



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

**CERTIFICATION TEST REPORT**

*For*

**Wyze Bulb White**

**MODEL NUMBER: WLPA19V2**

**FCC ID: 2AUIUWLPA19V2  
IC: 25466-WLPA19V2**

**REPORT NUMBER: 4790005915-F2**

**ISSUE DATE: 19 August 2021**

*Prepared for*

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*Prepared by*

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Revision History

Rev.	Issue Date	Revisions	Revised By
--	19/08/2021	Initial Issue	--



Summary of Test Results			
Clause	Test Items	FCC/IC Rules	Test Results
1	6 dB Bandwidth and 99% Bandwidth	FCC Part 15.247 (a) (2) RSS-247 Clause 5.2 (a) 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
Remark: 1) The measurement result for the sample received is <Pass> according to < CFR 47 FCC PART 15 SUBPART C, when <Accuracy Method> decision rule is applied.			



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## 1. ATTESTATION OF TEST RESULTS

### Applicant Information

Company Name: Wyze Labs, Inc.  
Address: 5808 Lake Washington Blvd NE Ste 300, Kirkland, WA, United States

### Manufacturer Information

Company Name: Wyze Labs, Inc.  
Address: 5808 Lake Washington Blvd NE Ste 300, Kirkland, WA, United States

### EUT Description

EUT Name: Wyze Bulb White  
Brand Name: WYZE  
Model: WLPA19V2  
Sample Status: Normal  
Model: 210630005-4  
Sample Received Date: 01 July 2021  
Date of Tested: 01 July 2021 ~ 19 August 2021

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC Part 15 Subpart C	PASS
ISED RSS-247 Issue 2	PASS
ISED RSS-GEN Issue 5	PASS

Prepared By:

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Reviewed By:

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Laboratory Manager



## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with 558074 D01 15.247 Meas Guidance v05r02, 414788 D01 Radiated Test Site v01r01, FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, ISED RSS-247 Issue 2 and ISED RSS-GEN Issue 5.

## 3. FACILITIES AND ACCREDITATION

Accreditation Certificate	<b>A2LA (Certificate No.: 4338.01)</b> Shenzhen STS Test Services Co., Ltd. has been assessed and proved to be in compliance with A2LA. <b>CNAS (Registration No.: L7649)</b> Shenzhen STS Test Services Co., Ltd. has been assessed and proved to be in compliance with CNAS. <b>IC(Company No.: 12108A)</b> Shenzhen STS Test Services Co., Ltd. has been registered and fully described in a report filed with Industry Canada. The Company Number is 12108A.
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Note: All tests measurement facilities use to collect the measurement data are located at A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China



## 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

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	RF output power, conducted	$\pm 0.7\text{dB}$
2	Unwanted Emissions, conducted	$\pm 3.0\text{dB}$
3	All emissions, radiated 9K-30MHz	$\pm 2.7\text{dB}$
4	All emissions, radiated 30M-1GHz	$\pm 4.4\text{dB}$
5	All emissions, radiated 1G-6GHz	$\pm 5.1\text{dB}$
6	All emissions, radiated >6G	$\pm 5.5\text{dB}$
7	Conducted Emission (9KHz-150KHz)	$\pm 2.8\text{dB}$
8	Conducted Emission (150KHz-30MHz)	$\pm 2.8\text{dB}$





## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

EUT Name	Wyze Bulb White
EUT Description	The EUT is a Wyze Bulb White
Model	WLPA19V2
PMN	Wyze Bulb White
HVIN	WLPA19V2
FVIN	1.3.1.1
Serial number	7C49EB0071A8
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 Parameter	120VAC 60Hz 9.5W 0.13A
Hardware Version	0.0.0.0
Software Version	1.3.1.1

### 5.2. MAXIMUM OUTPUT POWER

Frequency Range (MHz)	Number of Transmit Chains (NTX)	IEE Std. 802.11	Frequency (MHz)	Channel Number	Max average Conducted Power (dBm)
2400-2483.5	1	IEEE 802.11b	2412-2462	1-11[11]	11.15
2400-2483.5	1	IEEE 802.11g	2412-2462	1-11[11]	15.85
2400-2483.5	1	IEEE 802.11nHT20	2412-2462	1-11[11]	15.77
2400-2483.5	1	IEEE 802.11nHT40	2422-2452	3-9[7]	19.73

### 5.3. CHANNEL LIST

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
802.11b/g/n(20MHz)					
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457



3	2422	7	2442	11	2462
4	2427	8	2447	N/A	N/A
802.11n(40MHz)					
3	2422	6	2437	9	2452
4	2427	7	2442	N/A	N/A
5	2432	8	2447	N/A	N/A

#### 5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
WiFi TX(802.11b)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz
WiFi TX(802.11g)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz
WiFi TX(802.11n HT20)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz
WiFi TX(802.11n HT40)	CH 3, CH 6, CH 9	2422MHz, 2437MHz, 2452MHz

#### 5.5. THE WORSE CASE CONFIGURATIONS

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band							
Modulation Mode	Transmit Antenna Number	Test Channel					
		NCB: 20MHz			NCB: 40MHz		
		CH 1	CH 6	CH 11	CH 3	CH 6	CH 09
802.11b	1	32	0	0	N/A		
802.11g	1	32	0	0			
802.11n HT20	1	32	0	0			
802.11n HT40	1	N/A			0	0	0

#### 5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
1	2412-2472	integral antenna	0.96 (Provided by applicant)

Test Mode	Transmit and Receive Mode	Description
IEEE 802.11b	<input checked="" type="checkbox"/> 1TX, 1RX	Chain 1 can be used as transmitting/receiving antenna.
IEEE 802.11g	<input checked="" type="checkbox"/> 1TX, 1RX	Chain 1 can be used as transmitting/receiving antenna.
IEEE 802.11n HT20	<input checked="" type="checkbox"/> 1TX, 1RX	Chain 1 can be used as transmitting/receiving antenna.
IEEE 802.11n HT40	<input checked="" type="checkbox"/> 1TX, 1RX	Chain 1 can be used as transmitting/receiving antenna.



## 5.7. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	P/N
1	PC	DELL	VOSTRO.3800	N/A

### I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(cm)	Remarks
1	USB Cable	NO	N/A	100cm	N/A

### ACCESSORY

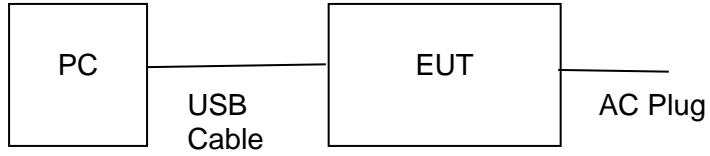
Item	Accessory	Brand Name	Model Name	Description
N/A	N/A	N/A	N/A	N/A

### TEST SETUP

The EUT can work in engineering mode with software EspRFTTestTool\_v2.8\_Manual through a Laptop.



**SETUP DIAGRAM FOR TESTS**





## 6. MEASURING INSTRUMENT AND SOFTWARE USED

### Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2020.10.12	2021.10.11
Signal Analyzer	R&S	FSV 40-N	101823	2020.10.10	2021.10.09
Active loop Antenna	ZHINAN	ZN30900C	16035	2021.04.11	2022.04.10
Bilog Antenna	TESEQ	CBL6111D	34678	2020.10.12	2022.10.11
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	2019.10.15	2021.10.14
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	J211020657	2020.10.12	2022.10.11
Pre-Amplifier (0.1M-3GHz)	EM	EM330	060665	2020.10.12	2021.10.11
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2020.10.12	2021.10.11
Pre-Amplifier (18G-40GHz)	SKET	LNPA-1840-50	SK2018101801	2020.10.10	2021.10.09
Temperature & Humidity	HH660	Mieo	N/A	2020.10.12	2021.10.11
Turn table	EM	SC100_1	60531	N/A	N/A
Antenna mast	EM	SC100	N/A	N/A	N/A
Band Reject Filter (2.4-2.5GHz)	COM-MW	ZBSF-2400-2500	N/A	2020.10.12	2021.10.11
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 RE)			

### Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2020.10.12	2021.10.11
LISN	R&S	ENV216	101242	2020.10.12	2021.10.11
LISN	EMCO	3810/2NM	23625	2020.10.12	2021.10.11
Temperature & Humidity	HH660	Mieo	N/A	2020.10.13	2021.10.12
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 RE)			



RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Power Sensor	Keysight	U2021XA	MY55520005	2020.10.10	2021.10.09
			MY55520006	2020.10.10	2021.10.09
			MY56120038	2020.10.10	2021.10.09
			MY56280002	2020.10.10	2021.10.09
Signal Analyzer	Agilent	N9020A	MY51110105	2021.03.04	2022.03.03
Temperature & Humidity	HH660	Mieo	N/A	2020.10.13	2021.10.12
MIMO Power measurement test Set	Keysight	U2021XA	MY55520005	2020.10.10	2021.10.09
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 RE)			



## 7. MEASUREMENT METHODS

No.	Test Item	KDB Name	Section
1	6 dB Bandwidth and 99% Bandwidth	558074 D01 15.247 Meas Guidance v05r02	8.2
2	Conducted Output Power	558074 D01 15.247 Meas Guidance v05r02	8.1.3
3	Power Spectral Density	558074 D01 15.247 Meas Guidance v05r02	8.4
4	Out-of-band emissions in non-restricted bands	558074 D01 15.247 Meas Guidance v05r02	8.5
5	Out-of-band emissions in restricted bands	558074 D01 15.247 Meas Guidance v05r02	8.6
6	Band-edge	558074 D01 15.247 Meas Guidance v05r02	8.7
7	Conducted Emission Test For AC Power Port	ANSI C63.10-2013	6.2



## 8. ANTENNA PORT TEST RESULTS

### 8.1. ON TIME AND DUTY CYCLE

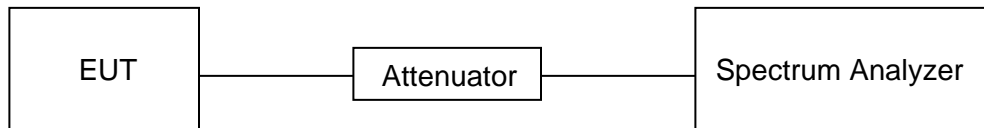
#### LIMITS

None; for reporting purposes only

#### PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

#### TEST SETUP



#### TEST ENVIRONMENT

Temperature	27.4°C	Relative Humidity	41%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V/60Hz

#### RESULTS

Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)	1/B Minimum VBW (KHz)
11b	100.000	100.000	1.000	100.00%	0.000	0.010
11g	100.000	100.000	1.000	100.00%	0.000	0.010
11n20	100.000	100.000	1.000	100.00%	0.000	0.010
11n40	100.000	100.000	1.000	100.00%	0.000	0.010

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

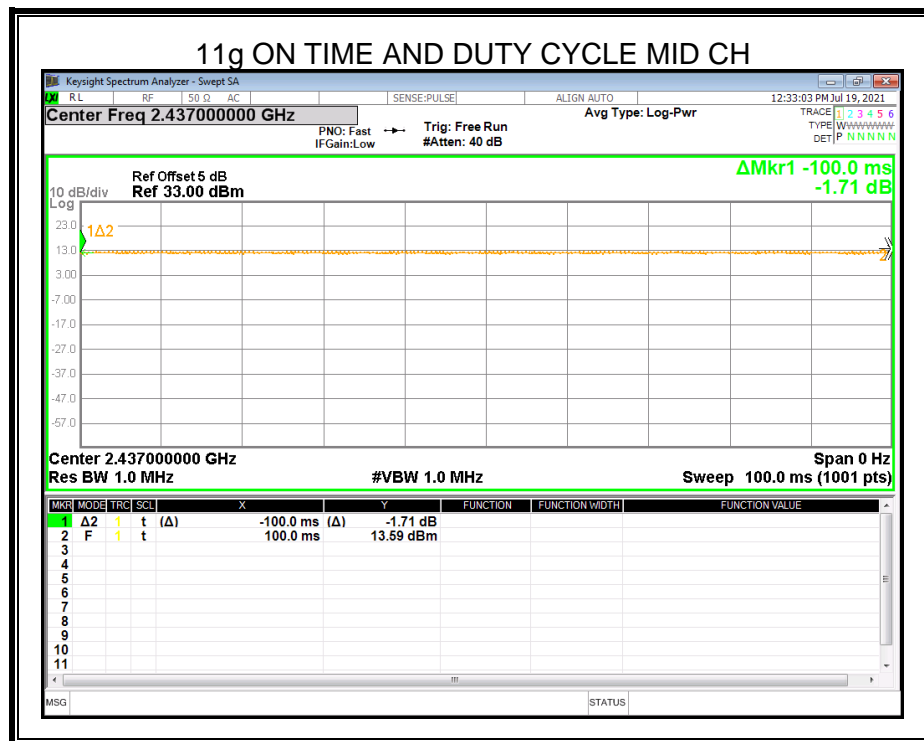
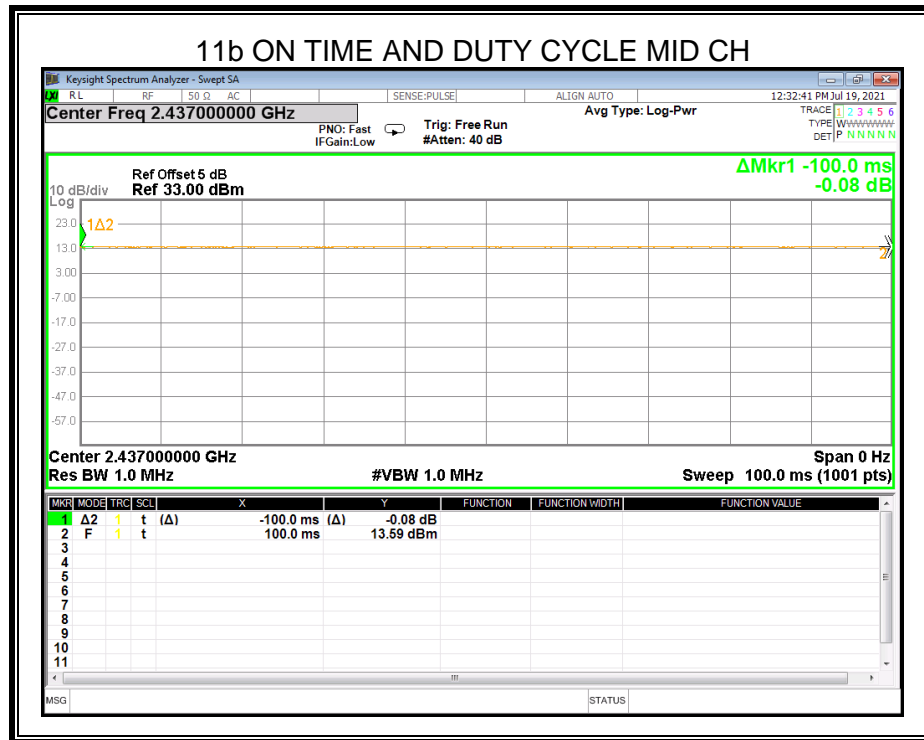
Where: x is Duty Cycle(Linear)

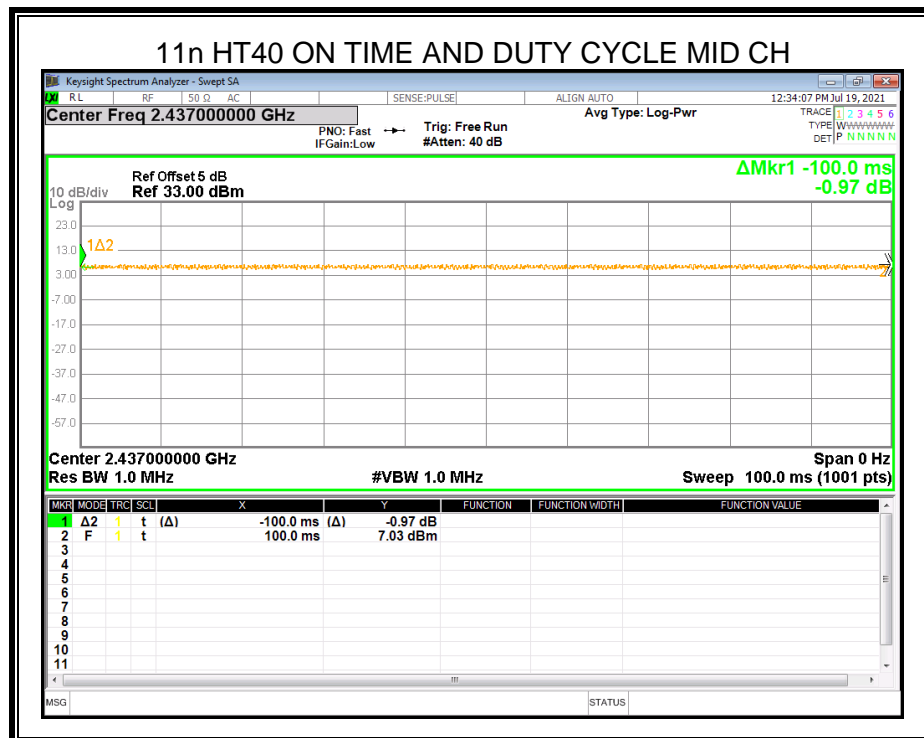
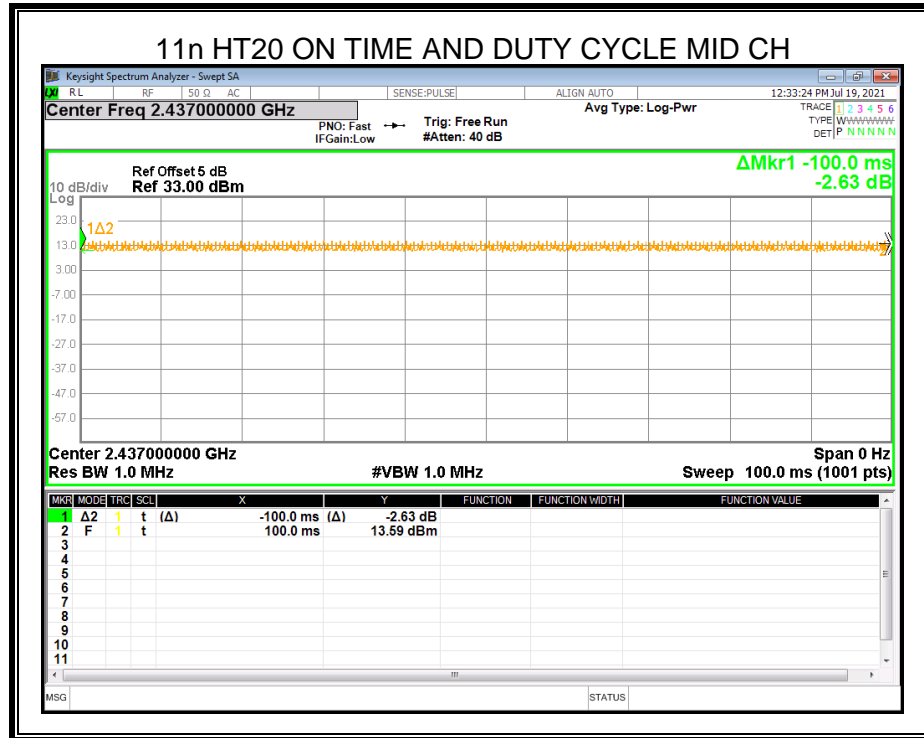
Where: B is On Time

When Duty Cycle > 98%,  $VBW \leq RBW/100$ ; When Duty Cycle < 98%,  $VBW \geq 1/B$ ;

Set the final test VBW = 10Hz;









## 8.2. 6 dB DTS BANDWIDTH AND 99% BANDWIDTH

### LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247(a)(2) RSS-247 5.2 (a)	6 dB Bandwidth	$\geq 500\text{KHz}$	2400-2483.5
RSS-Gen Clause 6.7	99% Bandwidth	For reporting purposes only.	2400-2483.5

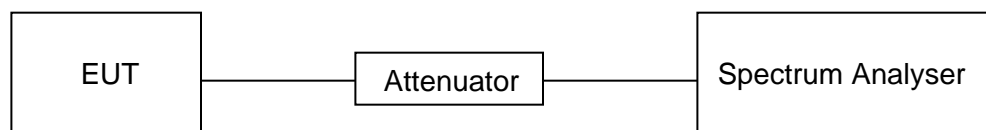
### TEST PROCEDURE

Connect the UUT to the spectrum analyzer and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	For 6dB Bandwidth :100K For 99% Bandwidth :1% to 5% of the occupied bandwidth
VBW	For 6dB Bandwidth : $\geq 3 \times \text{RBW}$ For 99% Bandwidth : approximately $3 \times \text{RBW}$
Trace	Max hold
Sweep	Auto couple

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 and 99% relative to the maximum level measured in the fundamental emission.

### TEST SETUP





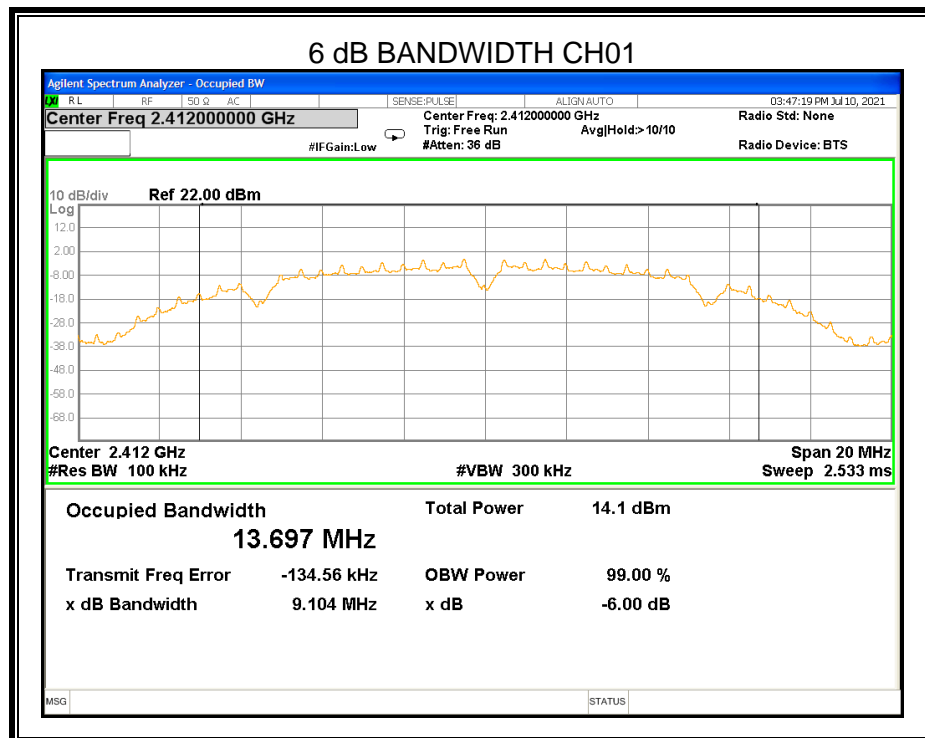
## TEST ENVIRONMENT

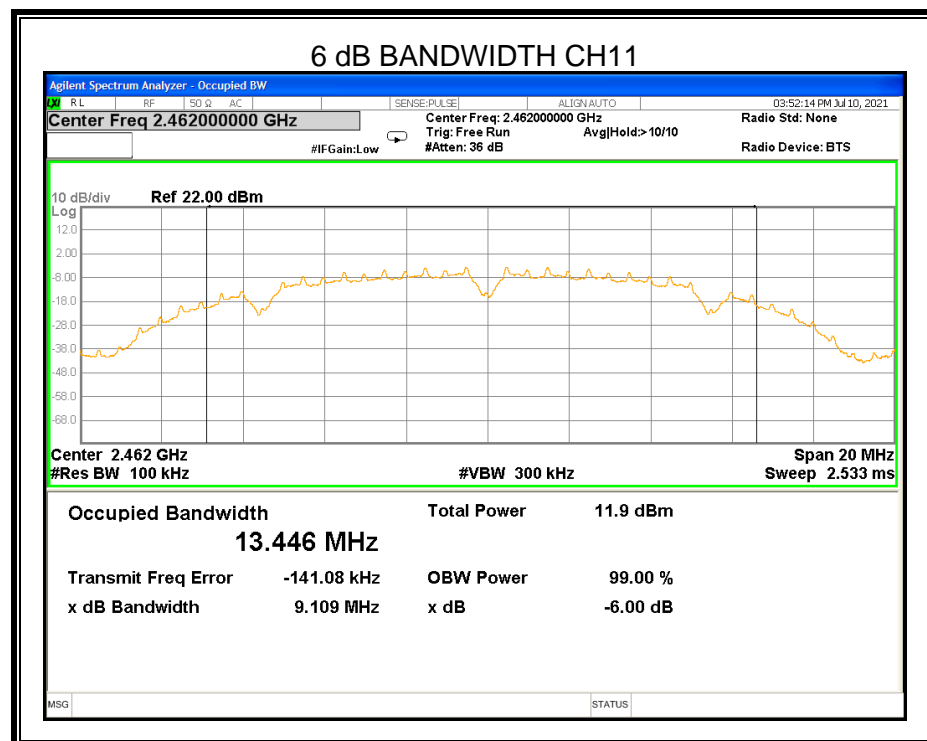
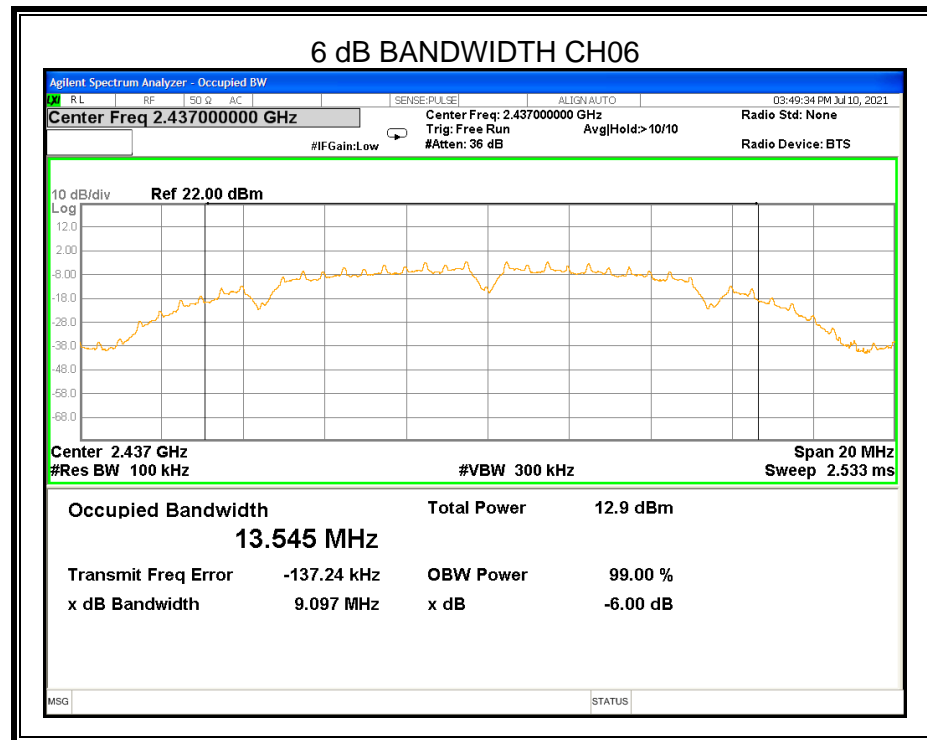
Temperature	27.4°C	Relative Humidity	41%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V/60Hz

## RESULTS

### 8.2.1. 802.11b MODE

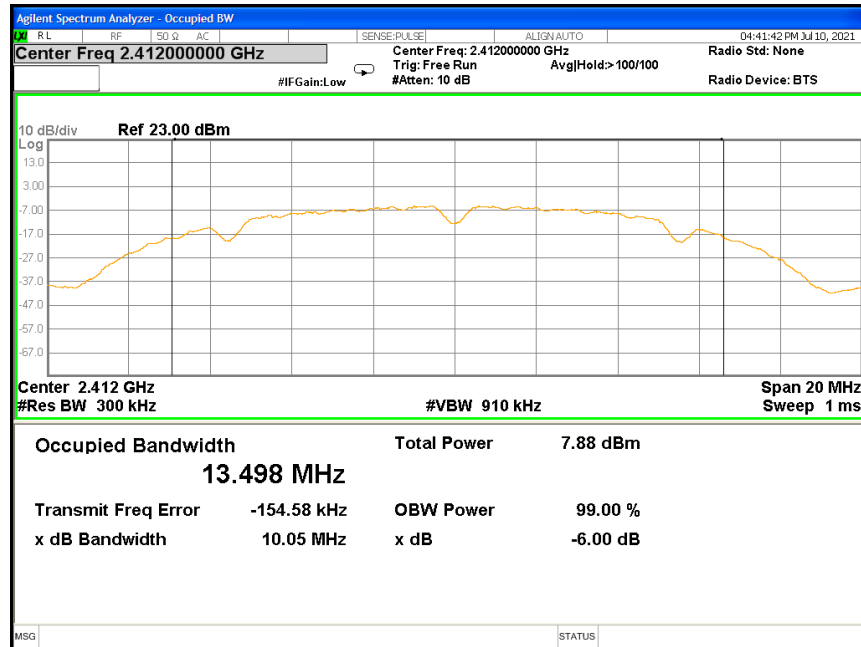
Channel	Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
CH01	2412	9.10	13.50	≥500KHz	Pass
CH06	2437	9.10	13.51	≥500KHz	Pass
CH11	2462	9.11	13.41	≥500KHz	Pass



