


Product Name: Action Camera	Report No: FCC022023-00283RF1
Product Model: ARG-AC-9180BK, ARG-AC-9181, ARG-AC-9182, ARG-AC-9183, ARG-AC-9184, ARG-AC-9185, ARG-AC-9186, ARG-AC-9187, ARG-AC-9188, ARG-AC-9189	Security Classification: Open
Version: V1.0	Total Page: 109

## TIRT Testing Report

Prepared By:	Checked By:	Approved By:	
Stone Tang	Randy Lv	Daniel Chen	
Stone Tang	Randy Lv	Daniel Chen	

# FCC Radio Test Report

## FCC ID: 2AUGWARG-AC-9180BK

This report concerns: Original Grant

**Project No.** : 2023-00283  
**Equipment** : Action Camera  
**Brand Name** : ArgomTech  
**Test Model** : ARG-AC-9180BK  
**Series Model** : ARG-AC-9181, ARG-AC-9182, ARG-AC-9183, ARG-AC-9184, ARG-AC-9185, ARG-AC-9186, ARG-AC-9187, ARG-AC-9188, ARG-AC-9189  
**Applicant** : MG Accessories & Distribution Inc  
**Address** : 12650 NW 25<sup>th</sup> Street Suite 112 Miami Florida United States 33182  
**Manufacturer** : MG Accessories & Distribution Inc  
**Address** : 12650 NW 25<sup>th</sup> Street Suite 112 Miami Florida United States 33182  
**Date of Receipt** : Feb. 02, 2023  
**Date of Test** : Feb. 02, 2023~Feb. 09, 2023  
**Issued Date** : Feb.10, 2023  
**Report Version** : V1.0  
**Test Sample** : Engineering Sample No.: 20230203001157  
**Standard(s)** : FCC CFR Title 47, Part 15, Subpart C  
FCC KDB 558074 D01 15.247 Meas Guidance v05r02  
ANSI C63.10-2013

- The test result referred exclusively to the presented test model /sample.
- Without written approval of TIRT Inc. the test report shall not reproduced except in full.

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**REPORT ISSUED HISTORY**

Report No.	Version	Description	Issued Date	Note
FCC022023-00283RF1	V1.0	Original Report.	2023.02.10	Valid

## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC CFR Title 47, Part 15, Subpart C				
Standard(s) Section	Test Item	Test Result	Judgment	Remark
15.207	AC Power Line Conducted Emissions	APPENDIX A	PASS	-----
15.247(d) 15.205(a) 15.209(a)	Radiated Emissions	APPENDIX B APPENDIX C APPENDIX D	PASS	-----
15.247(a)(2)	Bandwidth	APPENDIX E	PASS	-----
15.247(b)(3)	Maximum Output Power	APPENDIX F	PASS	-----
15.247(d)	Conducted Spurious Emissions	APPENDIX G	PASS	-----
15.247(e)	Power Spectral Density	APPENDIX H	PASS	-----
15.203	Antenna Requirement	-----	PASS	Note(2)

Note:

- (1) "N/A" denotes test is not applicable in this test report.
- (2) The device what use a permanently attached antenna were considered sufficient to comply with the provisions of 15.203.

## 1.1 TEST FACILITY

Company:	Beijing TIRT Technology Service Co.,Ltd Shenzhen
Address:	101, 3 # Factory Building, Gongjin Electronics Shatin Community, Kengzi Street, Pingshan District, Shenzhen, China
CNAS Registration Number:	CNAS L14158
A2LA Registration Number:	6049.01
FCC Accredited Lab. Designation Number:	CN1309
FCC Test Firm Registration Number:	825524
Telephone:	+86-0755-27087573

## 1.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

The TIRT measurement uncertainty as below table:

Uncertainty	
Parameter	Uncertainty
Occupied Channel Bandwidth	$\pm 142.12\text{kHz}$
RF power conducted	$\pm 0.74\text{dB}$
RF power radiated	$\pm 3.25\text{dB}$
RF power density	$\pm 1.28\text{dB}$
Spurious emissions, conducted	$\pm 1.78\text{dB}$
Spurious emissions, radiated (9kHz~30MHz)	$\pm 2.56\text{dB}$
Spurious emissions, radiated (30MHz~1GHz)	$\pm 4.6\text{dB}$
Spurious emissions, radiated (1GHz~18GHz)	$\pm 4.9\text{dB}$
Spurious emissions, radiated (18GHz~26.5GHz)	$\pm 4.9\text{dB}$
Conduction Emissions(150kHz~30MHz)	$\pm 3.1\text{dB}$
Humidity	$\pm 4.6\%$
Temperature	$\pm 0.7^\circ\text{C}$
Time	$\pm 1.2\%$

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

### 1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By
AC Power Line Conducted Emissions	22°C	52%	AC 120V/60Hz	Stone Tang
Radiated Emissions-9kHz to 30 MHz	24°C	51%	AC 120V/60Hz	Stone Tang
Radiated Emissions-30MHz to 1000MHz	24°C	51%	AC 120V/60Hz	Stone Tang
Radiated Emissions-Above 1000MHz	24°C	51%	AC 120V/60Hz	Stone Tang
Bandwidth	25°C	65%	AC 120V/60Hz	Stone Tang
Maximum Output Power	23°C	60%	AC 120V/60Hz	Stone Tang
Conducted Spurious Emissions	24.5°C	58%	AC 120V/60Hz	Stone Tang
Power Spectral Density	26°C	52%	AC 120V/60Hz	Stone Tang



## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	Action Camera
Brand Name	ArgomTech
Test Model	ARG-AC-9180BK
Series Model	ARG-AC-9181, ARG-AC-9182, ARG-AC-9183, ARG-AC-9184, ARG-AC-9185, ARG-AC-9186, ARG-AC-9187, ARG-AC-9188, ARG-AC-9189
Model Difference(s)	All model numbers are identical in interior structure, electrical circuits and components, only different is model name
Software Version	2023.01.09
Hardware Version	IT_X3_v3.7 2020.07.23
Power Source	DC voltage supplied from AC/DC adapter
Power Rating	3.7V Li-ion Battery 900mAh 3.33Wh
Operation Frequency	2412 MHz ~ 2462 MHz
Modulation Type	IEEE 802.11b: DSSS IEEE 802.11g: OFDM IEEE 802.11n: OFDM
Bit Rate of Transmitter	IEEE 802.11b: 11/5.5/2/1 Mbps IEEE 802.11g: 54/48/36/24/18/12/9/6 Mbps IEEE 802.11n: up to 300 Mbps
Maximum Output Power	IEEE 802.11n20: 1.75dBm (0.0015W)

Note:

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

## 2. Channel List:

CH01 - CH11 for IEEE 802.11b, IEEE 802.11g, IEEE 802.11n(HT20)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

## 3. Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	AT-B758K	PCB	N/A	-5.94

Note:

1) The antenna gain is provided by the manufacturer.

## 2.2 DESCRIPTION OF TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation mode.

Pretest Mode	Description
Mode 1	TX B Mode Channel 01/06/11
Mode 2	TX G Mode Channel 01/06/11
Mode 3	TX N(HT20) Mode Channel 01/06/11

Following mode(s) was (were) found to be the worst case(s) and selected for the final test.

AC power line conducted emissions test	
Final Test Mode	Description
Mode 3	TX N(HT20) Mode Channel 11

Radiated emissions test - Below 1GHz	
Final Test Mode	Description
Mode 3	TX N(HT20) Mode Channel 11

Radiated emissions test- Above 1GHz	
Final Test Mode	Description
Mode 1	TX B Mode Channel 01/06/11
Mode 2	TX G Mode Channel 01/06/11
Mode 3	TX N(HT20) Mode Channel 01/06/11

Conducted test	
Final Test Mode	Description
Mode 1	TX B Mode Channel 01/06/11
Mode 2	TX G Mode Channel 01/06/11
Mode 3	TX N(HT20) Mode Channel 01/06/11

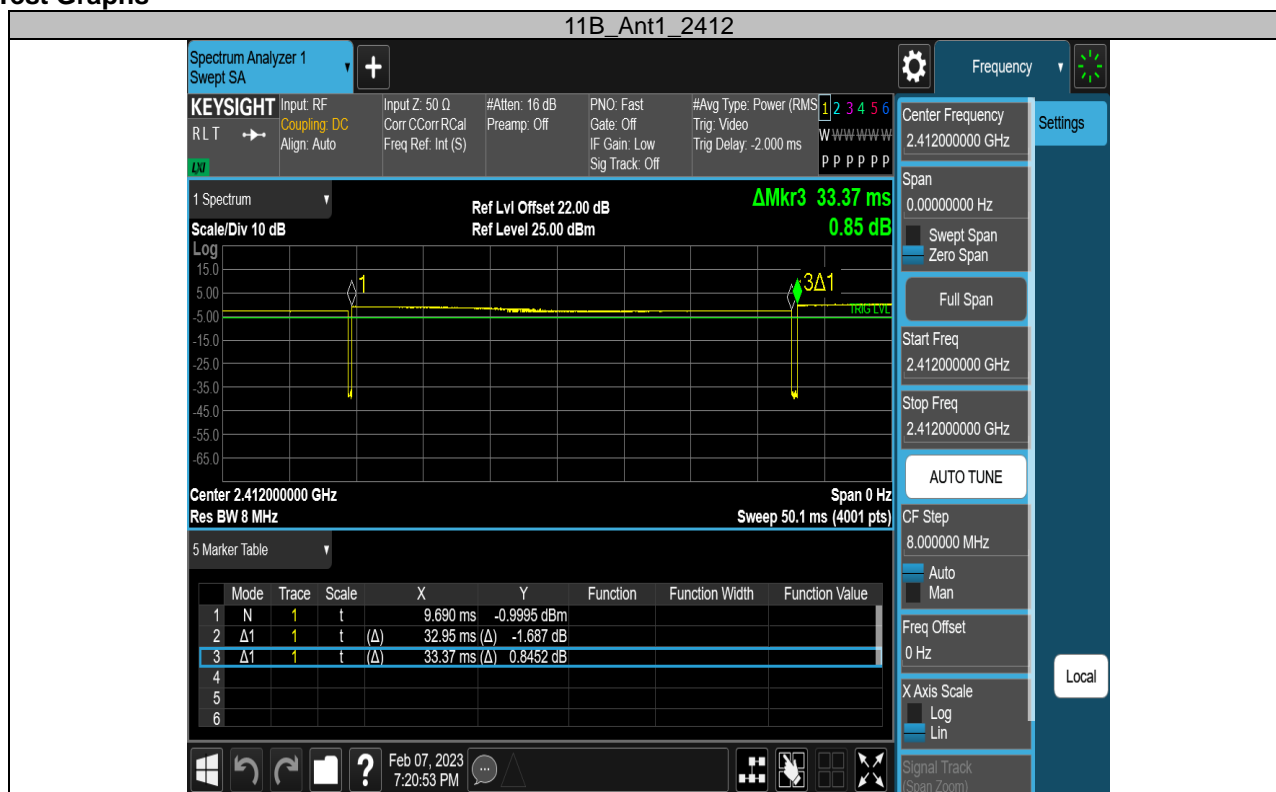
### NOTE:

