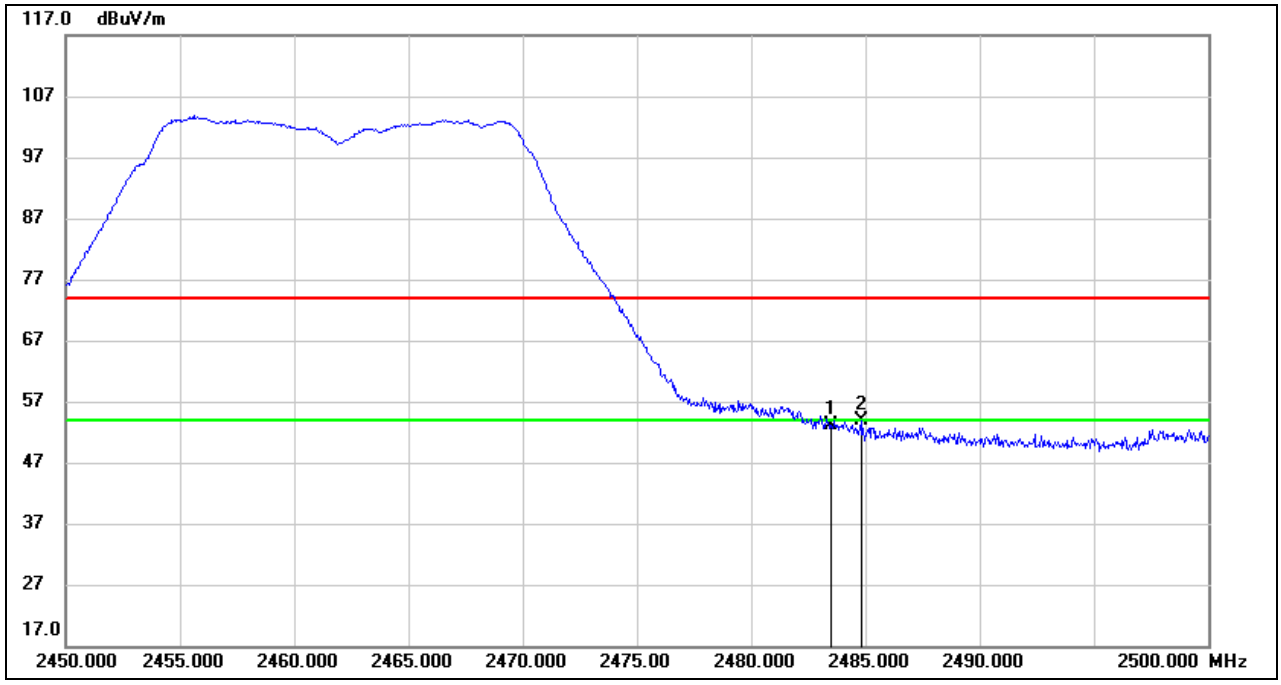


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.890	41.96	11.95	53.91	74.00	-20.09	peak
2	2390.000	39.62	11.96	51.58	74.00	-22.42	peak

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.

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

PEAK



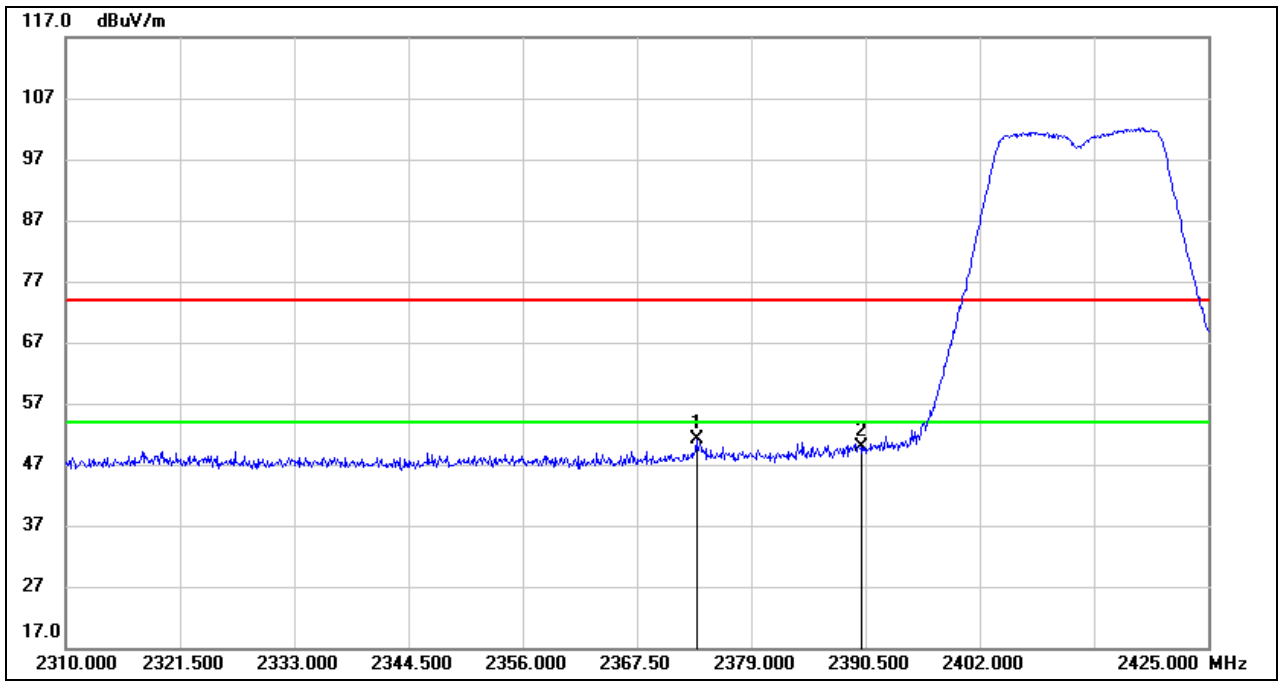
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	40.74	12.38	53.12	74.00	-20.88	peak
2	2484.800	41.56	12.38	53.94	74.00	-20.06	peak

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

8.1.3. 802.11n HT20 MODE

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

PEAK

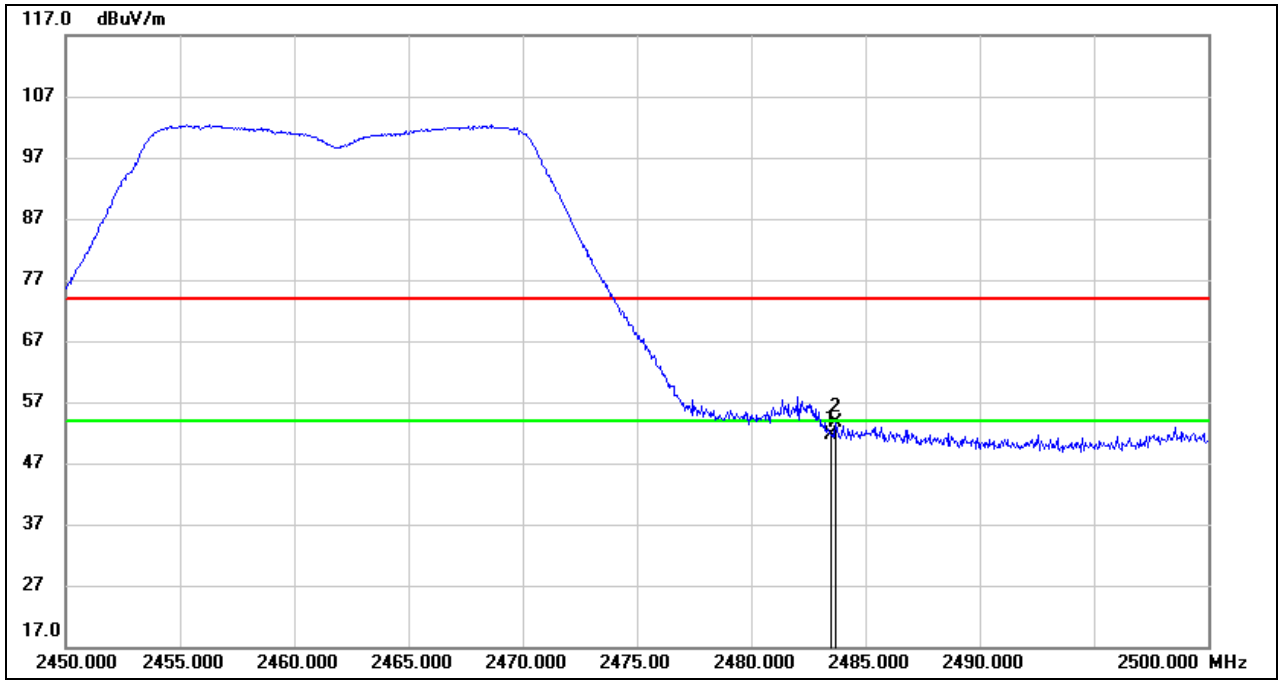


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2373.480	39.17	11.84	51.01	74.00	-22.99	peak
2	2390.000	37.89	11.96	49.85	74.00	-24.15	peak

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



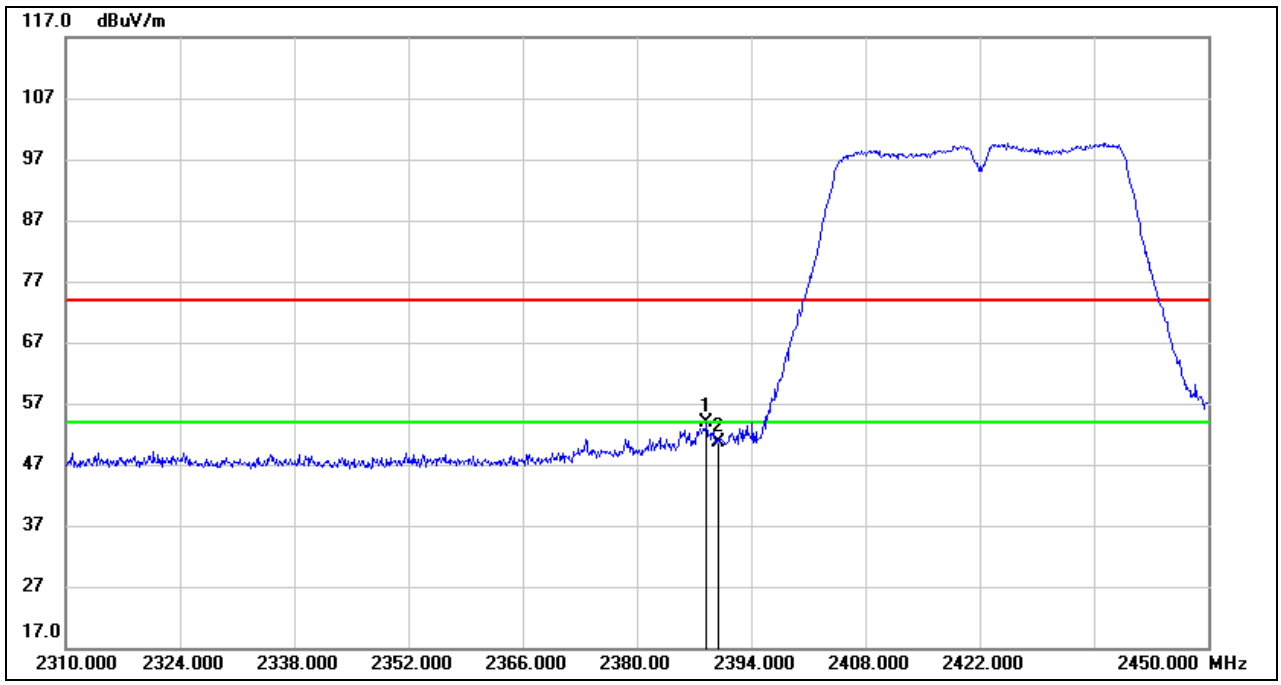
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	39.32	12.38	51.70	74.00	-22.30	peak
2	2483.700	41.31	12.38	53.69	74.00	-20.31	peak

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.

8.1.4. 802.11n HT40 MODE

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

PEAK

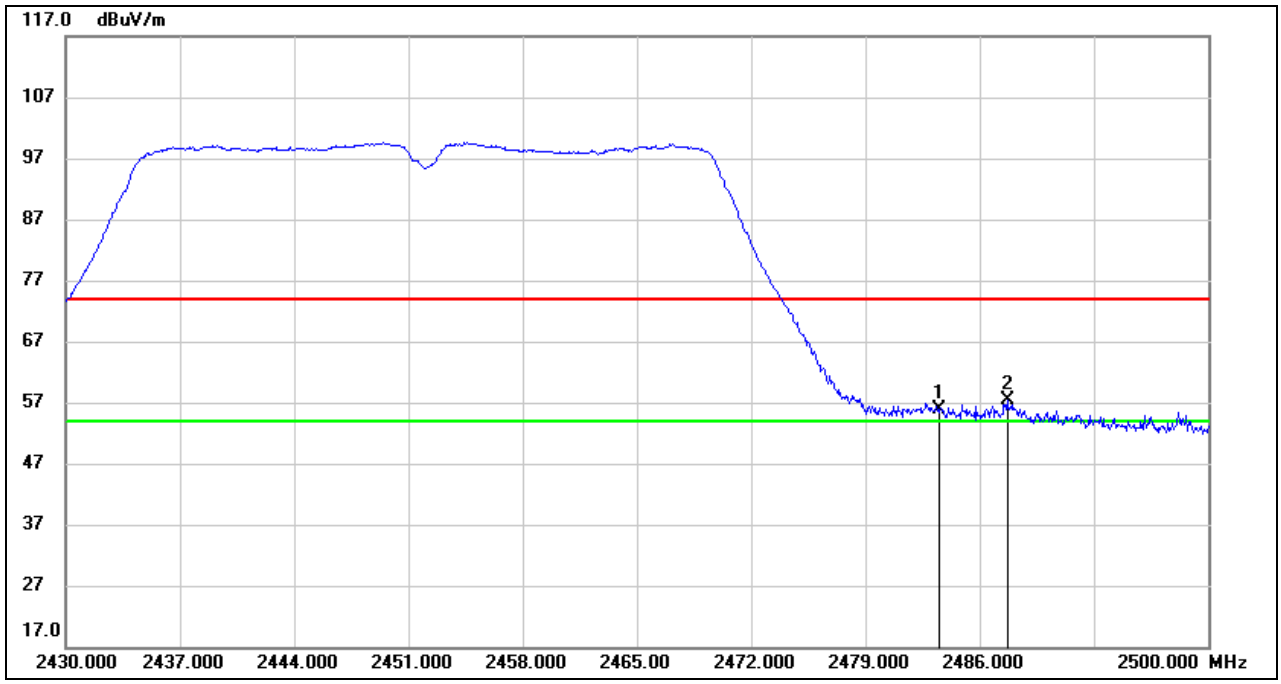


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.540	41.93	11.95	53.88	74.00	-20.12	peak
2	2390.000	38.77	11.96	50.73	74.00	-23.27	peak

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. 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)

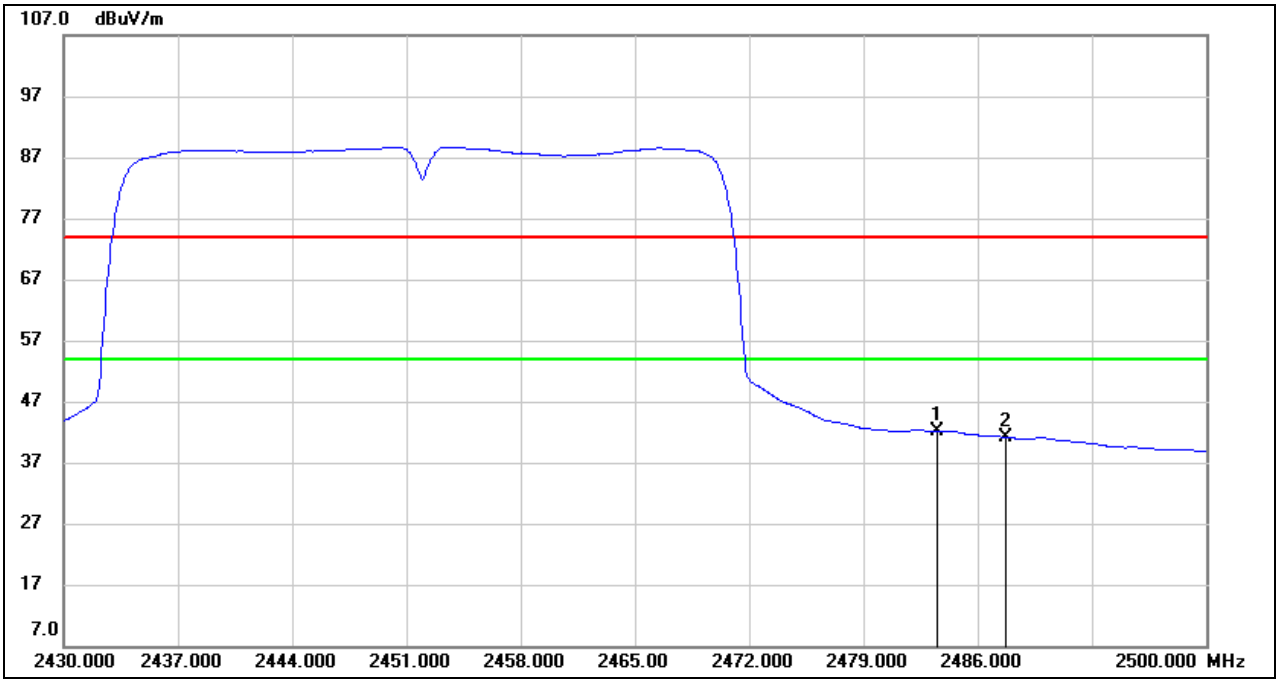
PEAK



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	43.59	12.38	55.97	74.00	-18.03	peak
2	2487.680	44.89	12.39	57.28	74.00	-16.72	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	29.79	12.38	42.17	54.00	-11.83	AVG
2	2487.680	28.81	12.39	41.20	54.00	-12.80	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.

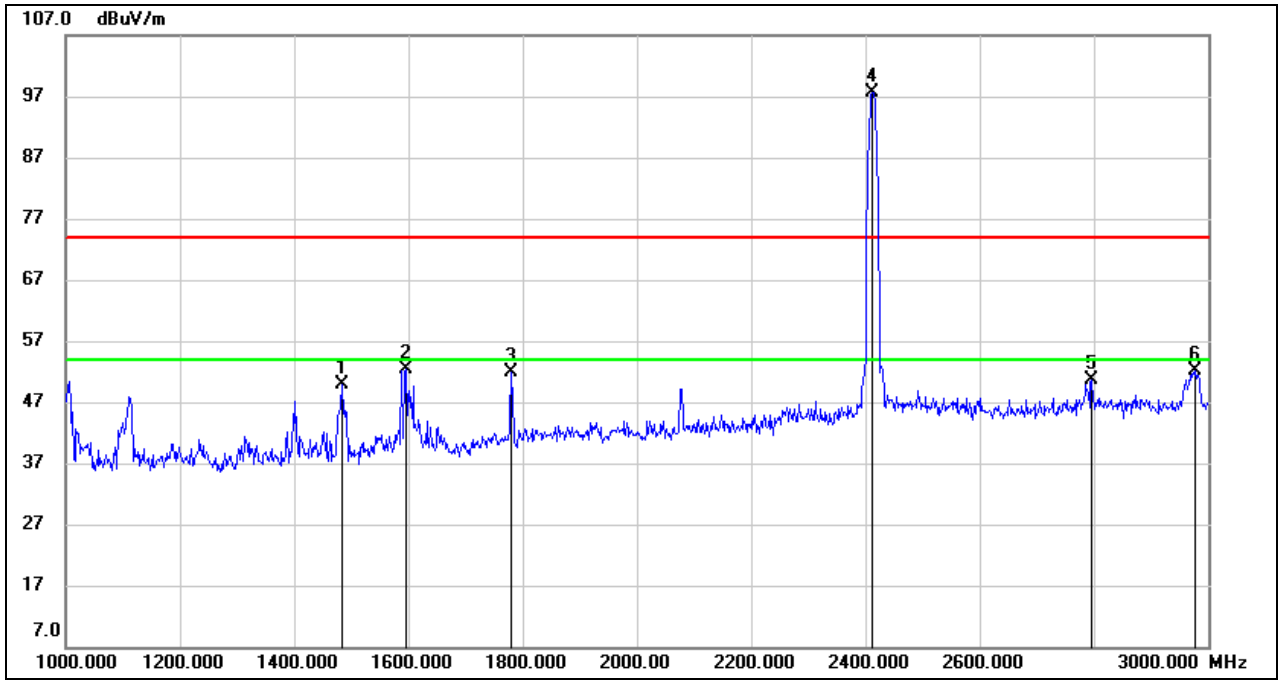
Note: All the polarities had been tested, only the worst data was recorded in the report.

8.2. SPURIOUS EMISSIONS (1 GHz ~ 3 GHz)

8.2.1. 802.11b MODE

ANTENNA 1 TEST RESULTS (WORST CASE)

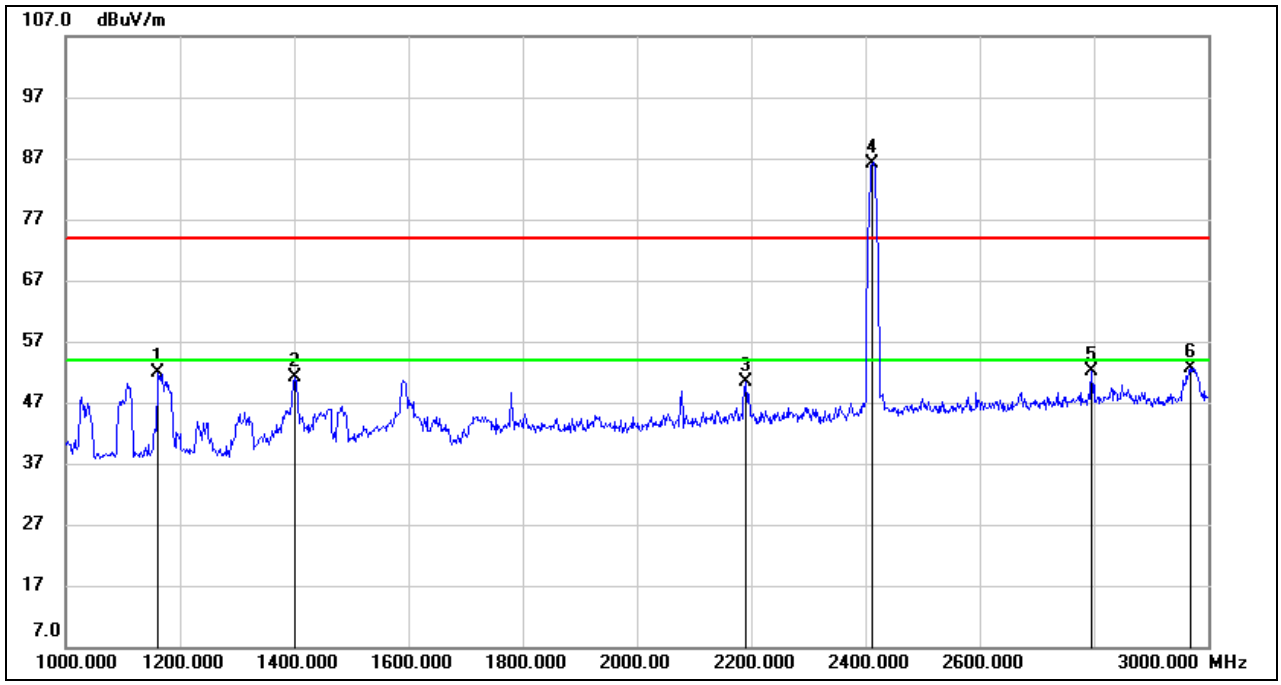
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1484.000	42.87	6.92	49.79	74.00	-24.21	peak
2	1596.000	44.42	7.93	52.35	74.00	-21.65	peak
3	1780.000	42.46	9.47	51.93	74.00	-22.07	peak
4	2412.000	85.66	12.08	97.74	/	/	fundamental
5	2796.000	36.84	13.74	50.58	74.00	-23.42	peak
6	2978.000	37.58	14.55	52.13	74.00	-21.87	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.

