



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

**CERTIFICATION TEST REPORT**

*For*

**IEEE 802.11a/b/g/n/ac 2T2R USB Wi-Fi Module Integrated Bluetooth  
2.1+EDR/4.2/5.1**

**MODEL NUMBER: SKI.WB663U.2**

**FCC ID: 2AR82-SKIWB663U21**

**IC: 24728-SKIWB663U21**

**REPORT NUMBER: 4790010773.1-3**

**ISSUE DATE: July 28, 2021**

**Prepared for**

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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V0	07/28/2021	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
<b>Note:</b> 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

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Address: NO.6 Liankun Road, Huangpu District, Guangzhou  
510530, China

## Manufacturer Information

Company Name: Guangzhou Shikun Electronics Co., Ltd  
Address: NO.6 Liankun Road, Huangpu District, Guangzhou  
510530, China

## EUT Information

EUT Name: IEEE 802.11a/b/g/n/ac 2T2R USB Wi-Fi Module  
Integrated Bluetooth 2.1+EDR/4.2/5.1  
Model: SKI.WB663U.2  
Sample Received Date: July 4, 2021  
Sample Status: Normal  
Sample ID: 4043984  
Date of Tested: July 5, 2021~ July 28, 2021

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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## 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, KDB 662911 D01 Multiple Transmitter Output v02r01, 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	<p><b>A2LA (Certificate No.: 4102.01)</b> UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA.</p> <p><b>FCC (FCC Designation No.: CN1187)</b> UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules</p> <p><b>ISED (Company No.: 21320)</b> 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 and the test lab Conformity Assessment Body Identifier (CABID) is CN0046.</p> <p><b>VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)</b> 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</p>
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Note 1: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

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

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



## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

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

### 4.2. MEASUREMENT UNCERTAINTY

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

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





## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

EUT Name	IEEE 802.11a/b/g/n/ac 2T2R USB Wi-Fi Module Integrated Bluetooth 2.1+EDR/4.2/5.1
Model Name	SKI.WB663U.2
Radio Technology	IEEE802.11b/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) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK,BPSK)
Power Supply	DC 3.3 V

### 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]	11.21	12.71
g	2412 ~ 2462	1-11[11]	11.23	12.73
n HT20	2412 ~ 2462	1-11[11]	13.38	14.88
n HT40	2422 ~ 2452	3-9[7]	10.63	12.13

**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 Worst Case Power Setting Parameter under 2400 ~ 2483.5MHz Band										
Test Software		QA Tool								
Modulation Mode	Transmit Antenna Number	Test Channel								
		NCB: 20MHz			NCB: 40MHz					
		CH 1	CH 6	CH 11	CH 3	CH 6	CH 9			
802.11b	1	1A	1A	1A	/					
	2	1A	1A	1A						
802.11g	1	1C	1C	1C						
	2	1C	1C	1C						
802.11n HT20	1	1C	1C	1C						
	2	1C	1C	1C						
802.11n HT40	1	/						16	16	16
	2	/						16	16	16

## 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 as provided by the client were:

802.11b mode: 1 Mbps

802.11b mode: 6 Mbps

802.11n HT20 mode: MCS0

802.11n HT40 mode: MCS0

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

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

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

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

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

The EUT support Cyclic Shift Diversity(CDD), Space Time Coding(STBC), Spatial Division Multiplexing(SDM) modes. They use the same conducted power per chain in any given mode, so we only chose the worst case mode CDD for final testing.

## 5.7. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna	Frequency (MHz)	Antenna Type	MAX Antenna Gain (dBi)
1	2412-2462	FPC	1.5
2	2412-2462	FPC	1.5

The EUT support Cyclic Shift Diversity(CDD) mode.

MIMO output power port and MIMO PSD port summing were performed in accordance with KDB 662911 D01. For the CDD results the Directional Gain was calculated in accordance with the following method.

For output power measurements:

Directional gain=  $G_{ANT} + \text{Array Gain} = 1.5 \text{ dBi}$

$G_{ANT}$  : equal to the gain of the antenna having the highest gain

Array Gain = 0 dB (i.e., no array gain) for  $N_{ANT} \leq 4$

For power spectral density (PSD) measurements:

Directional gain=  $G_{ANT} + \text{Array Gain} = 4.51 \text{ dBi}$

Array Gain =  $10 \log(N_{ANT}/N_{SS}) \text{ dB}$ .

$N_{ANT}$  : number of transmit antennas

$N_{SS}$  : number of spatial streams, The worst case directional gain will occur when  $N_{SS} = 1$

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

Note:

1.BT&WLAN 2.4G, BT & WLAN 5G, WLAN 2.4G & WLAN 5G can't transmit simultaneously.  
(declared by client)

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	Remarks
1	Laptop	Dell	Vostro 3902	/
2	Laptop	ThinkPad	E480	/
3	Test fixture	/	/	/
4	Switching Adapter	FLYPOWER	PS65IBCAY5000H	Input: AC 100-240 V, 50/60 Hz, 1.5A Output: DC 12.0 V, 5000 mA

### I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	USB	Unshielded	1.0	/

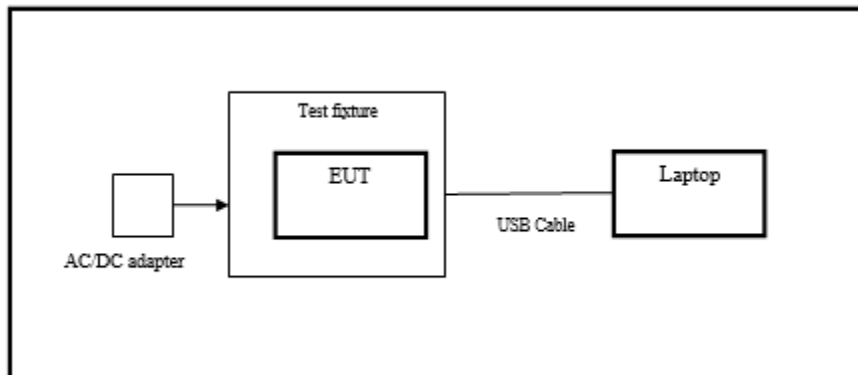
### ACCESSORIES

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

### TEST SETUP

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

### SETUP DIAGRAM FOR TESTS





## 6. MEASURING INSTRUMENT AND SOFTWARE USED

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

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



Software			
Description	Manufacturer	Name	Version
Test Software for Radiated Emissions	Farad	EZ-EMC	Ver. UL-3A1

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

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



## 7. ANTENNA PORT TEST RESULTS

### 7.1. ON TIME AND DUTY CYCLE

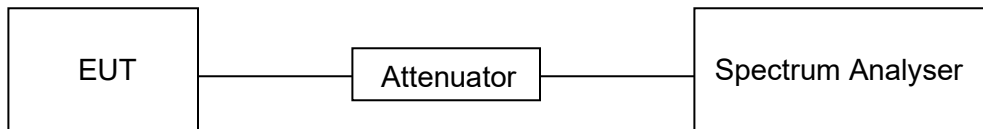
#### LIMITS

None; for reporting purposes only

#### PROCEDURE

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

#### TEST SETUP



#### TEST ENVIRONMENT

Temperature	26.2 °C	Relative Humidity	55.9 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3.3 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

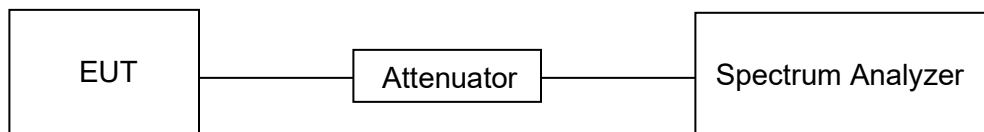
Connect the EUT to the spectrum analyser and use the following settings:

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	26.2 °C	Relative Humidity	55.9 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3.3 V

**RESULTS**

Please refer to appendix A & B.

### 7.3. CONDUCTED OUTPUT POWER

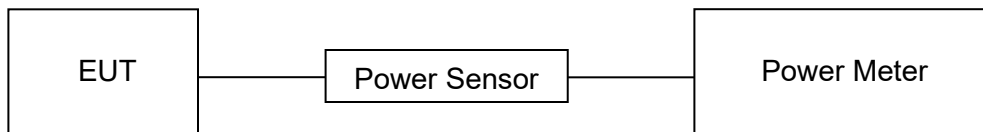
#### LIMITS

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)	AVG Output Power	1 watt or 30 dBm	2400-2483.5

#### TEST PROCEDURE

Connect the EUT to a low loss RF cable from the antenna port to the power sensor (video bandwidth is greater than the occupied bandwidth). Measure peak emission level, the indicated level is the average output power, after any corrections for external attenuators and cables.

#### TEST SETUP



#### TEST ENVIRONMENT

Temperature	26.2 °C	Relative Humidity	55.9 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3.3 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.

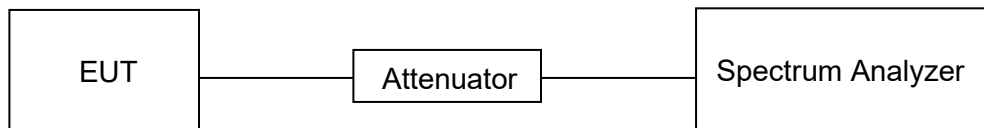
Connect the EUT to the spectrum analyser and use the following settings:

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

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

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

### TEST SETUP



### TEST ENVIRONMENT

Temperature	26.2 °C	Relative Humidity	55.9 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3.3 V



**RESULTS**

Please refer to appendix D.



## 7.5. CONDUCTED BANDEGE 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:

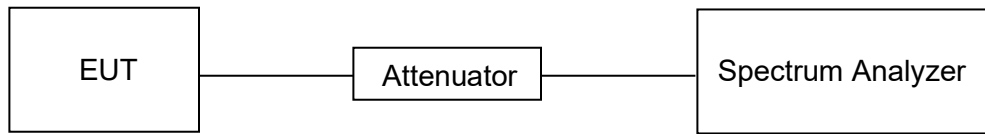
Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	100 kHz
VBW	$\geq 3 \times \text{RBW}$
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

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

Change the settings for emission level measurement:

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

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

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

Temperature	26.2 °C	Relative Humidity	55.9 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3.3 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 <sup>Note 1</sup>	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 <sup>Note 1</sup>		
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 - 3.028	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):

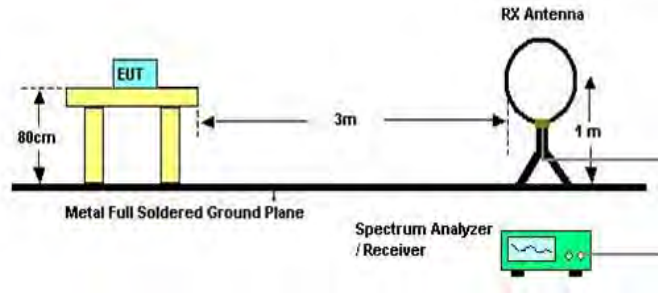
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
<sup>1</sup> 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
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	( <sup>2</sup> )
13.36-13.41			

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

<sup>2</sup>Above 38.6c

**TEST SETUP AND PROCEDURE**

Below 30 MHz

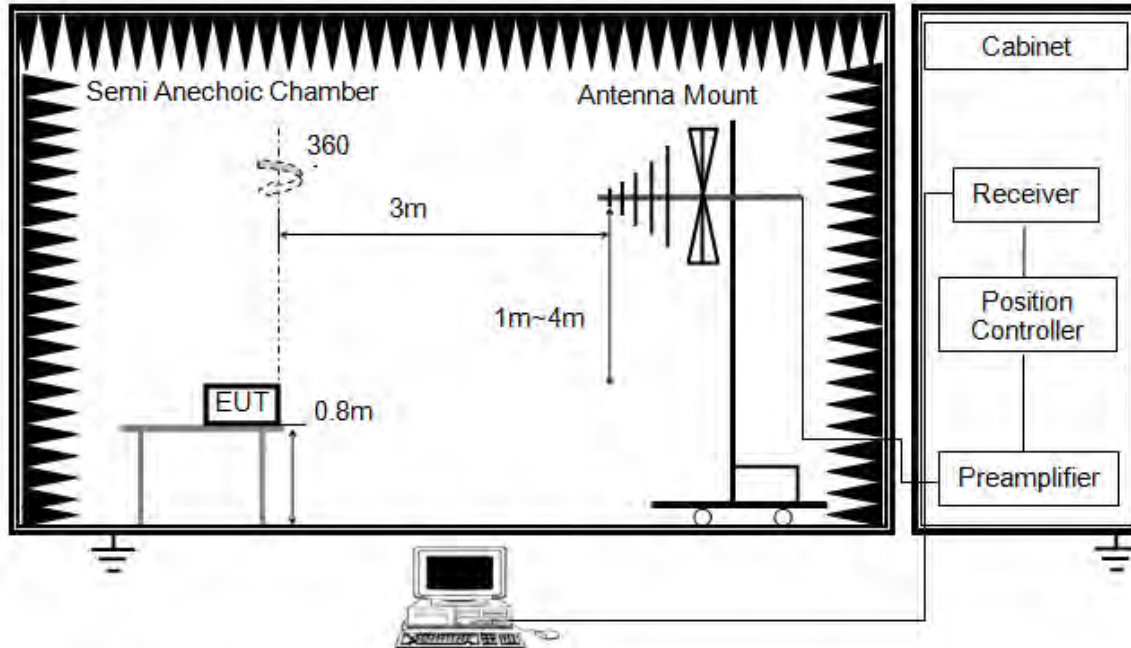


The setting of the spectrum analyser

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

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

Below 1 GHz and above 30 MHz

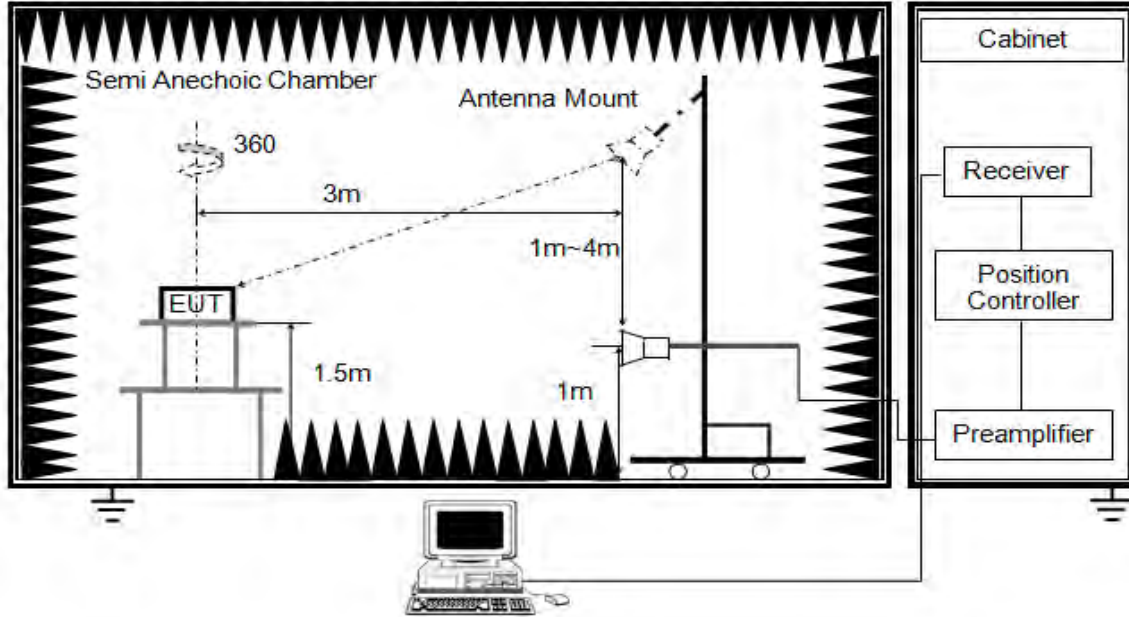


The setting of the spectrum analyzer

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

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

Above 1 GHz

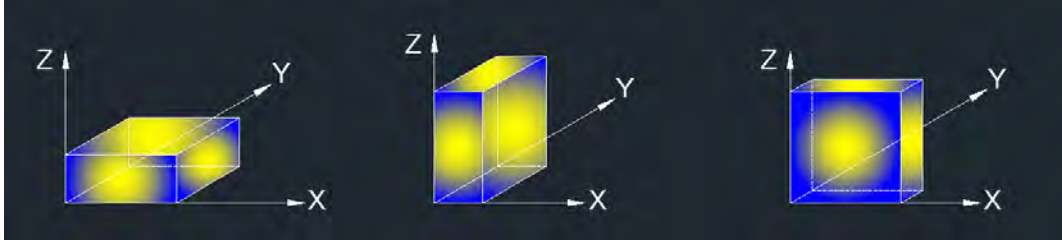


The setting of the spectrum analyser

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

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

X axis, Y axis, Z axis positions:



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

### TEST ENVIRONMENT

Temperature	24.3 °C	Relative Humidity	61 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3.3 V

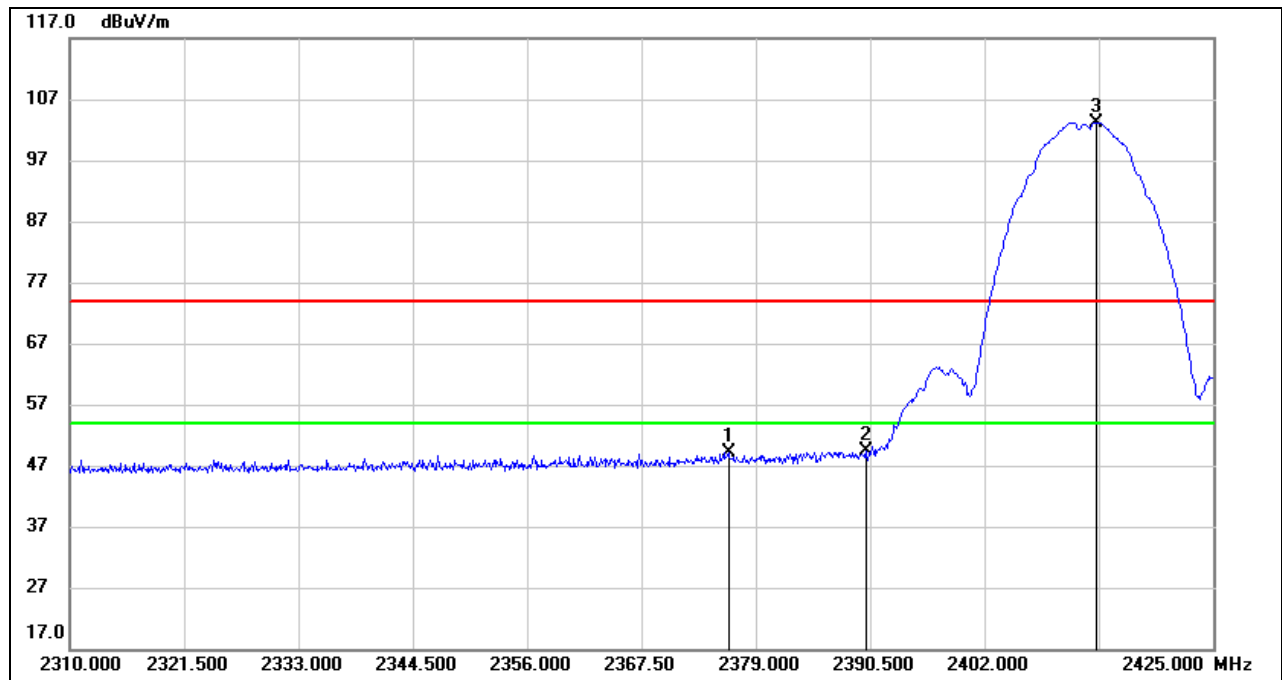
### RESULTS

## 8.1. RESTRICTED BANDEDGE

### 8.1.1. 802.11b SISO 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	2376.240	15.81	33.25	49.06	74.00	-24.94	peak
2	2390.000	15.95	33.35	49.30	74.00	-24.70	peak
3	2413.270	69.77	33.47	103.24	/	/	Fundamental

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

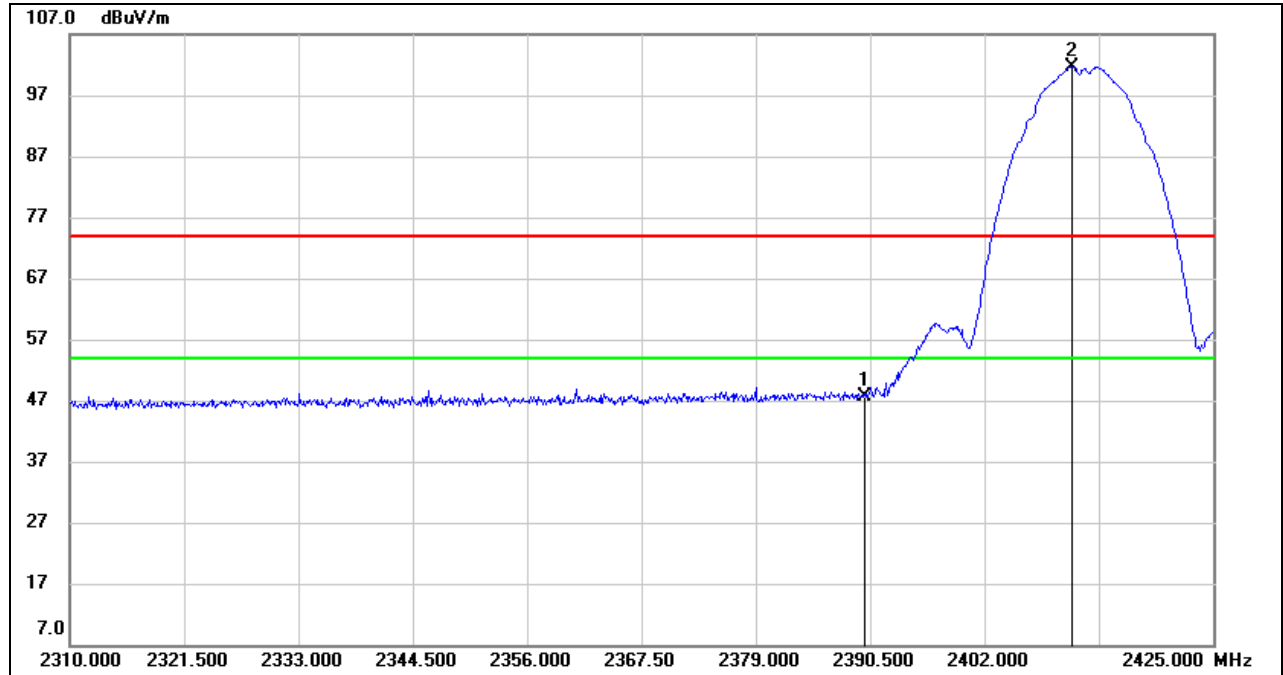
2. Peak: Peak detector.

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



**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**

**PEAK**



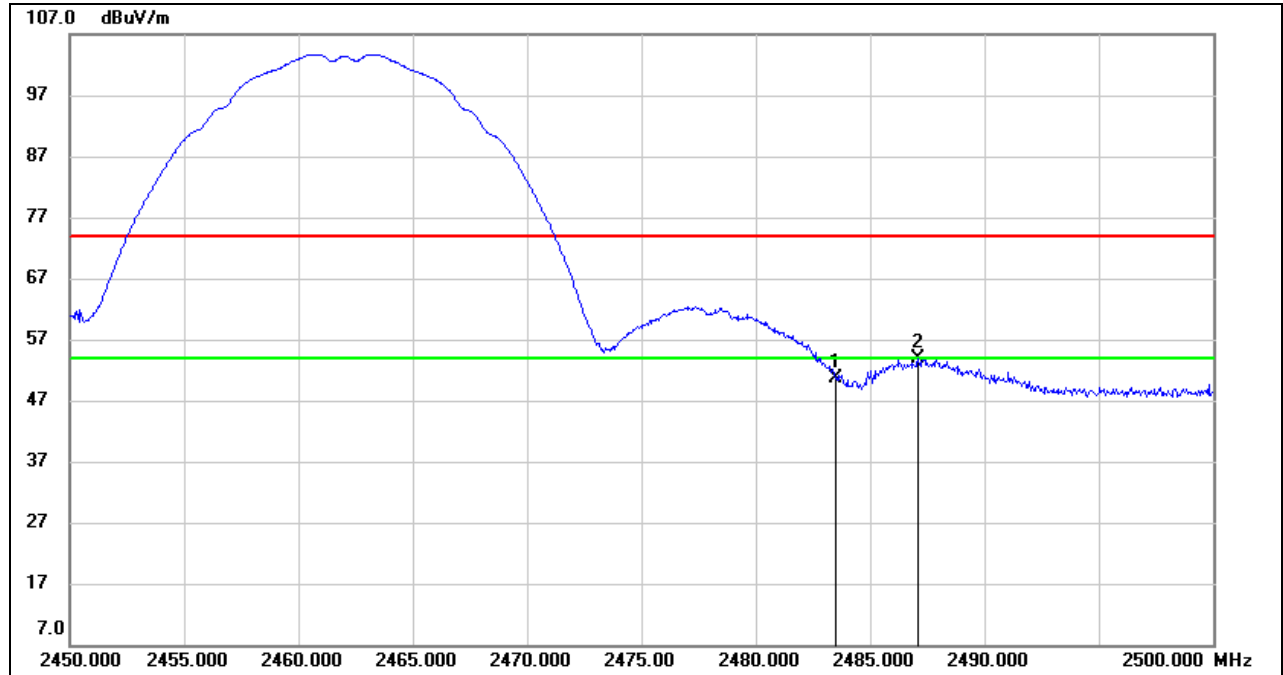
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	14.29	33.35	47.64	74.00	-26.36	peak
2	2410.855	68.17	33.47	101.64	/	/	Fundamental

Note: 1. Measurement = Reading Level + Correct Factor.  
 2. Peak: Peak detector.  
 3. 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	16.90	33.71	50.61	74.00	-23.39	peak
2	2487.100	20.09	33.72	53.81	74.00	-20.19	peak

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

2. Peak: Peak detector.

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

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

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

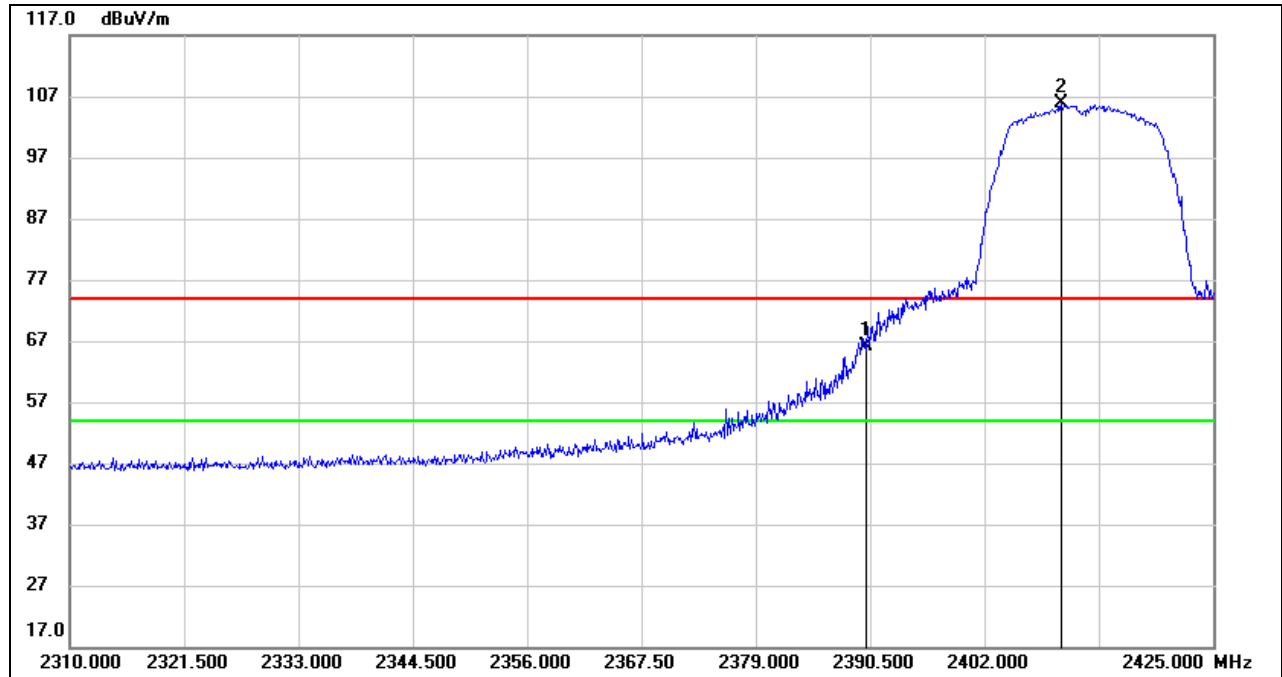


**8.1.2. 802.11g SISO MODE**

**ANTENNA 1 TEST RESULTS (WORST CASE)**

**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**

**PEAK**



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	32.86	33.35	66.21	74.00	-7.79	peak
2	2409.705	72.33	33.46	105.79	/	/	Fundamental

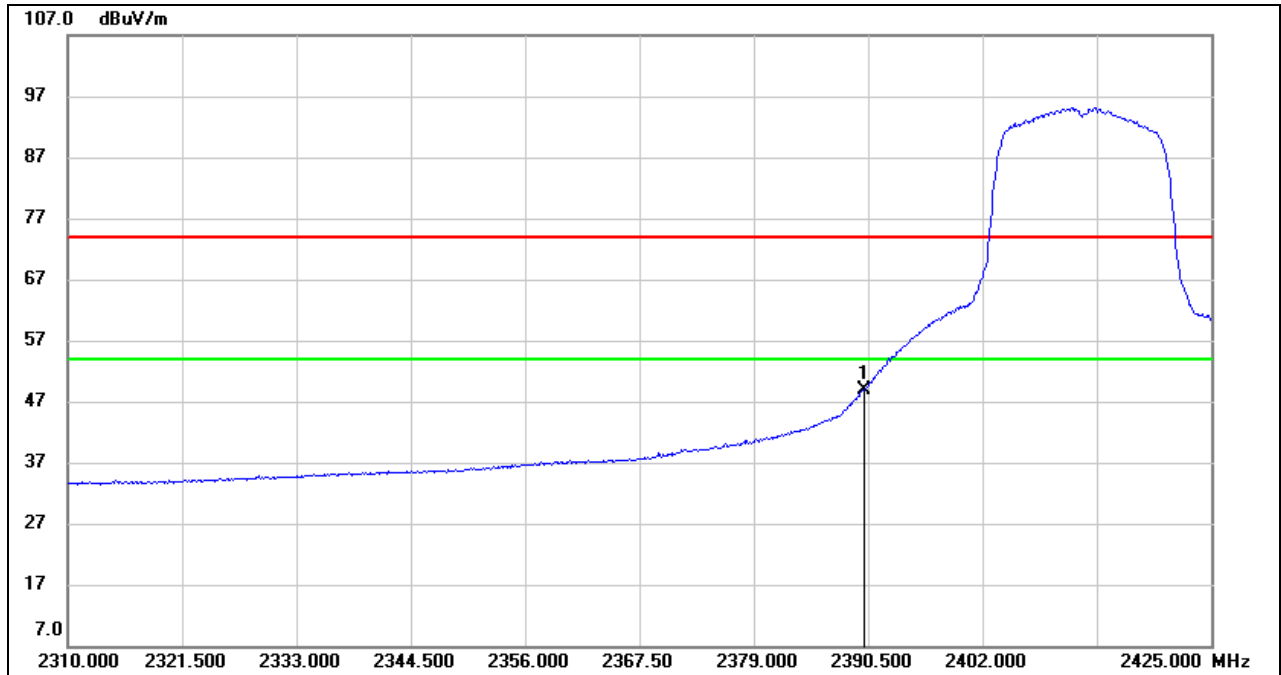
Note: 1. Measurement = Reading Level + Correct Factor.

2. Peak: Peak detector.

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



**AVG**



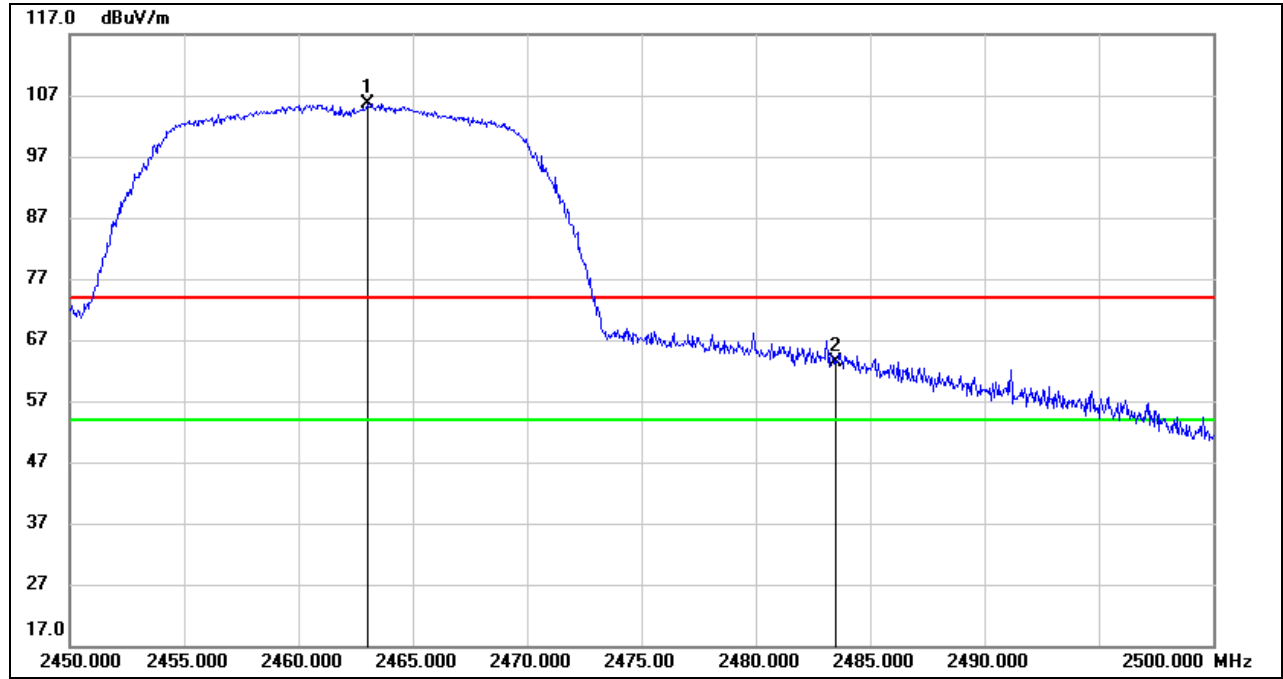
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	15.61	33.35	48.96	54.00	-5.04	AVG

- Note:
1. Measurement = Reading Level + Correct Factor.
  2. AVG:  $VBW=1/Ton$ , where:  $Ton$  is the transmitting duration.
  3. For the transmitting duration, please refer to clause 7.1.
  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	2463.000	72.09	33.63	105.72	/	/	Fundamental
2	2483.500	29.73	33.71	63.44	74.00	-10.56	peak

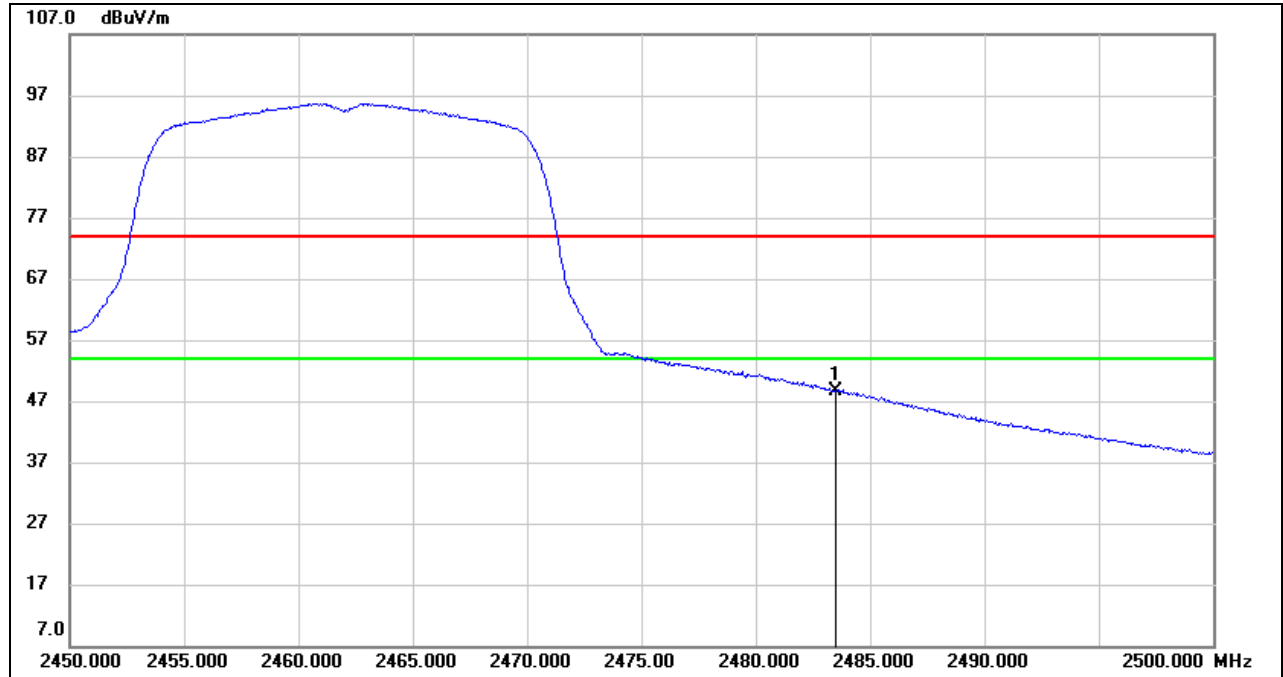
Note: 1. Measurement = Reading Level + Correct Factor.

2. Peak: Peak detector.

3. 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	14.83	33.71	48.54	54.00	-5.46	AVG

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

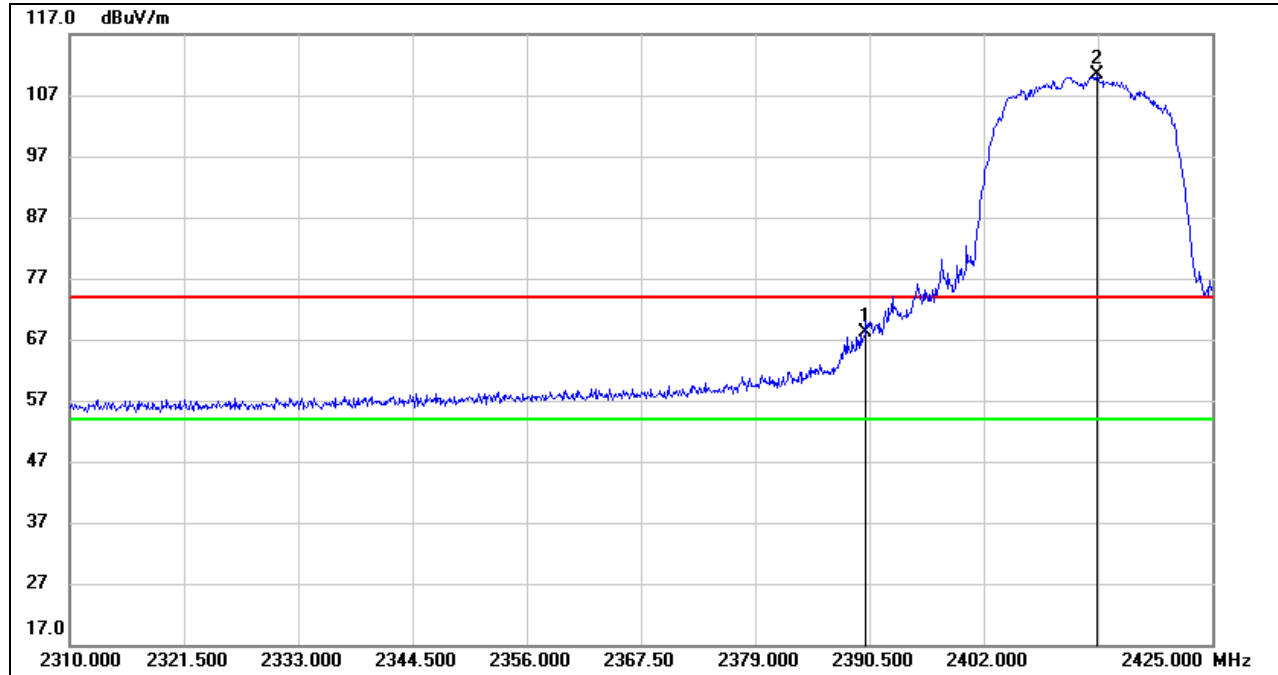
Note: Horizontal and Vertical have been tested, only the worst data was recorded in the report.  
 Note: Both antennas have been tested, only the worst data was recorded in the report.



8.1.3. 802.11n HT20 MIMO MODE

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

PEAK



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	34.71	33.35	68.06	74.00	-5.94	peak
2	2413.385	76.81	33.47	110.28	/	/	Fundamental

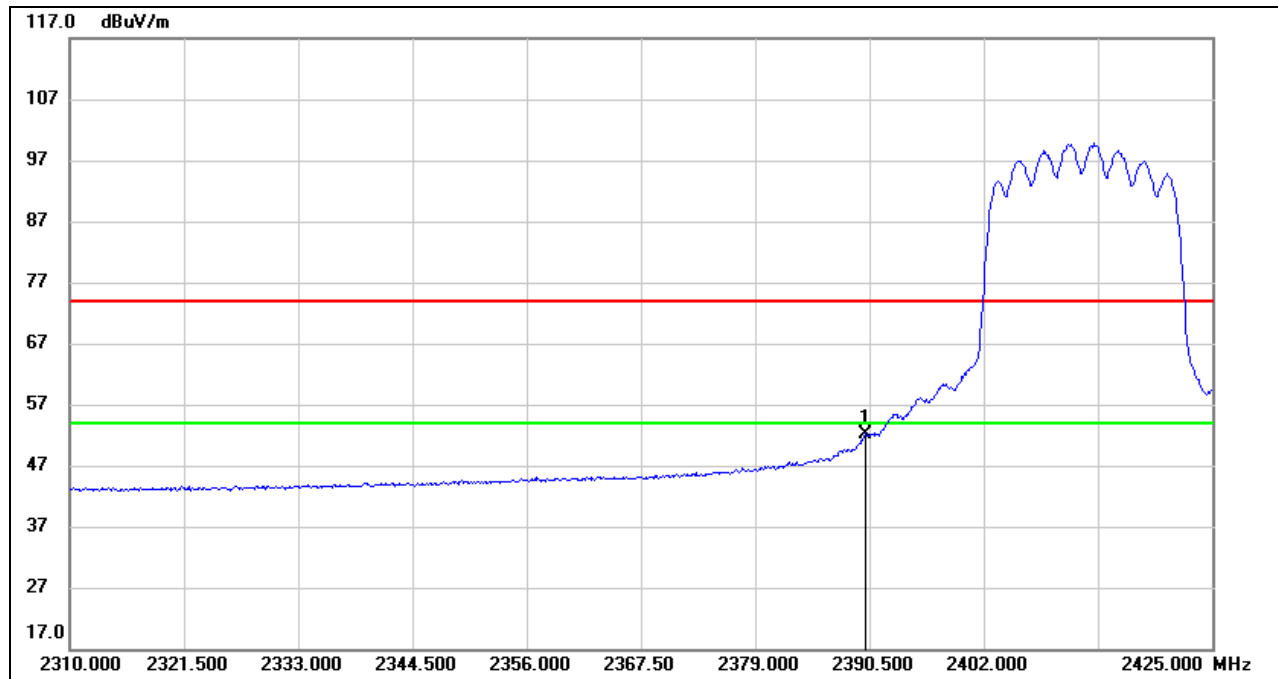
Note: 1. Measurement = Reading Level + Correct Factor.