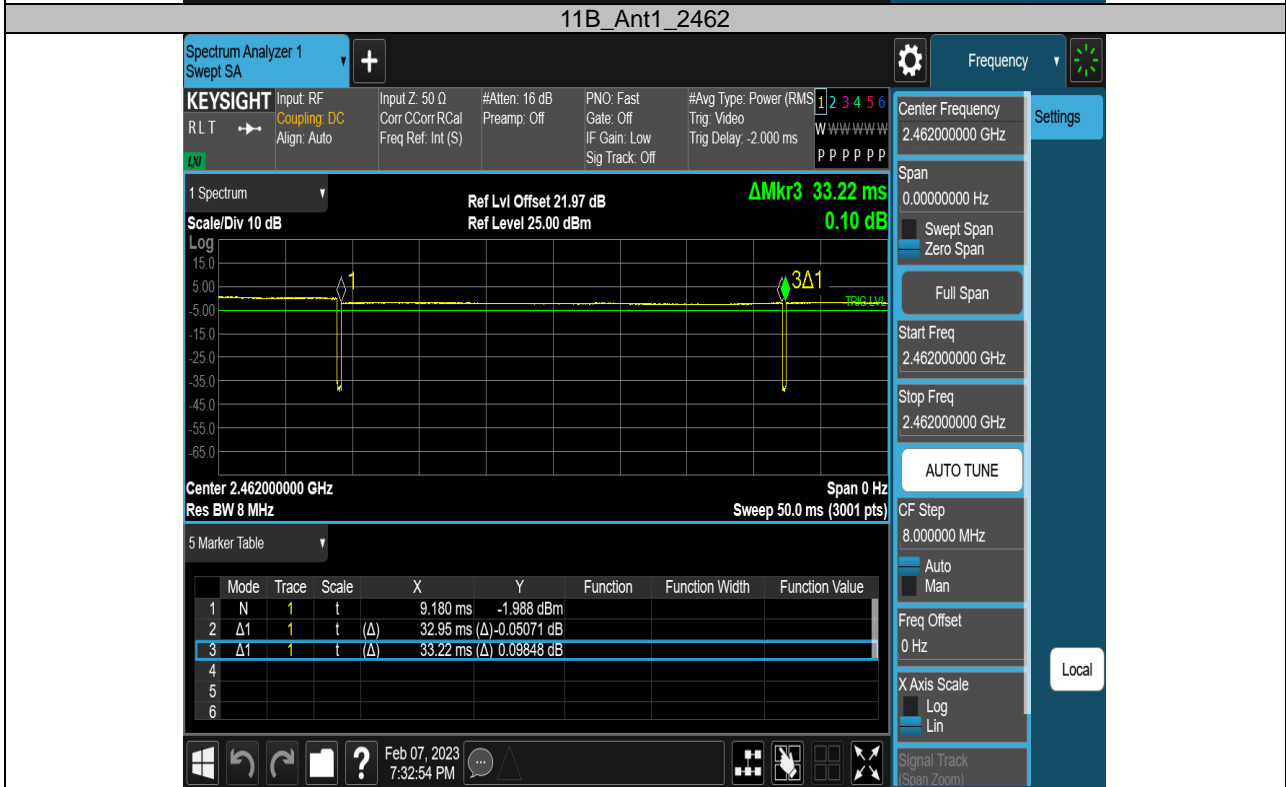
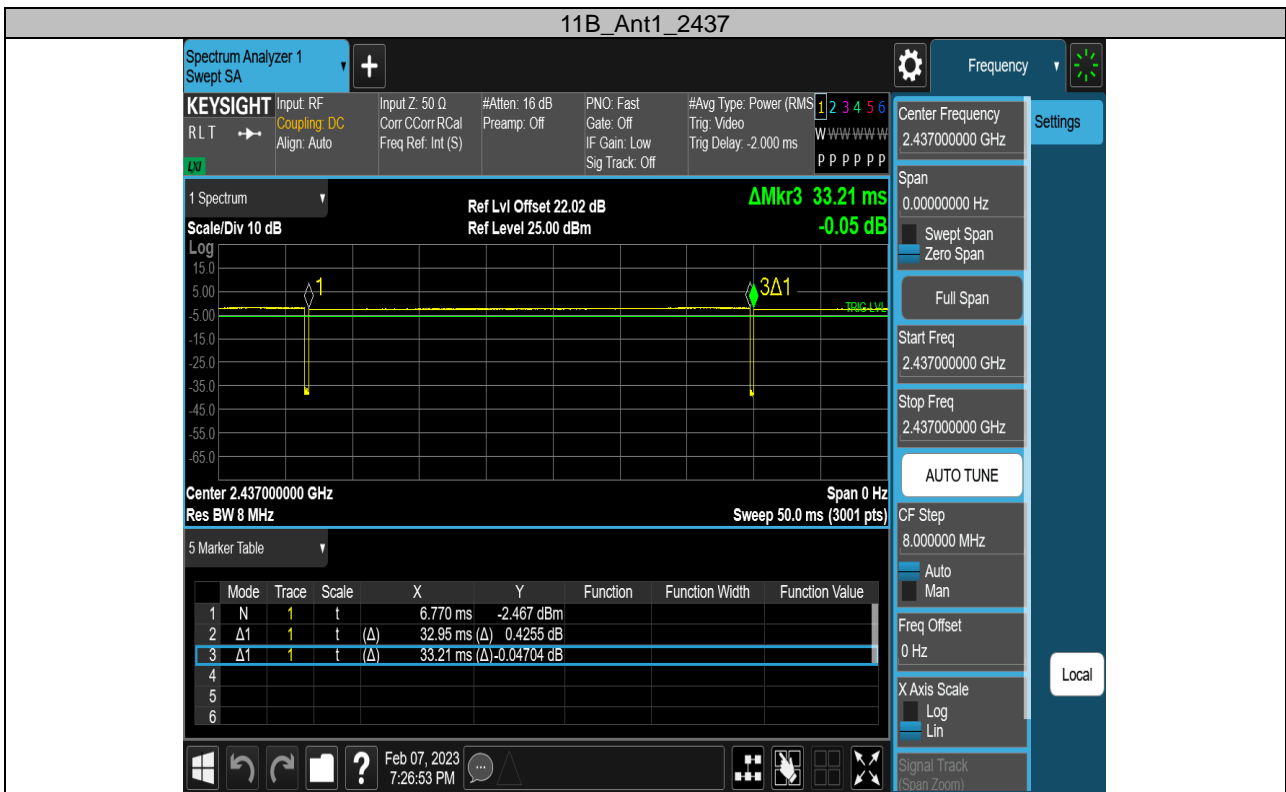
- (1) All the bit rate of transmitter have been tested and found the lowest rate is found to be the worst case and recorded.
- (2) For radiated emission above 1 GHz test, the spurious points of 1GHz~26.5GHz have been pre-tested and in this report only recorded the worst case. The remaining spurious points are all below the limit value of 20dB.

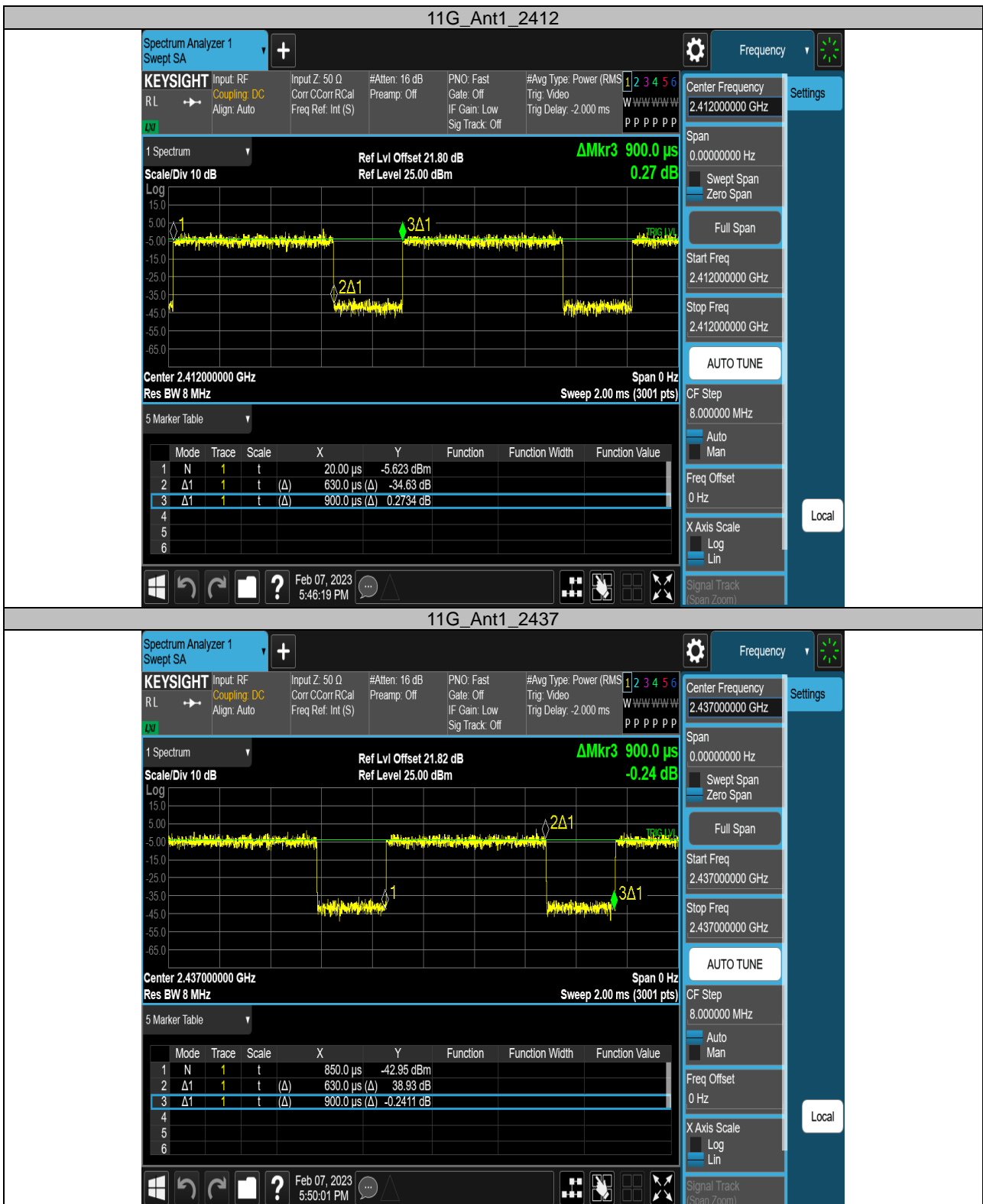
Test Software Version	N/A <sup>note1</sup>		
Frequency (MHz)	2412	2437	2462
IEEE 802.11b	9	9	9
IEEE 802.11g	9	9	9
IEEE 802.11n(HT20)	9	9	9