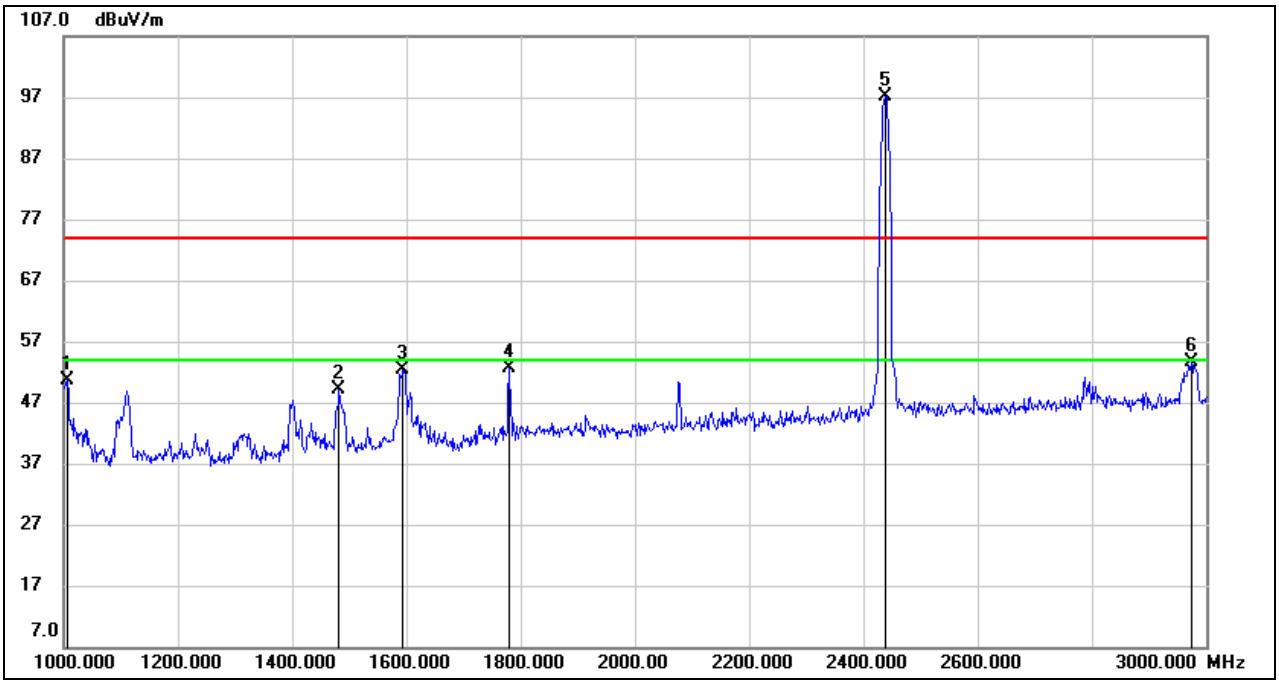
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1162.000	45.96	5.95	51.91	74.00	-22.09	peak
2	1402.000	44.40	6.70	51.10	74.00	-22.90	peak
3	2190.000	39.00	11.29	50.29	74.00	-23.71	peak
4	2412.000	74.16	12.08	86.24	/	/	fundamental
5	2796.000	38.38	13.74	52.12	74.00	-21.88	peak
6	2968.000	38.11	14.48	52.59	74.00	-21.41	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.

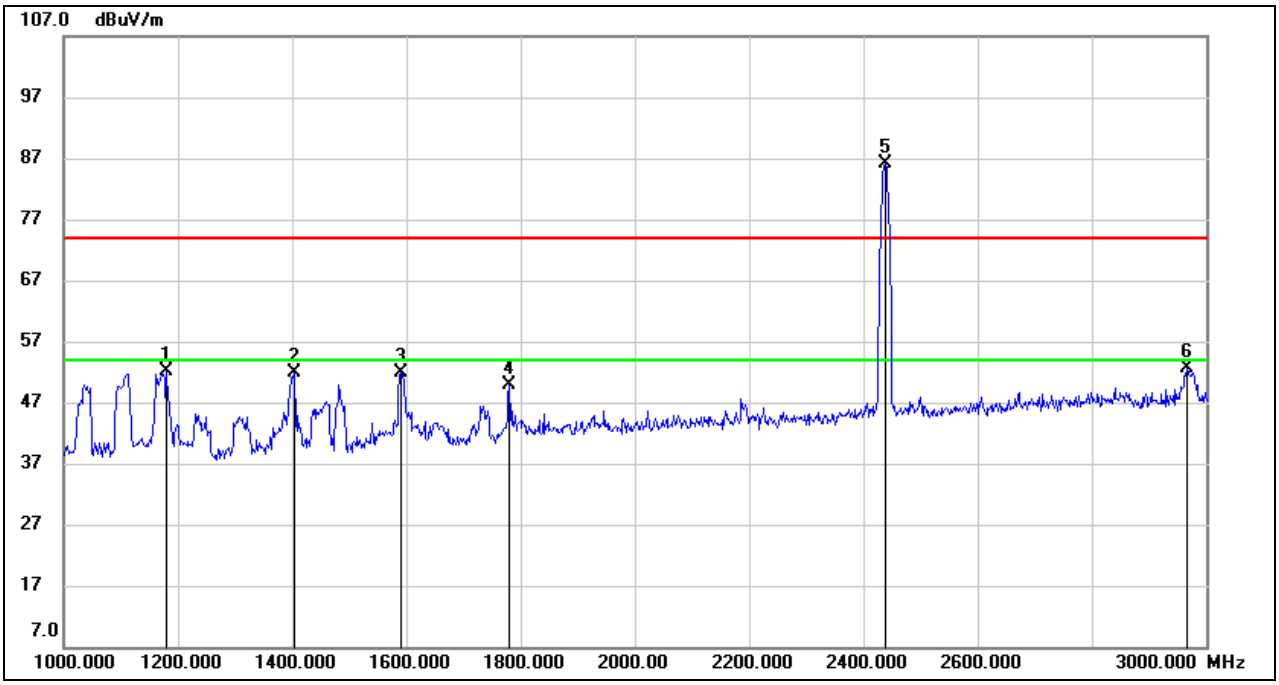
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1006.000	45.63	5.05	50.68	74.00	-23.32	peak
2	1482.000	42.27	6.92	49.19	74.00	-24.81	peak
3	1594.000	44.50	7.92	52.42	74.00	-21.58	peak
4	1780.000	43.06	9.47	52.53	74.00	-21.47	peak
5	2437.000	84.99	12.19	97.18	/	/	fundamental
6	2974.000	39.02	14.52	53.54	74.00	-20.46	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.

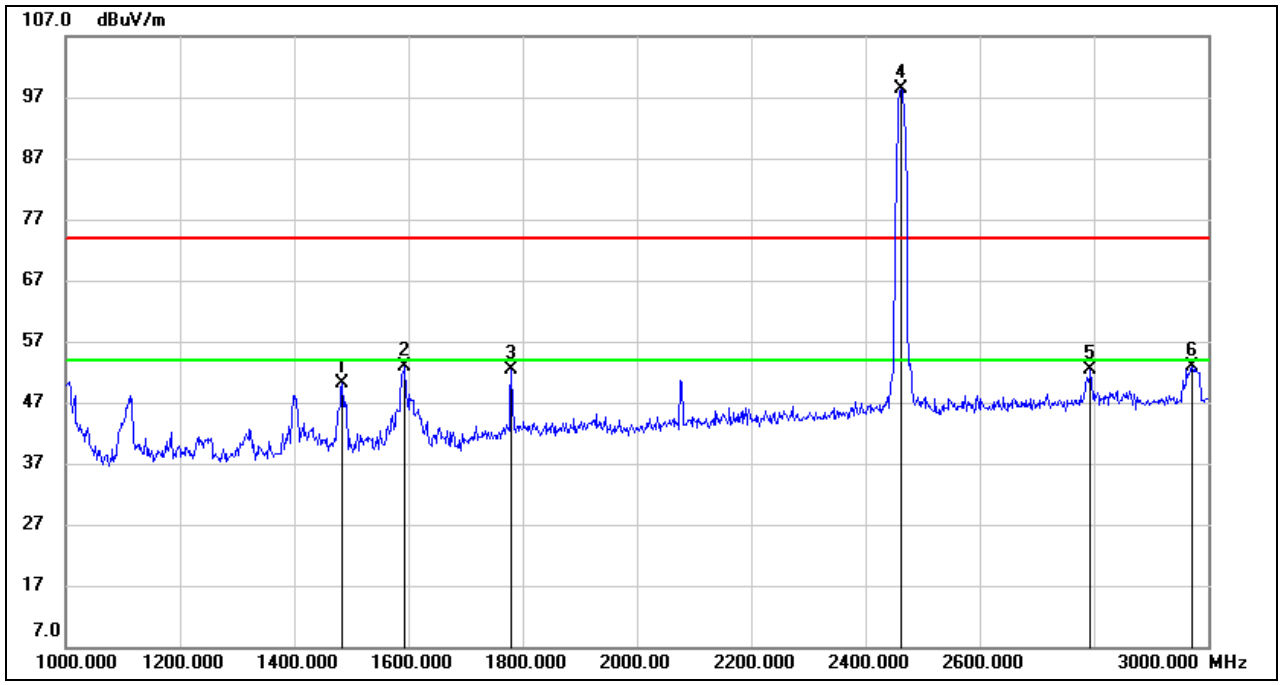
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1180.000	45.96	6.17	52.13	74.00	-21.87	peak
2	1404.000	45.06	6.71	51.77	74.00	-22.23	peak
3	1590.000	43.95	7.87	51.82	74.00	-22.18	peak
4	1780.000	40.37	9.47	49.84	74.00	-24.16	peak
5	2437.000	73.82	12.19	86.01	/	/	fundamental
6	2966.000	38.09	14.47	52.56	74.00	-21.44	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.

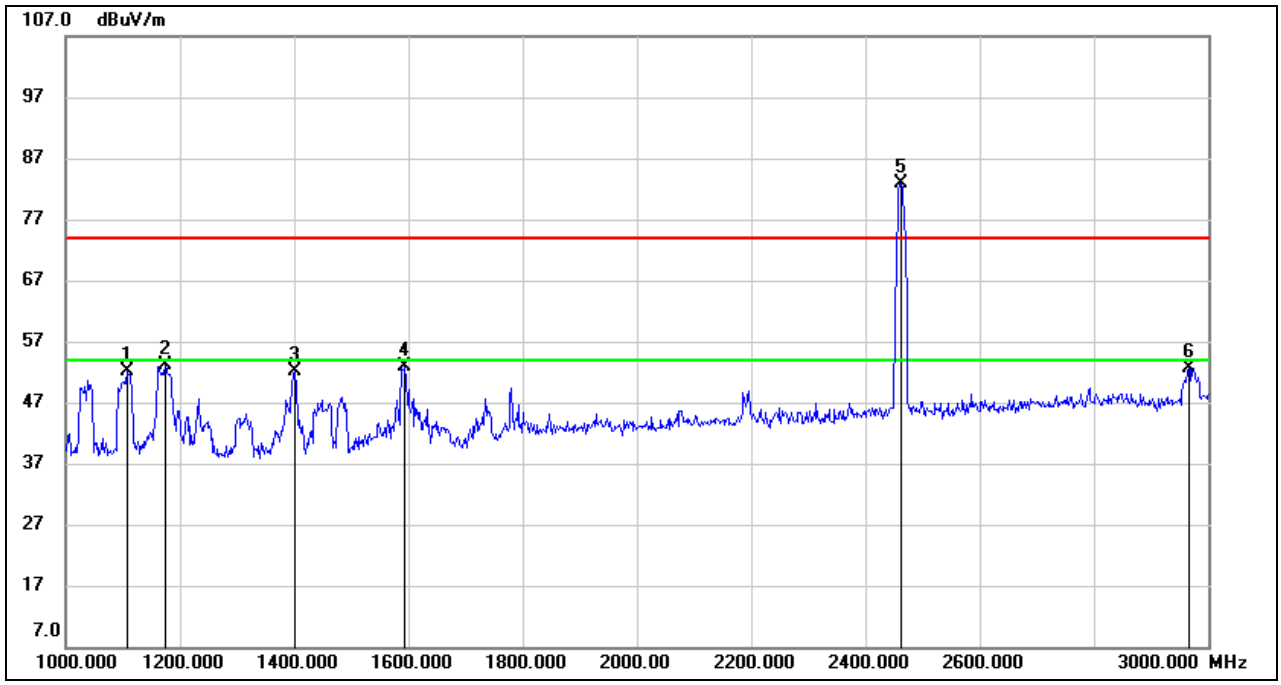
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1484.000	43.19	6.92	50.11	74.00	-23.89	peak
2	1594.000	44.91	7.92	52.83	74.00	-21.17	peak
3	1780.000	42.83	9.47	52.30	74.00	-21.70	peak
4	2462.000	86.04	12.29	98.33	/	/	fundamental
5	2794.000	38.56	13.71	52.27	74.00	-21.73	peak
6	2972.000	38.44	14.51	52.95	74.00	-21.05	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.

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	1108.000	46.76	5.30	52.06	74.00	-21.94	peak
2	1174.000	46.96	6.09	53.05	74.00	-20.95	peak
3	1400.000	45.50	6.69	52.19	74.00	-21.81	peak
4	1594.000	44.95	7.92	52.87	74.00	-21.13	peak
5	2462.000	70.54	12.29	82.83	/	/	fundamental
6	2966.000	38.20	14.47	52.67	74.00	-21.33	peak

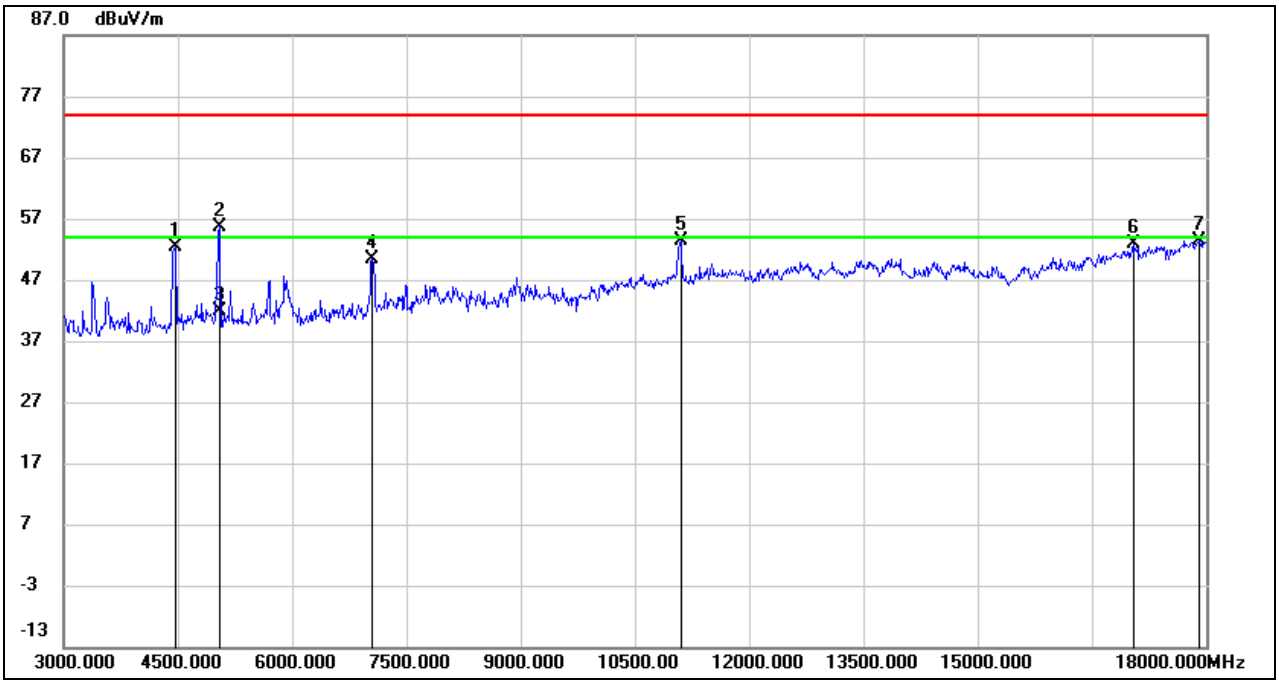
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

Note: All the modes and channels 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 MODE

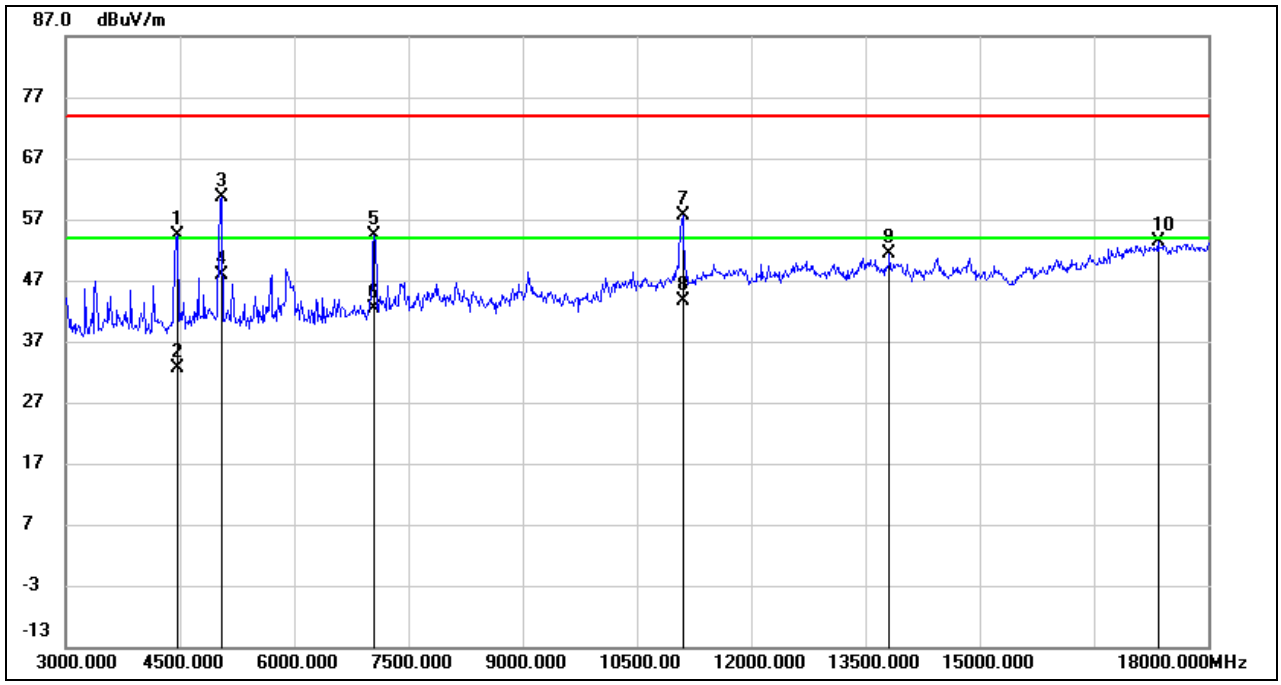
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4470.000	53.24	-0.98	52.26	74.00	-21.74	peak
2	5040.000	54.29	1.46	55.75	74.00	-18.25	peak
3	5040.000	40.32	1.46	41.78	54.00	-12.22	AVG
4	7050.000	44.48	5.84	50.32	74.00	-23.68	peak
5	11100.000	40.83	12.56	53.39	74.00	-20.61	peak
6	17040.000	32.39	20.49	52.88	74.00	-21.12	peak
7	17910.000	30.11	23.35	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

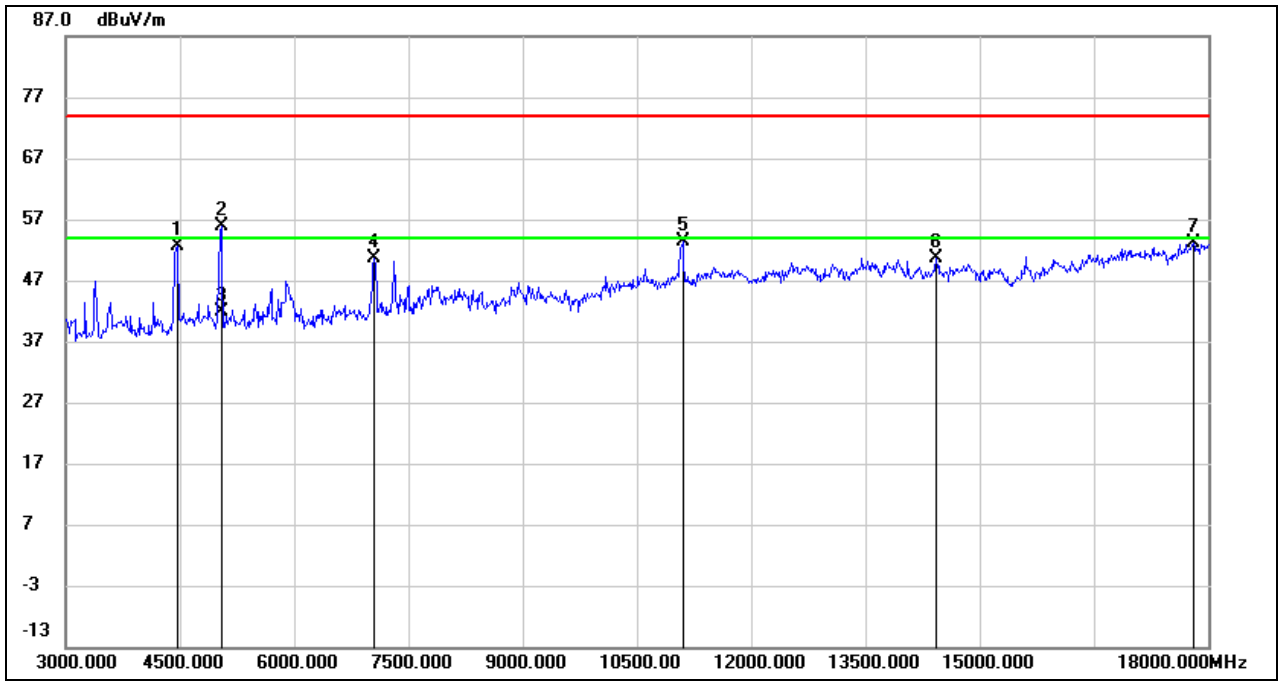
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4470.000	55.36	-0.98	54.38	74.00	-19.62	peak
2	4470.000	33.54	-0.98	32.56	54.00	-21.44	AVG
3	5040.000	59.10	1.46	60.56	74.00	-13.44	peak
4	5040.000	46.31	1.46	47.77	54.00	-6.23	AVG
5	7050.000	48.56	5.84	54.40	74.00	-19.60	peak
6	7050.000	36.47	5.84	42.31	54.00	-11.69	AVG
7	11100.000	44.97	12.56	57.53	74.00	-16.47	peak
8	11100.000	31.08	12.56	43.64	54.00	-10.36	AVG
9	13815.000	34.46	16.97	51.43	74.00	-22.57	peak
10	17340.000	31.78	21.61	53.39	74.00	-20.61	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