2. Peak: Peak detector.

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



**AVG**

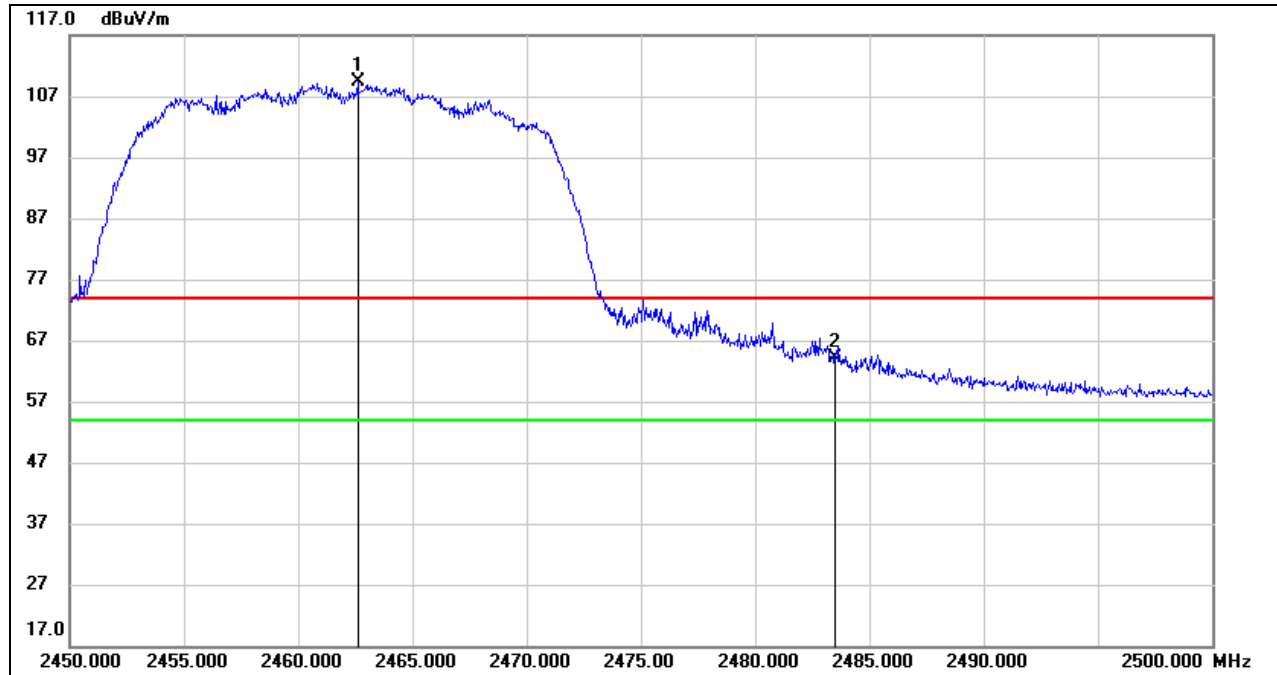


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	18.69	33.35	52.04	54.00	-1.96	AVG

- Note: 1. Measurement = Reading Level + Correct Factor.  
 2. AVG:  $VBW=1/Ton$ , where: Ton is the transmitting duration.  
 3. For the transmitting duration, please refer to clause 7.1.  
 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**

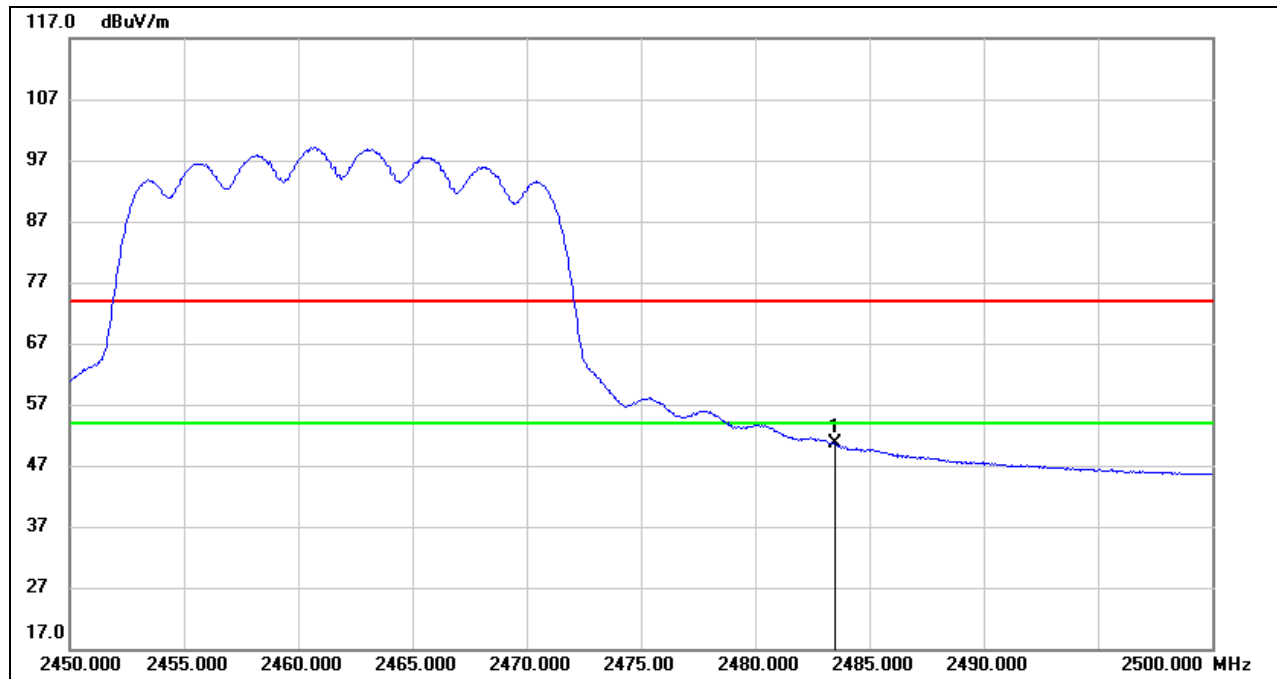


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2462.600	75.67	33.63	109.30	/	/	Fundamental
2	2483.500	30.53	33.71	64.24	74.00	-9.76	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
 2. Peak: Peak detector.  
 3. 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	16.87	33.71	50.58	54.00	-3.42	AVG

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

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

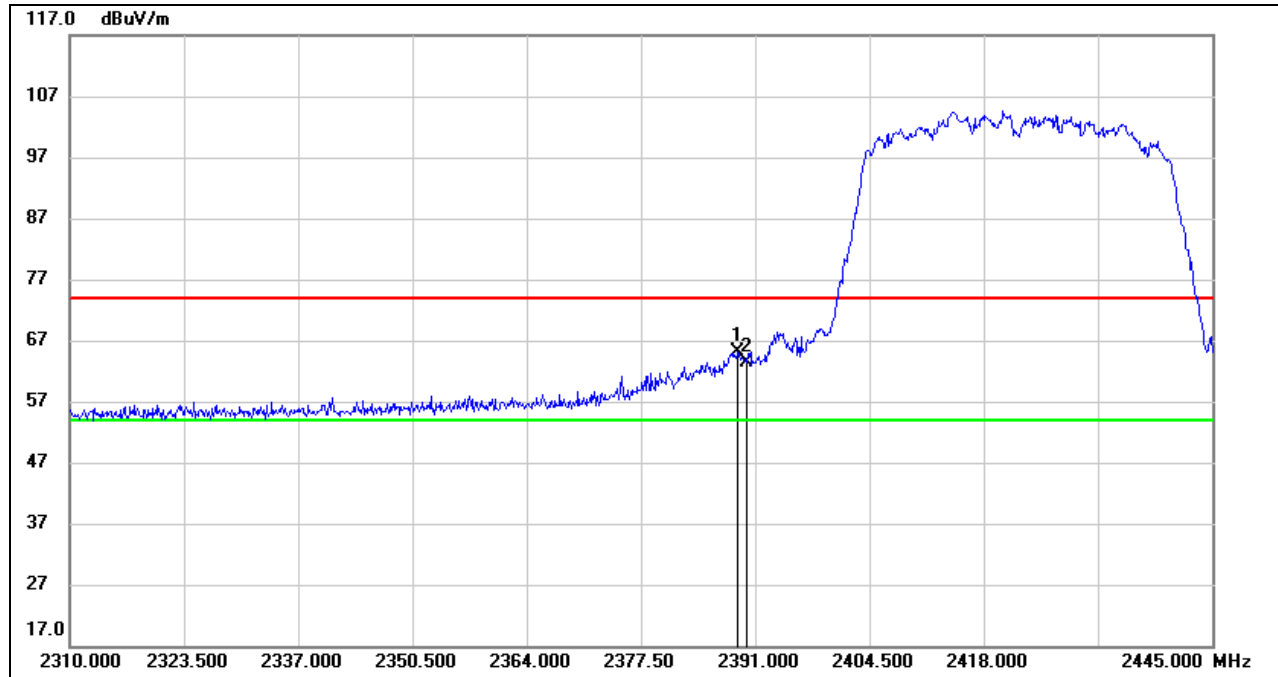




### 8.1.4. 802.11n HT40 MIMO MODE

#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

#### PEAK

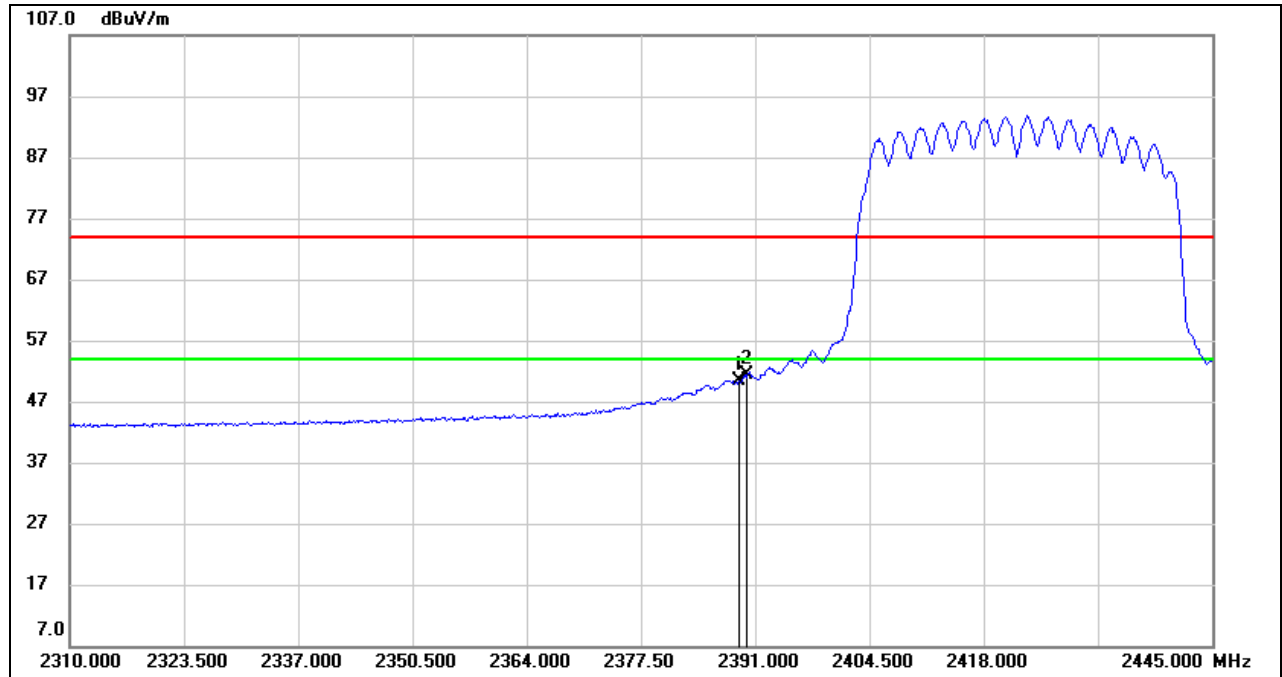


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.975	31.69	33.34	65.03	74.00	-8.97	peak
2	2390.000	30.03	33.35	63.38	74.00	-10.62	peak

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

2. Peak: Peak detector.

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

**AVG**


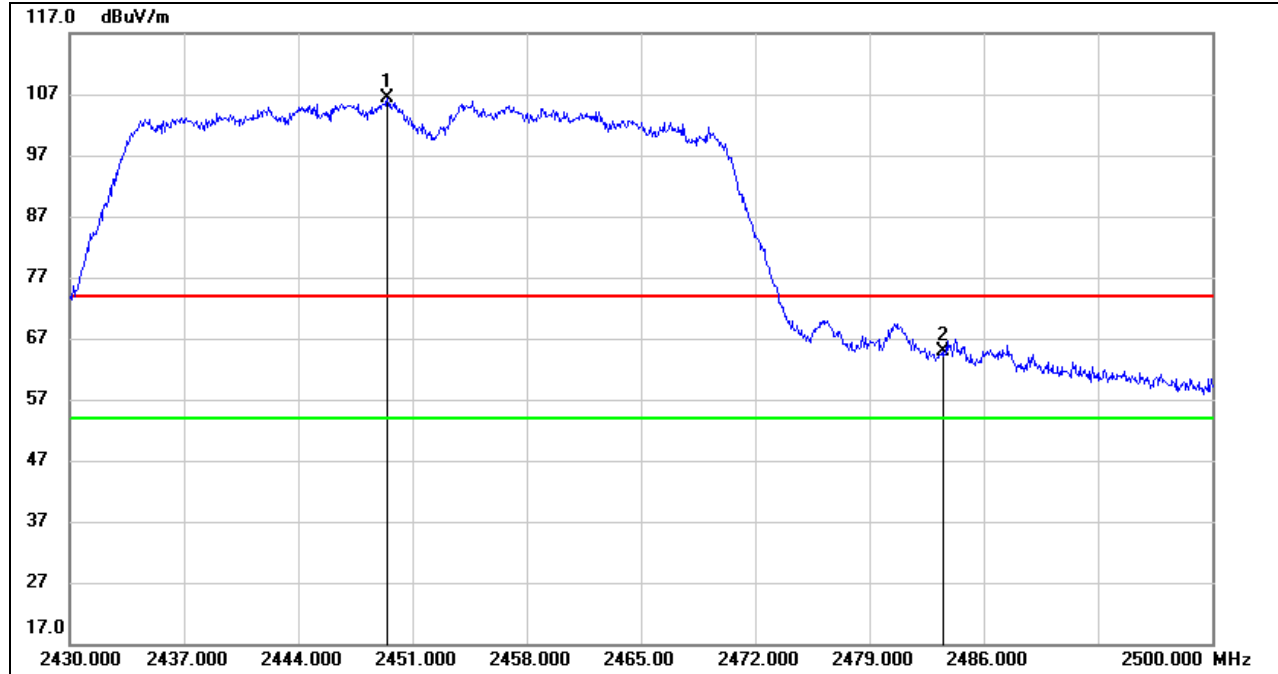
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.975	16.99	33.34	50.33	54.00	-3.67	AVG
2	2390.000	17.91	33.35	51.26	54.00	-2.74	AVG

- Note:
1. Measurement = Reading Level + Correct Factor.
  2. AVG:  $VBW=1/Ton$ , where: Ton is the transmitting duration.
  3. For the transmitting duration, please refer to clause 7.1.
  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**

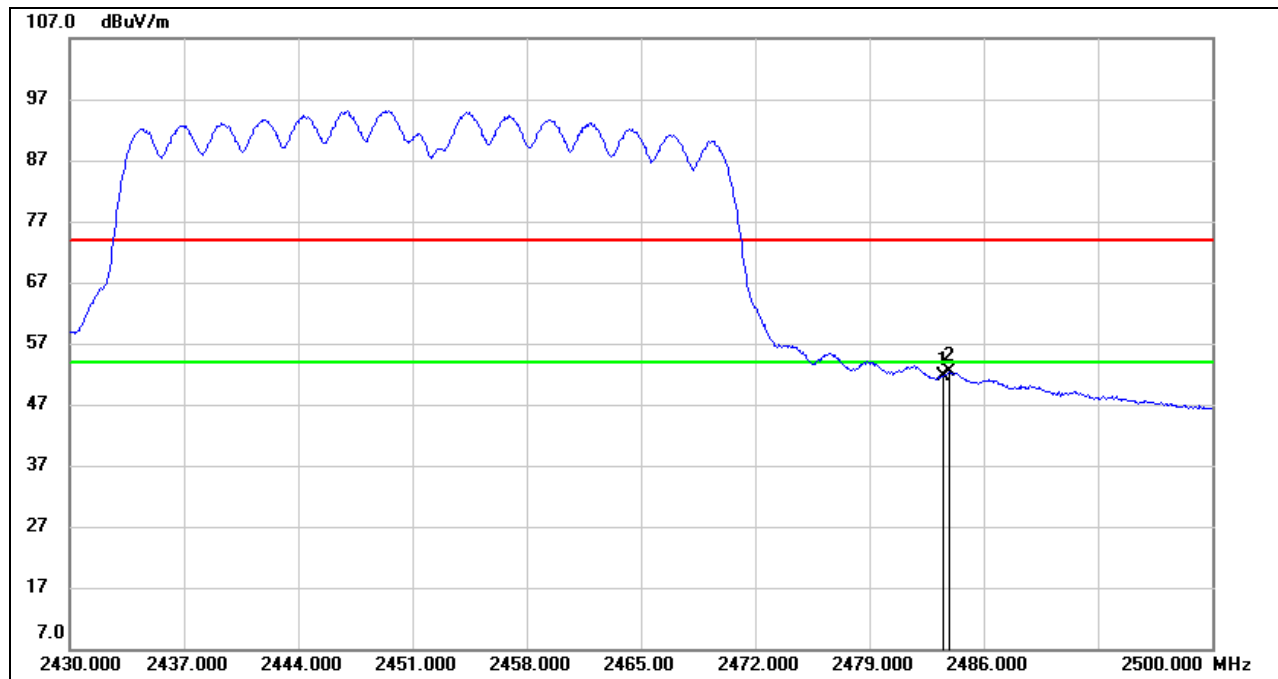


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2449.460	72.89	33.59	106.48	/	/	Fundamental
2	2483.500	31.09	33.71	64.80	74.00	-9.20	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
 2. Peak: Peak detector.  
 3. 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	17.92	33.71	51.63	54.00	-2.37	AVG
2	2483.900	18.57	33.71	52.28	54.00	-1.72	AVG

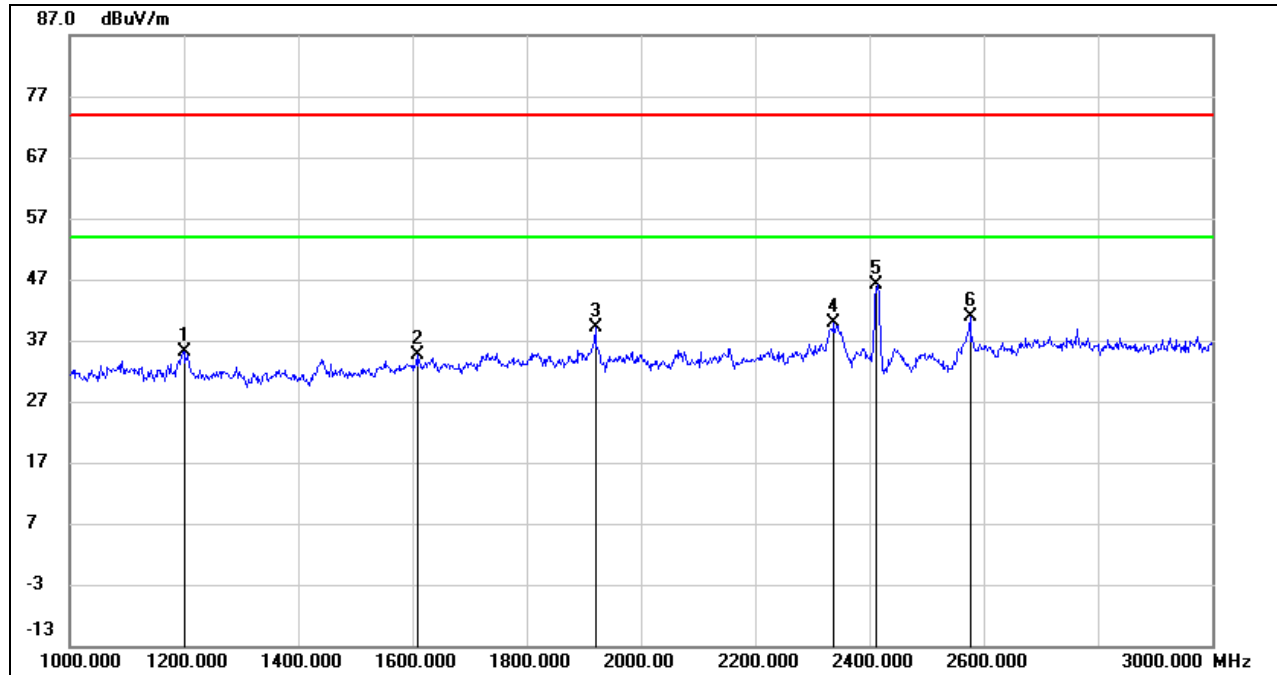
- Note: 1. Measurement = Reading Level + Correct Factor.  
 2. AVG:  $VBW=1/Ton$ , where: Ton is the transmitting duration.  
 3. For the transmitting duration, please refer to clause 7.1.  
 4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with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

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

## 8.2. SPURIOUS EMISSIONS (1 GHz ~ 3 GHz)

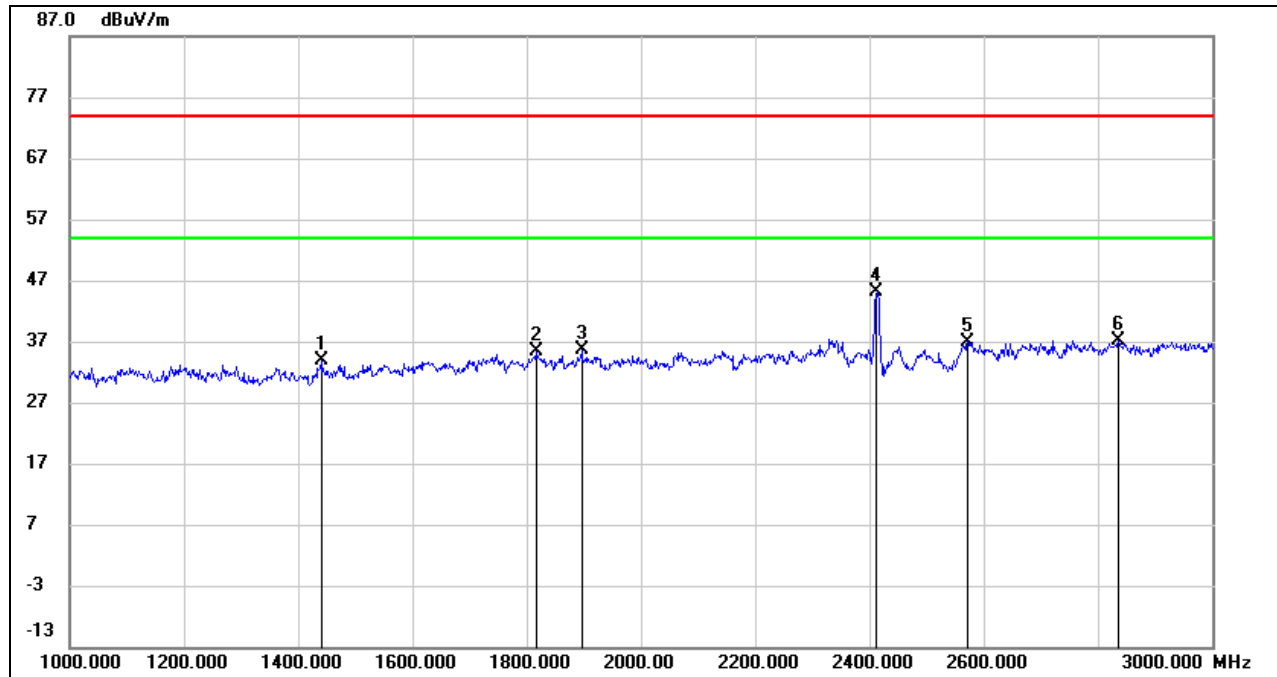
### 8.2.1. 802.11b SISO MODE

#### HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



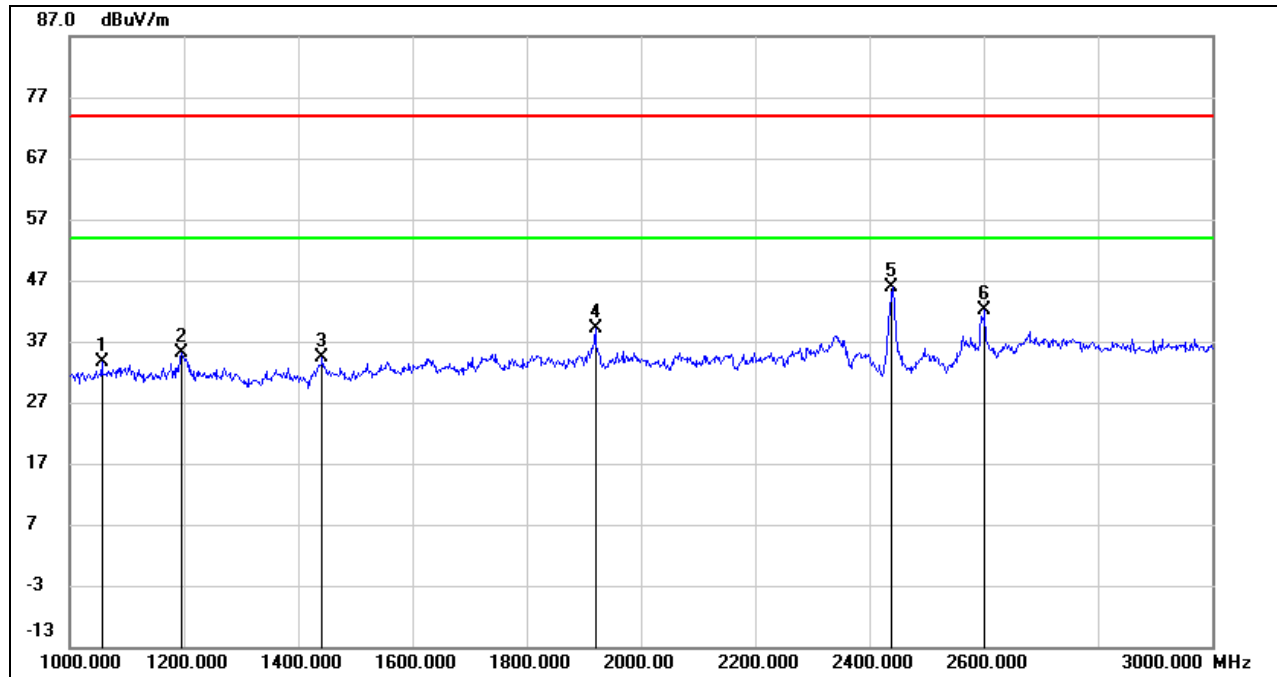
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1200.000	48.08	-12.99	35.09	74.00	-38.91	peak
2	1608.000	46.07	-11.50	34.57	74.00	-39.43	peak
3	1920.000	49.16	-10.13	39.03	74.00	-34.97	peak
4	2338.000	48.52	-8.60	39.92	74.00	-34.08	peak
5	2412.000	54.58	-8.37	46.21	/	/	Fundamental
6	2576.000	48.90	-7.96	40.94	74.00	-33.06	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.

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

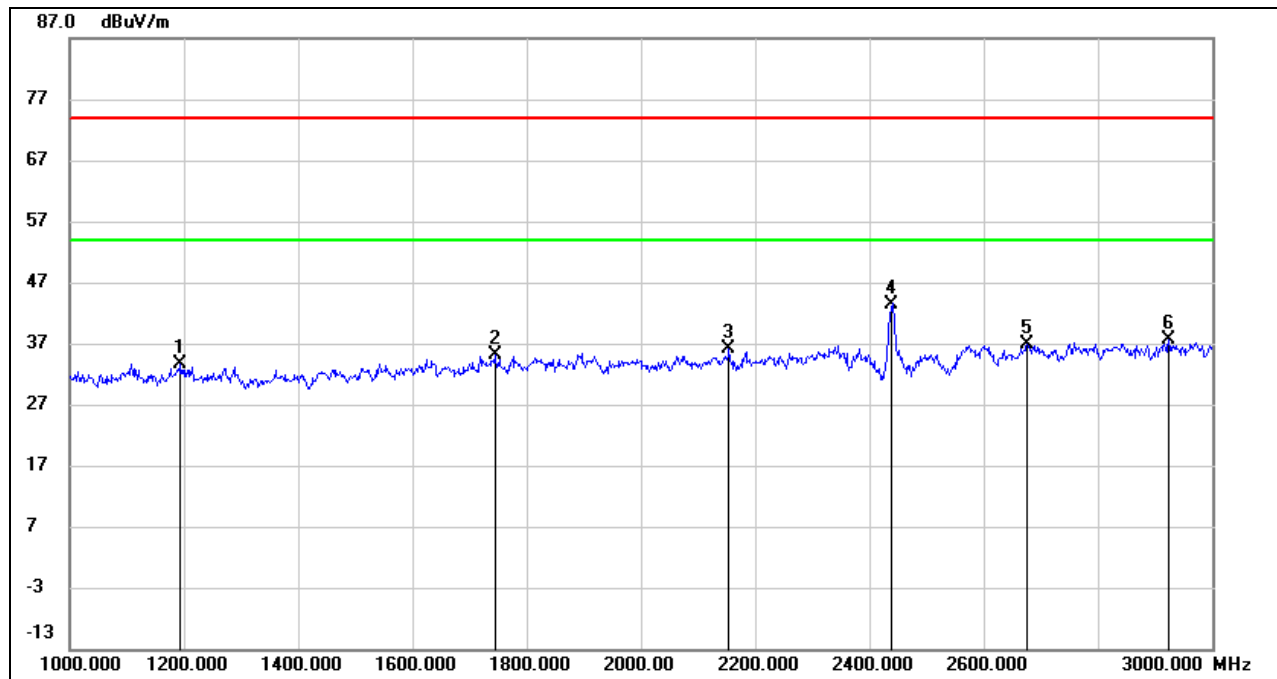
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1440.000	46.38	-12.51	33.87	74.00	-40.13	peak
2	1816.000	45.56	-10.06	35.50	74.00	-38.50	peak
3	1896.000	45.72	-10.12	35.60	74.00	-38.40	peak
4	2412.000	53.40	-8.37	45.03	/	/	Fundamental
5	2572.000	44.96	-7.96	37.00	74.00	-37.00	peak
6	2836.000	43.41	-6.38	37.03	74.00	-36.97	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	1056.000	47.22	-13.70	33.52	74.00	-40.48	peak
2	1196.000	48.25	-13.01	35.24	74.00	-38.76	peak
3	1442.000	46.76	-12.50	34.26	74.00	-39.74	peak
4	1920.000	49.36	-10.13	39.23	74.00	-34.77	peak
5	2437.000	54.19	-8.33	45.86	/	/	Fundamental
6	2602.000	49.90	-7.85	42.05	74.00	-31.95	peak

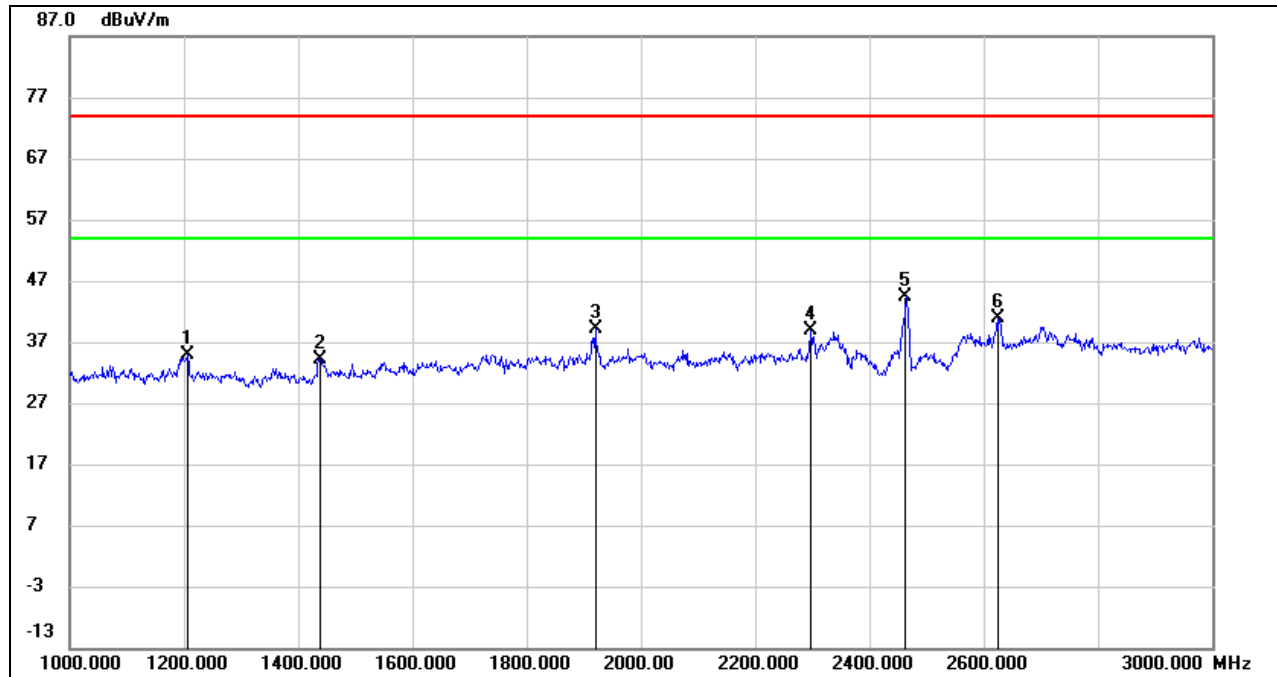
- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.

**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	1194.000	46.66	-13.02	33.64	74.00	-40.36	peak
2	1744.000	45.55	-10.47	35.08	74.00	-38.92	peak
3	2154.000	45.50	-9.31	36.19	74.00	-37.81	peak
4	2437.000	51.83	-8.33	43.50	/	/	Fundamental
5	2676.000	44.31	-7.37	36.94	74.00	-37.06	peak
6	2924.000	43.51	-5.95	37.56	74.00	-36.44	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)**

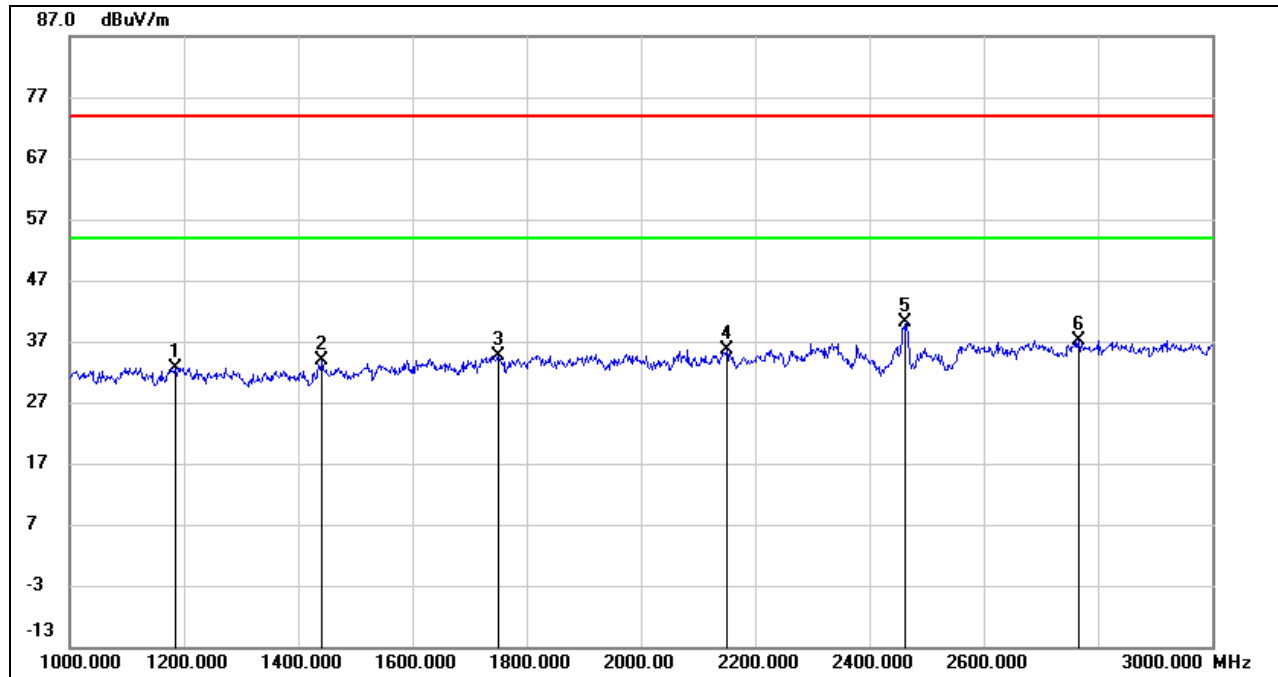
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1206.000	47.87	-12.98	34.89	74.00	-39.11	peak
2	1438.000	46.68	-12.52	34.16	74.00	-39.84	peak
3	1920.000	49.38	-10.13	39.25	74.00	-34.75	peak
4	2298.000	47.65	-8.72	38.93	74.00	-35.07	peak
5	2462.000	52.67	-8.29	44.38	/	/	Fundamental
6	2624.000	48.61	-7.70	40.91	74.00	-33.09	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	1186.000	45.78	-13.07	32.71	74.00	-41.29	peak
2	1442.000	46.42	-12.50	33.92	74.00	-40.08	peak
3	1750.000	45.11	-10.43	34.68	74.00	-39.32	peak
4	2150.000	45.04	-9.34	35.70	74.00	-38.30	peak
5	2462.000	48.44	-8.29	40.15	/	/	Fundamental
6	2766.000	43.91	-6.77	37.14	74.00	-36.86	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.

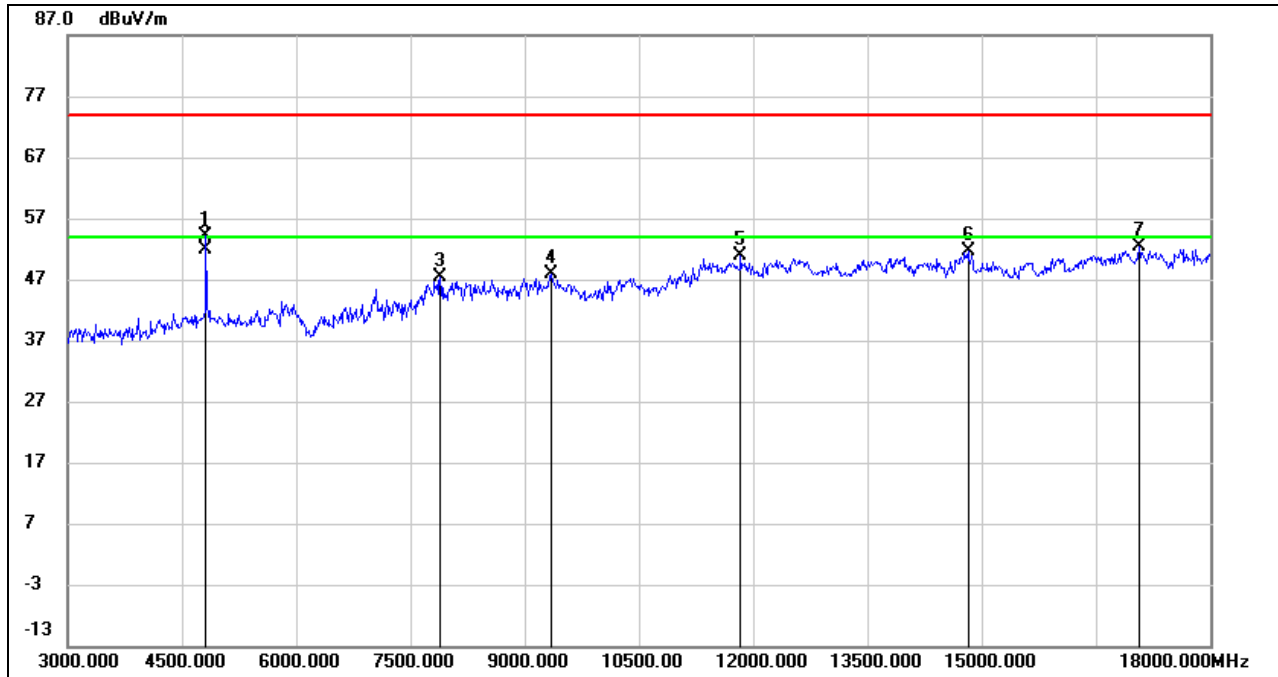
Note: Both the two antennas had been tested, but only the worst data was recorded in the report.