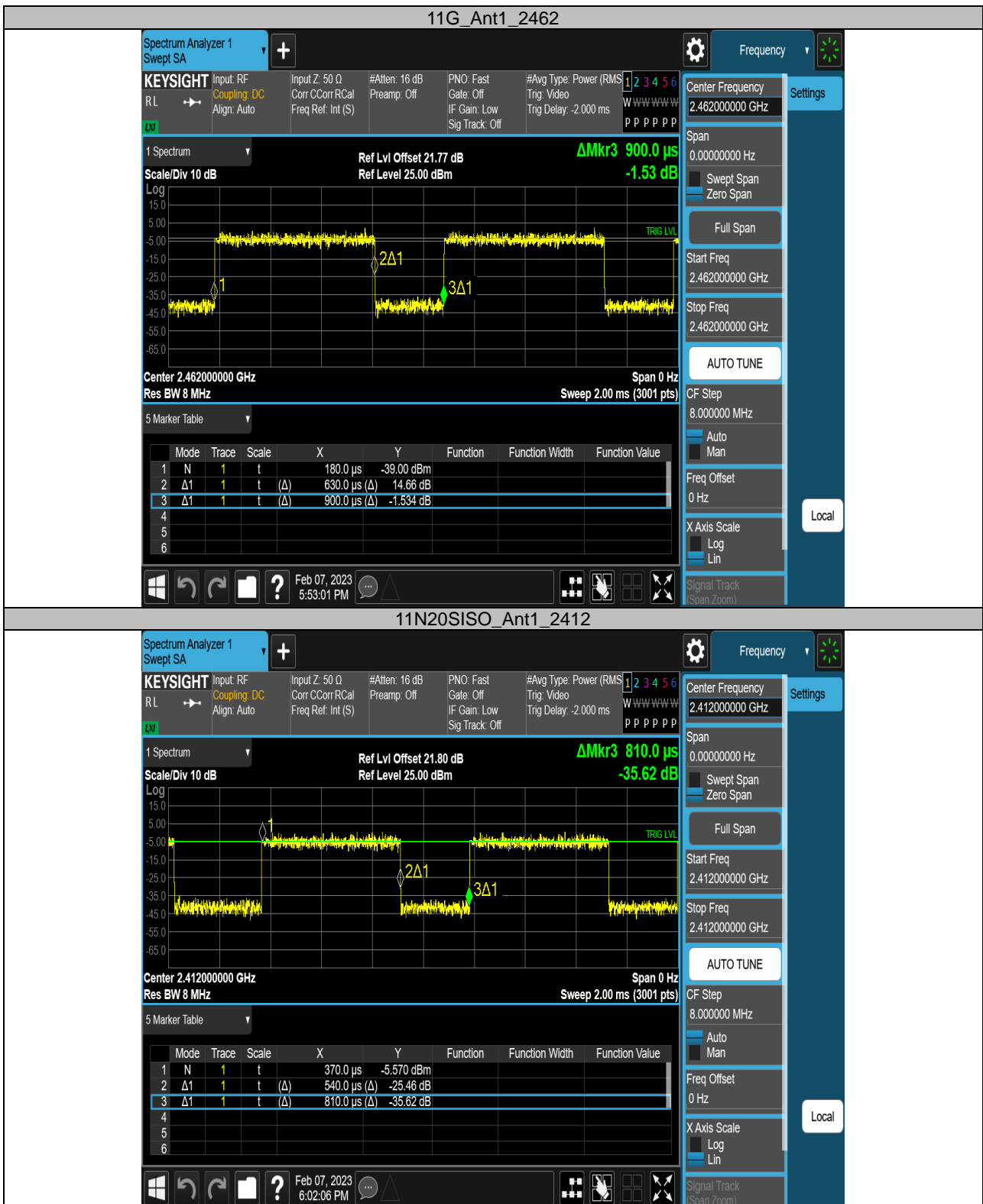
Note1: Test with adb test command

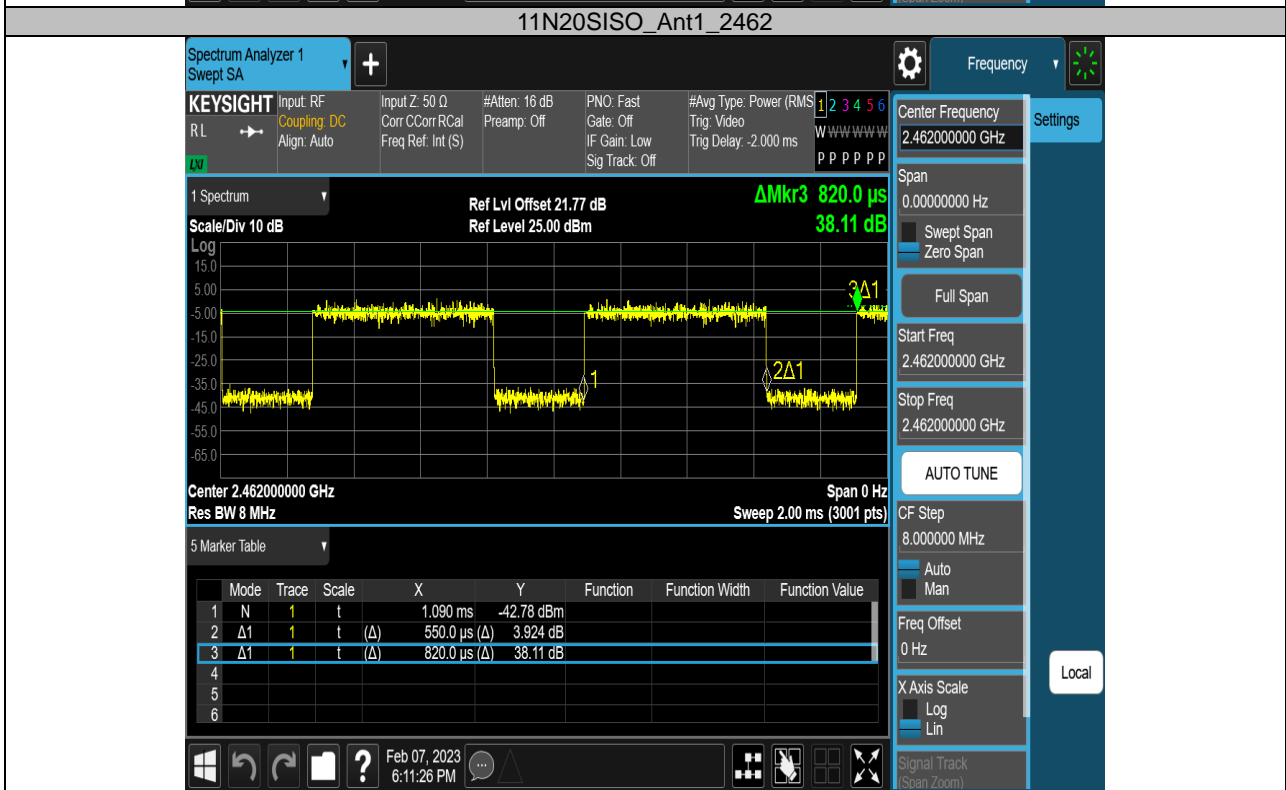
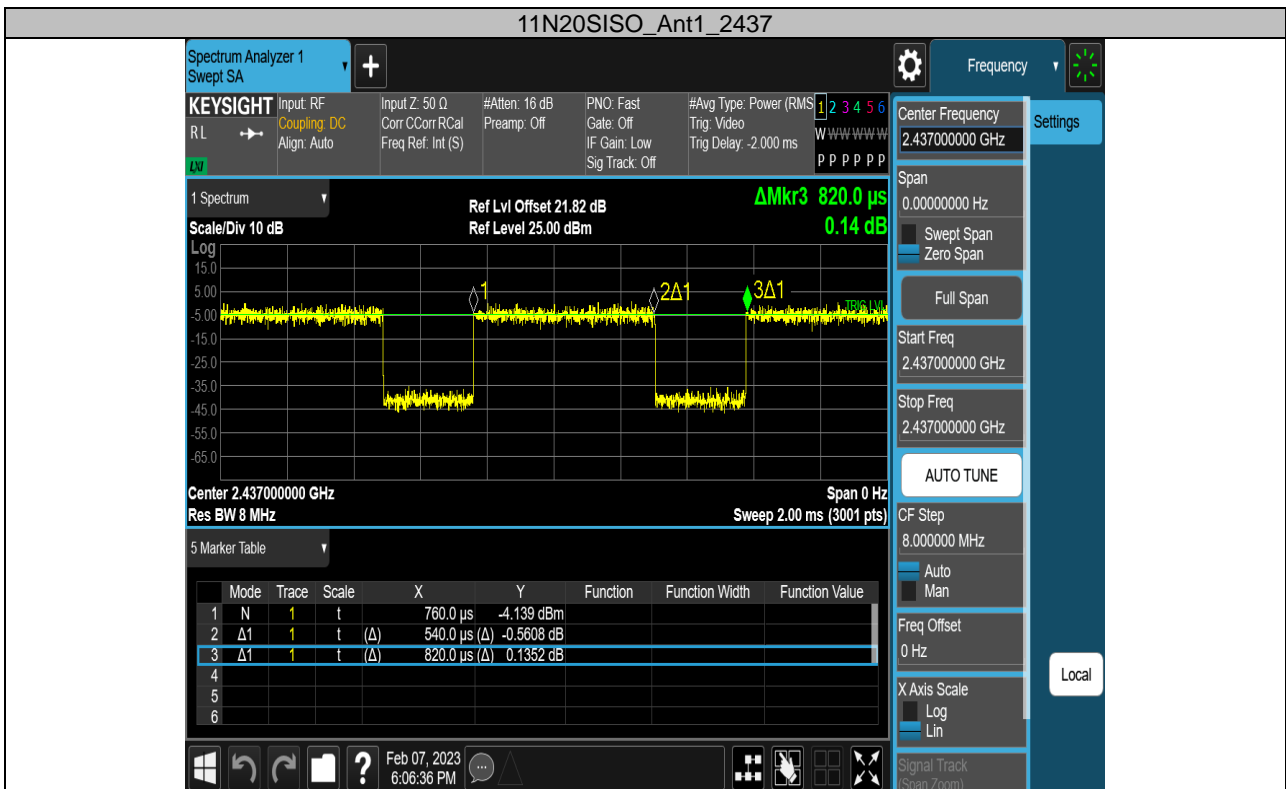
TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11B	Ant1	2412	32.95	33.37	98.74
		2437	32.95	33.21	99.22
		2462	32.95	33.22	99.19
11G	Ant1	2412	0.63	0.90	70.00
		2437	0.63	0.90	70.00
		2462	0.63	0.90	70.00
11N20SISO	Ant1	2412	0.54	0.81	66.67
		2437	0.54	0.82	65.85
		2462	0.55	0.82	67.07













**NOTE:**

For IEEE 802.11b:

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10Hz.

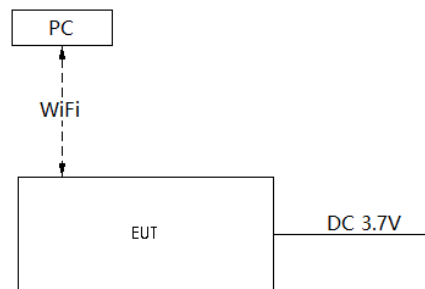
For IEEE 802.11g:

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10Hz.

For IEEE 802.11n(HT20):

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10Hz.