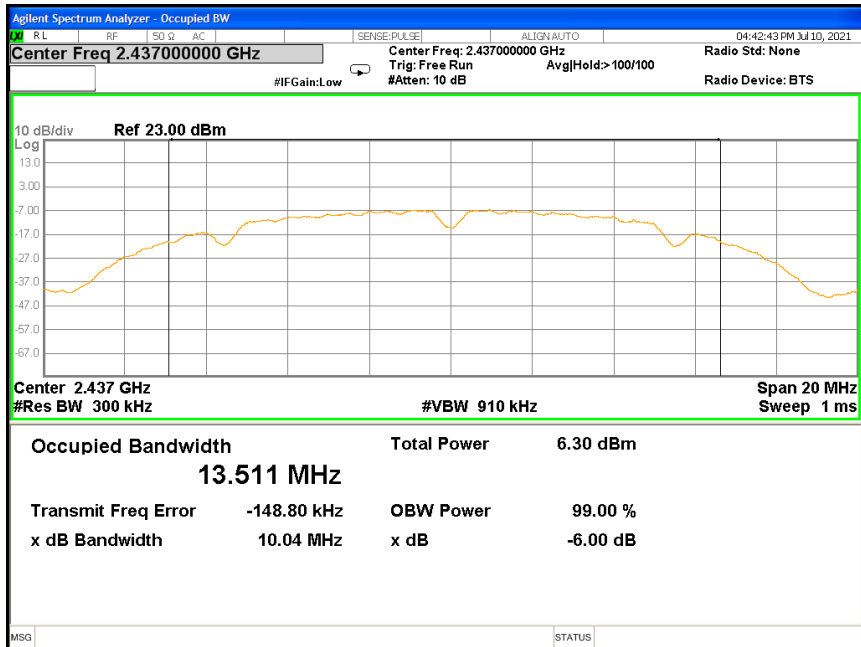


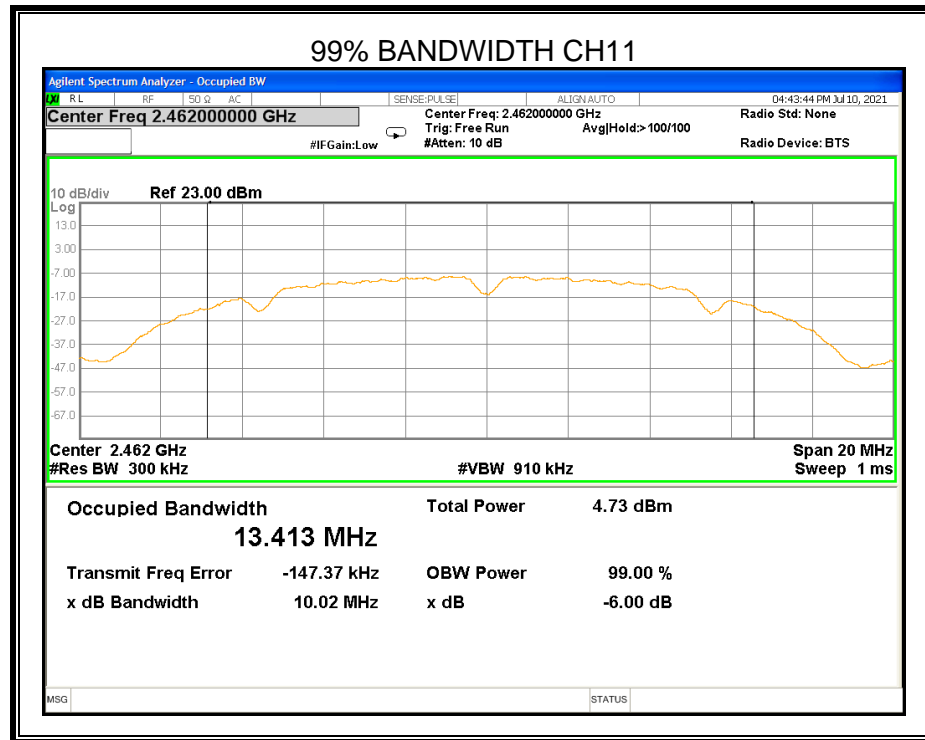


## 99% BANDWIDTH CH01



## 99% BANDWIDTH CH06

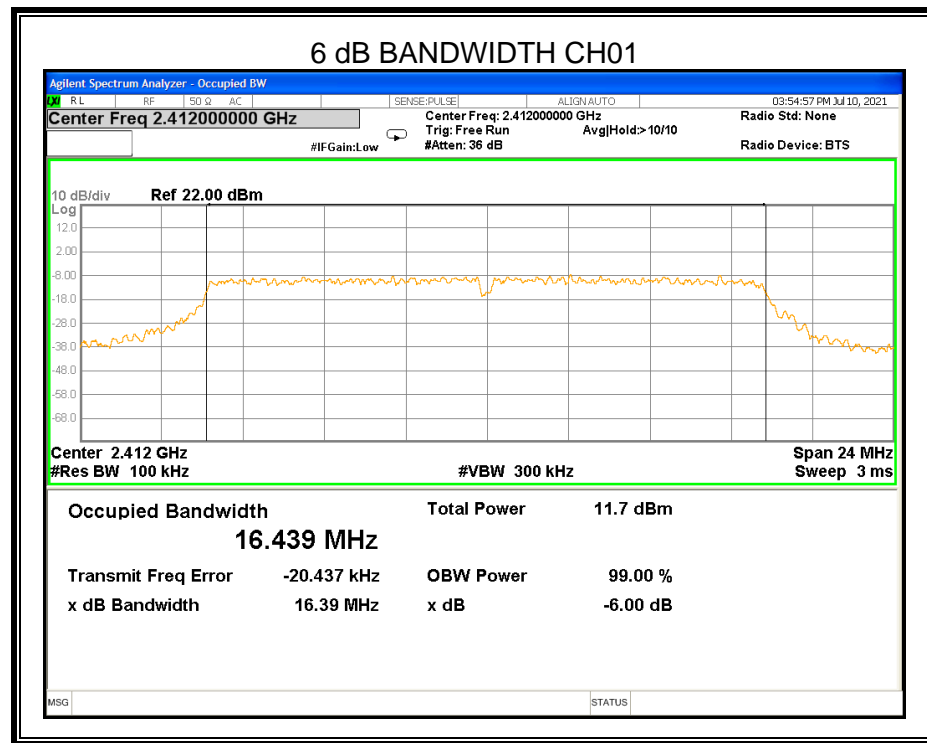




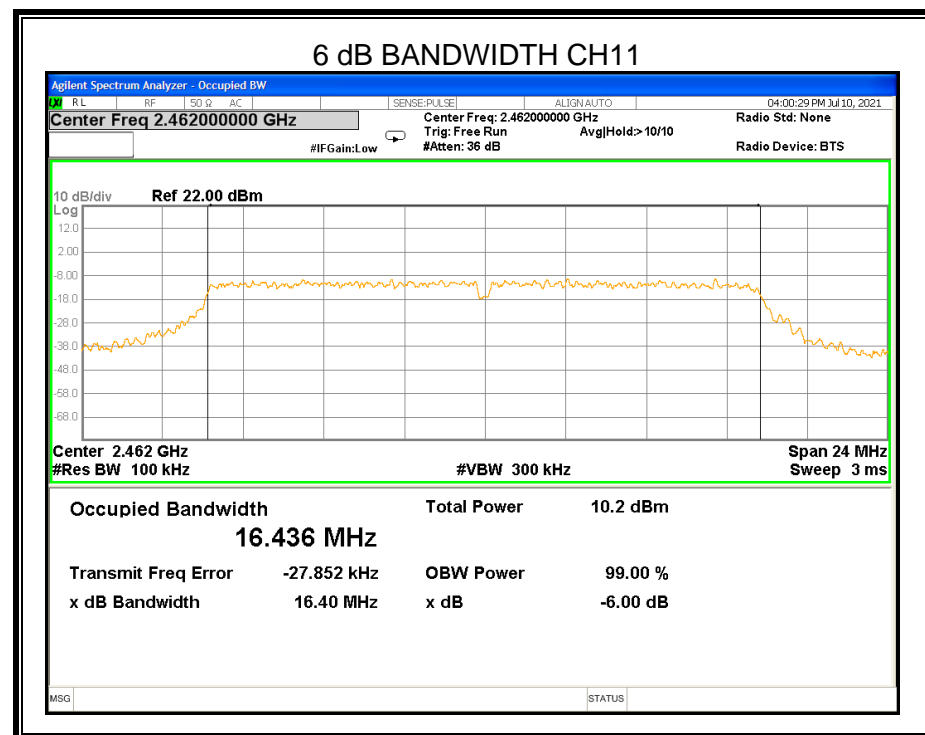
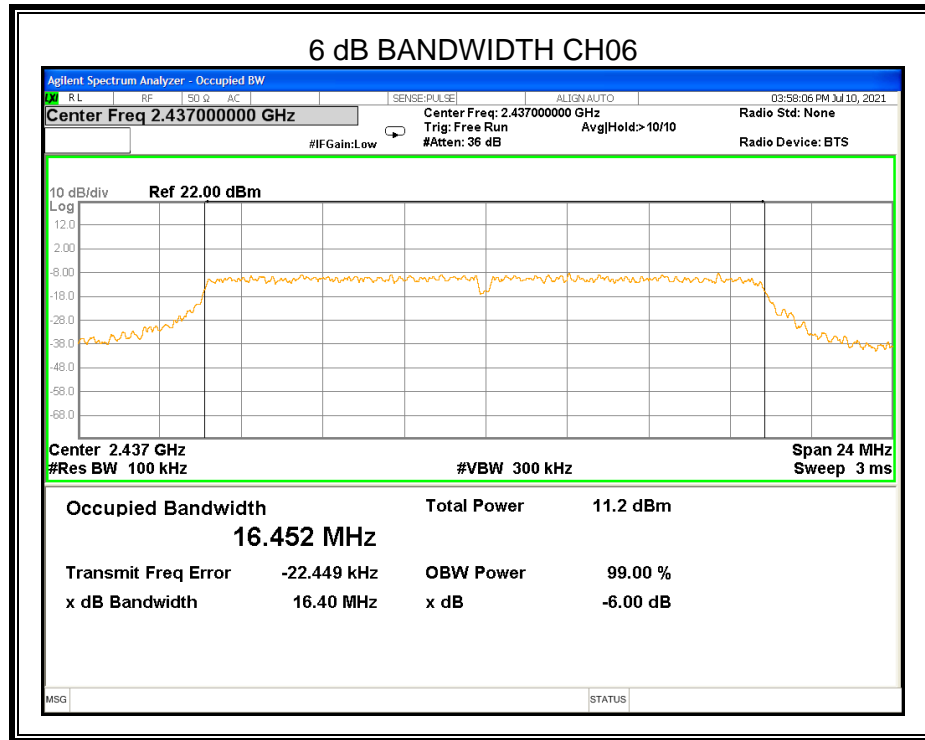


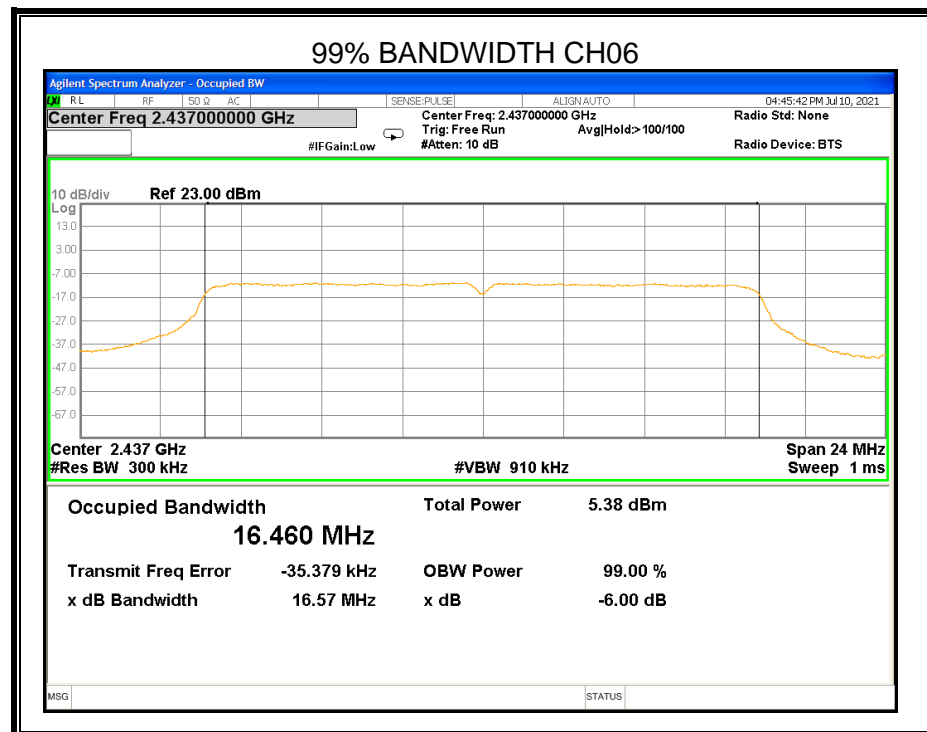
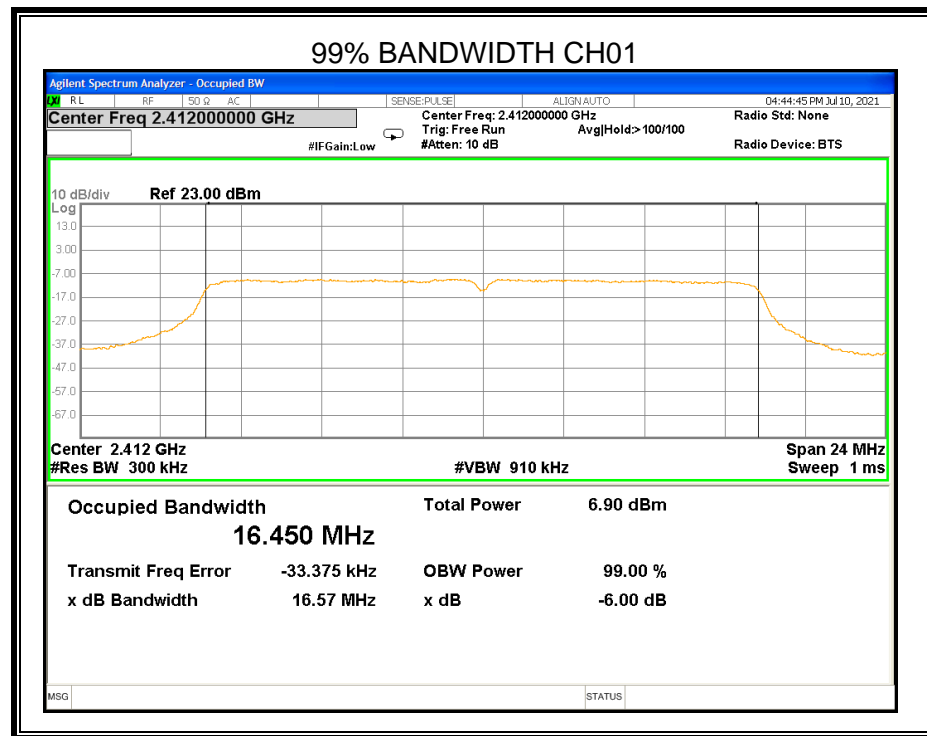
### 8.2.2. 802.11g MODE

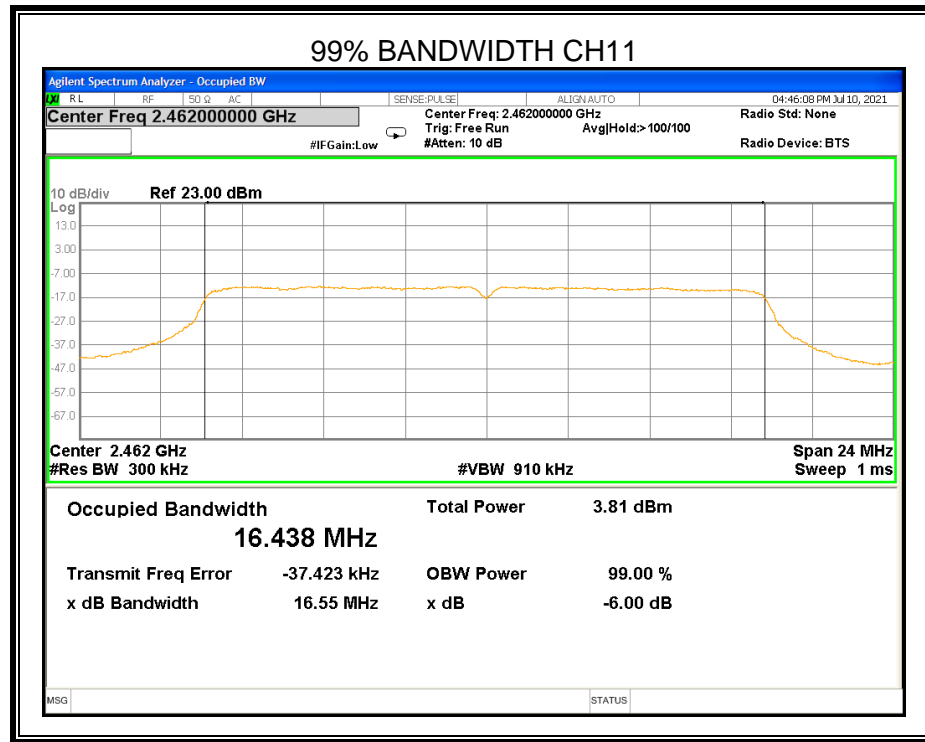
Channel	Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
CH01	2412	16.39	16.45	≥500KHz	Pass
CH06	2437	16.40	16.46	≥500KHz	Pass
CH11	2462	16.40	16.44	≥500KHz	Pass







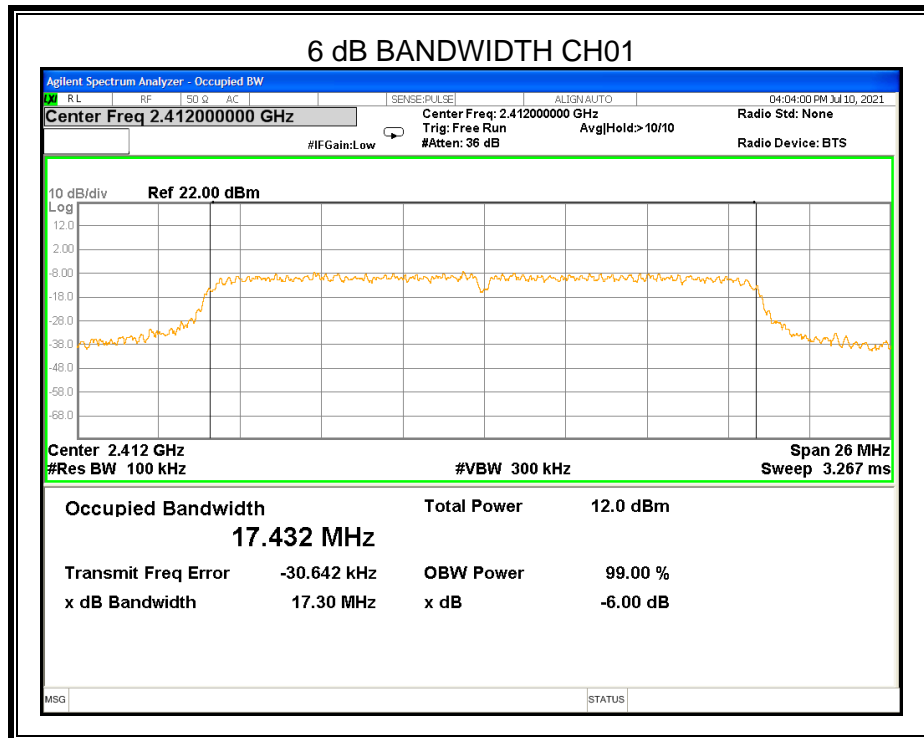


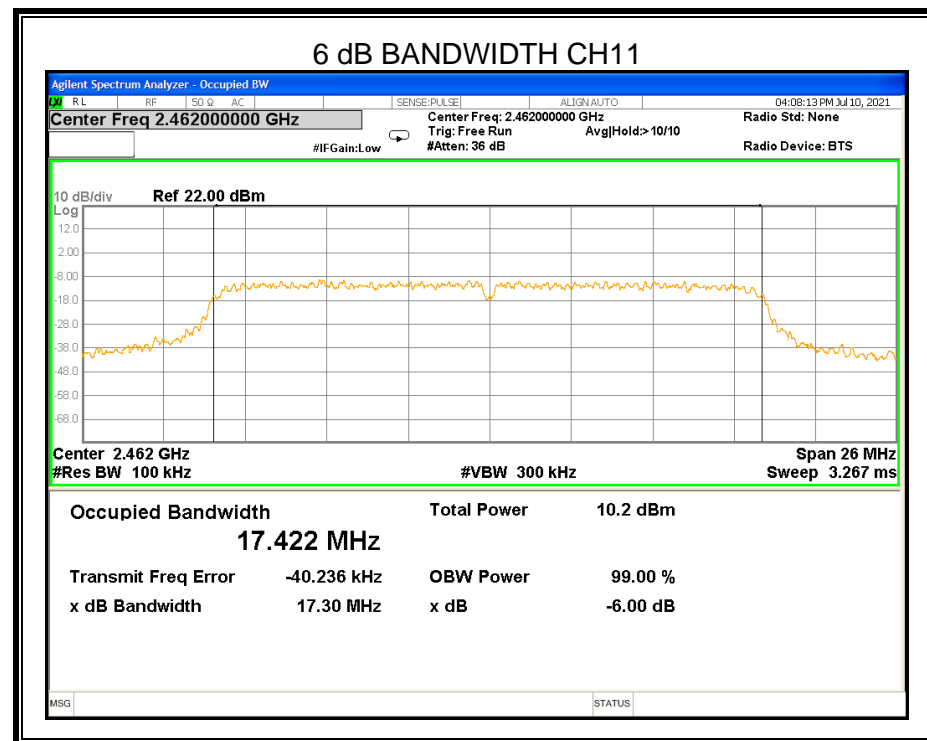
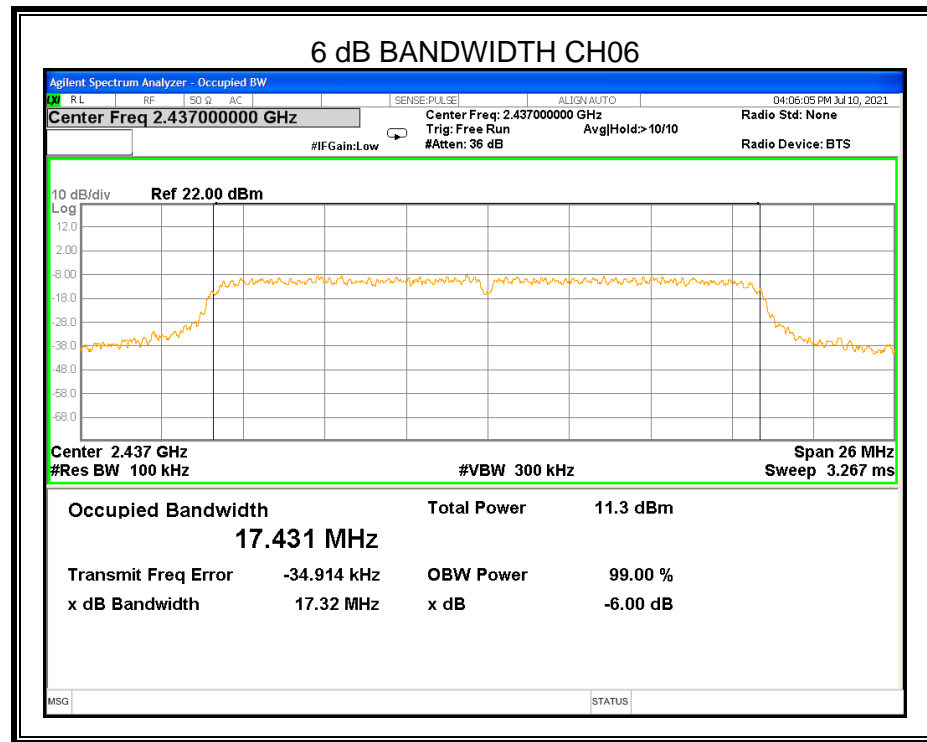


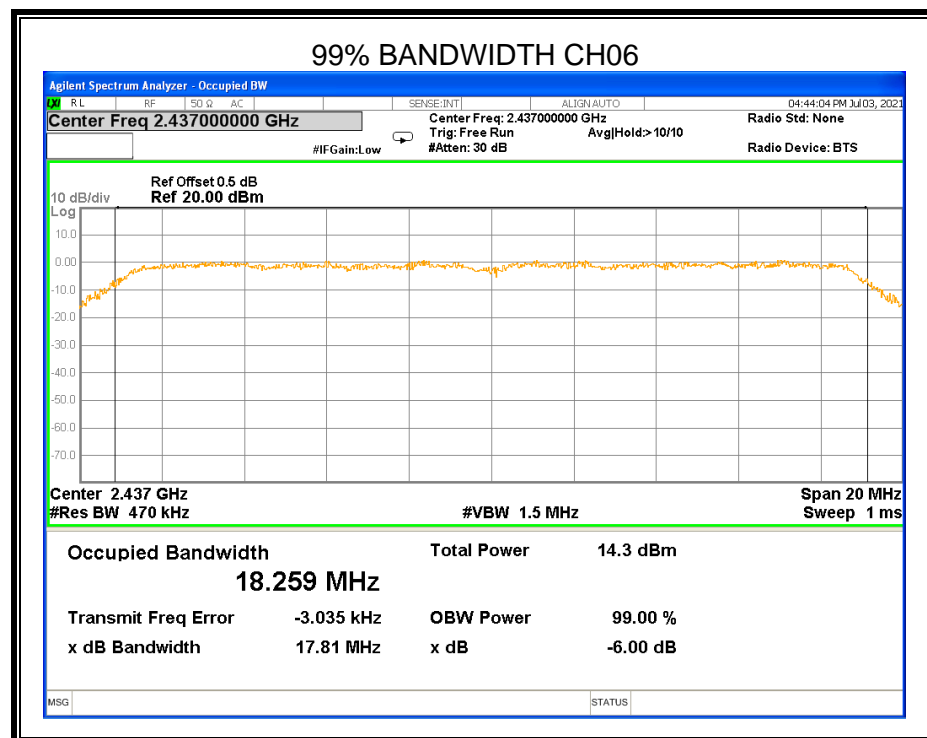
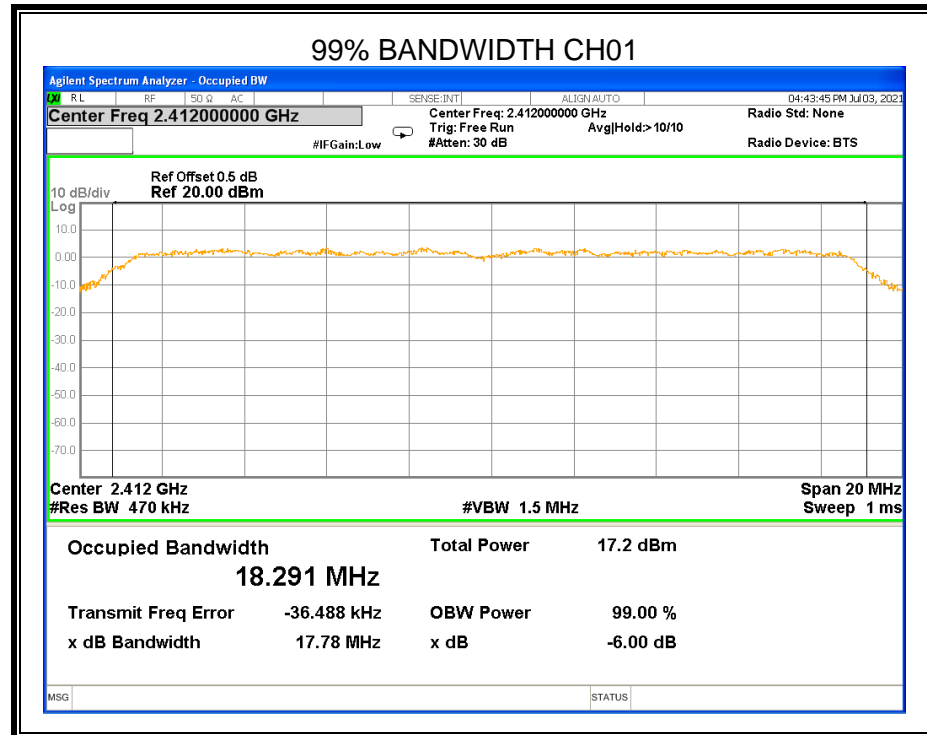


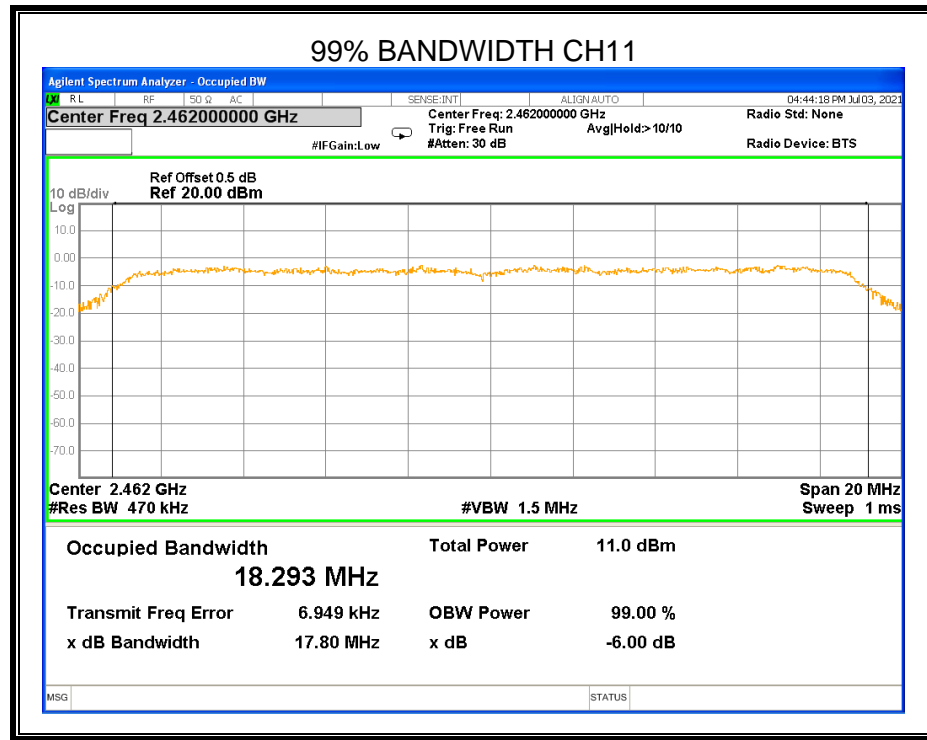
### 8.2.3. 802.11n HT20 MODE

Channel	Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
CH01	2412	17.30	18.291	≥500KHz	Pass
CH06	2437	17.32	18.259	≥500KHz	Pass
CH11	2462	17.30	18.293	≥500KHz	Pass





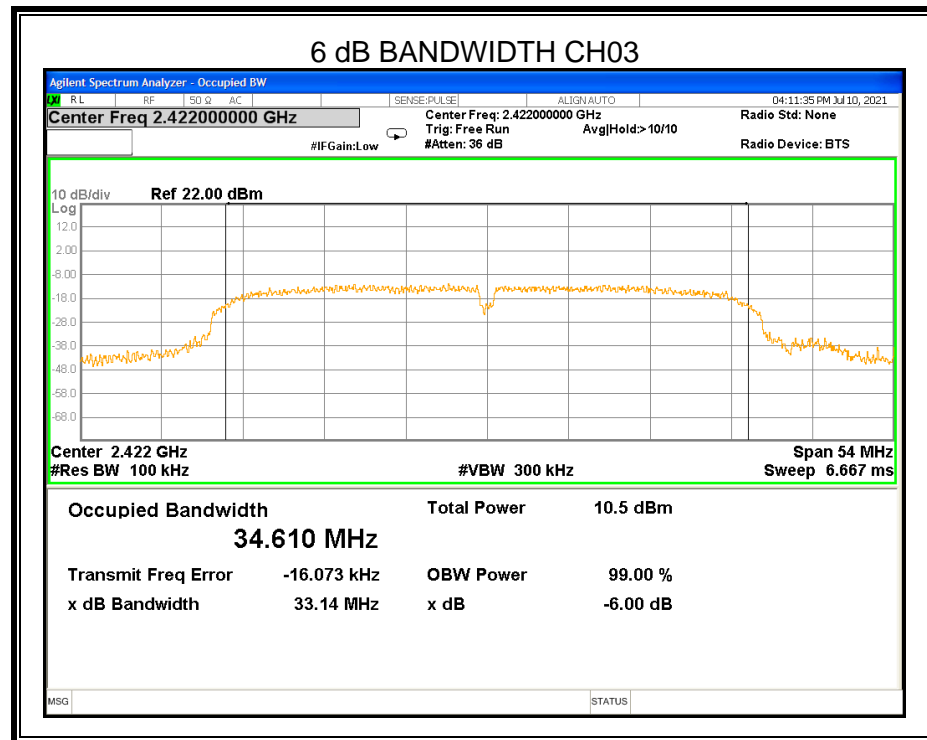




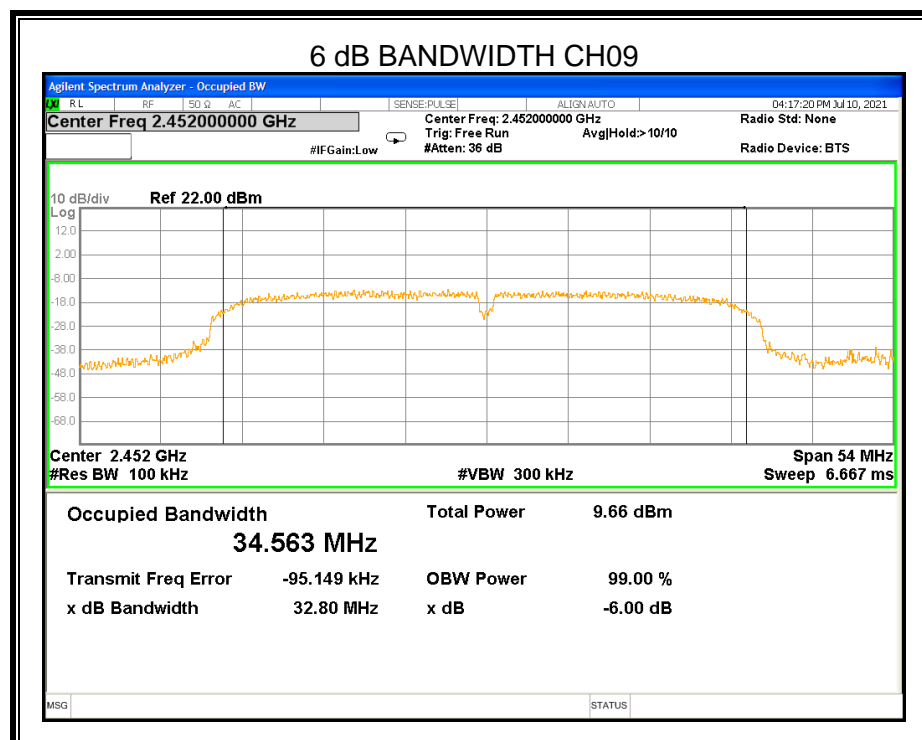
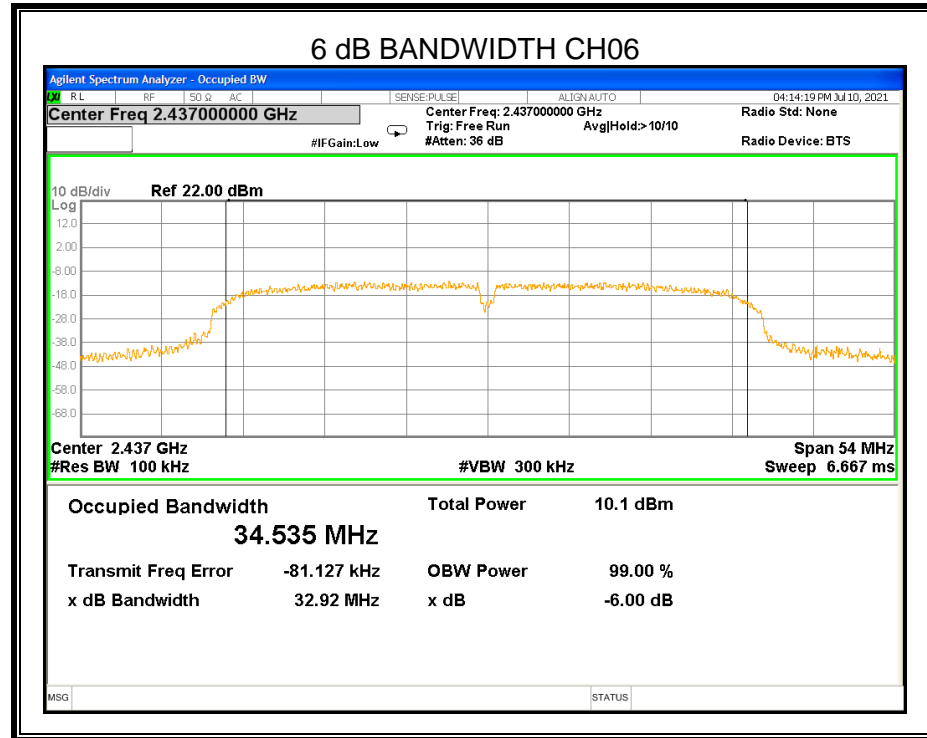