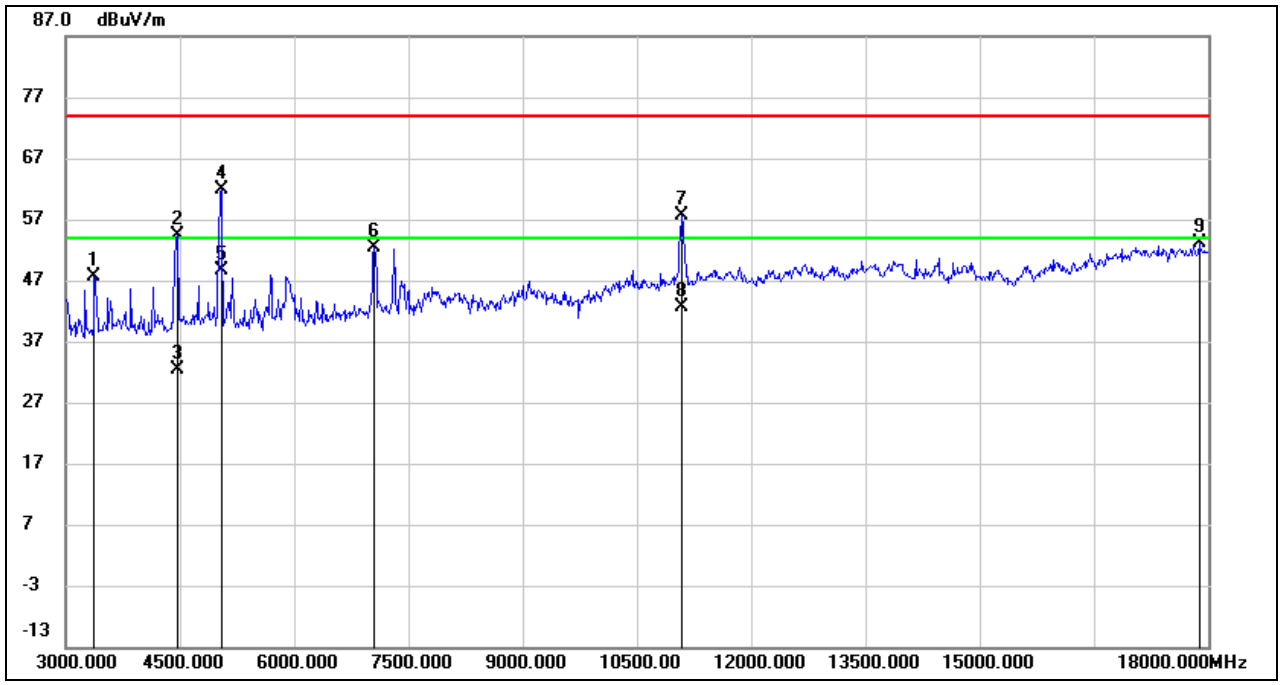
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4470.000	53.62	-0.98	52.64	74.00	-21.36	peak
2	5040.000	54.34	1.46	55.80	74.00	-18.20	peak
3	5040.000	40.50	1.46	41.96	54.00	-12.04	AVG
4	7050.000	44.91	5.84	50.75	74.00	-23.25	peak
5	11100.000	40.81	12.56	53.37	74.00	-20.63	peak
6	14430.000	34.37	16.35	50.72	74.00	-23.28	peak
7	17805.000	29.81	23.31	53.12	74.00	-20.88	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

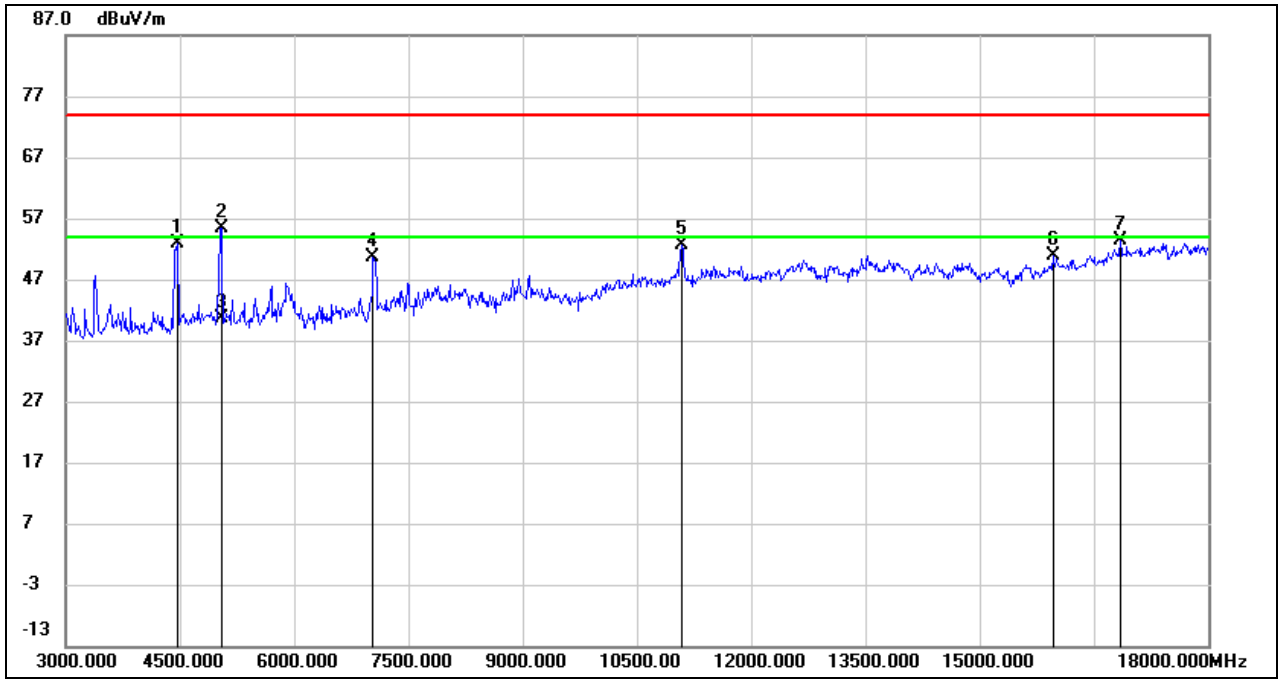
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3375.000	52.02	-4.35	47.67	74.00	-26.33	peak
2	4470.000	55.45	-0.98	54.47	74.00	-19.53	peak
3	4470.000	33.34	-0.98	32.36	54.00	-21.64	AVG
4	5040.000	60.32	1.46	61.78	74.00	-12.22	peak
5	5040.000	47.08	1.46	48.54	54.00	-5.46	AVG
6	7050.000	46.54	5.84	52.38	74.00	-21.62	peak
7	11085.000	45.01	12.57	57.58	74.00	-16.42	peak
8	11085.000	30.12	12.57	42.69	54.00	-11.31	AVG
9	17880.000	29.78	23.34	53.12	74.00	-20.88	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

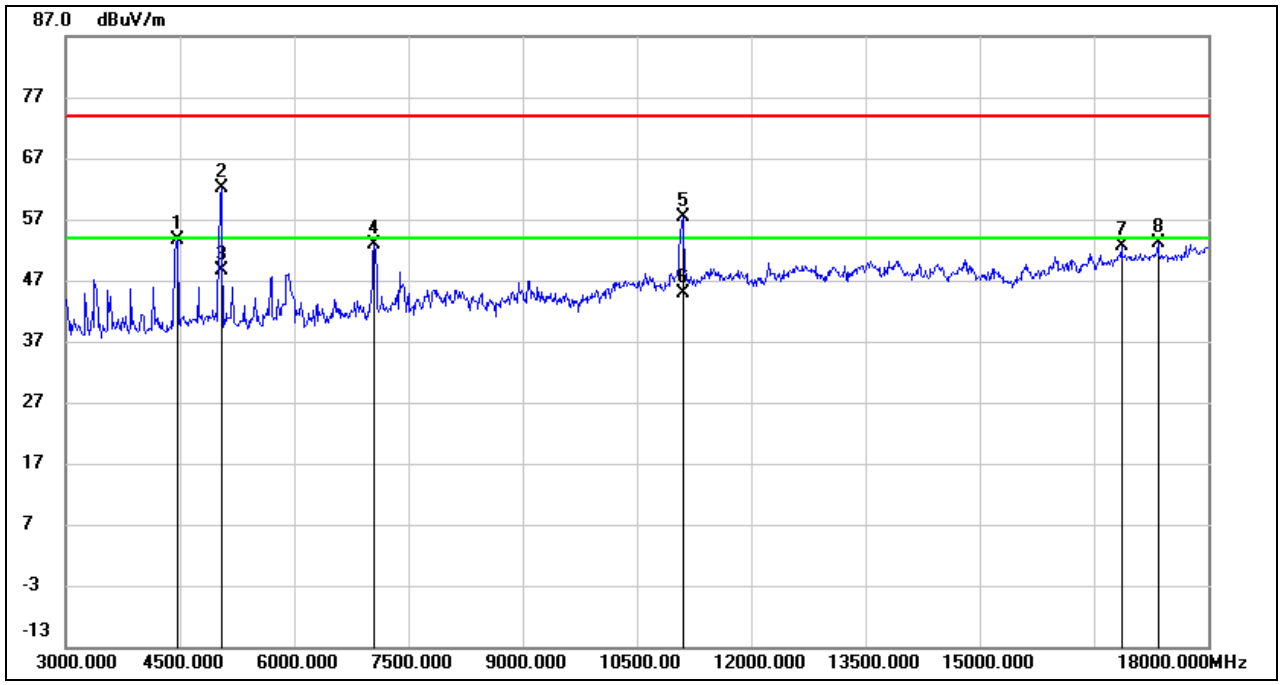
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4470.000	53.89	-0.98	52.91	74.00	-21.09	peak
2	5040.000	54.00	1.46	55.46	74.00	-18.54	peak
3	5040.000	39.10	1.46	40.56	54.00	-13.44	AVG
4	7035.000	44.77	5.81	50.58	74.00	-23.42	peak
5	11085.000	39.99	12.57	52.56	74.00	-21.44	peak
6	15960.000	33.29	17.63	50.92	74.00	-23.08	peak
7	16845.000	33.54	19.96	53.50	74.00	-20.50	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)

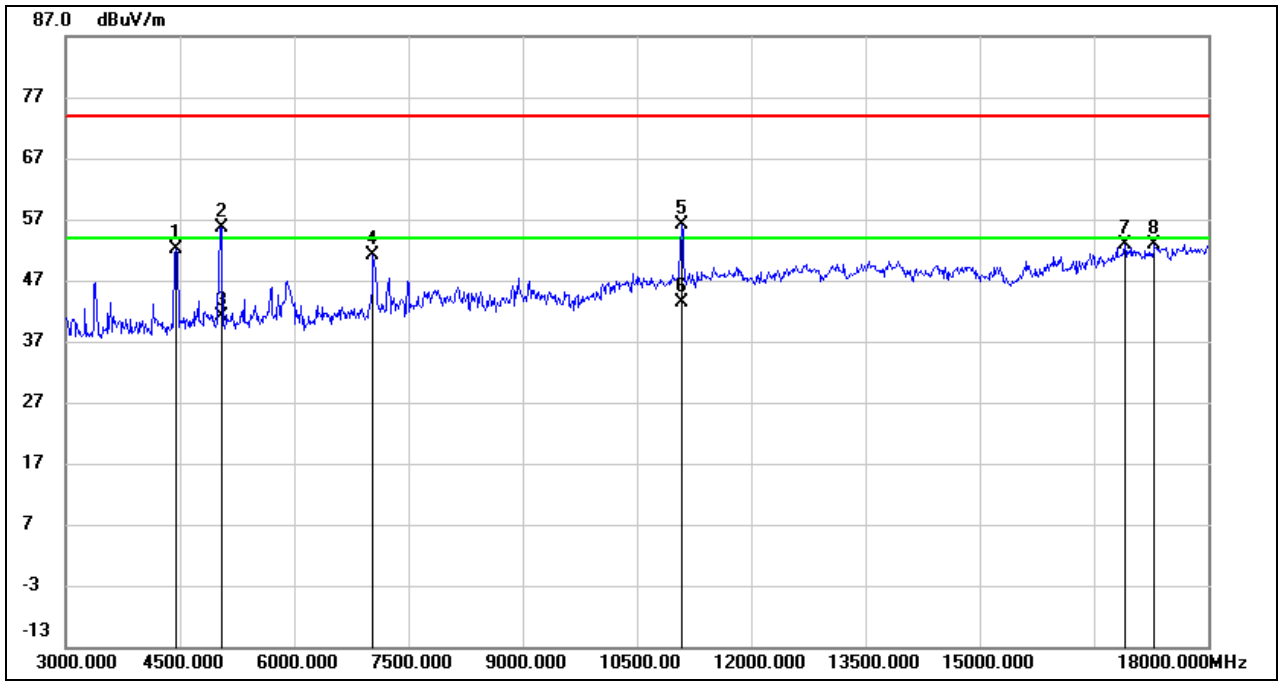


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4470.000	54.50	-0.98	53.52	74.00	-20.48	peak
2	5040.000	60.65	1.46	62.11	74.00	-11.89	peak
3	5040.000	47.06	1.46	48.52	54.00	-5.48	AVG
4	7050.000	47.04	5.84	52.88	74.00	-21.12	peak
5	11100.000	44.82	12.56	57.38	74.00	-16.62	peak
6	11100.000	32.22	12.56	44.78	54.00	-9.22	AVG
7	16860.000	32.60	19.95	52.55	74.00	-21.45	peak
8	17340.000	31.42	21.61	53.03	74.00	-20.97	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

8.3.2. 802.11g MODE

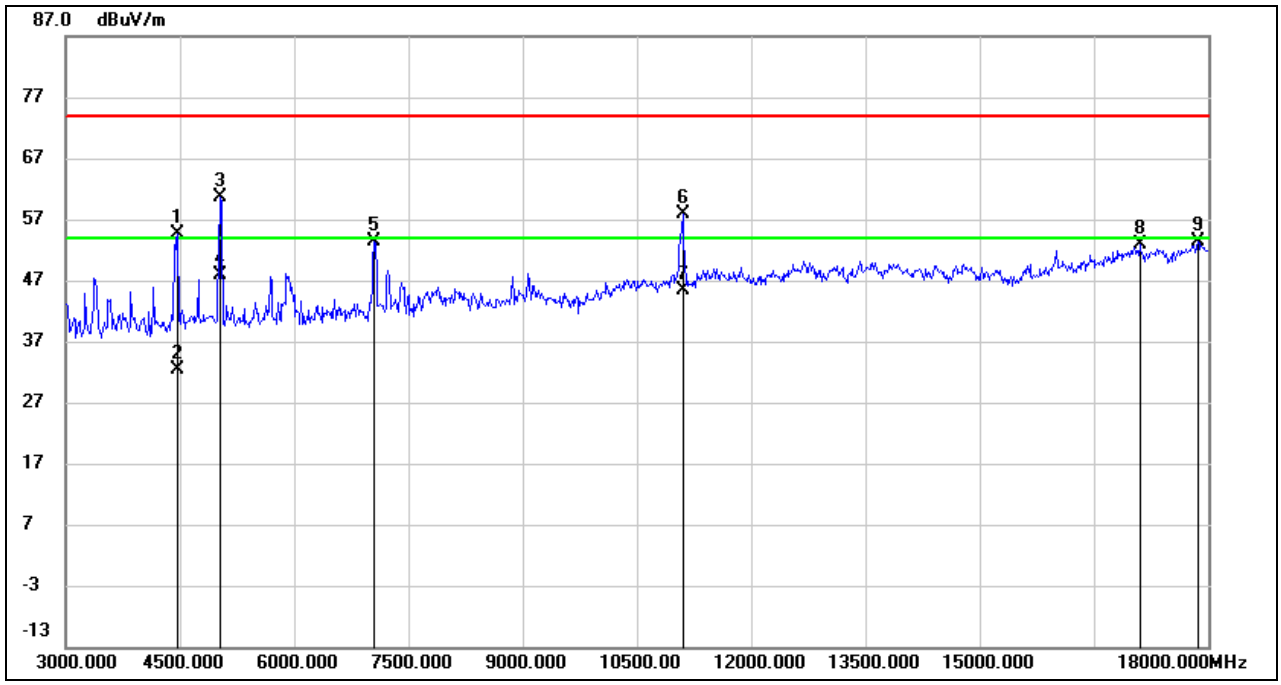
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4455.000	53.22	-1.13	52.09	74.00	-21.91	peak
2	5040.000	54.14	1.46	55.60	74.00	-18.40	peak
3	5040.000	39.72	1.46	41.18	54.00	-12.82	AVG
4	7035.000	45.31	5.81	51.12	74.00	-22.88	peak
5	11085.000	43.45	12.57	56.02	74.00	-17.98	peak
6	11085.000	30.88	12.57	43.45	54.00	-10.55	AVG
7	16905.000	32.84	19.99	52.83	74.00	-21.17	peak
8	17295.000	31.26	21.71	52.97	74.00	-21.03	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

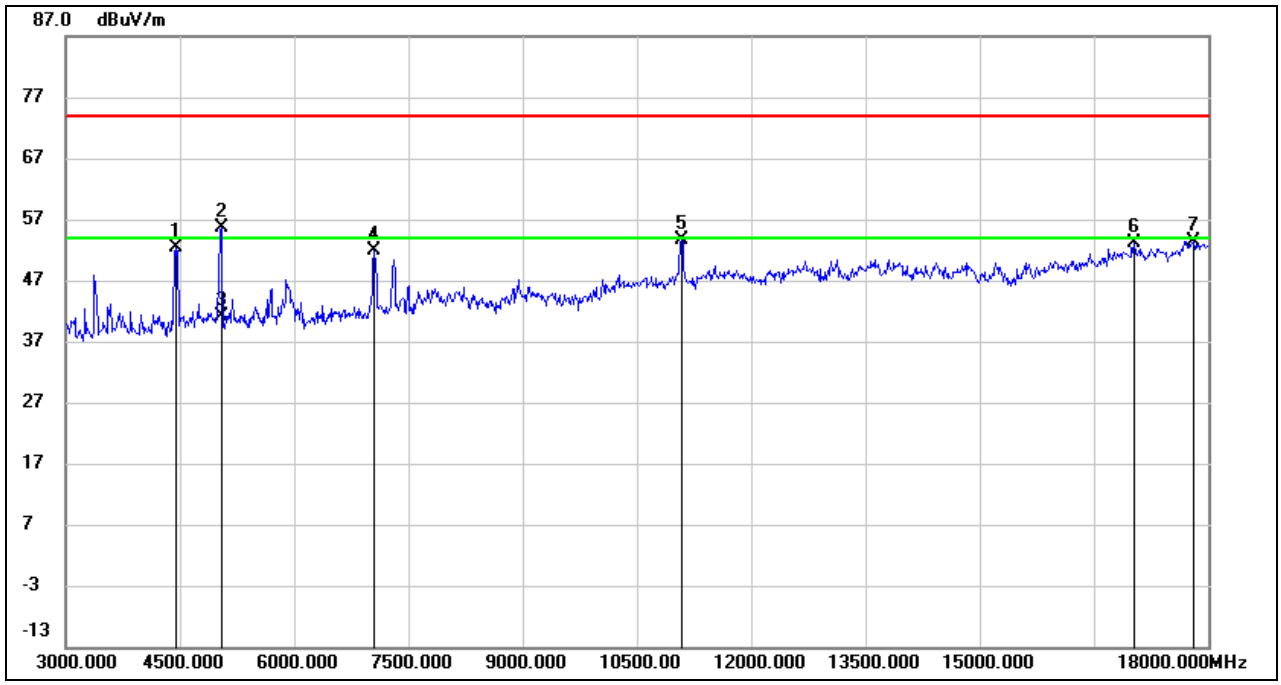
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4470.000	55.49	-0.98	54.51	74.00	-19.49	peak
2	4470.000	33.26	-0.98	32.28	54.00	-21.72	AVG
3	5025.000	59.28	1.43	60.71	74.00	-13.29	peak
4	5025.000	46.55	1.43	47.98	54.00	-6.02	AVG
5	7050.000	47.44	5.84	53.28	74.00	-20.72	peak
6	11100.000	45.38	12.56	57.94	74.00	-16.06	peak
7	11100.000	32.75	12.56	45.31	54.00	-8.69	AVG
8	17100.000	32.36	20.64	53.00	74.00	-21.00	peak
9	17865.000	29.98	23.33	53.31	74.00	-20.69	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