## 2.5 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



## 2.6 SUPPORT UNITS

### Support Equipment

Description	Manufacturer	Model No.	Serial Number	Supplied by
Notebook	Lenovo	L450	/	Lab
Adapter	/	CAN100USAPTVV	/	Lab

### Support Cable

Cable No.	Description	Connector	Length	Supplied by
1	USB cable	Micro-B	1 Meter	Lab

### 3. AC POWER LINE CONDUCTED EMISSIONS

#### 3.1 LIMIT

Frequency of Emission (MHz)	Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56*	56 to 46*
0.5 - 5.0	56	46
5.0 - 30.0	60	50

NOTE:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

#### 3.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

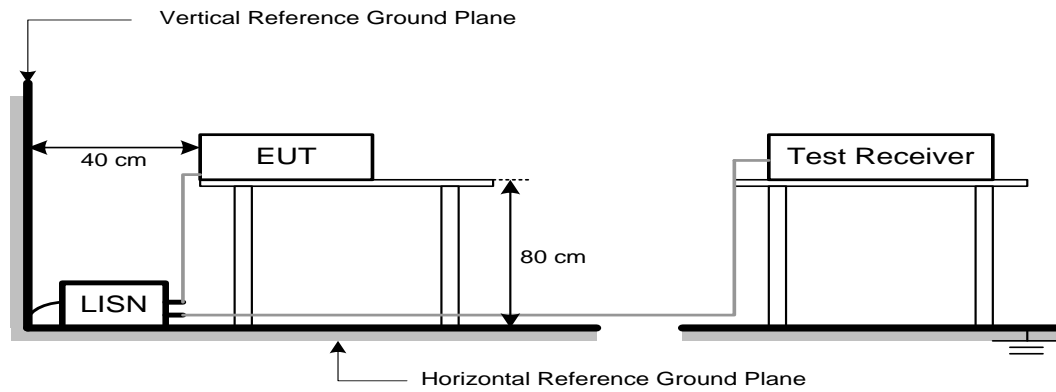
The following table is the setting of the receiver:

Receiver Parameters	Setting
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

#### 3.3 DEVIATION FROM TEST STANDARD

No deviation.

### 3.4 TEST SETUP



### 3.5 EUT OPERATION CONDITIONS

EUT was programmed to be in continuously transmitting mode.

### 3.6 TEST RESULTS

Please refer to the APPENDIX A.

## 4. RADIATED EMISSIONS

### 4.1 LIMIT

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

#### LIMITS OF RADIATED EMISSION MEASUREMENT (9 kHz-1000 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
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

#### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000 MHz)

Frequency (MHz)	(dBuV/m at 3 m)	
	Peak	Average
Above 1000	74	54

#### NOTE:

- (1) The limit for radiated test was performed according to FCC CFR Title 47, Part 15, Subpart C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

## 4.2 TEST PROCEDURE

- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1 GHz)
- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1 GHz)
- The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
- The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.  
(below 1 GHz)
- All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1 GHz)
- For the actual test configuration, please refer to the related Item -EUT Test Photos.

The following table is the setting of the receiver:

Spectrum Parameters	Setting
Start ~ Stop Frequency	9 kHz~150 kHz for RBW 200 Hz
Start ~ Stop Frequency	0.15 MHz~30 MHz for RBW 9 kHz
Start ~ Stop Frequency	30 MHz~1000 MHz for RBW 100 kHz

Spectrum Parameters	Setting
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	1 MHz / 3 MHz for PK value 1 MHz / 1/T Hz for AVG value

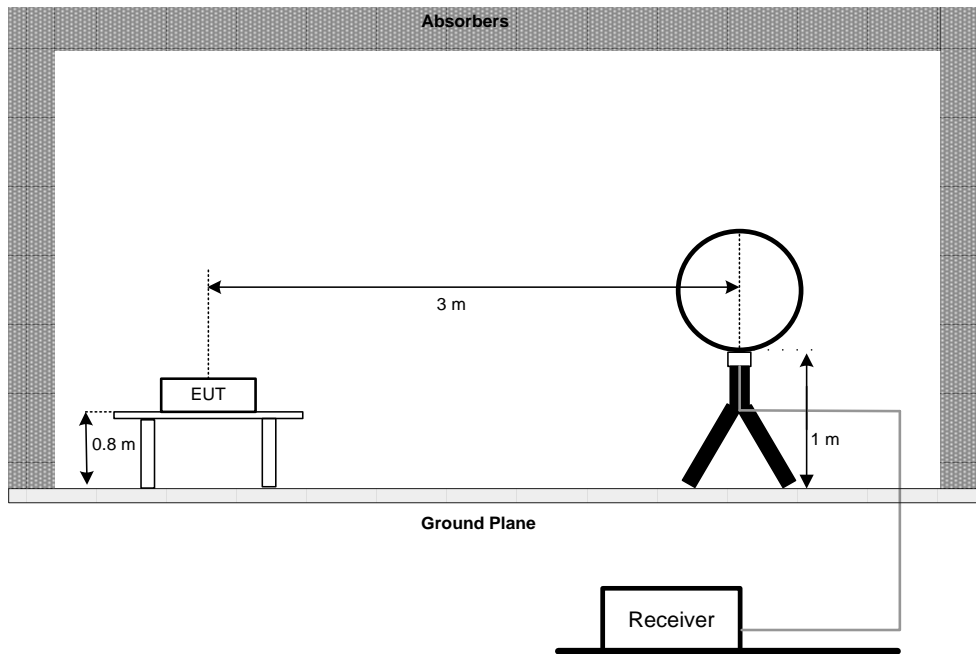
Receiver Parameters	Setting
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30 MHz~1000 MHz for QP detector
Start ~ Stop Frequency	1 GHz~26.5 GHz for PK/AVG detector

#### 4.3 DEVIATION FROM TEST STANDARD

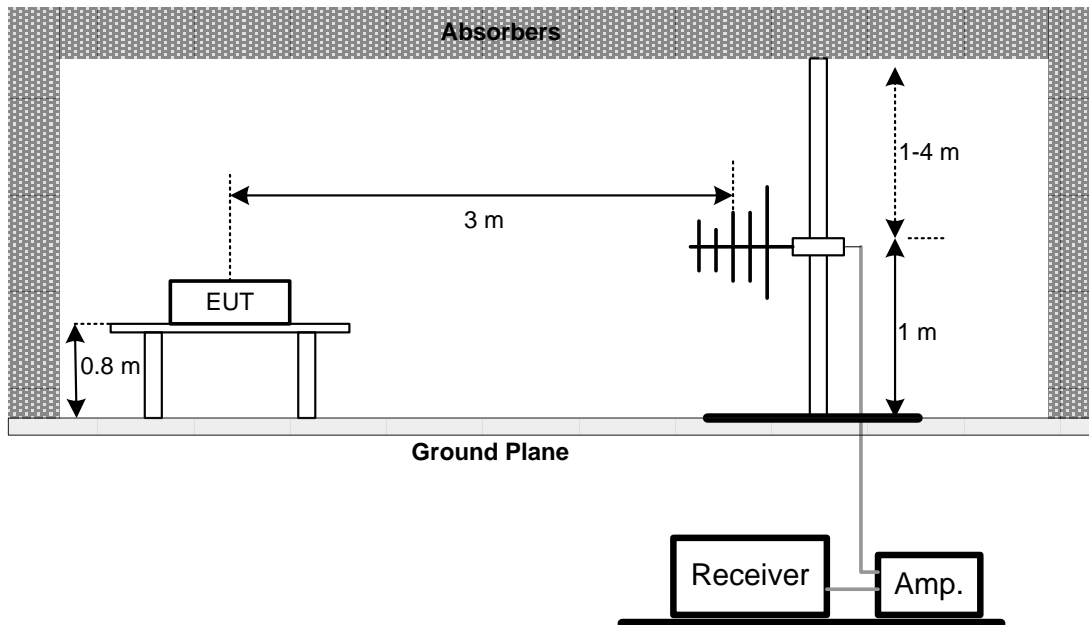
No deviation.

#### 4.4 TEST SETUP

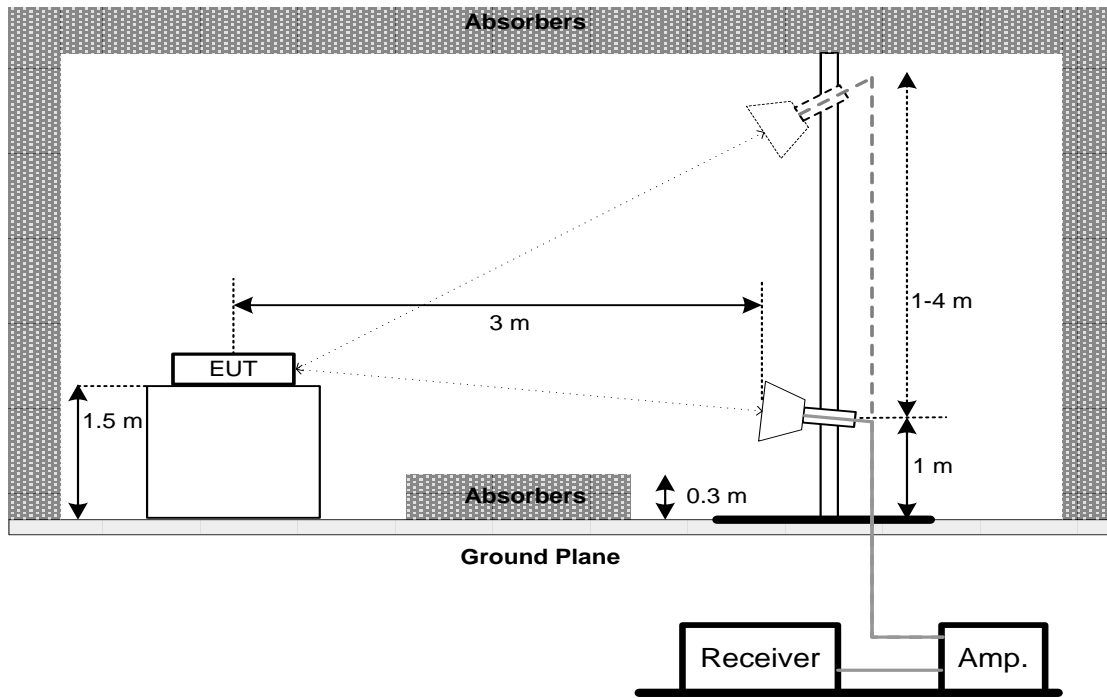
##### 9 kHz to 30 MHz



##### 30 MHz to 1 GHz



**Above 1 GHz**



#### 4.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 4.6 TEST RESULTS - 9 KHZ TO 30 MHZ

Please refer to the APPENDIX B.

Remark:

- (1) Distance extrapolation factor =  $40 \log (\text{specific distance} / \text{test distance})$  (dB).
- (2) Limit line = specific limits (dBuV) + distance extrapolation factor.

#### 4.7 TEST RESULTS - 30 MHZ TO 1000 MHZ

Please refer to the APPENDIX C.

#### 4.8 TEST RESULTS - ABOVE 1000 MHZ

Please refer to the APPENDIX D.

Remark:

- (1) No limit: This is fundamental signal, the judgment is not applicable.  
For fundamental signal judgment was referred to Peak output test.