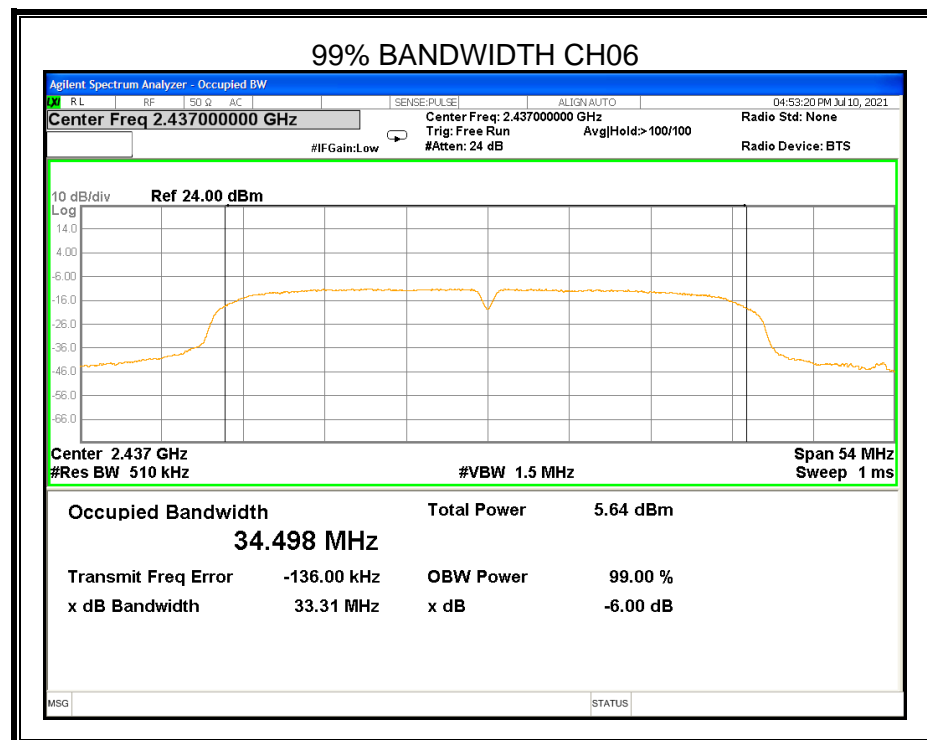
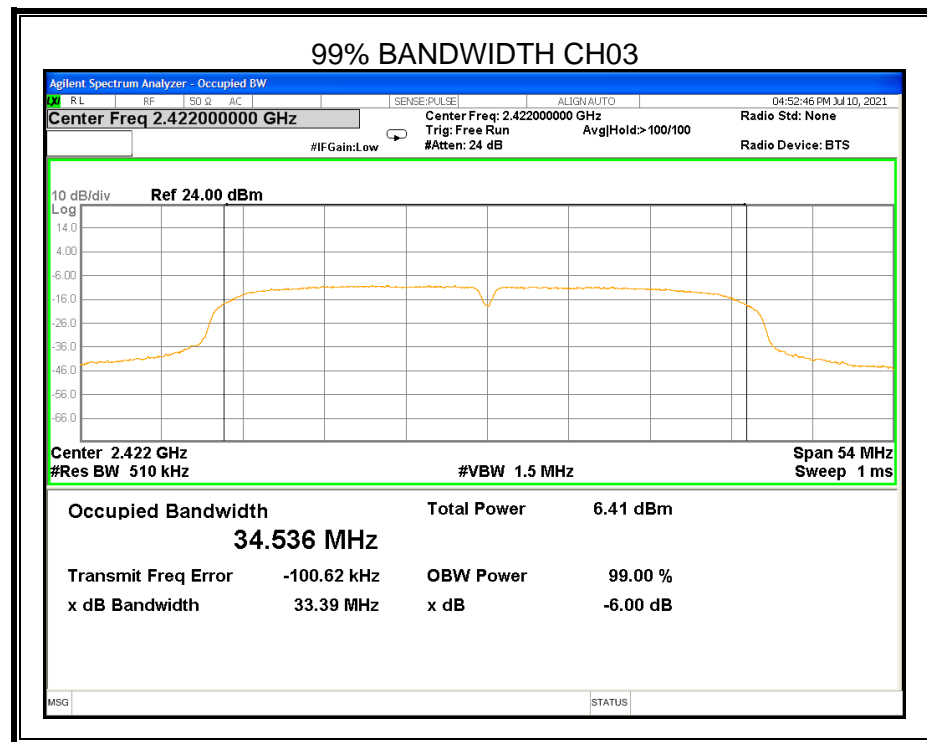
#### 8.2.4. 802.11n HT40 MODE

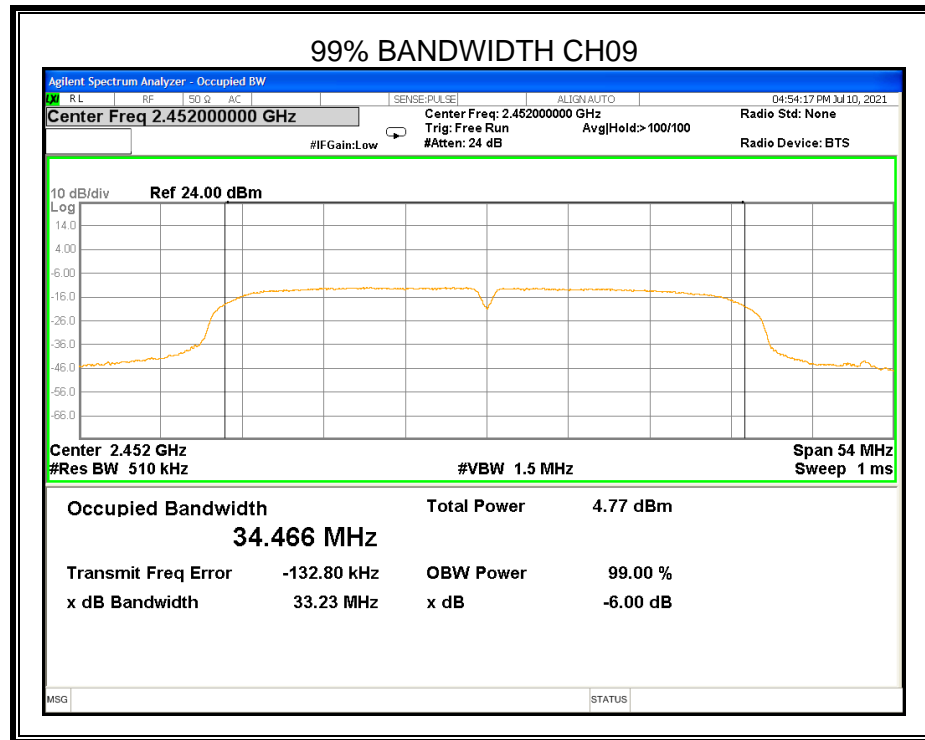
Channel	Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
CH03	2422	33.14	34.54	≥500KHz	Pass
CH06	2437	32.92	34.50	≥500KHz	Pass
CH09	2452	32.80	34.47	≥500KHz	Pass













### 8.3. CONDUCTED OUTPUT POWER

#### LIMITS

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

#### TEST PROCEDURE

802.11 b,g,n20:

Place the EUT on the table and set it in the transmitting mode.

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power sensor.

Measure peak and average power each channel.

802.11 n40:

Maximum conducted (average) output power:

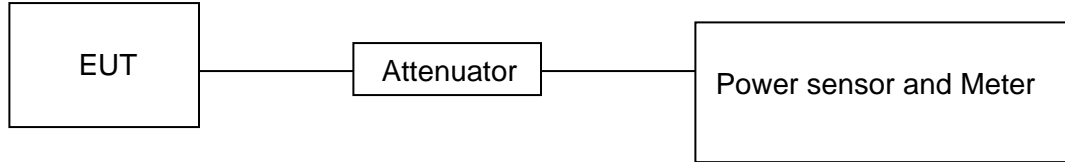
The procedure for this method is as follows:

- Set span to at least 1.5 times the OBW.
- Set RBW = 1% to 5% of the OBW, not to exceed 1 MHz.
- Set VBW  $\square$   $[3 \times \text{RBW}]$ .
- Number of points in sweep  $\square$   $[2 \times \text{span} / \text{RBW}]$ . (This gives bin-to-bin spacing  $\square$   $\text{RBW} / 2$ , so that narrowband signals are not lost between frequency bins.)
- Sweep time = auto.
- Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- If transmit duty cycle < 98%, use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall operate at the maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no OFF intervals) or at duty cycle  $\square$  98%, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run."
- Trace average at least 100 traces in power averaging (rms) mode.
- Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

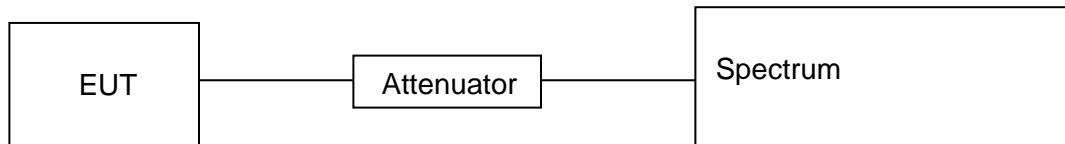


### TEST SETUP

802.11 b, g, n HT20:



802.11 n HT40:



### TEST ENVIRONMENT

Temperature	27.4°C	Relative Humidity	41%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V/60Hz



## RESULTS

### 8.3.1. 802.11b MODE

Test Channel	Frequency	Maximum Conducted Output Power (PK)	Maximum Conducted Output Power (AVG)	LIMIT
	(MHz)	(dBm)		dBm
CH01	2412	14.35	11.15	30
CH06	2437	13.69	10.57	30
CH11	2462	13.56	10.44	30

### 8.3.2. 802.11g MODE

Test Channel	Frequency	Maximum Conducted Output Power (PK)	Maximum Conducted Output Power (AVG)	LIMIT
	(MHz)	(dBm)		dBm
CH01	2412	20.29	15.85	30
CH06	2437	19.88	15.43	30
CH11	2462	19.53	15.16	30

### 8.3.3. 802.11n HT20 MODE

Test Channel	Frequency	Maximum Conducted Output Power (PK)	Maximum Conducted Output Power (AVG)	LIMIT
	(MHz)	(dBm)		dBm
CH01	2412	20.40	15.77	30
CH06	2437	20.04	15.30	30
CH11	2462	19.83	15.05	30

### 8.3.4. 802.11 n HT40 MODE

Test Channel	Frequency	Maximum Conducted Output Power (PK)	Maximum Conducted Output Power (AVG)	LIMIT
	(MHz)	(dBm)		dBm
CH03	2422	/	19.73	30
CH06	2437	/	19.09	30
CH09	2452	/	19.00	30

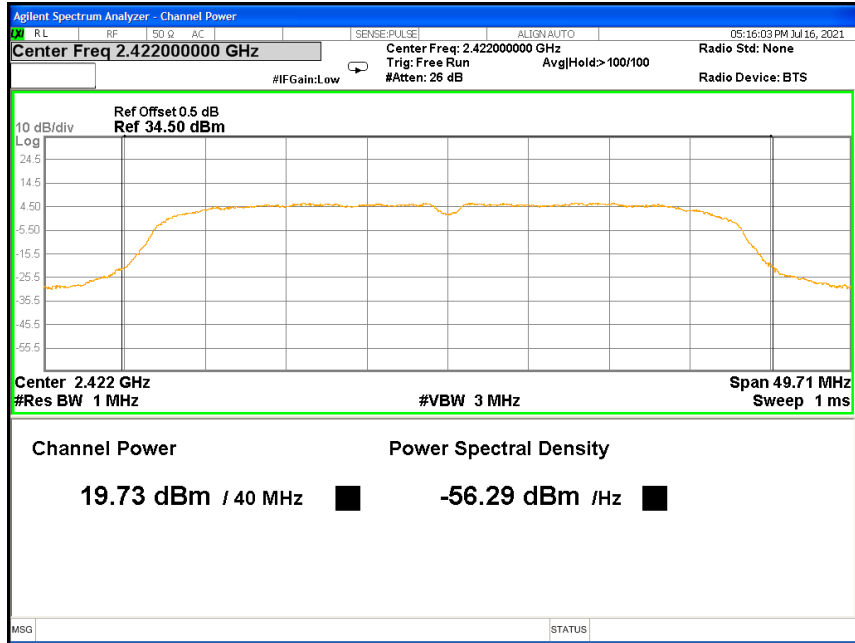


### RSS-247 EIRP Power

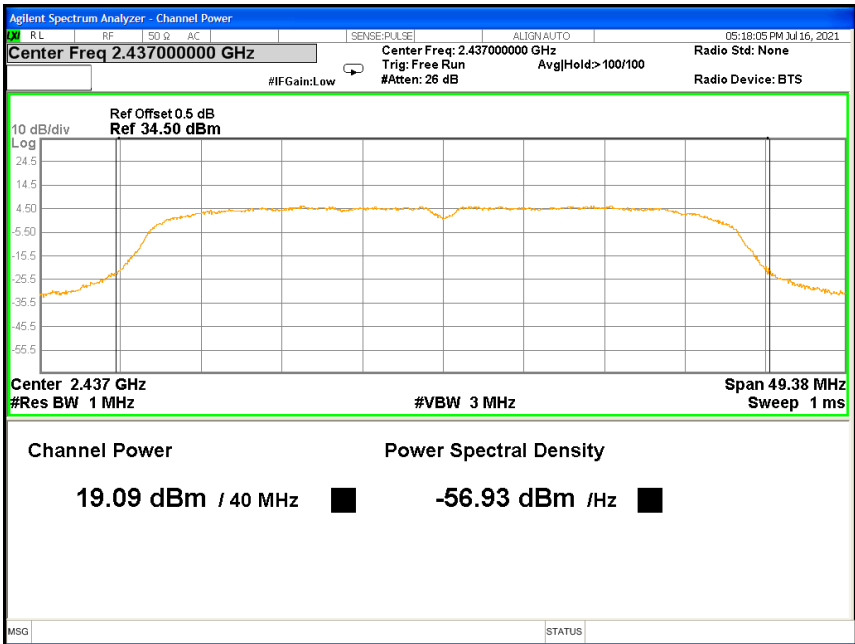
TX 802.11b Mode					
Test Channel	Frequency	Peak Power	Antenna Gain	EIRP Power	LIMIT
	(MHz)	(dBm)	(dBi)	(dBm)	dBm
CH01	2412	14.35	0.96	15.31	36.02
CH06	2437	13.69	0.96	14.65	36.02
CH11	2462	13.56	0.96	14.52	36.02
TX 802.11g Mode					
Test Channel	Frequency	Peak Power	Antenna Gain	EIRP Power	LIMIT
	(MHz)	(dBm)	(dBi)	(dBm)	dBm
CH01	2412	20.29	0.96	21.25	36.02
CH06	2437	19.88	0.96	20.84	36.02
CH11	2462	19.53	0.96	20.49	36.02
TX 802.11n20 Mode					
Test Channel	Frequency	Peak Power	Antenna Gain	EIRP Power	LIMIT
	(MHz)	(dBm)	(dBi)	(dBm)	dBm
CH01	2412	20.40	0.96	21.36	36.02
CH06	2437	20.04	0.96	21.00	36.02
CH11	2462	19.83	0.96	20.79	36.02
TX 802.11n40 Mode					
Test Channel	Frequency	Average Power	Antenna Gain	EIRP Power	LIMIT
	(MHz)	(dBm)	(dBi)	(dBm)	dBm
CH03	2422	19.73	0.96	20.69	36.02
CH06	2437	19.09	0.96	20.05	36.02
CH09	2452	19.00	0.96	19.96	36.02



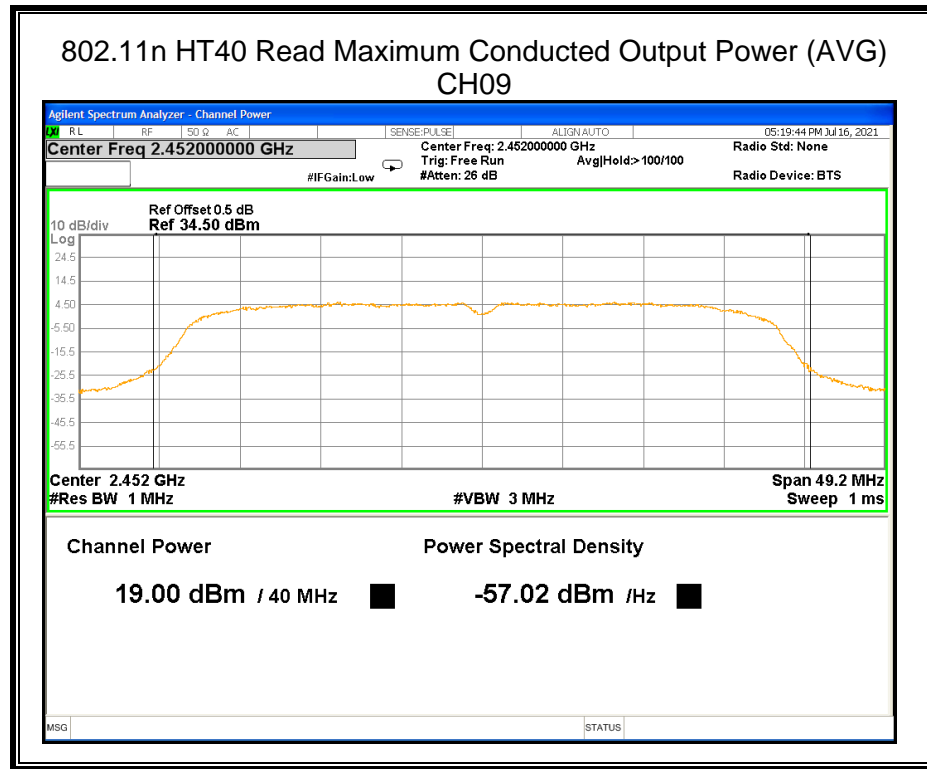
802.11n HT40 Read Maximum Conducted Output Power (AVG)  
CH03



802.11n HT40 Read Maximum Conducted Output Power (AVG)  
CH06









## 8.4. POWER SPECTRAL DENSITY

### LIMITS

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

### TEST PROCEDURE

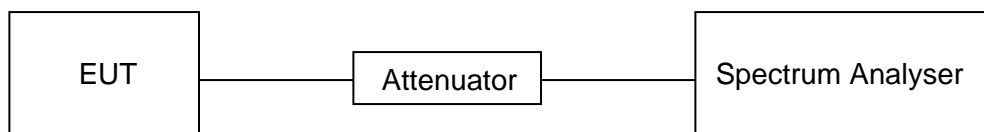
Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre 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.

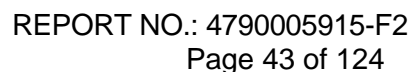
If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

### TEST SETUP



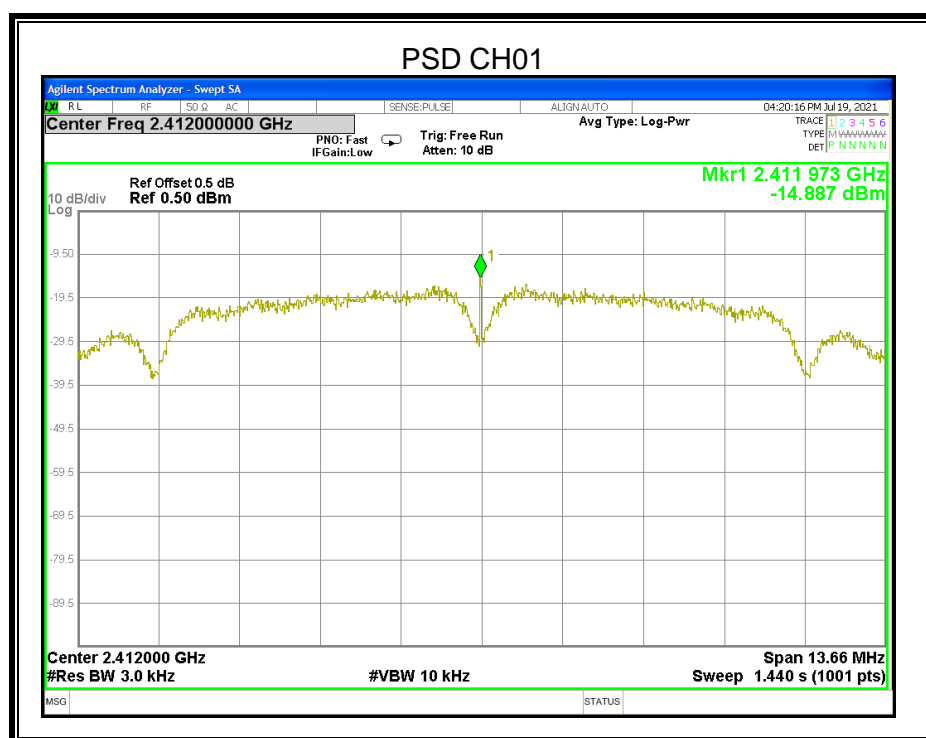
### TEST ENVIRONMENT

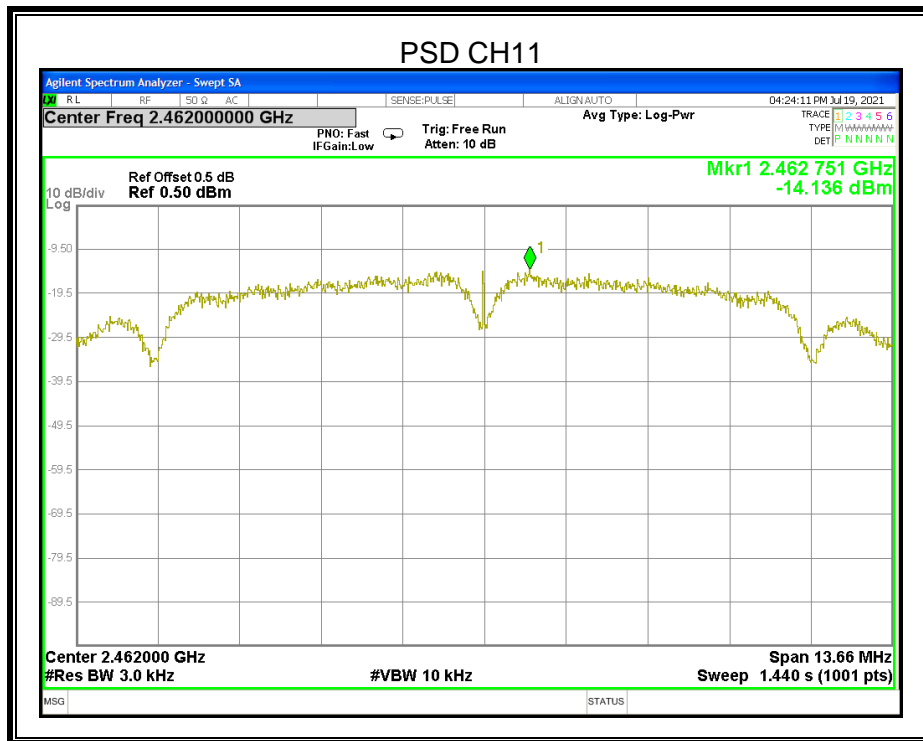
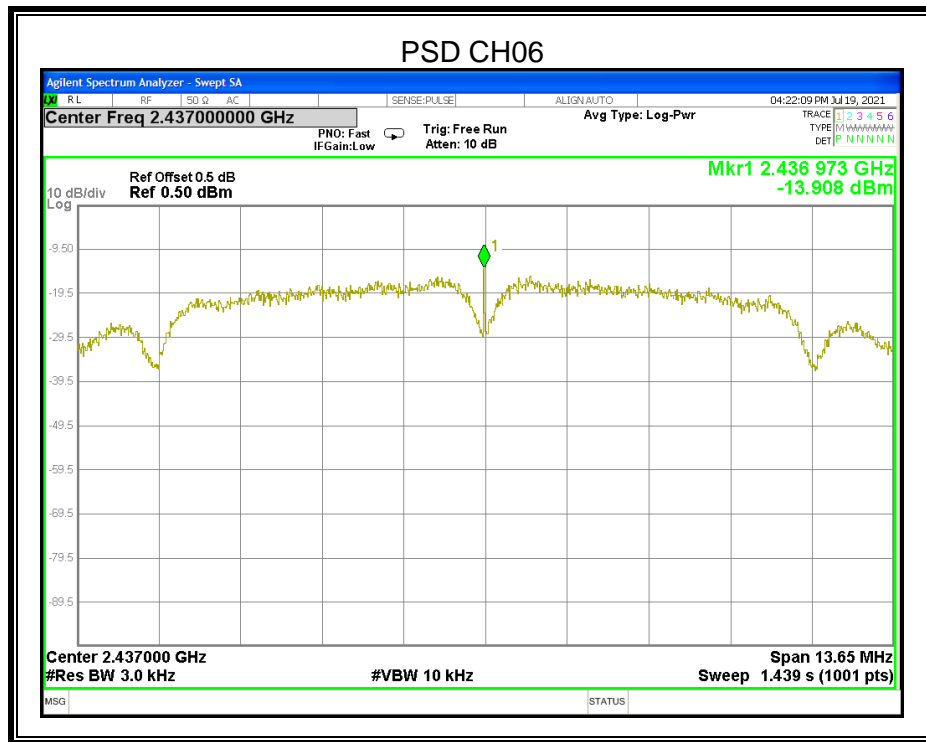
Temperature	27.4°C	Relative Humidity	41%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V/60Hz

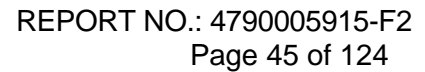


### 8.4.1. 802.11b MODE

Test Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH01	2412	-14.887	≤8	PASS
CH06	2437	-13.908	≤8	PASS
CH11	2462	-14.136	≤8	PASS



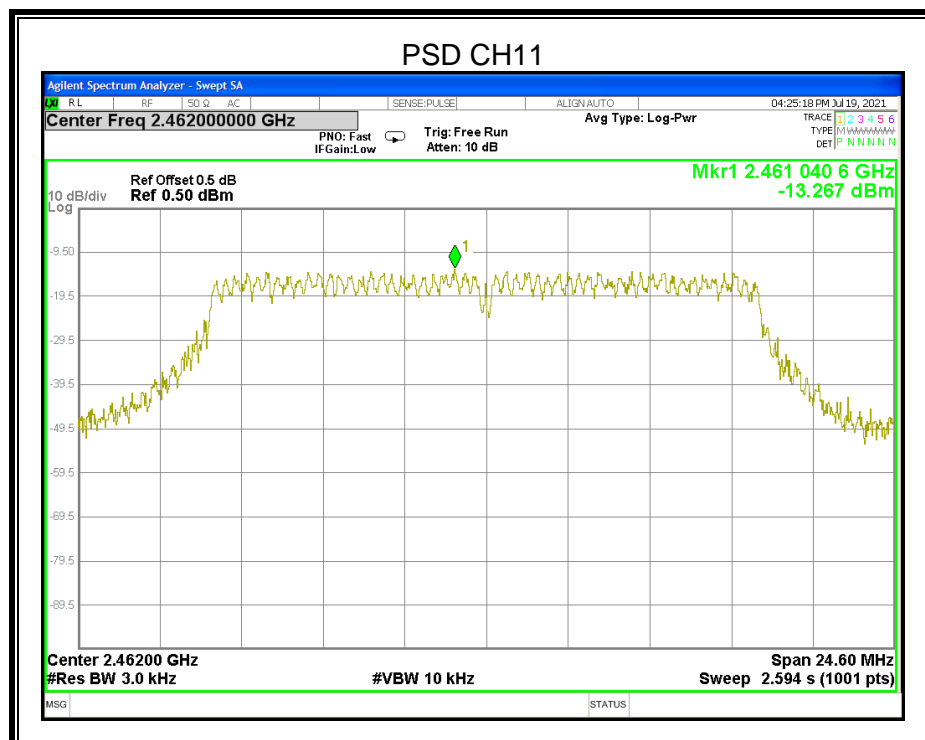
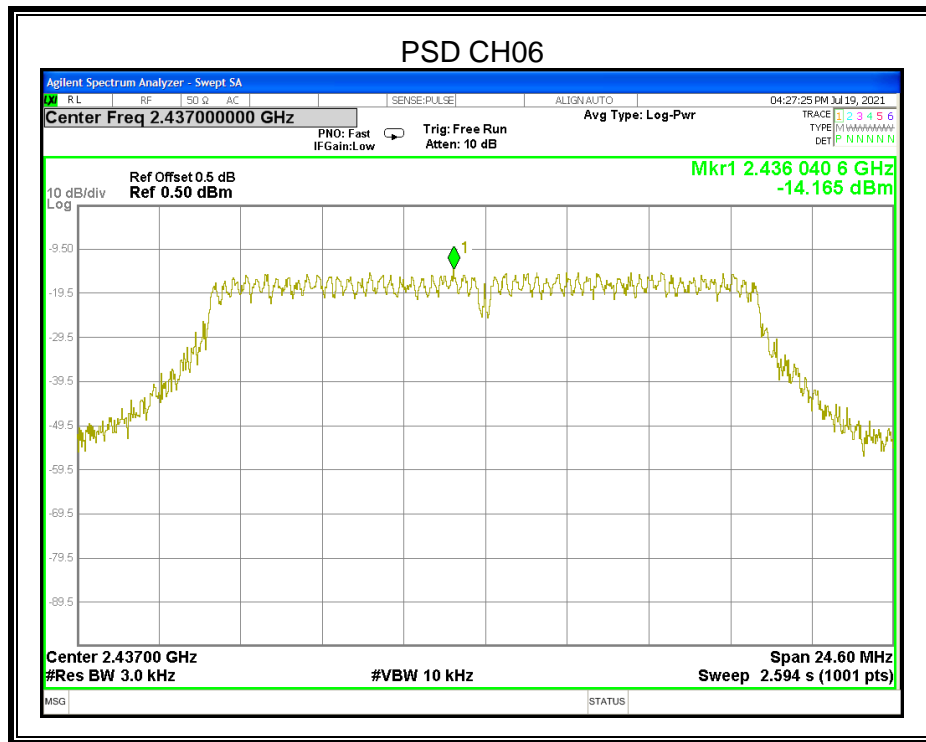




Test Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH01	2412	-14.6740	≤8	PASS
CH06	2437	-14.1650	≤8	PASS
CH11	2462	-13.2670	≤8	PASS