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

### 8.3. SPURIOUS EMISSIONS (3 GHz ~ 18 GHz)

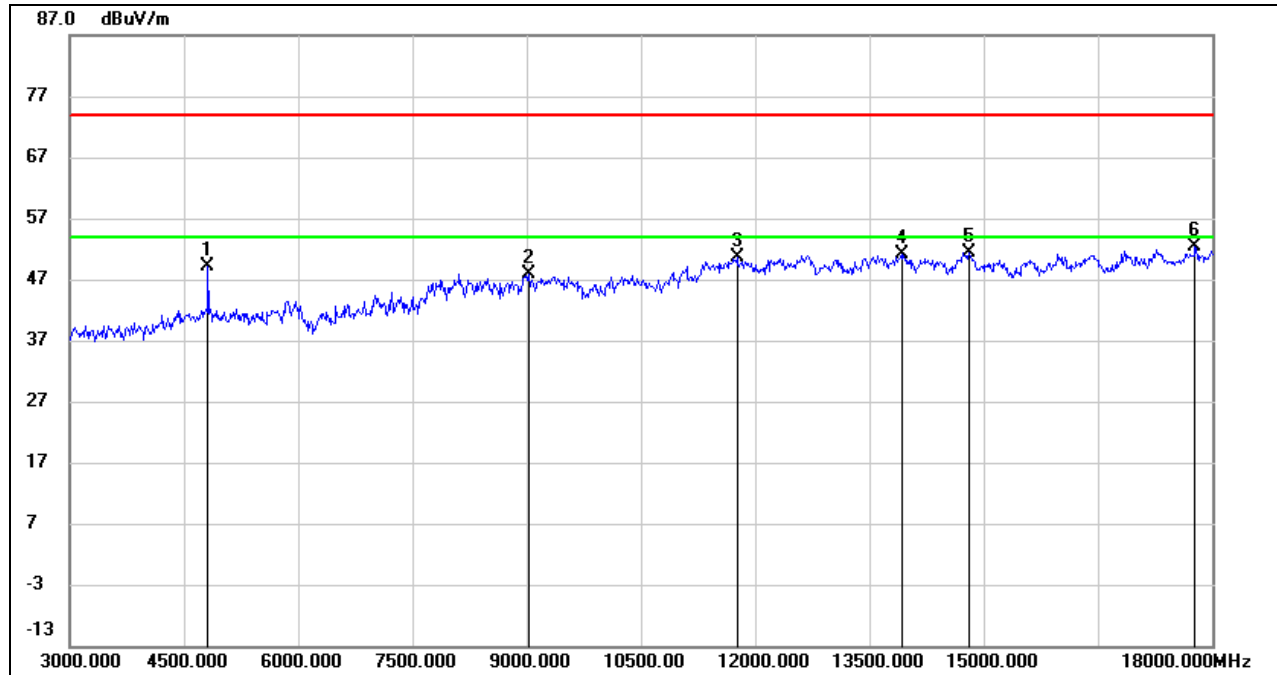
#### 8.3.1. 802.11b SISO MODE

##### 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	4815.000	52.63	1.38	54.01	74.00	-19.99	peak
2	4815.000	50.55	1.38	51.93	54.00	-2.07	AVG
3	7890.000	38.47	8.91	47.38	74.00	-26.62	peak
4	9345.000	37.22	10.66	47.88	74.00	-26.12	peak
5	11835.000	35.53	15.34	50.87	74.00	-23.13	peak
6	14820.000	33.67	17.91	51.58	74.00	-22.42	peak
7	17070.000	30.62	21.71	52.33	74.00	-21.67	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	4815.000	47.75	1.38	49.13	74.00	-24.87	peak
2	9030.000	36.89	10.93	47.82	74.00	-26.18	peak
3	11760.000	35.33	15.29	50.62	74.00	-23.38	peak
4	13920.000	33.49	17.55	51.04	74.00	-22.96	peak
5	14805.000	33.49	18.00	51.49	74.00	-22.51	peak
6	17775.000	28.58	23.91	52.49	74.00	-21.51	peak

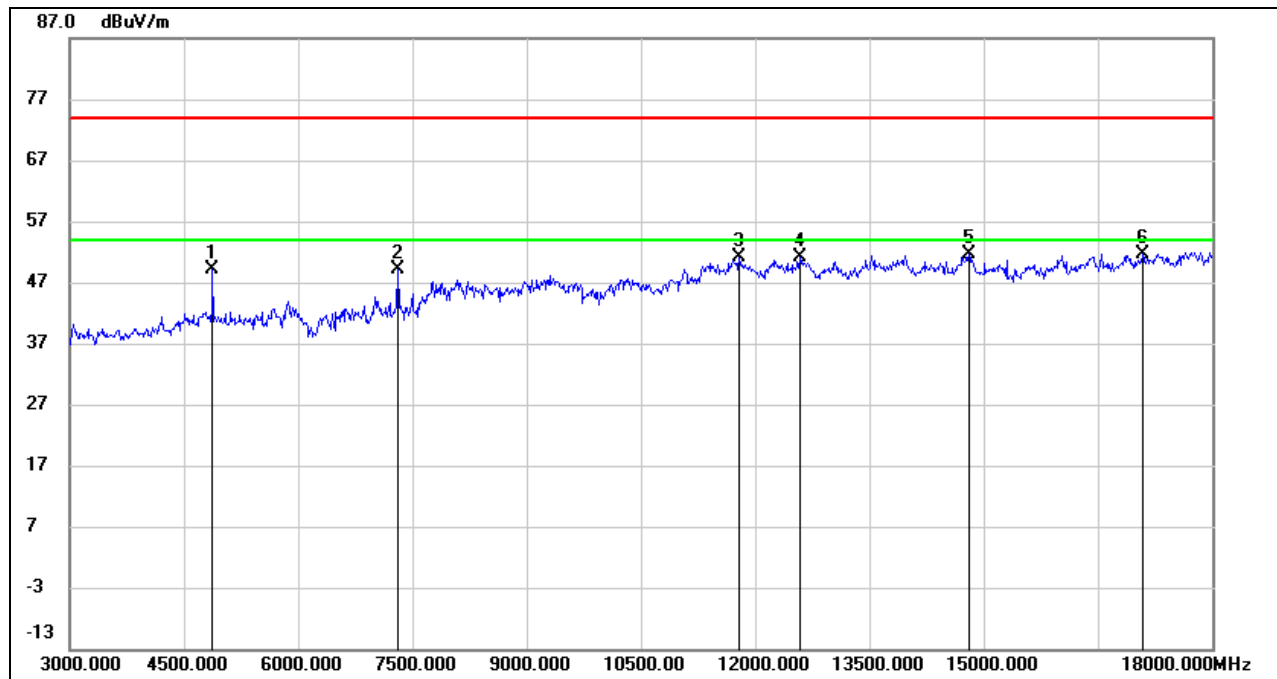
Note: 1. Peak Result = Reading Level + Correct Factor.

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

3. Peak: Peak detector.

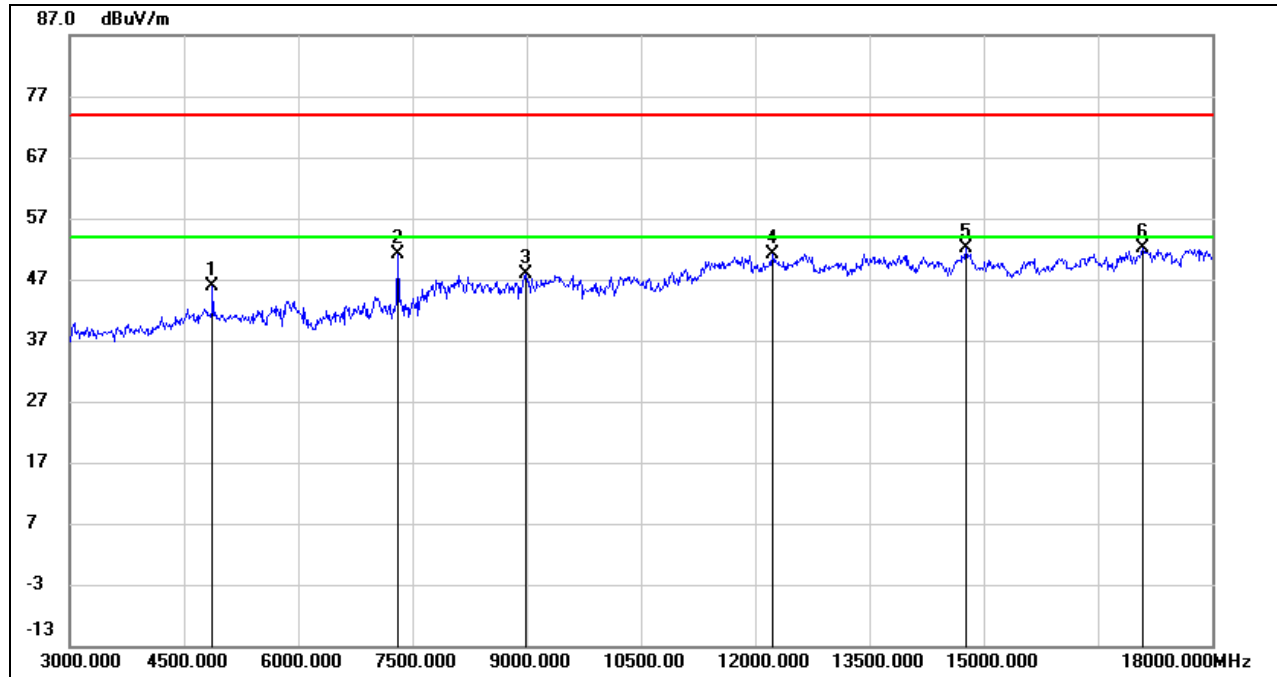
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

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

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

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4875.000	47.87	1.32	49.19	74.00	-24.81	peak
2	7305.000	42.09	7.14	49.23	74.00	-24.77	peak
3	11790.000	35.80	15.26	51.06	74.00	-22.94	peak
4	12585.000	35.33	15.77	51.10	74.00	-22.90	peak
5	14805.000	33.53	18.00	51.53	74.00	-22.47	peak
6	17085.000	29.94	21.80	51.74	74.00	-22.26	peak

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

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

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4875.000	44.58	1.32	45.90	74.00	-28.10	peak
2	7305.000	44.10	7.14	51.24	74.00	-22.76	peak
3	8985.000	36.78	10.99	47.77	74.00	-26.23	peak
4	12225.000	35.25	15.99	51.24	74.00	-22.76	peak
5	14760.000	34.17	17.90	52.07	74.00	-21.93	peak
6	17085.000	30.28	21.80	52.08	74.00	-21.92	peak

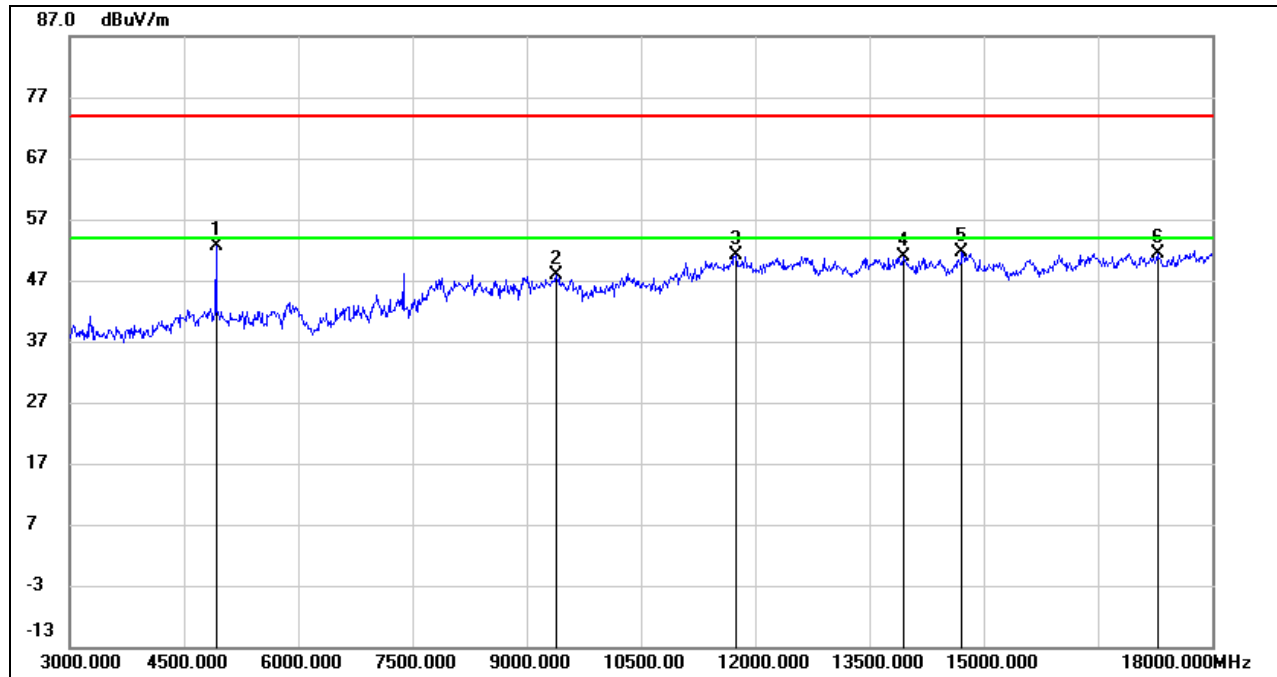
Note: 1. Peak Result = Reading Level + Correct Factor.

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

3. Peak: Peak detector.

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

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

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

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4920.000	51.16	1.45	52.61	74.00	-21.39	peak
2	9390.000	37.08	10.92	48.00	74.00	-26.00	peak
3	11745.000	35.75	15.30	51.05	74.00	-22.95	peak
4	13950.000	33.35	17.60	50.95	74.00	-23.05	peak
5	14715.000	33.78	17.74	51.52	74.00	-22.48	peak
6	17280.000	28.98	22.48	51.46	74.00	-22.54	peak

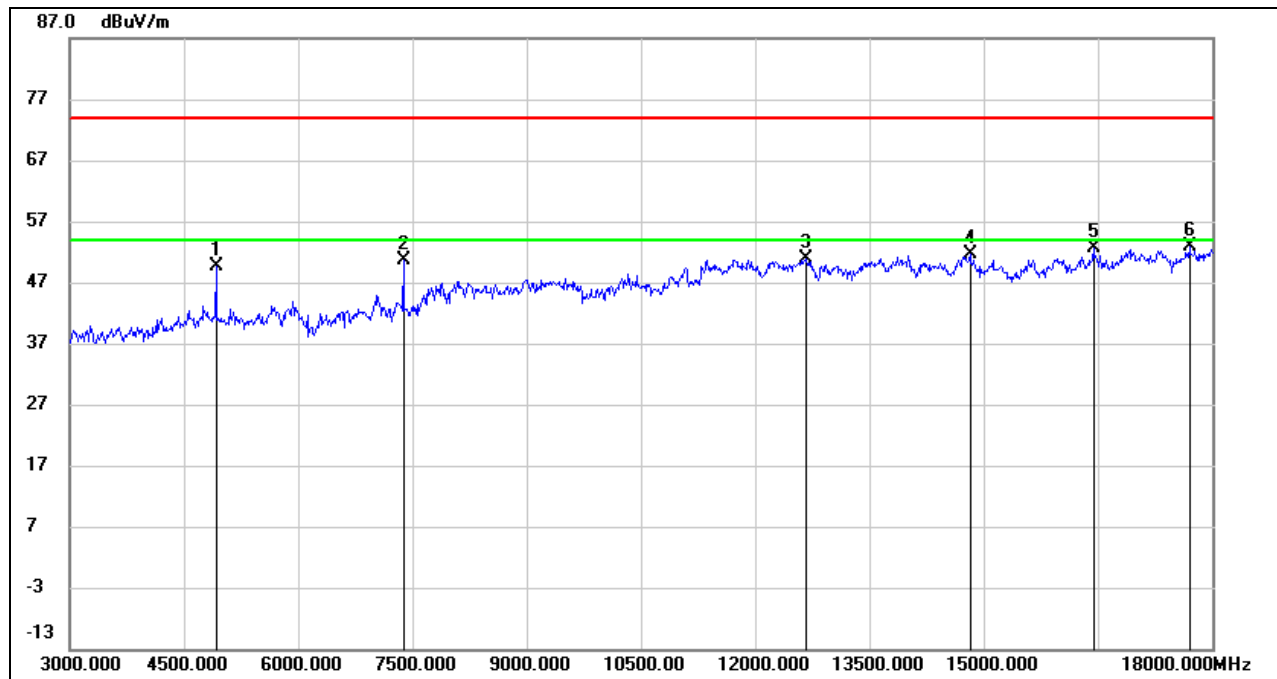
Note: 1. Peak Result = Reading Level + Correct Factor.

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

3. Peak: Peak detector.

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

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

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

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4920.000	48.16	1.45	49.61	74.00	-24.39	peak
2	7380.000	42.89	7.79	50.68	74.00	-23.32	peak
3	12675.000	35.34	15.66	51.00	74.00	-23.00	peak
4	14820.000	33.73	17.91	51.64	74.00	-22.36	peak
5	16440.000	32.87	19.68	52.55	74.00	-21.45	peak
6	17700.000	29.36	23.47	52.83	74.00	-21.17	peak

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

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

3. Peak: Peak detector.

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

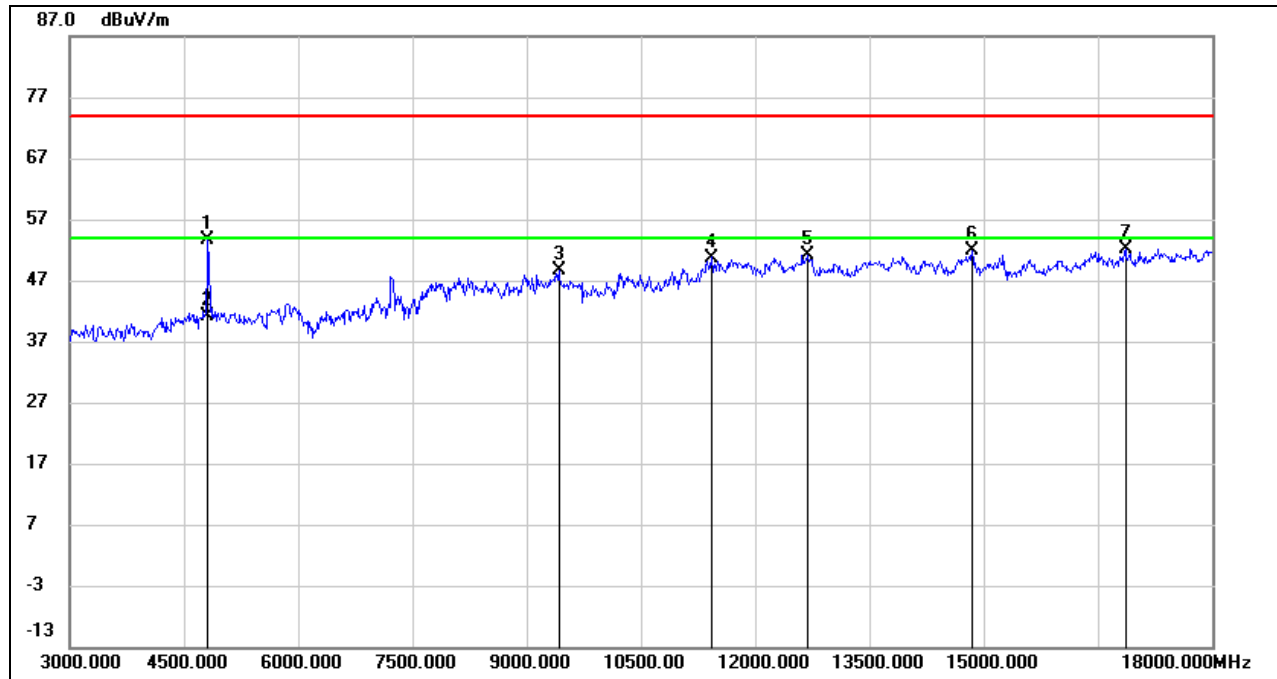
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

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



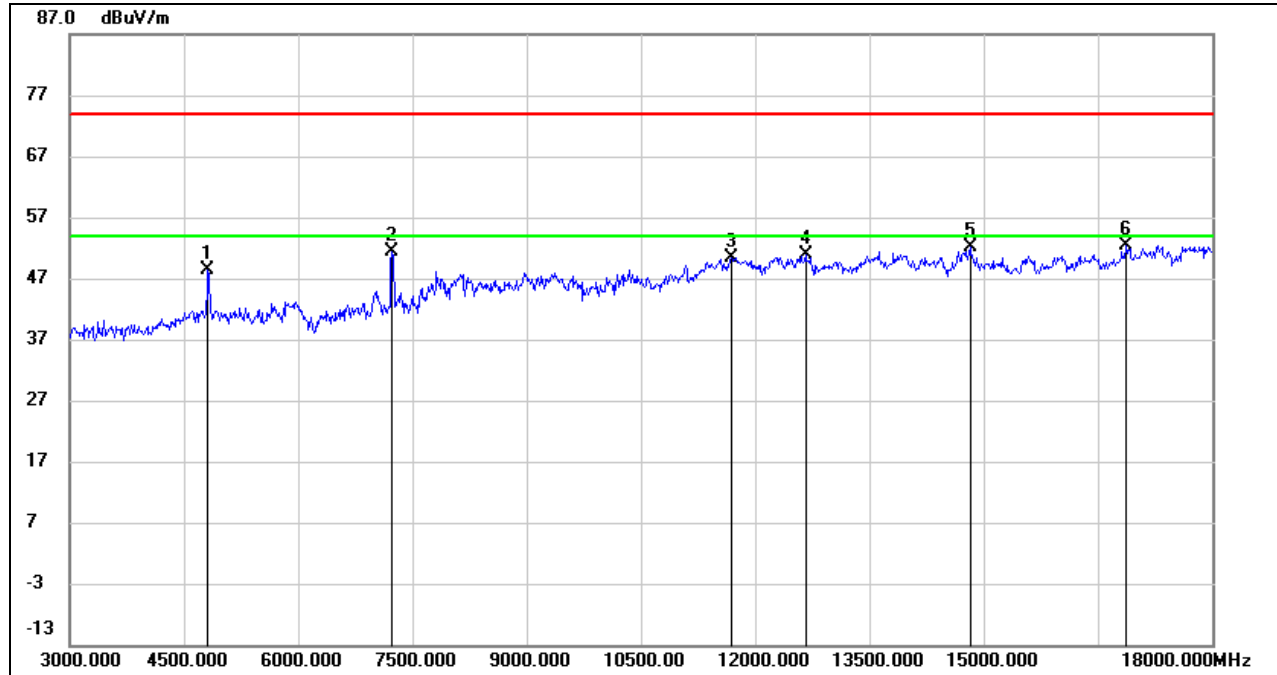
### 8.3.2. 802.11g SISO MODE

#### 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	4815.000	52.15	1.38	53.53	74.00	-20.47	peak
2	4815.000	39.86	1.38	41.24	54.00	-12.76	AVG
3	9420.000	37.68	10.88	48.56	74.00	-25.44	peak
4	11430.000	36.03	14.72	50.75	74.00	-23.25	peak
5	12690.000	35.39	15.64	51.03	74.00	-22.97	peak
6	14850.000	34.24	17.71	51.95	74.00	-22.05	peak
7	16860.000	30.95	21.22	52.17	74.00	-21.83	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	4815.000	47.05	1.38	48.43	74.00	-25.57	peak
2	7230.000	43.98	7.28	51.26	74.00	-22.74	peak
3	11685.000	35.08	15.26	50.34	74.00	-23.66	peak
4	12660.000	35.20	15.69	50.89	74.00	-23.11	peak
5	14820.000	34.30	17.91	52.21	74.00	-21.79	peak
6	16875.000	31.06	21.35	52.41	74.00	-21.59	peak

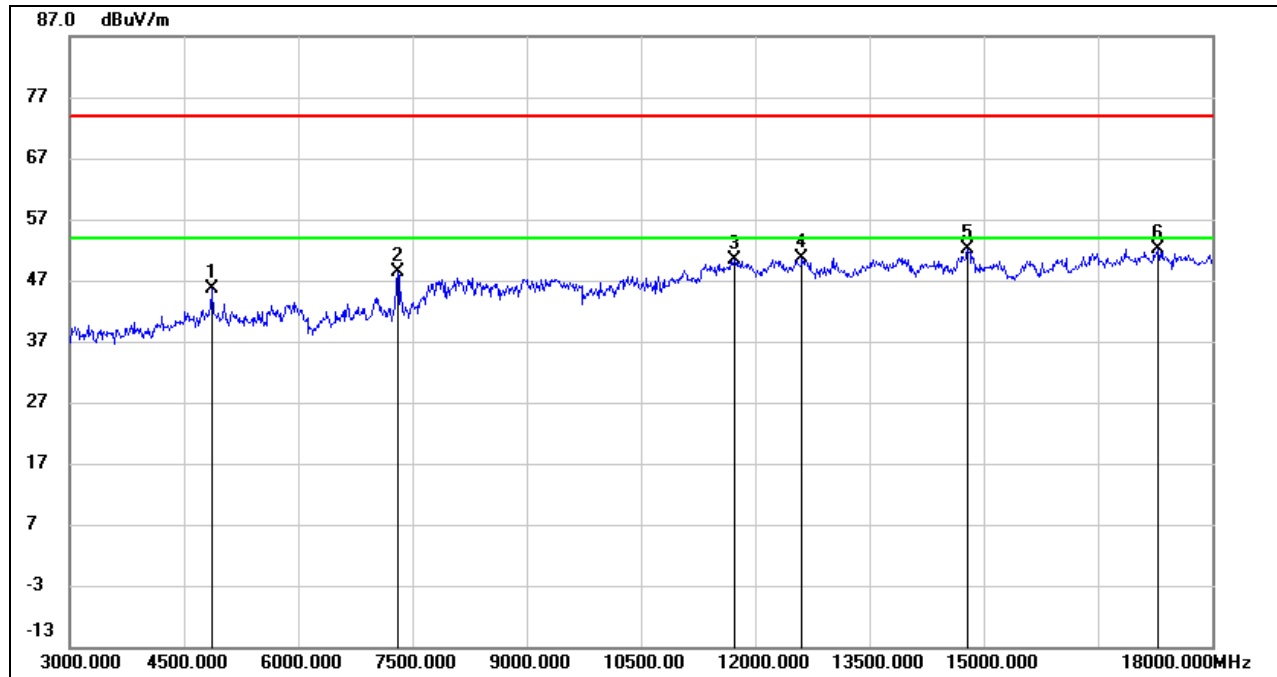
Note: 1. Peak Result = Reading Level + Correct Factor.

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

3. Peak: Peak detector.

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

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

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

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4875.000	44.35	1.32	45.67	74.00	-28.33	peak
2	7305.000	41.31	7.14	48.45	74.00	-25.55	peak
3	11730.000	35.15	15.32	50.47	74.00	-23.53	peak
4	12615.000	34.88	15.75	50.63	74.00	-23.37	peak
5	14790.000	34.11	18.01	52.12	74.00	-21.88	peak
6	17295.000	29.59	22.58	52.17	74.00	-21.83	peak

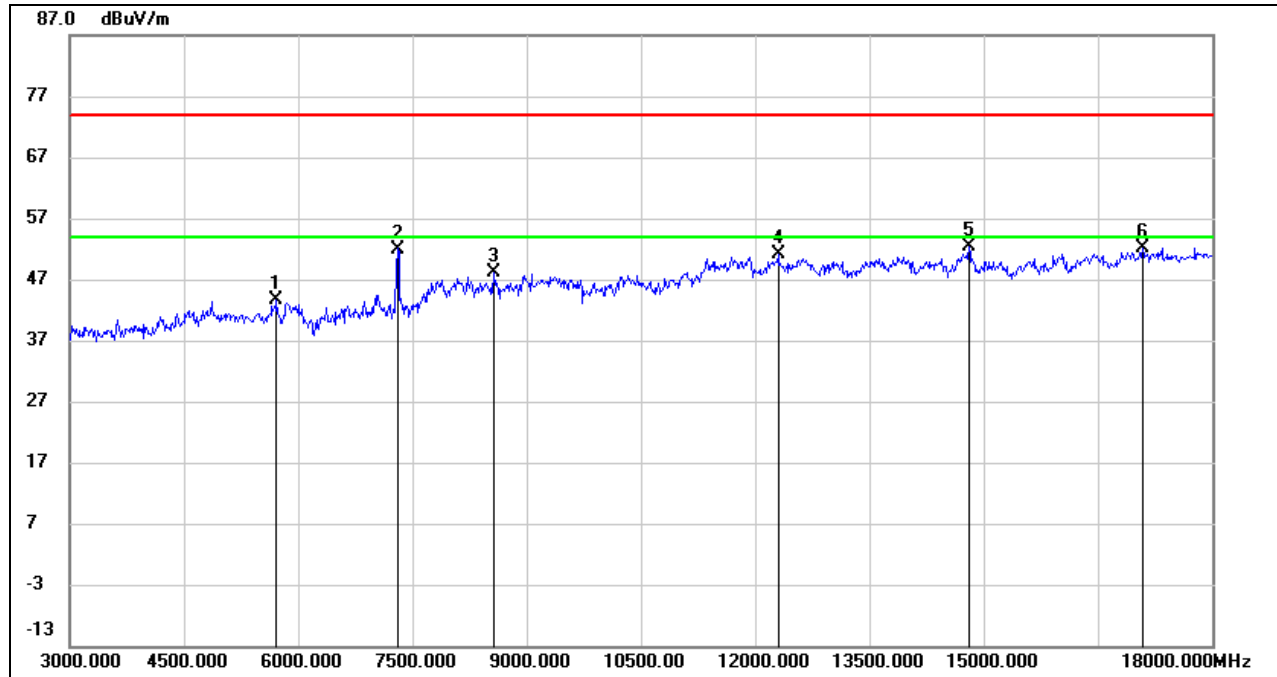
Note: 1. Peak Result = Reading Level + Correct Factor.

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

3. Peak: Peak detector.

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

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

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

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5715.000	40.37	3.15	43.52	74.00	-30.48	peak
2	7305.000	44.86	7.14	52.00	74.00	-22.00	peak
3	8565.000	38.92	9.15	48.07	74.00	-25.93	peak
4	12300.000	35.07	16.09	51.16	74.00	-22.84	peak
5	14805.000	34.46	18.00	52.46	74.00	-21.54	peak
6	17085.000	30.32	21.80	52.12	74.00	-21.88	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.

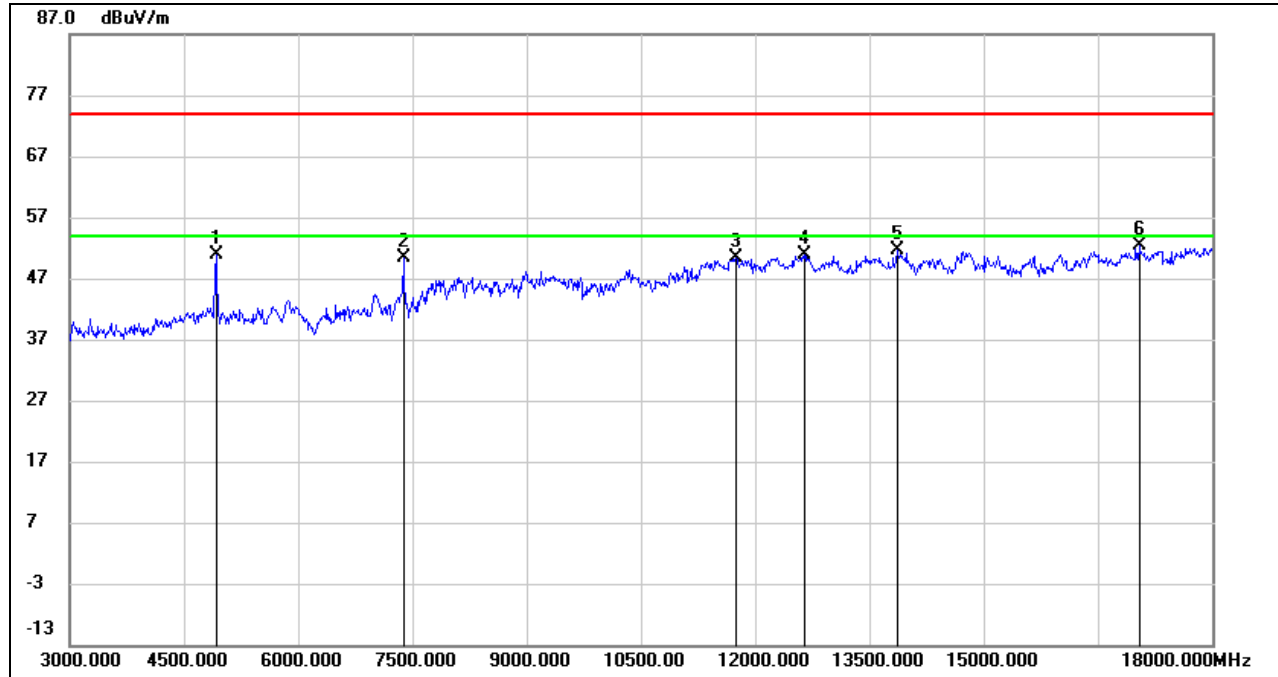
3. Peak: Peak detector.

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

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

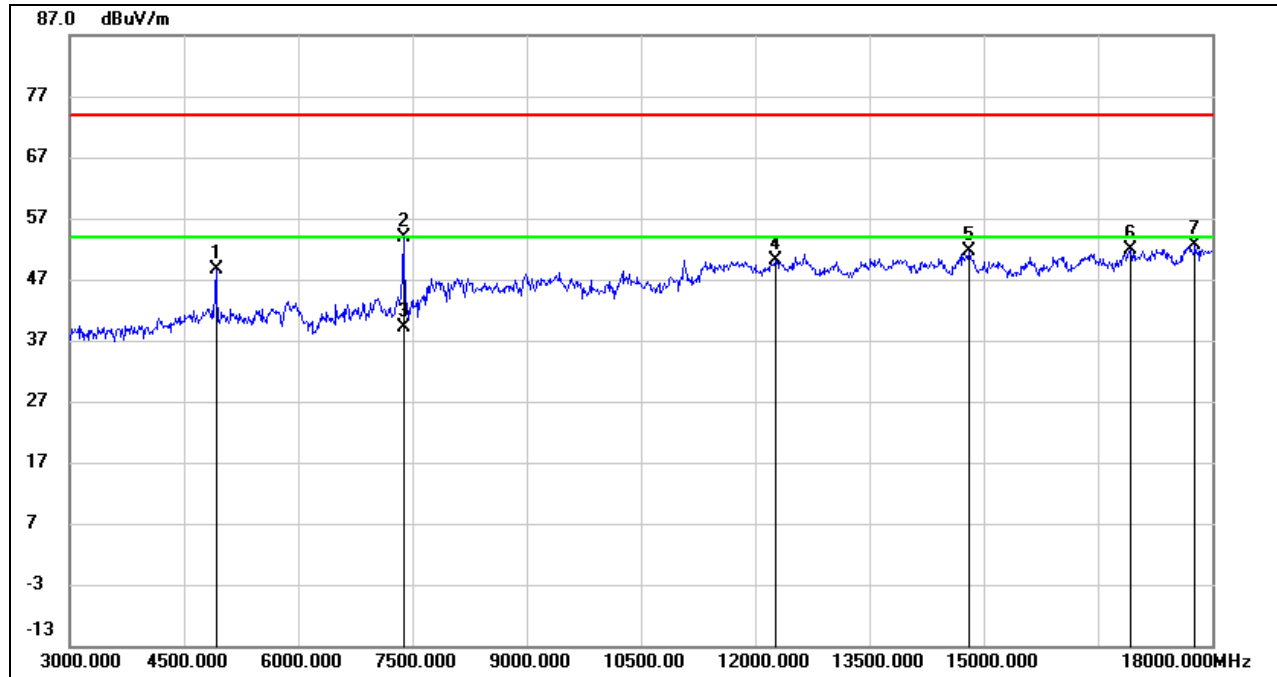


**HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)**



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4920.000	49.33	1.45	50.78	74.00	-23.22	peak
2	7380.000	42.49	7.79	50.28	74.00	-23.72	peak
3	11745.000	35.04	15.30	50.34	74.00	-23.66	peak
4	12645.000	35.10	15.71	50.81	74.00	-23.19	peak
5	13860.000	34.14	17.55	51.69	74.00	-22.31	peak
6	17040.000	30.77	21.50	52.27	74.00	-21.73	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. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.  
 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

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

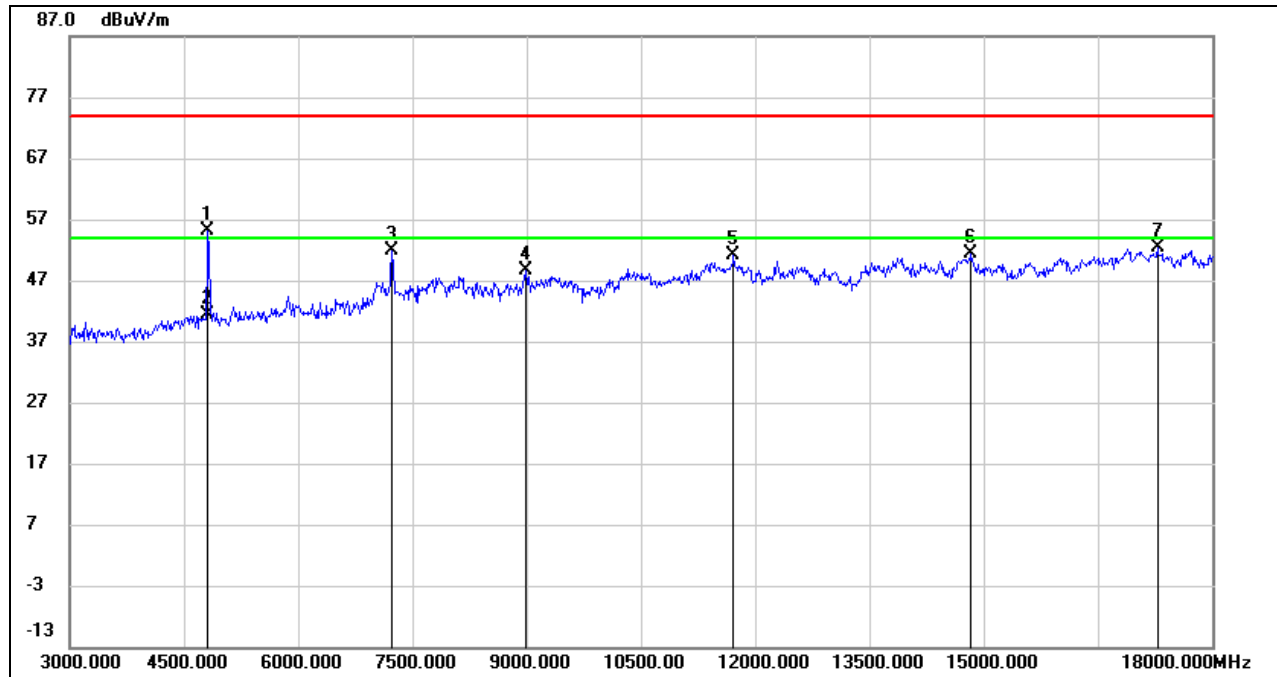
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4920.000	47.21	1.45	48.66	74.00	-25.34	peak
2	7380.000	46.19	7.79	53.98	74.00	-20.02	peak
3	7380.000	31.24	7.79	39.03	54.00	-14.97	AVG
4	12270.000	34.07	16.04	50.11	74.00	-23.89	peak
5	14805.000	33.54	18.00	51.54	74.00	-22.46	peak
6	16935.000	30.32	21.45	51.77	74.00	-22.23	peak
7	17775.000	28.65	23.91	52.56	74.00	-21.44	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 the two antennas had been tested, but only the worst data was recorded in the report.

### 8.3.3. 802.11n HT20 MIMO MODE

#### HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4815.000	53.67	1.38	55.05	74.00	-18.95	peak
2	4815.000	40.11	1.38	41.49	54.00	-12.51	AVG
3	7230.000	44.57	7.28	51.85	74.00	-22.15	peak
4	8985.000	37.71	10.99	48.70	74.00	-25.30	peak
5	11715.000	35.73	15.34	51.07	74.00	-22.93	peak
6	14835.000	33.57	17.80	51.37	74.00	-22.63	peak
7	17280.000	29.90	22.48	52.38	74.00	-21.62	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.

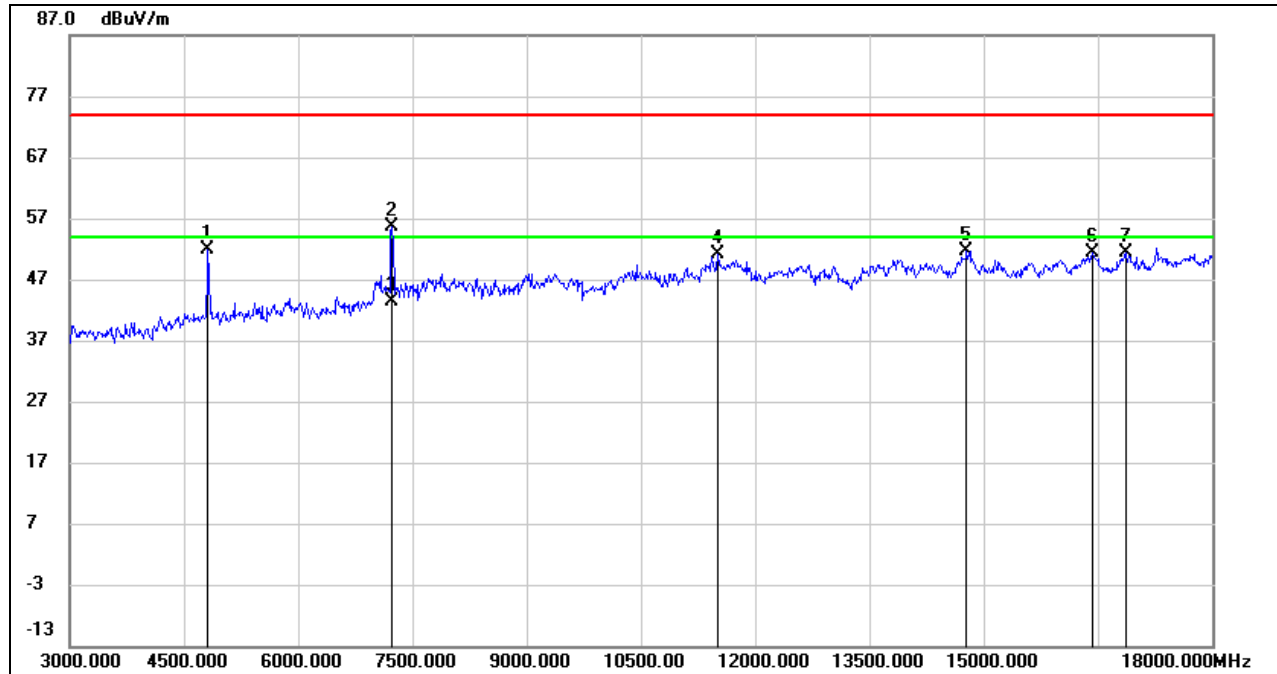
3. Peak: Peak detector.

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.