## 5. BANDWIDTH

### 5.1 LIMIT

Section	Test Item	Limit
FCC 15.247(a)(2)	6 dB Bandwidth	Minimum 500 kHz
	99% Emission Bandwidth	-

### 5.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- The following table is the setting of the spectrum analyzer:

For 6 dB Bandwidth:

Spectrum Parameters	Setting
Span Frequency	> Measurement Bandwidth
RBW	100 kHz
VBW	300 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

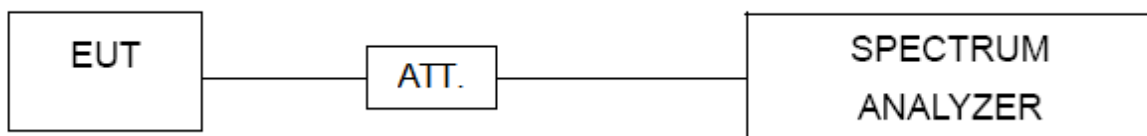
For 99% Emission Bandwidth:

Spectrum Parameters	Setting
Span Frequency	Between 1.5 times and 5.0 times the OBW
RBW	300 kHz For 20MHz 1 MHz For 40MHz
VBW	1 MHz For 20MHz 3 MHz For 40MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

### 5.3 DEVIATION FROM STANDARD

No deviation.

### 5.4 TEST SETUP



### 5.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 5.6 TEST RESULTS

Please refer to the APPENDIX E.

## 6. MAXIMUM OUTPUT POWER

### 6.1 LIMIT

Section	Test Item	Limit
FCC 15.247(b)(3)	Maximum Output Power	1.0000 Watt or 30.00 dBm

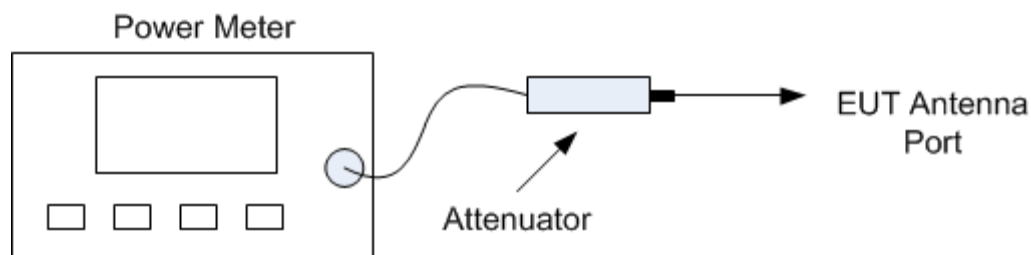
### 6.2 TEST PROCEDURE

- The EUT was directly connected to the peak power analyzer and antenna output port as show in the block diagram below.
- The maximum output power was performed in accordance with method 11.9.1.3 of ANSI C63.10.

### 6.3 DEVIATION FROM STANDARD

No deviation.

### 6.4 TEST SETUP



### 6.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 6.6 TEST RESULTS

Please refer to the APPENDIX F.

## 7. CONDUCTED SPURIOUS EMISSIONS

### 7.1 LIMIT

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 Output Power limits. If the transmitter complies with the Output 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. Attenuation below the general limits specified in Section 15.209(a) is not required.

### 7.2 TEST PROCEDURE

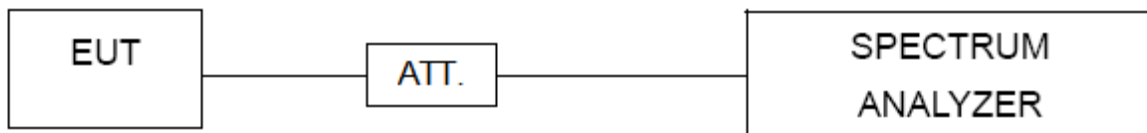
- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting
Start Frequency	30 MHz
Stop Frequency	26.5 GHz
RBW	100 kHz
VBW	300 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

### 7.3 DEVIATION FROM STANDARD

No deviation.

### 7.4 TEST SETUP



### 7.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 7.6 TEST RESULTS

Please refer to the APPENDIX G.

## 8. POWER SPECTRAL DENSITY

### 8.1 LIMIT

Section	Test Item	Limit
FCC 15.247(e)	Power Spectral Density	8 dBm (in any 3 kHz)

### 8.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting
Span Frequency	25 MHz (20 MHz) / 60 MHz (40 MHz)
RBW	3 kHz
VBW	10 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

### 8.3 DEVIATION FROM STANDARD

No deviation.

### 8.4 TEST SETUP



### 8.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 8.6 TEST RESULTS

Please refer to the APPENDIX H.

## 9. MEASUREMENT INSTRUMENTS LIST

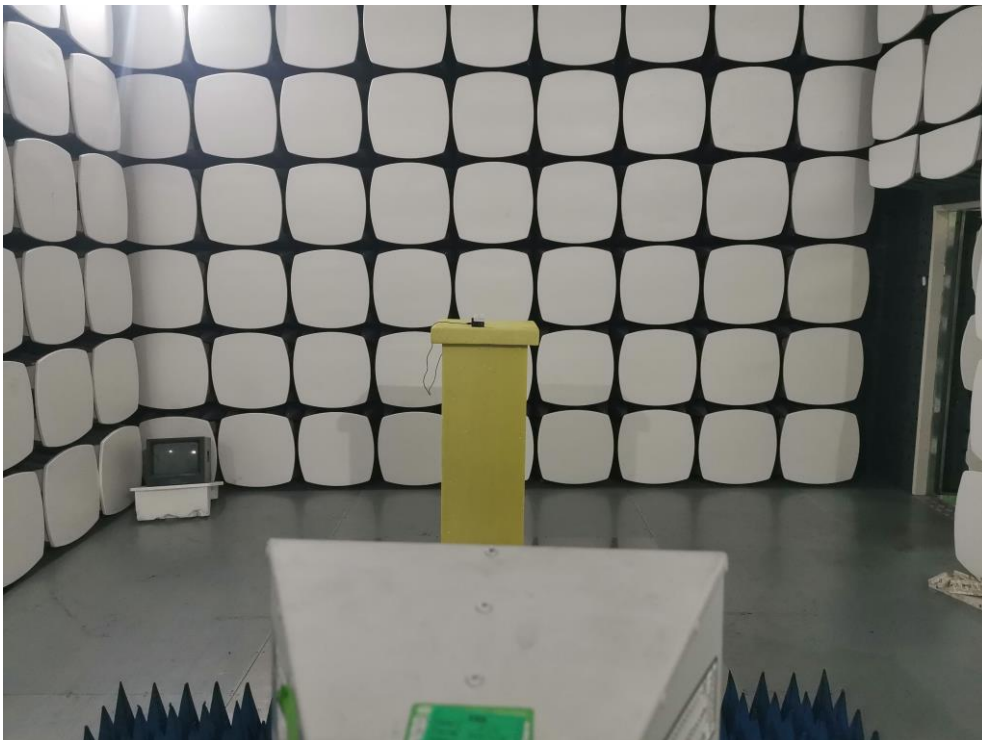
No.	Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMI Receiver	Rohde&Schwarz	ESCI	1166.5950.03	2023/10/14
2	AMN	Rohde&Schwarz	ENV216	3560.6550.05	2023/10/14
3	AMN	Schwarzbeck	NSLK8127	#829	2023/10/14
4	ECSI RF IN RF Cable	Rohde&Schwarz	RP-X1	\	2023/10/14
5	ECSI RF IN RF Cable	Rohde&Schwarz	Sapre sm	\	2023/10/14
6	EMI Receiver	Rohde&Schwarz	ESR7	102013	2023/10/14
7	Spectrum analyzer	Rohde&Schwarz	FSV30	103741	2023/10/17
8	EMI receiver	Rohde&Schwarz	ESU	100184	2023/07/20
9	Spectrum analyzer	KEYSIGHT	N9010A-44	MY51440158	2023/10/17
10	Loop Antenna*	Schwarzbeck	FMZB1519B	00029	2025/07/03
11	Integral Antenna	Schwarzbeck	VULB 9163	VULB 9163-361	2023/10/20
12	Integral Antenna	Schwarzbeck	BBHA 9120D	BBHA 9120D 1201	2023/10/15
13	Integral Antenna	Schwarzbeck	BBHA 9170	9170#685	2023/10/15
14	Preamplifier	CD Systems Inc	PAP-03036-30	85060000	2023/10/15
15	Preamplifier	Schwarzbeck	BBV9721	9721-019	2023/10/15
16	Preamplifier	emci	EMC012645 SE	980417	2023/10/16
17	ECSI RF IN RF Cable	Rohde&Schwarz	AP-X1	\	2023/10/16
18	Spectrum Analyzer	Agilent	N9010A	MY52221119	2023/10/17
19	Power Collection Unit	Tonscend	JS0806-2	188060134	2023/10/16
20	Tonscend Test System	Tonscend	2.6.77.0518	N/A	N/A
21	10dB Attenuator	Tonscend	10dB	N/A	N/A
22	Temp&Humidity Recorder	Anymetre	JR900	N/A	2023/10/16
23	Temp&Humidity Chamber	ETOMA	NTH1100-30 A	16080628	2023/10/16
24	Filter	STI	STI15-9845	N/A	N/A
25	Filter	STI	5.1G	N/A	N/A
26	Filter	STI	STI15-9845	N/A	N/A
27	Testing Software	EZ-EMC	TW-03A2	N/A	N/A

Remark: "N/A" denotes no model name, serial no. or calibration specified.

"\*\*" calibration period of equipment list is three year.

Except \* item, all calibration period of equipment list is one year.

**10. EUT TEST PHOTO****AC Power Line Conducted Emissions Test Photos**

**Radiated Emissions Test Photos****30 MHz to 1 GHz****Radiated Emissions Test Photos****Above 1 GHz**



### Conducted Test Photos

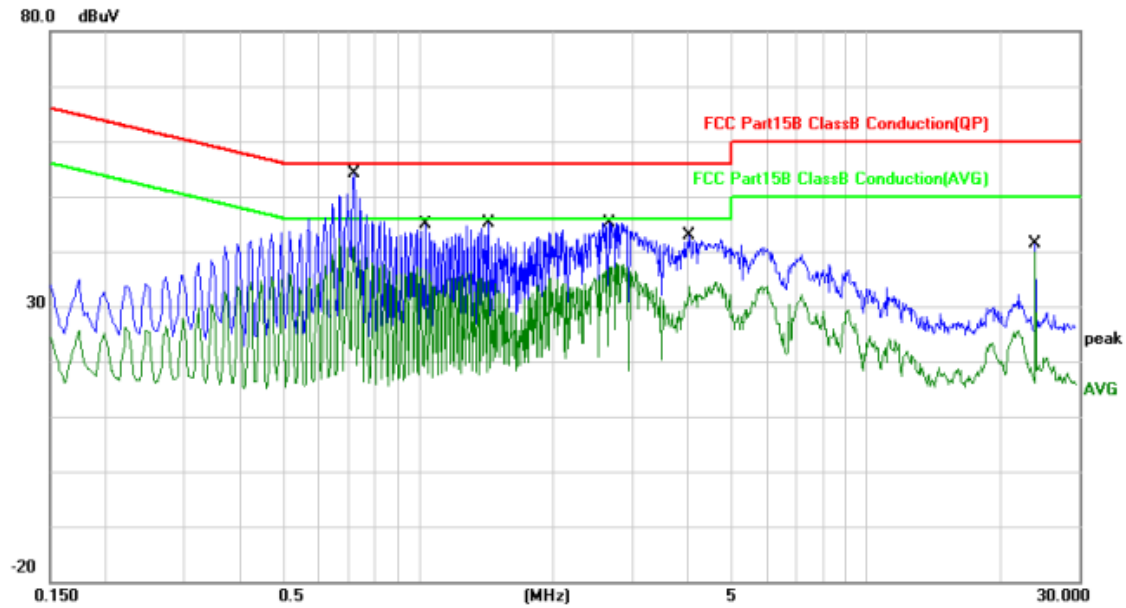




## **APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS**

Test Mode	TX 11N20SISO Mode Channel 11	Phase	Line
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### Conducted Emission Measurement