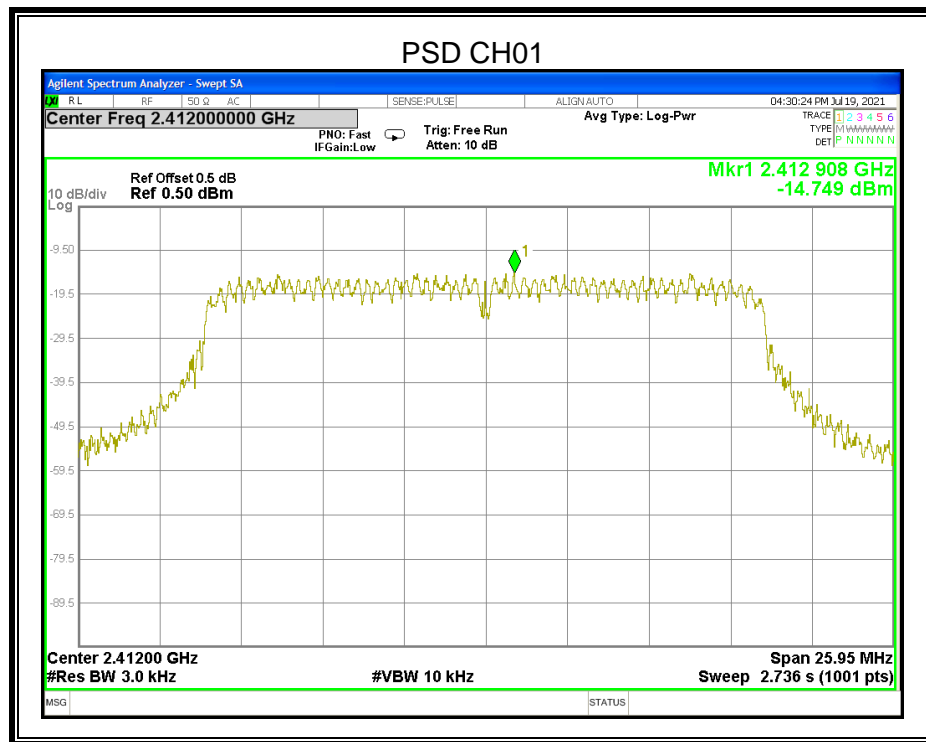
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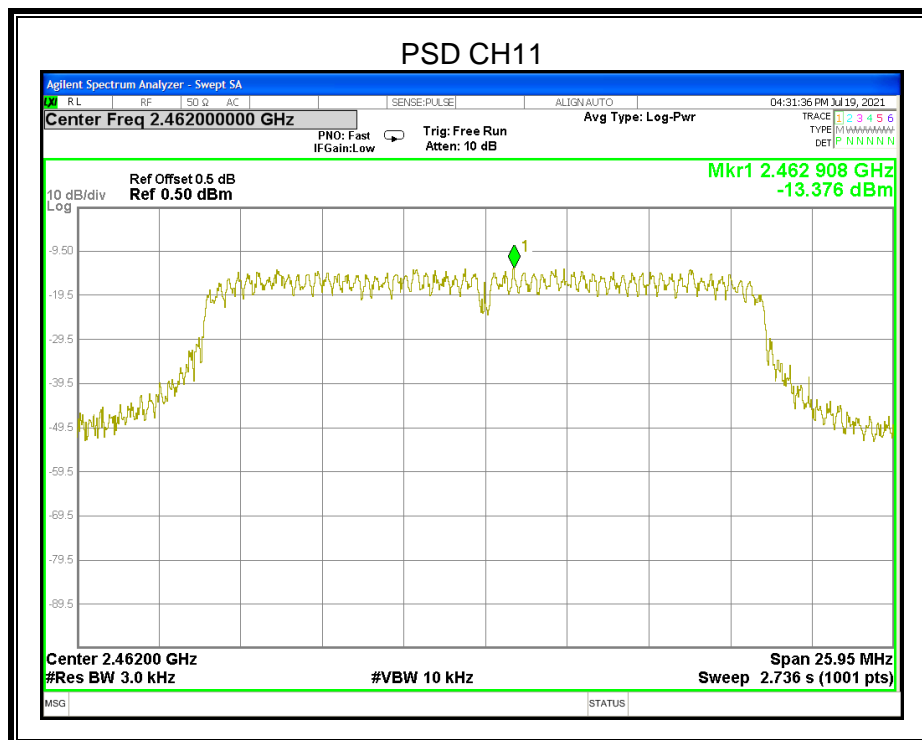
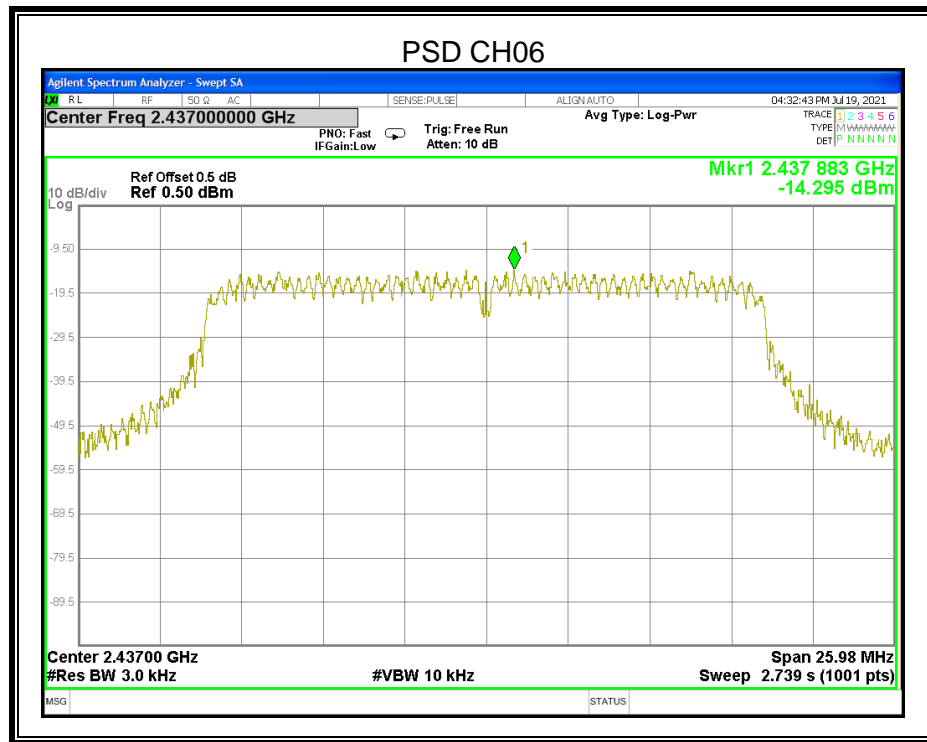




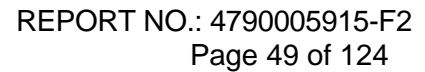
#### 8.4.3. 802.11n HT20 MODE

Test Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH01	2412	-14.7490	≤8	PASS
CH06	2437	-14.2950	≤8	PASS
CH11	2462	-13.3760	≤8	PASS



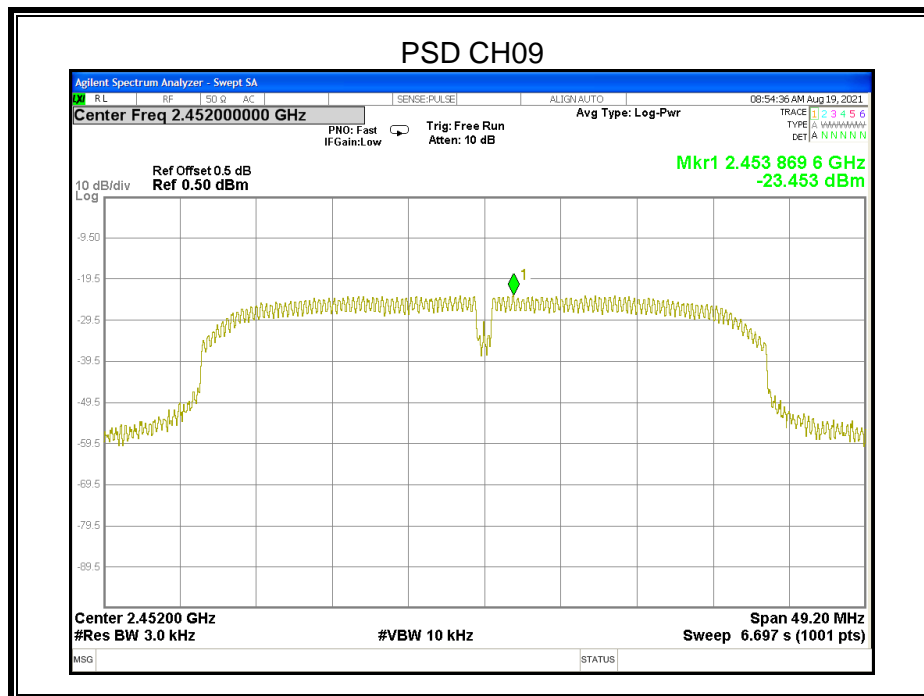
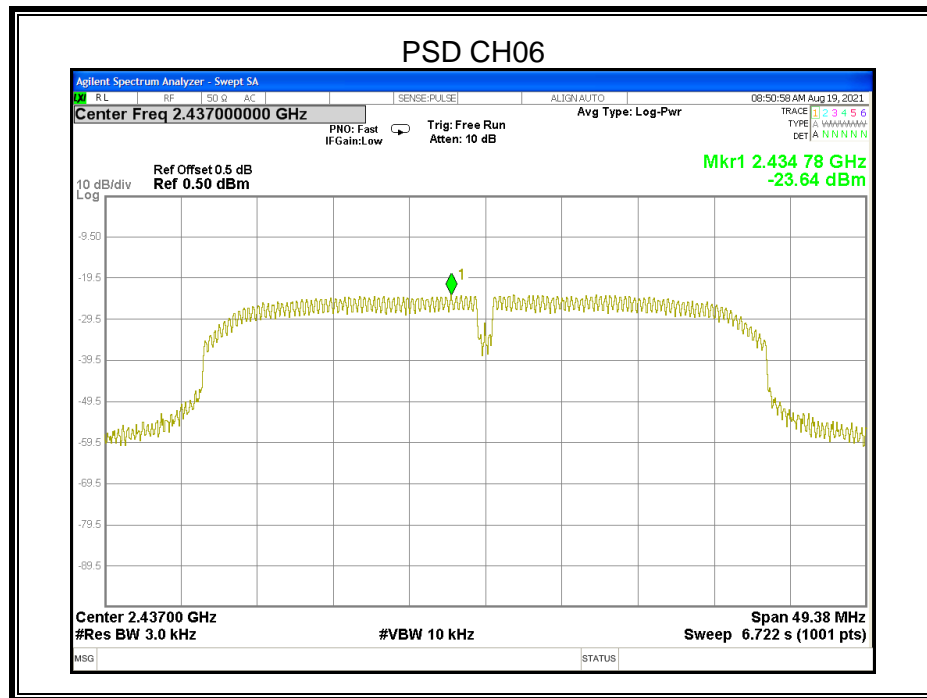






Test Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH03	2422	-24.1100	≤8	PASS
CH06	2437	-23.6400	≤8	PASS
CH09	2452	-23.4530	≤8	PASS







## 8.5. CONDUCTED BANDEGE AND SPURIOUS EMISSIONS

### LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2		
Section	Test Item	Limit
FCC §15.247 (d) RSS-247 5.5	Conducted Bandedge and Spurious Emissions	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

### TEST PROCEDURE

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

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

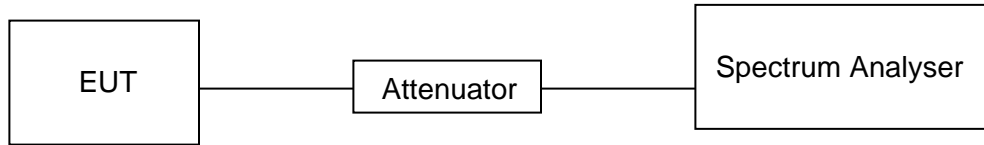
Use the peak marker function to determine the maximum PSD level.

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

Use the peak marker function to determine the maximum amplitude level.



## TEST SETUP

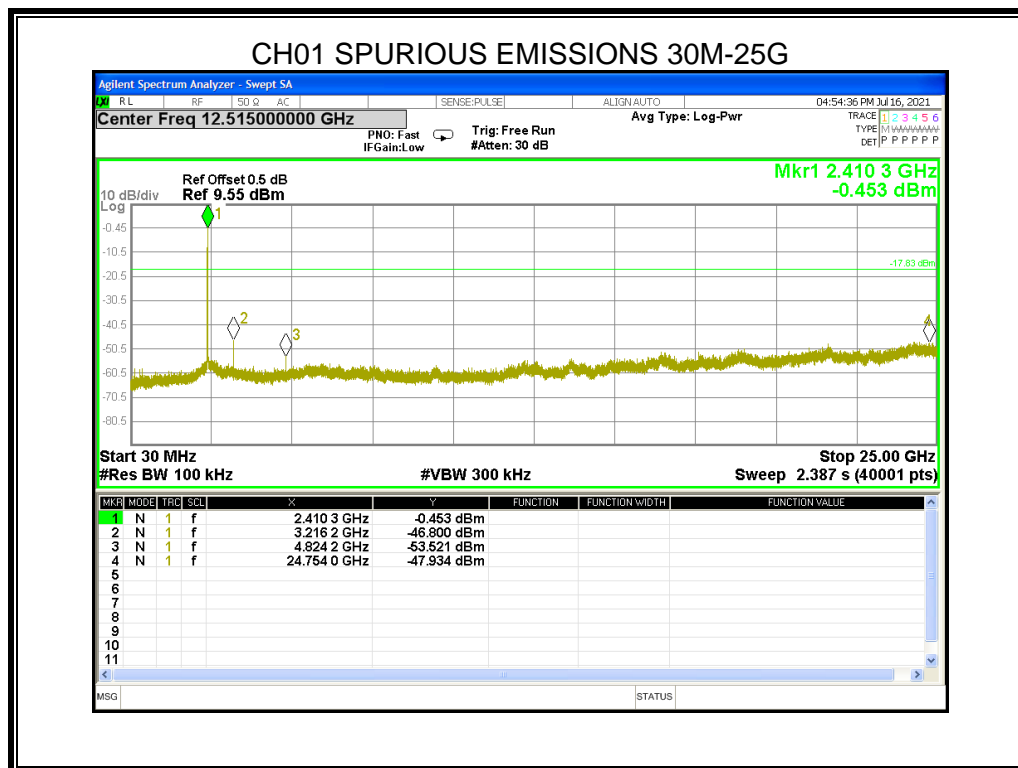


## TEST ENVIRONMENT

Temperature	27.4°C	Relative Humidity	41%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V/60Hz

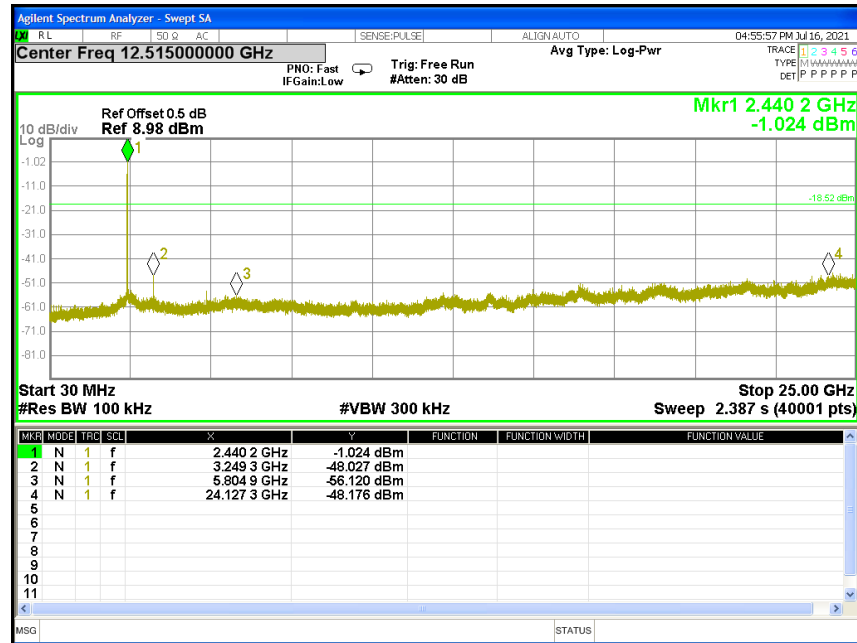
## RESULTS

### 8.5.1. 802.11b MODE

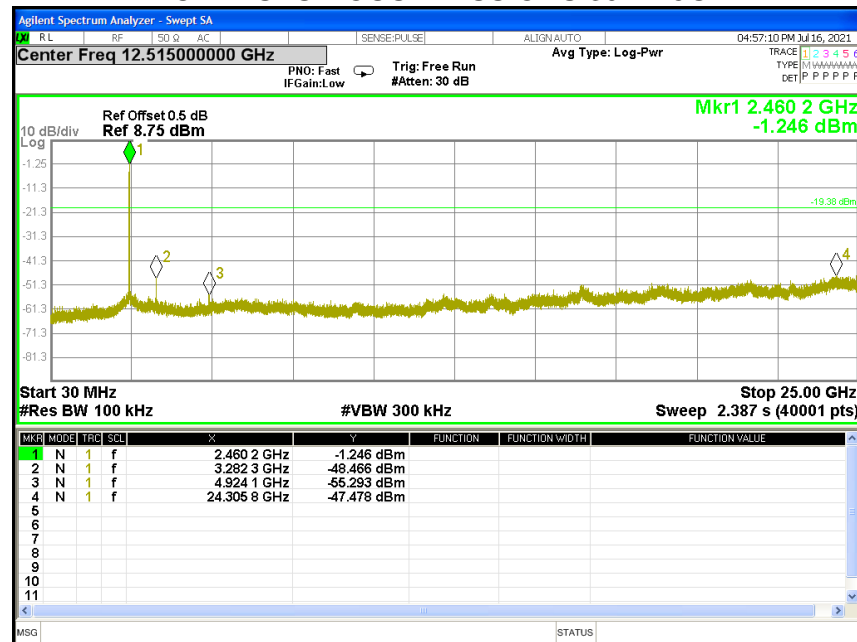




### CH06 SPURIOUS EMISSIONS 30M-25G

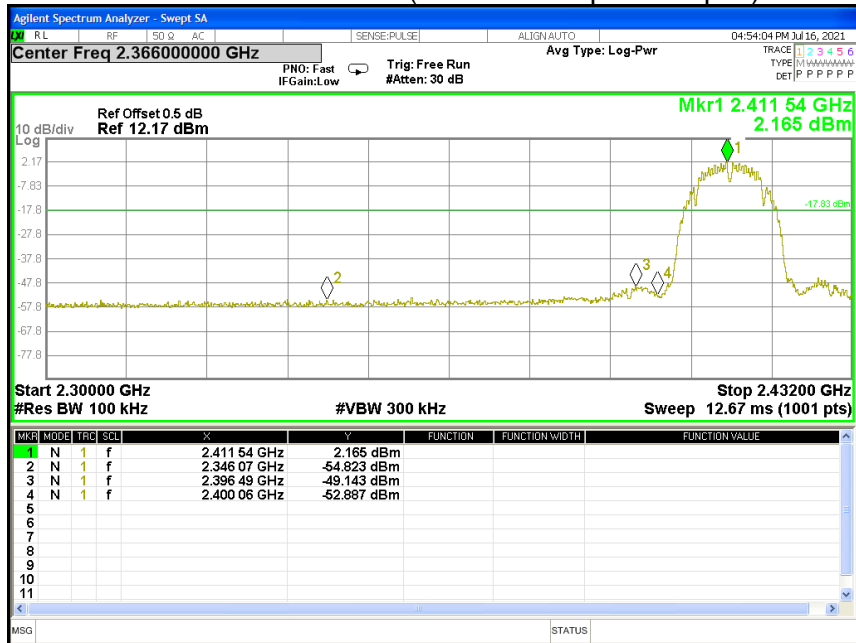


### CH11 SPURIOUS EMISSIONS 30M-25G

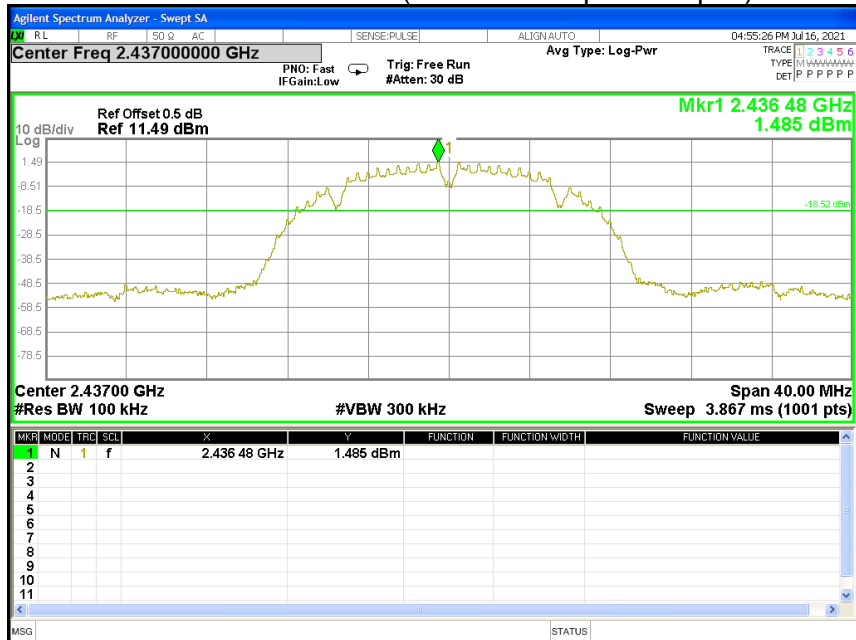


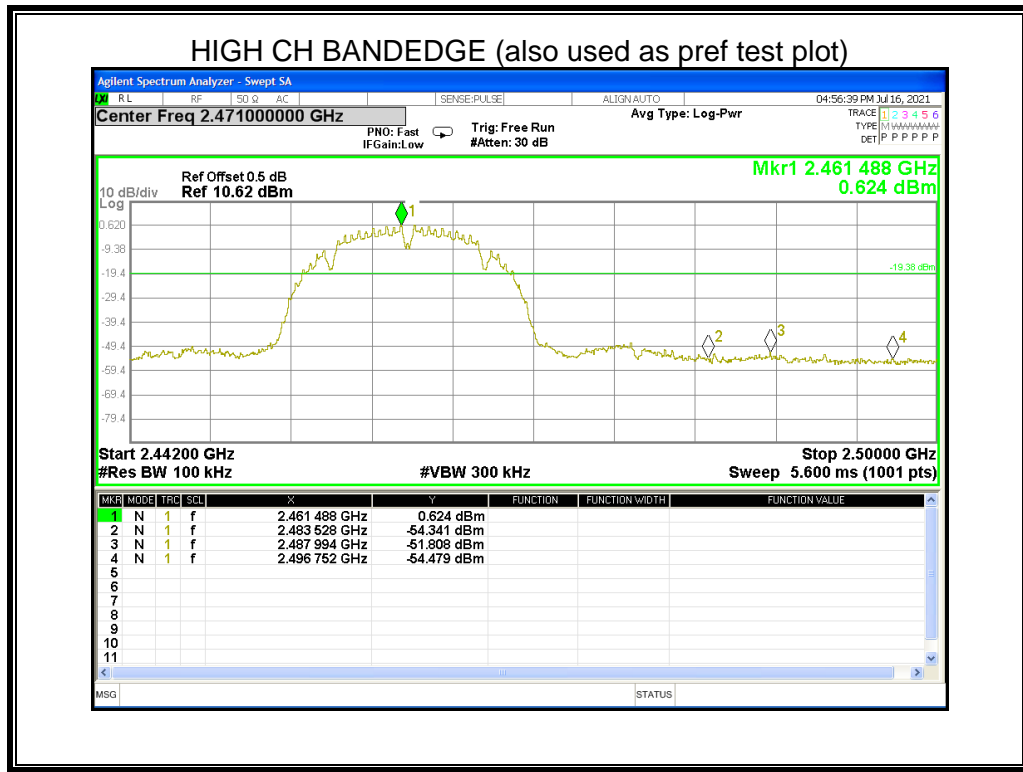


### LOW CH BANDEDGE (also used as pref test plot)



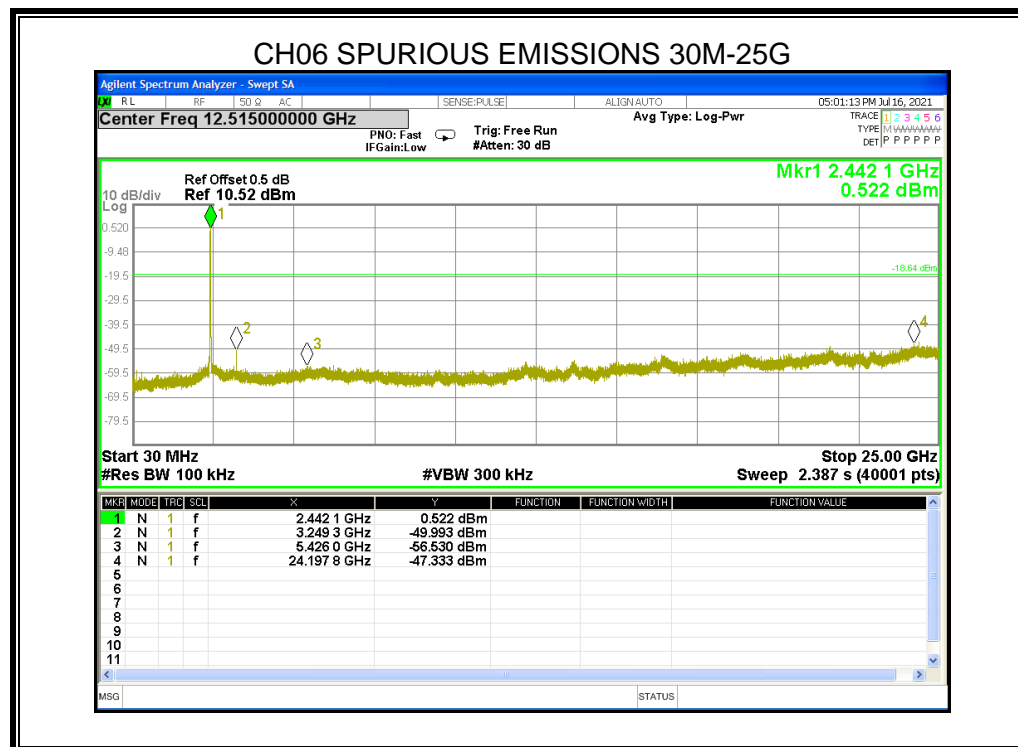
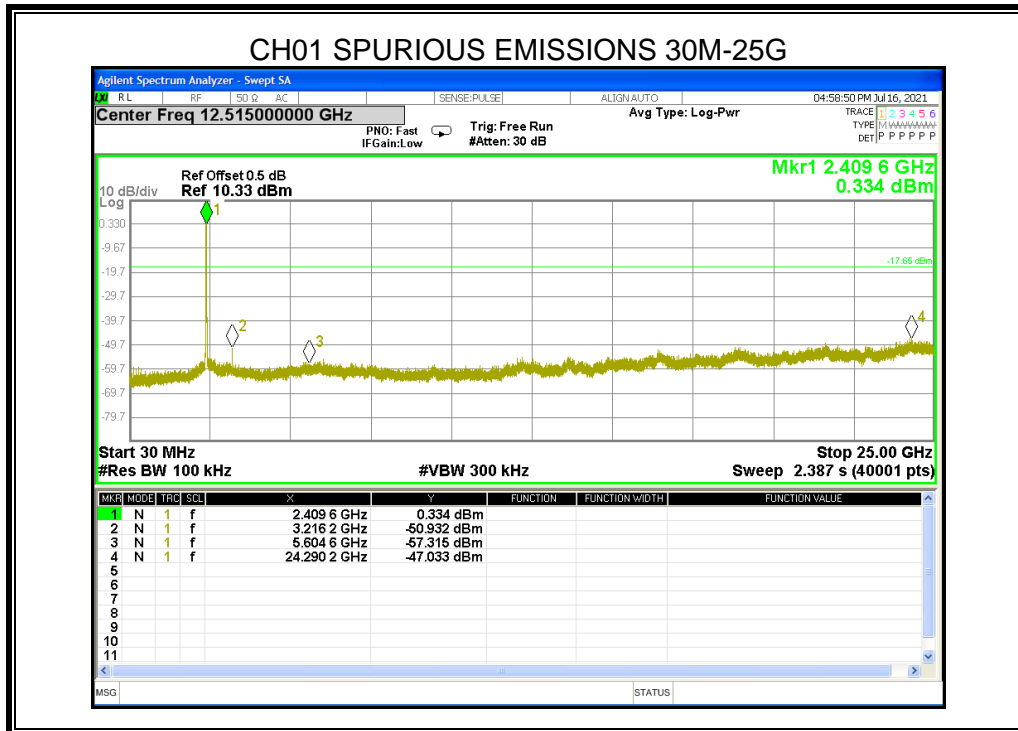
### MID CH BANDEDGE (also used as pref test plot)