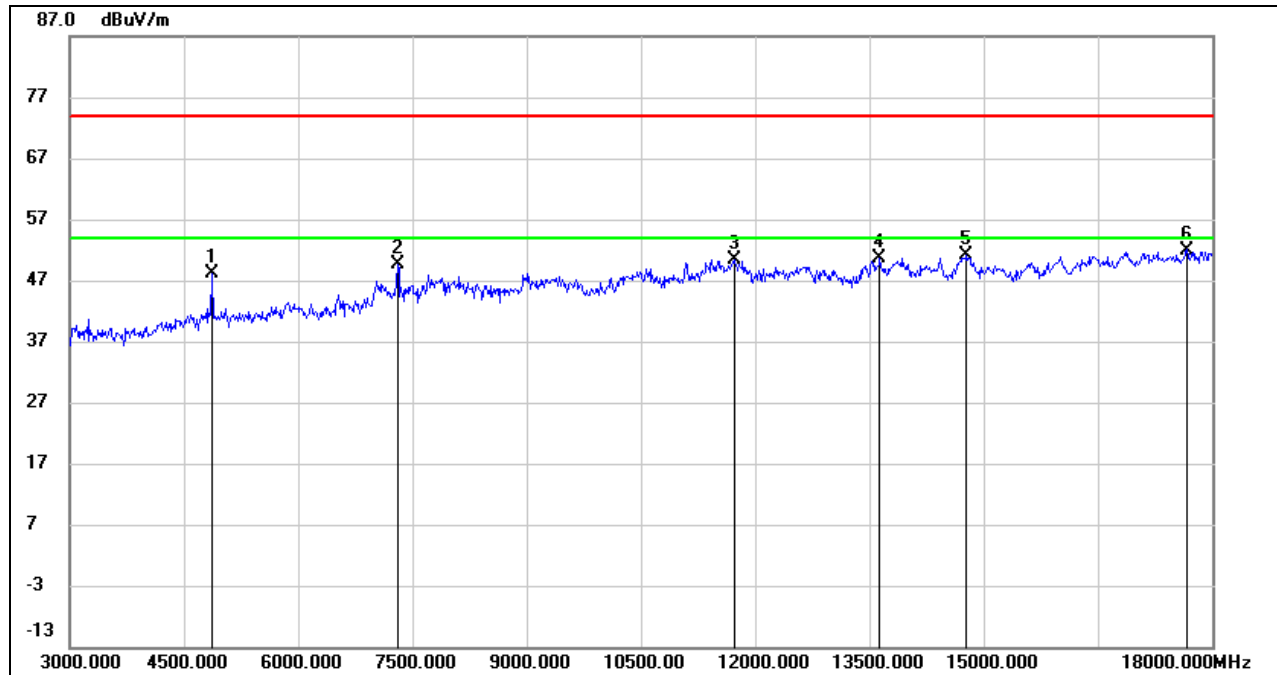
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**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	4815.000	50.40	1.38	51.78	74.00	-22.22	peak
2	7230.000	48.30	7.28	55.58	74.00	-18.42	peak
3	7230.000	36.07	7.28	43.35	54.00	-10.65	AVG
4	11505.000	36.40	14.66	51.06	74.00	-22.94	peak
5	14775.000	33.71	17.95	51.66	74.00	-22.34	peak
6	16425.000	31.70	19.68	51.38	74.00	-22.62	peak
7	16860.000	30.28	21.22	51.50	74.00	-22.50	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 (MID CHANNEL, HORIZONTAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4860.000	46.91	1.33	48.24	74.00	-25.76	peak
2	7305.000	42.38	7.14	49.52	74.00	-24.48	peak
3	11730.000	35.02	15.32	50.34	74.00	-23.66	peak
4	13635.000	33.41	17.28	50.69	74.00	-23.31	peak
5	14775.000	33.12	17.95	51.07	74.00	-22.93	peak
6	17670.000	28.76	23.24	52.00	74.00	-22.00	peak

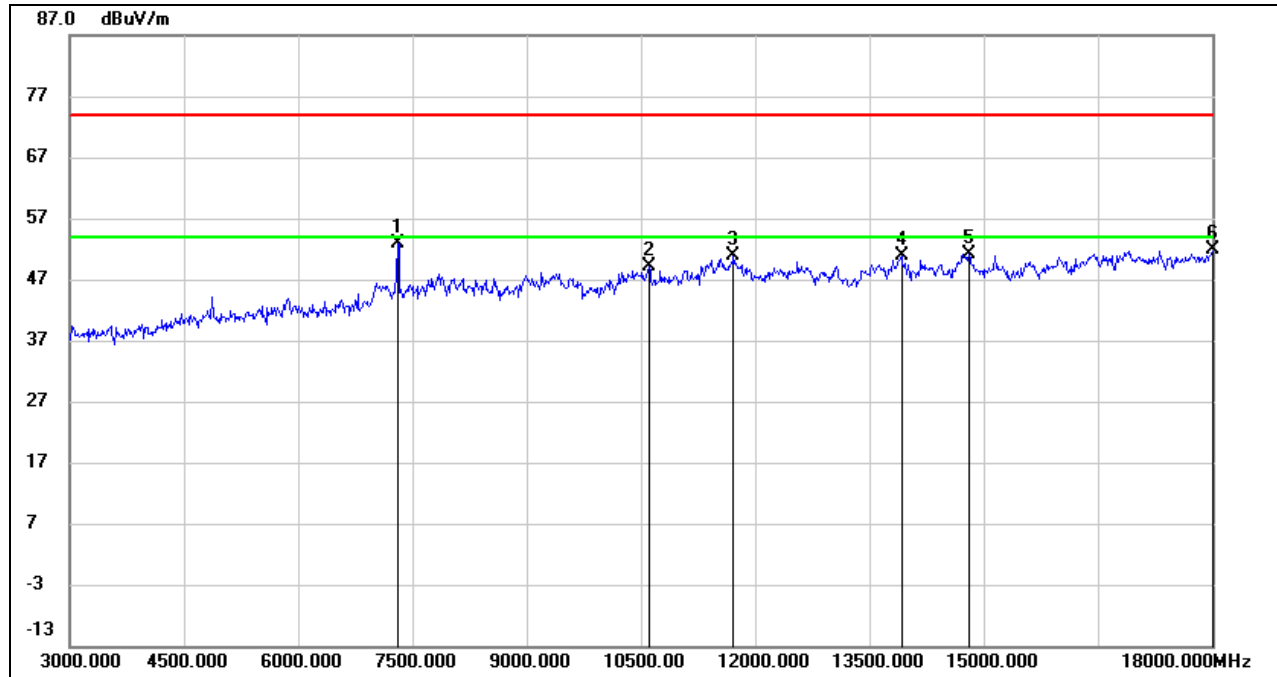
Note: 1. Peak Result = Reading Level + Correct Factor.

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

3. Peak: Peak detector.

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

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

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

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7305.000	45.79	7.14	52.93	74.00	-21.07	peak
2	10605.000	36.40	12.69	49.09	74.00	-24.91	peak
3	11715.000	35.53	15.34	50.87	74.00	-23.13	peak
4	13920.000	33.33	17.55	50.88	74.00	-23.12	peak
5	14805.000	33.10	18.00	51.10	74.00	-22.90	peak
6	18000.000	27.51	24.27	51.78	74.00	-22.22	peak

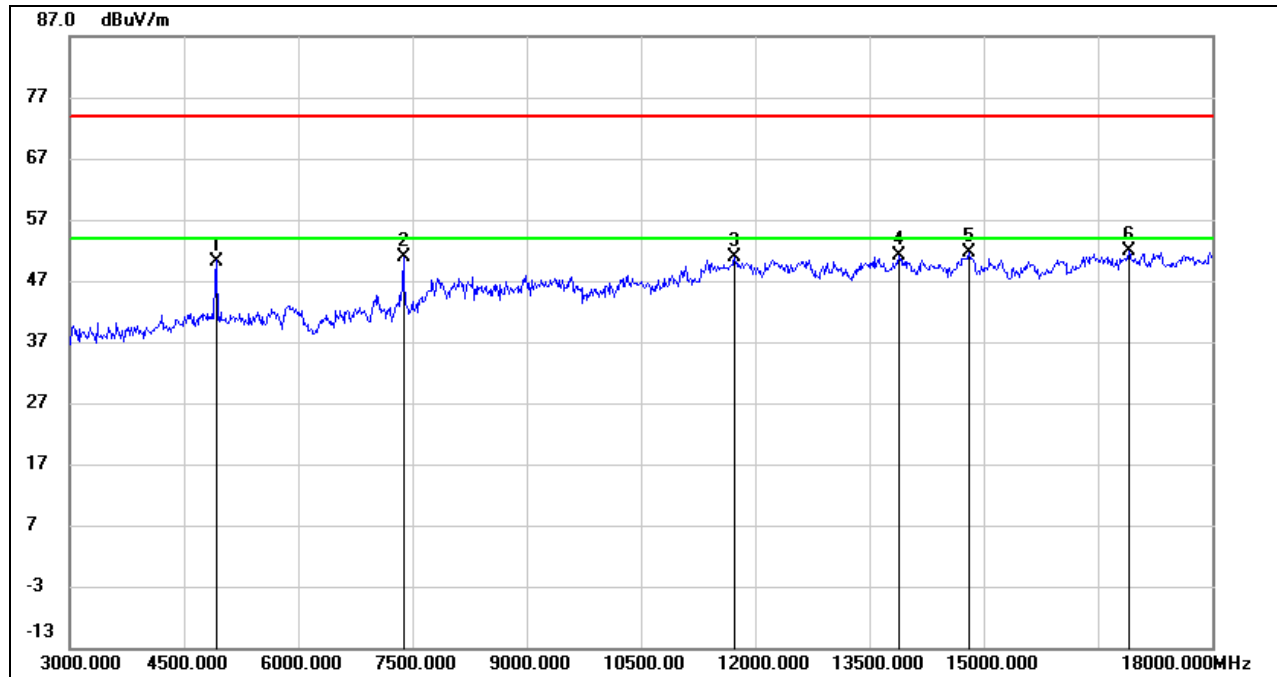
Note: 1. Peak Result = Reading Level + Correct Factor.

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

3. Peak: Peak detector.

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

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

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

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4920.000	48.80	1.45	50.25	74.00	-23.75	peak
2	7380.000	43.18	7.79	50.97	74.00	-23.03	peak
3	11730.000	35.66	15.32	50.98	74.00	-23.02	peak
4	13890.000	33.59	17.53	51.12	74.00	-22.88	peak
5	14805.000	33.71	18.00	51.71	74.00	-22.29	peak
6	16905.000	30.22	21.55	51.77	74.00	-22.23	peak

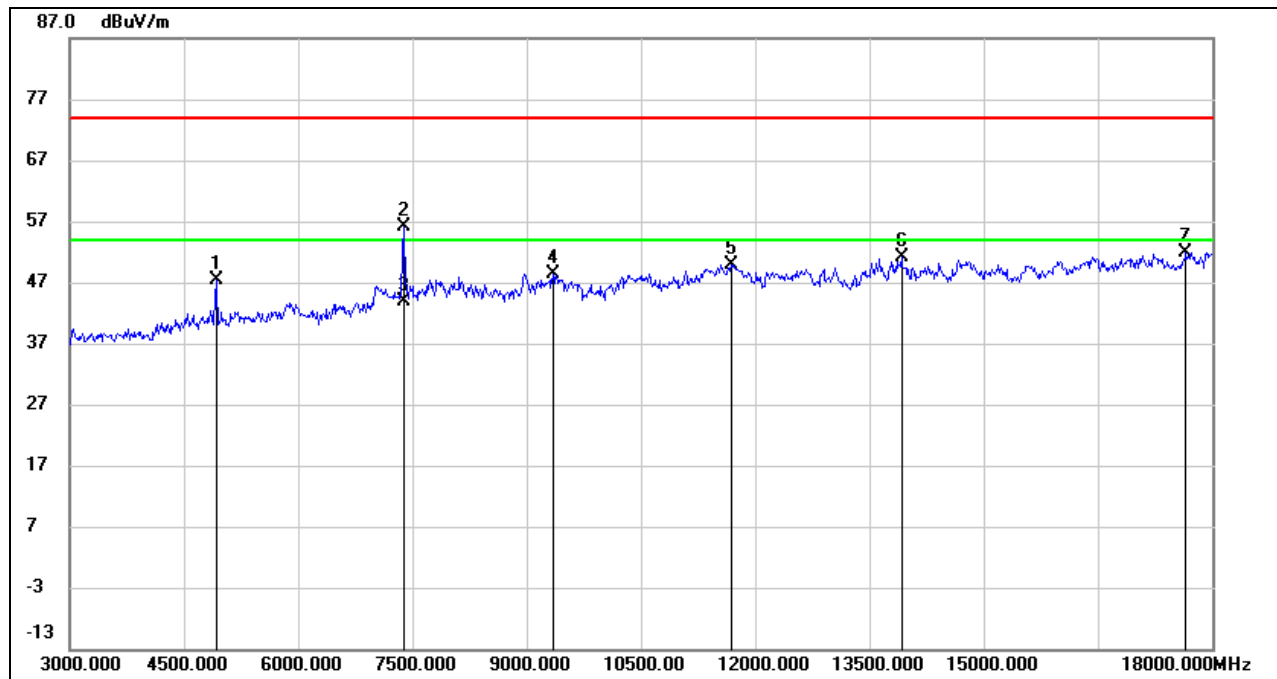
Note: 1. Peak Result = Reading Level + Correct Factor.

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

3. Peak: Peak detector.

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

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

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

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4920.000	45.94	1.45	47.39	74.00	-26.61	peak
2	7380.000	48.44	7.79	56.23	74.00	-17.77	peak
3	7380.000	36.07	7.79	43.86	54.00	-10.14	AVG
4	9345.000	37.84	10.66	48.50	74.00	-25.50	peak
5	11685.000	34.68	15.26	49.94	74.00	-24.06	peak
6	13920.000	33.49	17.55	51.04	74.00	-22.96	peak
7	17655.000	28.75	23.14	51.89	74.00	-22.11	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.

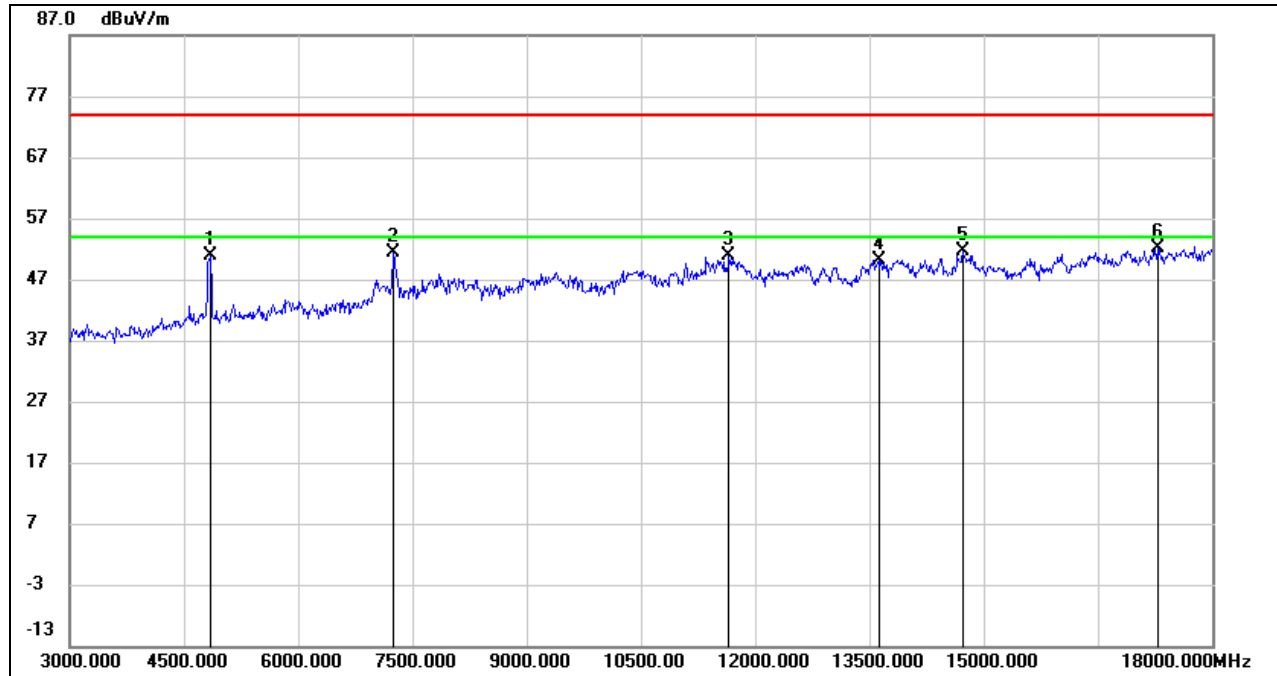
3. Peak: Peak detector.

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 MIMO MODE****HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4845.000	49.60	1.35	50.95	74.00	-23.05	peak
2	7245.000	44.13	7.25	51.38	74.00	-22.62	peak
3	11655.000	35.88	15.07	50.95	74.00	-23.05	peak
4	13620.000	33.00	17.19	50.19	74.00	-23.81	peak
5	14730.000	33.81	17.79	51.60	74.00	-22.40	peak
6	17280.000	29.67	22.48	52.15	74.00	-21.85	peak

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

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

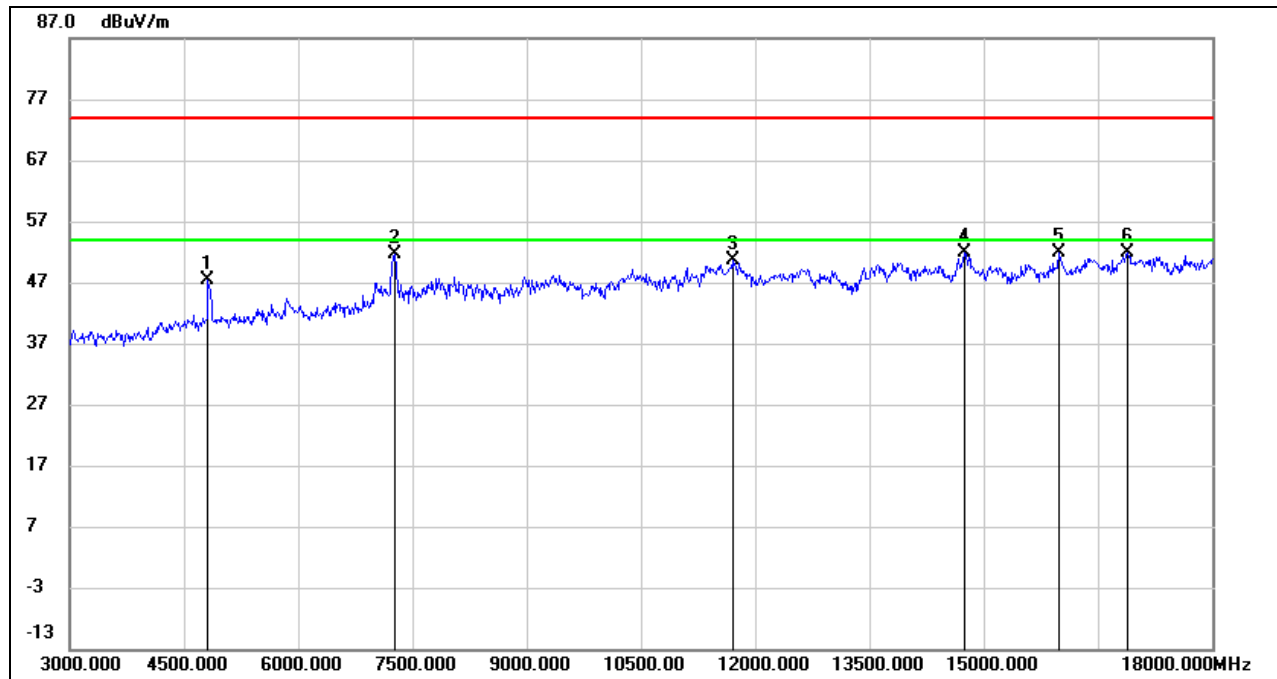
3. Peak: Peak detector.

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

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



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

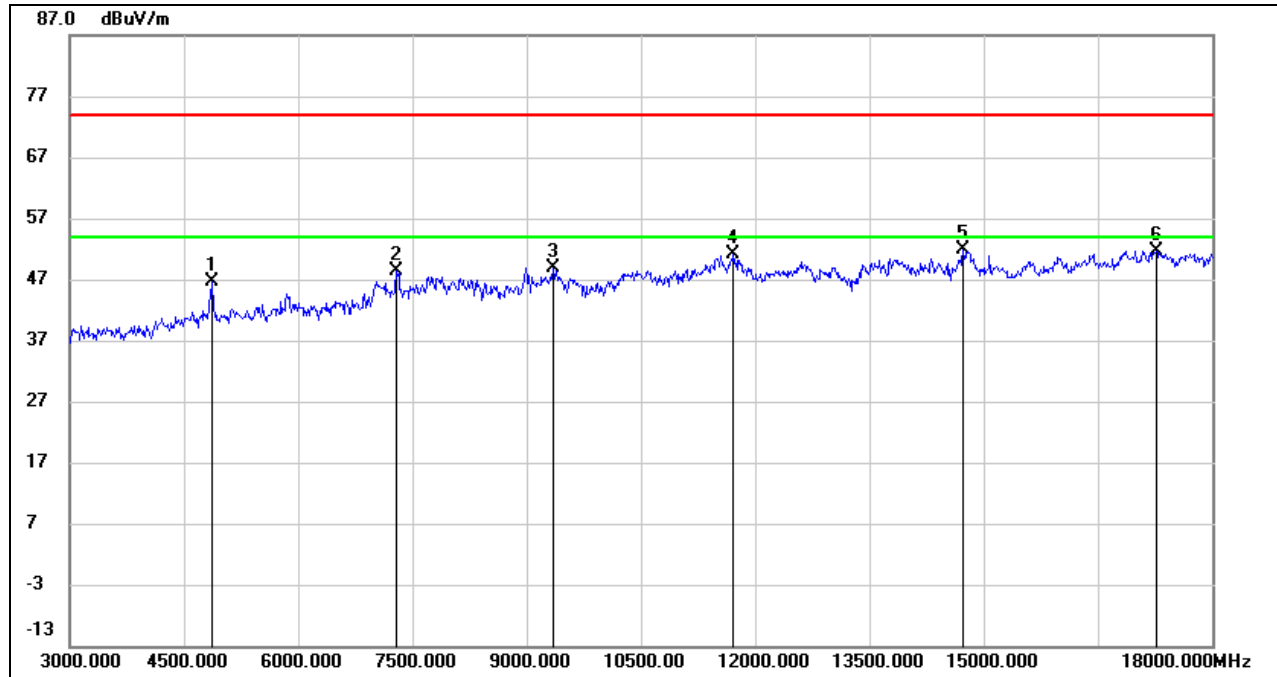


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4815.000	45.89	1.38	47.27	74.00	-26.73	peak
2	7275.000	44.58	7.16	51.74	74.00	-22.26	peak
3	11700.000	35.17	15.35	50.52	74.00	-23.48	peak
4	14745.000	33.96	17.84	51.80	74.00	-22.20	peak
5	15990.000	33.49	18.39	51.88	74.00	-22.12	peak
6	16890.000	30.41	21.49	51.90	74.00	-22.10	peak

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

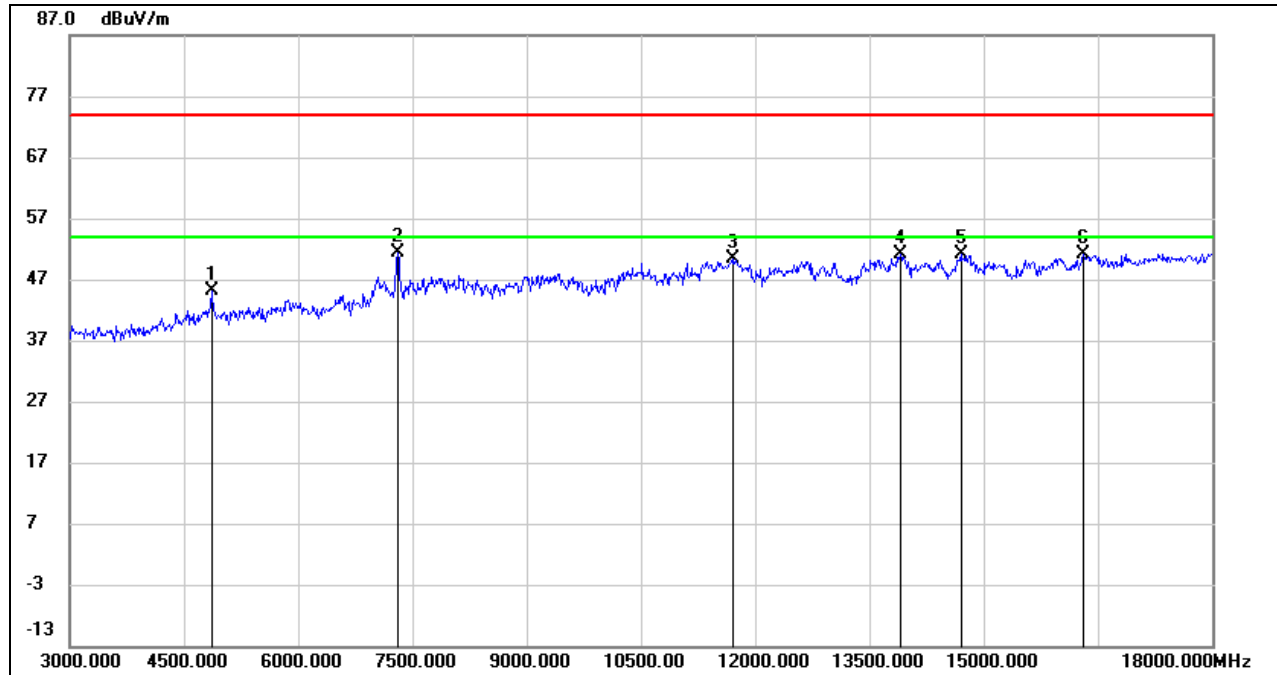


**HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)**



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4875.000	45.25	1.32	46.57	74.00	-27.43	peak
2	7290.000	41.23	7.12	48.35	74.00	-25.65	peak
3	9345.000	38.26	10.66	48.92	74.00	-25.08	peak
4	11715.000	35.84	15.34	51.18	74.00	-22.82	peak
5	14730.000	34.21	17.79	52.00	74.00	-22.00	peak
6	17265.000	29.31	22.39	51.70	74.00	-22.30	peak

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

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

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4860.000	43.72	1.33	45.05	74.00	-28.95	peak
2	7305.000	44.21	7.14	51.35	74.00	-22.65	peak
3	11700.000	34.96	15.35	50.31	74.00	-23.69	peak
4	13905.000	33.51	17.54	51.05	74.00	-22.95	peak
5	14700.000	33.38	17.69	51.07	74.00	-22.93	peak
6	16305.000	31.61	19.62	51.23	74.00	-22.77	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.

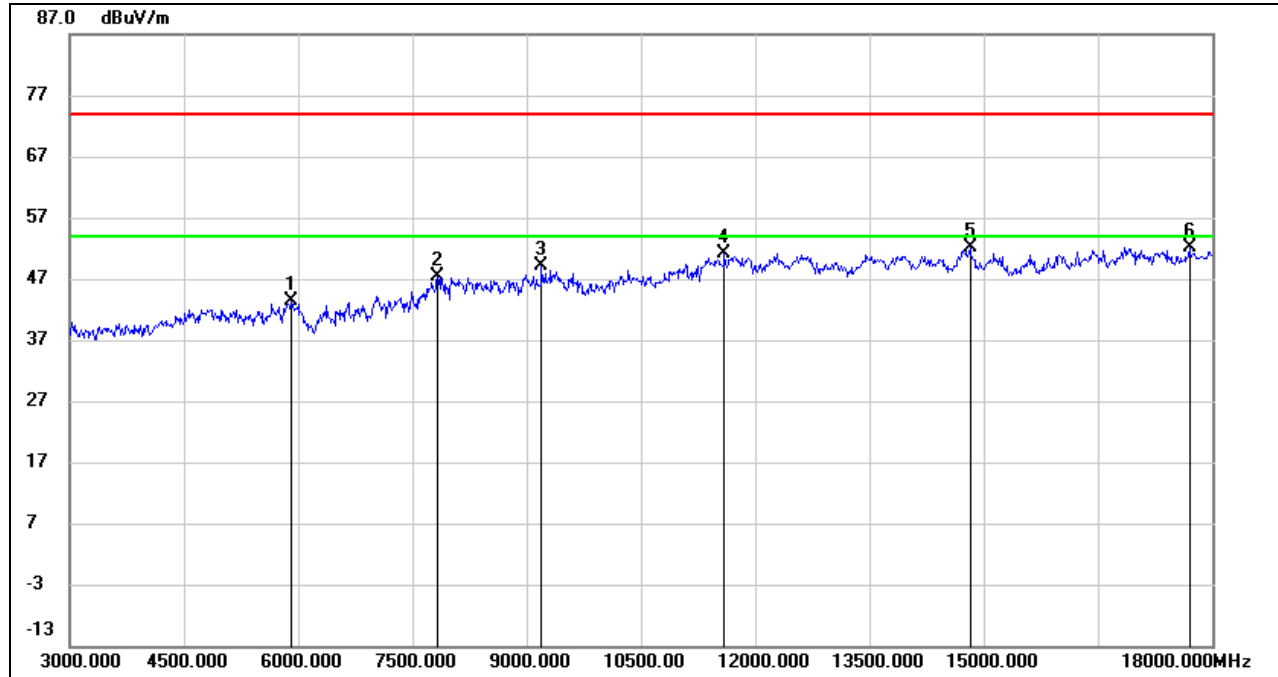
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

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



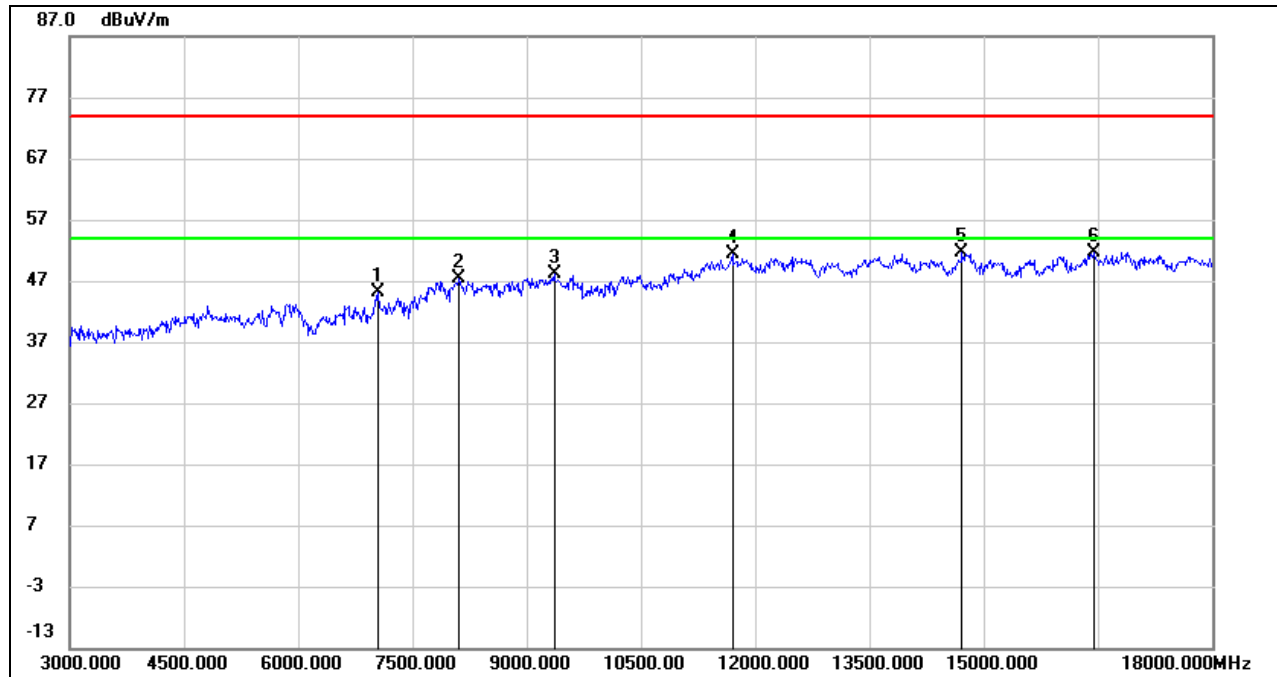


**HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)**



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5910.000	39.02	4.45	43.47	74.00	-30.53	peak
2	7830.000	38.07	9.20	47.27	74.00	-26.73	peak
3	9195.000	39.17	9.92	49.09	74.00	-24.91	peak
4	11595.000	36.47	14.71	51.18	74.00	-22.82	peak
5	14820.000	34.32	17.91	52.23	74.00	-21.77	peak
6	17700.000	28.62	23.47	52.09	74.00	-21.91	peak

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

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

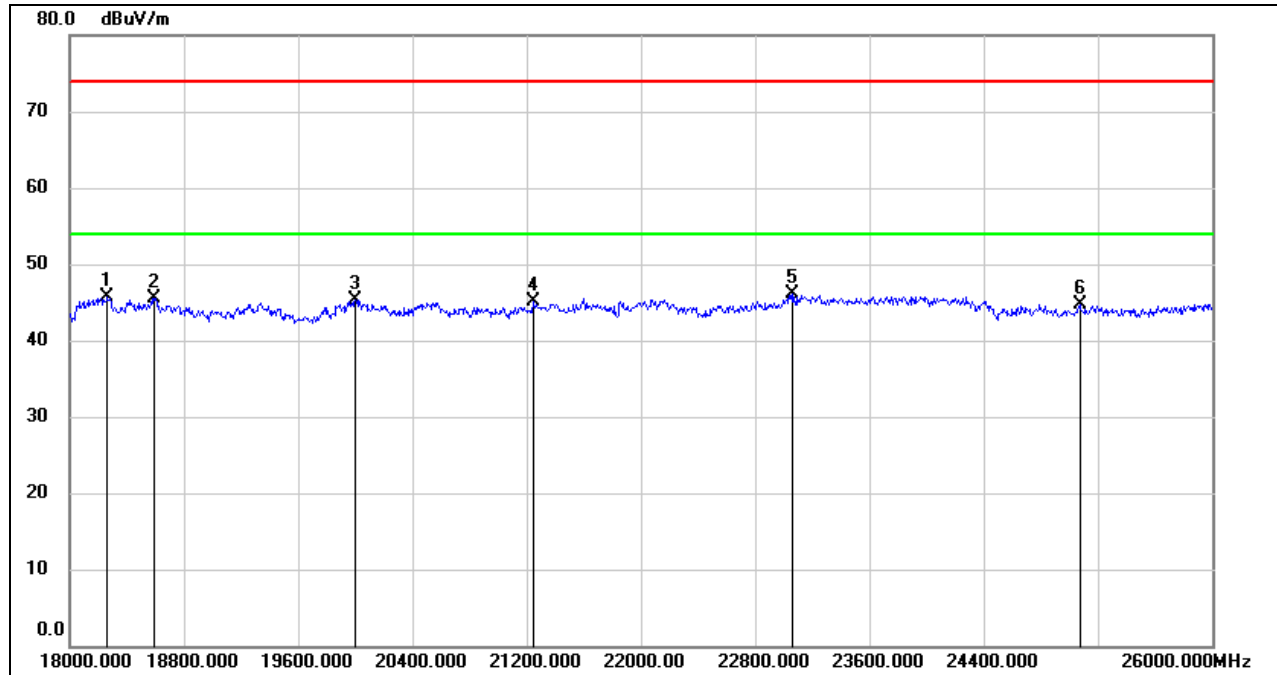
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7050.000	37.42	7.63	45.05	74.00	-28.95	peak
2	8115.000	37.35	10.13	47.48	74.00	-26.52	peak
3	9360.000	37.31	10.75	48.06	74.00	-25.94	peak
4	11700.000	35.94	15.35	51.29	74.00	-22.71	peak
5	14715.000	33.90	17.74	51.64	74.00	-22.36	peak
6	16440.000	31.86	19.68	51.54	74.00	-22.46	peak

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

## 8.5. SPURIOUS EMISSIONS (18 GHz ~ 26 GHz)

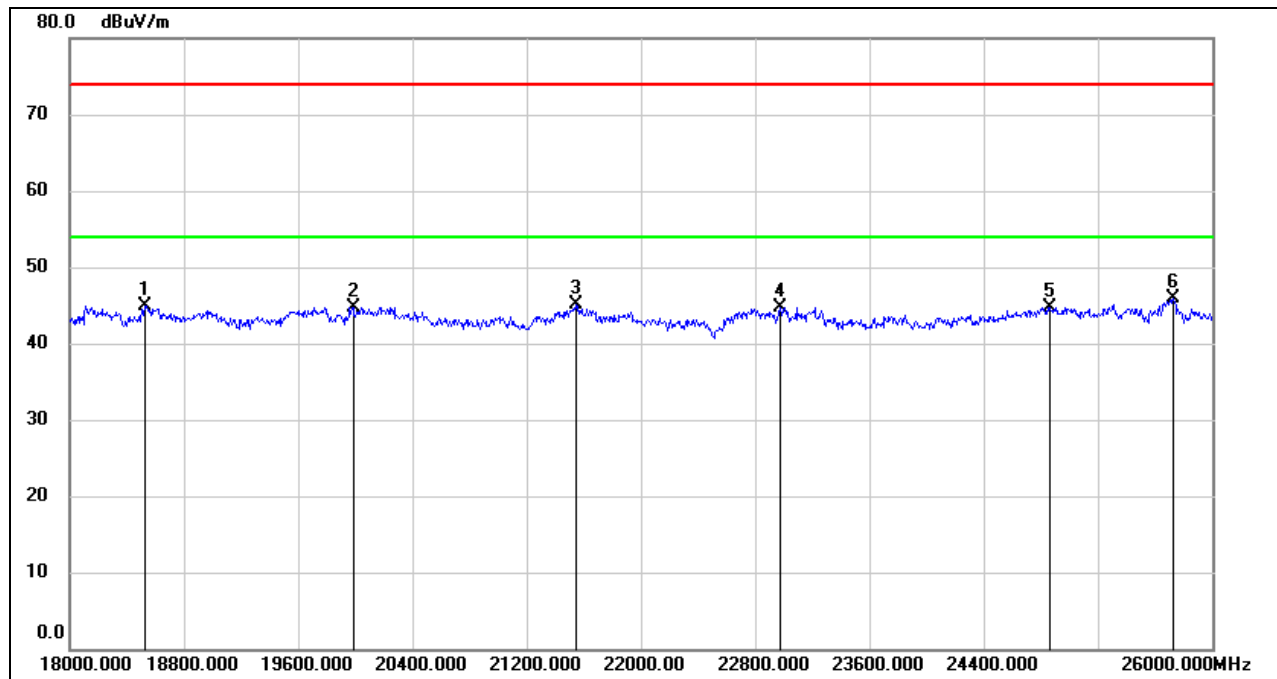
### 8.5.1. 802.11n HT20 MIMO MODE

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



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18264.000	51.15	-5.53	45.62	74.00	-28.38	peak
2	18592.000	50.75	-5.31	45.44	74.00	-28.56	peak
3	20000.000	50.81	-5.45	45.36	74.00	-28.64	peak
4	21248.000	49.79	-4.77	45.02	74.00	-28.98	peak
5	23064.000	49.49	-3.42	46.07	74.00	-27.93	peak
6	25072.000	46.67	-1.97	44.70	74.00	-29.30	peak

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

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

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18528.000	50.11	-5.26	44.85	74.00	-29.15	peak
2	19984.000	50.21	-5.44	44.77	74.00	-29.23	peak
3	21544.000	49.76	-4.63	45.13	74.00	-28.87	peak
4	22976.000	48.26	-3.46	44.80	74.00	-29.20	peak
5	24864.000	47.03	-2.23	44.80	74.00	-29.20	peak
6	25728.000	46.61	-0.72	45.89	74.00	-28.11	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.

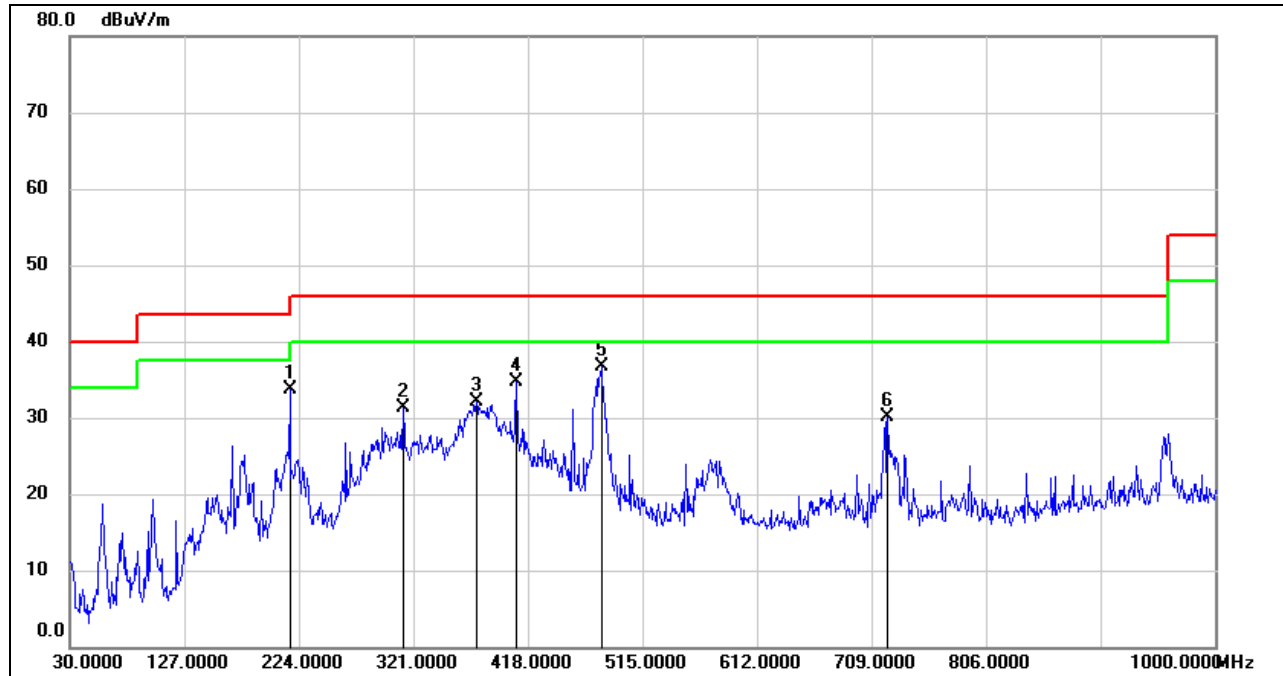
3. Peak: Peak detector.