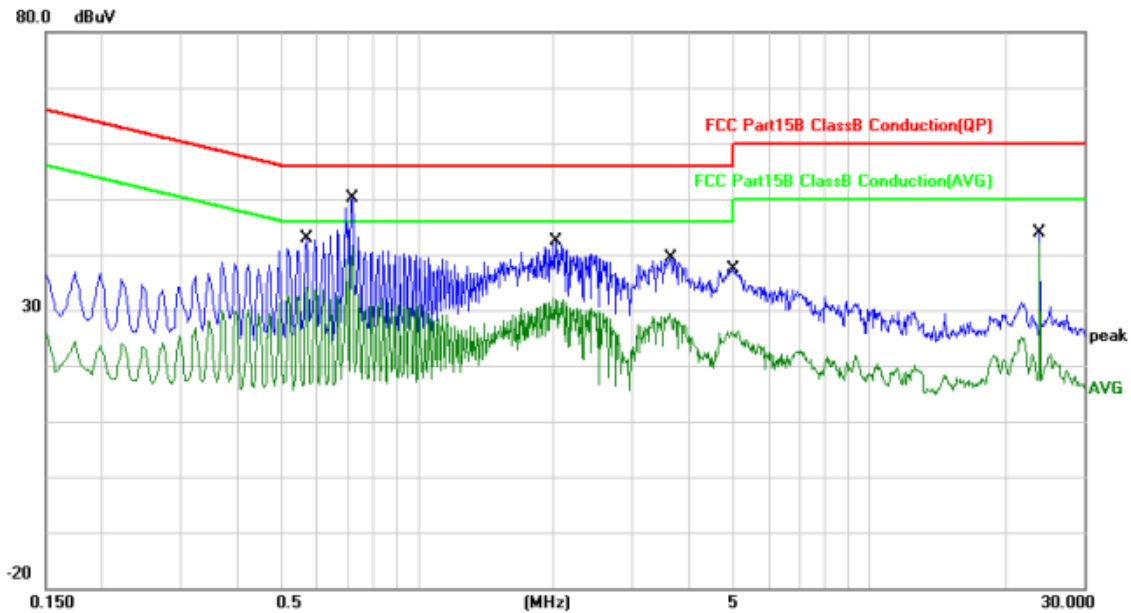
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.7180	30.94	19.88	50.82	56.00	-5.18	QP	
2	*	0.7180	23.52	19.88	43.40	46.00	-2.60	AVG	
3		1.0380	22.81	19.89	42.70	56.00	-13.30	QP	
4		1.0380	16.94	19.89	36.83	46.00	-9.17	AVG	
5		1.4340	20.09	19.90	39.99	56.00	-16.01	QP	
6		1.4340	13.49	19.90	33.39	46.00	-12.61	AVG	
7		2.6700	24.11	19.91	44.02	56.00	-11.98	QP	
8		2.6700	18.15	19.91	38.06	46.00	-7.94	AVG	
9		4.0300	21.12	19.91	41.03	56.00	-14.97	QP	
10		4.0300	14.32	19.91	34.23	46.00	-11.77	AVG	
11		24.0020	20.33	20.10	40.43	60.00	-19.57	QP	
12		24.0020	19.83	20.10	39.93	50.00	-10.07	AVG	

#### REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11N20SISO Mode Channel 11	Phase	Neutral
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### Conducted Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.5700	20.18	19.88	40.06	56.00	-15.94	QP	
2		0.5700	12.99	19.88	32.87	46.00	-13.13	AVG	
3		0.7180	28.59	19.88	48.47	56.00	-7.53	QP	
4	*	0.7180	20.63	19.88	40.51	46.00	-5.49	AVG	
5		2.0260	19.67	19.91	39.58	56.00	-16.42	QP	
6		2.0260	11.67	19.91	31.58	46.00	-14.42	AVG	
7		3.6580	16.22	19.91	36.13	56.00	-19.87	QP	
8		3.6580	6.72	19.91	26.63	46.00	-19.37	AVG	
9		5.0180	13.40	19.92	33.32	60.00	-26.68	QP	
10		5.0180	3.17	19.92	23.09	50.00	-26.91	AVG	
11		24.0020	22.60	20.10	42.70	60.00	-17.30	QP	
12		24.0020	21.97	20.10	42.07	50.00	-7.93	AVG	

#### REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

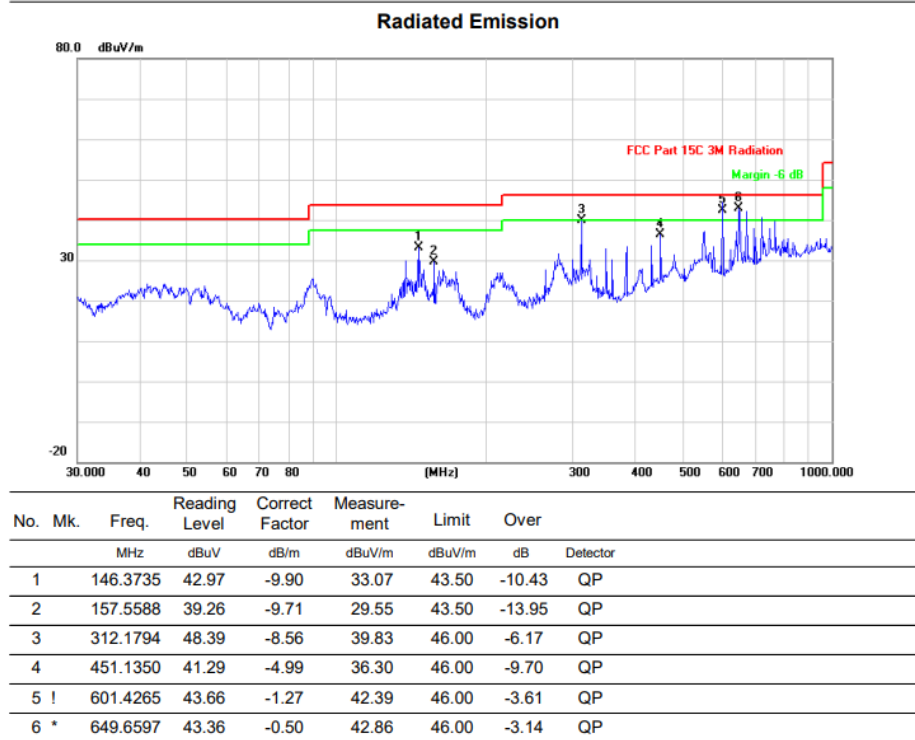
## **APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ**

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

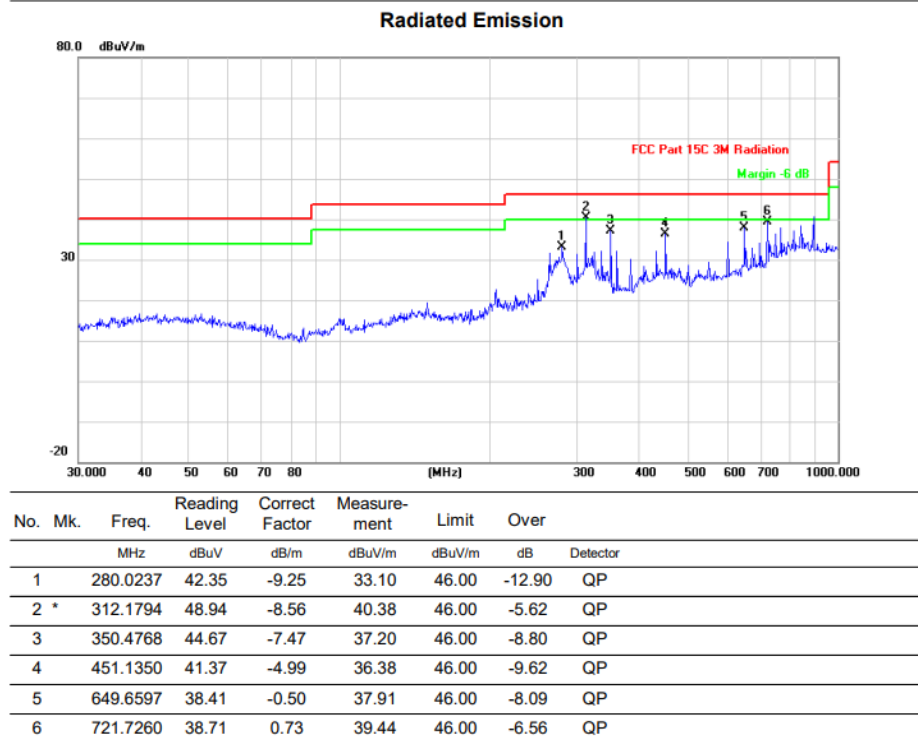
## **APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ**

Test Mode	TX 11N20SISO Mode Channel 11	Polarization	Vertical
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**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11N20SISO Mode Channel 11	Polarization	Horizontal
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**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