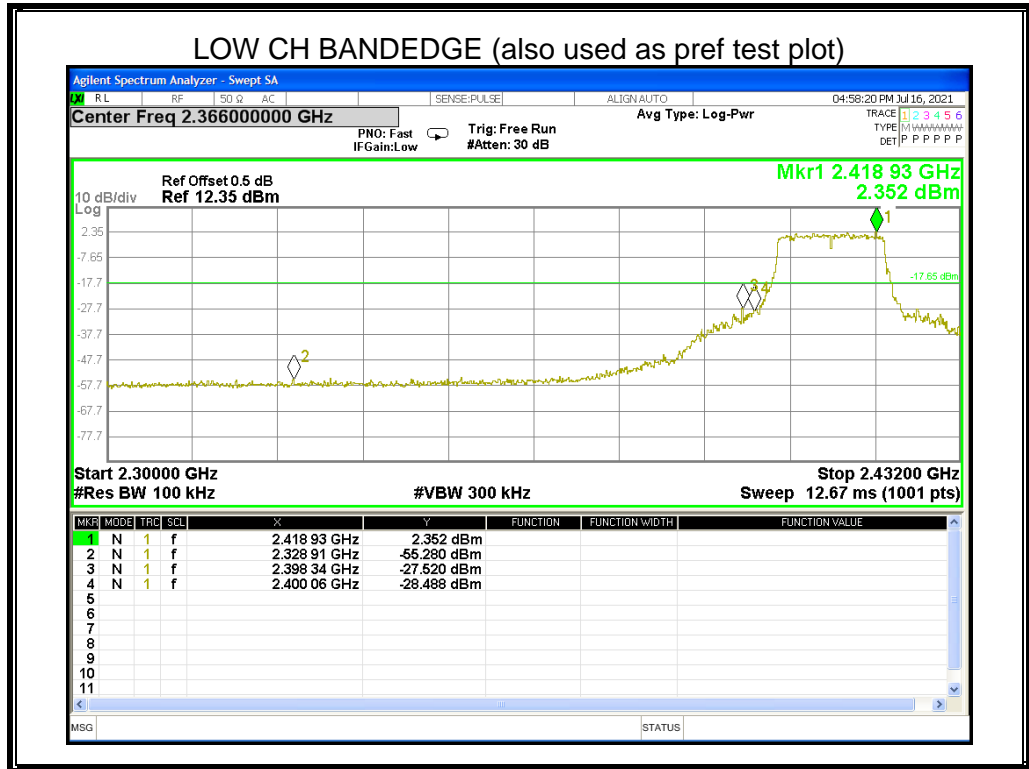




## 8.5.2. 802.11g MODE

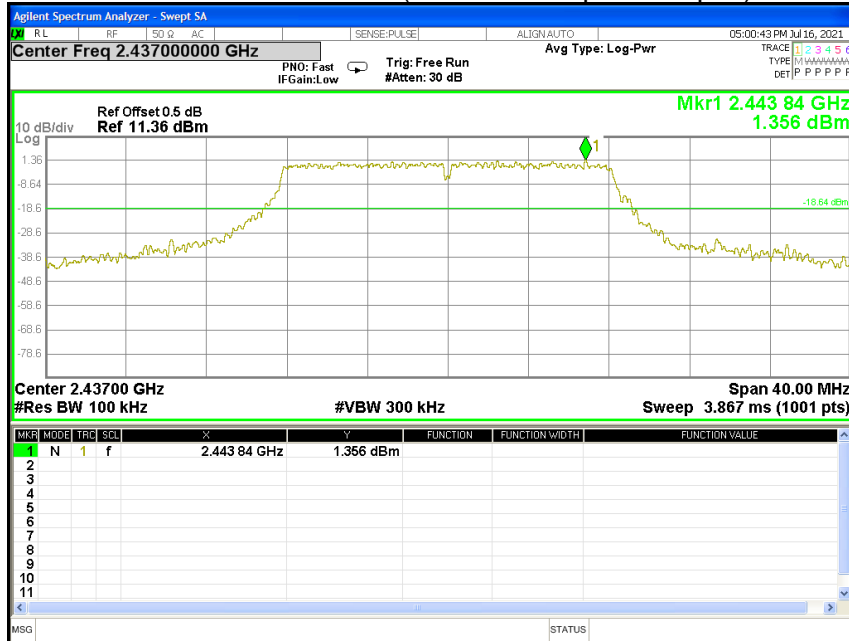




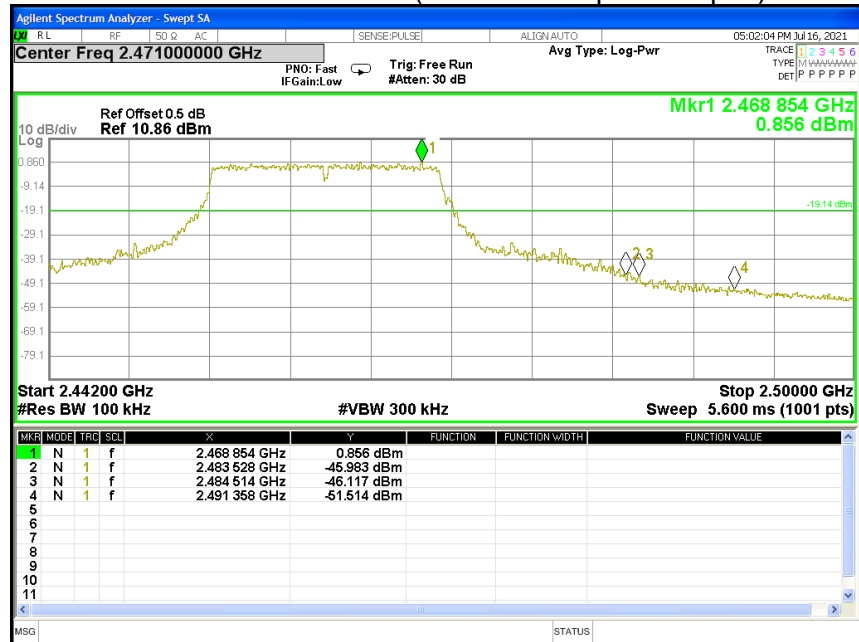




### MID CH BANDEDGE (also used as pref test plot)

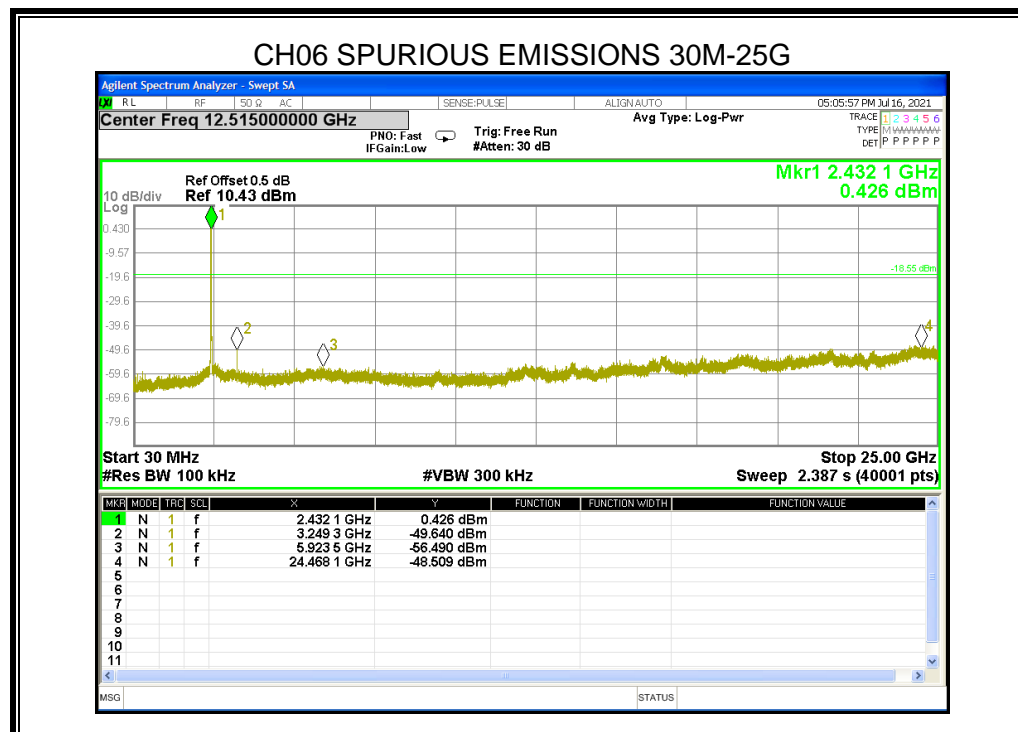
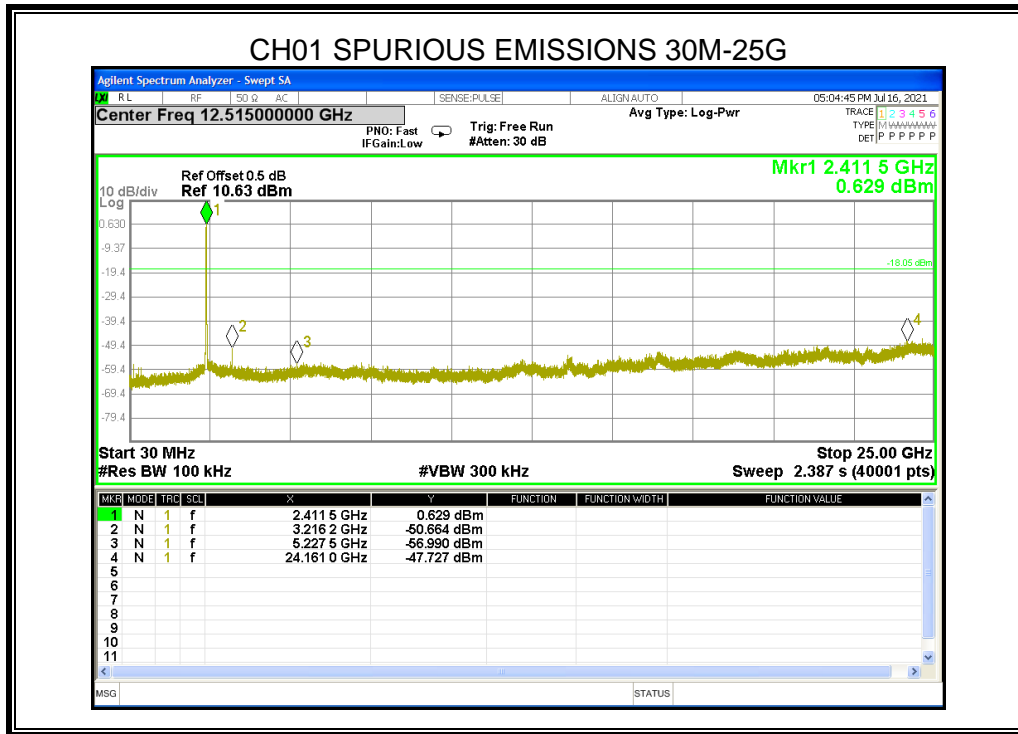


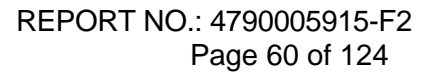
### HIGH CH BANDEDGE (also used as pref test plot)





### 8.5.3. 802.11n HT20 MODE





Agilent Spectrum Analyzer - Swept SA

Center Freq 12.51500000 GHz

Ref Offset 0.5 dB  
Ref 9.78 dBm

Trig: Free Run  
#Atten: 30 dB

Avg Type: Log-Pwr

05:07:13 PM Jul 16, 2021

TRACE 1 2 3 4 5  
TYPE I Q V X Y  
DET P P P P P

10 dB/div  
Log

Mkr1 2.465 2 GHz  
-0.217 dBm

-10.92 dBm

Start 30 MHz  
#Res BW 100 kHz

#VBW 300 kHz

Stop 25.00 GHz  
Sweep 2.387 s (40001 pts)

MSG	MODE	TRC	SOL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.465 2 GHz	-0.217 dBm			
2	N	1	f	3.282 3 GHz	-50.913 dBm			
3	N	1	f	5.942 9 GHz	-67.113 dBm			
4	N	1	f	24.664 2 GHz	-47.684 dBm			

Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω AC SENSE:PULSE ALIGN: AUTO Avg Type: Log-Pwr 05:04:14 PM Jul 16, 2021

Center Freq 2.366000000 GHz

PNO: Fast Trig: Free Run IF Gain: Low #Atten: 30 dB

Ref Offset 0.5 dB Ref 11.95 dBm

Mkr1 2.411 41 GHz 1.952 dBm

Start 2.30000 GHz Stop 2.43200 GHz

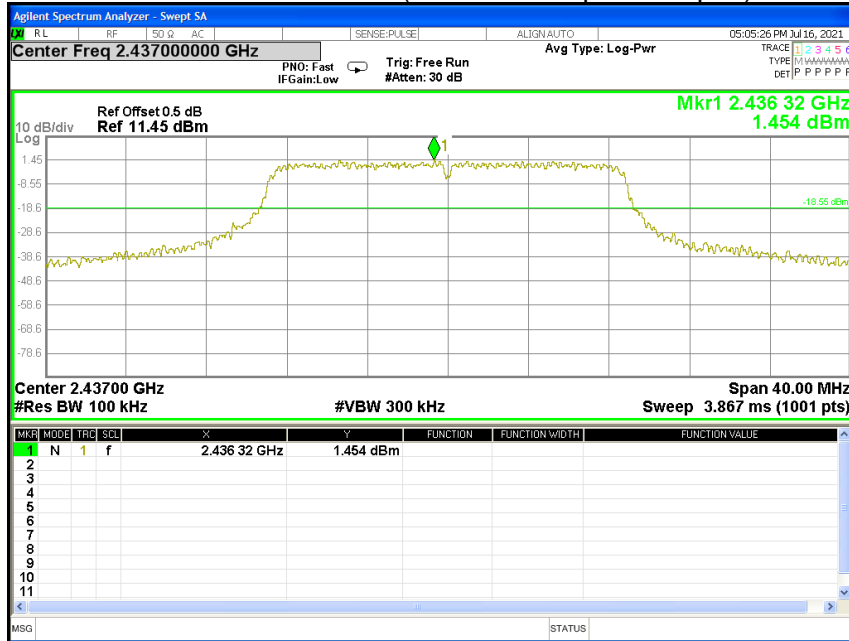
#Res BW 100 kHz #VBW 300 kHz Sweep 12.67 ms (1001 pts)

Mkrs	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.411 41 GHz	1.952 dBm			
2	N	1	f	2.339 73 GHz	-55.382 dBm			
3	N	1	f	2.399 40 GHz	-30.740 dBm			
4	N	1	f	2.400 06 GHz	-30.203 dBm			

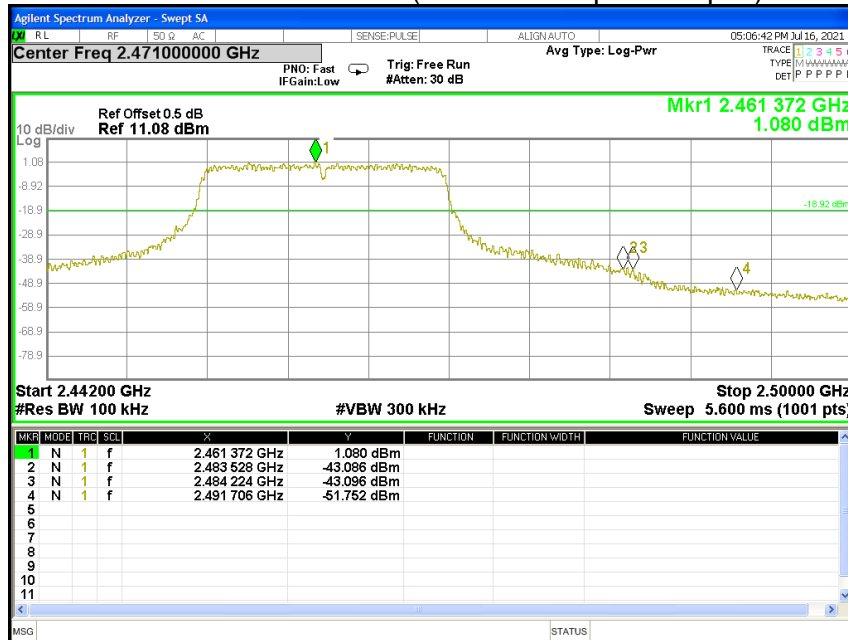
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### MID CH BANDEDGE (also used as pref test plot)

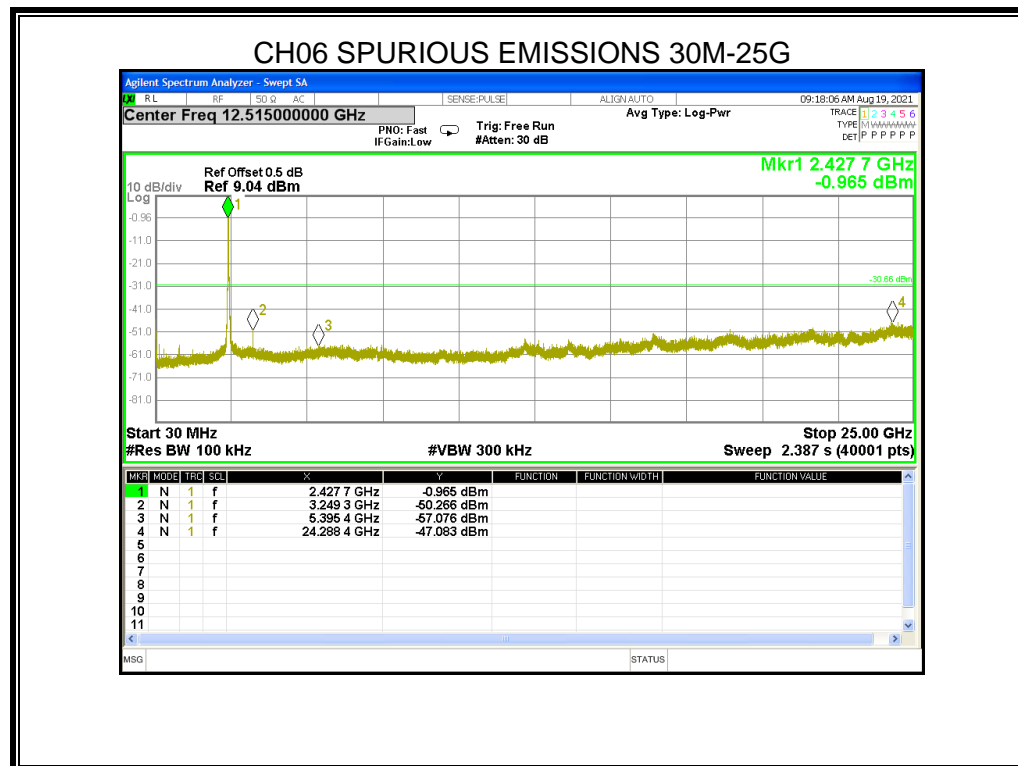
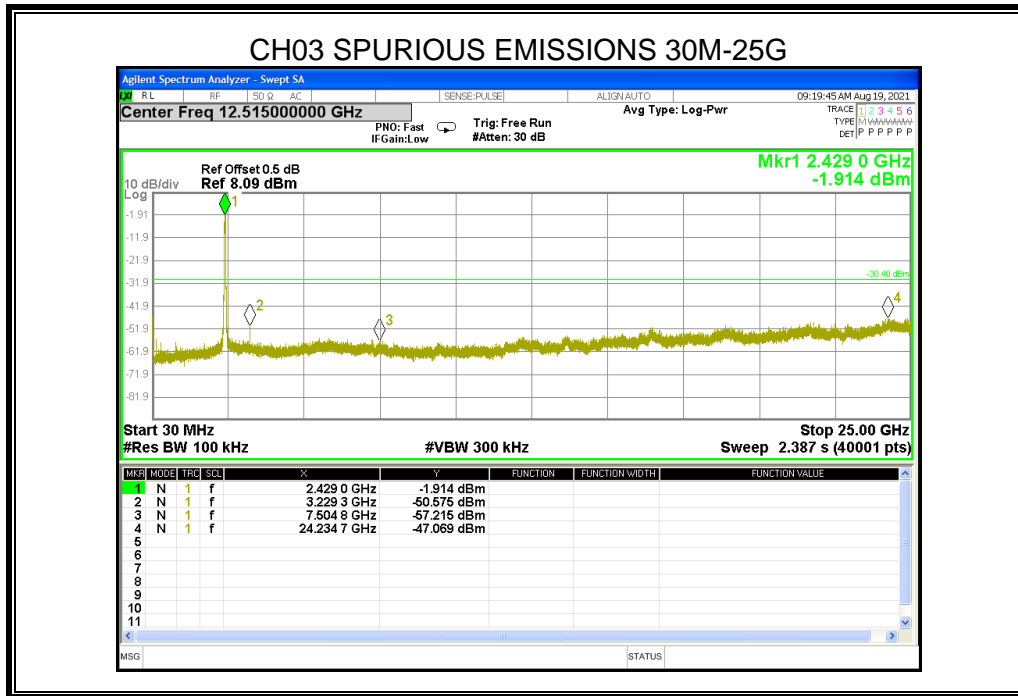


### HIGH CH BANDEDGE (also used as pref test plot)



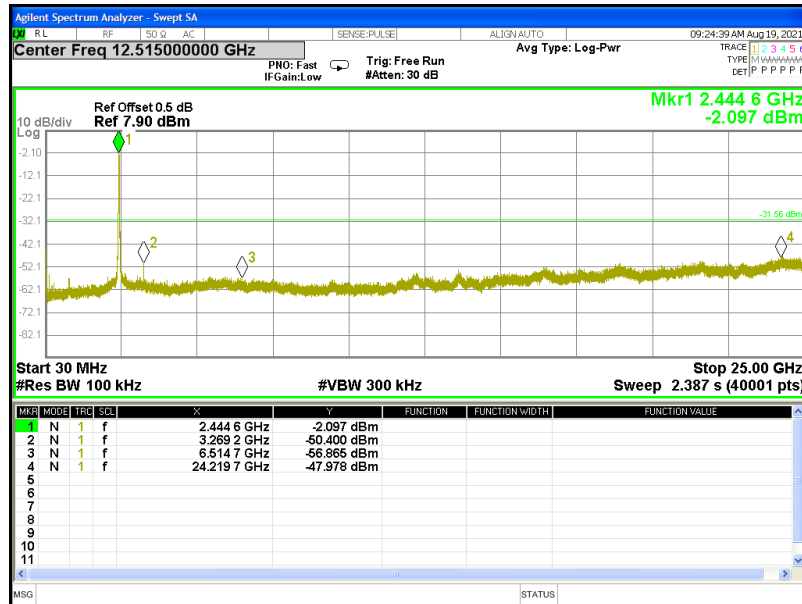


#### 8.5.4. 802.11n HT40 MODE

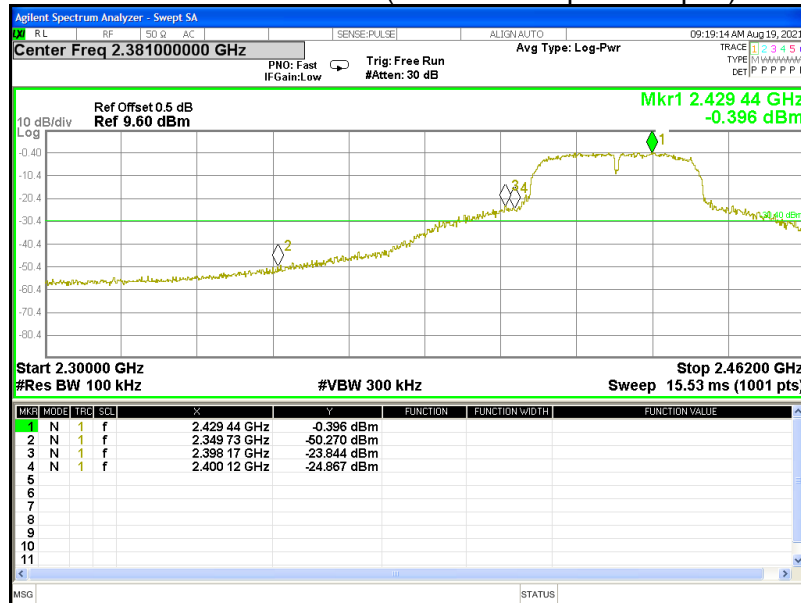


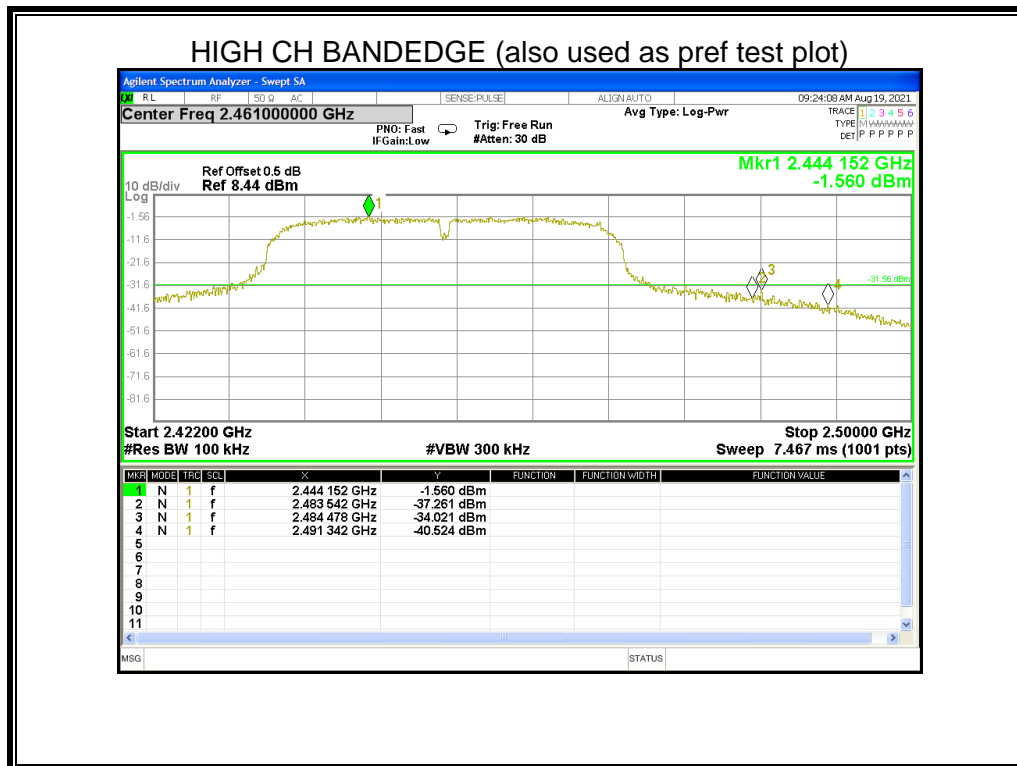
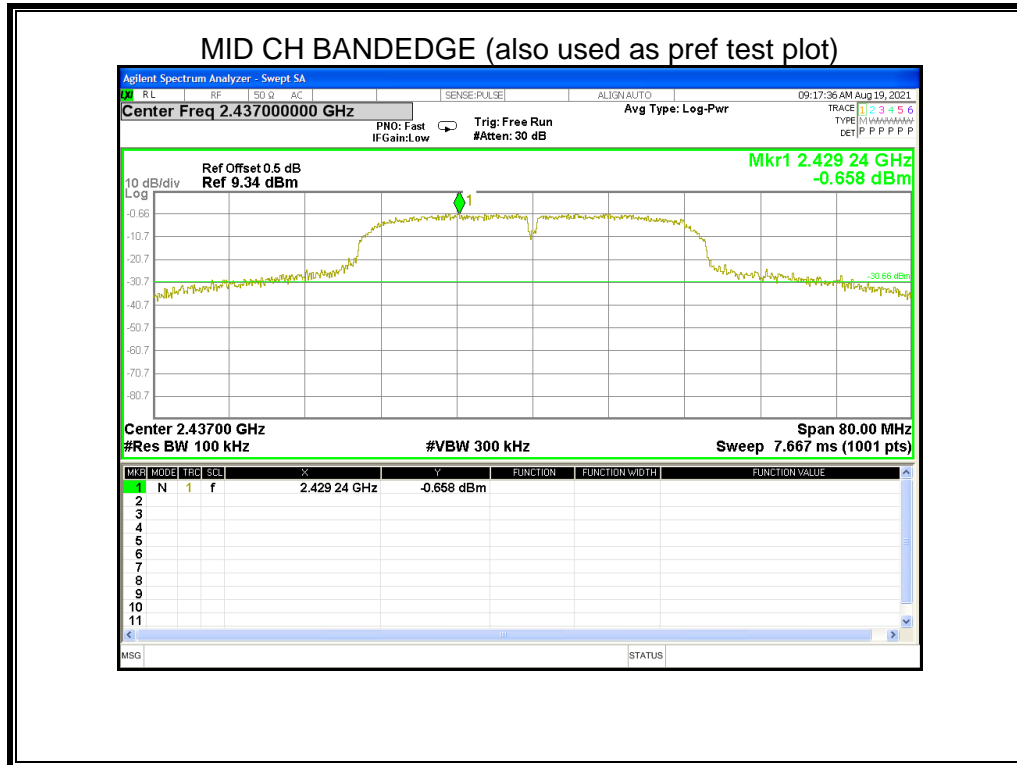
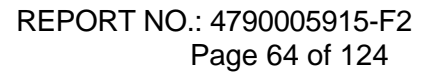


### CH09 SPURIOUS EMISSIONS 30M-25G



### LOW CH BANDEDGE (also used as pref test plot)









## 9. RADIATED TEST RESULTS

### LIMITS

Please refer to FCC §15.205 and §15.209

Please refer to RSS-GEN Clause 8.9 (Transmitter)

Radiation Disturbance Test Limit for FCC (Class B)(9KHz-1GHz)

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
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

Note: 1) At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

(2) At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). This paragraph (f) shall not apply to Access BPL devices operating below 30 MHz.



Radiation Disturbance Test Limit for RSS-Gen (9KHz-1GHz)

Frequencies (MHz)	Magnetic field strength (H-Field) ( $\mu\text{A/m}$ )	Measurement Distance (meters)
0.009~0.490	6.37/F(KHz)	300
0.490~1.705	63.7/F(KHz)	30
1.705~30.0	0.08	30

Frequencies (MHz)	Field strength ( $\mu\text{V/m}$ at 3 m)
30~88	100
88~216	150
216~960	200
Above 960	500

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

Radiation Disturbance Test Limit for FCC (Above 1G)

Frequency (MHz)	dB( $\mu\text{V/m}$ ) (at 3 meters)	
	Peak	Average
Above 1000	74	54

Restricted bands of operation

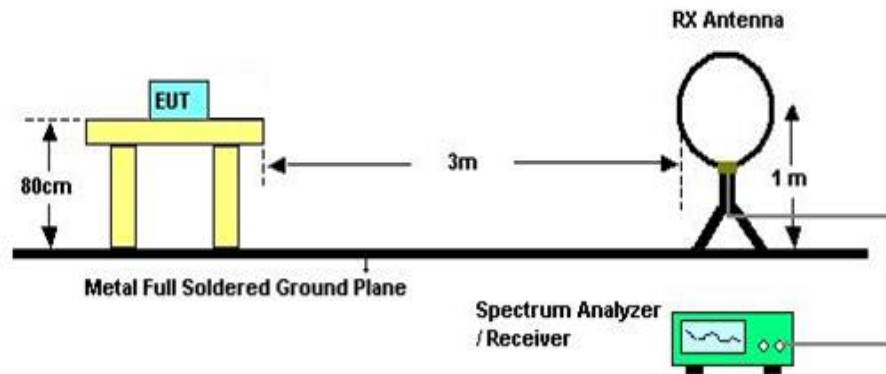
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
<sup>1</sup> 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
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 30MHz



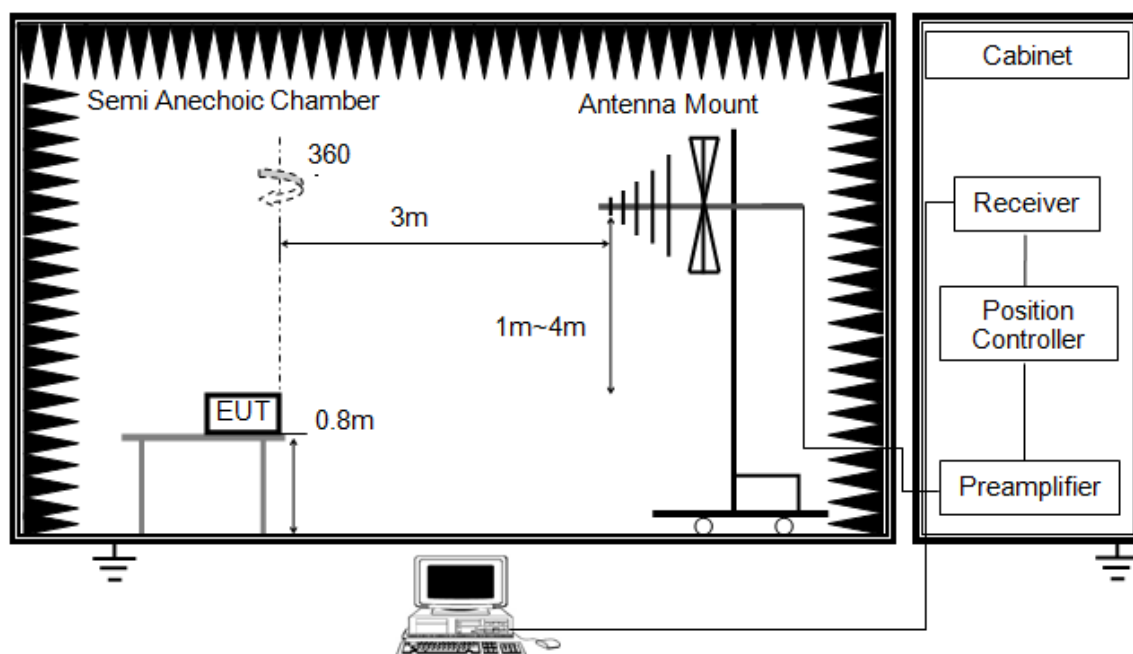
The setting of the spectrum analyser

RBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
VBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
Sweep	Auto
Detector	Peak/QP/ Average
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013
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 and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 0.8 meter 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 1GHz, 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.
6. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

Note: Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m open area test 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 based on KDB 414788.