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

## 8.6. SPURIOUS EMISSIONS (30 MHz ~ 1 GHz)

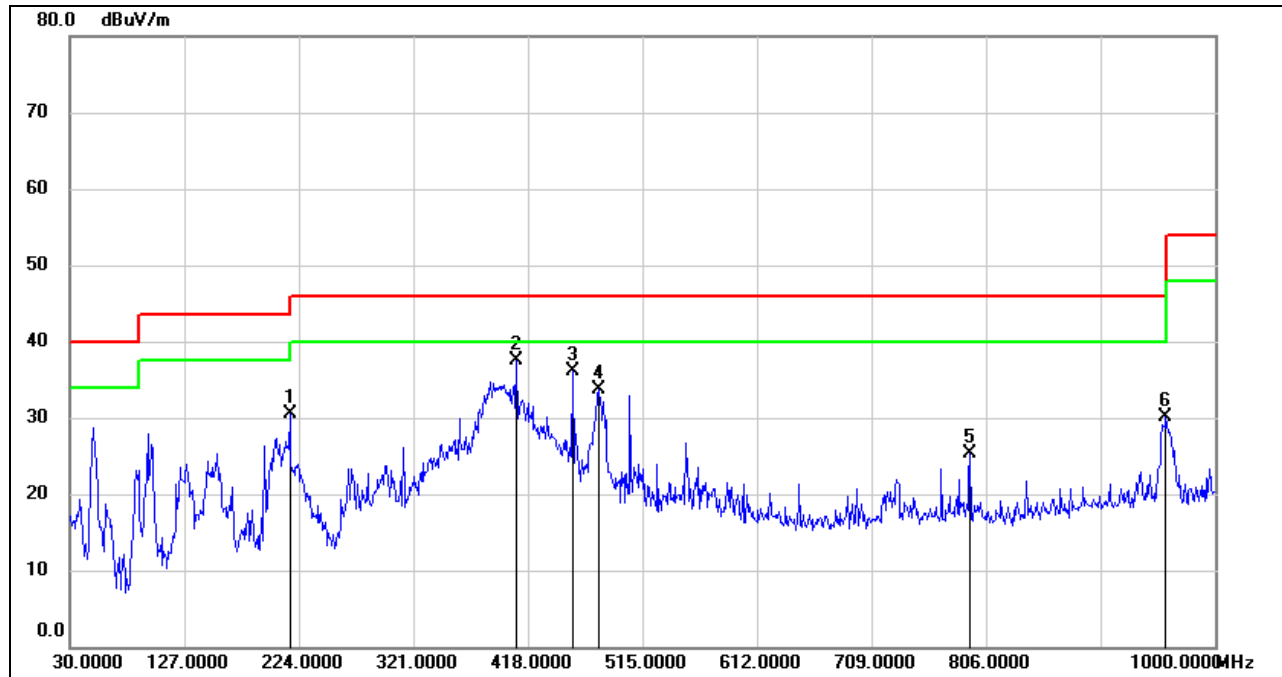
### 8.6.1. 802.11n HT20 MIMO MODE

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



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	216.2400	51.57	-17.84	33.73	46.00	-12.27	QP
2	312.2700	46.31	-15.01	31.30	46.00	-14.70	QP
3	374.3500	45.90	-13.82	32.08	46.00	-13.92	QP
4	408.3000	47.92	-13.17	34.75	46.00	-11.25	QP
5	480.0800	48.40	-11.79	36.61	46.00	-9.39	QP
6	722.5800	38.19	-8.08	30.11	46.00	-15.89	QP

- Note: 1. Result Level = Read Level + Correct Factor.  
 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.  
 3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

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

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	216.2400	48.27	-17.84	30.43	46.00	-15.57	QP
2	408.3000	50.63	-13.17	37.46	46.00	-8.54	QP
3	455.8300	48.32	-12.27	36.05	46.00	-9.95	QP
4	478.1400	45.44	-11.83	33.61	46.00	-12.39	QP
5	792.4200	32.76	-7.38	25.38	46.00	-20.62	QP
6	958.2900	34.58	-4.52	30.06	46.00	-15.94	QP

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

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

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

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

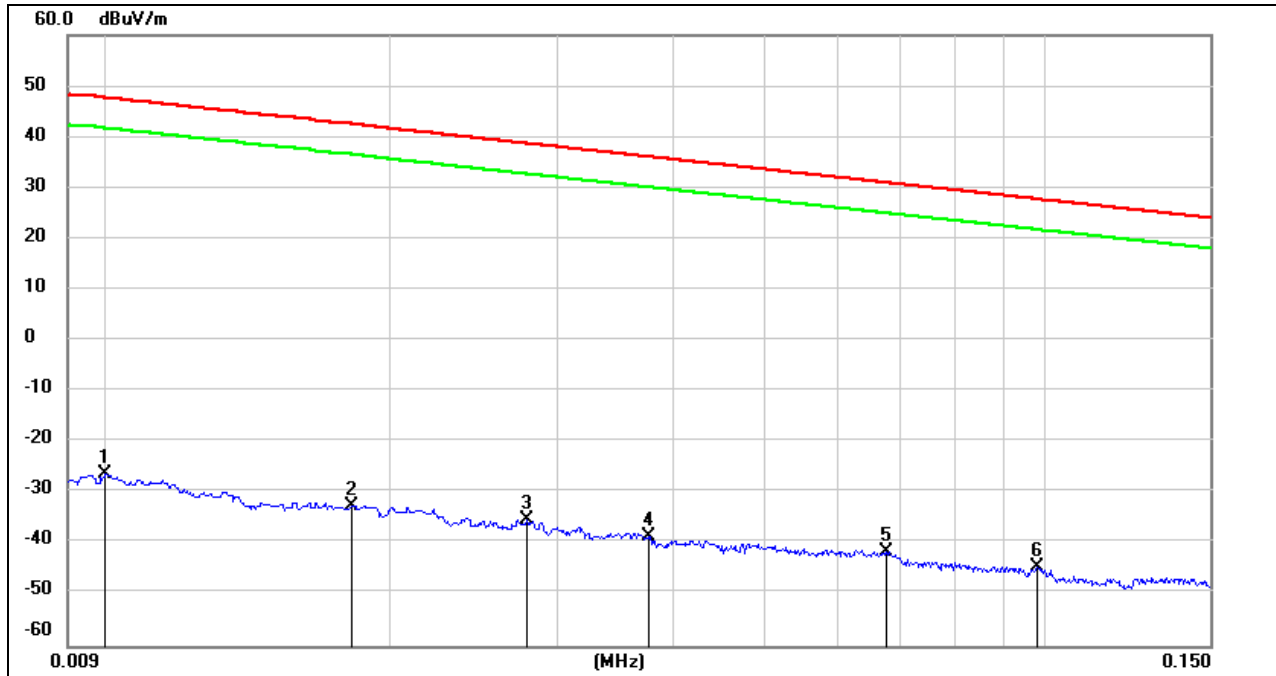


## 8.7. SPURIOUS EMISSIONS BELOW 30 MHz

### 8.7.1. 802.11n HT20 MIMO MODE

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

9 kHz~ 150 kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	FCC Result (dBuV/m)	FCC Limit (dBuV/m)	ISED Result (dBuA/m)	ISED Limit (dBuA/m)	Margin (dB)	Remark
1	0.0100	75.22	-101.40	-26.18	47.6	-77.68	-3.90	-73.78	peak
2	0.0181	68.85	-101.36	-32.51	42.45	-84.01	-9.05	-74.96	peak
3	0.0279	66.17	-101.38	-35.21	38.69	-86.71	-12.81	-73.90	peak
4	0.0376	62.75	-101.42	-38.67	36.1	-90.17	-15.40	-74.77	peak
5	0.0675	60.14	-101.56	-41.42	31.02	-92.92	-20.48	-72.44	peak
6	0.0981	57.27	-101.78	-44.51	27.77	-96.01	-23.73	-72.28	peak

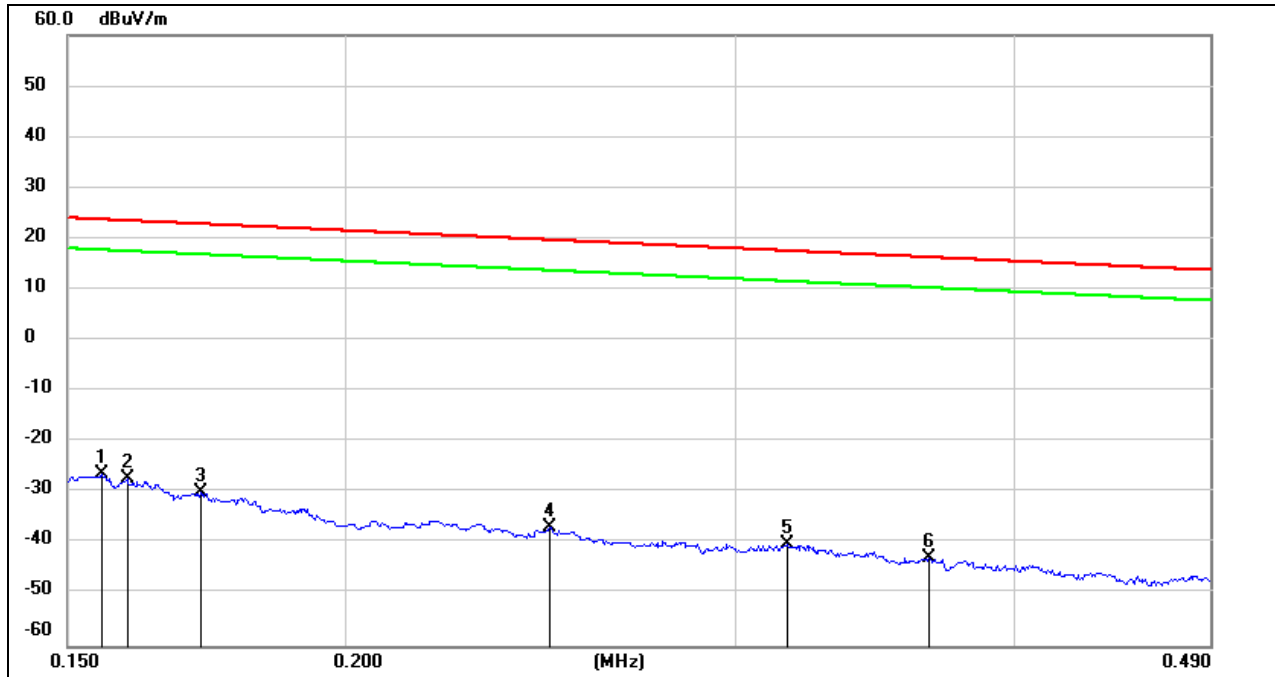
Note: 1. Measurement = Reading Level + Correct Factor (dBuA/m= dBuV/m- 20Log10[120π] = dBuV/m- 51.5).

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 (MHz)	Reading (dBuV)	Correct (dB/m)	FCC Result (dBuV/m)	FCC Limit (dBuV/m)	ISED Result (dBuA/m)	ISED Limit (dBuA/m)	Margin (dB)	Remark
1	0.1554	75.27	-101.65	-26.38	23.77	-77.88	-27.73	-50.15	peak
2	0.1595	74.36	-101.65	-27.29	23.55	-78.79	-27.95	-50.84	peak
3	0.1720	71.69	-101.67	-29.98	22.9	-81.48	-28.60	-52.88	peak
4	0.2472	64.95	-101.80	-36.85	19.74	-88.35	-31.76	-56.59	peak
5	0.3163	61.70	-101.87	-40.17	17.6	-91.67	-33.90	-57.77	peak
6	0.3662	59.08	-101.93	-42.85	16.33	-94.35	-35.17	-59.18	peak

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

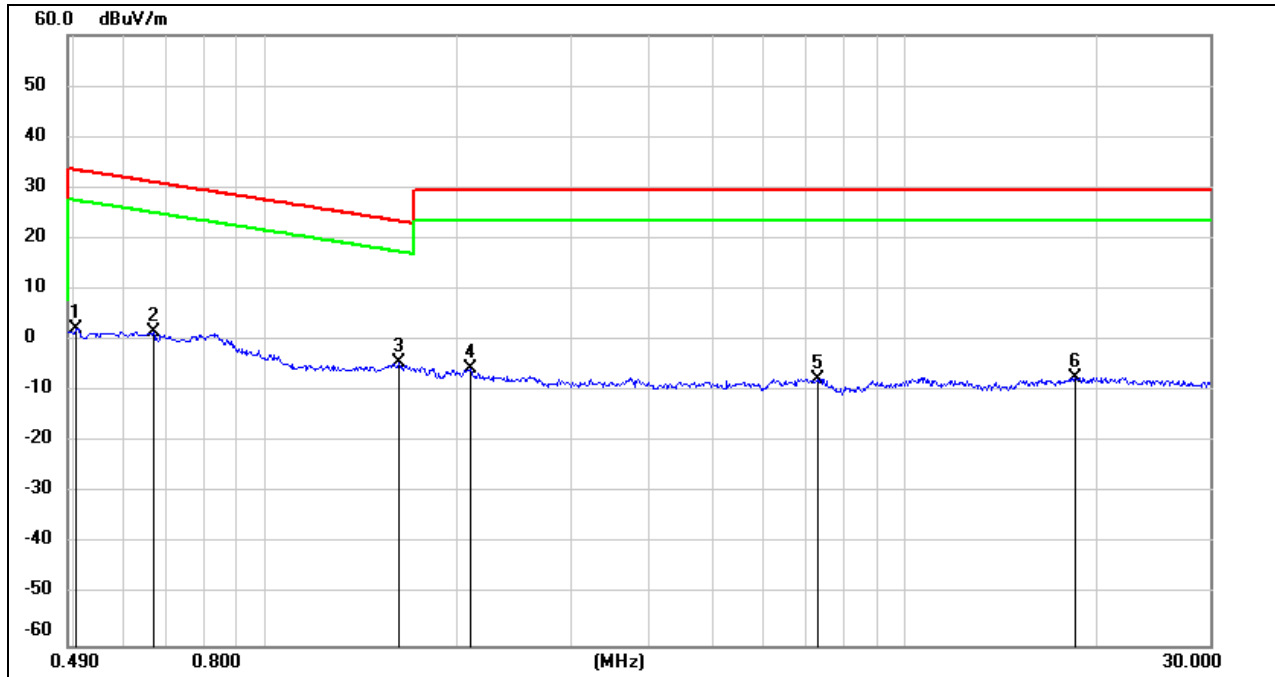
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

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 (MHz)	Reading (dBuV)	Correct (dB/m)	FCC Result (dBuV/m)	FCC Limit (dBuV/m)	ISED Result (dBuA/m)	ISED Limit (dBuA/m)	Margin (dB)	Remark
1	0.5039	64.44	-62.07	2.37	33.56	-49.13	-17.94	-31.19	peak
2	0.6671	63.75	-62.10	1.65	31.12	-49.85	-20.38	-29.47	peak
3	1.6149	57.62	-62.00	-4.38	23.44	-55.88	-28.06	-27.82	peak
4	2.0939	56.39	-61.79	-5.4	29.54	-56.90	-21.96	-34.94	peak
5	7.3361	53.58	-61.17	-7.59	29.54	-59.09	-21.96	-37.13	peak
6	18.4908	53.56	-60.89	-7.33	29.54	-58.83	-21.96	-36.87	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 and channels had been tested, but only the worst data was recorded in the report.

## 9. AC POWER LINE CONDUCTED EMISSIONS

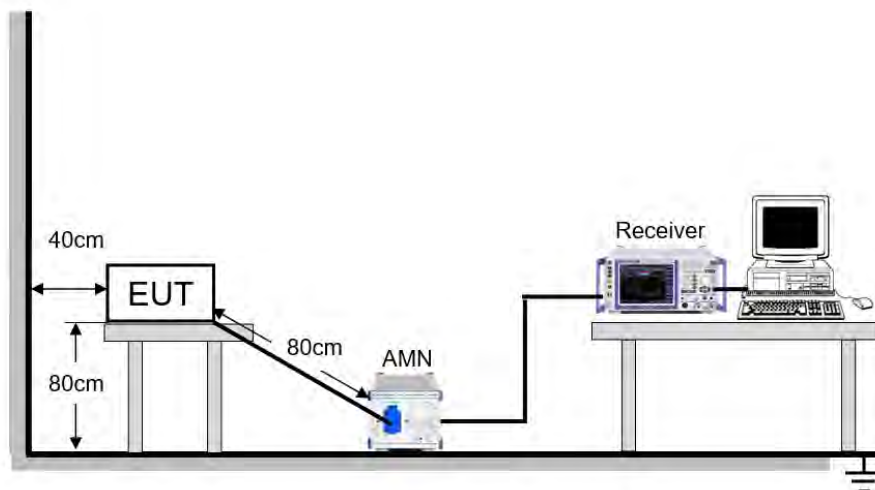
### LIMITS

Please refer to CFR 47 FCC §15.207 (a) 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

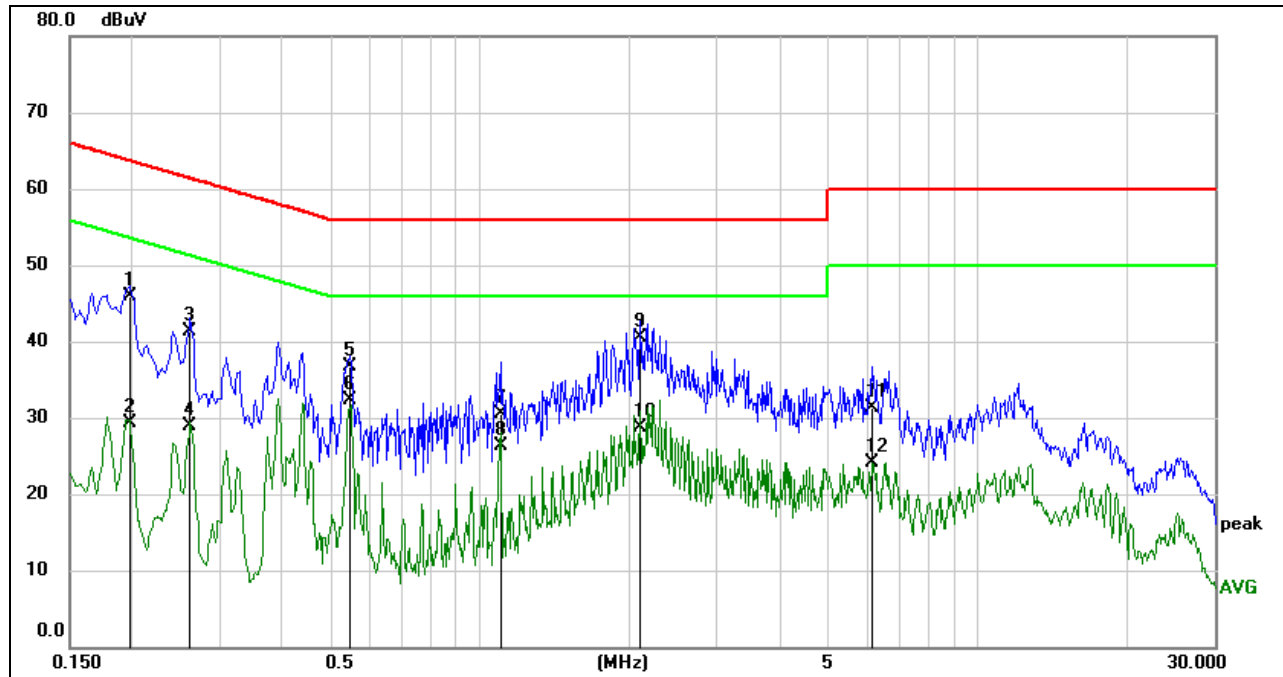
Temperature	26.1 °C	Relative Humidity	63 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3.3 V



**RESULTS**

**9.1. 802.11n HT20 MIMO MODE**

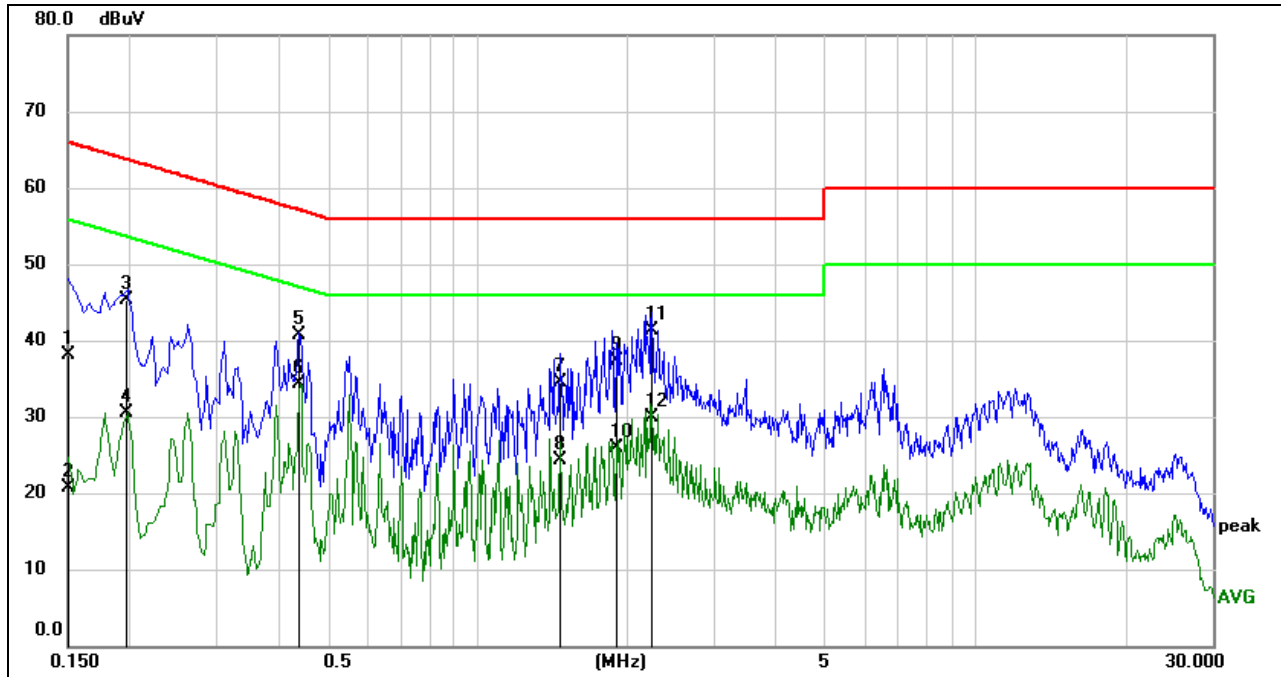
**LINE L RESULTS (HIGH CHANNEL, WORST-CASE CONFIGURATION)**



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1968	36.36	9.59	45.95	63.74	-17.79	QP
2	0.1968	19.79	9.59	29.38	53.74	-24.36	AVG
3	0.2621	31.66	9.59	41.25	61.36	-20.11	QP
4	0.2621	19.41	9.59	29.00	51.36	-22.36	AVG
5	0.5523	27.04	9.60	36.64	56.00	-19.36	QP
6	0.5523	22.64	9.60	32.24	46.00	-13.76	AVG
7	1.1049	20.91	9.61	30.52	56.00	-25.48	QP
8	1.1049	16.61	9.61	26.22	46.00	-19.78	AVG
9	2.1063	30.82	9.63	40.45	56.00	-15.55	QP
10	2.1063	19.15	9.63	28.78	46.00	-17.22	AVG
11	6.1388	21.69	9.64	31.33	60.00	-28.67	QP
12	6.1388	14.48	9.64	24.12	50.00	-25.88	AVG

Note: 1. Result = Reading +Correct Factor.  
 2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.  
 3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).  
 4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

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



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1515	28.48	9.59	38.07	65.92	-27.85	QP
2	0.1515	11.16	9.59	20.75	55.92	-35.17	AVG
3	0.1963	35.66	9.59	45.25	63.77	-18.52	QP
4	0.1963	20.92	9.59	30.51	53.77	-23.26	AVG
5	0.4399	31.09	9.60	40.69	57.06	-16.37	QP
6	0.4399	24.66	9.60	34.26	47.06	-12.80	AVG
7	1.4687	24.92	9.62	34.54	56.00	-21.46	QP
8	1.4687	14.63	9.62	24.25	46.00	-21.75	AVG
9	1.9086	27.76	9.62	37.38	56.00	-18.62	QP
10	1.9086	16.19	9.62	25.81	46.00	-20.19	AVG
11	2.2353	31.64	9.63	41.27	56.00	-14.73	QP
12	2.2353	20.31	9.63	29.94	46.00	-16.06	AVG

- Note: 1. Result = Reading +Correct Factor.  
 2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.  
 3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).  
 4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

Note: All the modes and channels 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	8.640	2407.440	2416.080	0.5	PASS
	Ant2	2412	7.640	2408.400	2416.040	0.5	PASS
	Ant1	2437	8.160	2432.920	2441.080	0.5	PASS
	Ant2	2437	8.600	2432.440	2441.040	0.5	PASS
	Ant1	2462	8.680	2457.400	2466.080	0.5	PASS
	Ant2	2462	8.160	2457.920	2466.080	0.5	PASS
11G	Ant1	2412	15.720	2403.840	2419.560	0.5	PASS
	Ant2	2412	15.880	2404.080	2419.960	0.5	PASS
	Ant1	2437	16.360	2428.840	2445.200	0.5	PASS
	Ant2	2437	16.000	2429.200	2445.200	0.5	PASS
	Ant1	2462	15.880	2454.080	2469.960	0.5	PASS
	Ant2	2462	16.360	2453.840	2470.200	0.5	PASS
11N20MIMO	Ant1	2412	17.000	2403.440	2420.440	0.5	PASS
	Ant2	2412	17.640	2403.200	2420.840	0.5	PASS
	Ant1	2437	17.640	2428.200	2445.840	0.5	PASS
	Ant2	2437	17.000	2428.200	2445.200	0.5	PASS
	Ant1	2462	17.400	2453.440	2470.840	0.5	PASS
	Ant2	2462	17.640	2453.200	2470.840	0.5	PASS
11N40MIMO	Ant1	2422	35.280	2404.400	2439.680	0.5	PASS
	Ant2	2422	35.200	2404.400	2439.600	0.5	PASS
	Ant1	2437	35.200	2419.400	2454.600	0.5	PASS
	Ant2	2437	35.200	2419.400	2454.600	0.5	PASS
	Ant1	2452	35.280	2434.400	2469.680	0.5	PASS
	Ant2	2452	35.280	2434.400	2469.680	0.5	PASS



### 11.1.2. Test Graphs



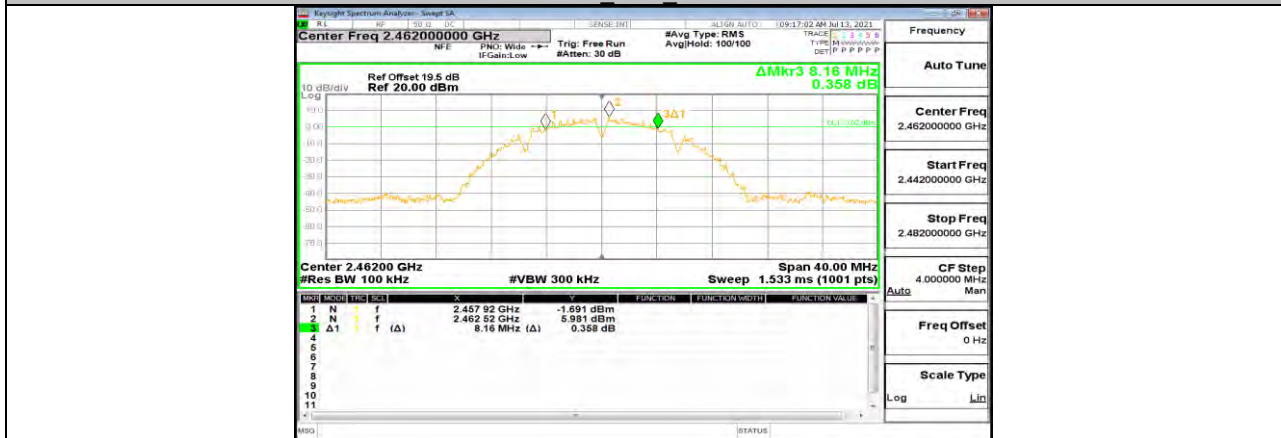




11B Ant2 2437



11B Ant1 2462



11B Ant2 2462





11G Ant1 2412



11G Ant2 2412



11G Ant1 2437



11G Ant2 2437



11G Ant1 2462



11G Ant2 2462



11N20MIMO Ant1 2412

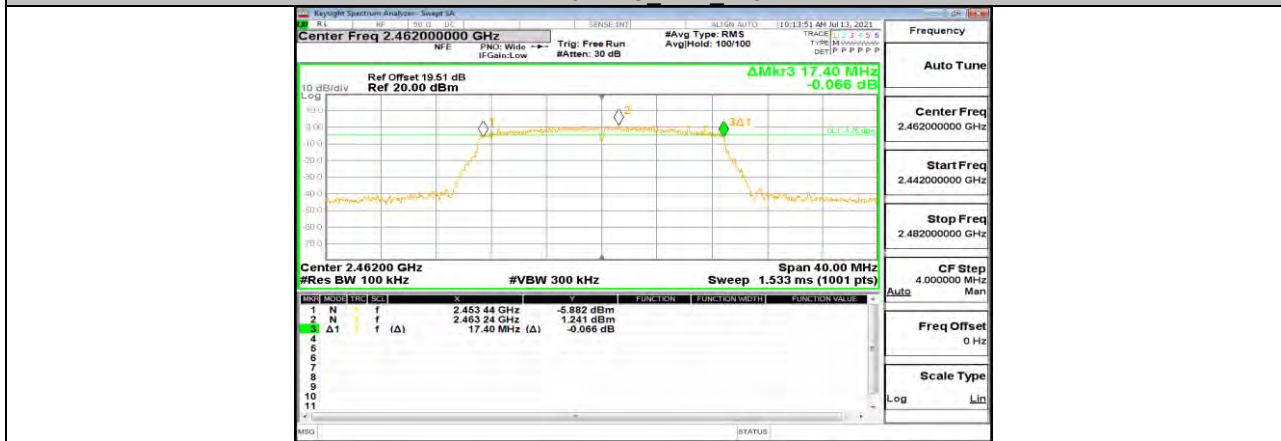
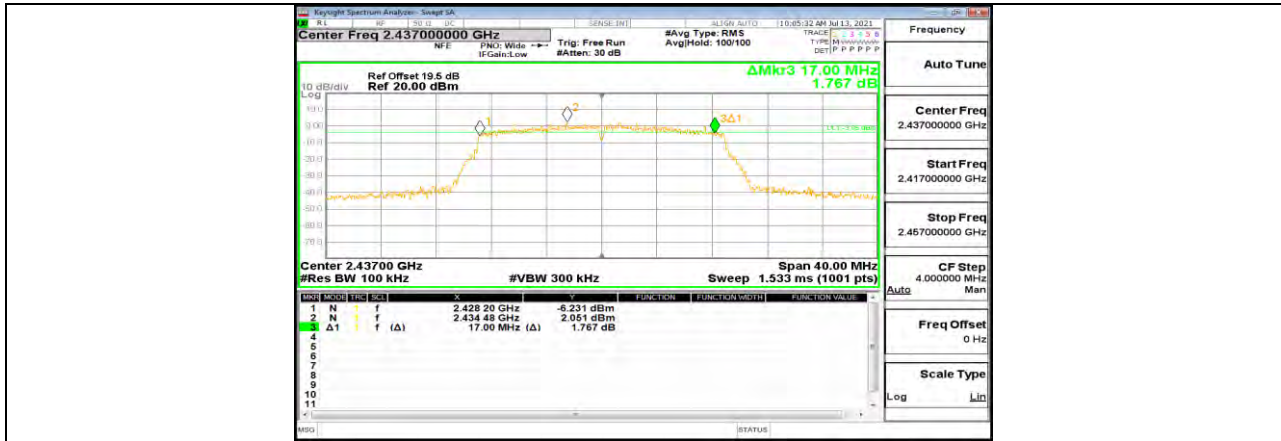


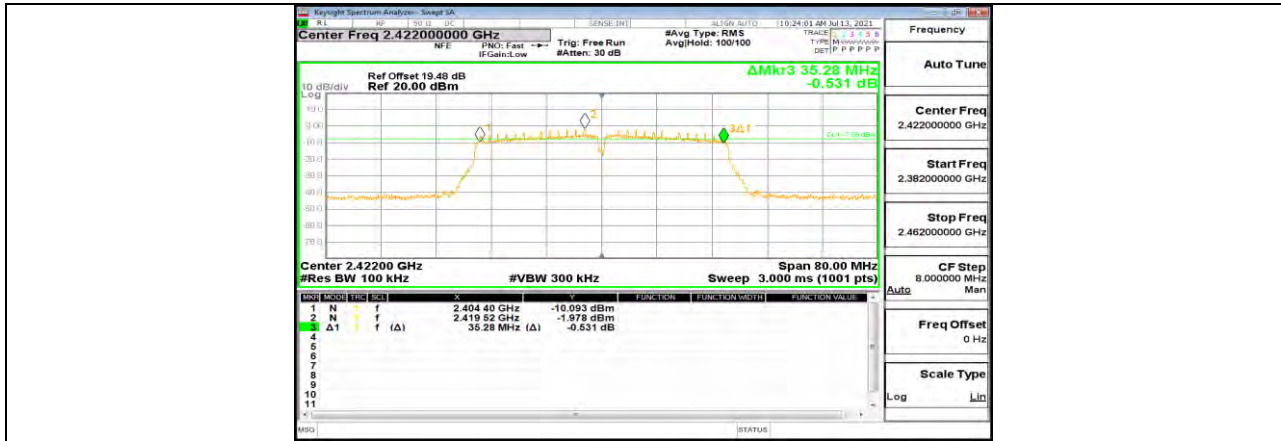
11N20MIMO Ant2 2412



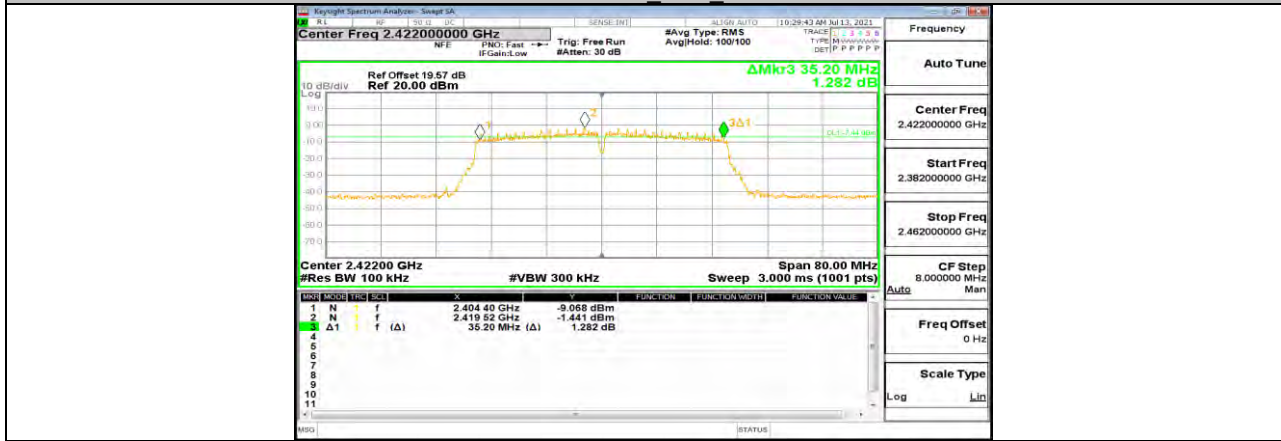
11N20MIMO Ant1 2437







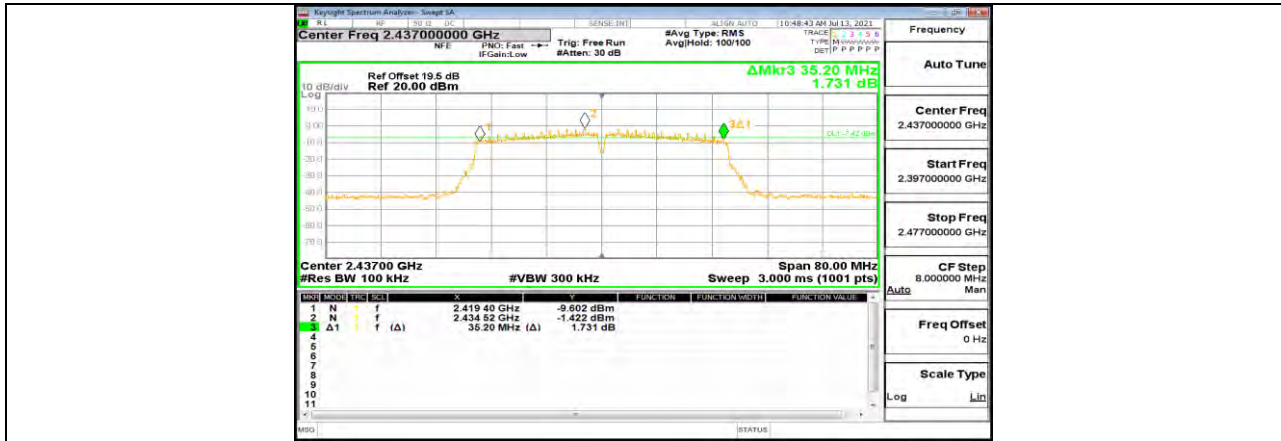
11N40MIMO Ant1 2422



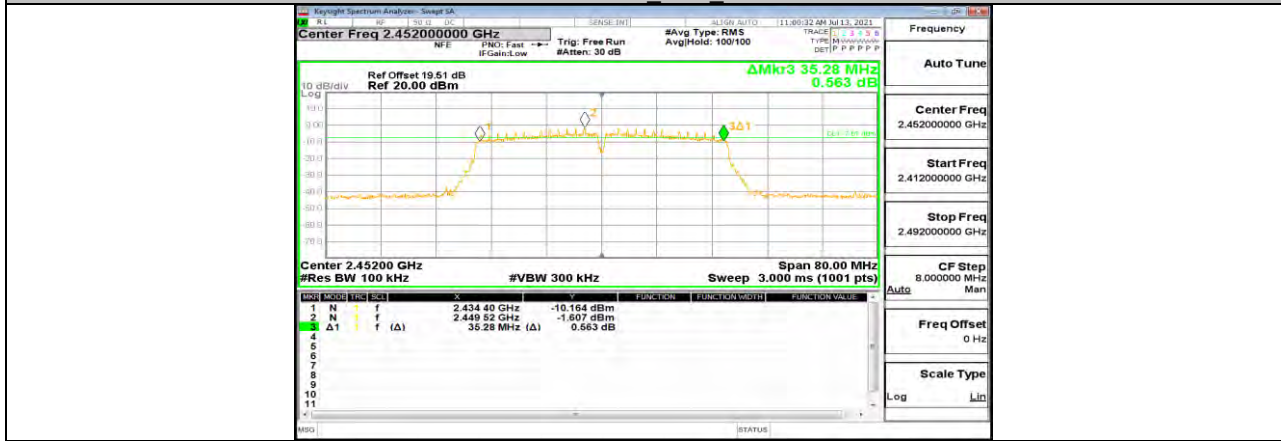
11N40MIMO Ant2 2422



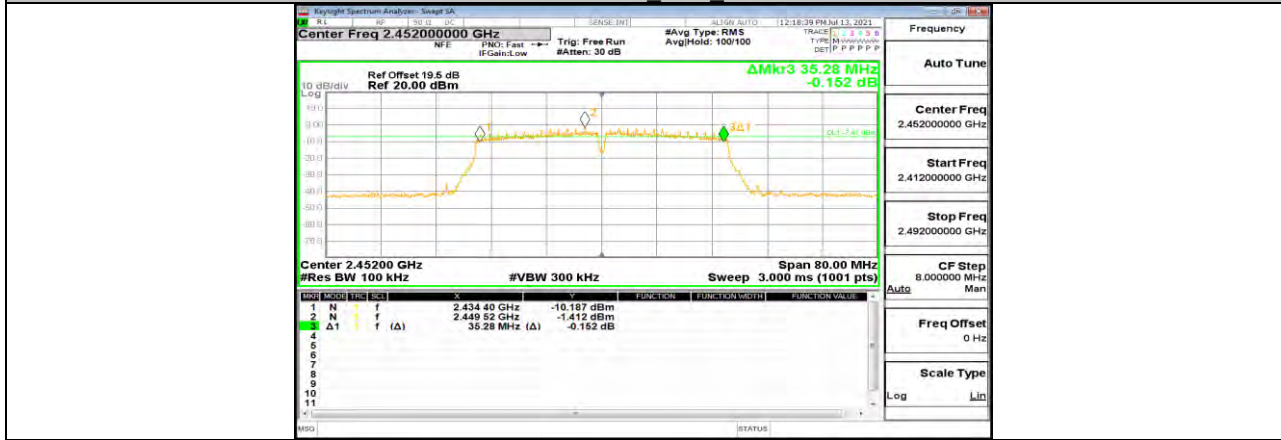
11N40MIMO Ant1 2437



11N40MIMO Ant2 2437



11N40MIMO Ant1 2452



11N40MIMO Ant2 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	13.467	2405.254	2418.721	PASS
	Ant2	2412	13.429	2405.272	2418.701	PASS
	Ant1	2437	13.513	2430.271	2443.784	PASS
	Ant2	2437	13.434	2430.292	2443.726	PASS
	Ant1	2462	13.496	2455.244	2468.740	PASS
	Ant2	2462	13.425	2455.275	2468.700	PASS
11G	Ant1	2412	16.870	2403.528	2420.398	PASS
	Ant2	2412	16.776	2403.608	2420.384	PASS
	Ant1	2437	16.821	2428.584	2445.405	PASS
	Ant2	2437	16.813	2428.579	2445.392	PASS
	Ant1	2462	16.819	2453.585	2470.404	PASS
	Ant2	2462	16.885	2453.582	2470.467	PASS
11N20MIMO	Ant1	2412	17.738	2403.175	2420.913	PASS
	Ant2	2412	17.685	2403.167	2420.852	PASS
	Ant1	2437	17.817	2428.095	2445.912	PASS
	Ant2	2437	17.747	2428.156	2445.903	PASS
	Ant1	2462	17.788	2453.122	2470.910	PASS
	Ant2	2462	17.696	2453.158	2470.854	PASS
11N40MIMO	Ant1	2422	36.098	2403.961	2440.059	PASS
	Ant2	2422	36.145	2403.890	2440.035	PASS
	Ant1	2437	36.015	2419.009	2455.024	PASS
	Ant2	2437	36.108	2418.970	2455.078	PASS
	Ant1	2452	36.107	2433.983	2470.090	PASS
	Ant2	2452	36.062	2434.099	2470.161	PASS