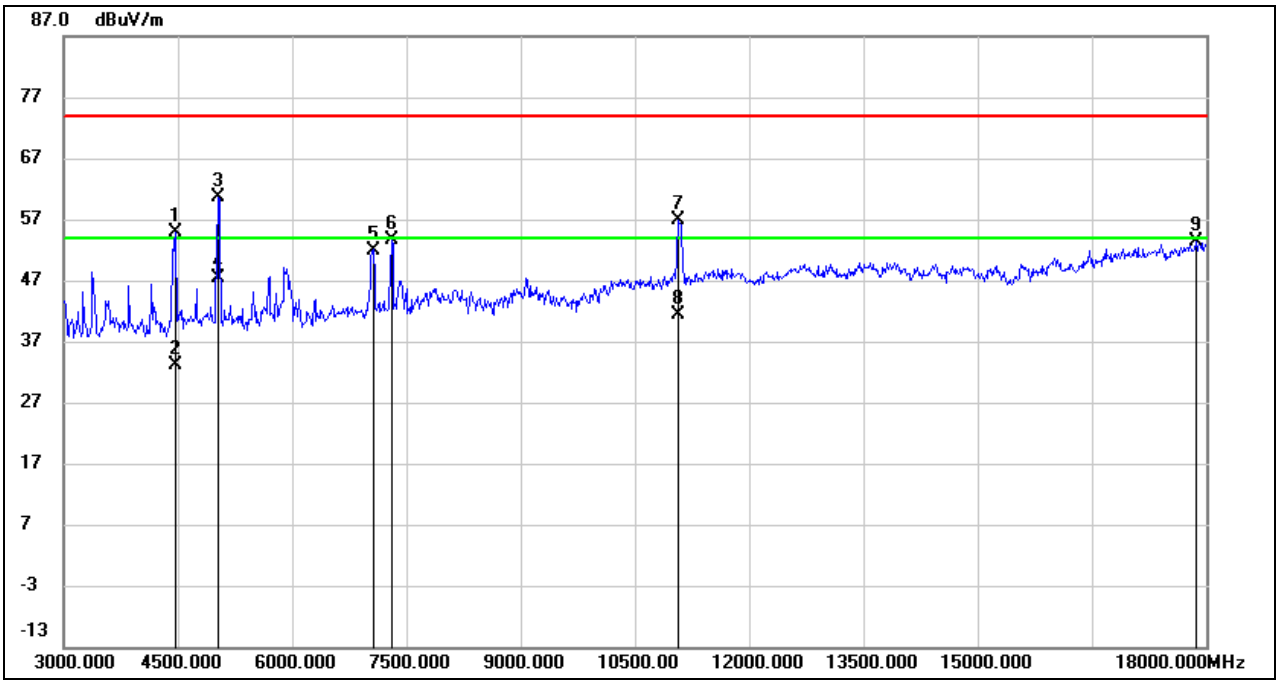
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4455.000	53.46	-1.13	52.33	74.00	-21.67	peak
2	5040.000	54.23	1.46	55.69	74.00	-18.31	peak
3	5040.000	39.78	1.46	41.24	54.00	-12.76	AVG
4	7050.000	45.93	5.84	51.77	74.00	-22.23	peak
5	11085.000	41.08	12.57	53.65	74.00	-20.35	peak
6	17025.000	32.60	20.46	53.06	74.00	-20.94	peak
7	17805.000	30.17	23.31	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

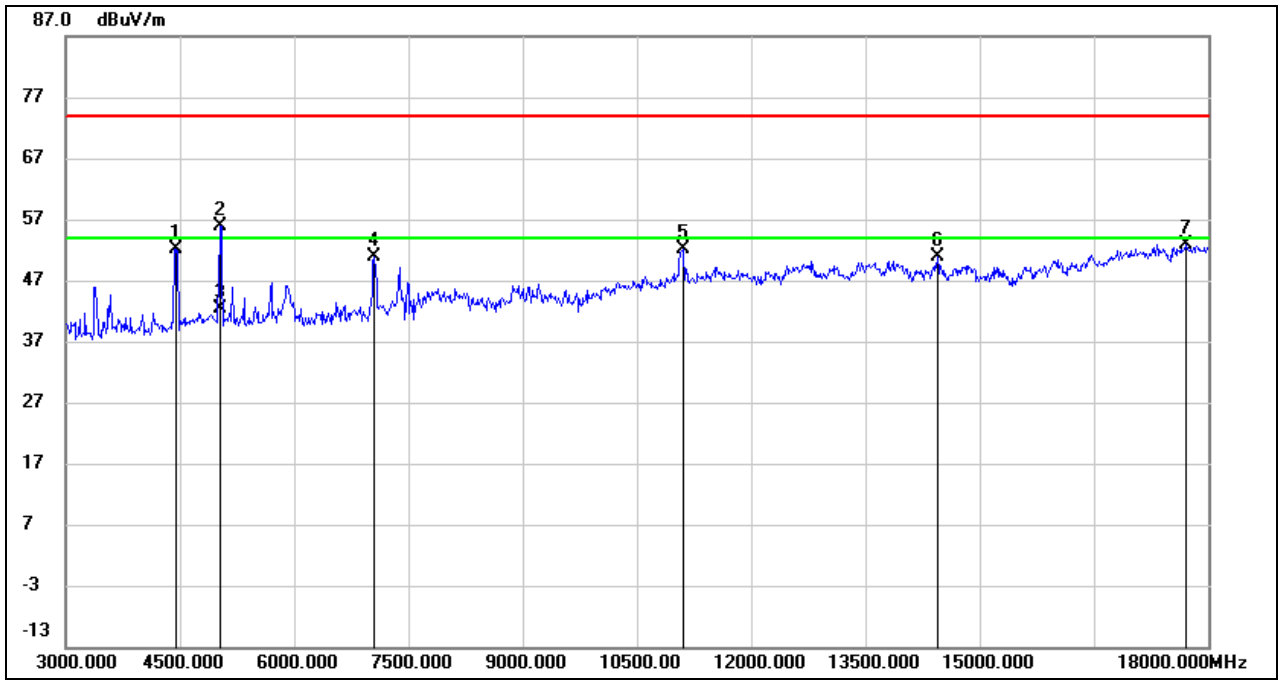
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4470.000	55.76	-0.98	54.78	74.00	-19.22	peak
2	4470.000	34.00	-0.98	33.02	54.00	-20.98	AVG
3	5025.000	59.30	1.43	60.73	74.00	-13.27	peak
4	5025.000	45.88	1.43	47.31	54.00	-6.69	AVG
5	7065.000	46.14	5.86	52.00	74.00	-22.00	peak
6	7305.000	47.47	6.08	53.55	74.00	-20.45	peak
7	11070.000	44.20	12.58	56.78	74.00	-17.22	peak
8	11070.000	28.86	12.58	41.44	54.00	-12.56	AVG
9	17865.000	30.06	23.33	53.39	74.00	-20.61	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

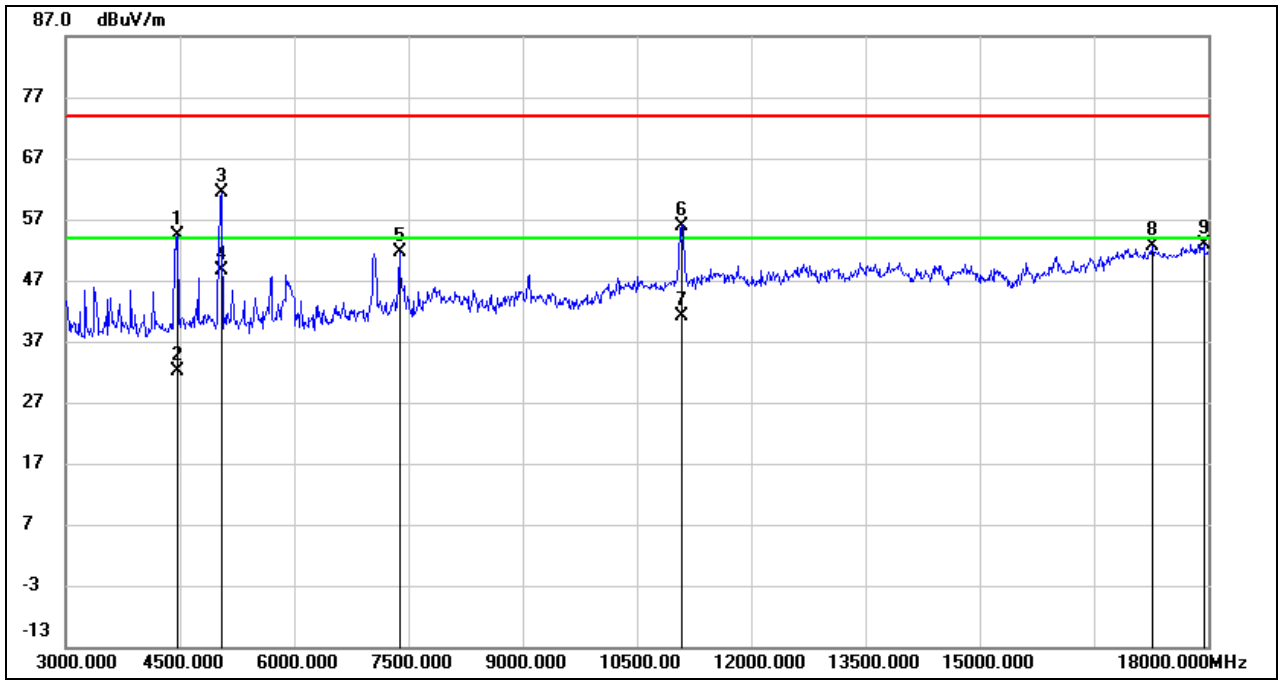
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4455.000	53.26	-1.13	52.13	74.00	-21.87	peak
2	5025.000	54.55	1.43	55.98	74.00	-18.02	peak
3	5025.000	40.88	1.43	42.31	54.00	-11.69	AVG
4	7050.000	44.98	5.84	50.82	74.00	-23.18	peak
5	11100.000	39.61	12.56	52.17	74.00	-21.83	peak
6	14445.000	34.43	16.36	50.79	74.00	-23.21	peak
7	17700.000	30.56	22.43	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)

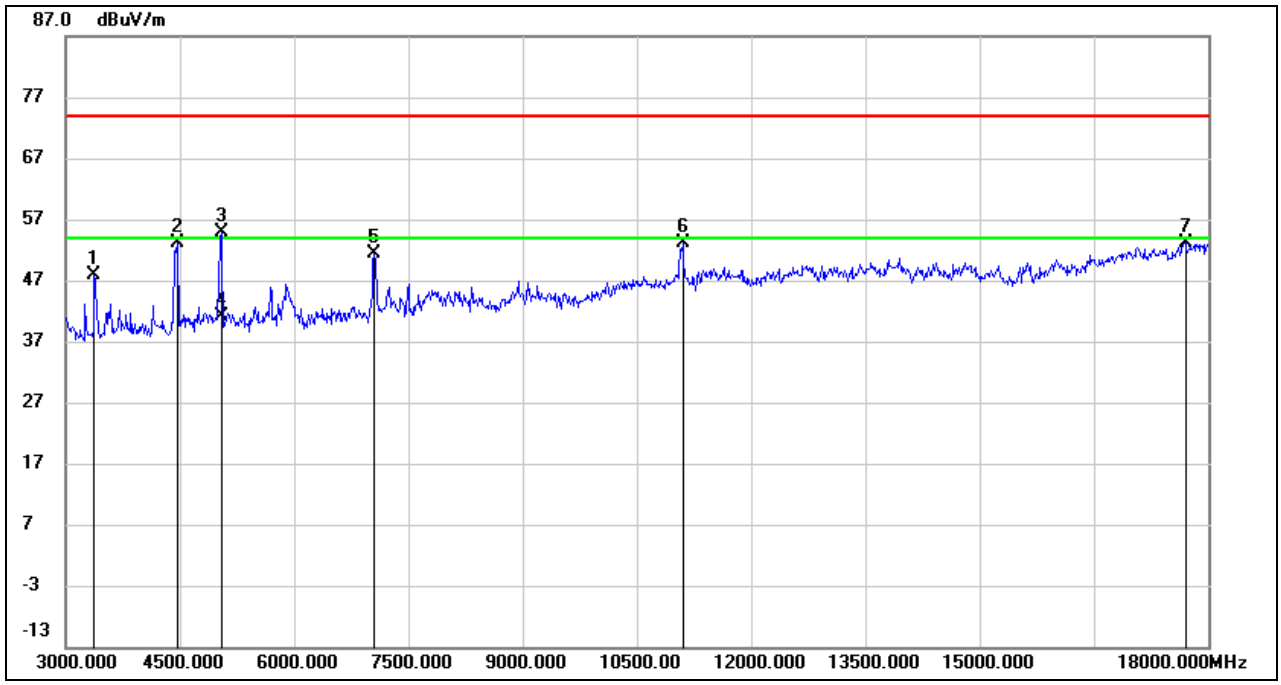


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4470.000	55.24	-0.98	54.26	74.00	-19.74	peak
2	4470.000	33.23	-0.98	32.25	54.00	-21.75	AVG
3	5040.000	59.89	1.46	61.35	74.00	-12.65	peak
4	5040.000	47.12	1.46	48.58	54.00	-5.42	AVG
5	7380.000	45.15	6.41	51.56	74.00	-22.44	peak
6	11085.000	43.43	12.57	56.00	74.00	-18.00	peak
7	11085.000	28.58	12.57	41.15	54.00	-12.85	AVG
8	17265.000	31.13	21.46	52.59	74.00	-21.41	peak
9	17940.000	29.61	23.39	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

8.3.3. 802.11n HT20 MODE

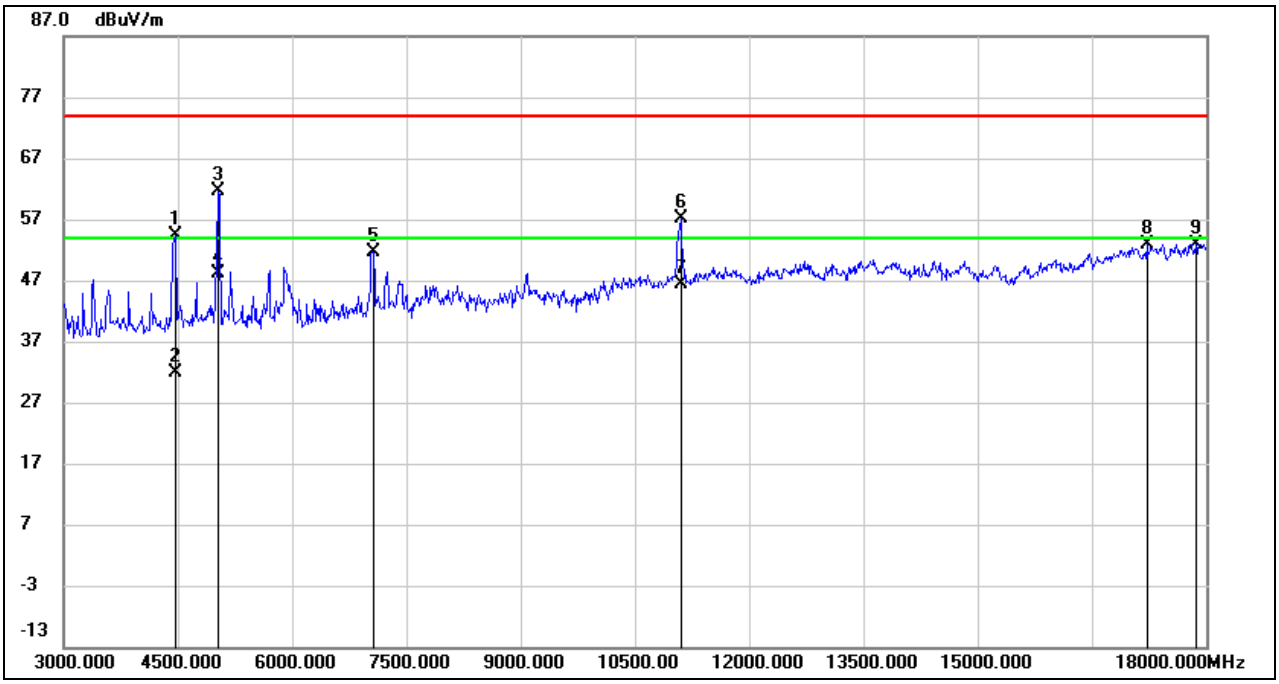
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3375.000	52.19	-4.35	47.84	74.00	-26.16	peak
2	4470.000	54.03	-0.98	53.05	74.00	-20.95	peak
3	5040.000	53.35	1.46	54.81	74.00	-19.19	peak
4	5040.000	39.78	1.46	41.24	54.00	-12.76	AVG
5	7050.000	45.59	5.84	51.43	74.00	-22.57	peak
6	11100.000	40.69	12.56	53.25	74.00	-20.75	peak
7	17700.000	30.69	22.43	53.12	74.00	-20.88	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

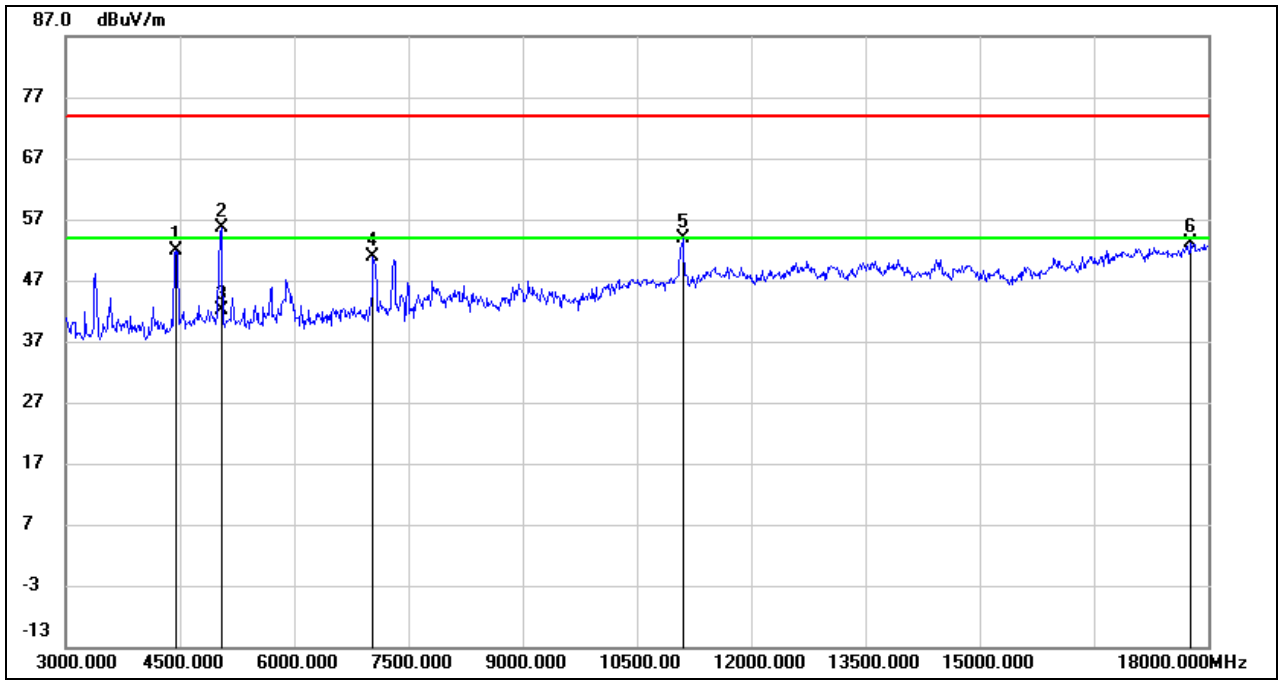
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4470.000	55.32	-0.98	54.34	74.00	-19.66	peak
2	4470.000	32.95	-0.98	31.97	54.00	-22.03	AVG
3	5025.000	60.28	1.43	61.71	74.00	-12.29	peak
4	5025.000	46.79	1.43	48.22	54.00	-5.78	AVG
5	7065.000	45.82	5.86	51.68	74.00	-22.32	peak
6	11100.000	44.48	12.56	57.04	74.00	-16.96	peak
7	11100.000	33.75	12.56	46.31	54.00	-7.69	AVG
8	17220.000	31.78	21.08	52.86	74.00	-21.14	peak
9	17865.000	29.59	23.33	52.92	74.00	-21.08	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

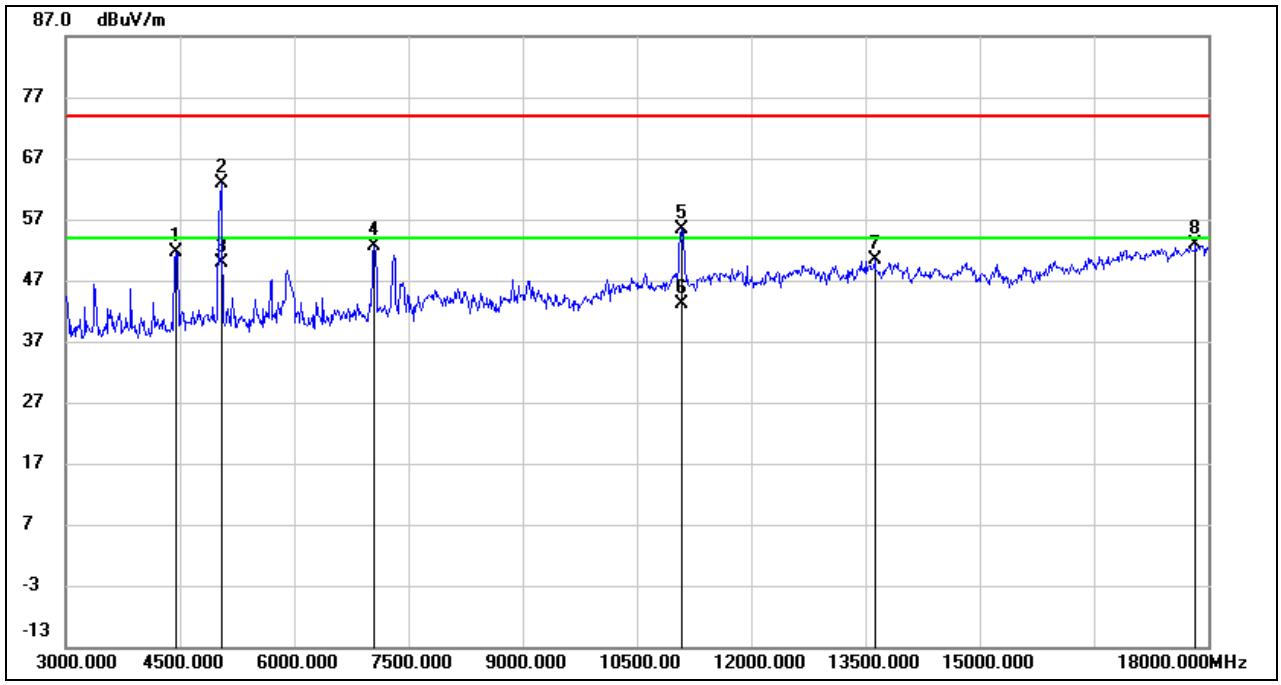
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4455.000	52.93	-1.13	51.80	74.00	-22.20	peak
2	5040.000	54.05	1.46	55.51	74.00	-18.49	peak
3	5040.000	40.57	1.46	42.03	54.00	-11.97	AVG
4	7035.000	44.99	5.81	50.80	74.00	-23.20	peak
5	11100.000	41.22	12.56	53.78	74.00	-20.22	peak
6	17775.000	30.07	23.09	53.16	74.00	-20.84	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