Below 1G

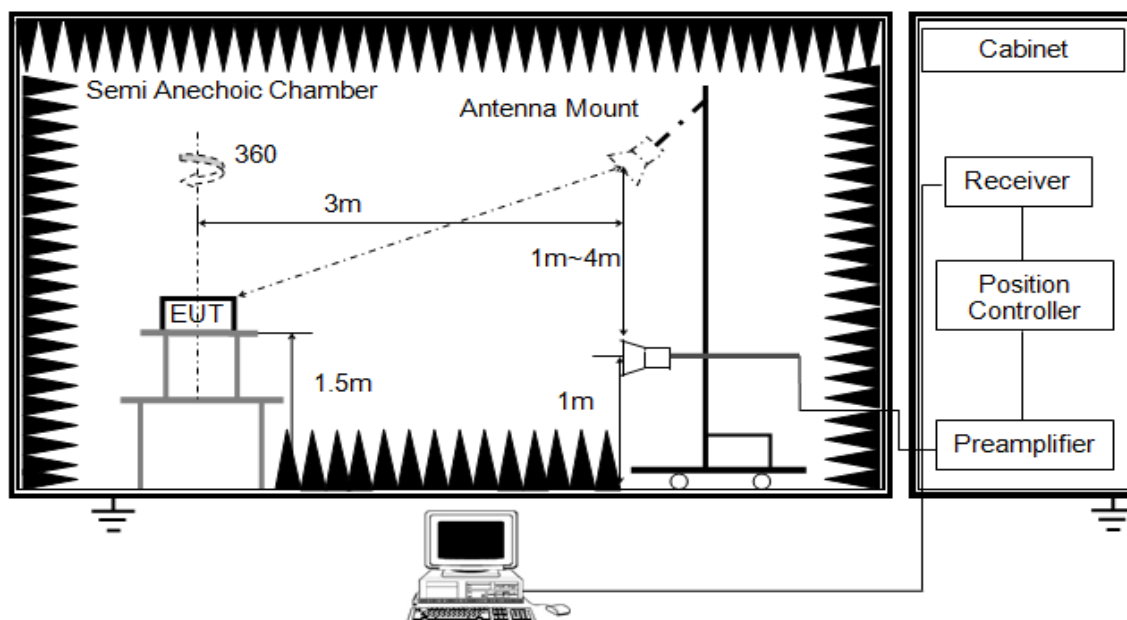


The setting of the spectrum analyser

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

1. The testing follows the guidelines in ANSI C63.10-2013.
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 0.8 meter 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 1GHz, 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.
6. For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration)

## ABOVE 1G

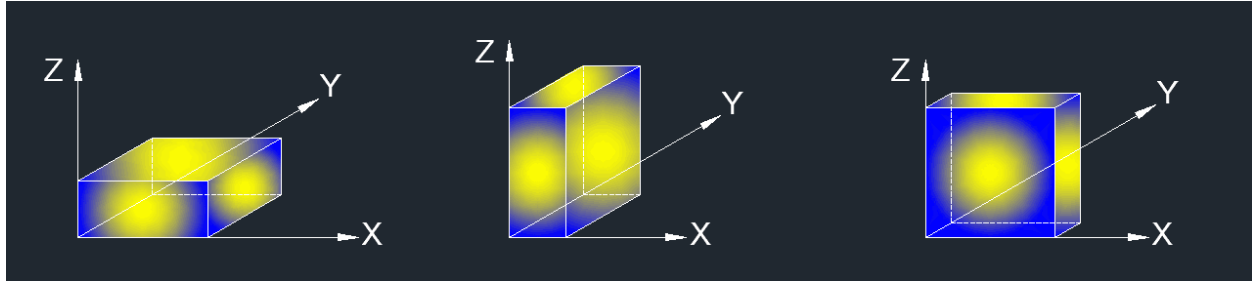


The setting of the spectrum analyser

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

1. The testing follows the guidelines in ANSI C63.10-2013.
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 1.5m 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 1GHz, 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 peak measurements, the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz with peak detector; For average measurements, the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 10Hz with peak detector.
7. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

X axis, Y axis, Z axis positions:



### **TEST ENVIRONMENT**

Temperature	27.4°C	Relative Humidity	41%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V/60Hz

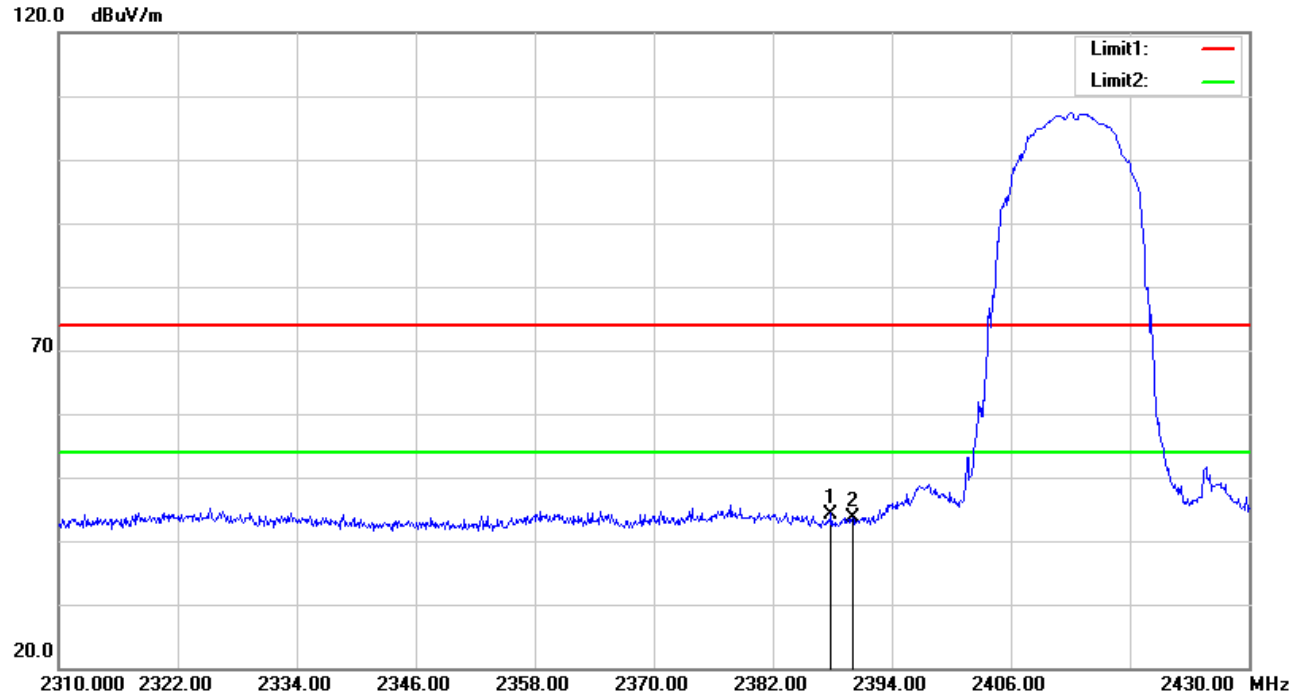
Note: Pre-test X-axis, Y-axis, and Z-axis positions, find the worst case in X-axis and record it in this report.



## 9.1. RESTRICTED BANDEDGE

802.11 b mode

### RESTRICTED BANDEDGE (01 CHANNEL, HORIZONTAL)

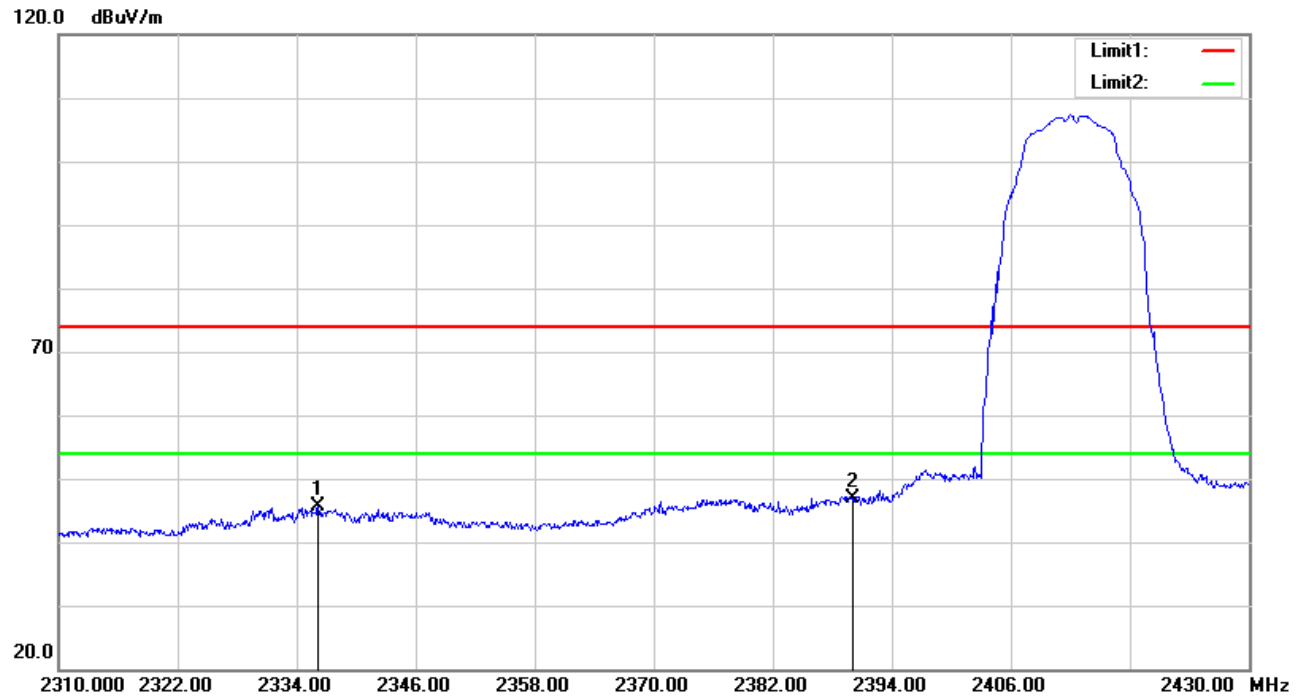


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2387.880	39.94	4.31	44.25	74.00	-29.75	peak
2	2390.000	39.38	4.34	43.72	74.00	-30.28	peak

Note: Measurement = Reading Level + Correct Factor.



**RESTRICTED BANDEDGE (01 CHANNEL, VERTICAL)**



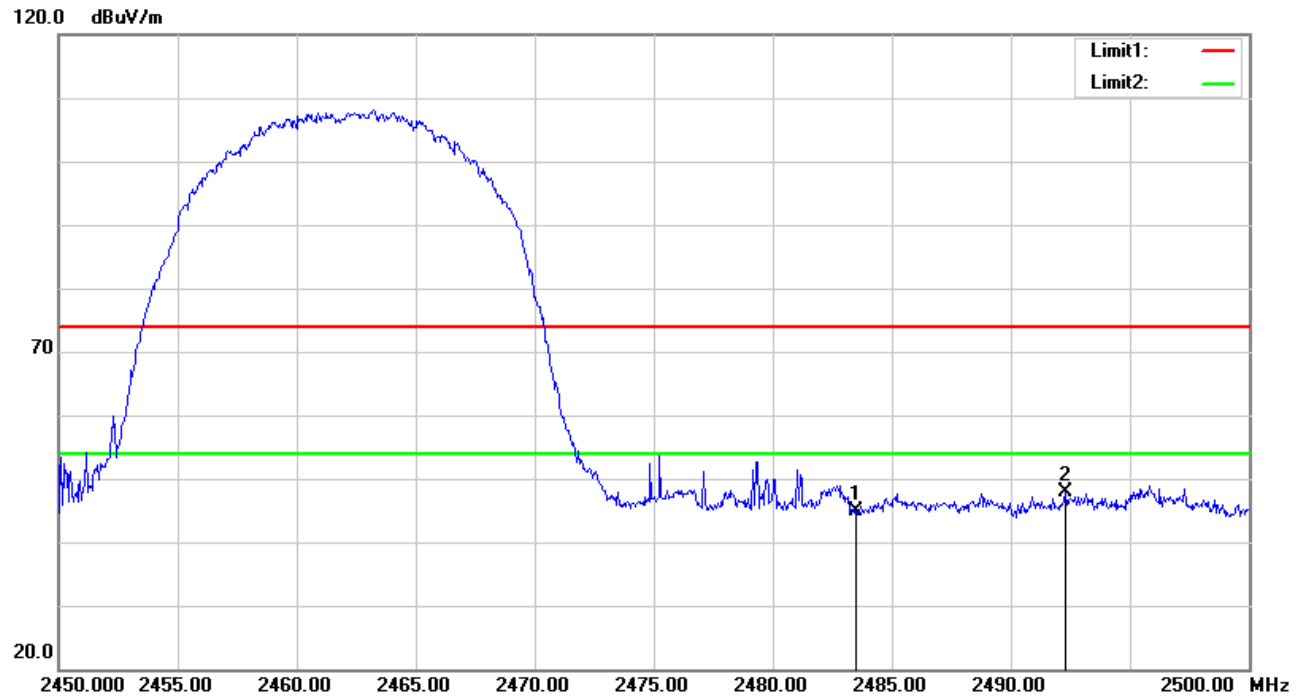
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2336.160	42.05	3.66	45.71	74.00	-28.29	peak
2	2390.000	42.48	4.34	46.82	74.00	-27.18	peak

Note: Measurement = Reading Level + Correct Factor.





**RESTRICTED BANDEGE (11 CHANNEL, HORIZONTAL)**

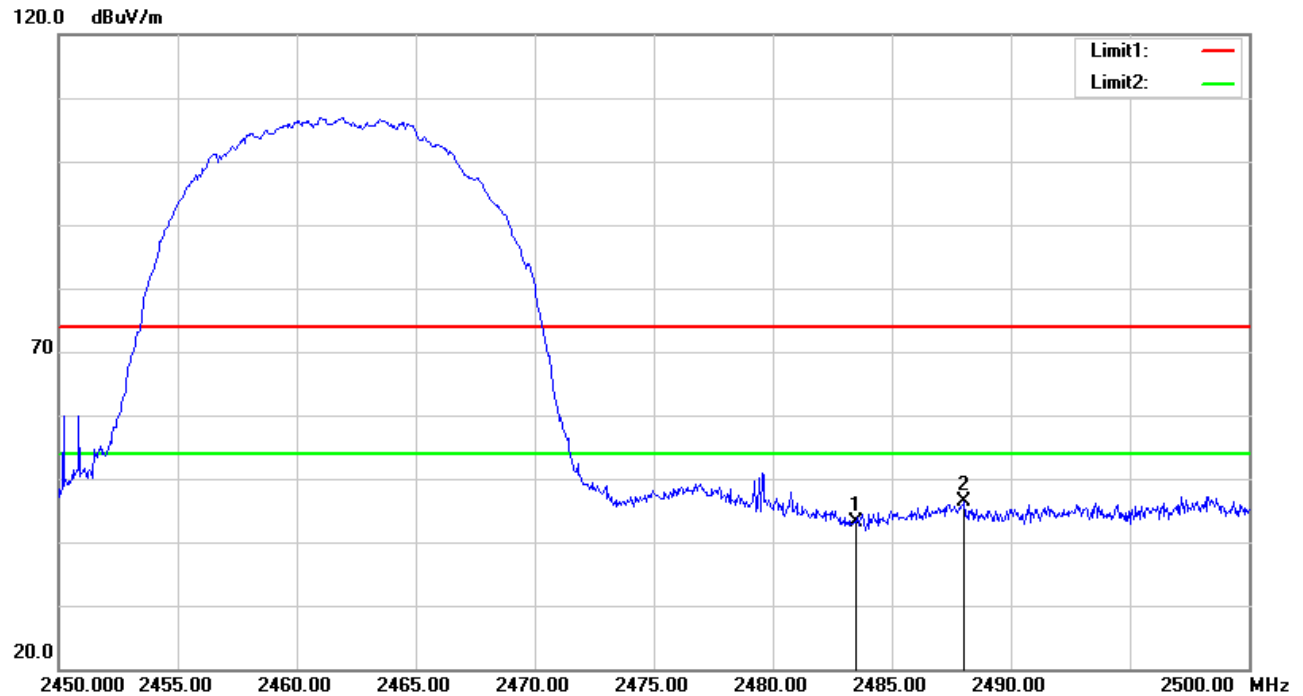


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	40.39	4.60	44.99	74.00	-29.01	peak
2	2492.300	43.32	4.63	47.95	74.00	-26.05	peak

Note: Measurement = Reading Level + Correct Factor.



**RESTRICTED BANDEDGE (11 CHANNEL, VERTICAL)**



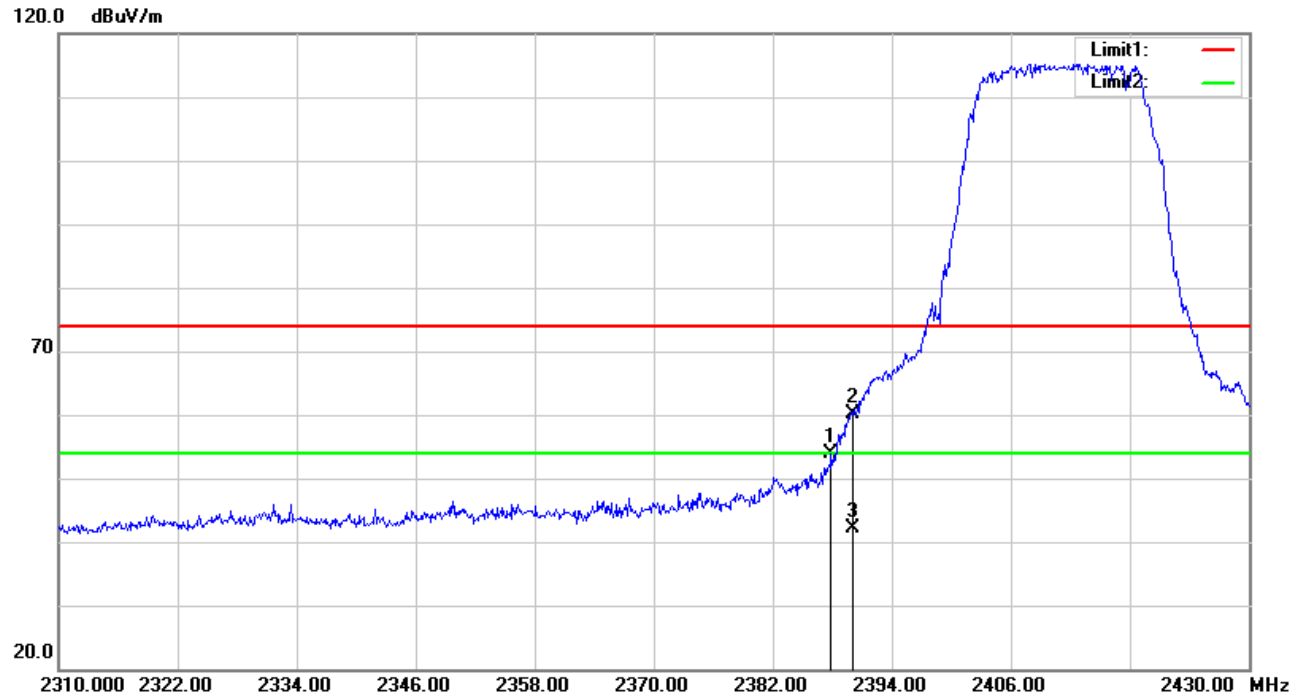
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	38.55	4.60	43.15	74.00	-30.85	peak
2	2488.050	41.86	4.62	46.48	74.00	-27.52	peak

Note: Measurement = Reading Level + Correct Factor.



802.11 g mode

**RESTRICTED BANDEDGE (01 CHANNEL, HORIZONTAL)**

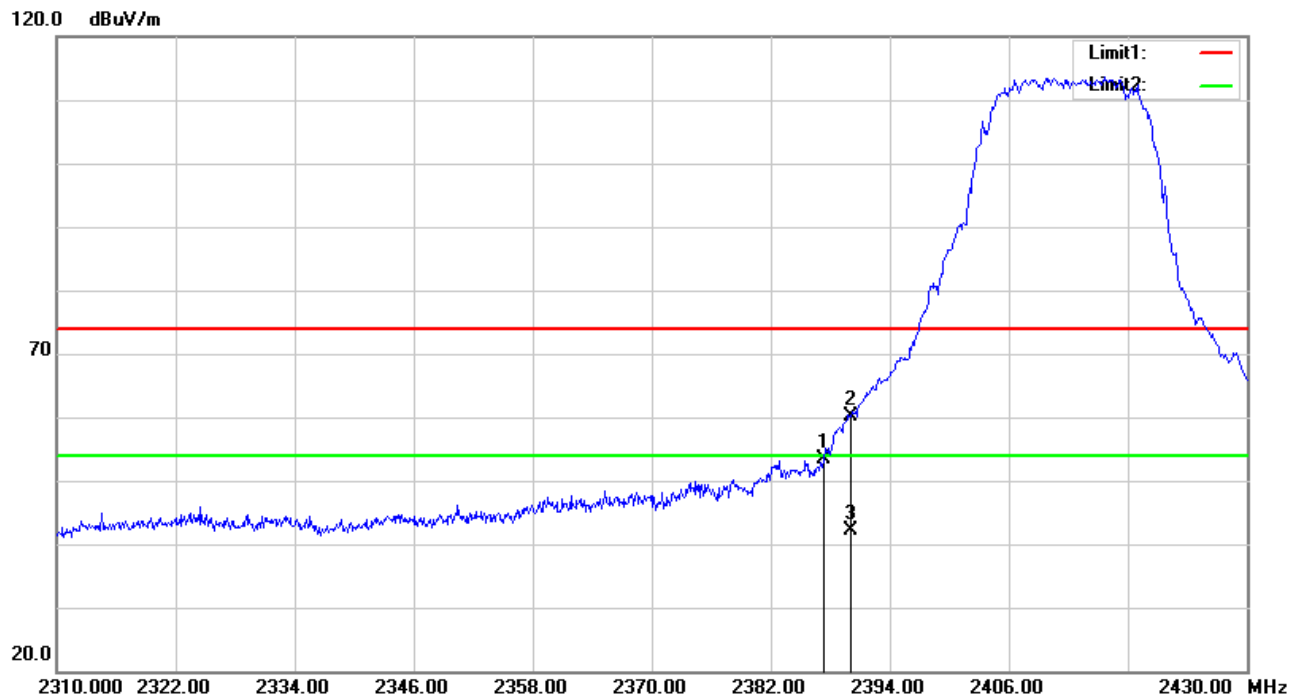


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2387.880	49.68	4.31	53.99	74.00	-20.01	peak
2	2390.000	55.79	4.34	60.13	74.00	-13.87	peak
3	2390.000	37.74	4.34	42.08	54.00	-11.92	AVG

Note: Measurement = Reading Level + Correct Factor.



**RESTRICTED BANDEDGE (01 CHANNEL, VERTICAL)**

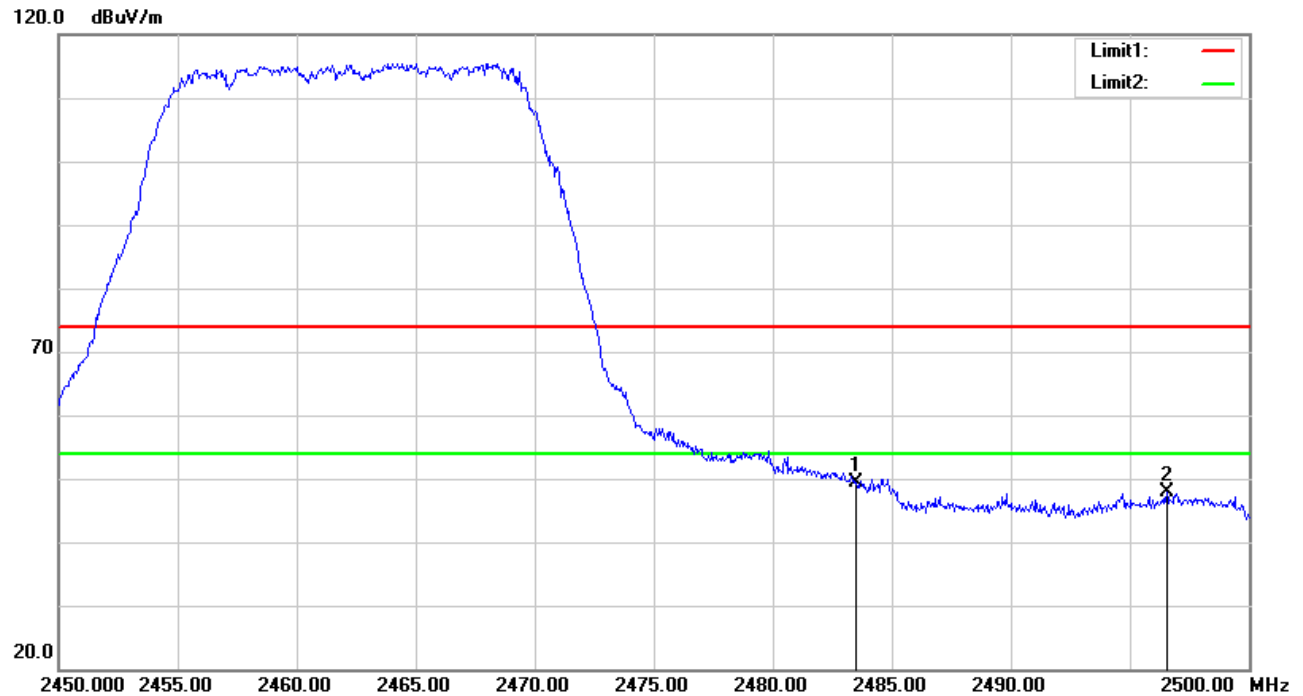


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2387.400	49.01	4.30	53.31	74.00	-20.69	peak
2	2390.000	55.73	4.34	60.07	74.00	-13.93	peak
3	2390.000	37.83	4.34	42.17	54.00	-11.83	AVG

Note: Measurement = Reading Level + Correct Factor.



**RESTRICTED BANDEDGE (11 CHANNEL, HORIZONTAL)**

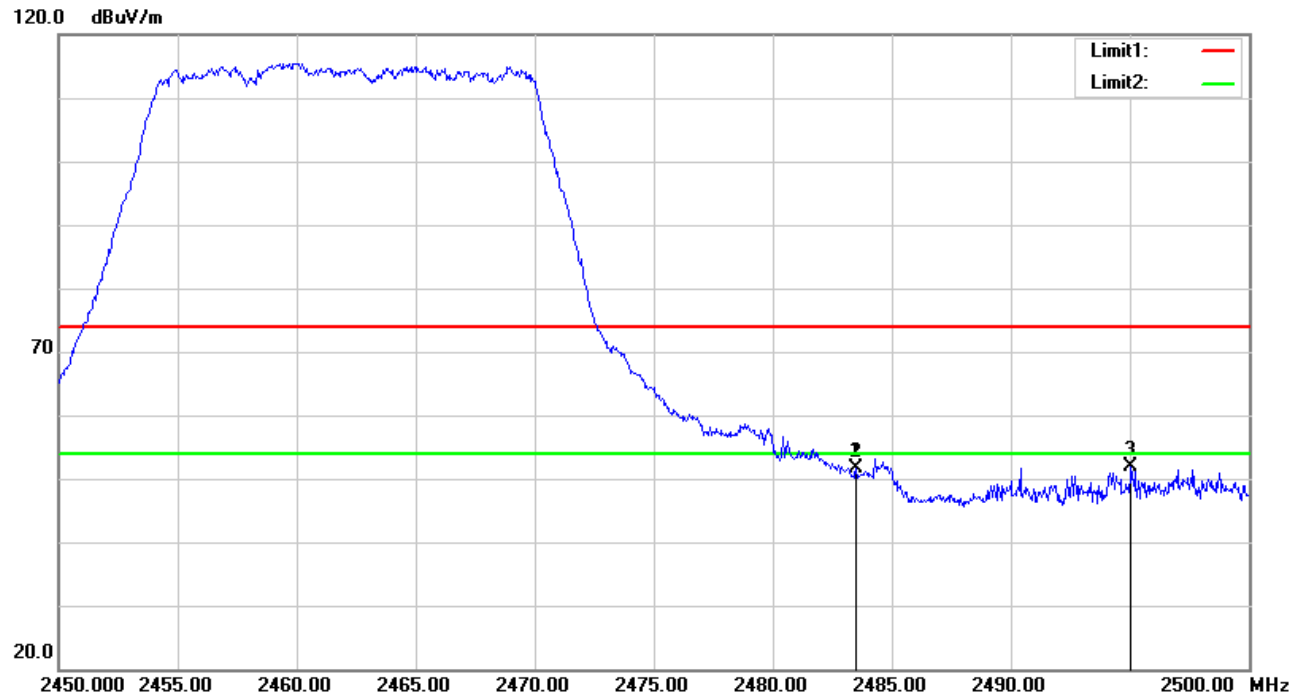


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	44.66	4.60	49.26	74.00	-24.74	peak
2	2496.550	43.19	4.64	47.83	74.00	-26.17	peak

Note: Measurement = Reading Level + Correct Factor.



**RESTRICTED BANDEDGE (11 CHANNEL, VERTICAL)**



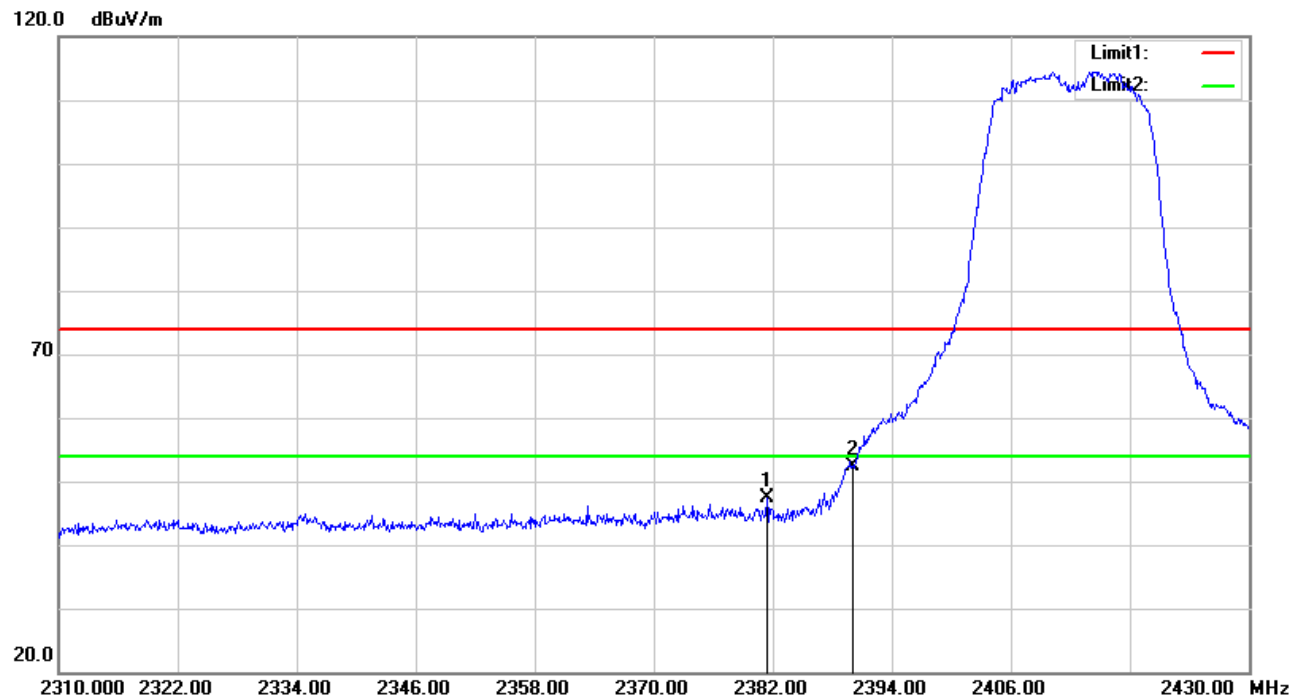
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	47.06	4.60	51.66	74.00	-22.34	peak
2	2483.500	47.06	4.60	51.66	74.00	-22.34	peak
3	2495.050	47.19	4.63	51.82	74.00	-22.18	peak

Note: Measurement = Reading Level + Correct Factor.



802.11 n20 mode

**RESTRICTED BANDEDGE (01 CHANNEL, HORIZONTAL)**

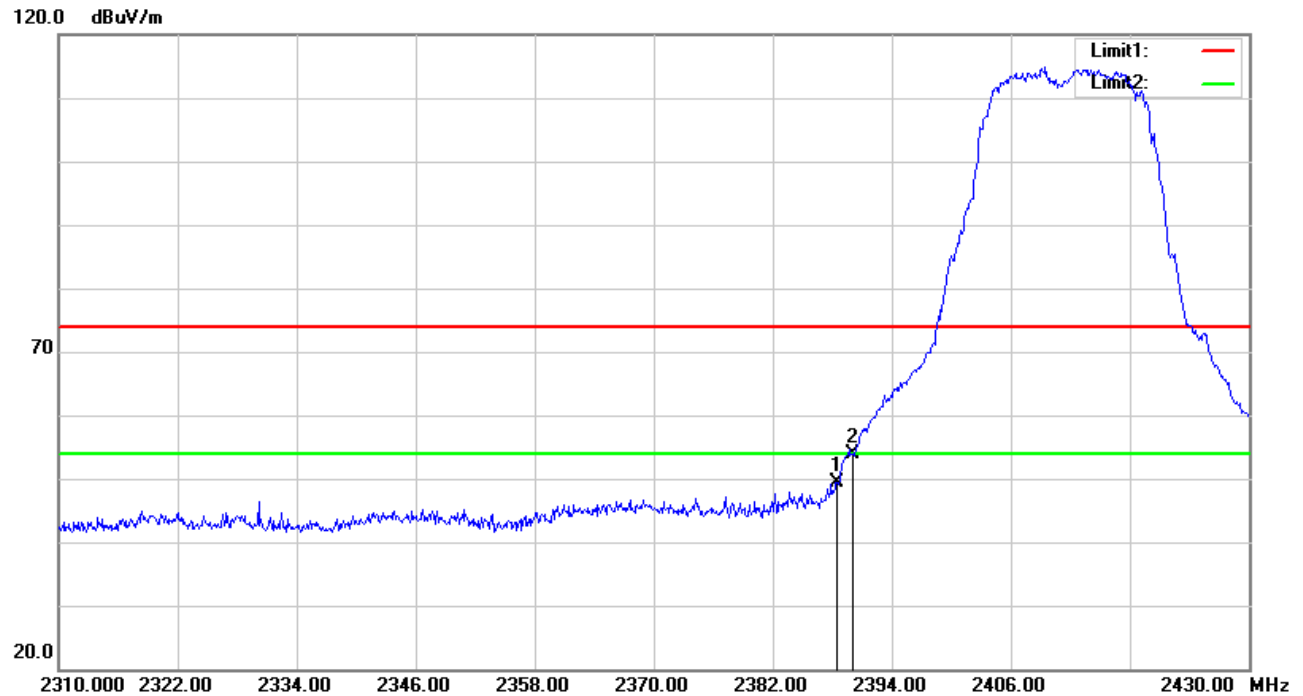


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2381.400	43.20	4.21	47.41	74.00	-26.59	peak
2	2390.000	48.01	4.34	52.35	74.00	-21.65	peak

Note: Measurement = Reading Level + Correct Factor.