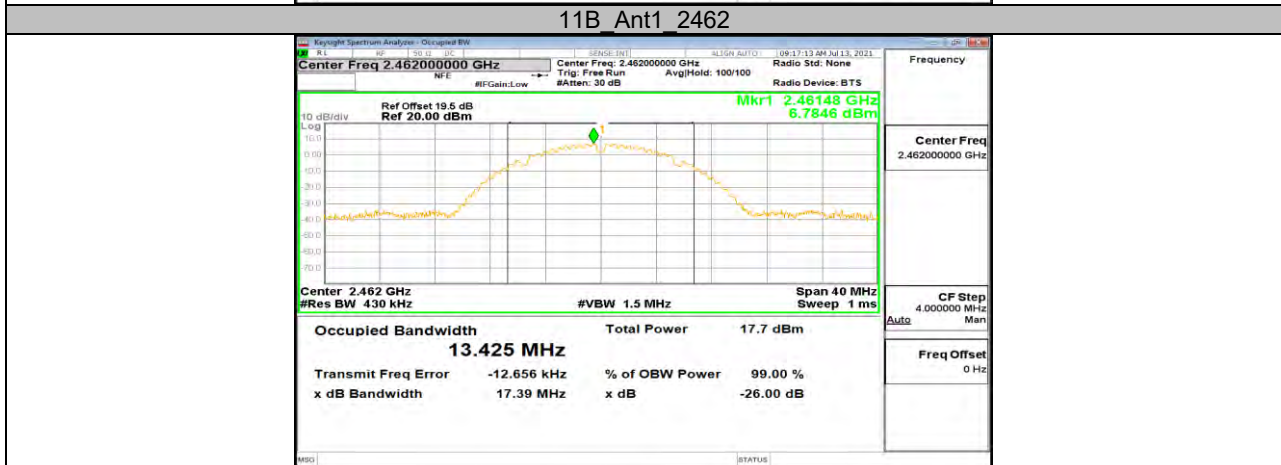
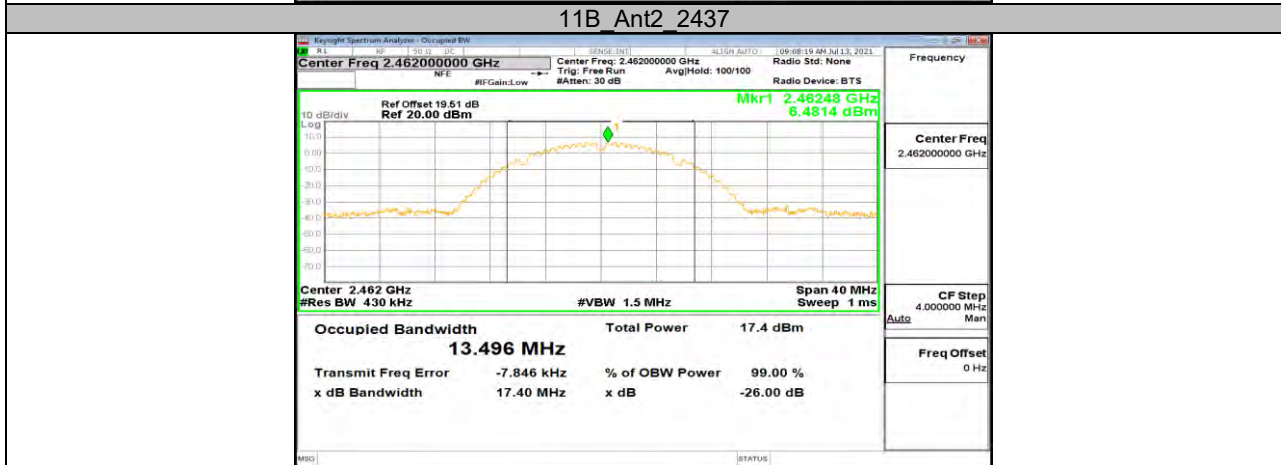
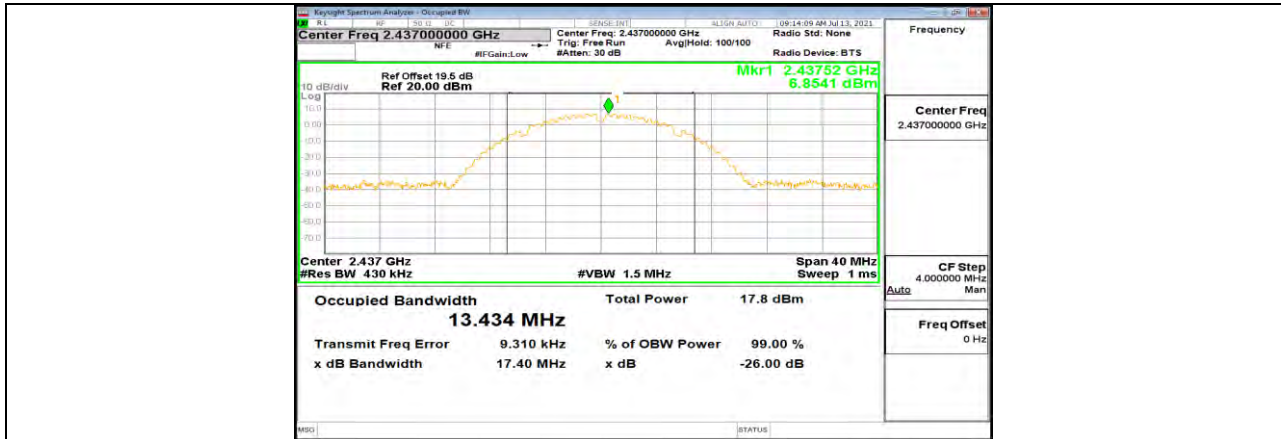


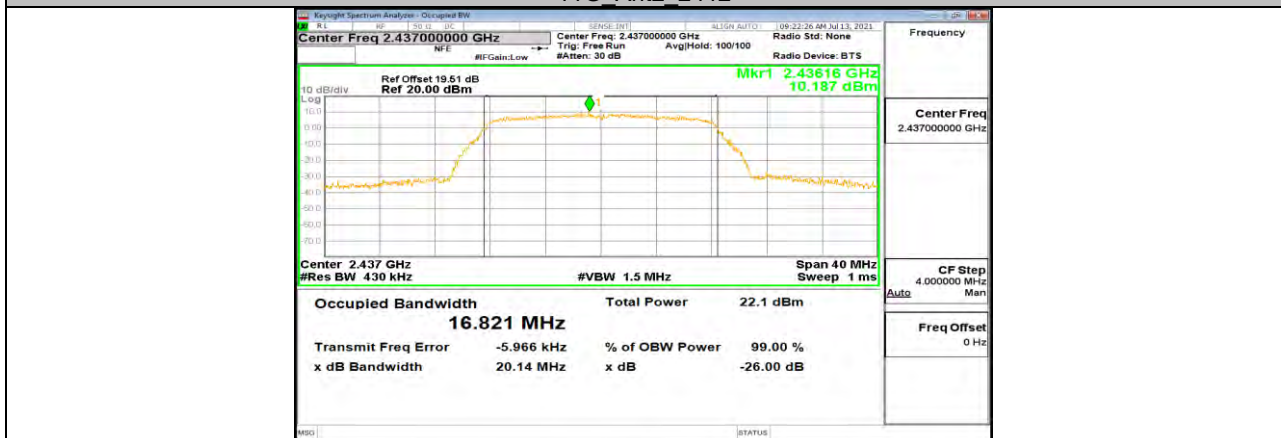
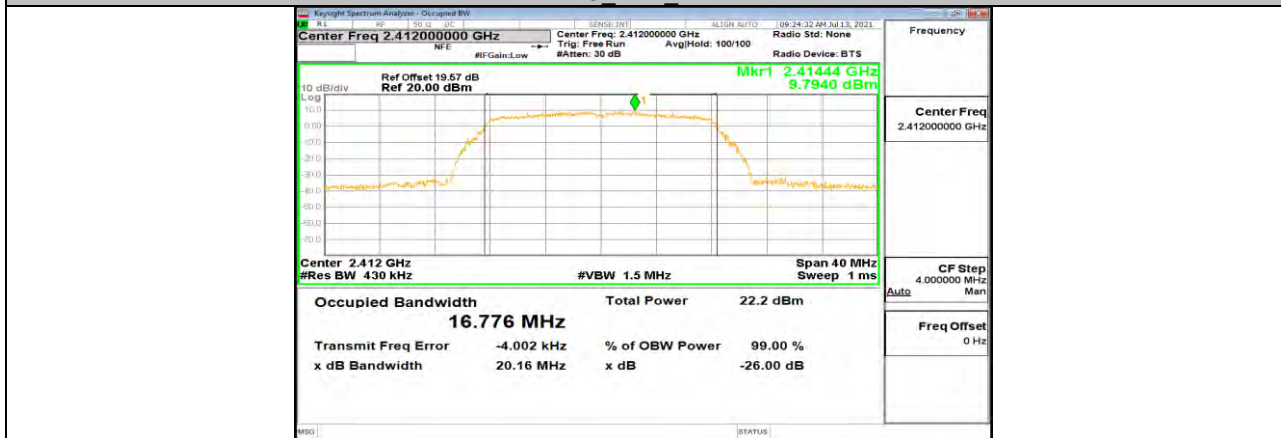
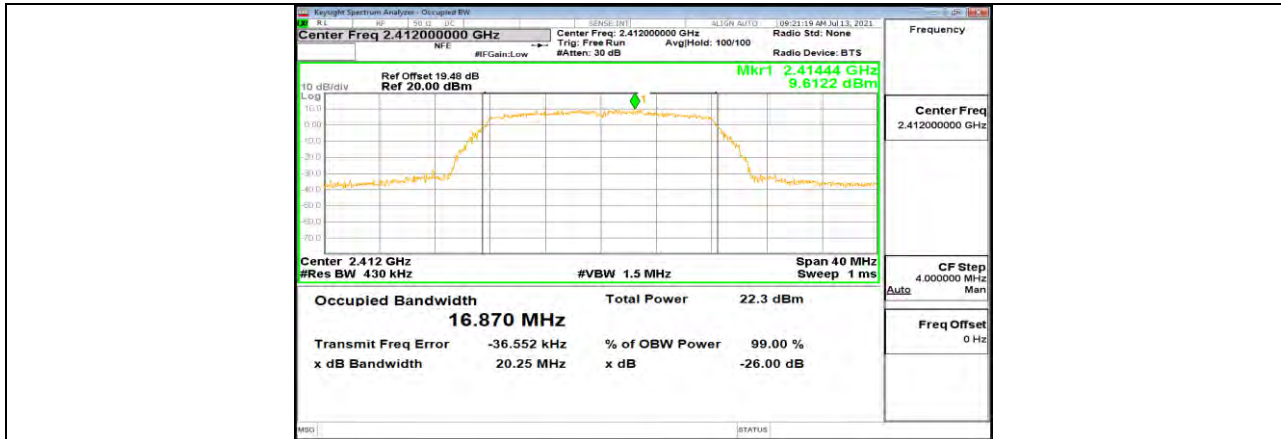


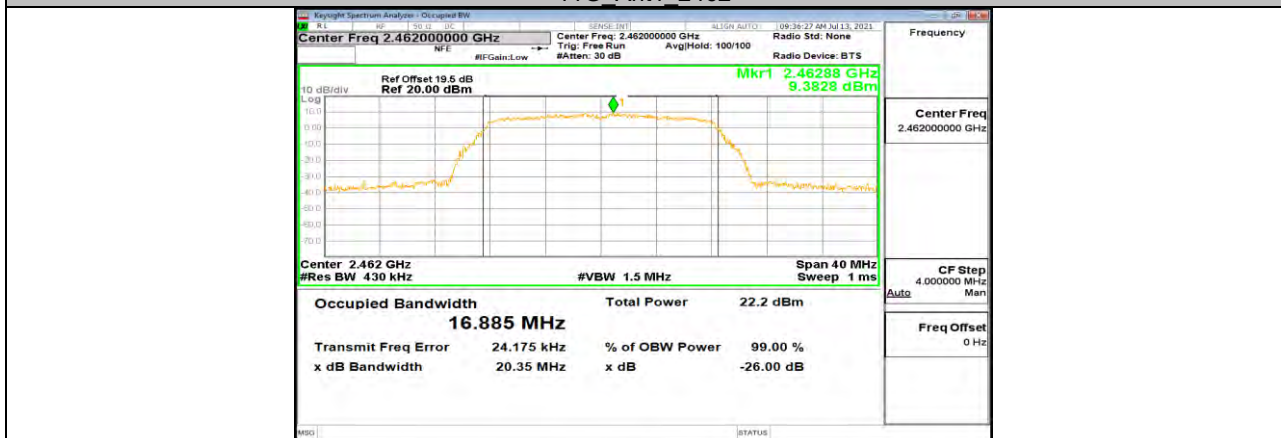
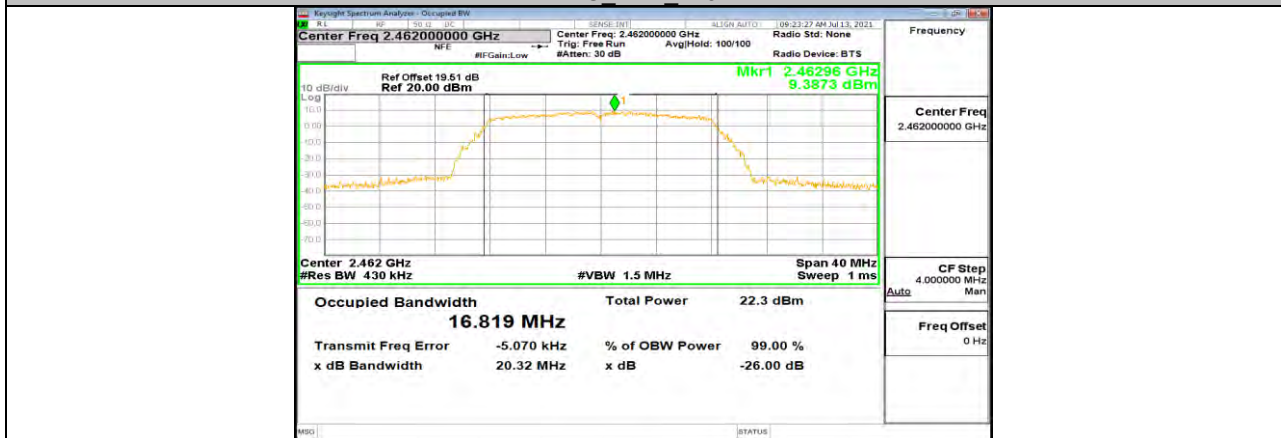
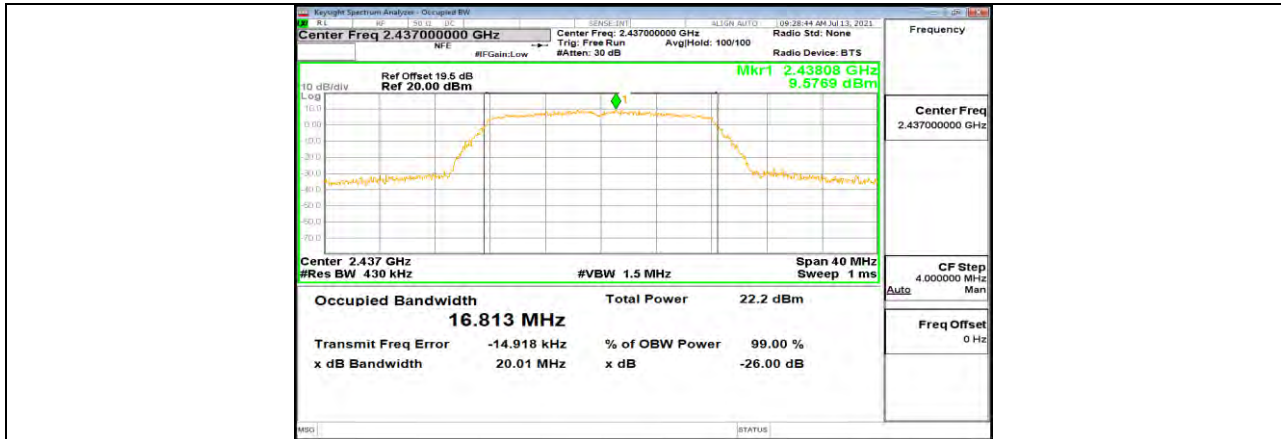
### 11.2.2. Test Graphs

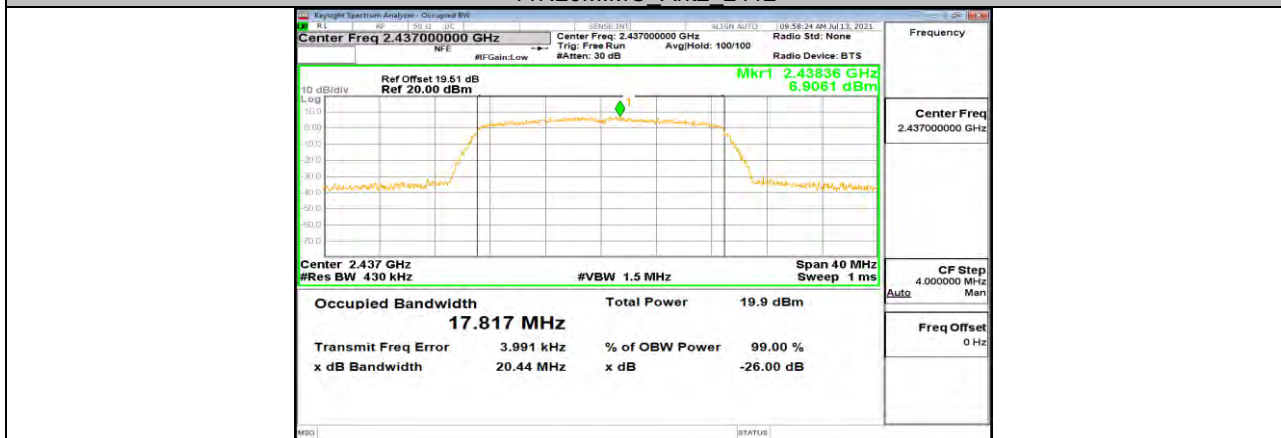
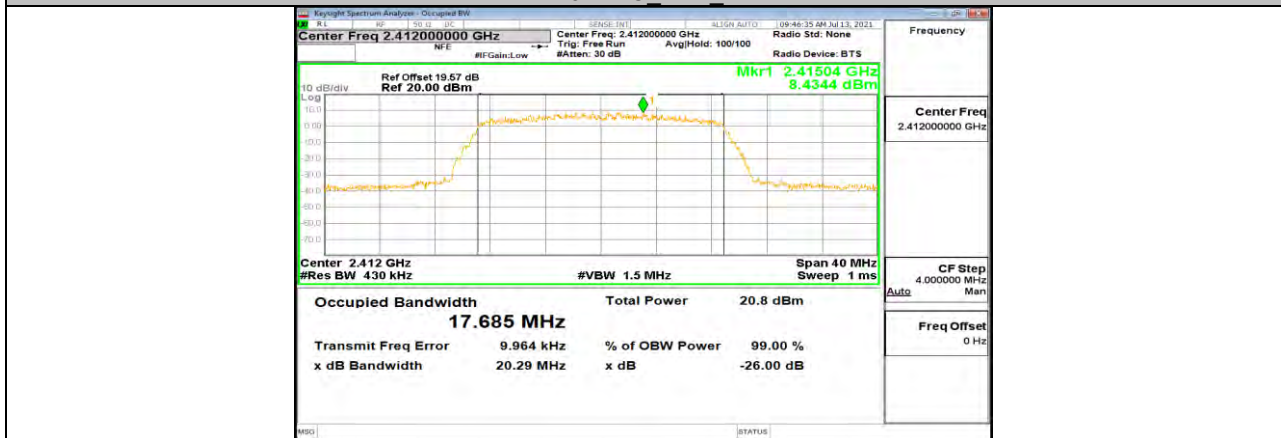
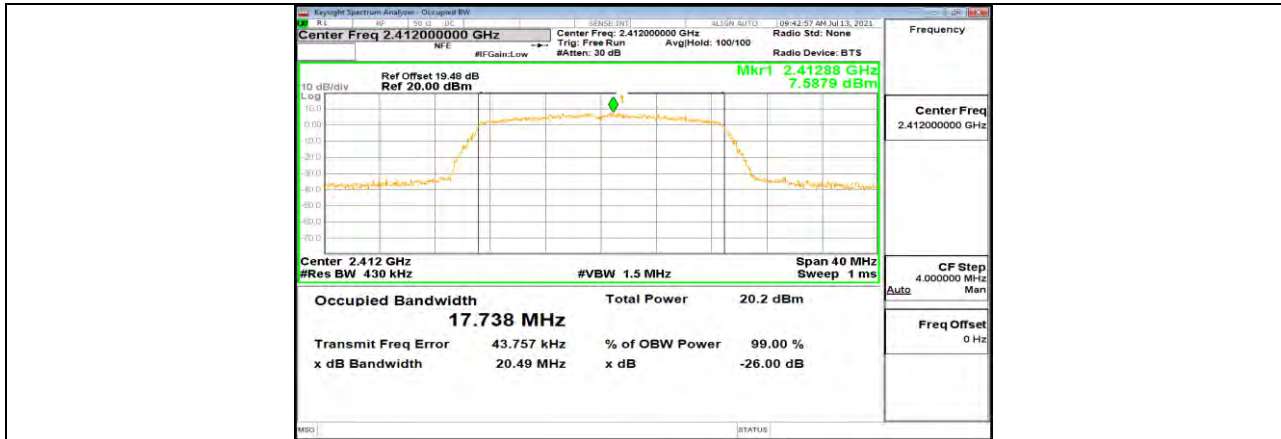




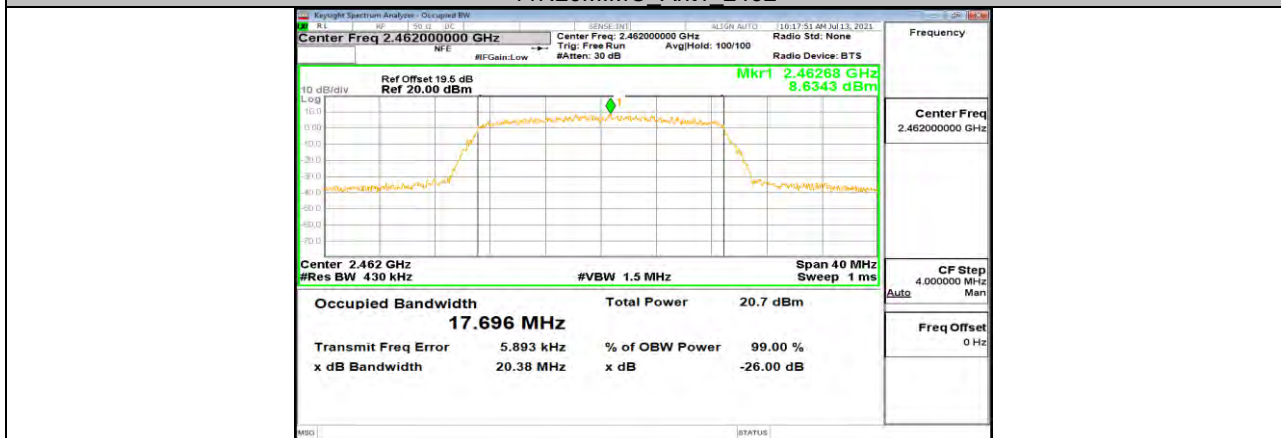
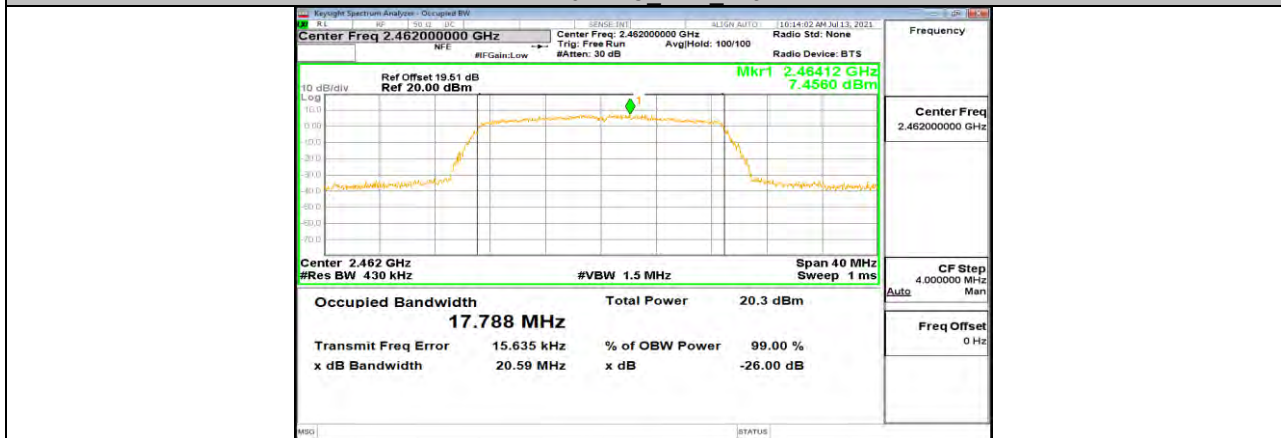
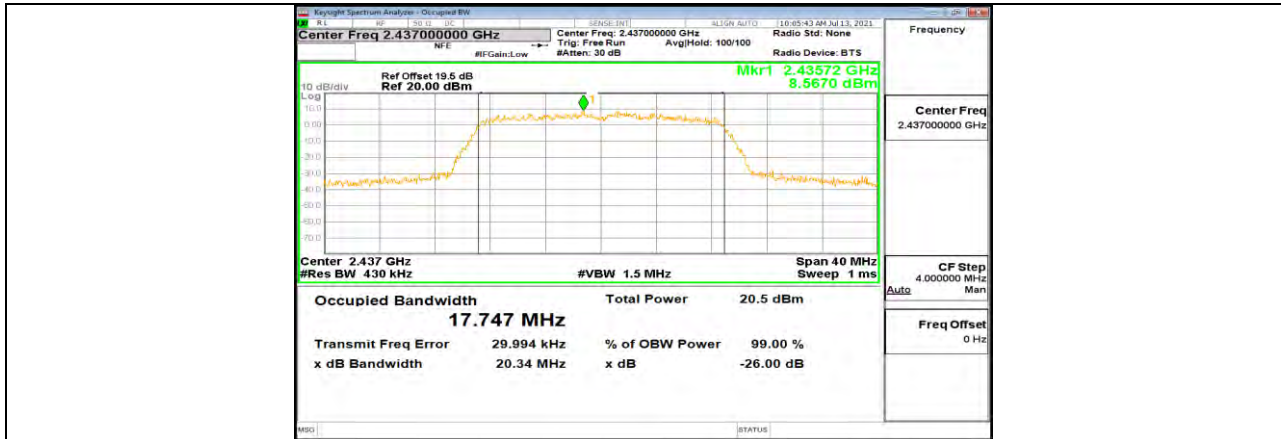


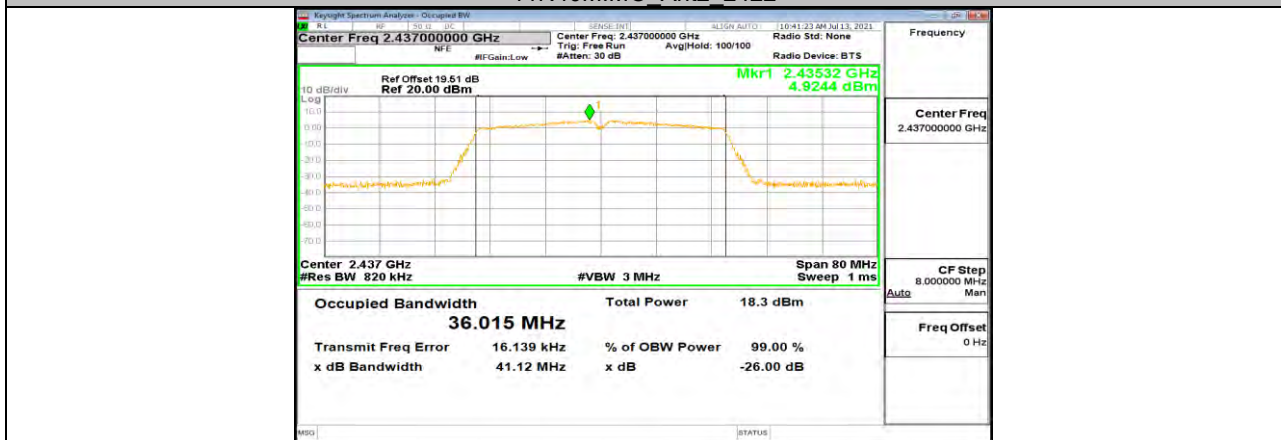
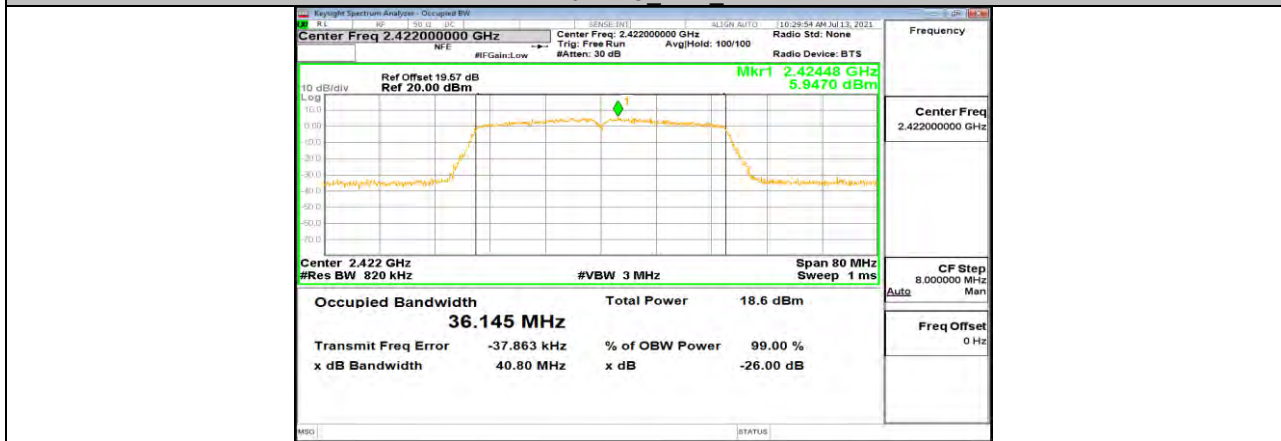
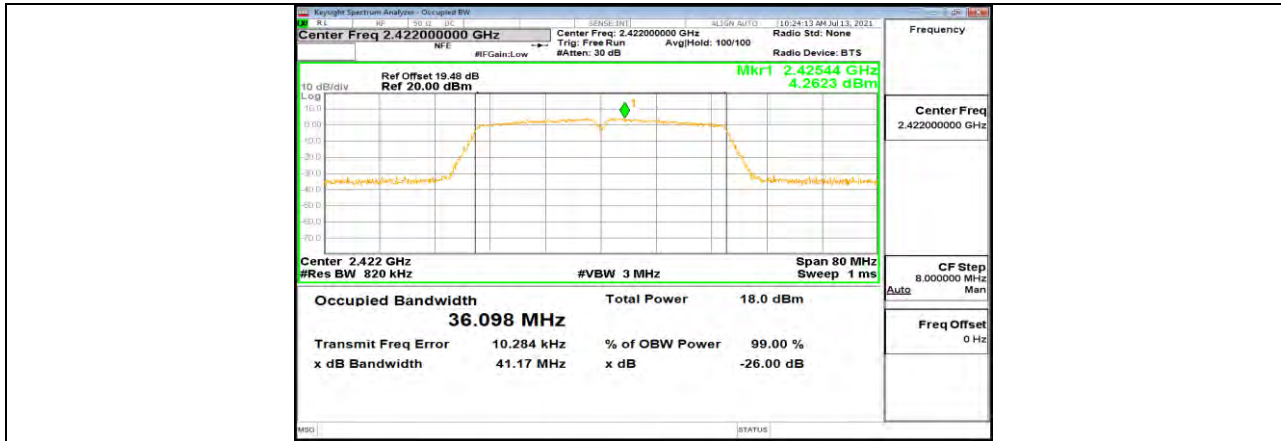


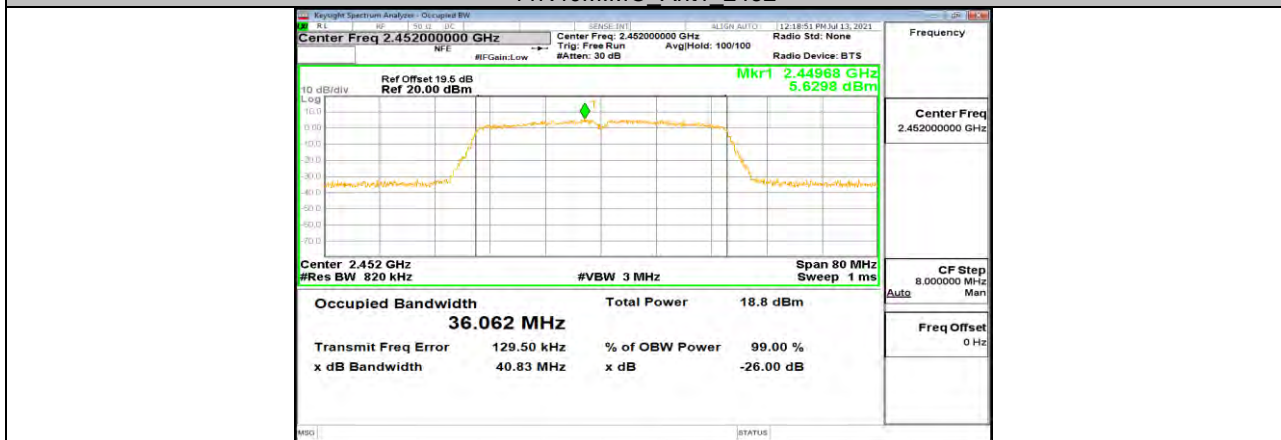
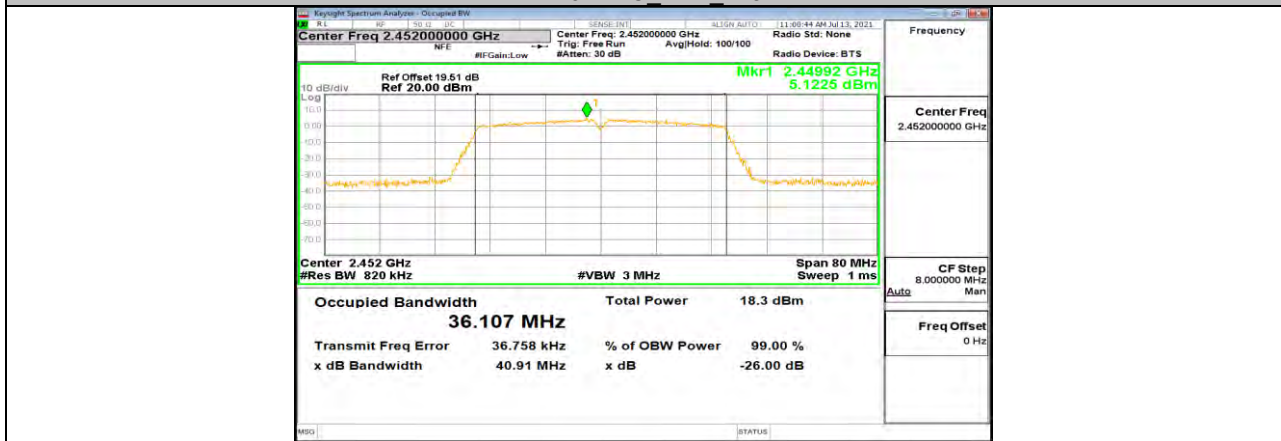
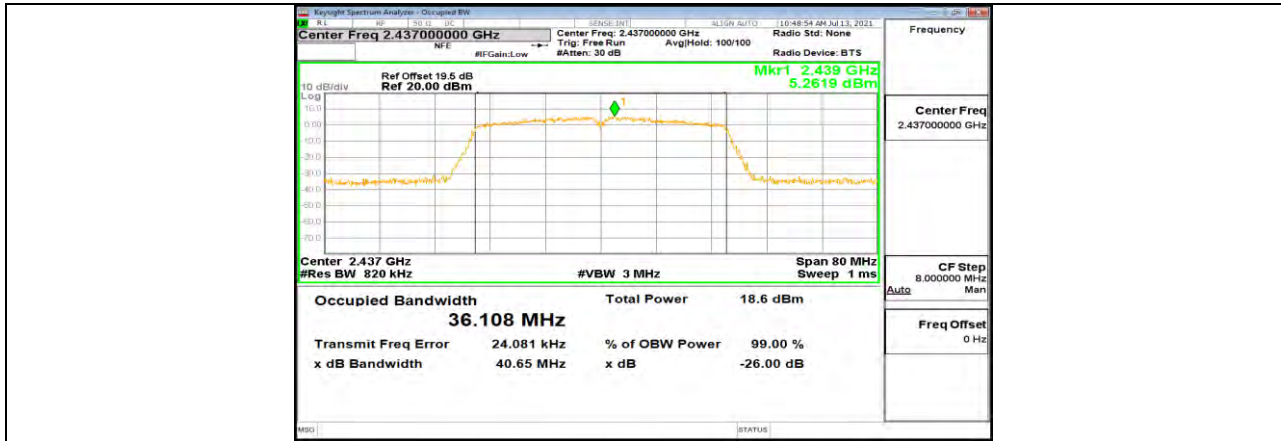














**11.3. Appendix C: Maximum conducted output power**  
**11.3.1. Test Result**

Test Mode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	10.11	<=30	PASS
	Ant2	2412	10.90	<=30	PASS
	Ant1	2437	10.49	<=30	PASS
	Ant2	2437	<b>11.21</b>	<=30	PASS
	Ant1	2462	10.72	<=30	PASS
	Ant2	2462	10.97	<=30	PASS
11G	Ant1	2412	10.63	<=30	PASS
	Ant2	2412	11.21	<=30	PASS
	Ant1	2437	10.65	<=30	PASS
	Ant2	2437	11.20	<=30	PASS
	Ant1	2462	10.68	<=30	PASS
	Ant2	2462	<b>11.23</b>	<=30	PASS
11N20MIMO	Ant1	2412	10.10	<=30	PASS
	Ant2	2412	10.63	<=30	PASS
	total	2412	<b>13.38</b>	<=30	PASS
	Ant1	2437	10.10	<=30	PASS
	Ant2	2437	10.45	<=30	PASS
	total	2437	13.29	<=30	PASS
	Ant1	2462	10.13	<=30	PASS
	Ant2	2462	10.51	<=30	PASS
total	2462	13.33	<=30	PASS	
11N40MIMO	Ant1	2422	7.29	<=30	PASS
	Ant2	2422	7.80	<=30	PASS
	total	2422	10.56	<=30	PASS
	Ant1	2437	7.30	<=30	PASS
	Ant2	2437	7.92	<=30	PASS
	total	2437	<b>10.63</b>	<=30	PASS
	Ant1	2452	7.36	<=30	PASS
	Ant2	2452	7.81	<=30	PASS
total	2452	10.60	<=30	PASS	

Note: 1. Conducted Power=Meas. Level+ Correction Factor  
2. The Duty Cycle Factor (refer to section 7.1) had already compensated to the test data.