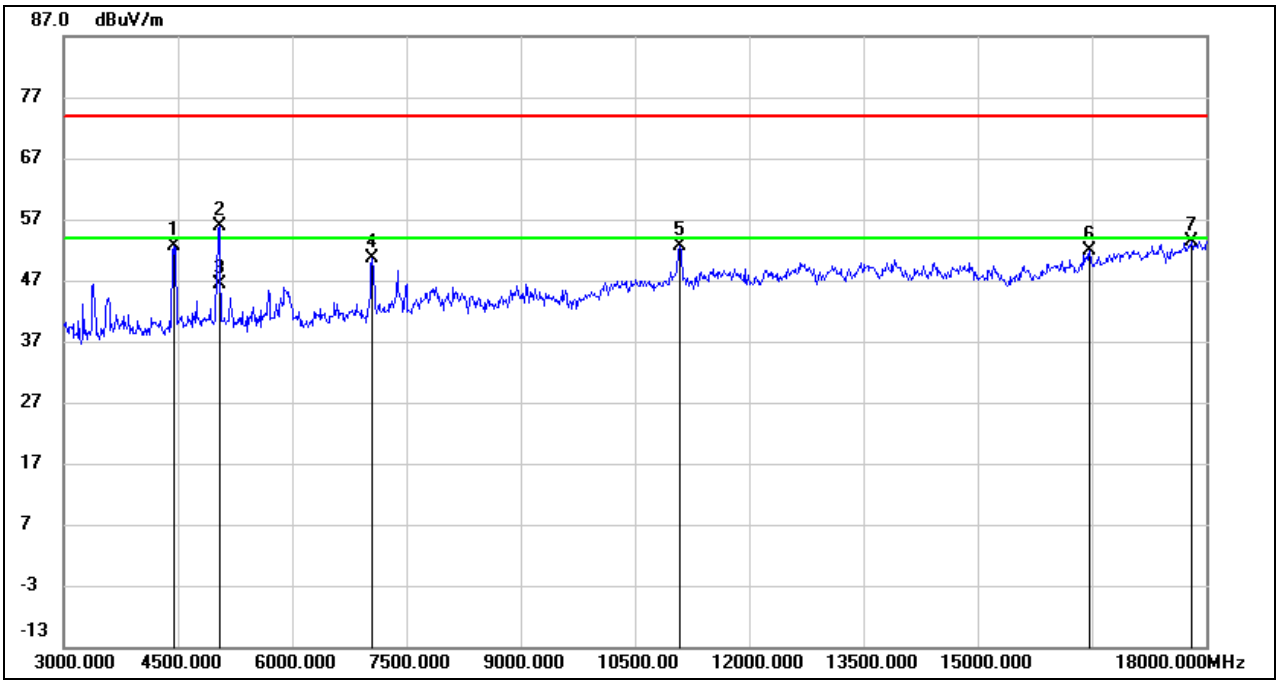
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4455.000	52.64	-1.13	51.51	74.00	-22.49	peak
2	5040.000	61.37	1.46	62.83	74.00	-11.17	peak
3	5040.000	48.32	1.46	49.78	54.00	-4.22	AVG
4	7050.000	46.72	5.84	52.56	74.00	-21.44	peak
5	11085.000	42.90	12.57	55.47	74.00	-18.53	peak
6	11085.000	30.59	12.57	43.16	54.00	-10.84	AVG
7	13620.000	34.36	15.99	50.35	74.00	-23.65	peak
8	17835.000	29.55	23.31	52.86	74.00	-21.14	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

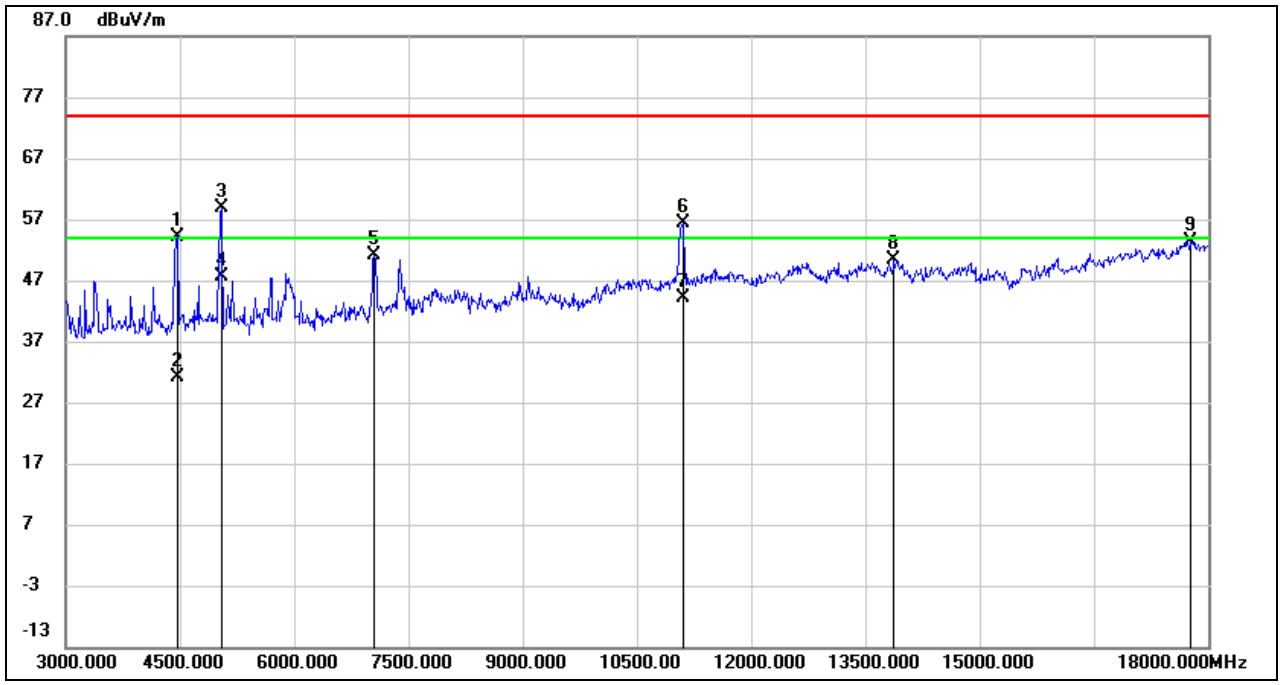
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4455.000	53.70	-1.13	52.57	74.00	-21.43	peak
2	5040.000	54.34	1.46	55.80	74.00	-18.20	peak
3	5040.000	44.90	1.46	46.36	54.00	-7.64	AVG
4	7050.000	44.74	5.84	50.58	74.00	-23.42	peak
5	11085.000	40.02	12.57	52.59	74.00	-21.41	peak
6	16470.000	32.76	19.06	51.82	74.00	-22.18	peak
7	17805.000	30.16	23.31	53.47	74.00	-20.53	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)

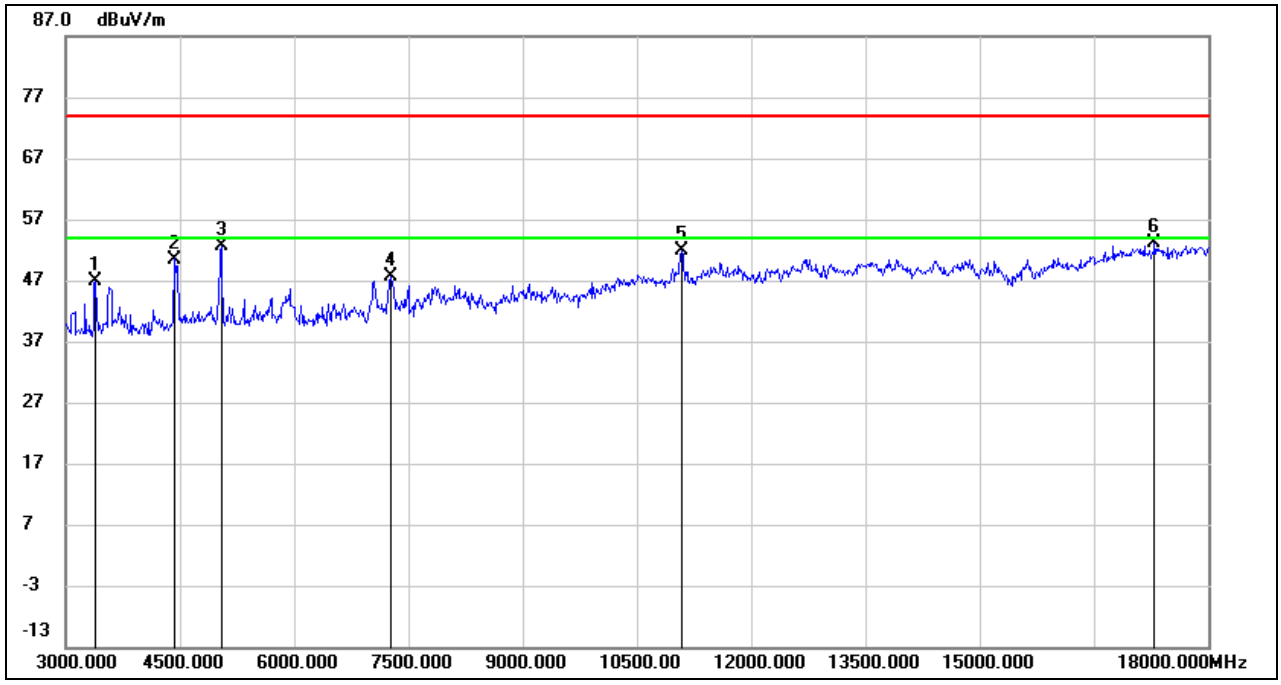


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4470.000	55.06	-0.98	54.08	74.00	-19.92	peak
2	4470.000	32.13	-0.98	31.15	54.00	-22.85	AVG
3	5040.000	57.37	1.46	58.83	74.00	-15.17	peak
4	5040.000	46.26	1.46	47.72	54.00	-6.28	AVG
5	7050.000	45.29	5.84	51.13	74.00	-22.87	peak
6	11100.000	43.78	12.56	56.34	74.00	-17.66	peak
7	11100.000	31.62	12.56	44.18	54.00	-9.82	AVG
8	13875.000	33.89	16.44	50.33	74.00	-23.67	peak
9	17775.000	30.37	23.09	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

8.3.4. 802.11n HT40 MODE

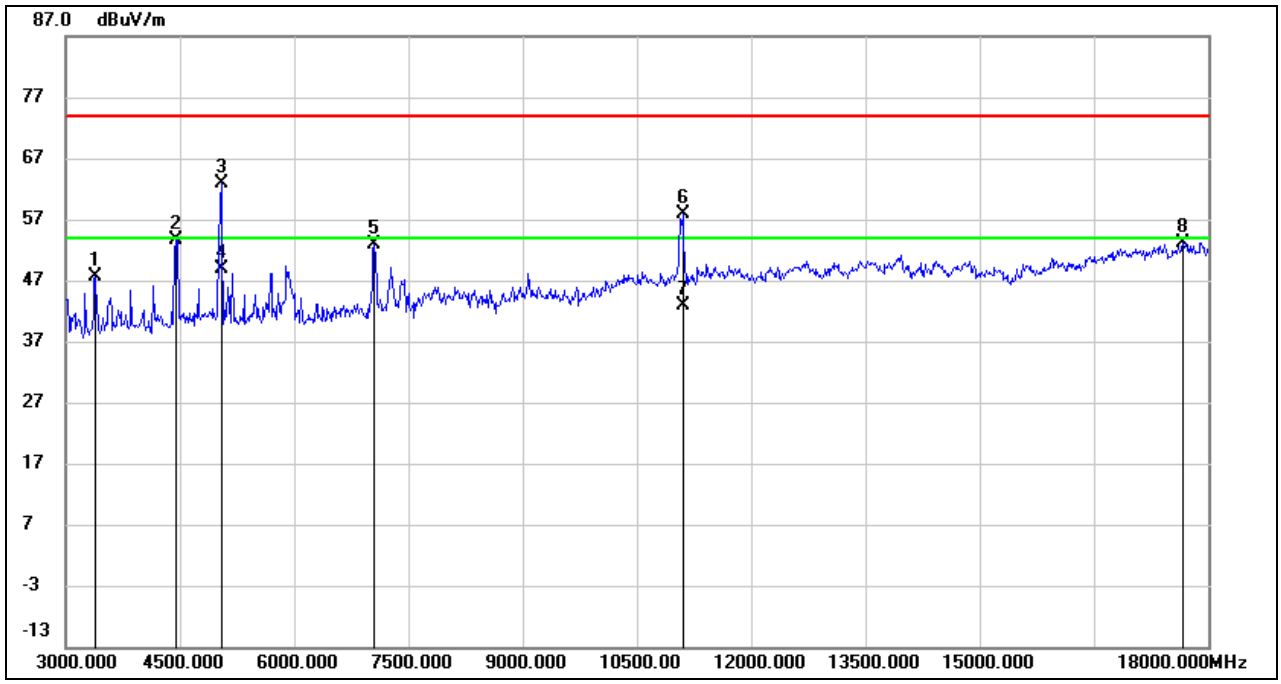
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3390.000	51.30	-4.37	46.93	74.00	-27.07	peak
2	4425.000	51.95	-1.45	50.50	74.00	-23.50	peak
3	5040.000	51.11	1.46	52.57	74.00	-21.43	peak
4	7275.000	41.69	6.00	47.69	74.00	-26.31	peak
5	11085.000	39.22	12.57	51.79	74.00	-22.21	peak
6	17295.000	31.32	21.71	53.03	74.00	-20.97	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.

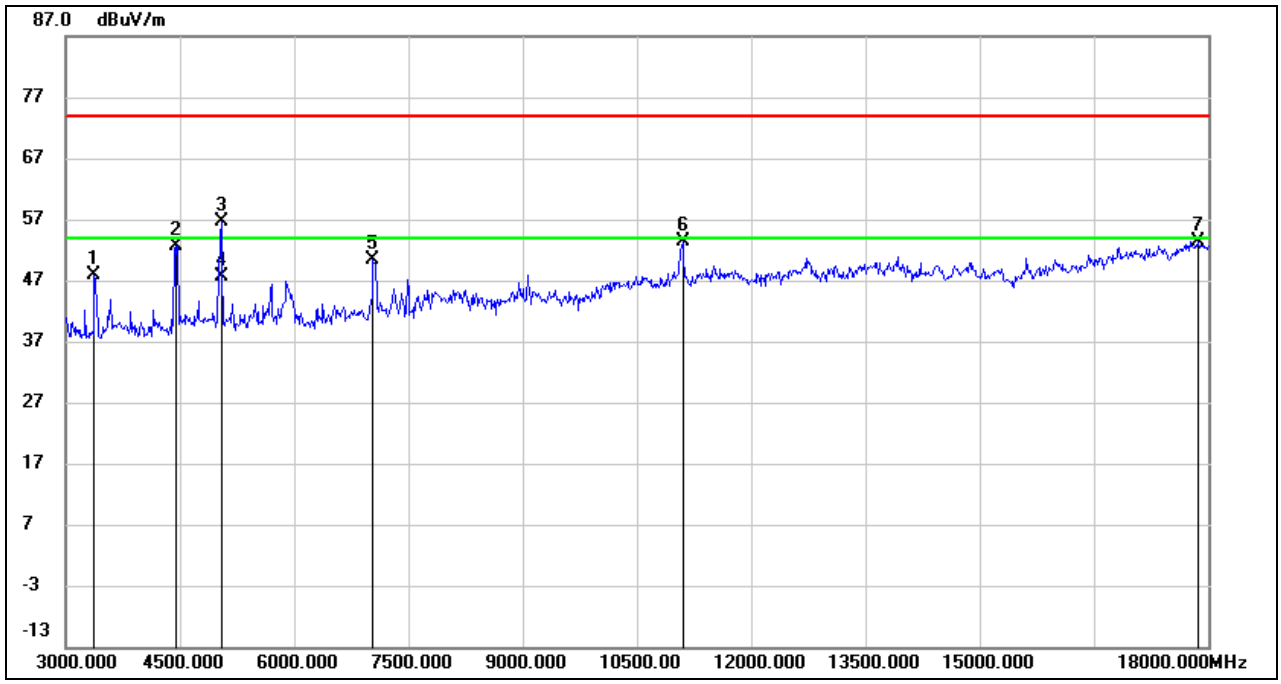
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3390.000	52.10	-4.37	47.73	74.00	-26.27	peak
2	4455.000	54.76	-1.13	53.63	74.00	-20.37	peak
3	5040.000	61.38	1.46	62.84	74.00	-11.16	peak
4	5040.000	47.38	1.46	48.84	54.00	-5.16	AVG
5	7050.000	47.14	5.84	52.98	74.00	-21.02	peak
6	11100.000	45.42	12.56	57.98	74.00	-16.02	peak
7	11100.000	30.32	12.56	42.88	54.00	-11.12	AVG
8	17670.000	30.99	22.24	53.23	74.00	-20.77	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

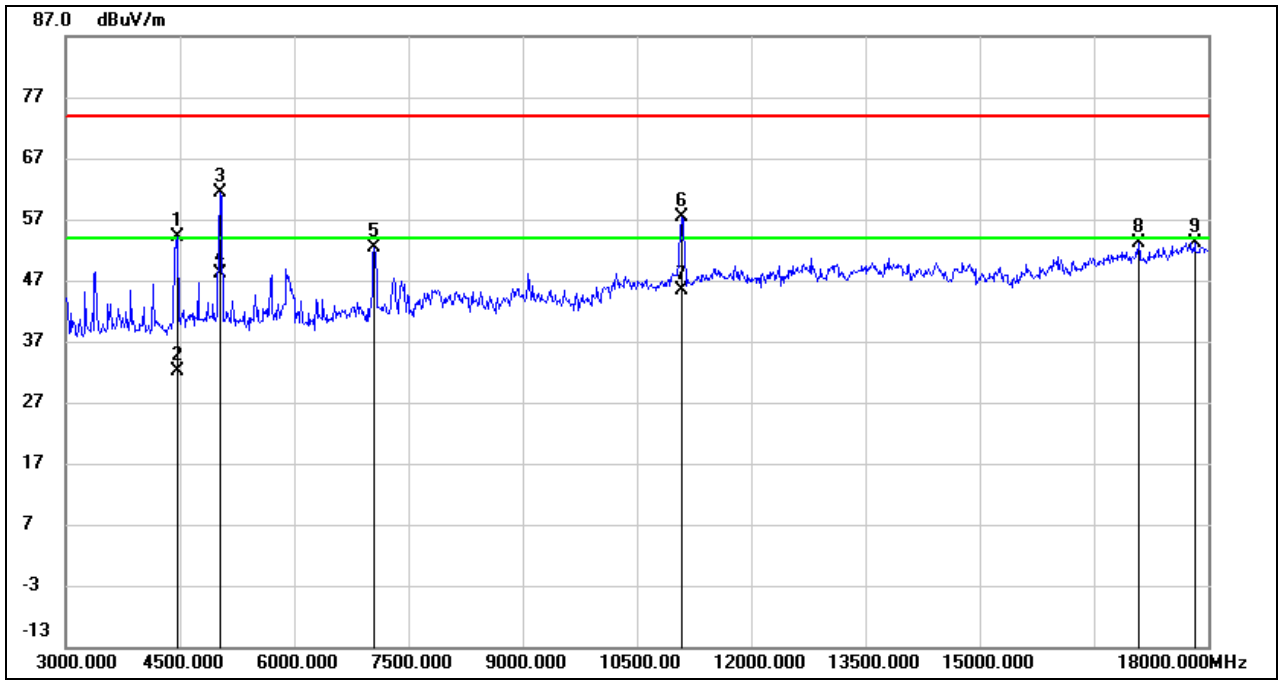
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3375.000	52.29	-4.35	47.94	74.00	-26.06	peak
2	4455.000	53.77	-1.13	52.64	74.00	-21.36	peak
3	5040.000	55.28	1.46	56.74	74.00	-17.26	peak
4	5040.000	46.06	1.46	47.52	54.00	-6.48	AVG
5	7035.000	44.68	5.81	50.49	74.00	-23.51	peak
6	11100.000	40.87	12.56	53.43	74.00	-20.57	peak
7	17865.000	30.08	23.33	53.41	74.00	-20.59	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

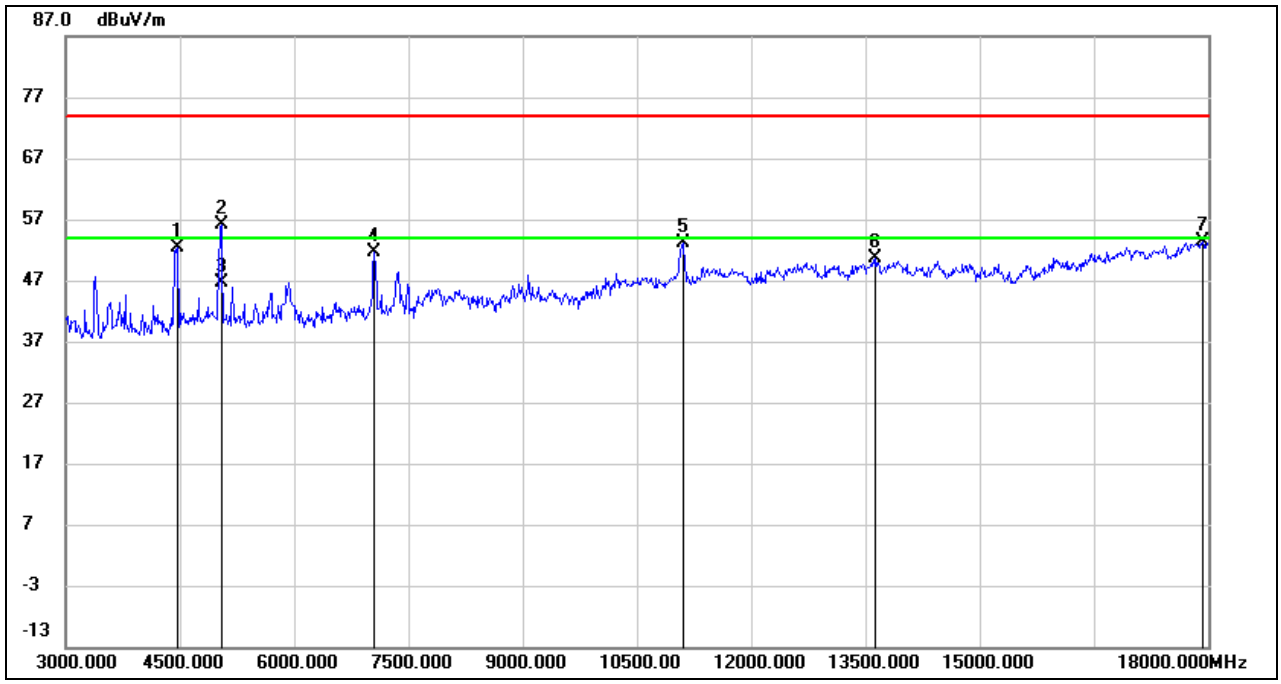
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4470.000	55.17	-0.98	54.19	74.00	-19.81	peak
2	4470.000	33.04	-0.98	32.06	54.00	-21.94	AVG
3	5025.000	59.97	1.43	61.40	74.00	-12.60	peak
4	5025.000	46.68	1.43	48.11	54.00	-5.89	AVG
5	7050.000	46.64	5.84	52.48	74.00	-21.52	peak
6	11085.000	44.83	12.57	57.40	74.00	-16.60	peak
7	11085.000	32.71	12.57	45.28	54.00	-8.72	AVG
8	17085.000	32.43	20.60	53.03	74.00	-20.97	peak
9	17820.000	29.93	23.30	53.23	74.00	-20.77	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.