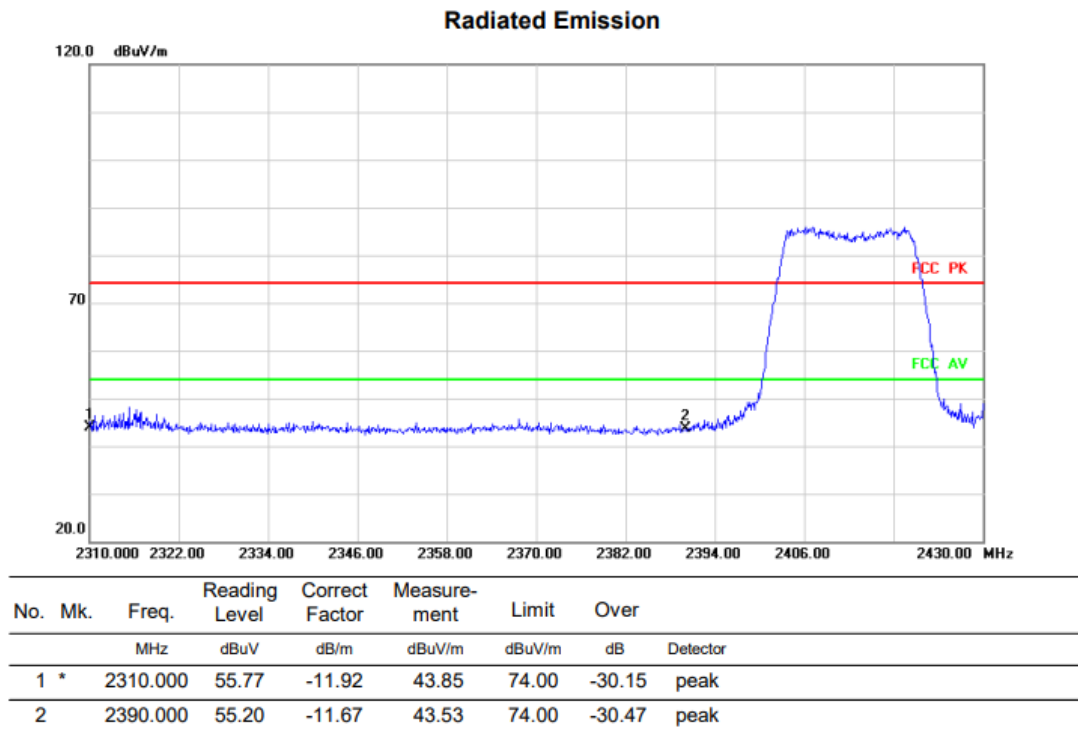


## **APPENDIX D - RADIATED EMISSION- ABOVE 1000 MHZ**

**Note:**

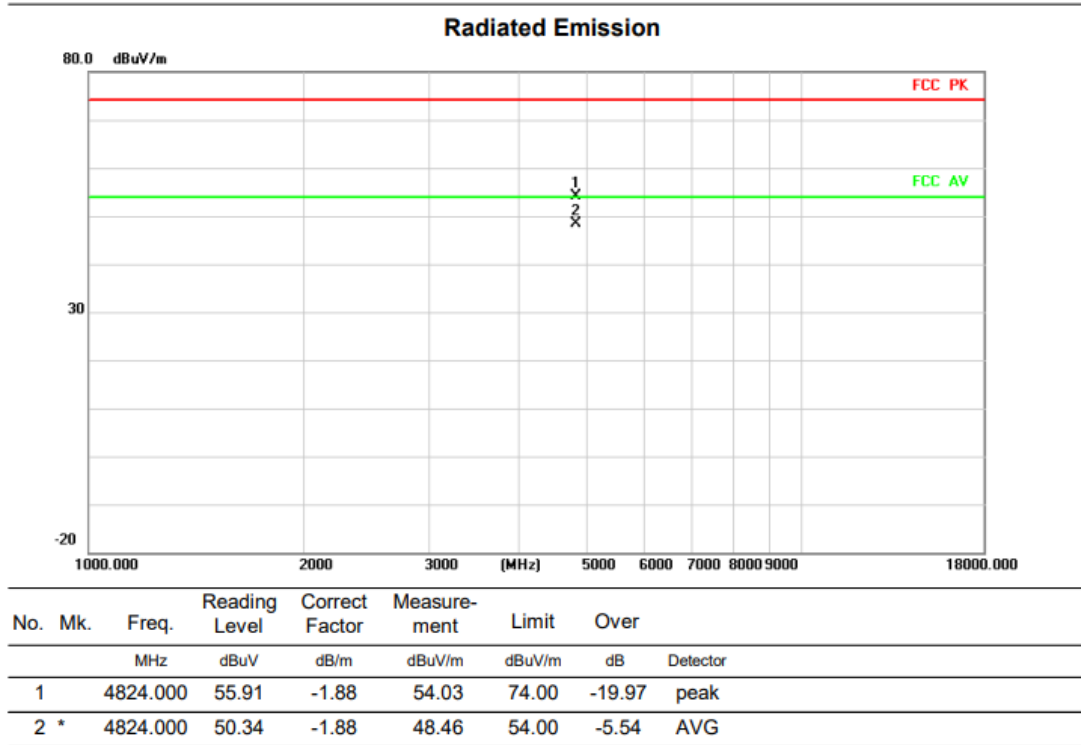
The frequency range scanned from 18GHz to the tenth harmonic of the highest fundamental frequency or 40GHz, whichever is lower. The emissions were below the limit by 20dBc, so we have not recorded it in the report.

Test Mode	TX 11B Mode 2412 MHz	Polarization	Vertical
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**REMARKS:**

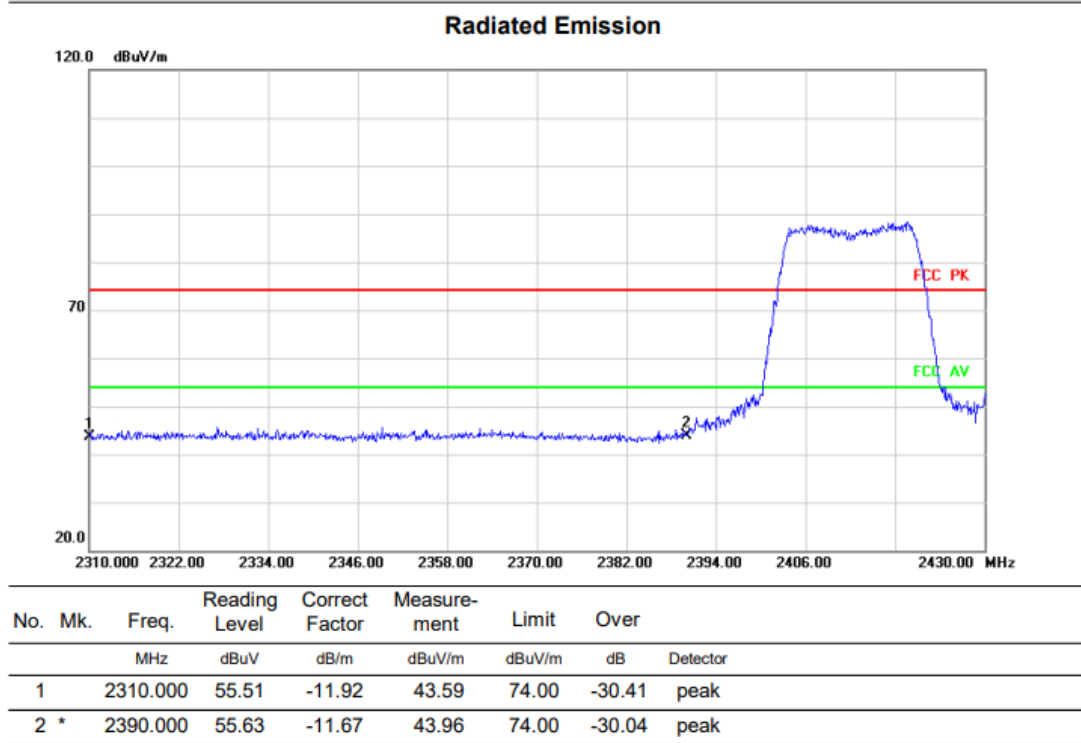
- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11B Mode 2412 MHz	Polarization	Vertical
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**REMARKS:**

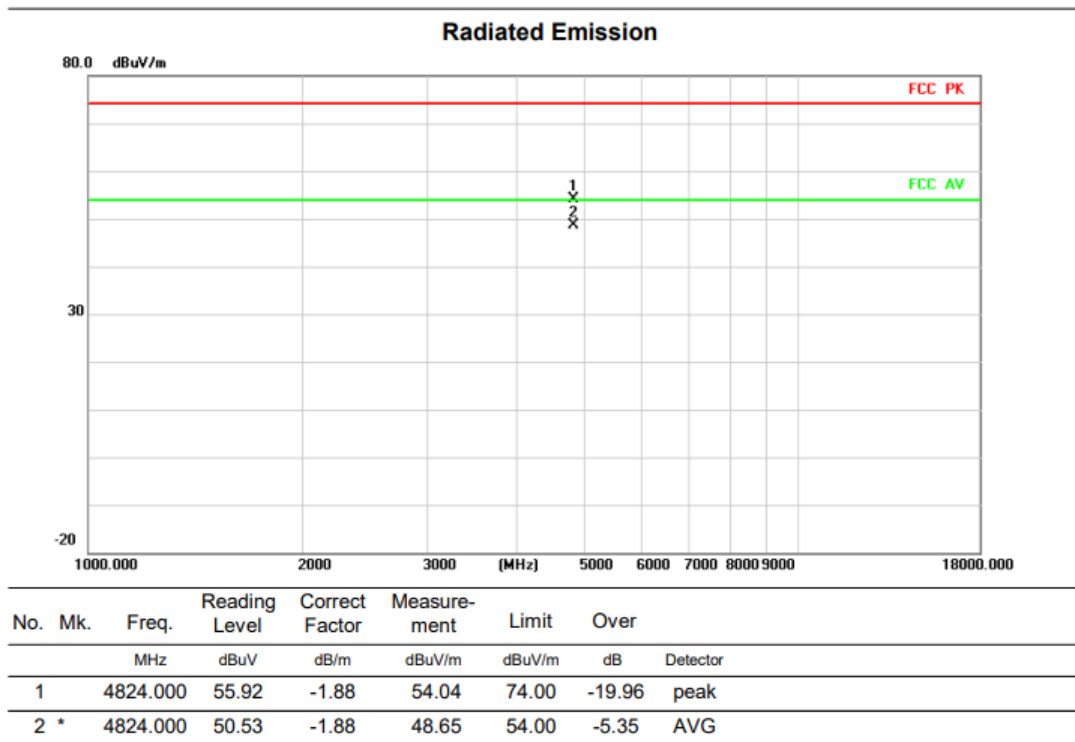
- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11B Mode 2412 MHz	Polarization	Horizontal
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**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

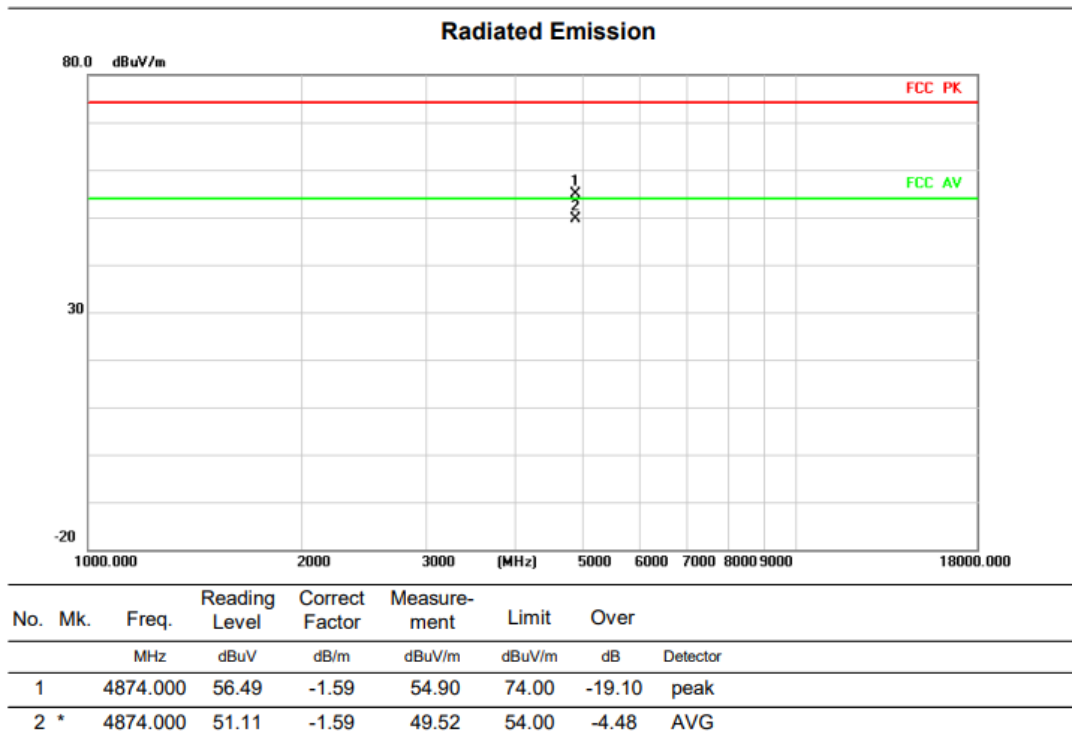
Test Mode	TX 11B Mode 2412 MHz	Polarization	Horizontal
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**REMARKS:**