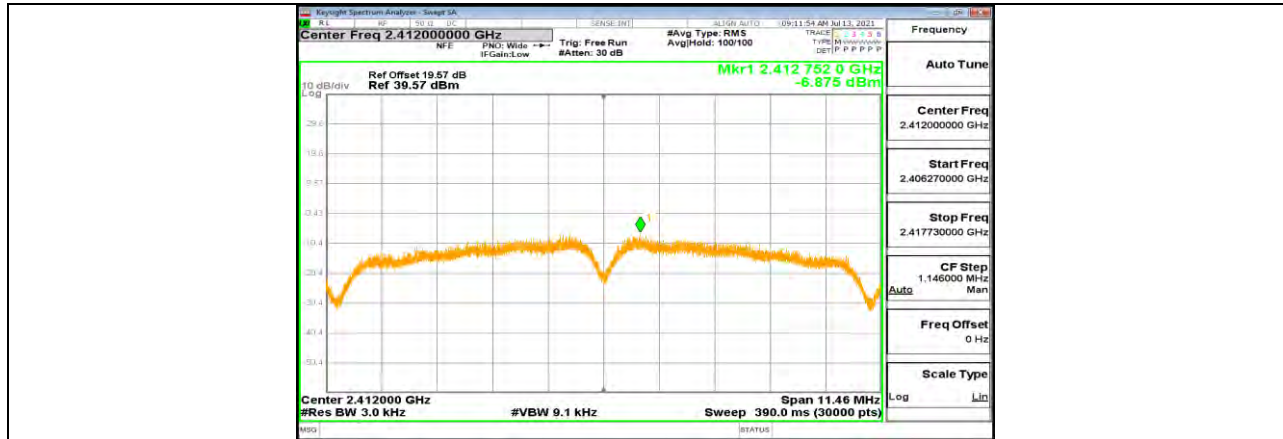


**11.4. Appendix D: Maximum power spectral density**  
**11.4.1. Test Result**

Test Mode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant2	2412	-6.88	<=8	PASS
		2437	-6.8	<=8	PASS
		2462	-7.36	<=8	PASS
11G	Ant2	2412	-9.28	<=8	PASS
		2437	-8.29	<=8	PASS
		2462	-9.37	<=8	PASS
11N20MIMO	Ant1	2412	-9.25	<=8	PASS
	Ant2	2412	-9.2	<=8	PASS
	total	2412	-6.21	<=8	PASS
	Ant1	2437	-9.03	<=8	PASS
	Ant2	2437	-10.1	<=8	PASS
	total	2437	-6.52	<=8	PASS
	Ant1	2462	-9.19	<=8	PASS
	Ant2	2462	-9.42	<=8	PASS
11N40MIMO	total	2462	-6.29	<=8	PASS
	Ant1	2422	-16.13	<=8	PASS
	Ant2	2422	-15.58	<=8	PASS
	total	2422	-12.84	<=8	PASS
	Ant1	2437	-15.75	<=8	PASS
	Ant2	2437	-15.01	<=8	PASS
	total	2437	-12.35	<=8	PASS
	Ant1	2452	-15.29	<=8	PASS
Ant2	2452	-14	<=8	PASS	
total	2452	-11.59	<=8	PASS	



### 11.4.2. Test Graphs



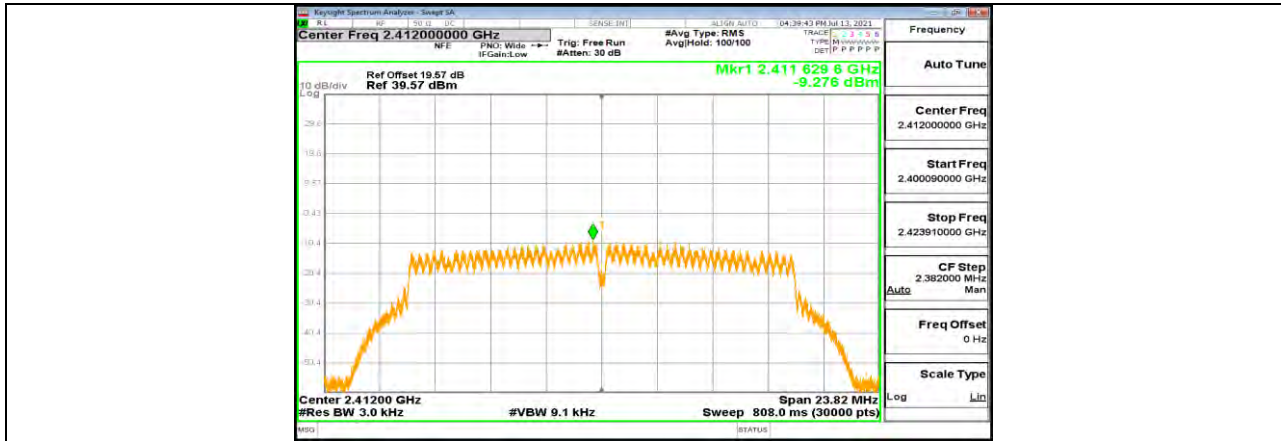
11B Ant2 2412



11B Ant2 2437



11B Ant2 2462









11N20MIMO Ant2 2437



11N20MIMO Ant1 2462



11N20MIMO Ant2 2462



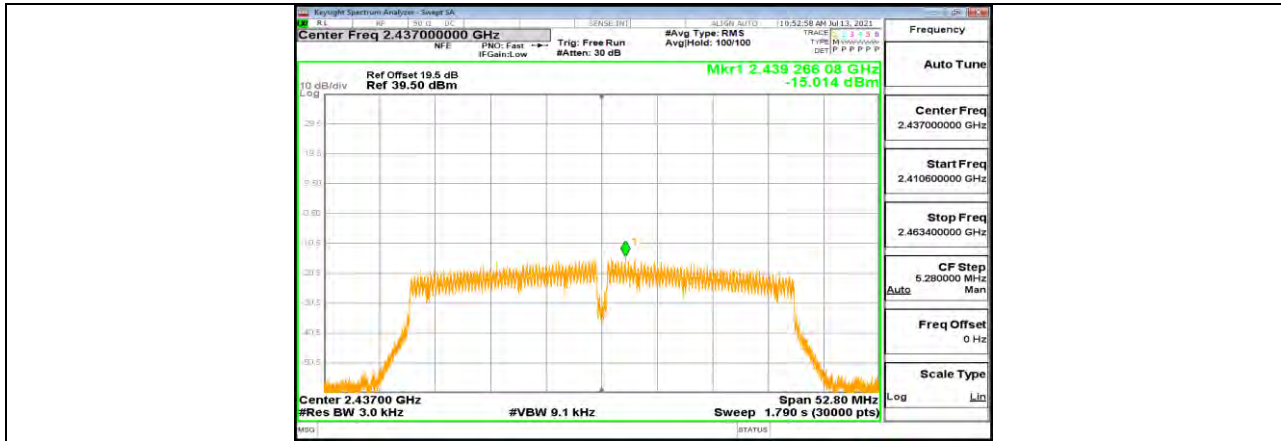
11N40MIMO Ant1 2422



11N40MIMO Ant2 2422



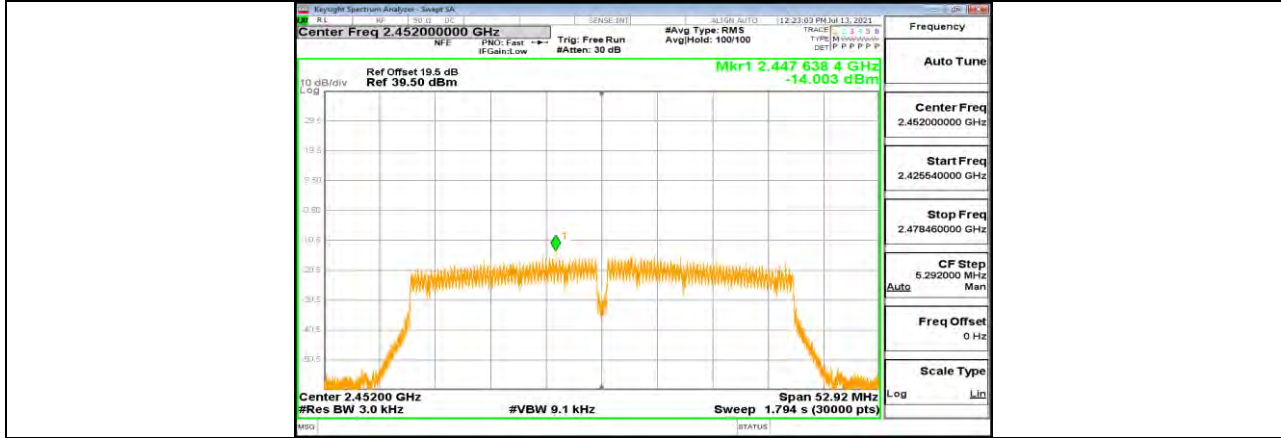
11N40MIMO Ant1 2437



11N40MIMO Ant2 2437



11N40MIMO Ant1 2452



11N40MIMO Ant2 2452



## 11.5. Appendix E: Band edge measurements

### 11.5.1. Test Result

Test Mode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant2	Low	2412	5.93	-38.45	<=-24.07	PASS
		High	2462	6.28	-41.13	<=-23.72	PASS
11G	Ant2	Low	2412	5.82	-37.91	<=-24.18	PASS
		High	2462	5.89	-40.29	<=-24.11	PASS
11N20MIMO	Ant1	Low	2412	3.71	-36.39	<=-26.29	PASS
	Ant2	Low	2412	3.51	-39.75	<=-26.49	PASS
	Ant1	High	2462	3.97	-40.76	<=-26.03	PASS
	Ant2	High	2462	3.70	-40.21	<=-26.3	PASS
11N40MIMO	Ant1	Low	2422	-2.13	-39.28	<=-32.13	PASS
	Ant2	Low	2422	-1.62	-37.94	<=-31.62	PASS
	Ant1	High	2452	-1.71	-41.05	<=-31.71	PASS
	Ant2	High	2452	-1.45	-40.7	<=-31.45	PASS



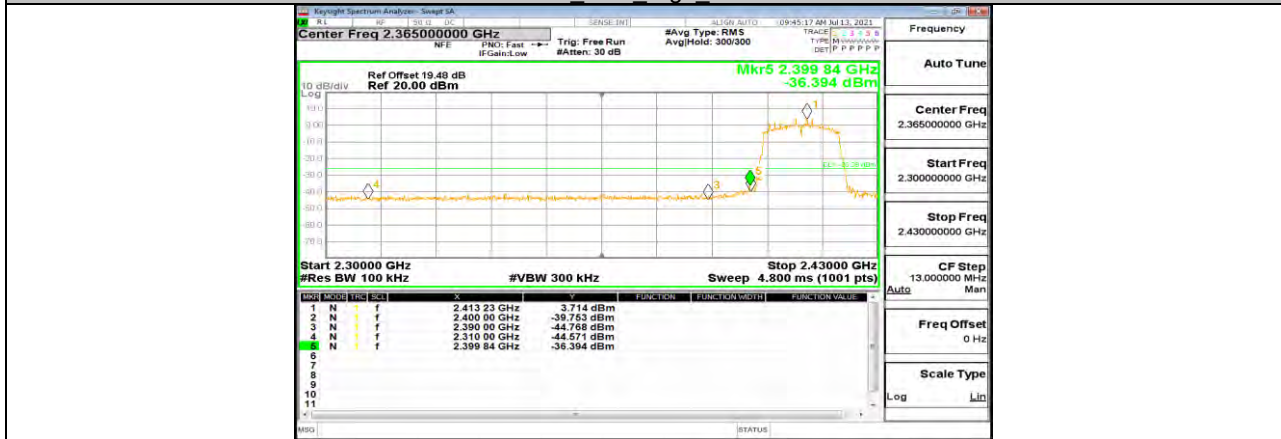


### 11.5.2. Test Graphs

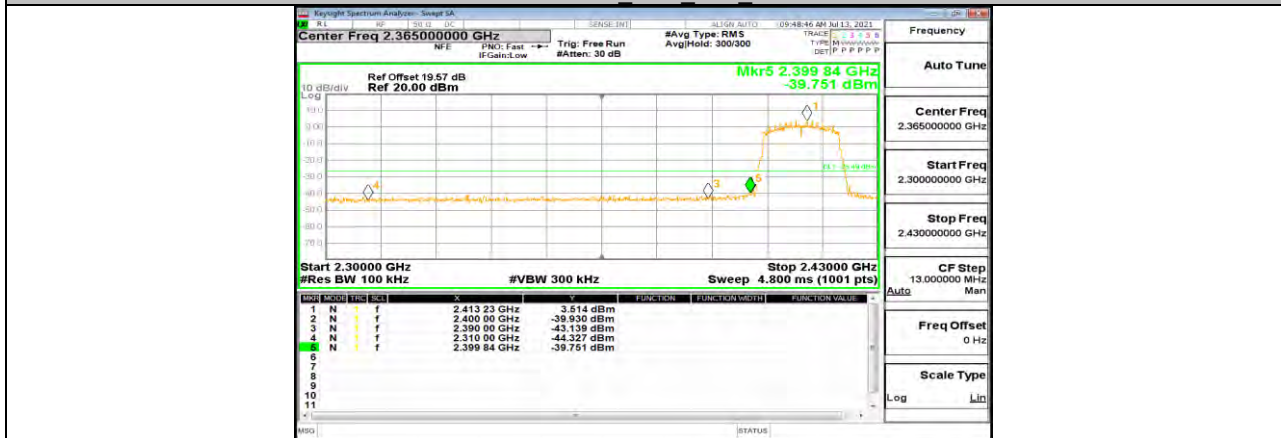




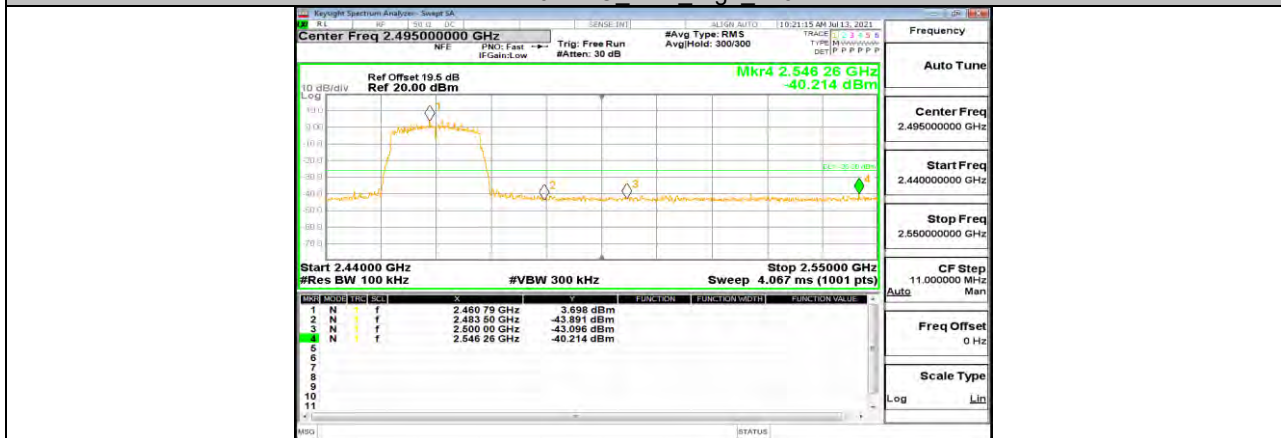
11G Ant2 High 2462



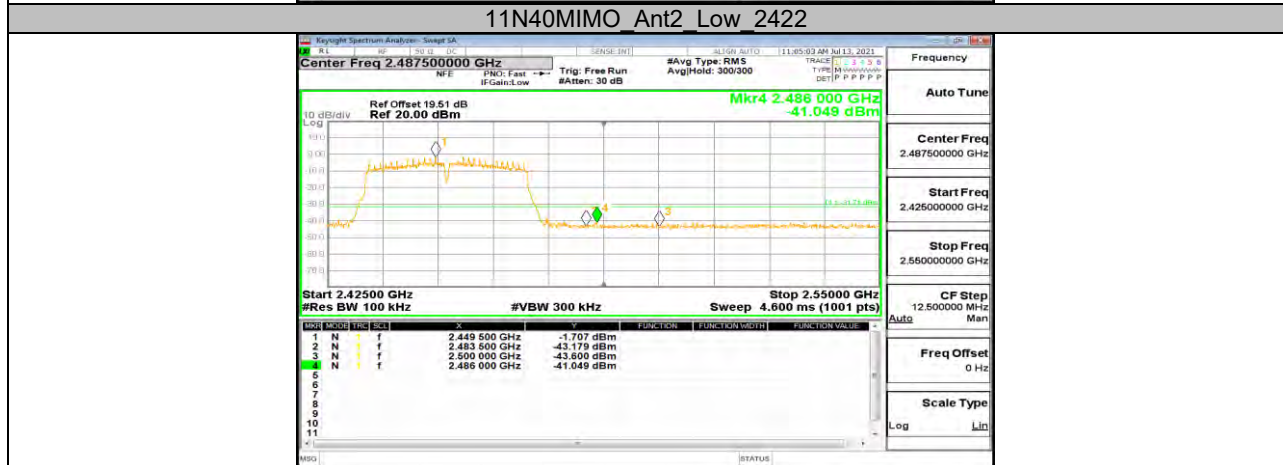
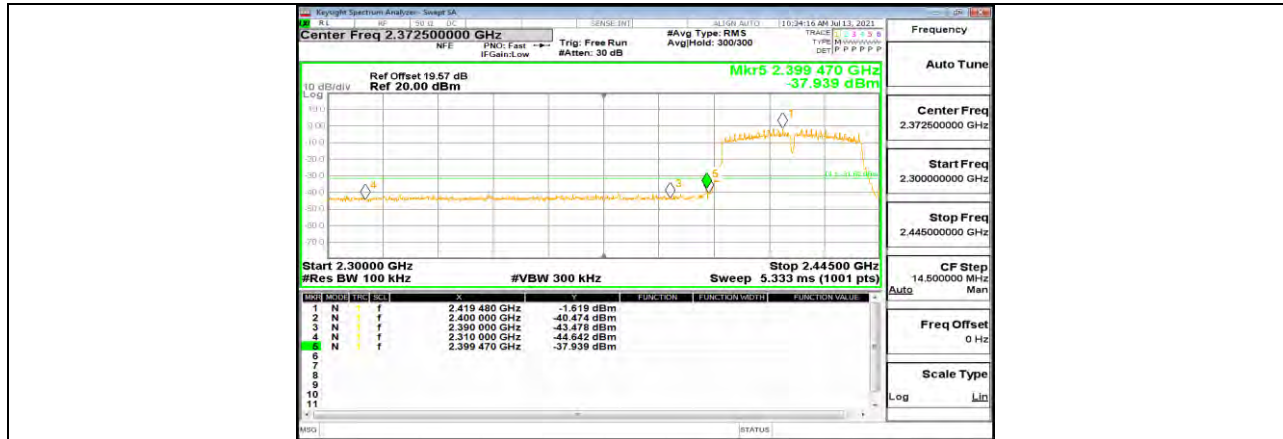
11N20MIMO Ant1 Low 2412



11N20MIMO Ant2 Low 2412







## 11.6. Appendix F: Conducted Spurious Emission

### 11.6.1. Test Result

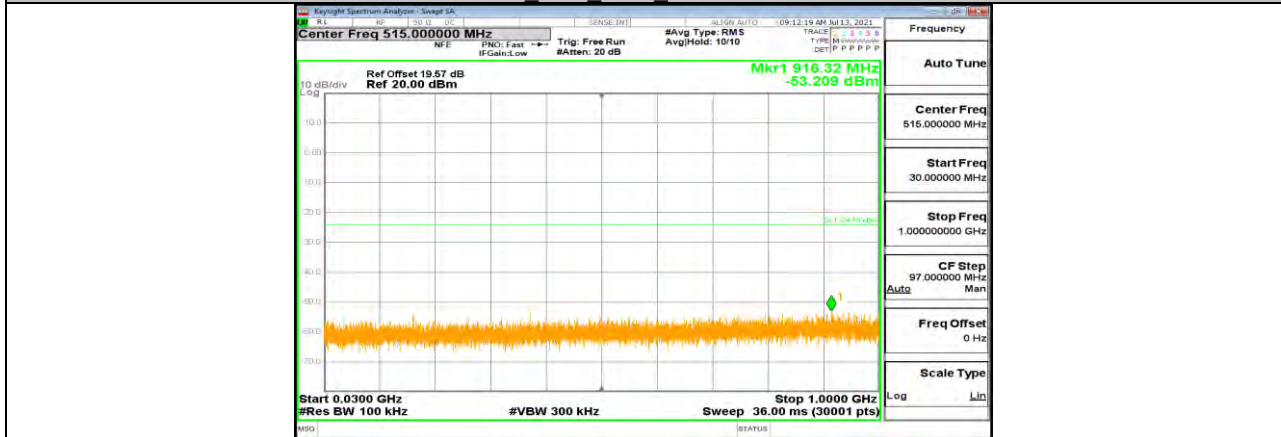
Test Mode	Antenna	Channel	FreqRange [Mhz]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant2	2412	Reference	5.82	---	PASS
			30~1000	-53.21	<=-24.18	PASS
			1000~26500	-44.4	<=-24.18	PASS
		2437	Reference	5.45	---	PASS
			30~1000	-52.85	<=-24.55	PASS
			1000~26500	-44.77	<=-24.55	PASS
		2462	Reference	5.74	---	PASS
			30~1000	-52.88	<=-24.26	PASS
			1000~26500	-44.69	<=-24.26	PASS
11G	Ant2	2412	Reference	5.06	---	PASS
			30~1000	-51.21	<=-24.94	PASS
			1000~26500	-44.03	<=-24.94	PASS
		2437	Reference	5.14	---	PASS
			30~1000	-52.93	<=-24.86	PASS
			1000~26500	-44.99	<=-24.86	PASS
		2462	Reference	5.89	---	PASS
			30~1000	-53.07	<=-24.11	PASS
			1000~26500	-44.74	<=-24.11	PASS
11N20MIMO	Ant1	2412	Reference	3.69	---	PASS
			30~1000	-53.82	<=-26.31	PASS
			1000~26500	-44.44	<=-26.31	PASS
	Ant2	2412	Reference	2.84	---	PASS
			30~1000	-53.53	<=-27.16	PASS
			1000~26500	-45.03	<=-27.16	PASS
	Ant1	2437	Reference	3.13	---	PASS
			30~1000	-53.85	<=-26.87	PASS
			1000~26500	-44.2	<=-26.87	PASS
	Ant2	2437	Reference	2.51	---	PASS
			30~1000	-53.52	<=-27.49	PASS
			1000~26500	-44.16	<=-27.49	PASS
	Ant1	2462	Reference	3.03	---	PASS
			30~1000	-53.59	<=-26.97	PASS
			1000~26500	-44.31	<=-26.97	PASS
	Ant2	2462	Reference	1.79	---	PASS
			30~1000	-52.94	<=-28.21	PASS
			1000~26500	-44.57	<=-28.21	PASS
11N40MIMO	Ant1	2422	Reference	-2.36	---	PASS
			30~1000	-53.08	<=-32.36	PASS
			1000~26500	-44.71	<=-32.36	PASS
	Ant2	2422	Reference	-2.13	---	PASS
			30~1000	-53.79	<=-32.13	PASS
			1000~26500	-44.69	<=-32.13	PASS
	Ant1	2437	Reference	-2.37	---	PASS
			30~1000	-53.04	<=-32.37	PASS
			1000~26500	-44.6	<=-32.37	PASS
	Ant2	2437	Reference	-1.52	---	PASS
			30~1000	-52.42	<=-31.52	PASS
			1000~26500	-44.42	<=-31.52	PASS
	Ant1	2452	Reference	-1.65	---	PASS
			30~1000	-53.51	<=-31.65	PASS
			1000~26500	-45.21	<=-31.65	PASS
	Ant2	2452	Reference	-2.50	---	PASS
			30~1000	-52.22	<=-32.5	PASS
			1000~26500	-44.68	<=-32.5	PASS



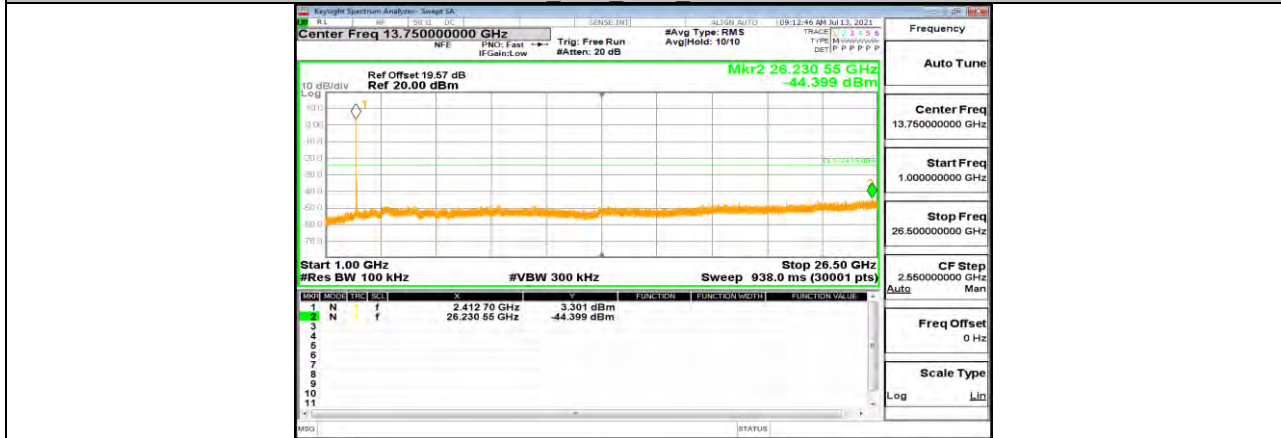
### 11.6.2. Test Graphs



11B\_Ant2\_2412\_0~Reference



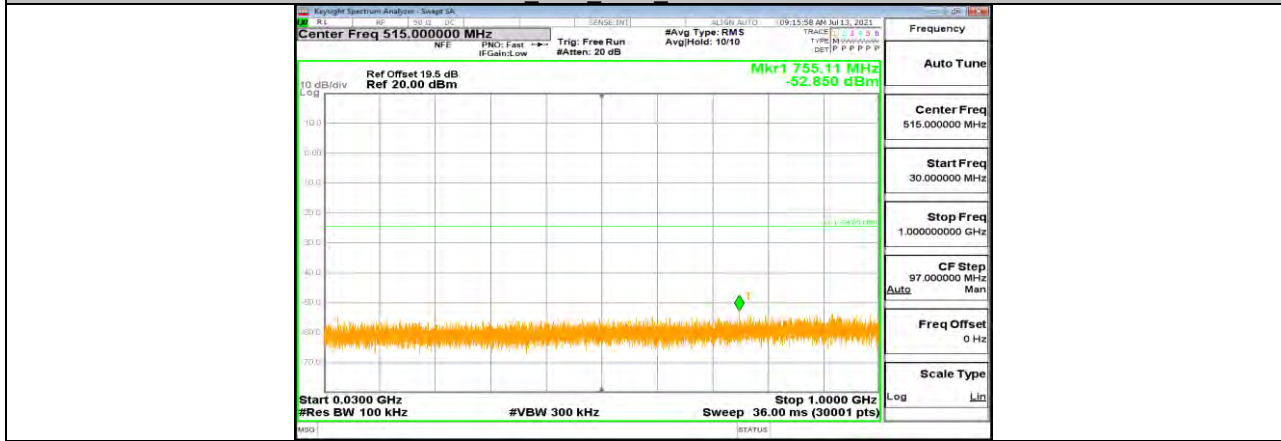
11B\_Ant2\_2412\_30~1000



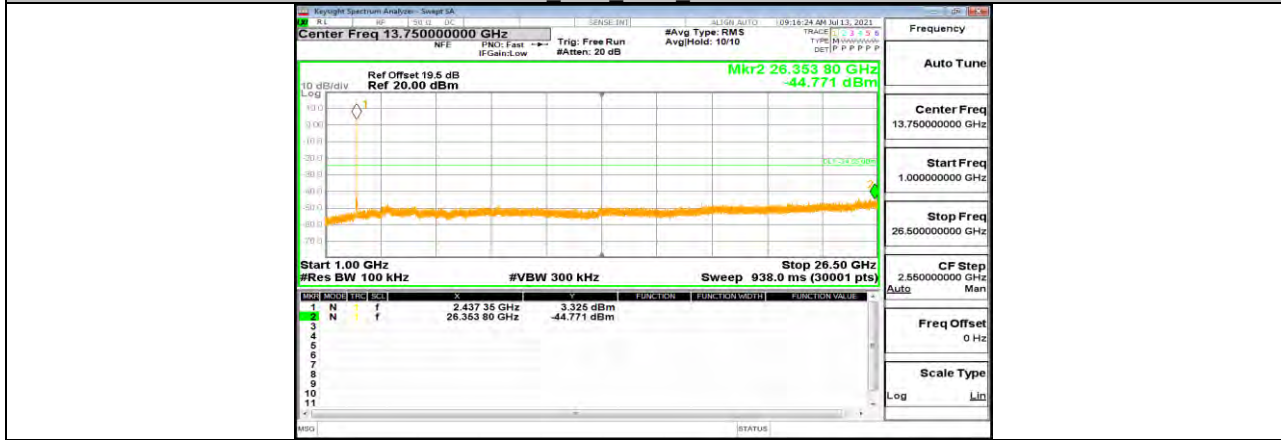
11B\_Ant2\_2412\_1000~26500



11B Ant2 2437 0~Reference



11B Ant2 2437 30~1000

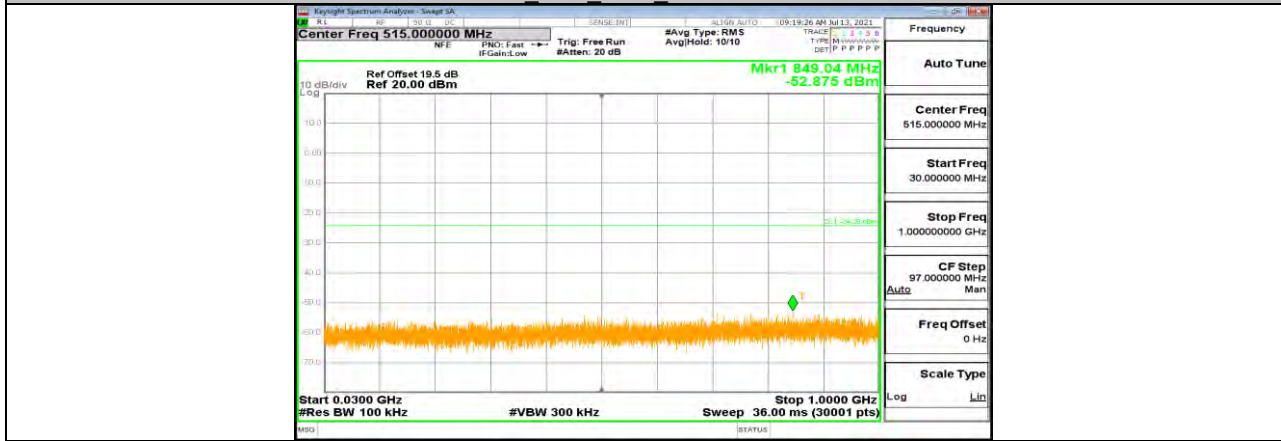


11B Ant2 2437 1000~26500

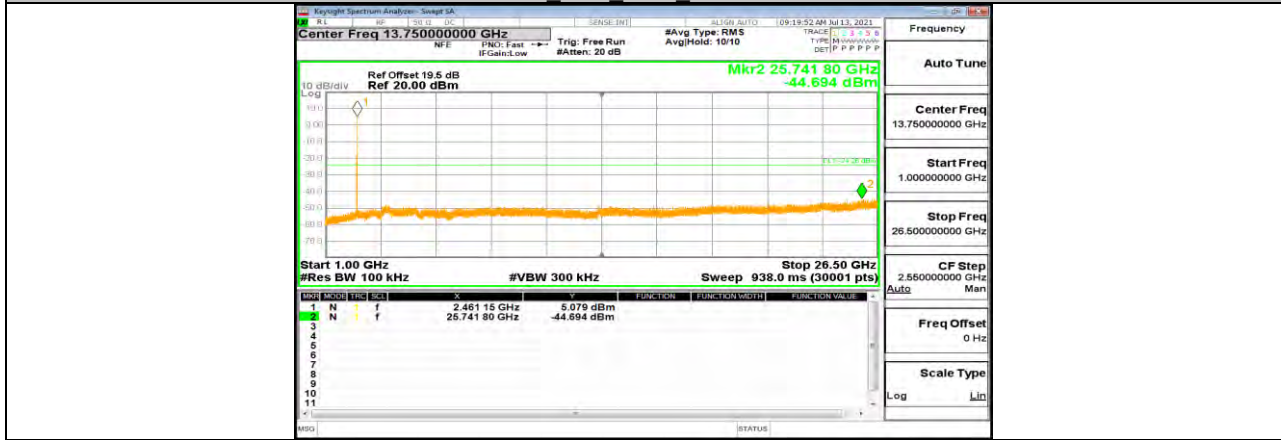




11B Ant2 2462 0~Reference

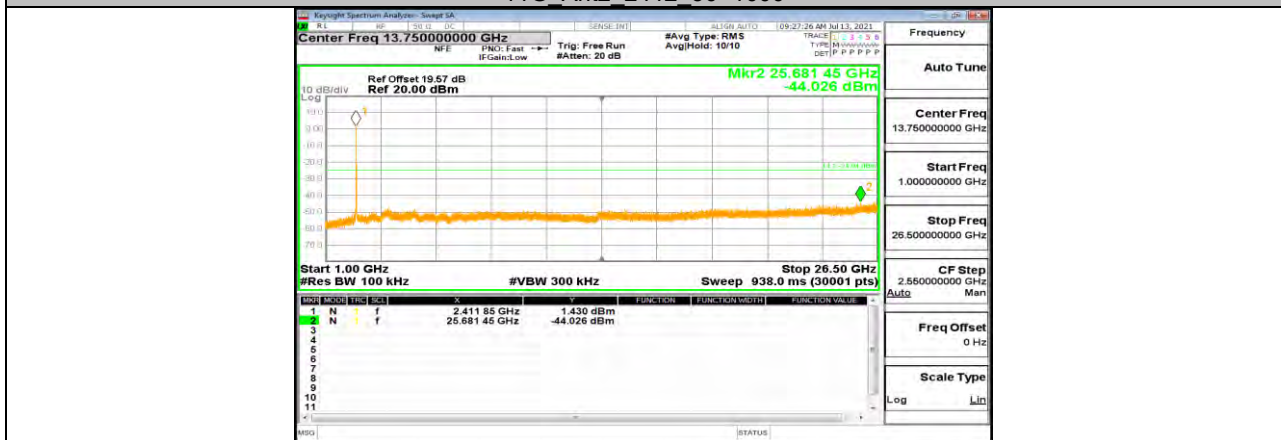
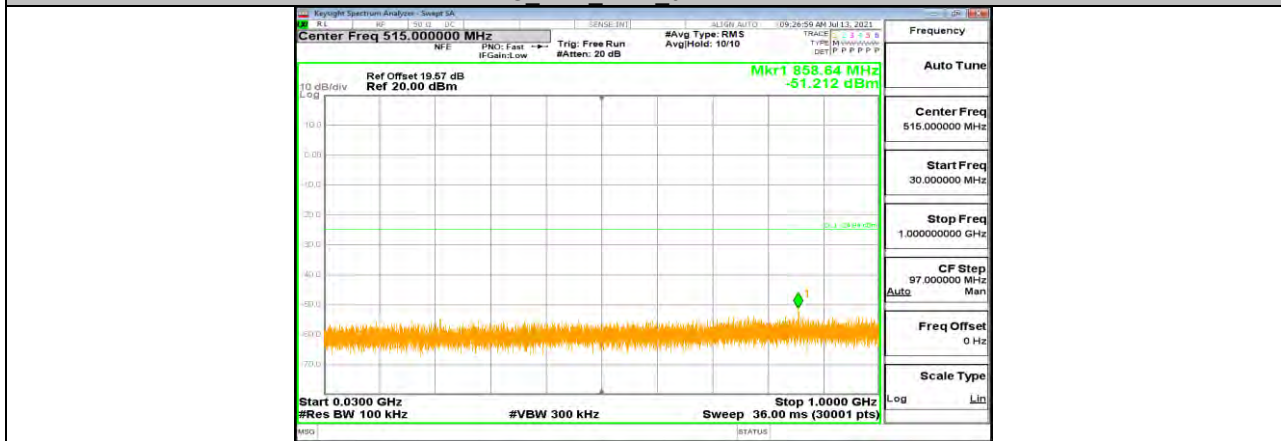