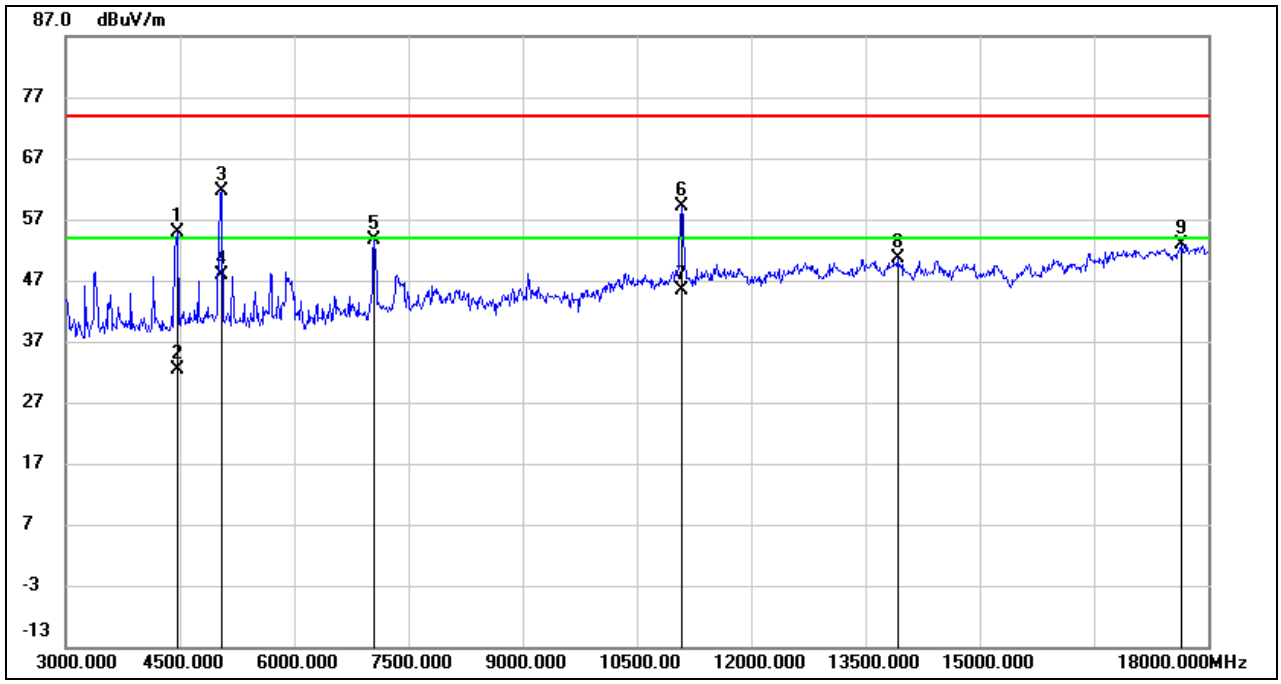
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4470.000	53.40	-0.98	52.42	74.00	-21.58	peak
2	5040.000	54.74	1.46	56.20	74.00	-17.80	peak
3	5040.000	45.13	1.46	46.59	54.00	-7.41	AVG
4	7050.000	45.81	5.84	51.65	74.00	-22.35	peak
5	11100.000	40.68	12.56	53.24	74.00	-20.76	peak
6	13635.000	34.63	15.97	50.60	74.00	-23.40	peak
7	17925.000	29.90	23.37	53.27	74.00	-20.73	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. 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	4470.000	55.87	-0.98	54.89	74.00	-19.11	peak
2	4470.000	33.37	-0.98	32.39	54.00	-21.61	AVG
3	5040.000	60.21	1.46	61.67	74.00	-12.33	peak
4	5040.000	46.42	1.46	47.88	54.00	-6.12	AVG
5	7050.000	47.68	5.84	53.52	74.00	-20.48	peak
6	11085.000	46.51	12.57	59.08	74.00	-14.92	peak
7	11085.000	32.72	12.57	45.29	54.00	-8.71	AVG
8	13920.000	34.48	16.17	50.65	74.00	-23.35	peak
9	17655.000	30.84	22.15	52.99	74.00	-21.01	peak

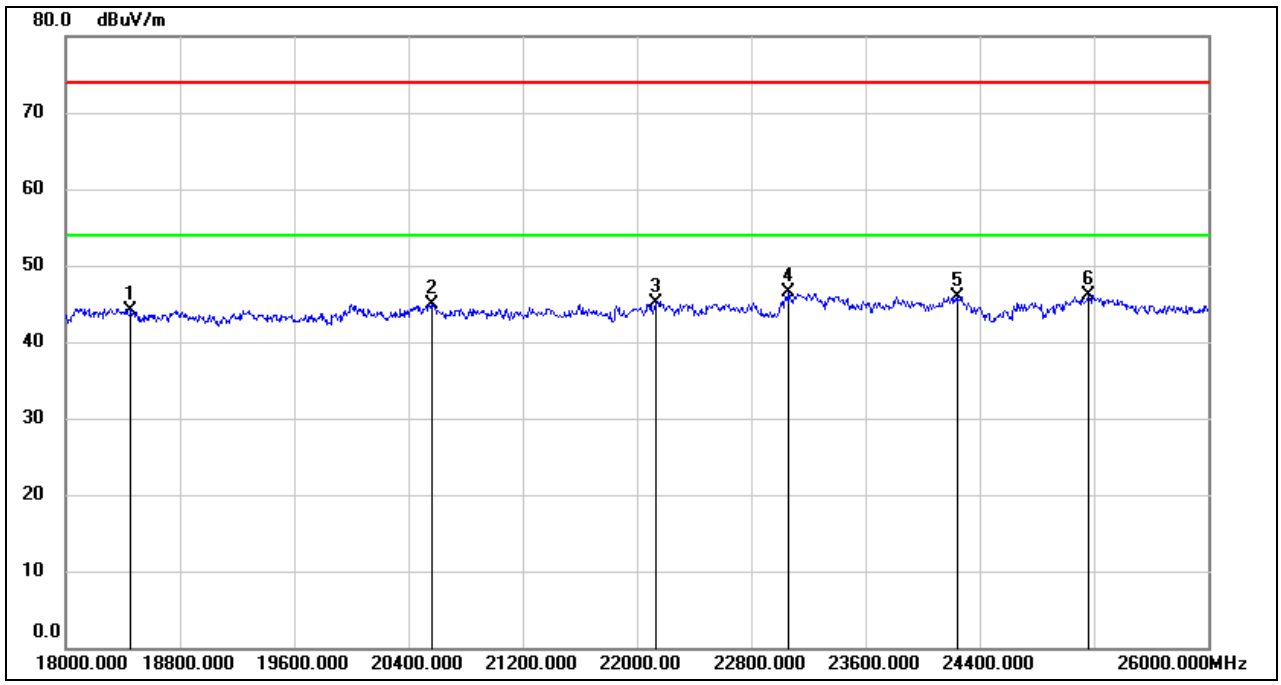
Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

Note: Both STBC and CDD modes had been tested, only the worst data was recorded in the report.

8.5. SPURIOUS EMISSIONS (18 GHz ~ 26 GHz)

8.5.1. 802.11n HT20 MODE

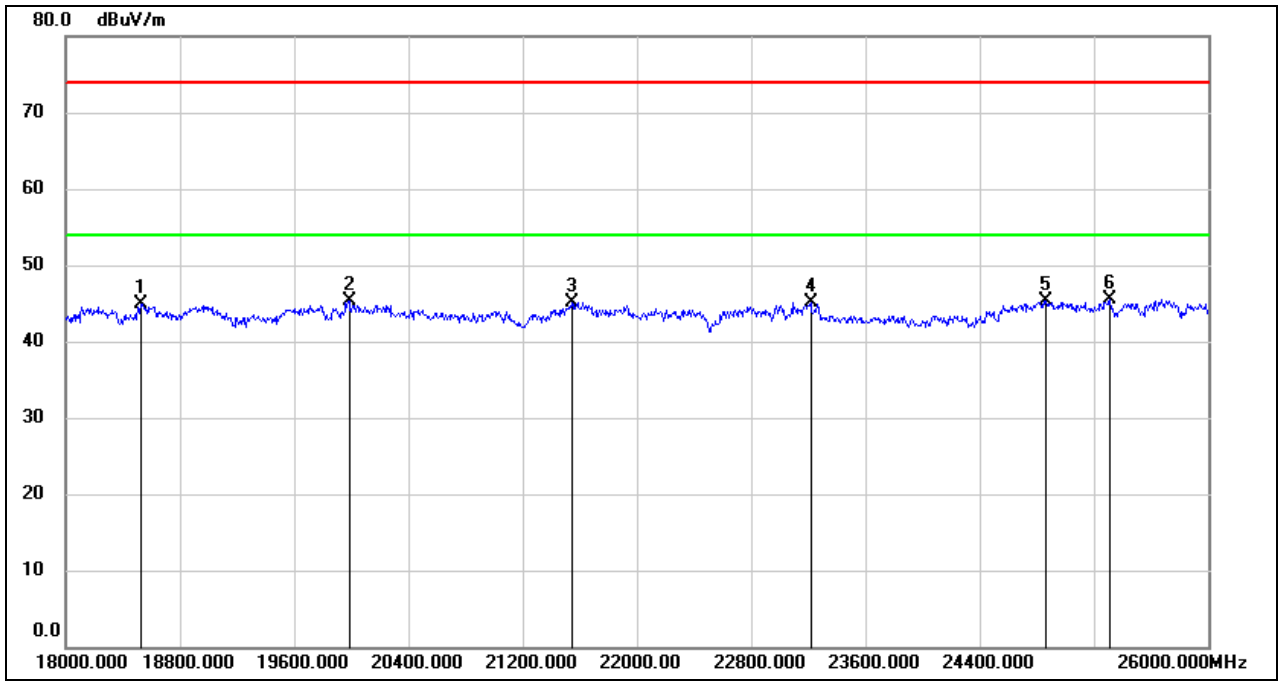
SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18456.000	49.50	-5.30	44.20	74.00	-29.80	peak
2	20560.000	50.23	-5.30	44.93	74.00	-29.07	peak
3	22136.000	49.41	-4.34	45.07	74.00	-28.93	peak
4	23064.000	49.99	-3.42	46.57	74.00	-27.43	peak
5	24248.000	48.82	-2.83	45.99	74.00	-28.01	peak
6	25160.000	47.92	-1.83	46.09	74.00	-27.91	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. The preamplifier only effect to the above 18GHz signal and no filter added to the measurement chain.

SPURIOUS EMISSIONS (LOW 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	50.11	-5.26	44.85	74.00	-29.15	peak
2	19984.000	50.71	-5.44	45.27	74.00	-28.73	peak
3	21544.000	49.76	-4.63	45.13	74.00	-28.87	peak
4	23216.000	48.51	-3.38	45.13	74.00	-28.87	peak
5	24864.000	47.53	-2.23	45.30	74.00	-28.70	peak
6	25312.000	47.20	-1.70	45.50	74.00	-28.50	peak

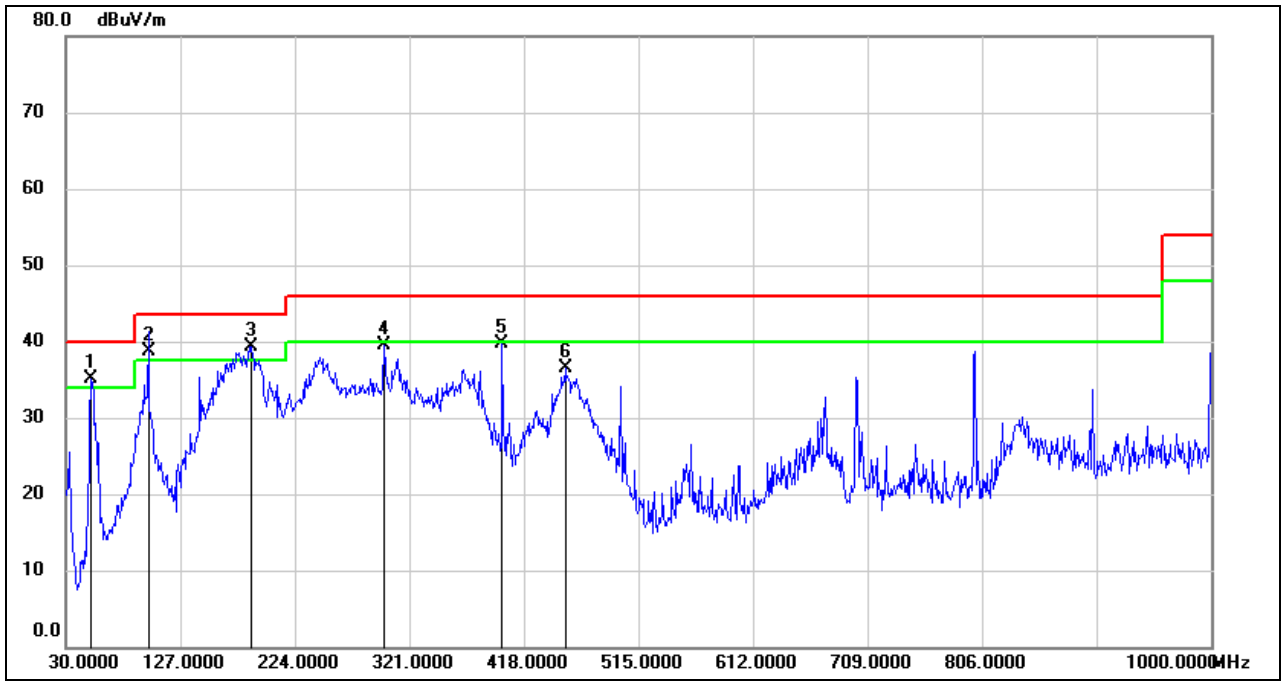
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. The preamplifier only effect to the above 18GHz signal and no filter added to the measurement chain.

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

8.6. SPURIOUS EMISSIONS (30 MHz ~ 1 GHz)

8.6.1. 802.11n HT20 MODE

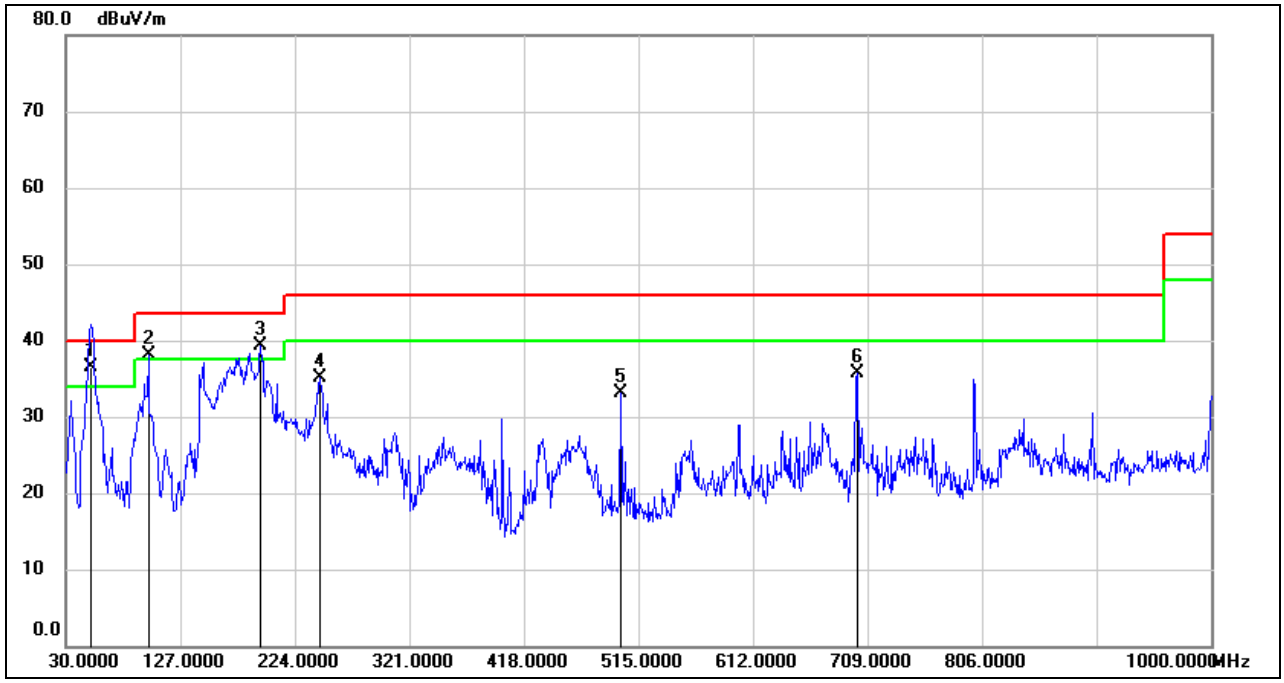
SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	51.3400	53.56	-18.46	35.10	40.00	-4.90	QP
2	99.8399	60.48	-21.72	38.76	43.50	-4.74	QP
3	187.1400	55.60	-16.23	39.37	43.50	-4.13	QP
4	299.6600	53.80	-14.39	39.41	46.00	-6.59	QP
5	399.5700	52.45	-12.81	39.64	46.00	-6.36	QP
6	452.9200	48.34	-11.82	36.52	46.00	-9.48	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 (LOW CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	51.3400	54.95	-18.46	36.49	40.00	-3.51	QP
2	99.8399	59.73	-21.72	38.01	43.50	-5.49	QP
3	194.9000	55.36	-15.99	39.37	43.50	-4.13	QP
4	245.3400	51.92	-16.77	35.15	46.00	-10.85	QP
5	500.4500	43.98	-10.91	33.07	46.00	-12.93	QP
6	700.2700	42.61	-6.90	35.71	46.00	-10.29	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

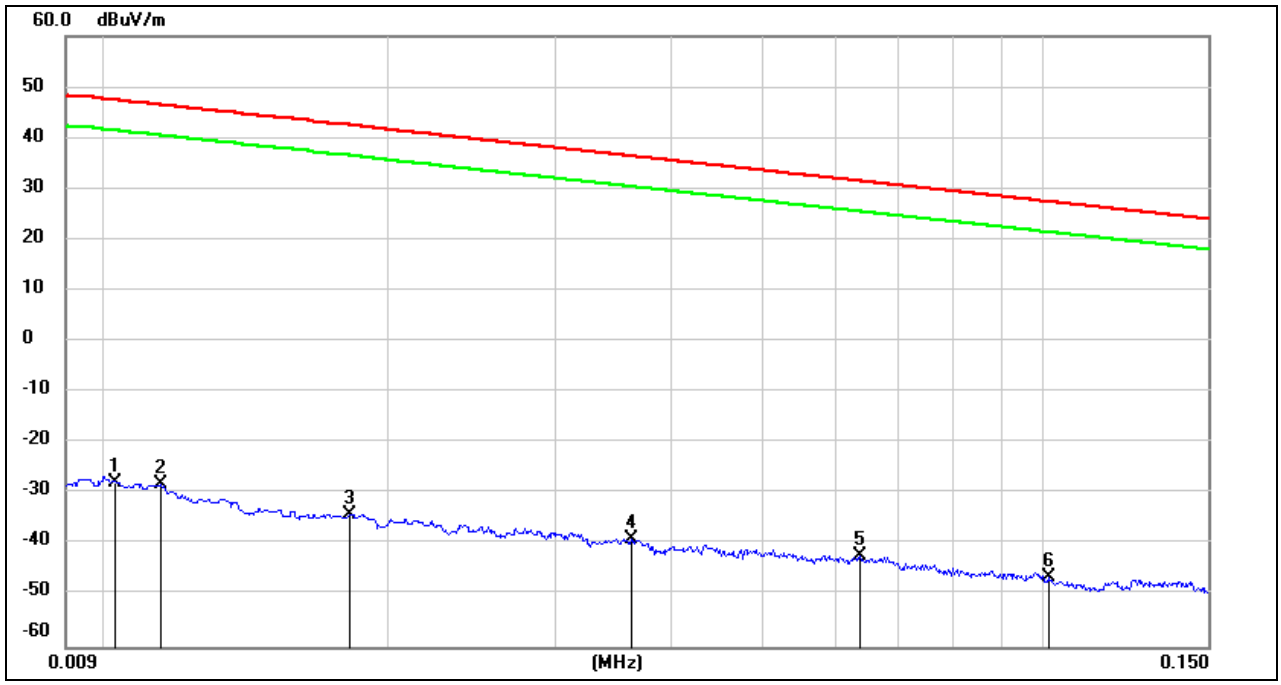
Note: All the modes had been tested, but only the worst data was recorded in the report.