**RESTRICTED BANDEDGE (01 CHANNEL, VERTICAL)**



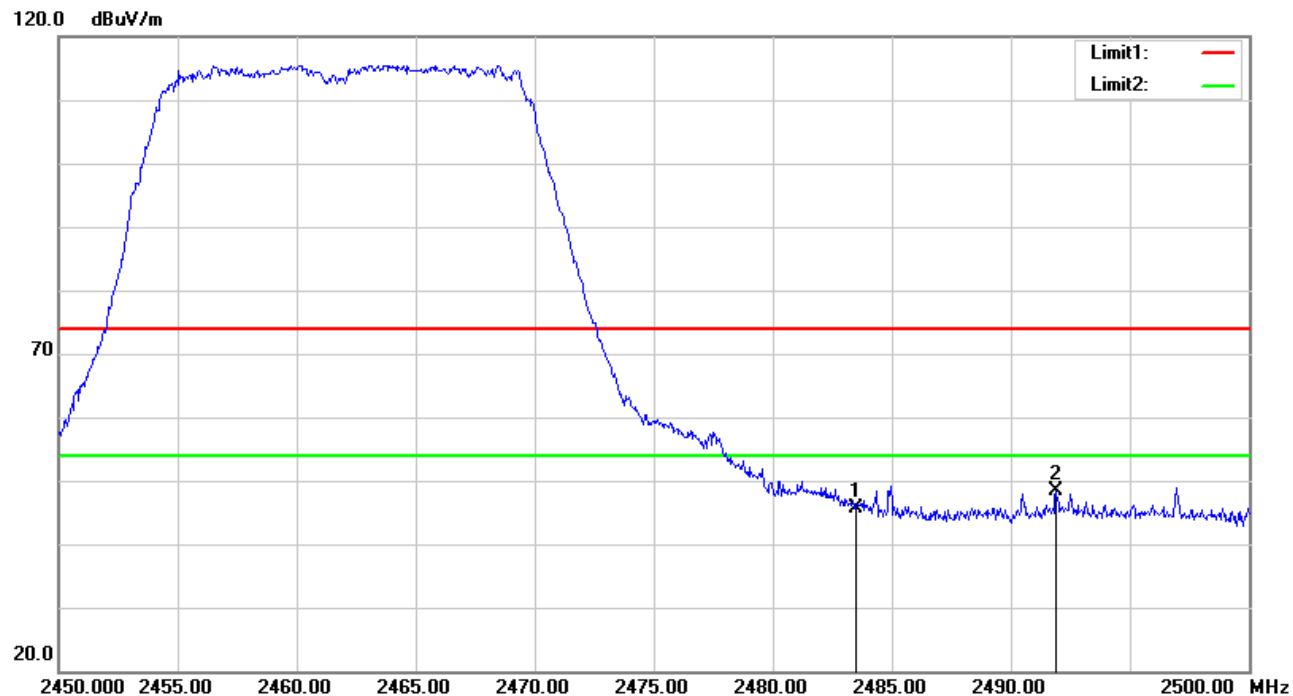
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.480	45.11	4.32	49.43	74.00	-24.57	peak
2	2390.000	49.44	4.34	53.78	74.00	-20.22	peak

Note: Measurement = Reading Level + Correct Factor.





**RESTRICTED BANDEDGE (11 CHANNEL, HORIZONTAL)**

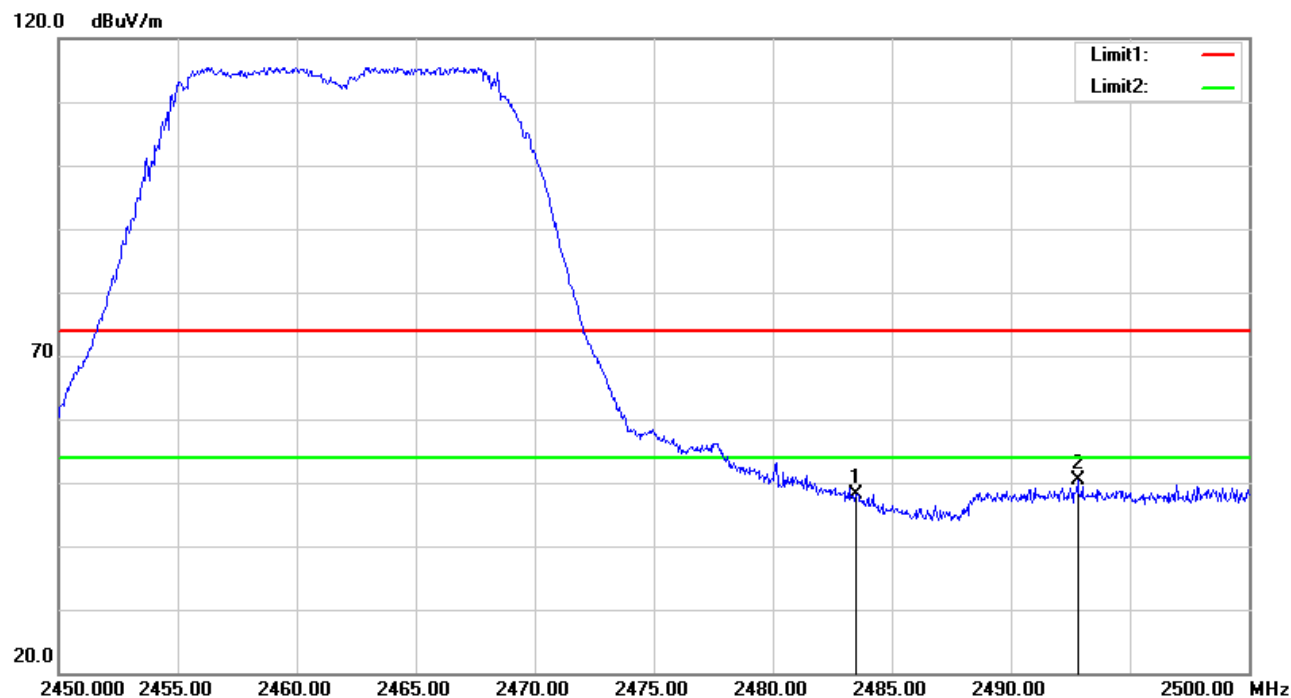


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	41.10	4.60	45.70	74.00	-28.30	peak
2	2491.900	43.63	4.63	48.26	74.00	-25.74	peak

Note: Measurement = Reading Level + Correct Factor.



**RESTRICTED BANDEDGE (11 CHANNEL, VERTICAL)**



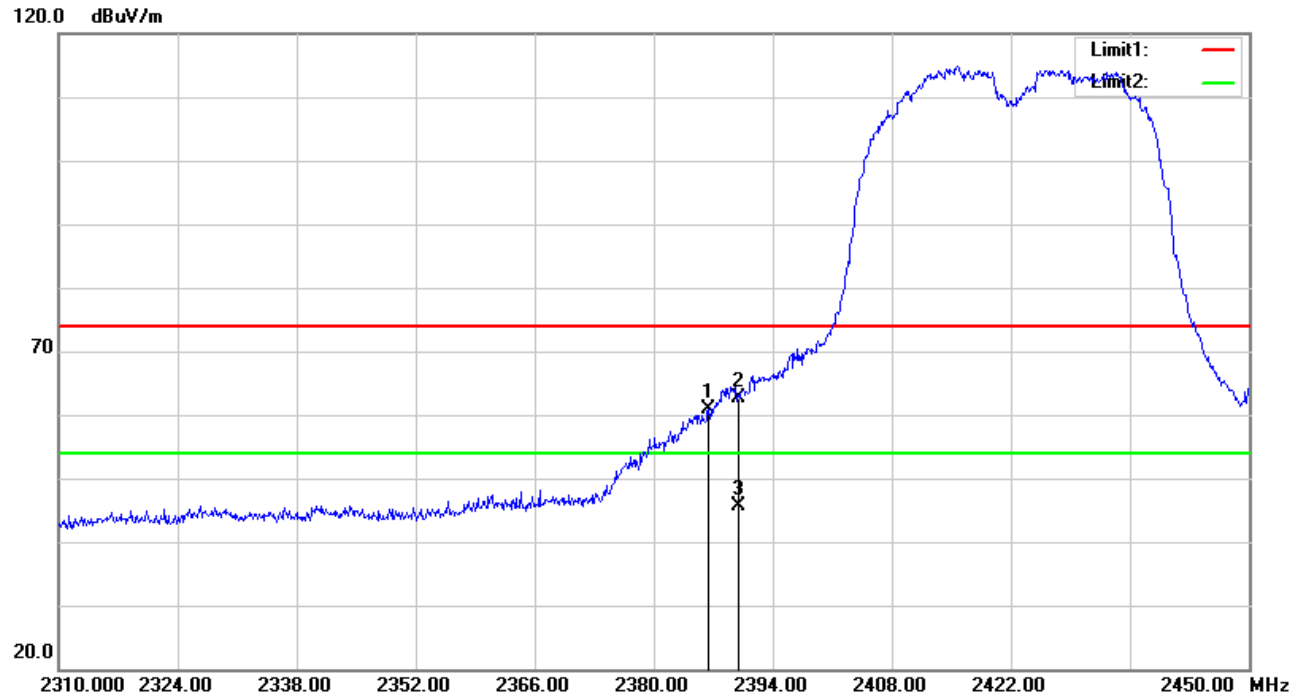
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	43.43	4.60	48.03	74.00	-25.97	peak
2	2492.800	45.67	4.64	50.31	74.00	-23.69	peak

Note: Measurement = Reading Level + Correct Factor.



802.11 n40 mode

**RESTRICTED BANDEDGE (03 CHANNEL, HORIZONTAL)**

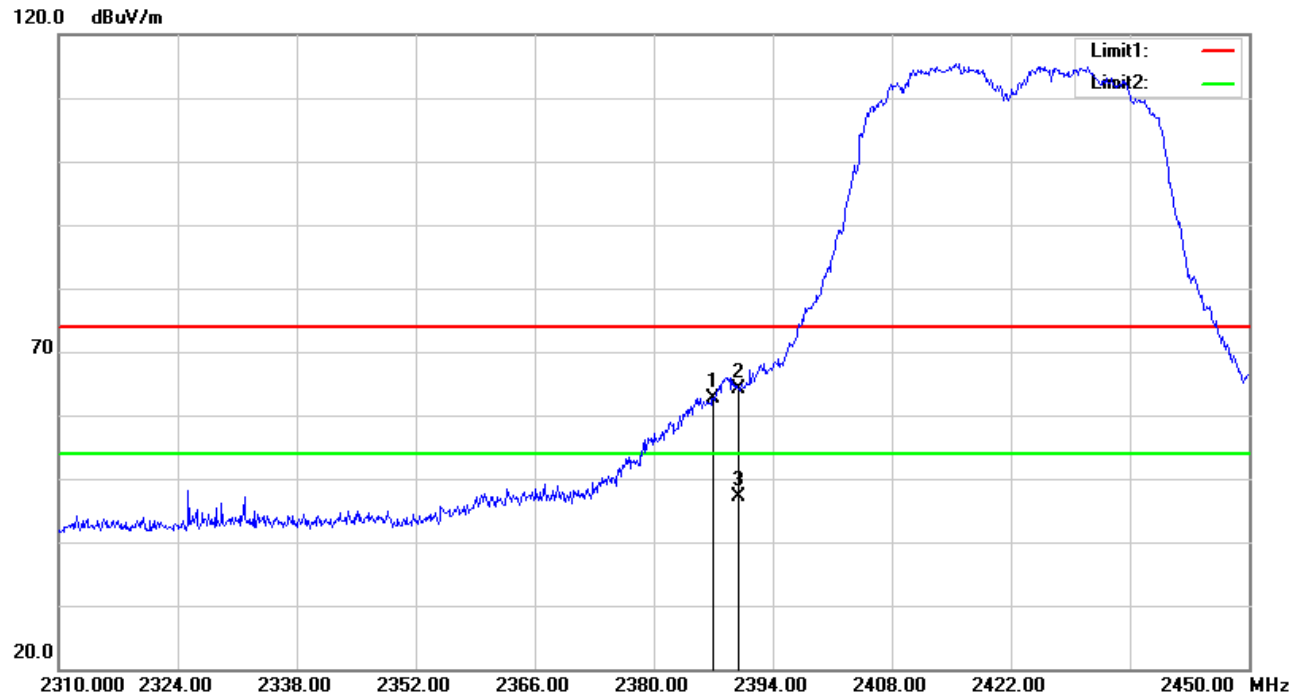


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2386.440	56.54	4.28	60.82	74.00	-13.18	peak
2	2386.440	39.54	4.28	43.82	54.00	-10.18	AVG
3	2390.000	58.18	4.34	62.52	74.00	-11.48	peak
4	2390.000	41.33	4.34	45.67	54.00	-8.33	AVG

Note: Measurement = Reading Level + Correct Factor.



**RESTRICTED BANDEDGE (03 CHANNEL, VERTICAL)**

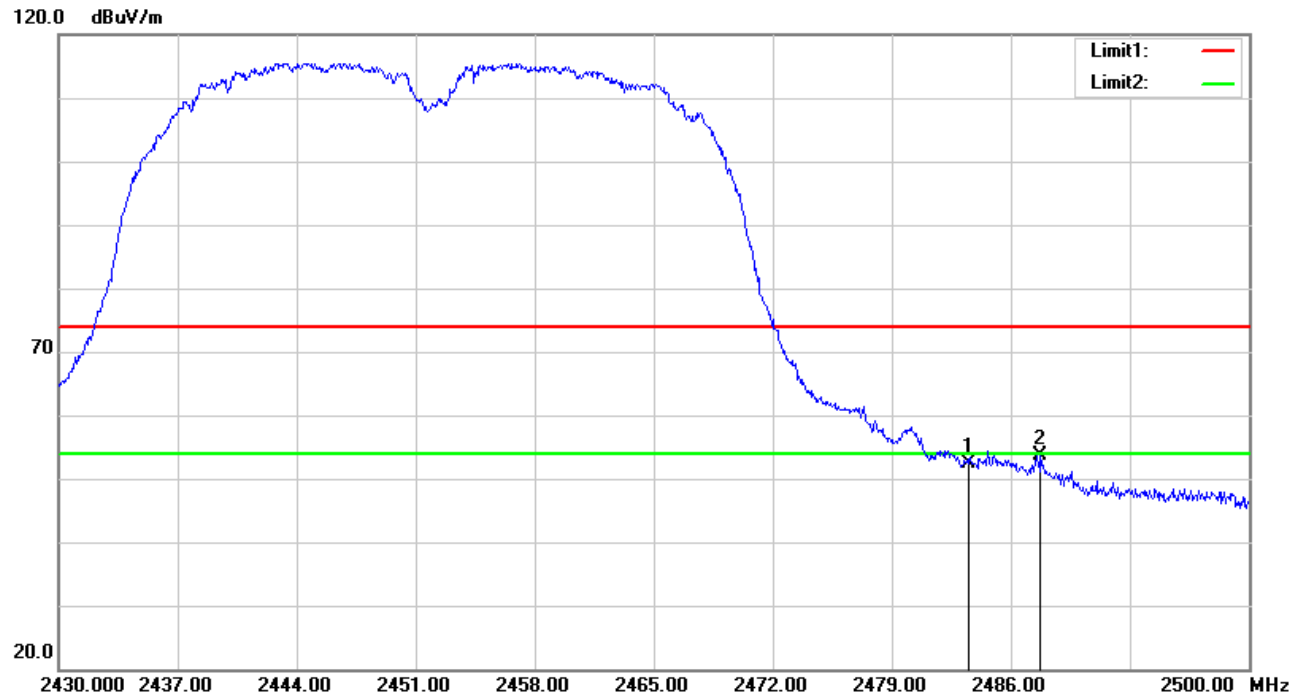


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2387.000	58.35	4.30	62.65	74.00	-11.35	peak
2	2387.000	41.35	4.30	45.65	54.00	-8.35	AVG
3	2390.000	59.79	4.34	64.13	74.00	-9.87	peak
4	2390.000	42.88	4.34	47.22	54.00	-6.78	AVG

Note: Measurement = Reading Level + Correct Factor.



**RESTRICTED BANDEDGE (09 CHANNEL, HORIZONTAL)**

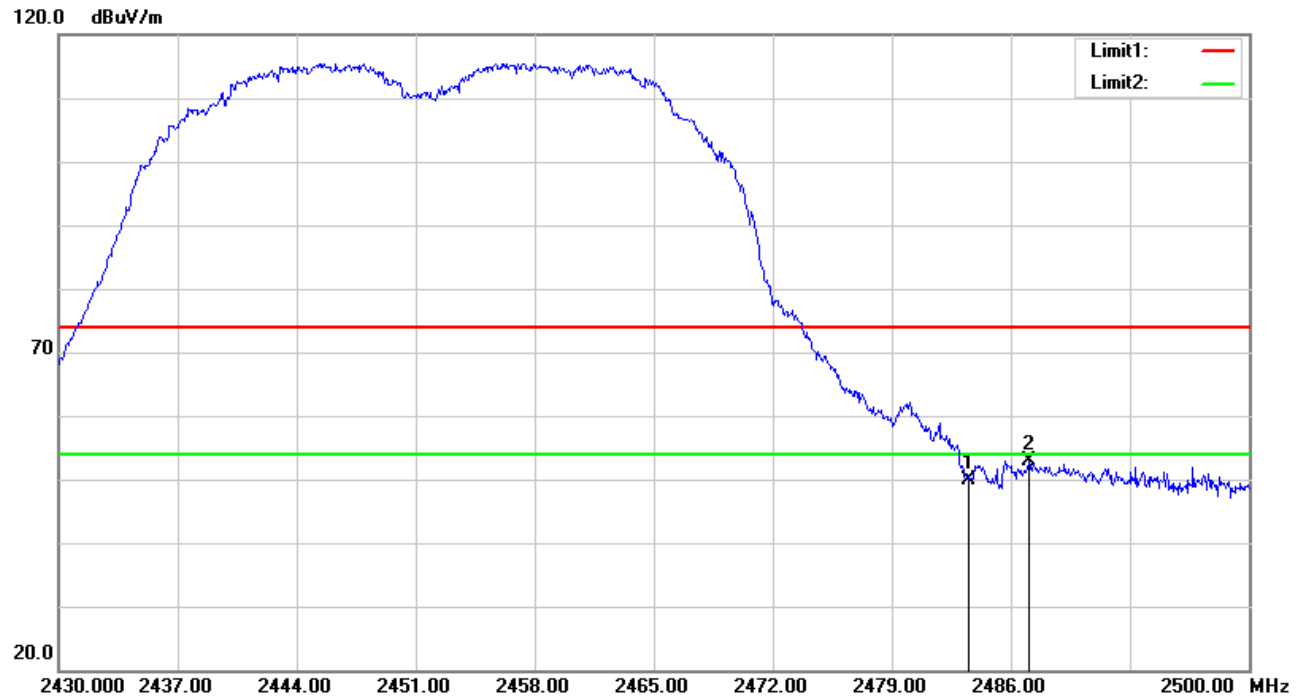


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	47.73	4.60	52.33	74.00	-21.67	peak
2	2487.680	49.01	4.62	53.63	74.00	-20.37	peak

Note: Measurement = Reading Level + Correct Factor.



**RESTRICTED BANDEDGE (09 CHANNEL, VERTICAL)**



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	45.37	4.60	49.97	74.00	-24.03	peak
2	2487.050	48.28	4.62	52.90	74.00	-21.10	peak

Note: Measurement = Reading Level + Correct Factor.

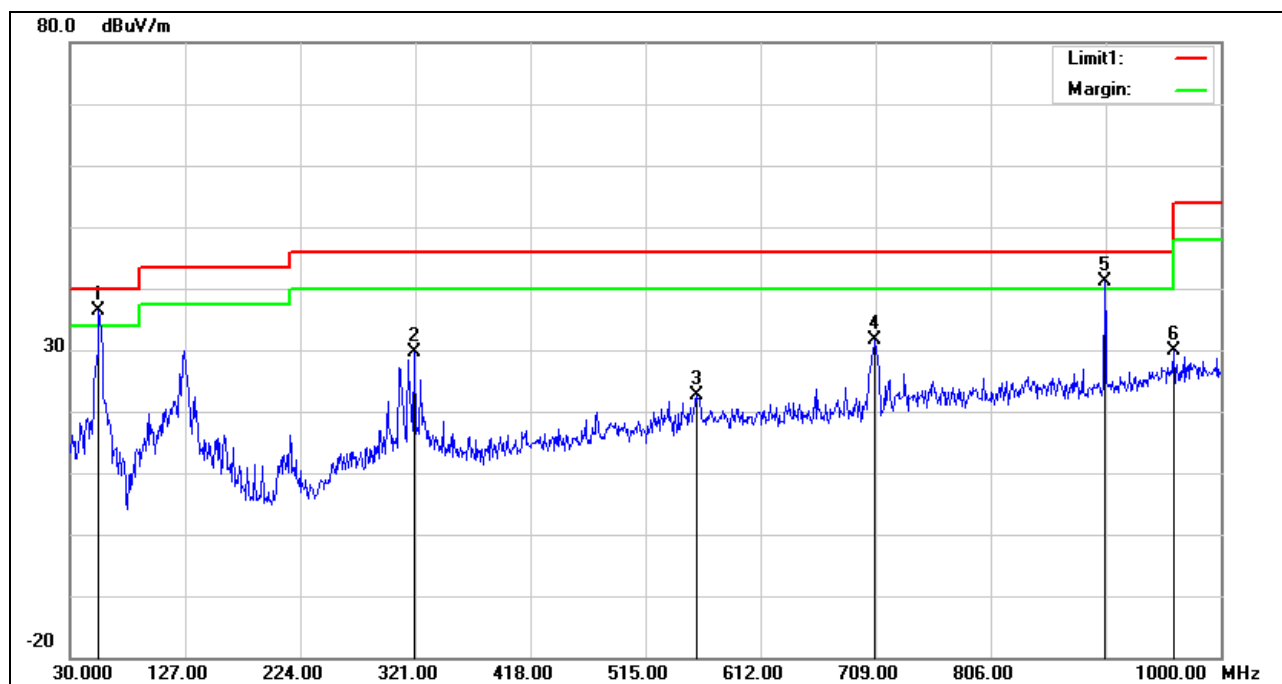


## 9.2. SPURIOUS EMISSIONS (30-1GHz)

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

### 802.11 b mode CH01

#### HARMONICS AND SPURIOUS EMISSIONS (HORIZONTAL)

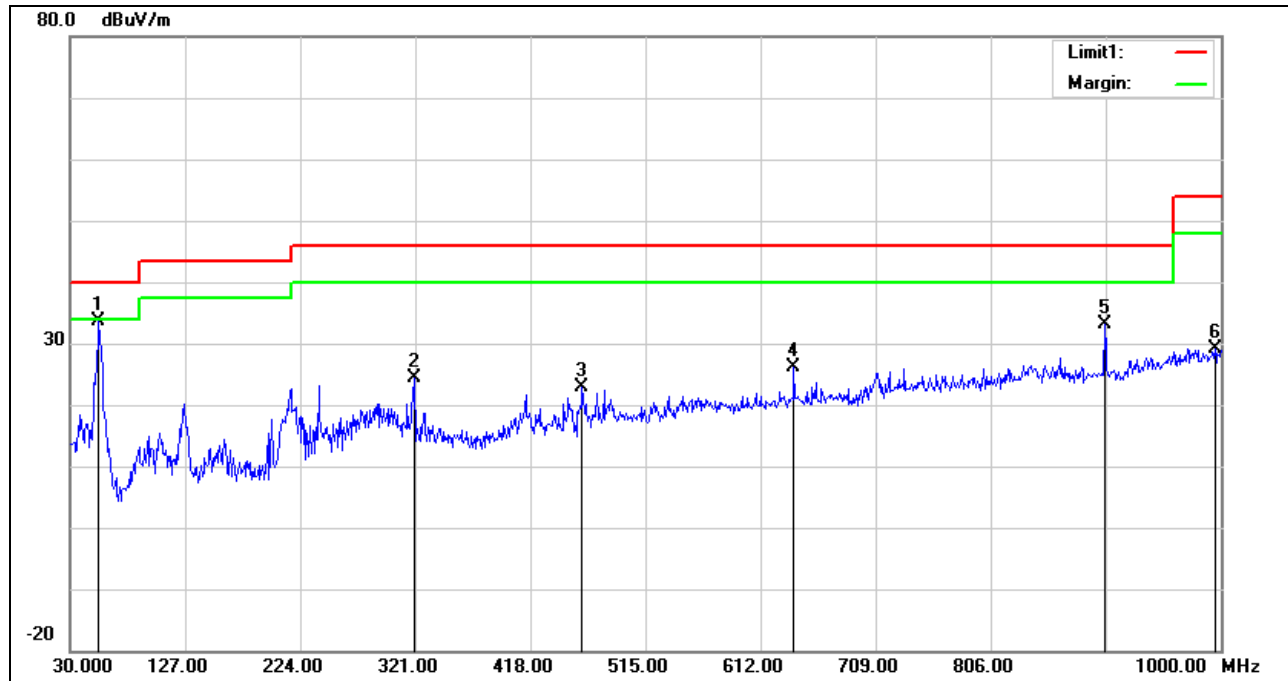


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	54.2500	61.13	-24.75	36.38	40.00	-3.62	QP
2	320.0300	43.59	-14.00	29.59	46.00	-16.41	QP
3	557.6800	28.26	-5.55	22.71	46.00	-23.29	QP
4	708.0300	35.51	-3.92	31.59	46.00	-14.41	QP
5	902.0300	41.59	-0.40	41.19	46.00	-4.81	QP
6	960.2300	28.16	1.76	29.92	54.00	-24.08	QP

Note: Measurement = Reading Level + Correct Factor.



### HARMONICS AND SPURIOUS EMISSIONS (VERTICAL)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	54.2500	58.46	-24.75	33.71	40.00	-6.29	QP
2	320.0300	38.49	-14.00	24.49	46.00	-21.51	QP
3	461.6500	32.18	-9.39	22.79	46.00	-23.21	QP
4	640.1300	31.08	-4.84	26.24	46.00	-19.76	QP
5	902.0300	33.51	-0.40	33.11	46.00	-12.89	QP
6	995.1500	27.13	2.04	29.17	54.00	-24.83	QP

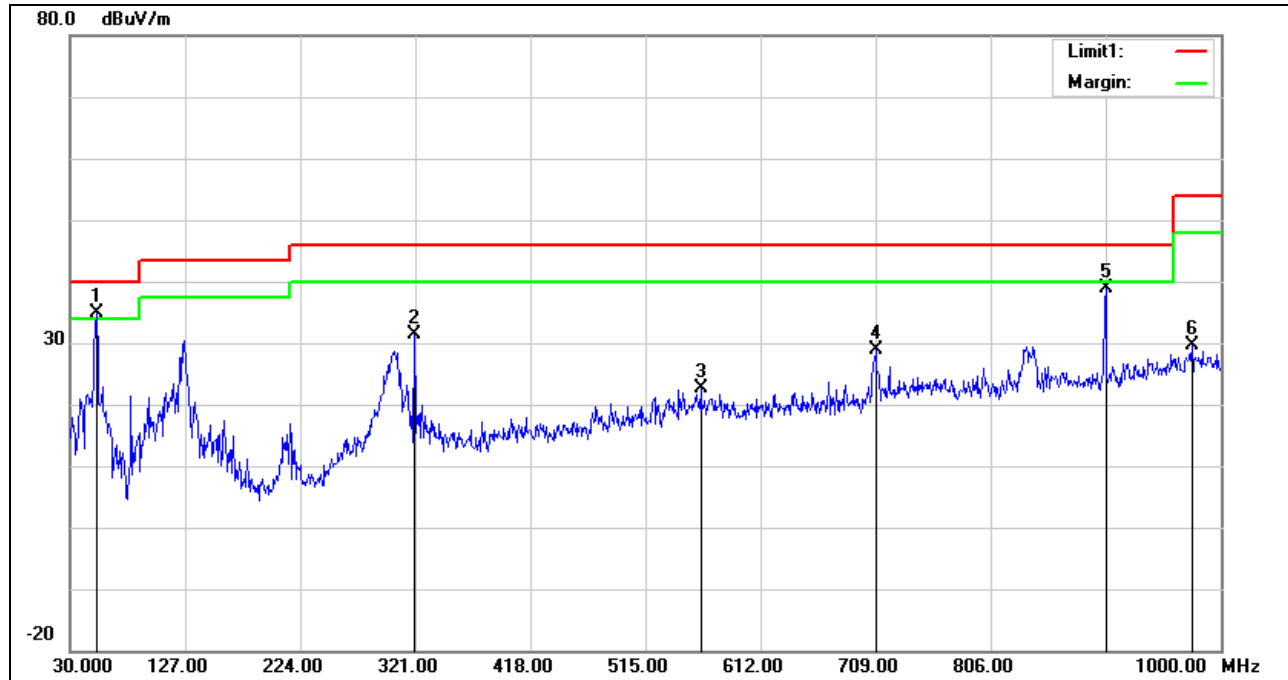
Note: Measurement = Reading Level + Correct Factor.





802.11 g mode CH01

HARMONICS AND SPURIOUS EMISSIONS (HORIZONTAL)

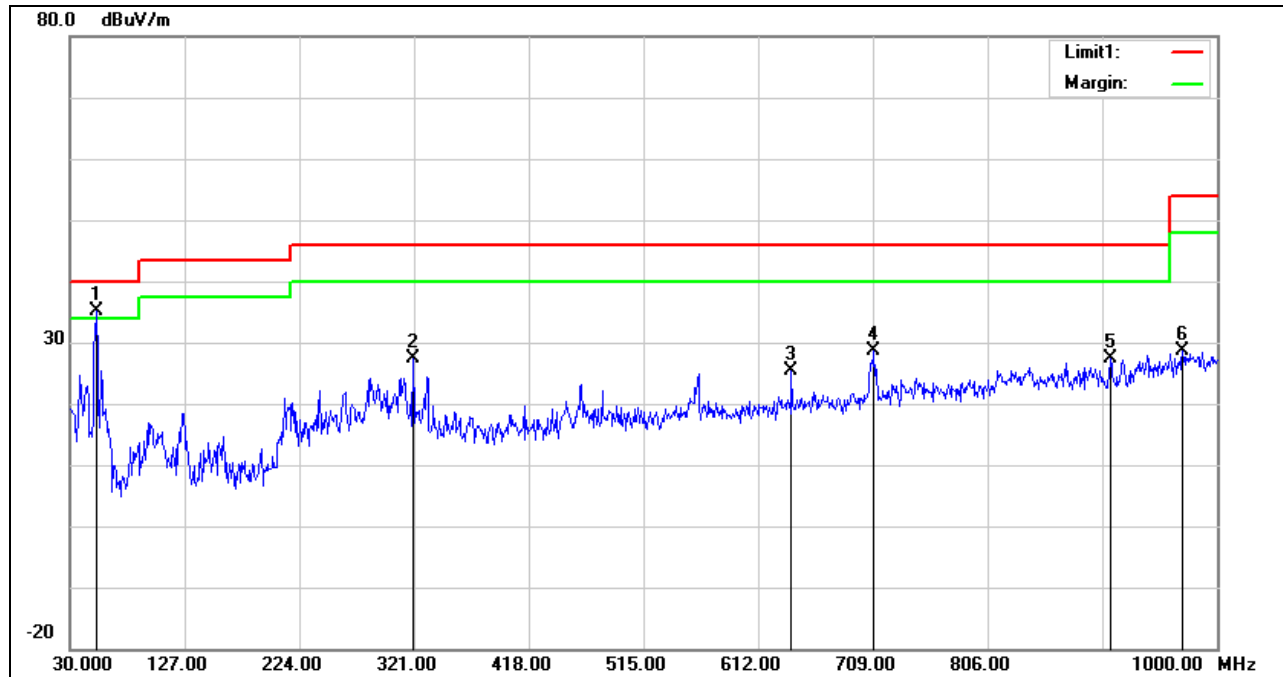


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	52.3100	58.97	-24.19	34.78	40.00	-5.22	QP
2	320.0300	45.45	-14.00	31.45	46.00	-14.55	QP
3	561.5600	28.08	-5.51	22.57	46.00	-23.43	QP
4	709.0000	32.66	-3.88	28.78	46.00	-17.22	QP
5	903.0000	39.24	-0.37	38.87	46.00	-7.13	QP
6	975.7500	27.36	2.38	29.74	54.00	-24.26	QP

Note: Measurement = Reading Level + Correct Factor.