11B Ant2 2462 30~1000



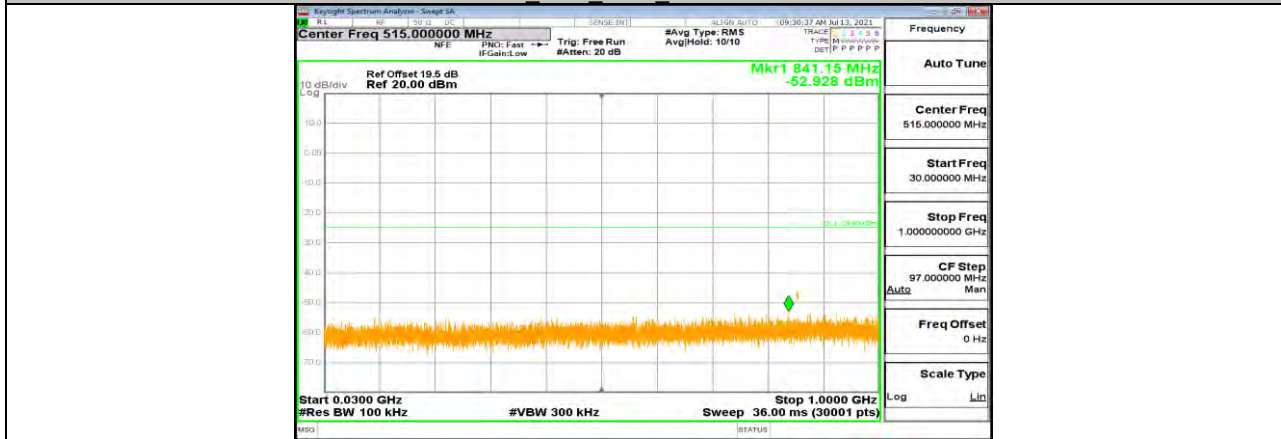
11B Ant2 2462 1000~26500



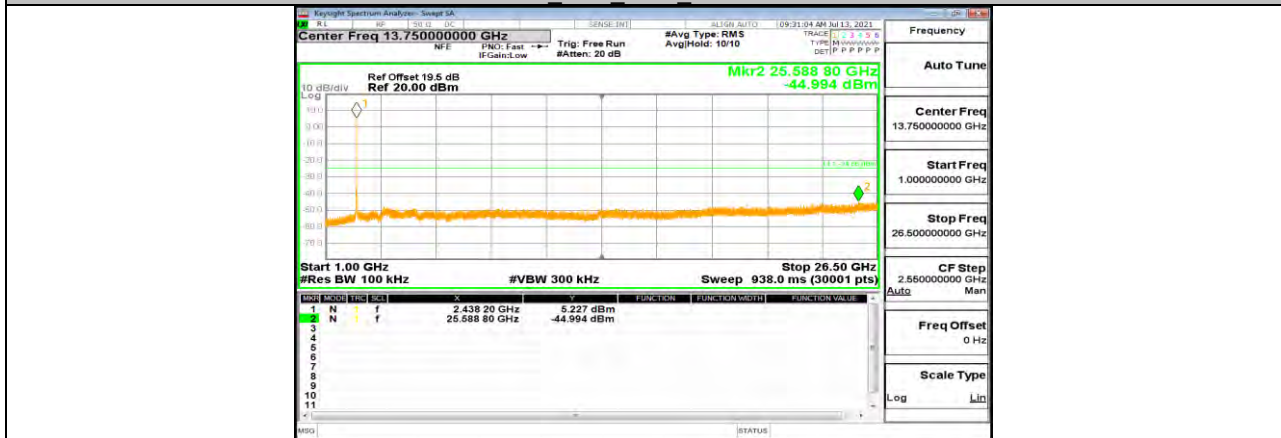




11G Ant2 2437 0~Reference



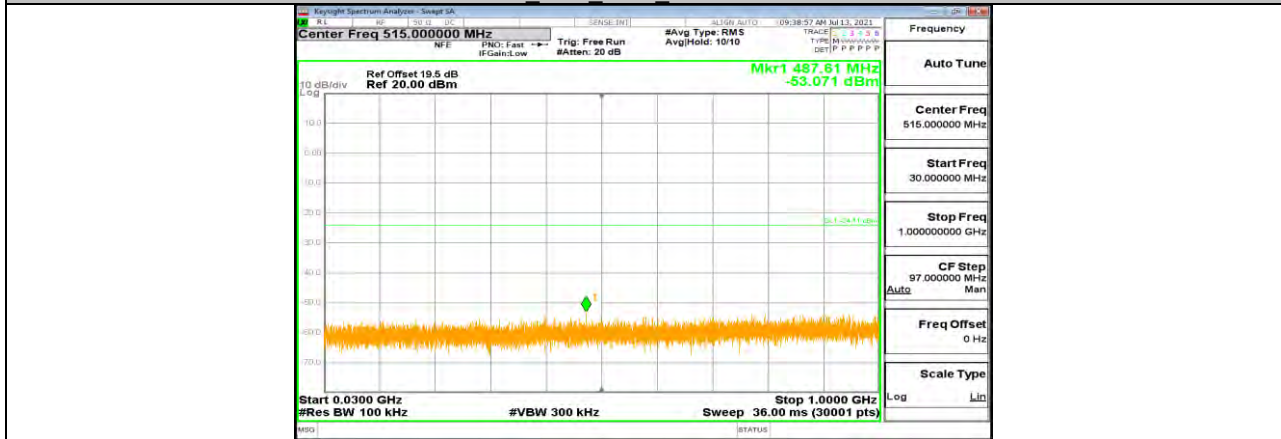
11G Ant2 2437 30~1000



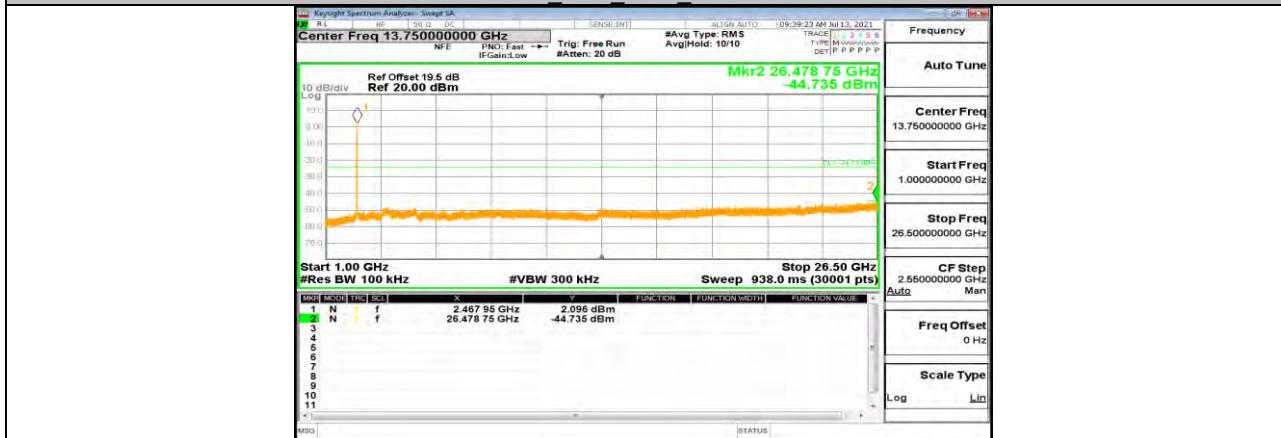
11G Ant2 2437 1000~26500



11G Ant2 2462 0~Reference



11G Ant2 2462 30~1000

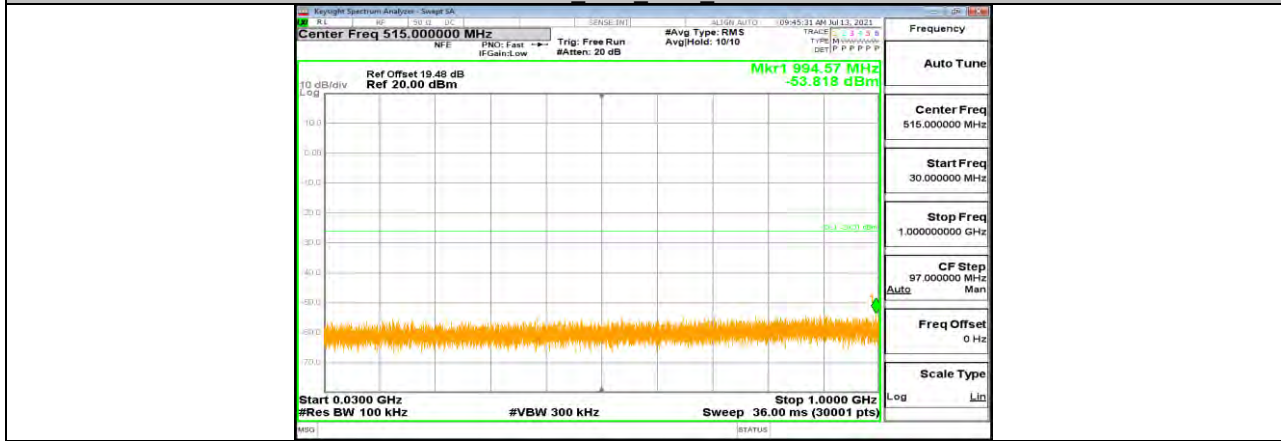


11G Ant2 2462 1000~26500

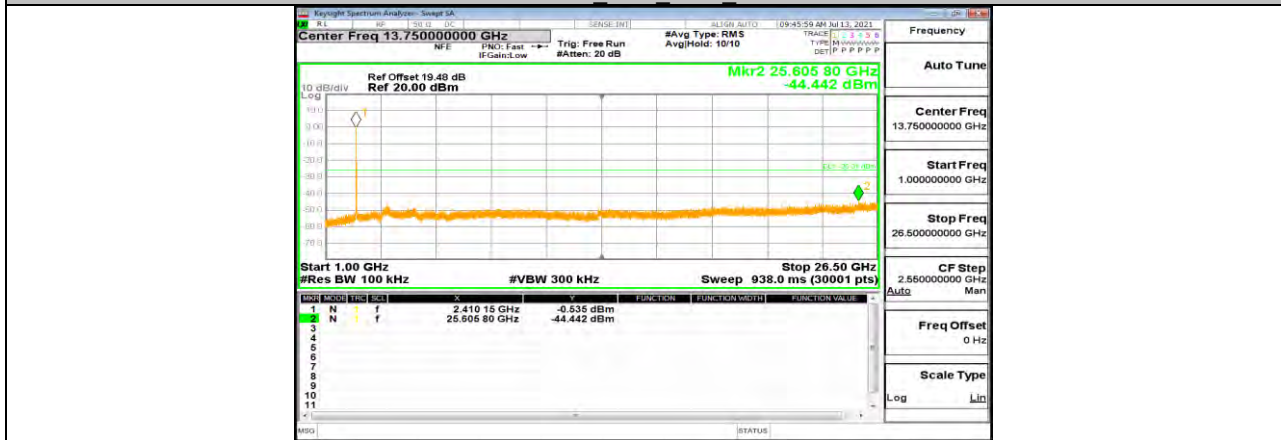




11N20MIMO Ant1 2412 0~Reference



11N20MIMO Ant1 2412 30~1000



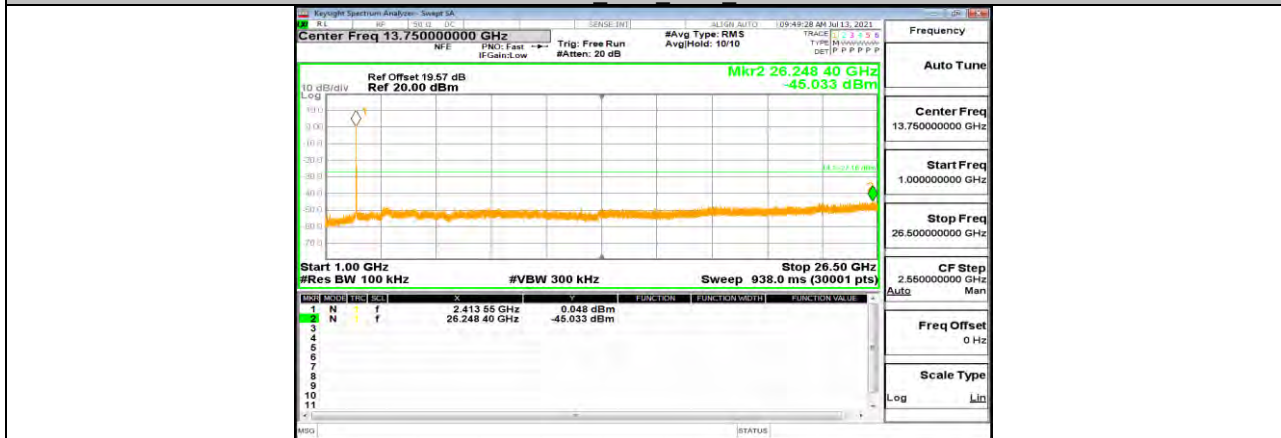
11N20MIMO Ant1 2412 1000~26500



11N20MIMO Ant2 2412 0~Reference



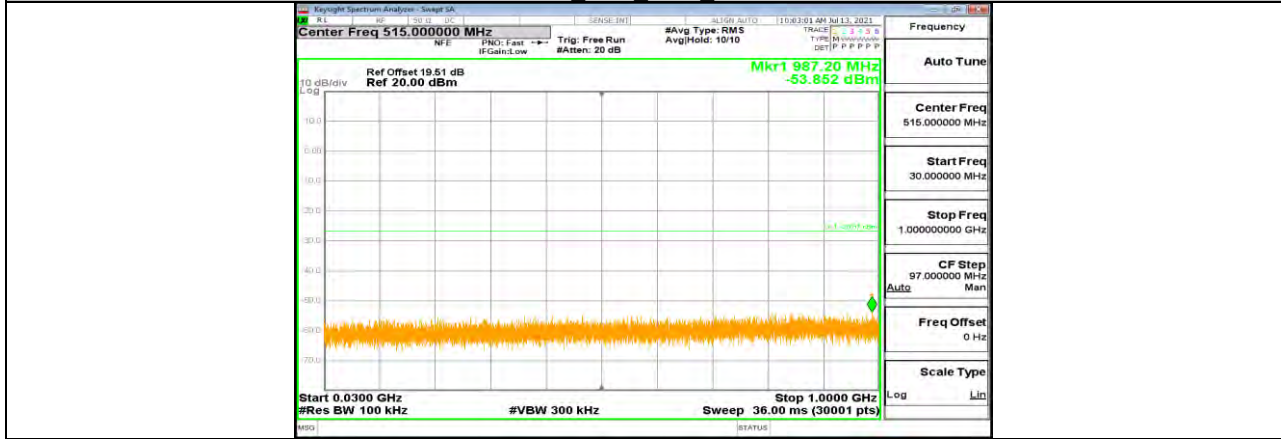
11N20MIMO Ant2 2412 30~1000



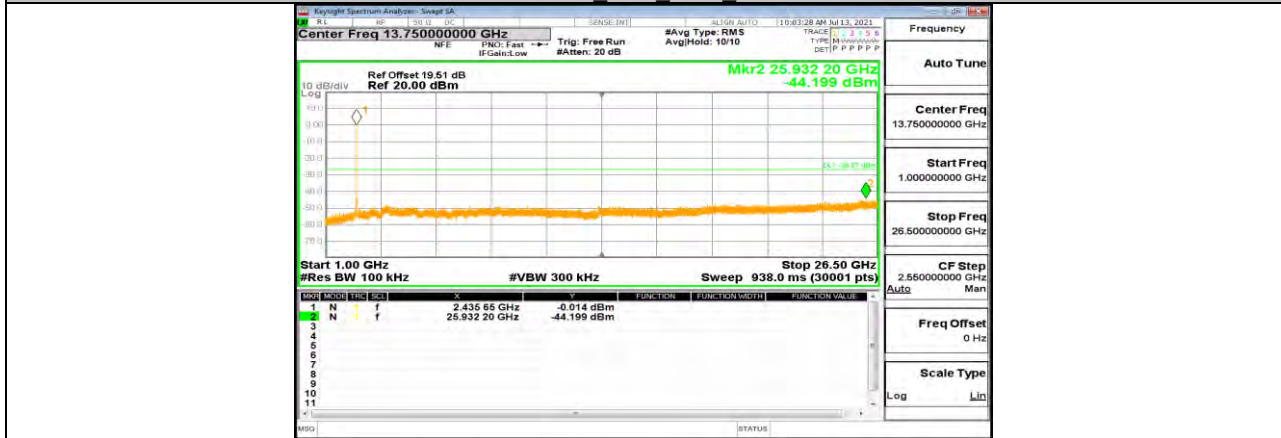
11N20MIMO Ant2 2412 1000~26500



11N20MIMO Ant1 2437 0~Reference



11N20MIMO Ant1 2437 30~1000

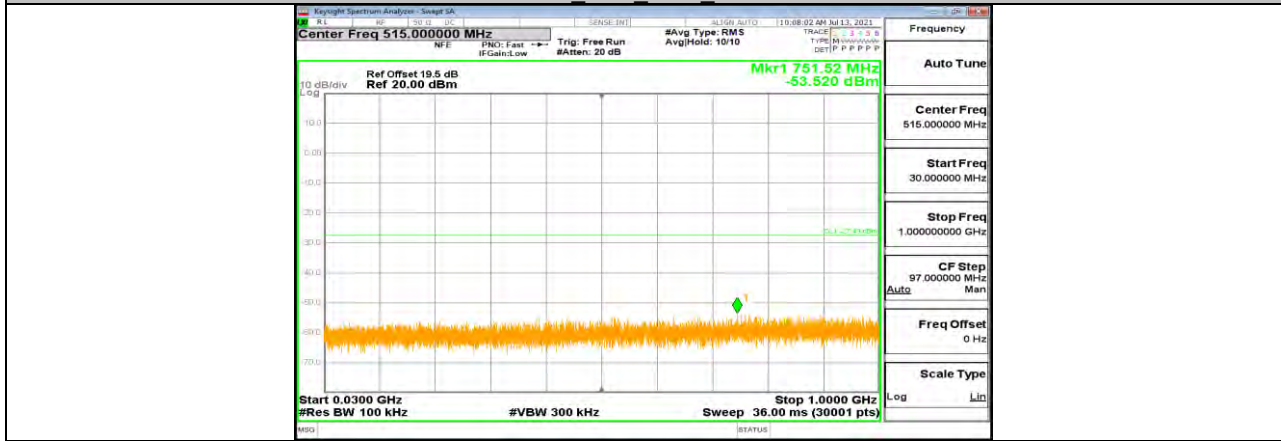


11N20MIMO Ant1 2437 1000~26500

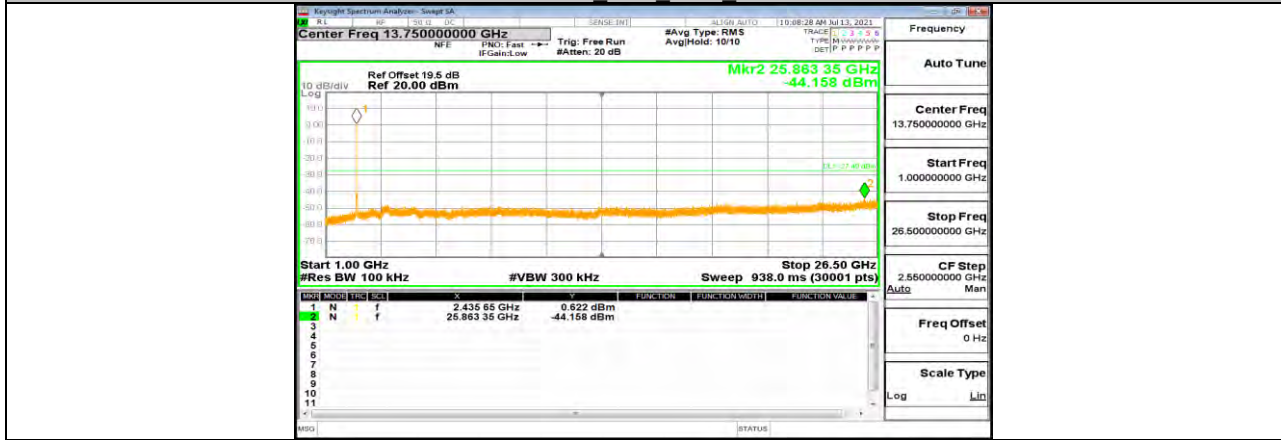




11N20MIMO Ant2 2437 0~Reference



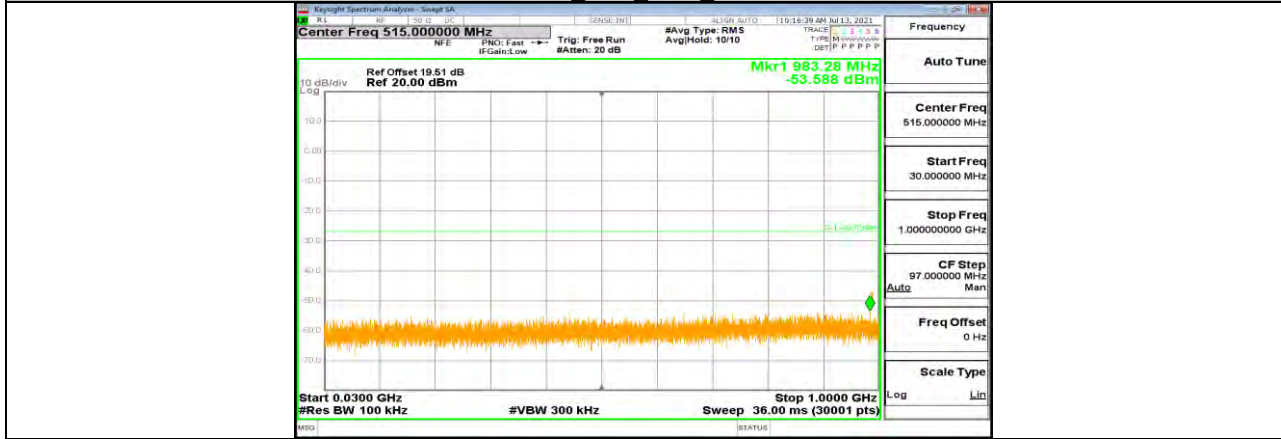
11N20MIMO Ant2 2437 30~1000



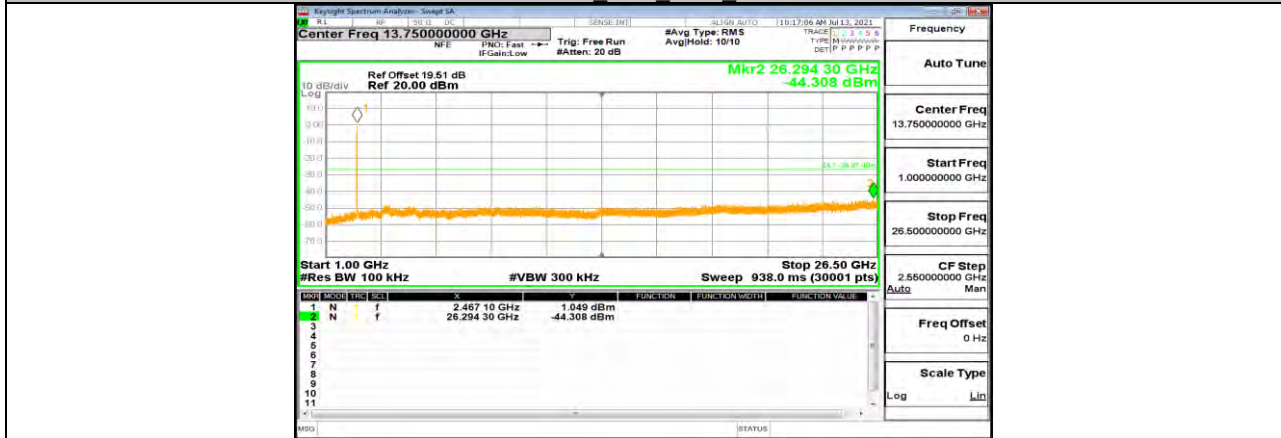
11N20MIMO Ant2 2437 1000~26500



11N20MIMO Ant1 2462 0~Reference



11N20MIMO Ant1 2462 30~1000

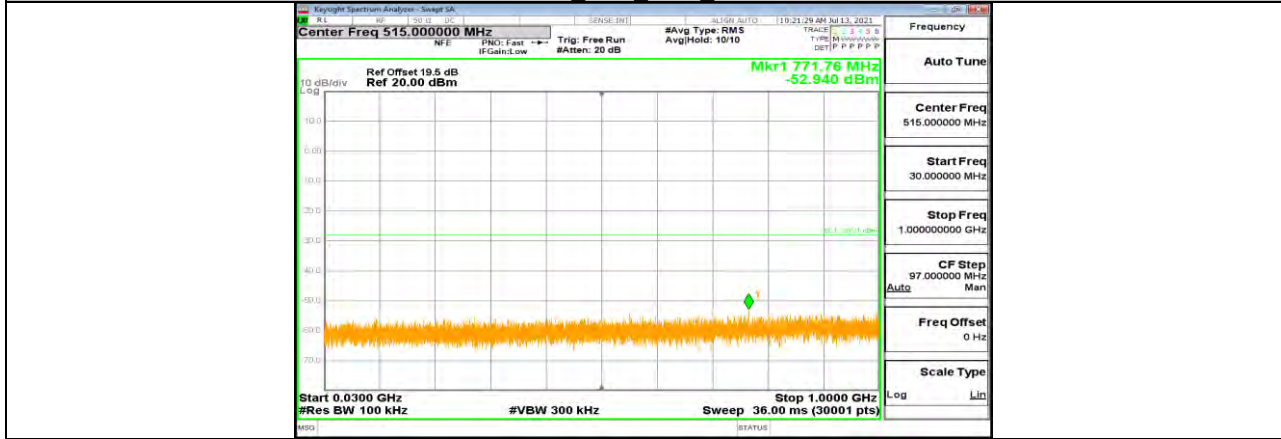


11N20MIMO Ant1 2462 1000~26500





11N20MIMO Ant2 2462 0~Reference



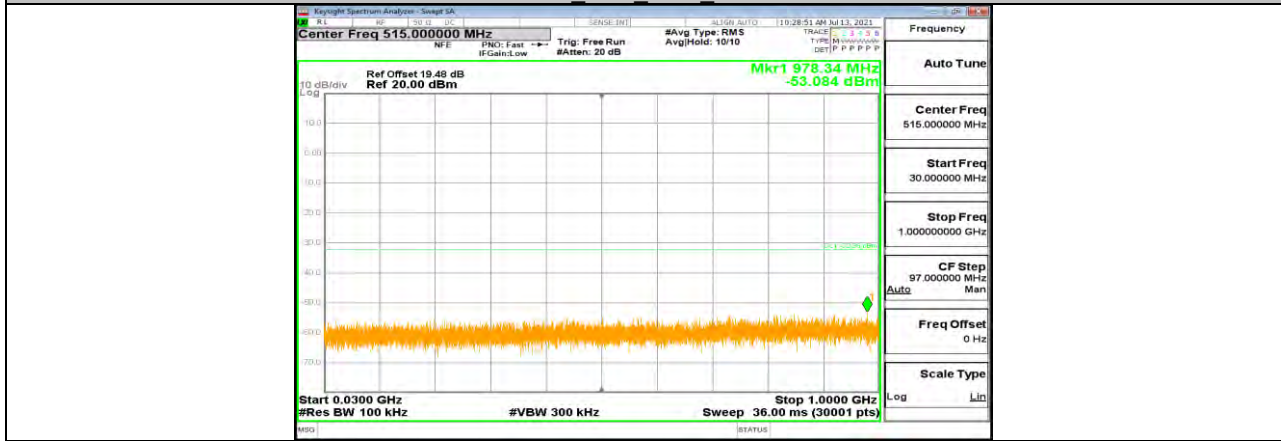
11N20MIMO Ant2 2462 30~1000



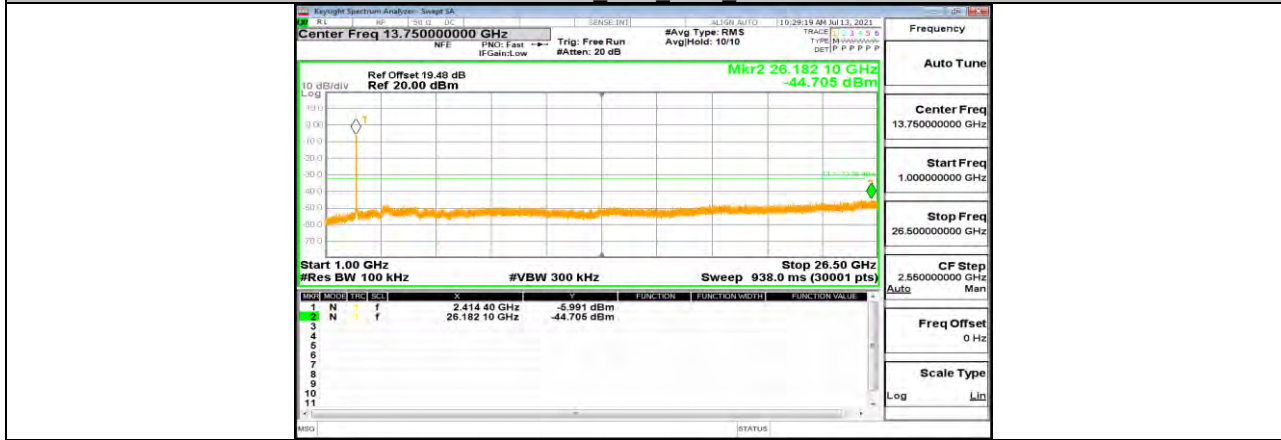
11N20MIMO Ant2 2462 1000~26500



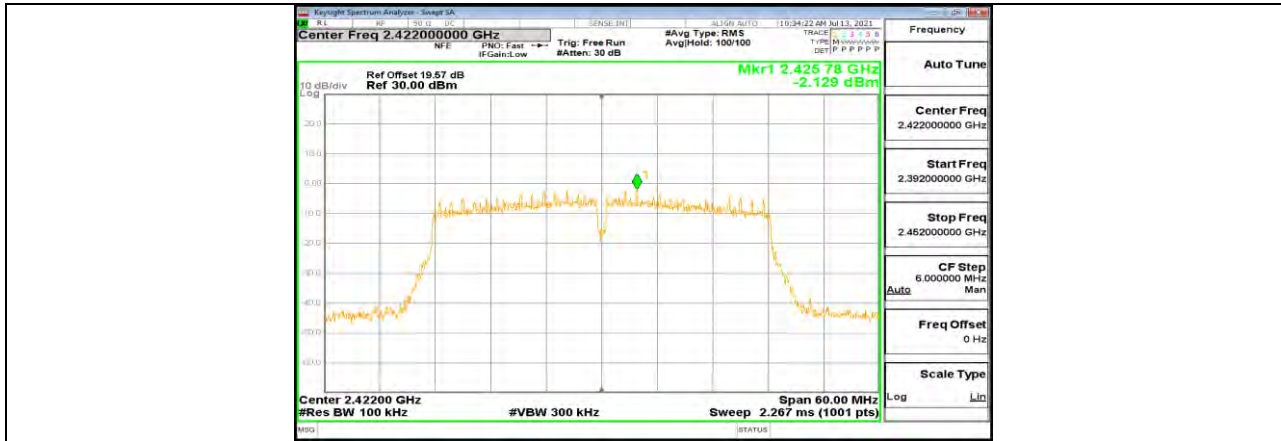
11N40MIMO Ant1 2422 0~Reference



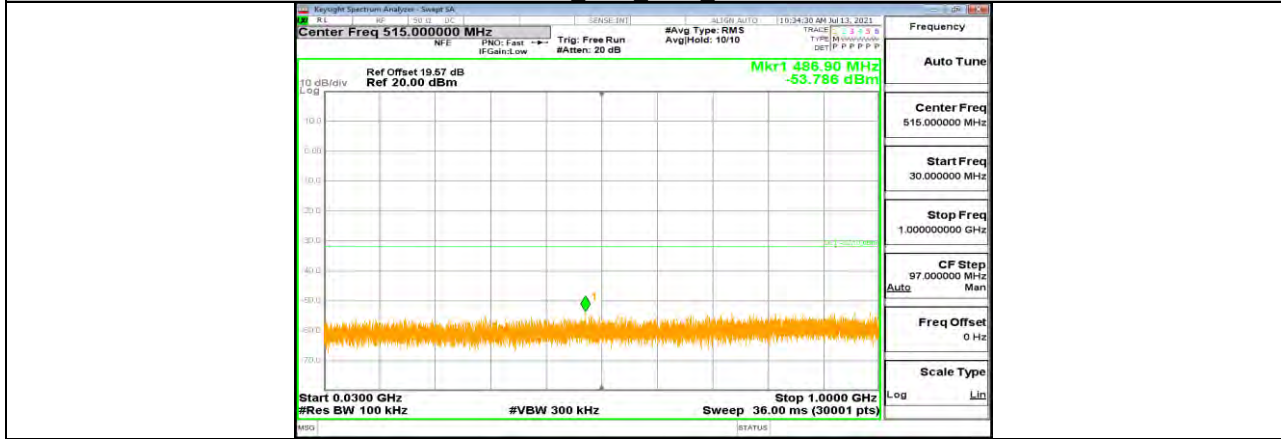
11N40MIMO Ant1 2422 30~1000



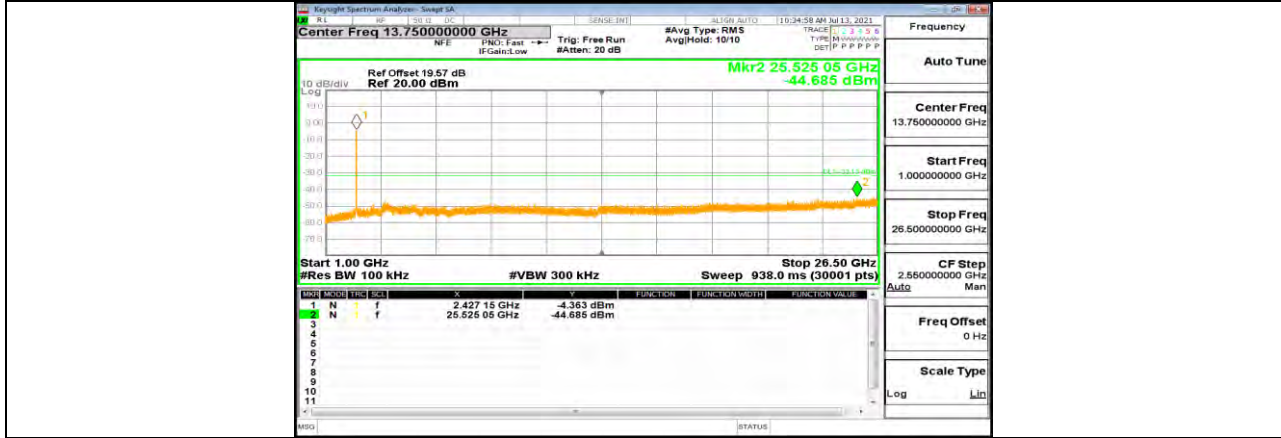
11N40MIMO Ant1 2422 1000~26500



11N40MIMO Ant2 2422 0~Reference



11N40MIMO Ant2 2422 30~1000

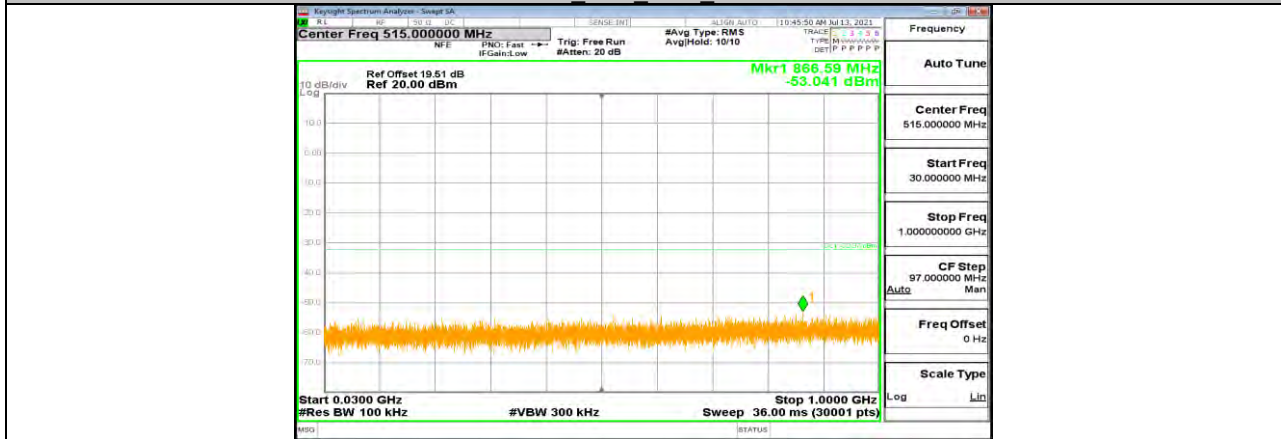


11N40MIMO Ant2 2422 1000~26500

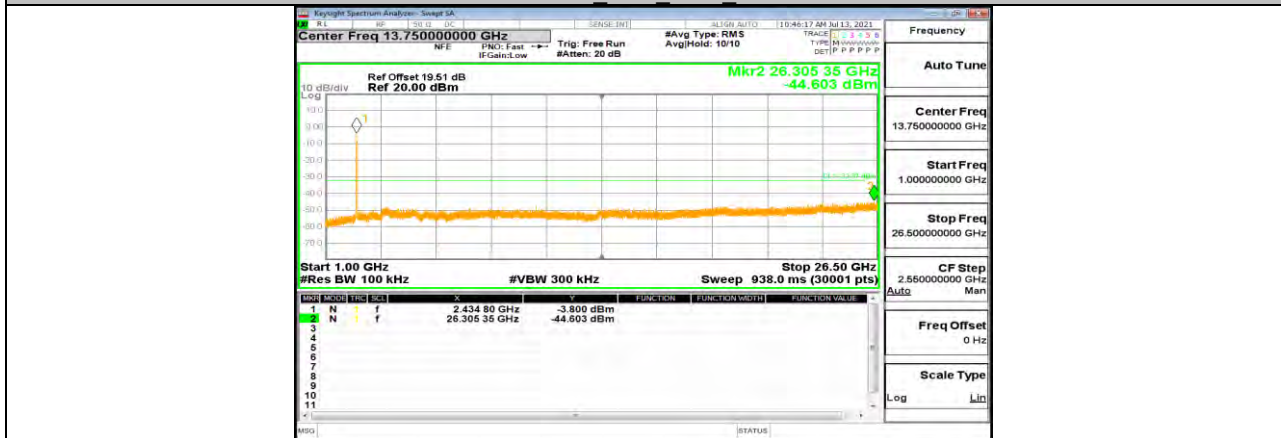




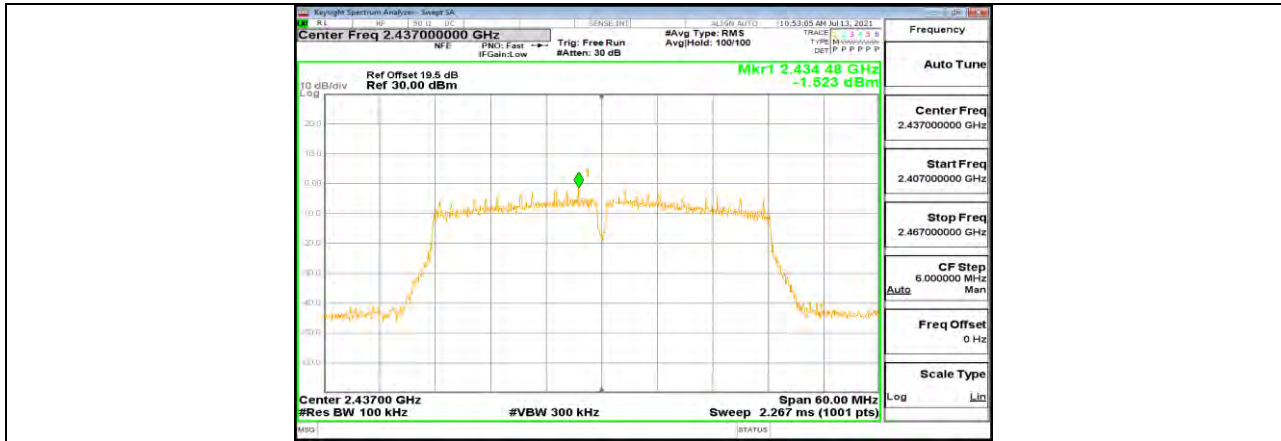
11N40MIMO Ant1 2437 0~Reference



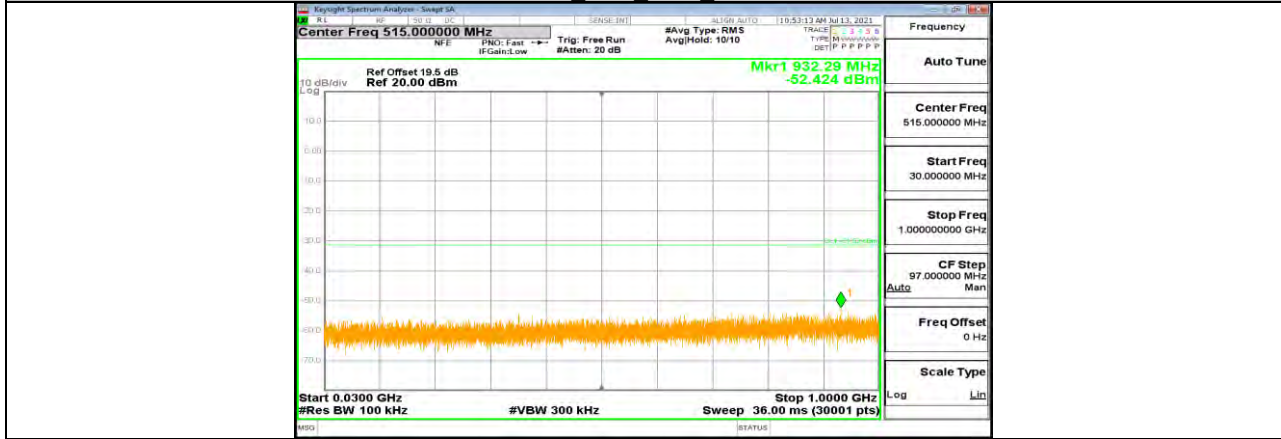
11N40MIMO Ant1 2437 30~1000



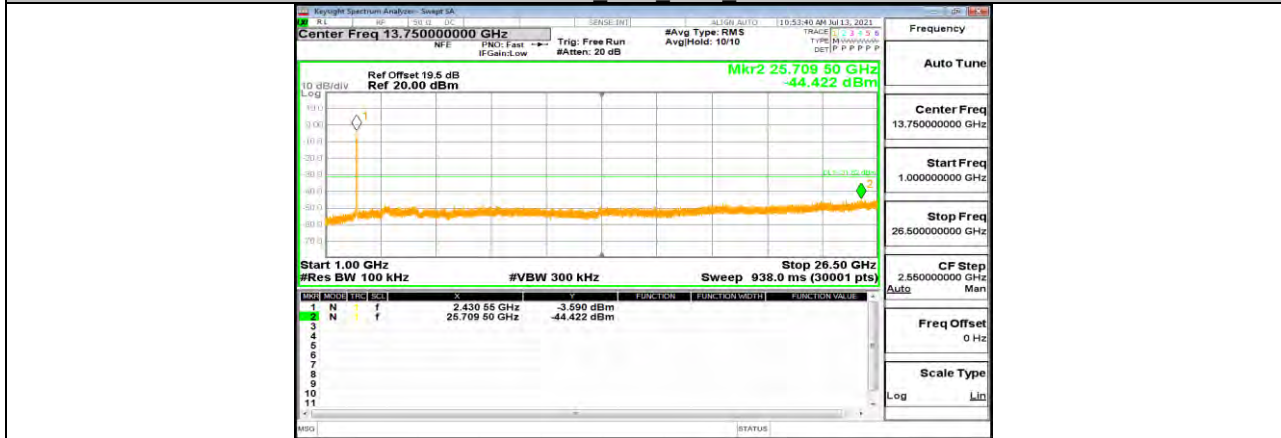
11N40MIMO Ant1 2437 1000~26500



11N40MIMO Ant2 2437 0~Reference



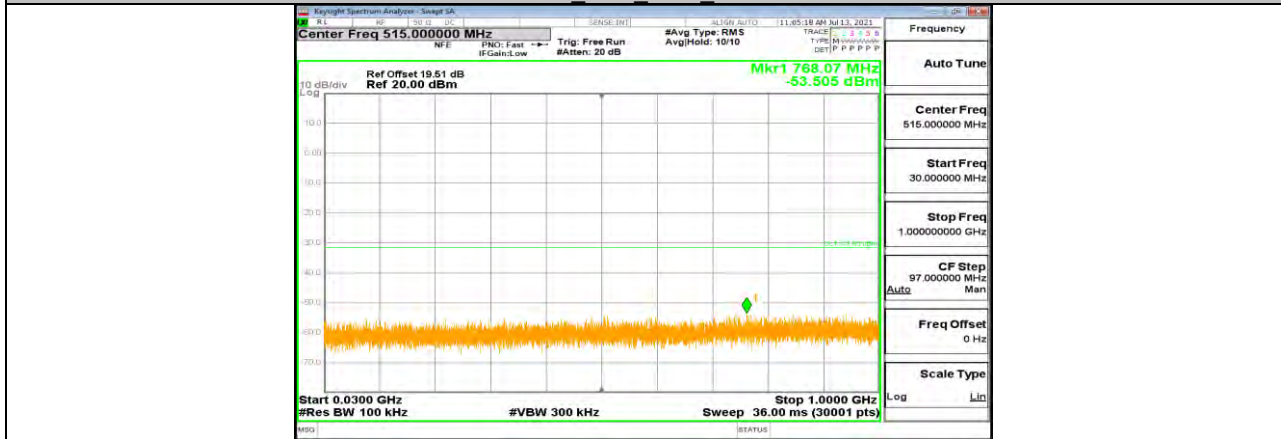
11N40MIMO Ant2 2437 30~1000



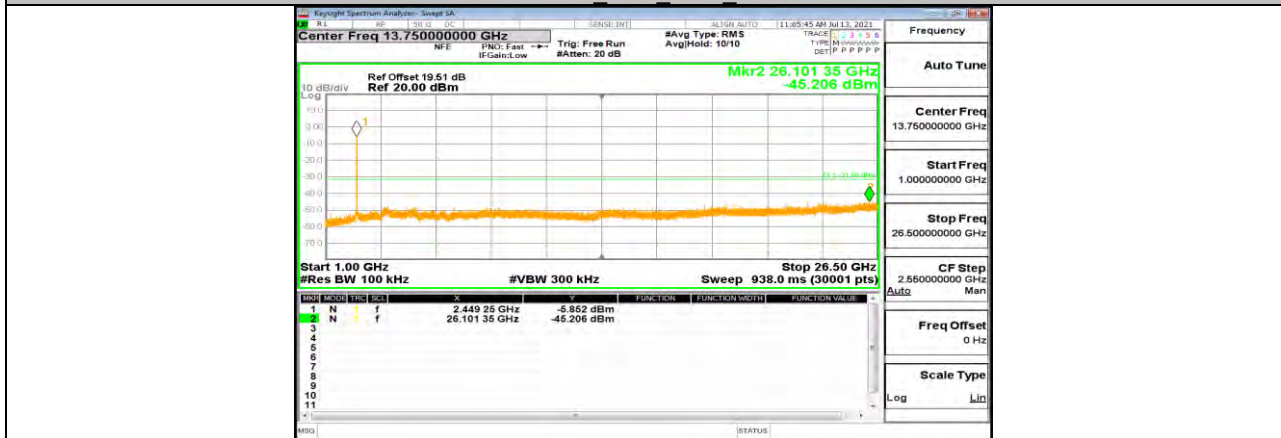
11N40MIMO Ant2 2437 1000~26500



11N40MIMO Ant1 2452 0~Reference



11N40MIMO Ant1 2452 30~1000

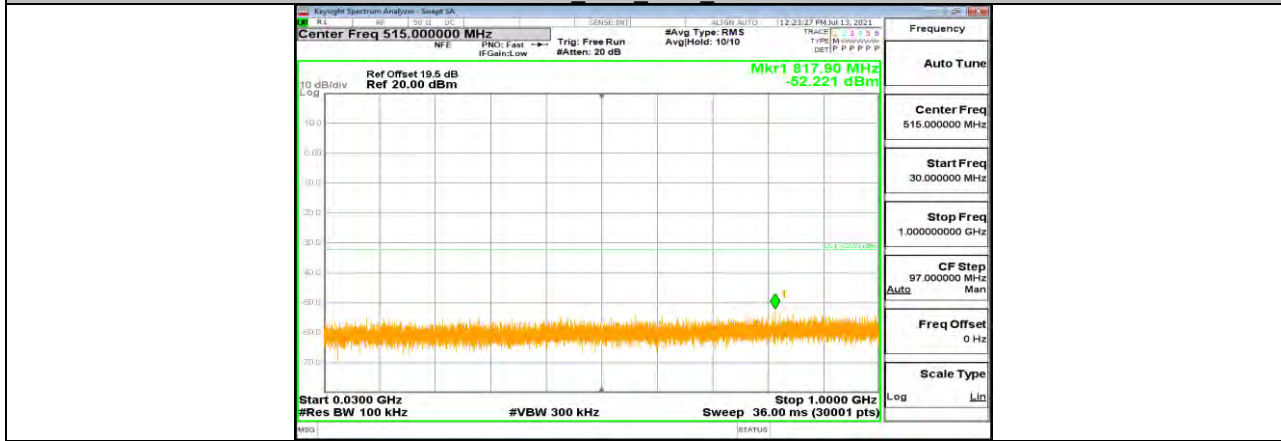


11N40MIMO Ant1 2452 1000~26500

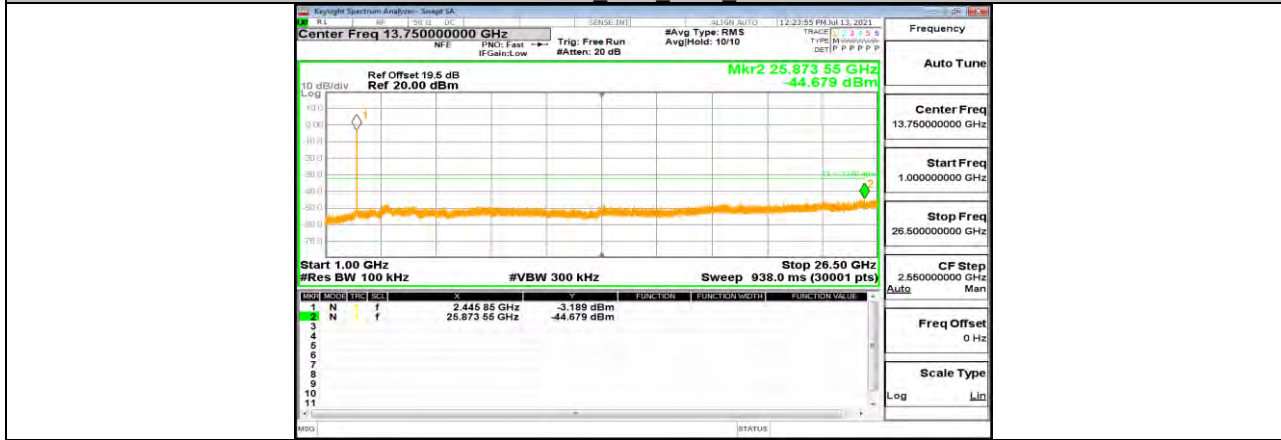




11N40MIMO Ant2 2452 0~Reference



11N40MIMO Ant2 2452 30~1000



11N40MIMO Ant2 2452 1000~26500



**11.7. Appendix G: Duty Cycle**  
**11.7.1. Test Result**

Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
11B	8.38	8.42	0.9952	99.52	0.02	0.12	0.01
11G	1.39	1.44	0.9653	96.53	0.15	0.72	1
11N20MIMO	1.30	1.34	0.9701	97.01	0.13	0.77	1
11N40MIMO	0.64	0.69	0.9275	92.75	0.33	1.56	2

Note:

Duty Cycle Correction Factor=10log (1/x).

Where: x is Duty Cycle (Linear)

Where: T is On Time

If that calculated VBW is not available on the analyzer then the next higher value should be used.



### 11.7.2. Test Graphs





11N40MIMO Ant2 2437

**END OF REPORT**