8.7. SPURIOUS EMISSIONS BELOW 30 MHz

8.7.1. 802.11n HT20 MODE

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

9 kHz~ 150 kHz



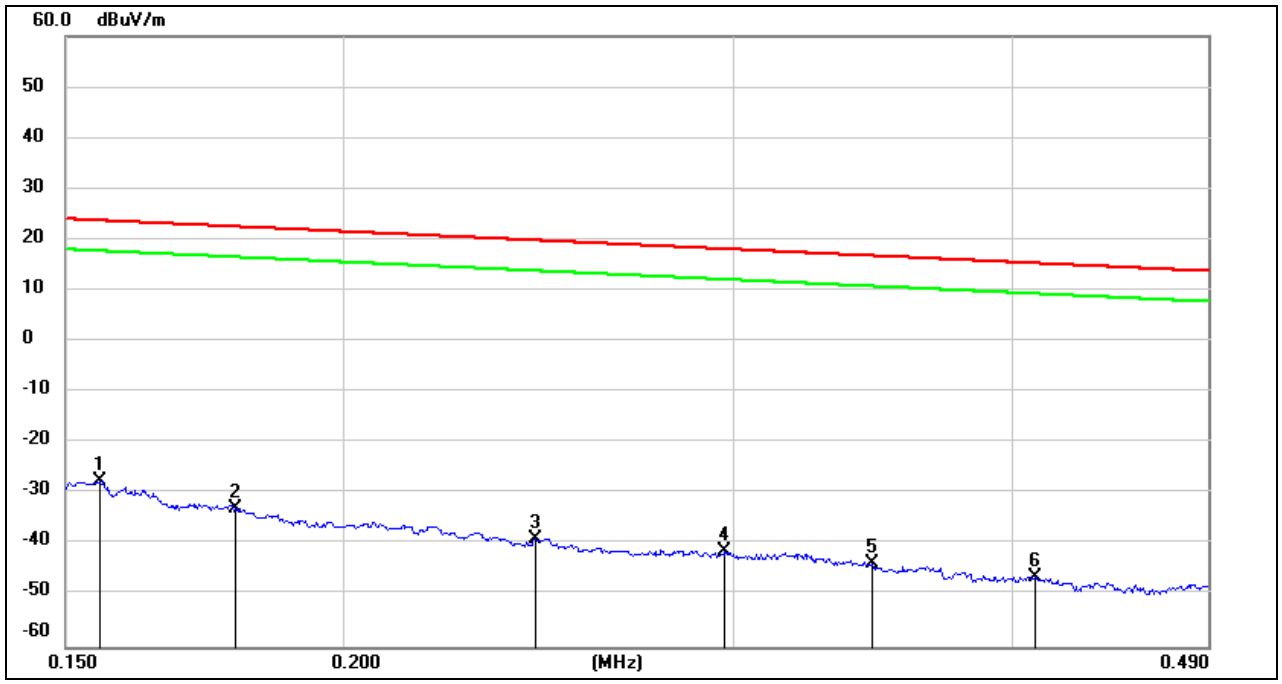
No.	Frequency	Reading	Correct	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.0102	73.55	-101.40	-27.85	47.43	-79.35	-4.07	-75.28	peak
2	0.0114	73.38	-101.40	-28.02	46.46	-79.52	-5.04	-74.48	peak
3	0.0181	67.35	-101.36	-34.01	42.45	-85.51	-9.05	-76.46	peak
4	0.0362	62.51	-101.42	-38.91	36.43	-90.41	-15.07	-75.34	peak
5	0.0636	59.31	-101.54	-42.23	31.53	-93.73	-19.97	-73.76	peak
6	0.1014	55.56	-101.79	-46.23	27.48	-97.73	-24.02	-73.71	peak

Note: 1. Measurement = Reading Level + Correct Factor (dBuA/m= dBuV/m- 20Log10[120π] = dBuV/m- 51.5).

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



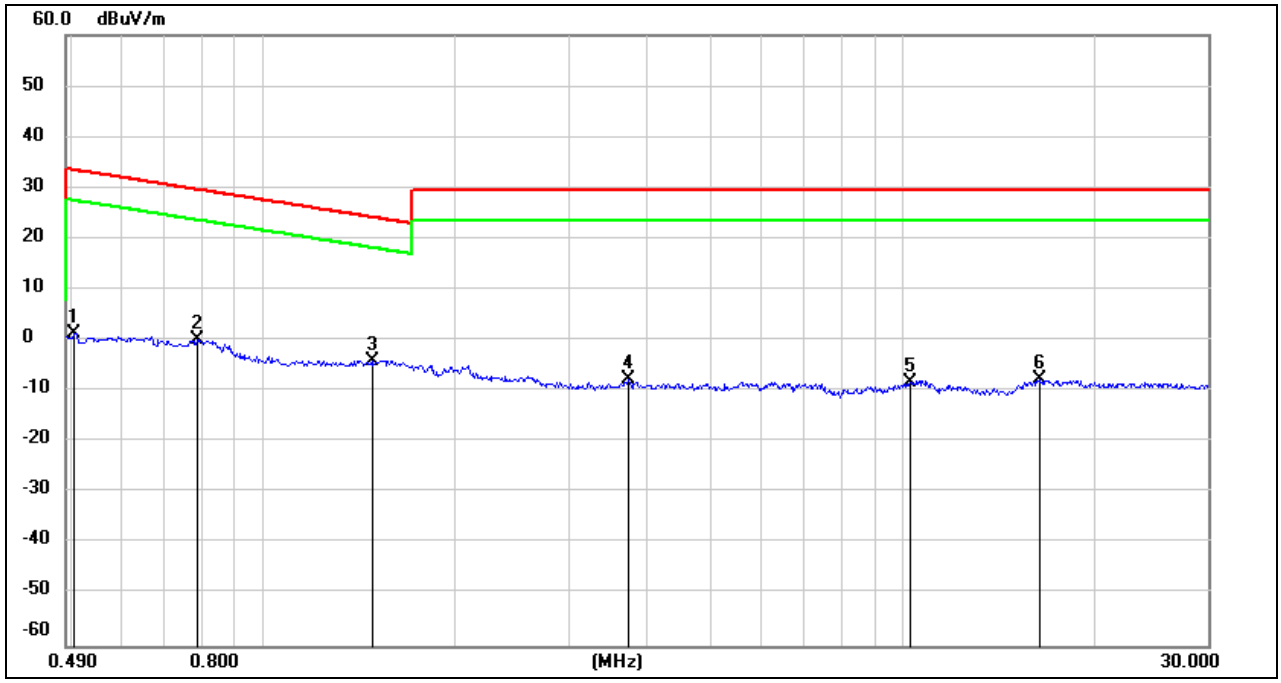
No.	Frequency	Reading	Correct	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.1554	74.27	-101.65	-27.38	23.77	-78.88	-27.73	-51.15	peak
2	0.1789	68.82	-101.68	-32.86	22.55	-84.36	-28.95	-55.41	peak
3	0.2442	63.03	-101.79	-38.76	19.85	-90.26	-31.65	-58.61	peak
4	0.2972	60.66	-101.85	-41.19	18.14	-92.69	-33.36	-59.33	peak
5	0.3462	58.24	-101.90	-43.66	16.81	-95.16	-34.69	-60.47	peak
6	0.4097	55.52	-101.97	-46.45	15.35	-97.95	-36.15	-61.80	peak

Note: 1. Measurement = Reading Level + Correct Factor (dBuA/m= dBuV/m- 20Log10[120π] = dBuV/m- 51.5).

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	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	0.5039	63.44	-62.07	1.37	33.56	-50.13	-17.94	-32.19	peak
2	0.7861	62.33	-62.14	0.19	29.69	-51.31	-21.81	-29.50	peak
3	1.4757	58.00	-62.05	-4.05	24.22	-55.55	-27.28	-28.27	peak
4	3.7100	53.70	-61.41	-7.71	29.54	-59.21	-21.96	-37.25	peak
5	10.2576	52.63	-60.81	-8.18	29.54	-59.68	-21.96	-37.72	peak
6	16.3959	53.17	-60.96	-7.79	29.54	-59.29	-21.96	-37.33	peak

Note: 1. Measurement = Reading Level + Correct Factor (dBuA/m= dBuV/m- 20Log10[120π] = dBuV/m- 51.5).

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 had been tested, but only the worst data was recorded in the report.

9. AC POWER LINE CONDUCTED EMISSIONS

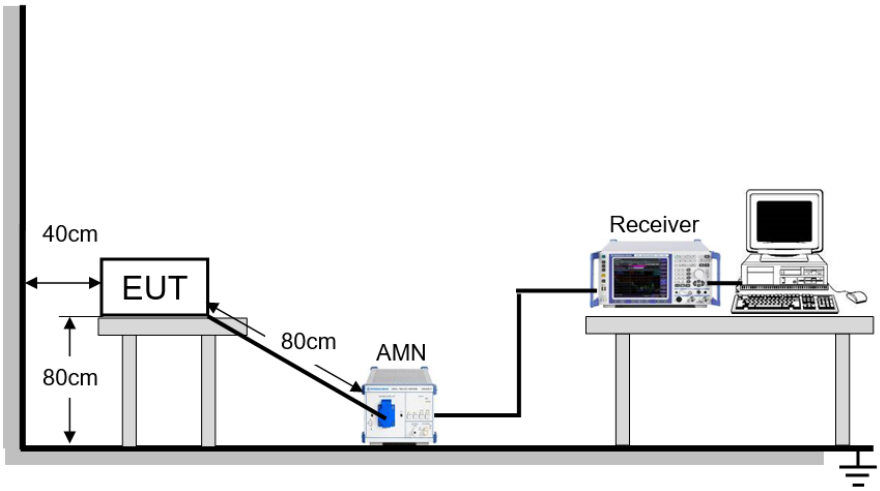
LIMITS

Please refer to CFR 47 FCC §15.207 (a) and ISED RSS-Gen Clause 8.8

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.

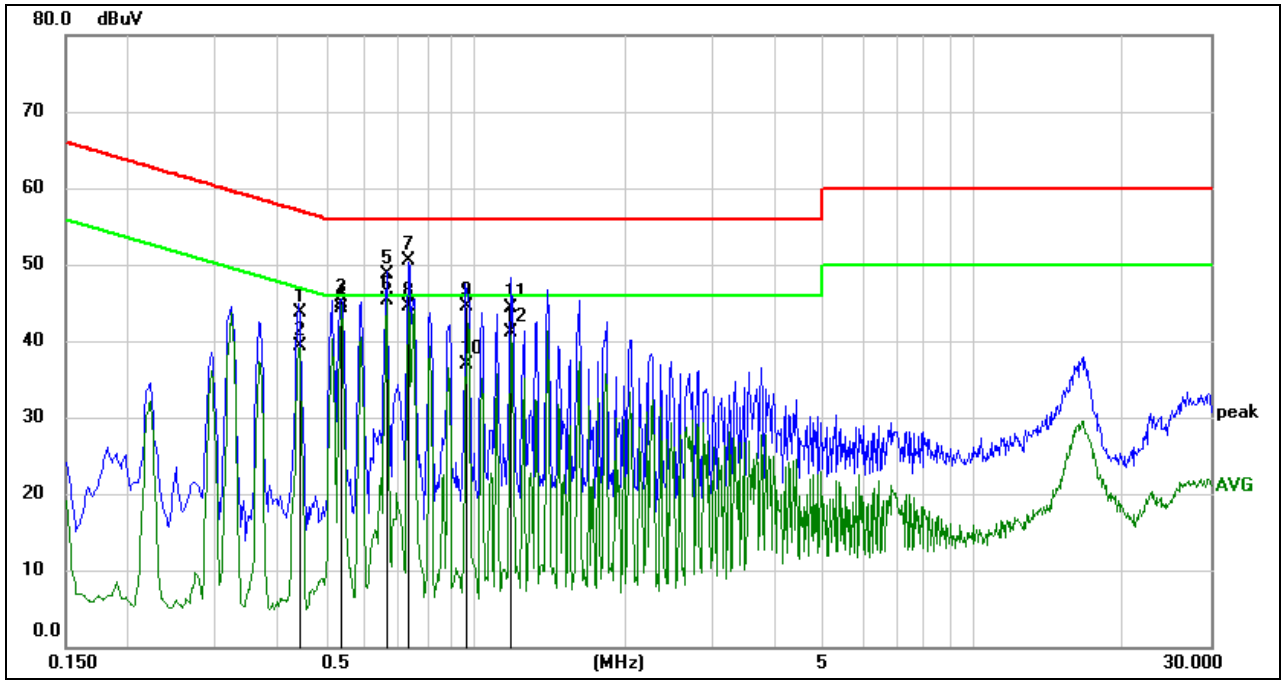
TEST ENVIRONMENT

Temperature	22 °C	Relative Humidity	68.9 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 12 V

RESULTS

9.1. 802.11n HT20 MODE

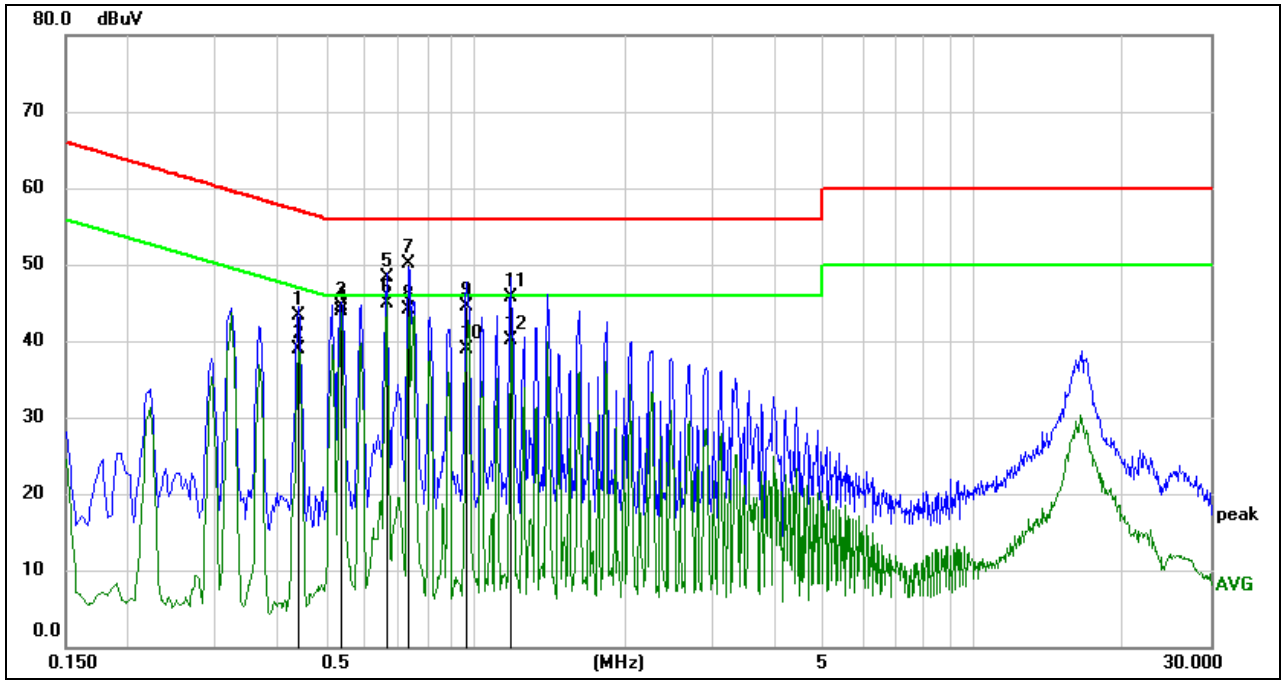
LINE N RESULTS (LOW CHANNEL, WORST-CASE CONFIGURATION)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.4421	34.18	9.60	43.78	57.02	-13.24	QP
2	0.4421	29.62	9.60	39.22	47.02	-7.80	AVG
3	0.5381	35.37	9.60	44.97	56.00	-11.03	QP
4	0.5381	34.77	9.60	44.37	46.00	-1.63	AVG
5	0.6619	39.09	9.60	48.69	56.00	-7.31	QP
6	0.6619	35.71	9.60	45.31	46.00	-0.69	AVG
7	0.7357	40.96	9.60	50.56	56.00	-5.44	QP
8	0.7357	34.91	9.60	44.51	46.00	-1.49	AVG
9	0.9621	34.81	9.61	44.42	56.00	-11.58	QP
10	0.9621	27.33	9.61	36.94	46.00	-9.06	AVG
11	1.1828	34.66	9.61	44.27	56.00	-11.73	QP
12	1.1828	31.41	9.61	41.02	46.00	-4.98	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 L RESULTS (LOW CHANNEL, WORST-CASE CONFIGURATION)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.4417	33.76	9.60	43.36	57.03	-13.67	QP
2	0.4417	29.22	9.60	38.82	47.03	-8.21	AVG
3	0.5377	34.91	9.60	44.51	56.00	-11.49	QP
4	0.5377	34.21	9.60	43.81	46.00	-2.19	AVG
5	0.6620	38.77	9.60	48.37	56.00	-7.63	QP
6	0.6620	35.37	9.60	44.97	46.00	-1.03	AVG
7	0.7357	40.52	9.60	50.12	56.00	-5.88	QP
8	0.7357	34.46	9.60	44.06	46.00	-1.94	AVG
9	0.9633	34.91	9.61	44.52	56.00	-11.48	QP
10	0.9633	29.25	9.61	38.86	46.00	-7.14	AVG
11	1.1796	36.14	9.61	45.75	56.00	-10.25	QP
12	1.1796	30.54	9.61	40.15	46.00	-5.85	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 had 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

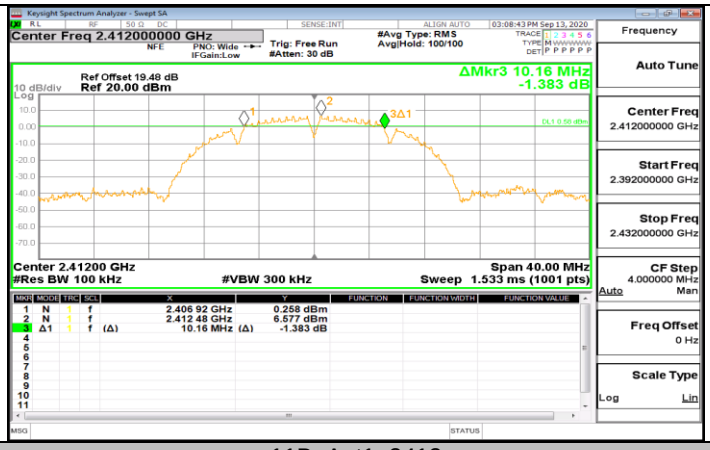
11. Appendix

11.1. Appendix A: DTS Bandwidth

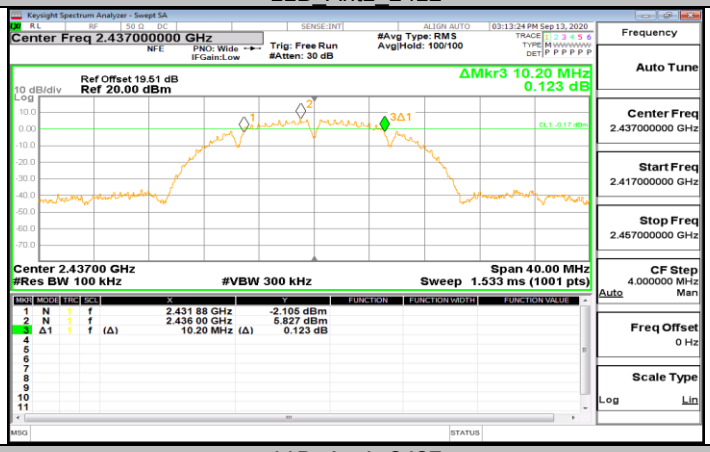
11.1.1. Test Result

Test Mode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	10.160	2406.920	2417.080	0.5	PASS
		2437	10.200	2431.880	2442.080	0.5	PASS
		2462	10.160	2456.920	2467.080	0.5	PASS
11G	Ant1	2412	16.560	2403.720	2420.280	0.5	PASS
		2437	16.600	2428.680	2445.280	0.5	PASS
		2462	16.560	2453.680	2470.240	0.5	PASS
11N20SISO	Ant1	2412	17.680	2403.160	2420.840	0.5	PASS
		2437	17.840	2428.080	2445.920	0.5	PASS
		2462	17.760	2453.080	2470.840	0.5	PASS
11N40SISO	Ant1	2422	36.480	2403.760	2440.240	0.5	PASS
		2437	36.480	2418.760	2455.240	0.5	PASS
		2452	36.480	2433.760	2470.240	0.5	PASS