### HARMONICS AND SPURIOUS EMISSIONS (VERTICAL)



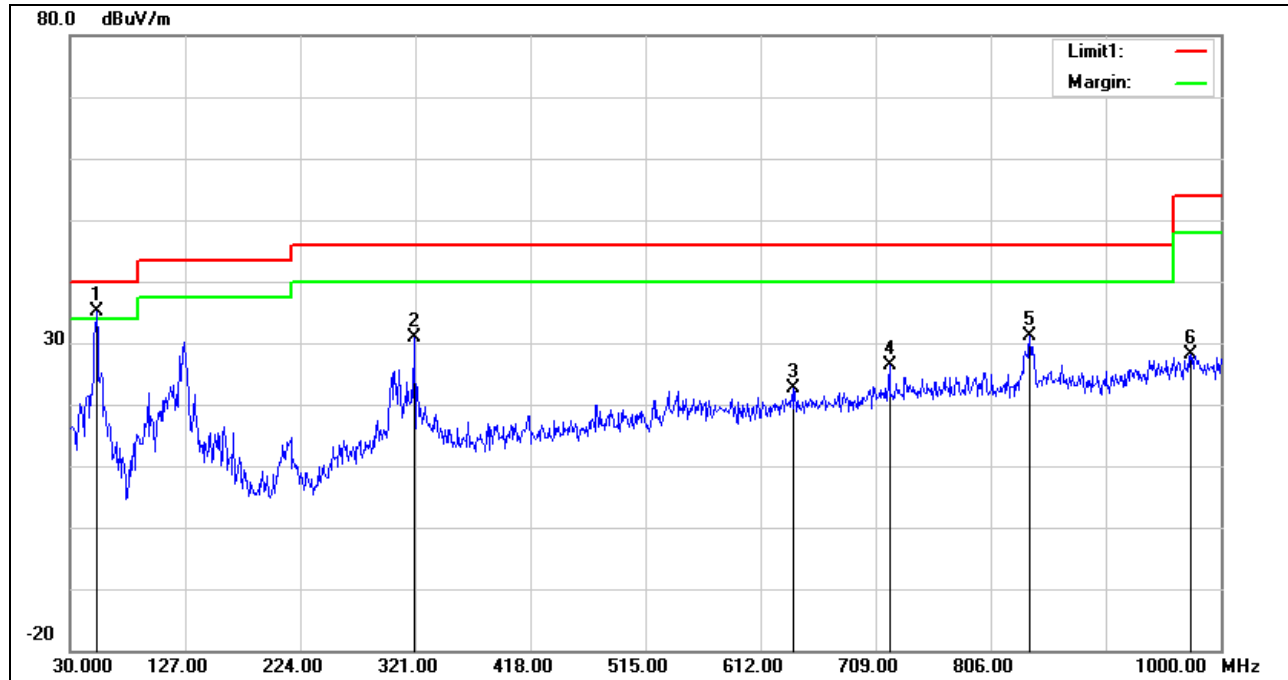
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	52.3100	59.20	-24.19	35.01	40.00	-4.99	QP
2	320.0300	41.42	-14.00	27.42	46.00	-18.58	QP
3	640.1300	30.33	-4.84	25.49	46.00	-20.51	QP
4	709.9700	32.60	-3.86	28.74	46.00	-17.26	QP
5	909.7900	27.58	-0.19	27.39	46.00	-18.61	QP
6	970.9000	26.60	2.06	28.66	54.00	-25.34	QP

Note: Measurement = Reading Level + Correct Factor.



802.11 n20 mode CH01

HARMONICS AND SPURIOUS EMISSIONS (HORIZONTAL)

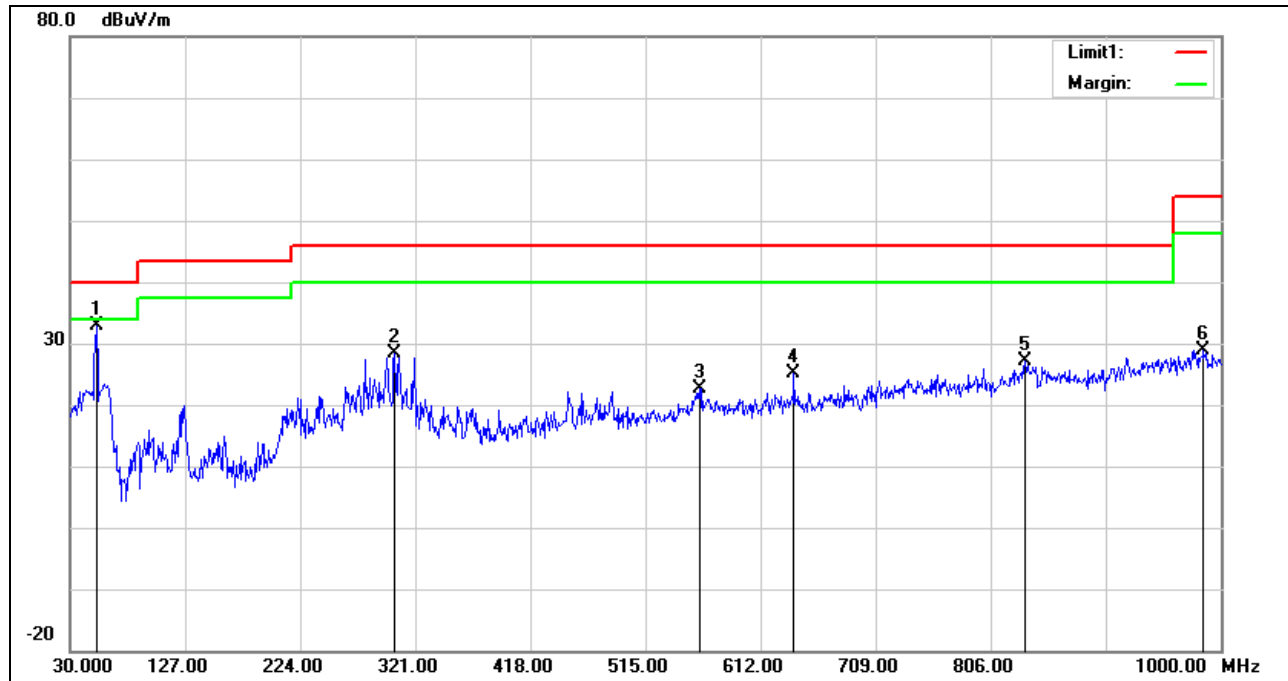


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	52.3100	59.43	-24.19	35.24	40.00	-4.76	QP
2	320.0300	44.79	-14.00	30.79	46.00	-15.21	QP
3	640.1300	27.44	-4.84	22.60	46.00	-23.40	QP
4	720.6400	29.66	-3.20	26.46	46.00	-19.54	QP
5	838.9800	31.47	-0.39	31.08	46.00	-14.92	QP
6	974.7800	25.69	2.32	28.01	54.00	-25.99	QP

Note: Measurement = Reading Level + Correct Factor.



### HARMONICS AND SPURIOUS EMISSIONS (VERTICAL)



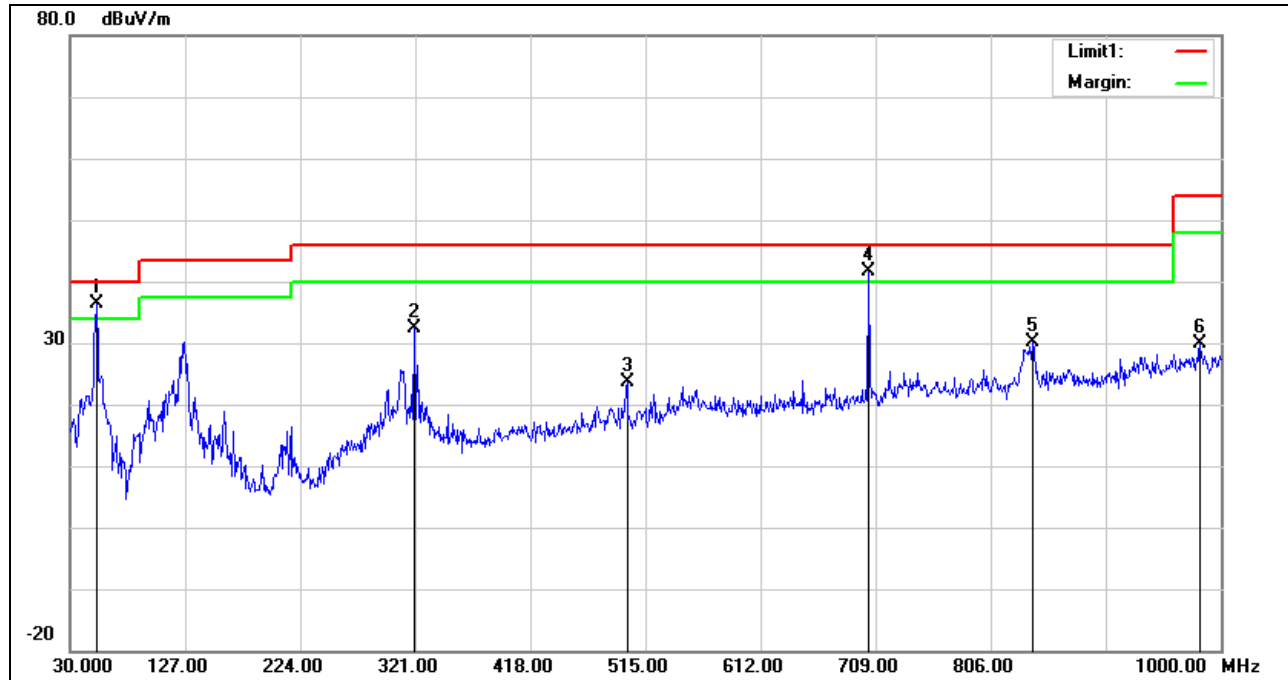
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	52.3100	56.95	-24.19	32.76	40.00	-7.24	QP
2	303.5400	43.08	-14.69	28.39	46.00	-17.61	QP
3	560.5900	28.23	-5.50	22.73	46.00	-23.27	QP
4	640.1300	30.00	-4.84	25.16	46.00	-20.84	QP
5	835.1000	27.67	-0.54	27.13	46.00	-18.87	QP
6	985.4500	26.54	2.33	28.87	54.00	-25.13	QP

Note: Measurement = Reading Level + Correct Factor.



802.11 n40 mode CH03

HARMONICS AND SPURIOUS EMISSIONS (HORIZONTAL)

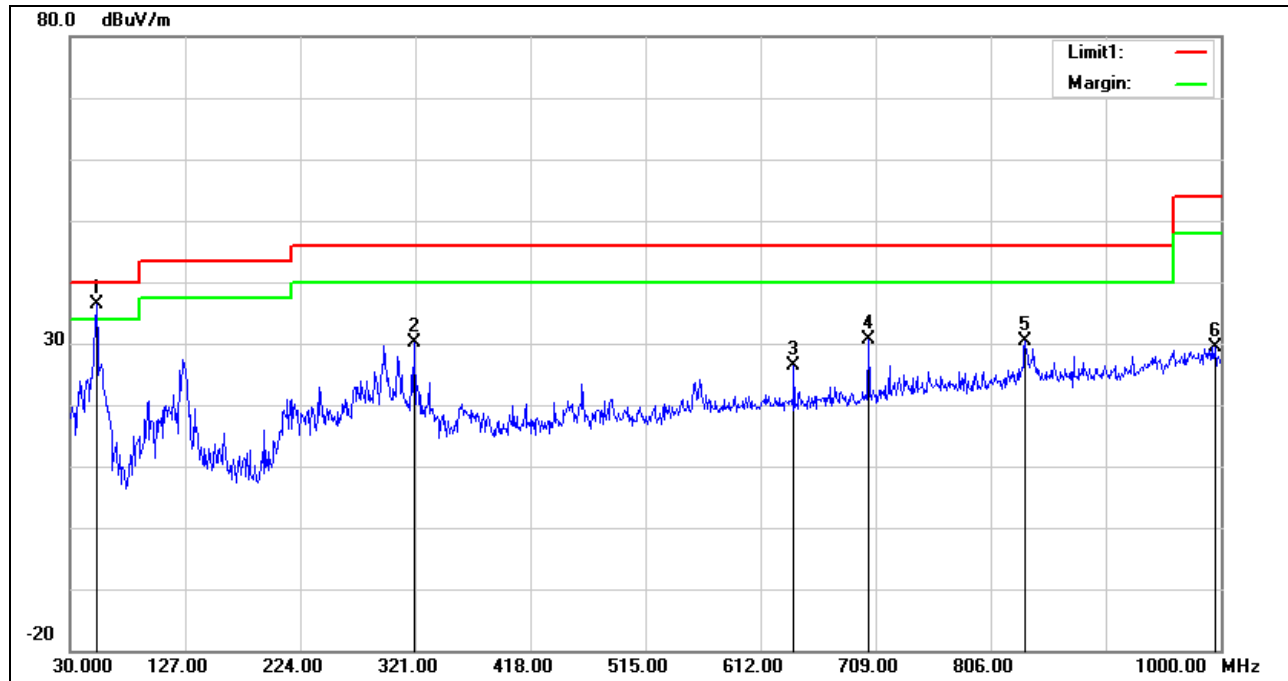


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	52.3100	60.47	-24.19	36.28	40.00	-3.72	QP
2	320.0300	46.27	-14.00	32.27	46.00	-13.73	QP
3	499.4800	31.55	-8.02	23.53	46.00	-22.47	QP
4	703.1800	45.75	-4.07	41.68	46.00	-4.32	QP
5	841.8900	30.56	-0.42	30.14	46.00	-15.86	QP
6	982.5400	27.25	2.52	29.77	54.00	-24.23	QP

Note: Measurement = Reading Level + Correct Factor.



### HARMONICS AND SPURIOUS EMISSIONS (VERTICAL)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	52.3100	60.67	-24.19	36.48	40.00	-3.52	QP
2	320.0300	44.17	-14.00	30.17	46.00	-15.83	QP
3	640.1300	31.15	-4.84	26.31	46.00	-19.69	QP
4	703.1800	34.75	-4.07	30.68	46.00	-15.32	QP
5	835.1000	30.95	-0.54	30.41	46.00	-15.59	QP
6	995.1500	27.28	2.04	29.32	54.00	-24.68	QP

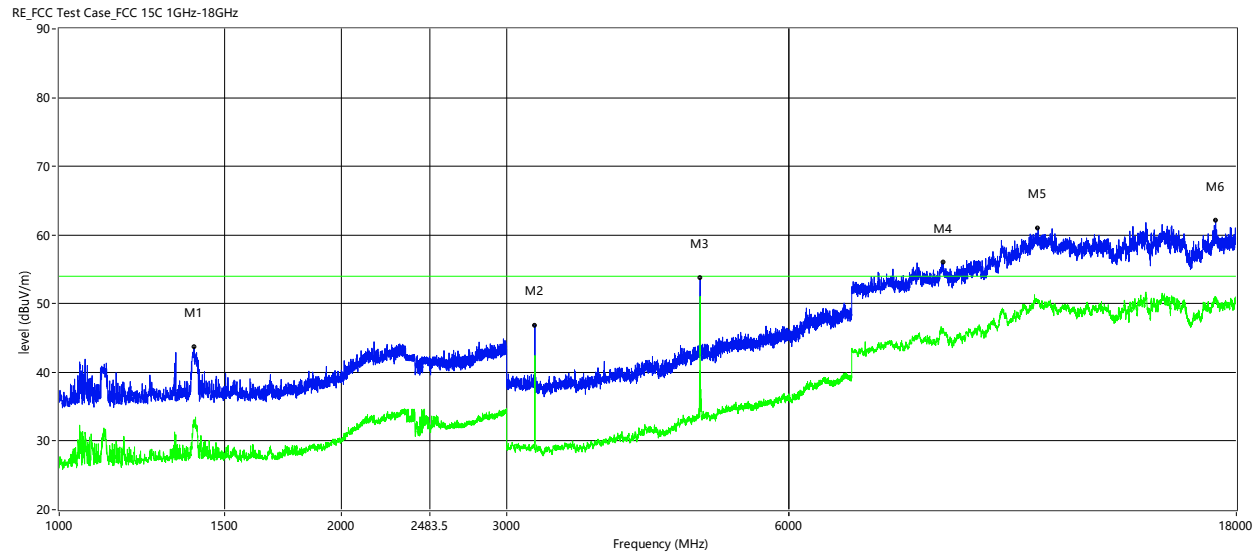
Note: Measurement = Reading Level + Correct Factor.



### 9.3. SPURIOUS EMISSIONS (1GHz-18GHz)

#### 802.11 b mode

##### HARMONICS AND SPURIOUS EMISSIONS (01 CHANNEL, HORIZONTAL)



Frequency (MHz)	Peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1393.000	43.63	33.11	-0.68	74.0	54.0	-20.89	Horizontal	Pass
3215.000	46.84	42.07	-12.14	74.0	54.0	-11.93	Horizontal	Pass
4824.000	53.66	51.06	-6.84	74.0	54.0	-2.94	Horizontal	Pass
8762.750	55.93	46.06	4.97	74.0	54.0	-7.94	Horizontal	Pass
11061.750	60.99	50.55	9.89	74.0	54.0	-3.45	Horizontal	Pass
17109.000	62.07	50.62	10.43	74.0	54.0	-3.38	Horizontal	Pass

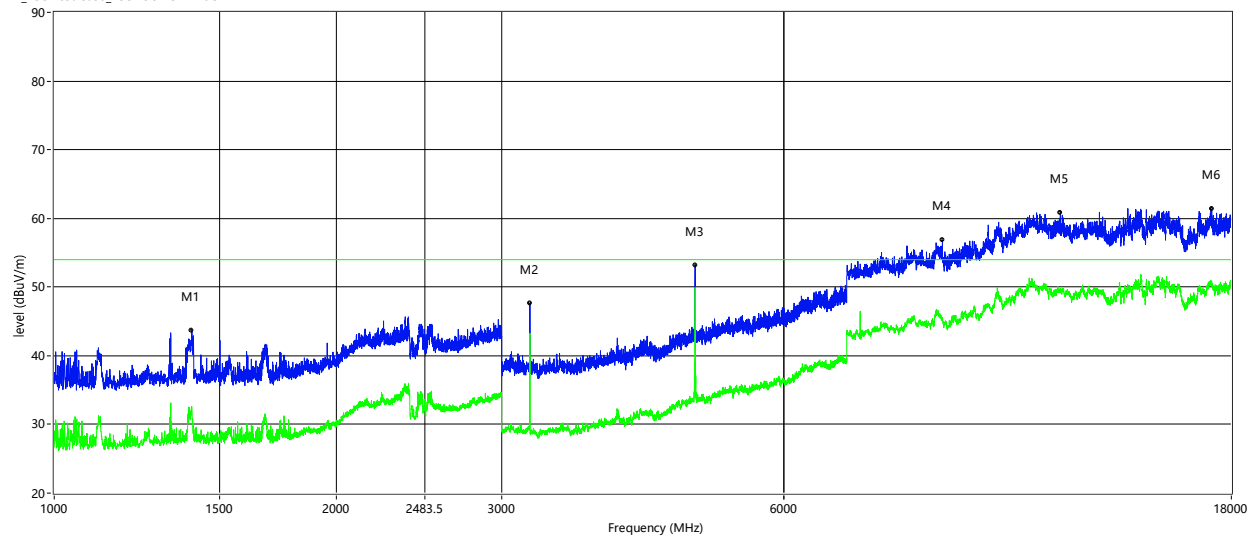
Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier + BRF Factor.
2. Margin = Limit - Emission Level
3. Tests were performed in three frequency range 1GHz~3GHz, 3GHz~13GHz, 13GHz~18GHz.
4. Above 18GHz emissions are mainly from the environment noise, not show in report.



### HARMONICS AND SPURIOUS EMISSIONS (01 CHANNEL, VERTICAL)

RE\_FCC Test Case\_FCC 15C 1GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1402.000	43.61	32.02	-0.66	74.0	54.0	-21.98	Vertical	Pass
3215.000	47.60	42.87	-12.14	74.0	54.0	-11.13	Vertical	Pass
4824.000	53.10	49.93	-6.84	74.0	54.0	-4.07	Vertical	Pass
8853.500	56.79	45.15	4.52	74.0	54.0	-8.85	Vertical	Pass
11826.250	60.75	49.52	9.32	74.0	54.0	-4.48	Vertical	Pass
17150.250	61.39	50.89	10.20	74.0	54.0	-3.11	Vertical	Pass

Remark:

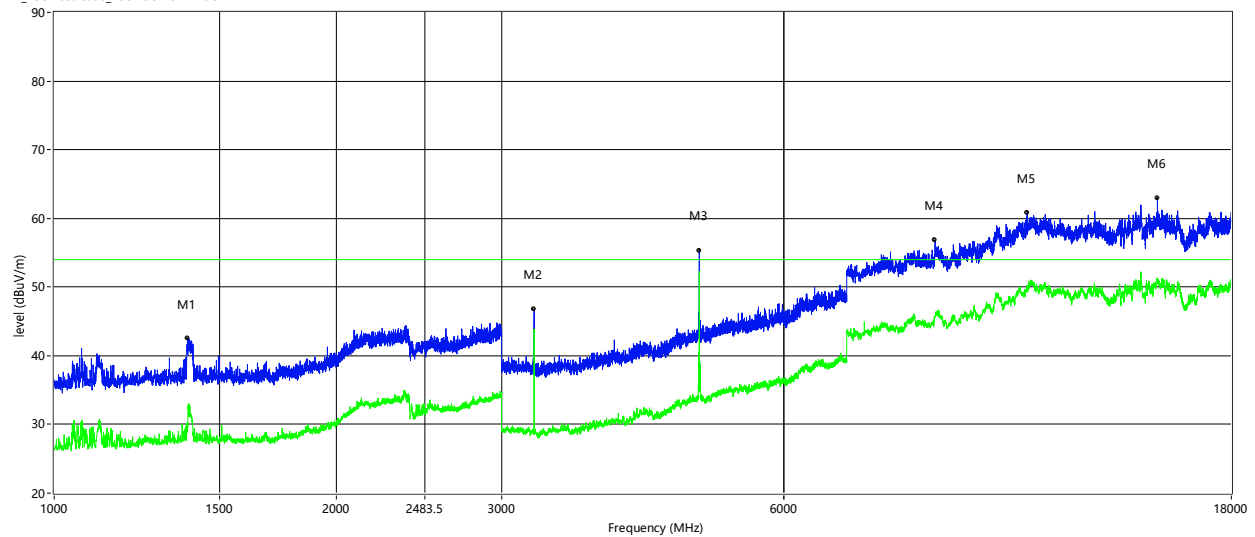
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier + BRF Factor.
2. Margin = Limit - Emission Level
3. Tests were performed in three frequency range 1GHz~3GHz, 3GHz~13GHz, 13GHz~18GHz.
4. Above 18GHz emissions are mainly from the environment noise, not show in report.





### **HARMONICS AND SPURIOUS EMISSIONS (06 CHANNEL, HORIZONTAL)**

RE\_FCC Test Case\_FCC 15C 1GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1387.500	42.53	30.30	-0.69	74.0	54.0	-23.70	Horizontal	Pass
3249.000	46.79	43.87	-12.18	74.0	54.0	-10.13	Horizontal	Pass
4874.000	55.34	51.30	-6.54	74.0	54.0	-2.70	Horizontal	Pass
8696.750	56.78	45.61	5.12	74.0	54.0	-8.39	Horizontal	Pass
10902.250	60.75	50.26	9.47	74.0	54.0	-3.74	Horizontal	Pass
15010.750	63.00	50.06	10.39	74.0	54.0	-3.94	Horizontal	Pass

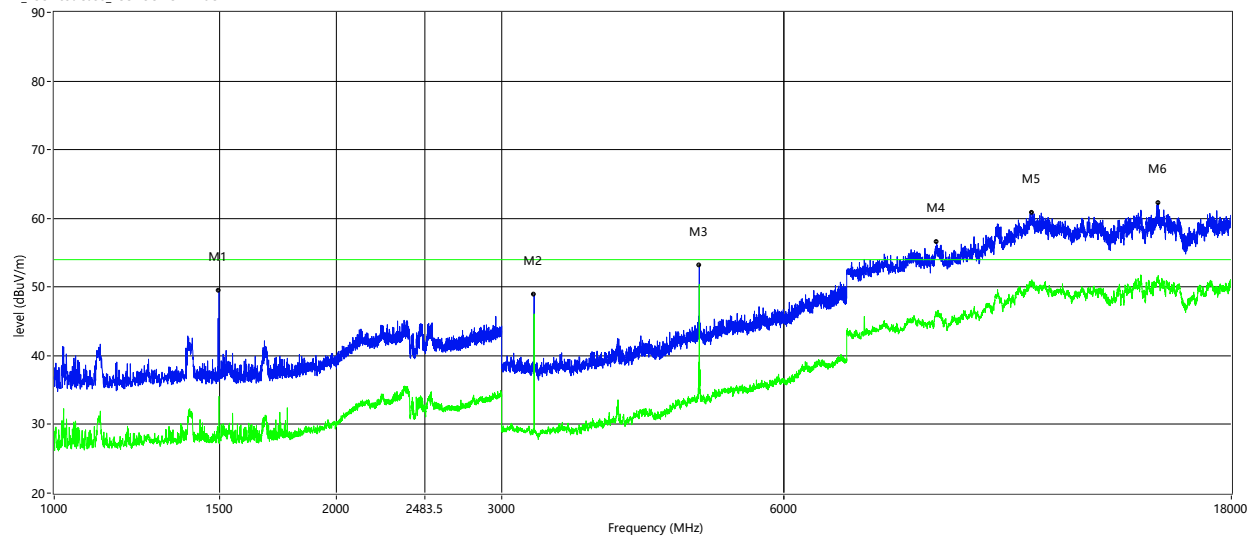
**Remark:**

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier + BRF Factor.
2. Margin = Limit - Emission Level
3. Tests were performed in three frequency range 1GHz~3GHz, 3GHz~13GHz, 13GHz~18GHz.
4. Above 18GHz emissions are mainly from the environment noise, not show in report.



### HARMONICS AND SPURIOUS EMISSIONS (06 CHANNEL, VERTICAL)

RE\_FCC Test Case\_FCC 15C 1GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1498.500	49.45	34.12	-0.56	74.0	54.0	-19.88	Vertical	Pass
3249.000	48.89	46.08	-12.18	74.0	54.0	-7.92	Vertical	Pass
4874.000	53.09	50.37	-6.54	74.0	54.0	-3.63	Vertical	Pass
8729.750	56.52	46.27	5.07	74.0	54.0	-7.73	Vertical	Pass
11037.000	60.81	50.71	10.02	74.0	54.0	-3.29	Vertical	Pass
15041.000	62.20	50.68	10.36	74.0	54.0	-3.32	Vertical	Pass

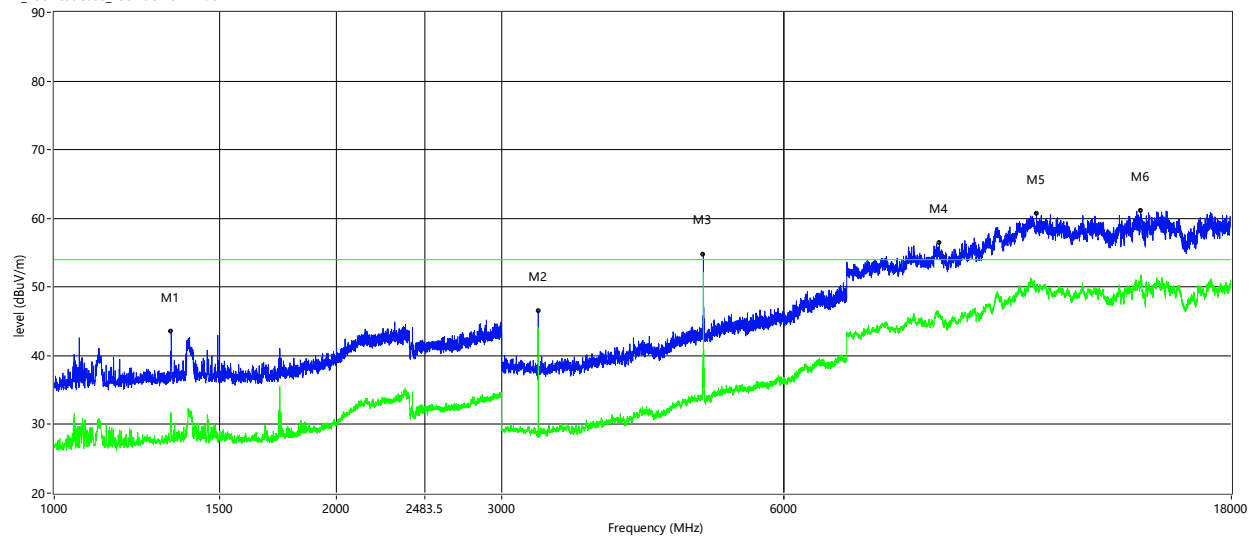
Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier + BRF Factor.
2. Margin = Limit - Emission Level
3. Tests were performed in three frequency range 1GHz~3GHz, 3GHz~13GHz, 13GHz~18GHz.
4. Above 18GHz emissions are mainly from the environment noise, not show in report.



### **HARMONICS AND SPURIOUS EMISSIONS (11 CHANNEL, HORIZONTAL)**

RE\_FCC Test Case\_FCC 15C 1GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1333.000	43.48	30.80	-0.84	74.0	54.0	-23.20	Horizontal	Pass
3282.000	46.49	44.09	-12.22	74.0	54.0	-9.91	Horizontal	Pass
4924.000	54.77	51.09	-6.39	74.0	54.0	-2.91	Horizontal	Pass
8790.250	56.43	46.04	4.88	74.0	54.0	-7.96	Horizontal	Pass
11155.250	60.65	49.70	9.64	74.0	54.0	-4.30	Horizontal	Pass
14405.750	61.04	50.54	11.36	74.0	54.0	-3.46	Horizontal	Pass

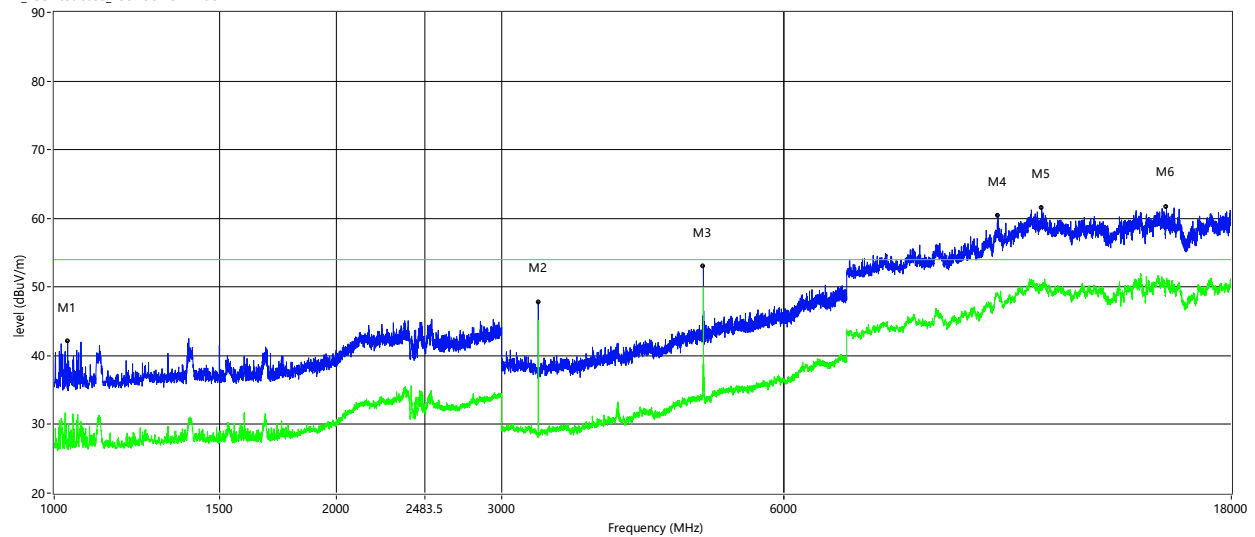
**Remark:**

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier + BRF Factor.
2. Margin = Limit - Emission Level
3. Tests were performed in three frequency range 1GHz~3GHz, 3GHz~13GHz, 13GHz~18GHz.
4. Above 18GHz emissions are mainly from the environment noise, not show in report.



### **HARMONICS AND SPURIOUS EMISSIONS (11 CHANNEL, VERTICAL)**

RE\_FCC Test Case\_FCC 15C 1GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	ANT	Verdict
1033.500	42.06	27.87	-1.87	74.0	54.0	-26.13	Vertical	Pass
3282.000	47.83	45.12	-12.22	74.0	54.0	-8.88	Vertical	Pass
4924.000	52.96	50.00	-6.39	74.0	54.0	-4.00	Vertical	Pass
10146.000	60.41	48.98	7.15	74.0	54.0	-5.02	Vertical	Pass
11301.000	61.54	50.41	9.53	74.0	54.0	-3.59	Vertical	Pass
15349.000	61.65	50.81	10.46	74.0	54.0	-3.19	Vertical	Pass

**Remark:**

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier + BRF Factor.
2. Margin = Limit - Emission Level
3. Tests were performed in three frequency range 1GHz~3GHz, 3GHz~13GHz, 13GHz~18GHz.
4. Above 18GHz emissions are mainly from the environment noise, not show in report.