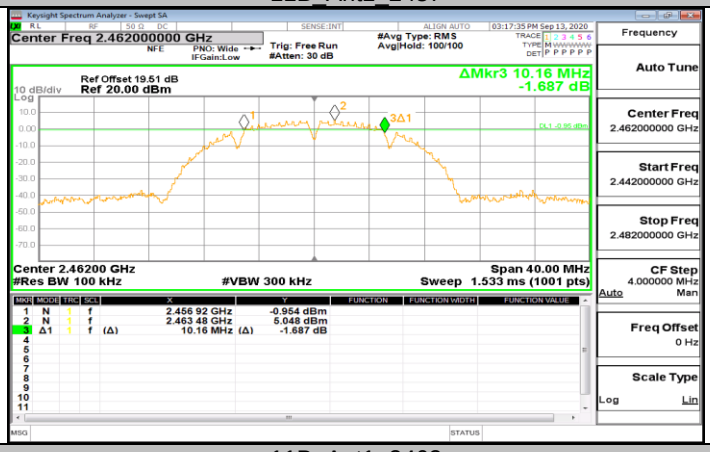
11.1.2. Test Graphs



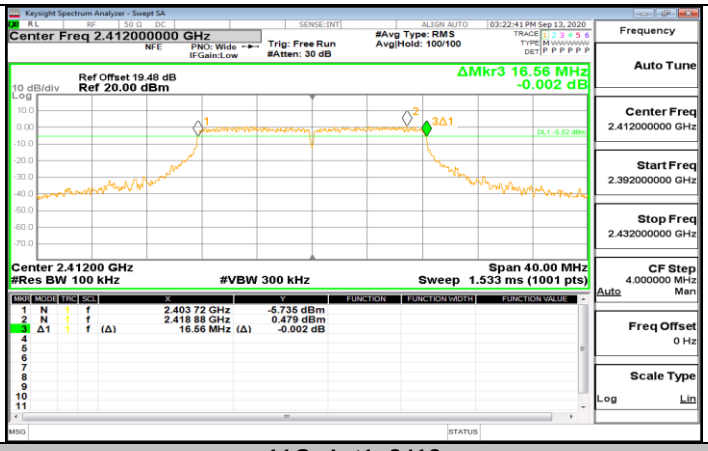
11B_Ant1_2412



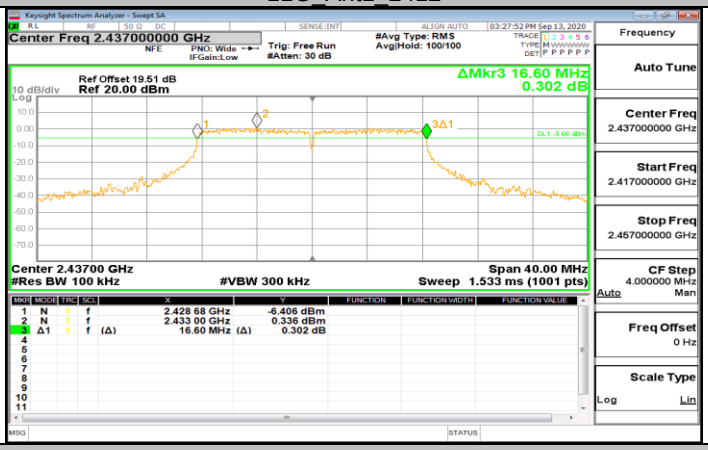
11B_Ant1_2437



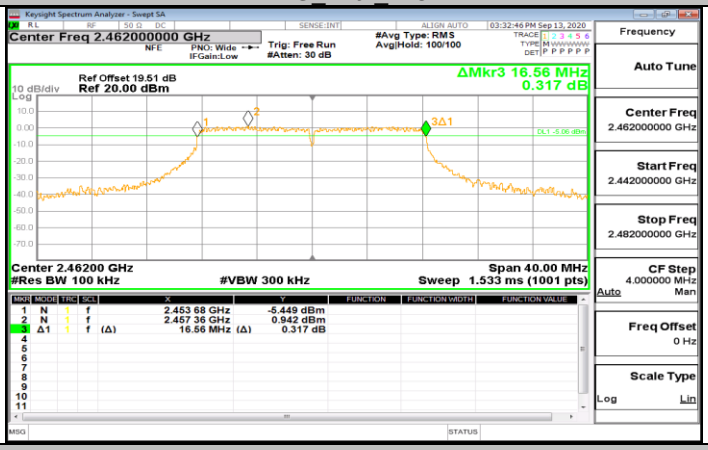
11B_Ant1_2462



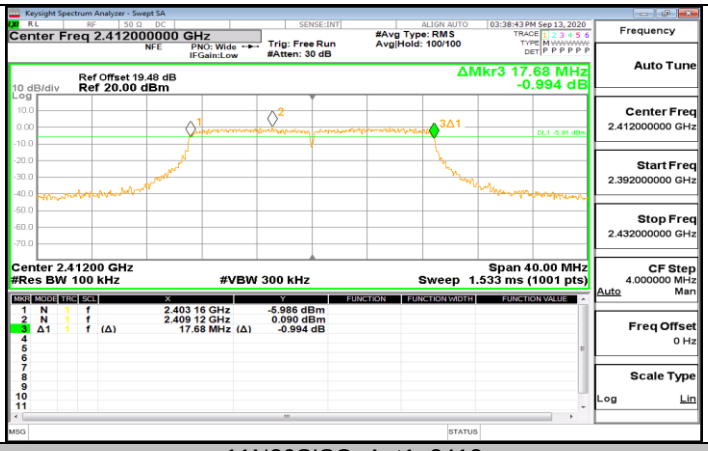
11G_Ant1_2412



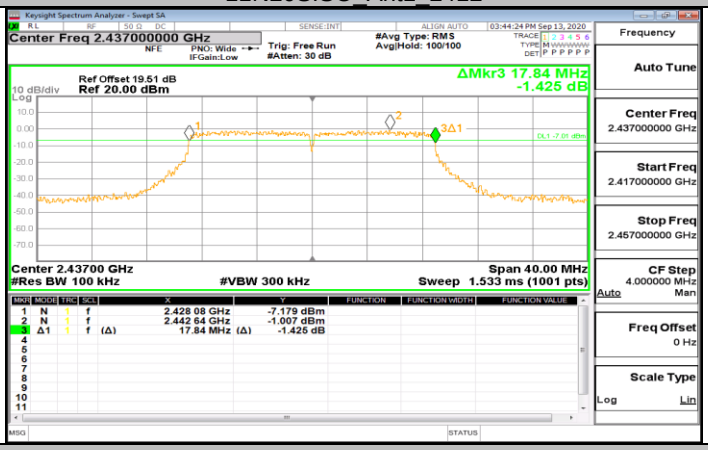
11G_Ant1_2437



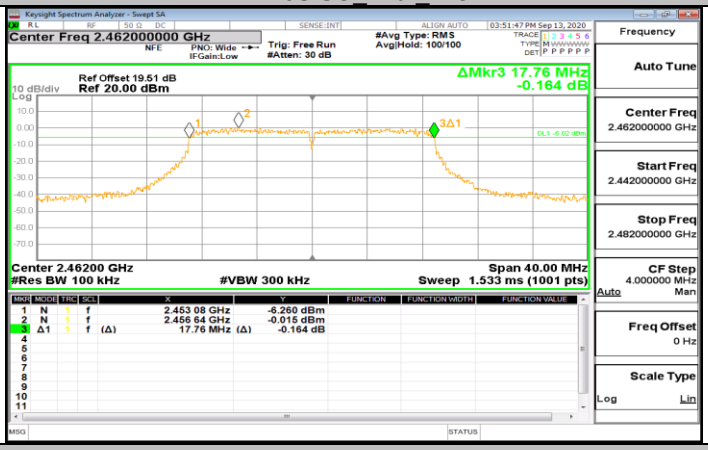
11G_Ant1_2462



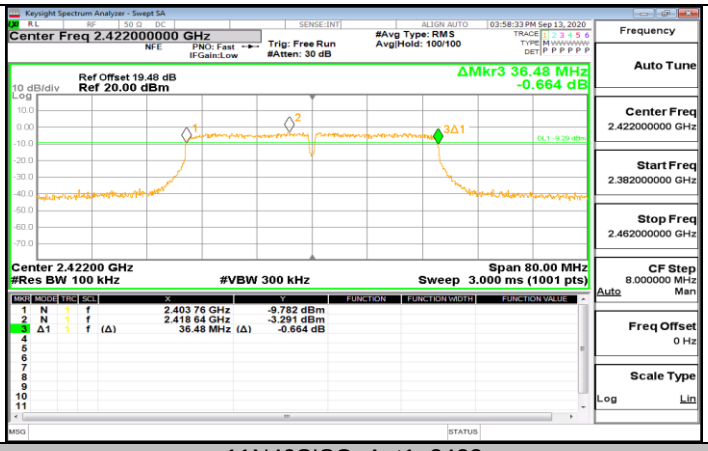
11N20SISO_Ant1_2412



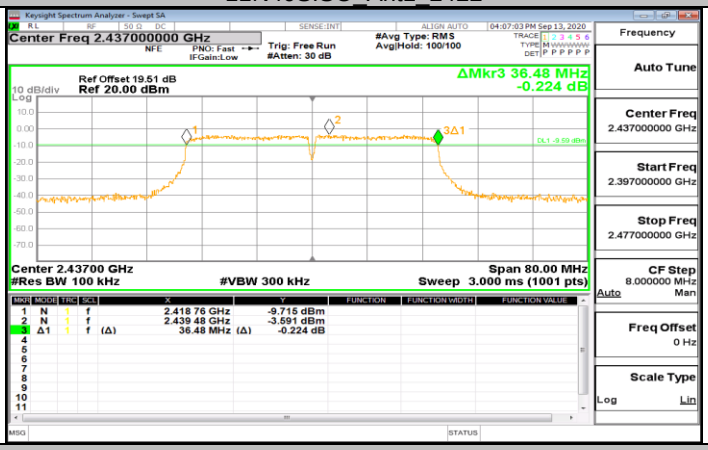
11N20SISO_Ant1_2437



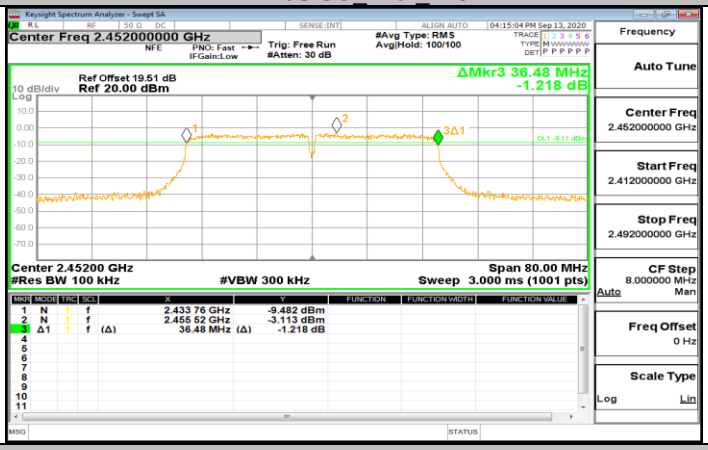
11N20SISO_Ant1_2462



11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



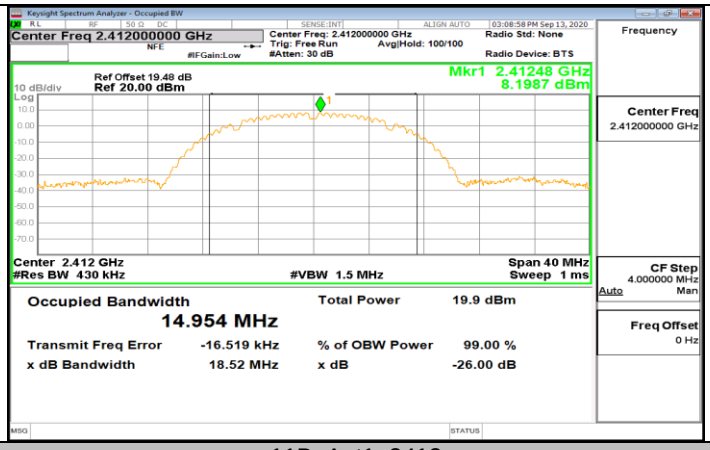
11N40SISO_Ant1_2452

11.2. Appendix B: Occupied Channel Bandwidth

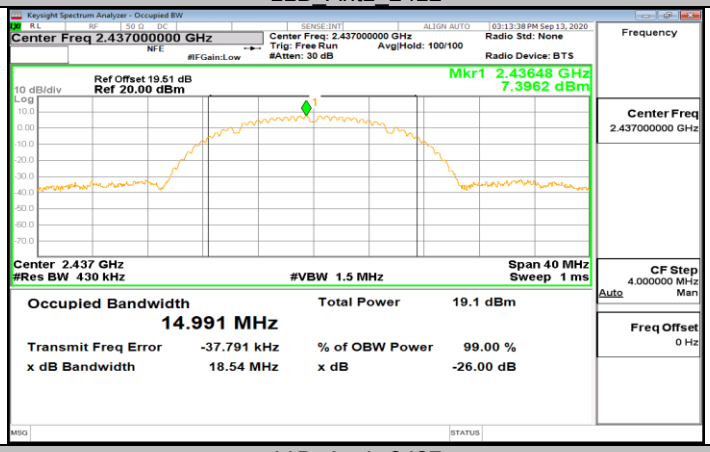
11.2.1. Test Result

Test Mode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Verdict
11B	Ant1	2412	14.954	2404.506	2419.460	PASS
		2437	14.991	2429.467	2444.458	PASS
		2462	14.957	2454.479	2469.436	PASS
11G	Ant1	2412	16.954	2403.432	2420.386	PASS
		2437	16.865	2428.521	2445.386	PASS
		2462	16.887	2453.482	2470.369	PASS
11N20SISO	Ant1	2412	17.925	2403.011	2420.936	PASS
		2437	17.899	2428.033	2445.932	PASS
		2462	17.882	2453.002	2470.884	PASS
11N40SISO	Ant1	2422	36.322	2403.848	2440.170	PASS
		2437	36.339	2418.806	2455.145	PASS
		2452	36.362	2433.775	2470.137	PASS

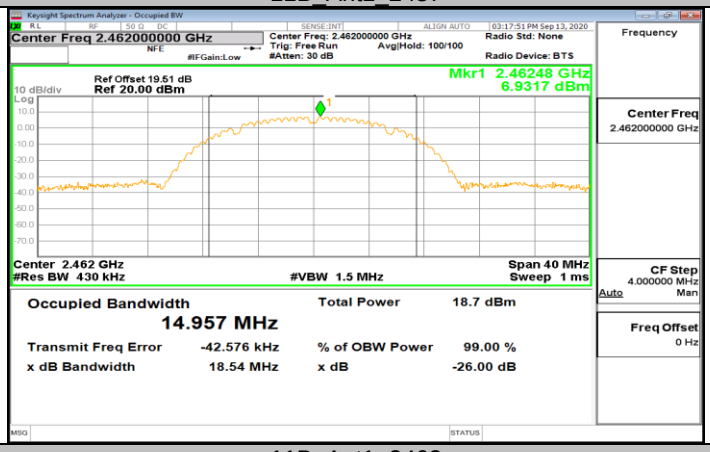
11.2.2. Test Graphs



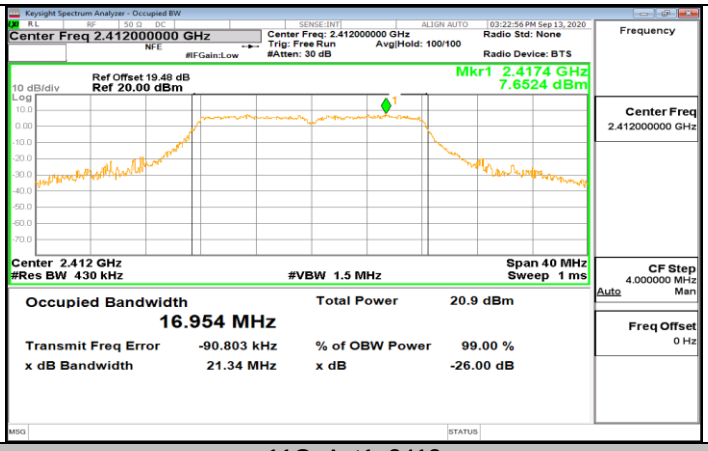
11B_Ant1_2412



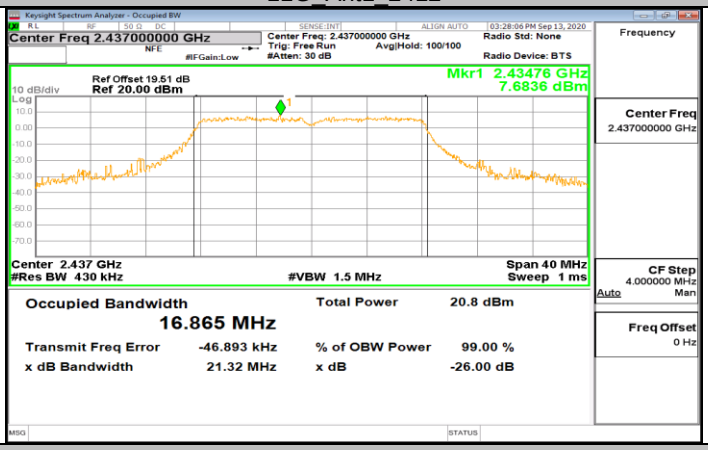
11B_Ant1_2437



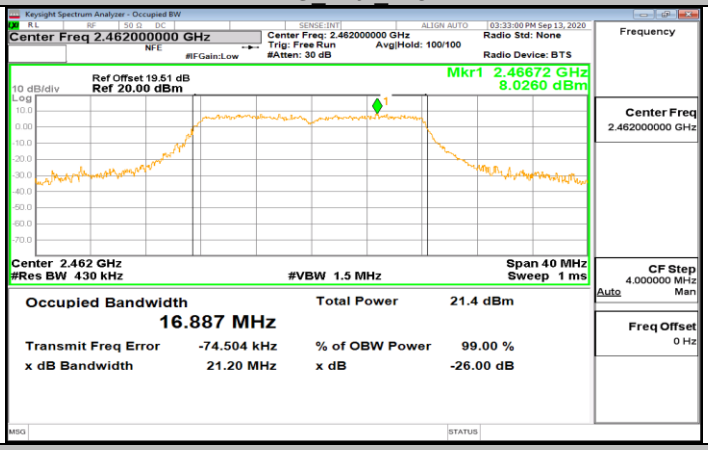
11B_Ant1_2462



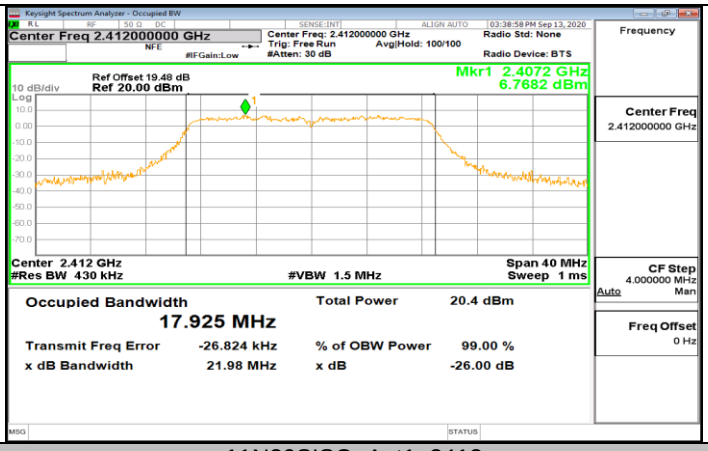
11G_Ant1_2412



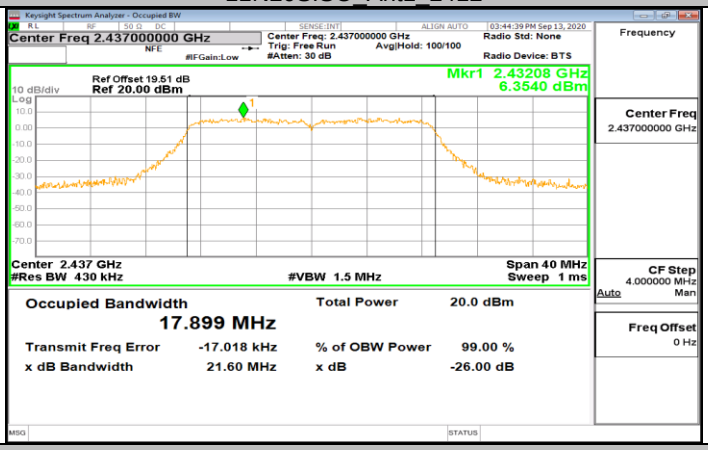
11G_Ant1_2437



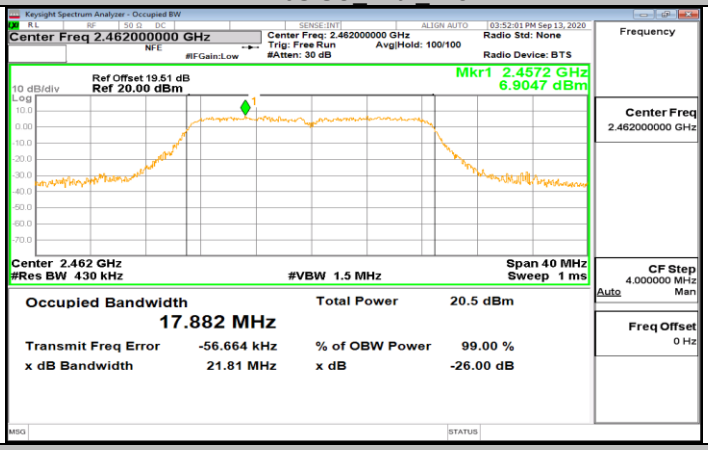
11G_Ant1_2462



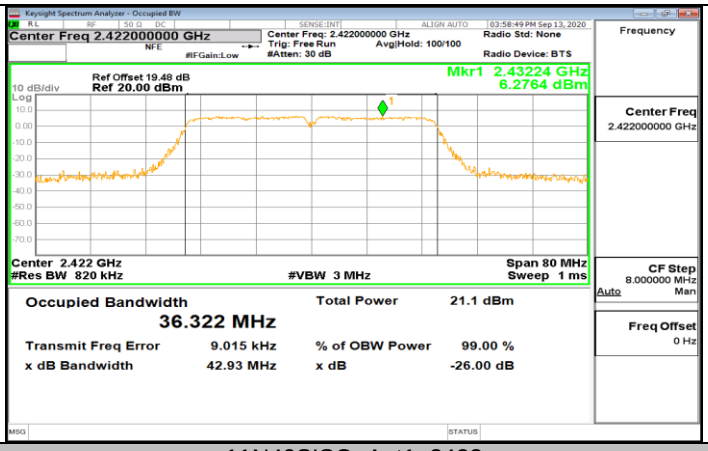
11N20SISO_Ant1_2412



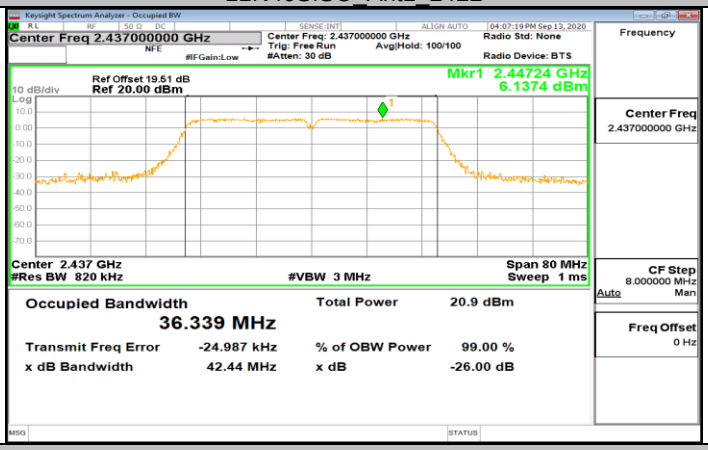
11N20SISO_Ant1_2437



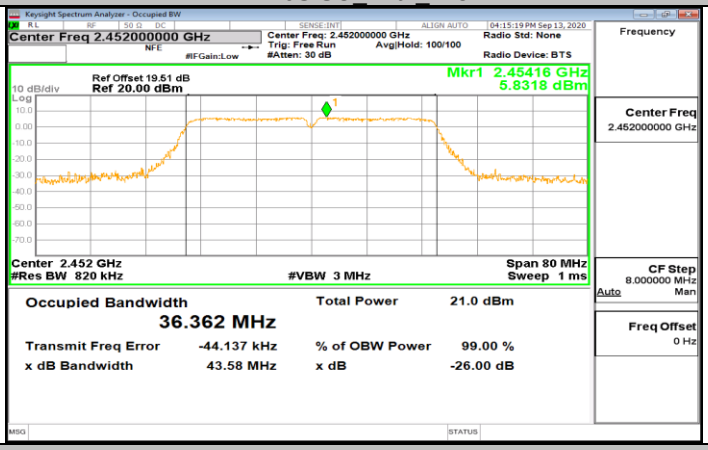
11N20SISO_Ant1_2462



11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452

11.3. Appendix C: Maximum conducted AVG output power

11.3.1. Test Result

Test Mode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	16.91	30	PASS
		2437	16.16	30	PASS
		2462	15.71	30	PASS
11G	Ant1	2412	14.91	30	PASS
		2437	14.80	30	PASS
		2462	15.27	30	PASS
11N20SISO	Ant1	2412	14.35	30	PASS
		2437	13.76	30	PASS
		2462	14.34	30	PASS
11N40SISO	Ant1	2422	14.18	30	PASS
		2437	14.09	30	PASS
		2452	14.07	30	PASS

11.4. Appendix D: Maximum power spectral density

11.4.1. Test Result

Test Mode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-14.37	<=8	PASS
		2437	-14.49	<=8	PASS
		2462	-15.08	<=8	PASS
11G	Ant1	2412	-14.59	<=8	PASS
		2437	-13.94	<=8	PASS
		2462	-13.82	<=8	PASS
11N20SISO	Ant1	2412	-12.89	<=8	PASS
		2437	-13.65	<=8	PASS
		2462	-13.3	<=8	PASS
11N40SISO	Ant1	2422	-15.59	<=8	PASS
		2437	-14.68	<=8	PASS
		2452	-15.03	<=8	PASS