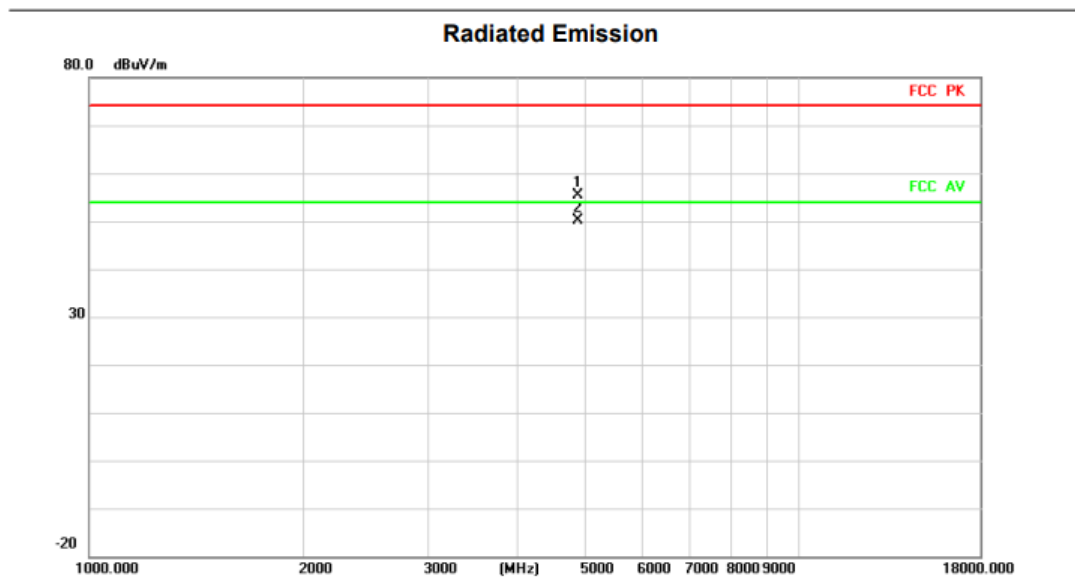
- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11B Mode 2437 MHz	Polarization	Vertical
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**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11B Mode 2437 MHz	Polarization	Horizontal
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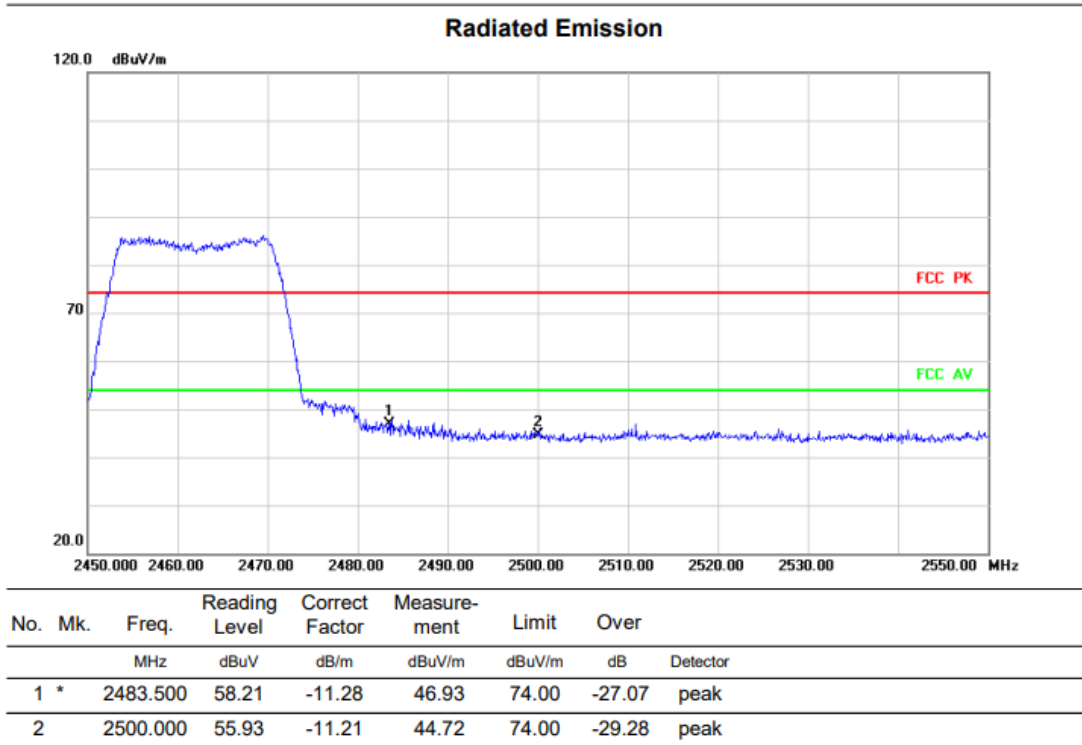


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		4874.000	56.96	-1.59	55.37	74.00	-18.63 peak
2	*	4874.000	51.67	-1.59	50.08	54.00	-3.92 AVG

# REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11B Mode 2462 MHz	Polarization	Vertical
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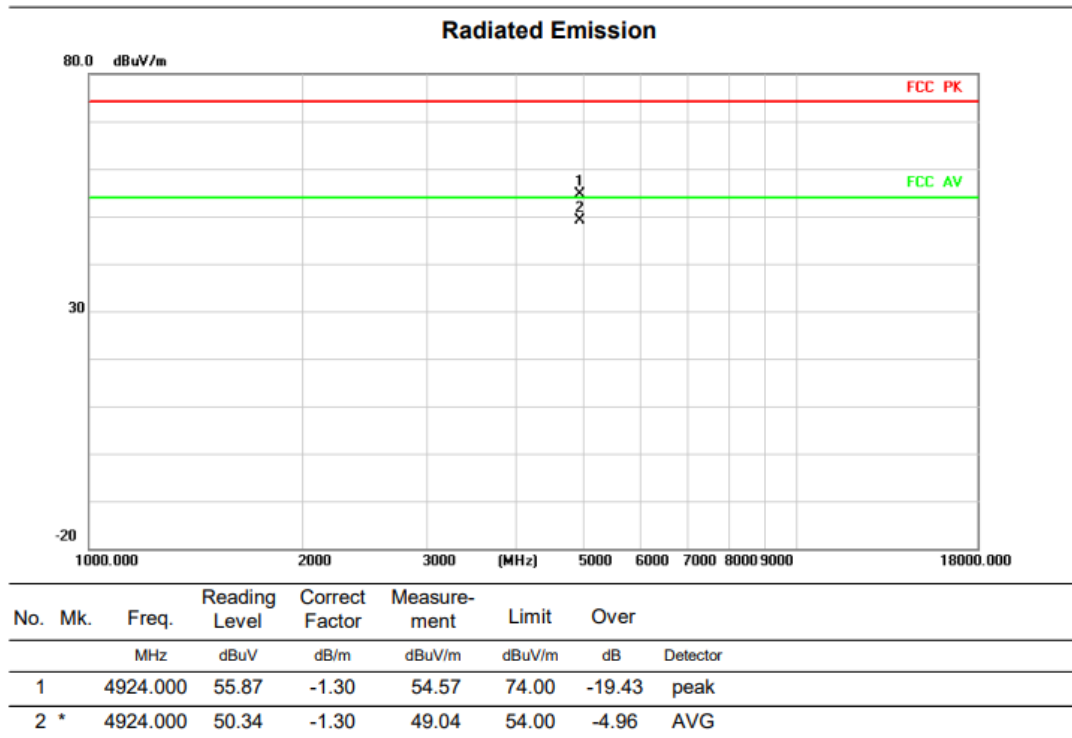


**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

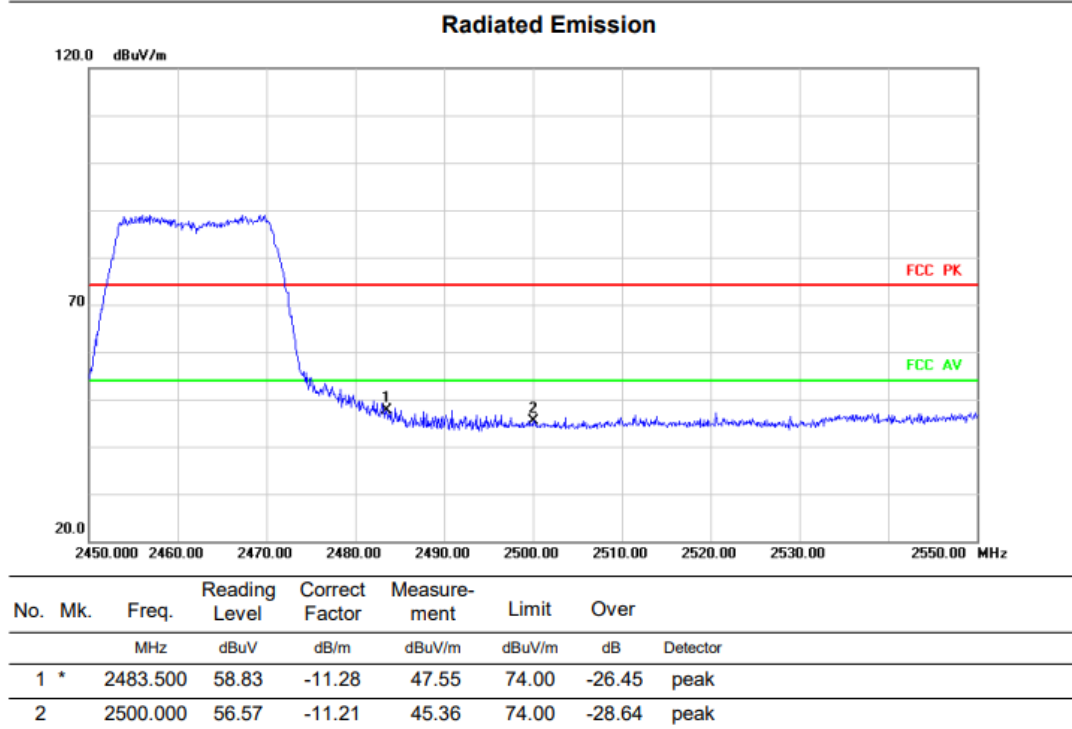


Test Mode	TX 11B Mode 2462 MHz	Polarization	Vertical
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**REMARKS:**

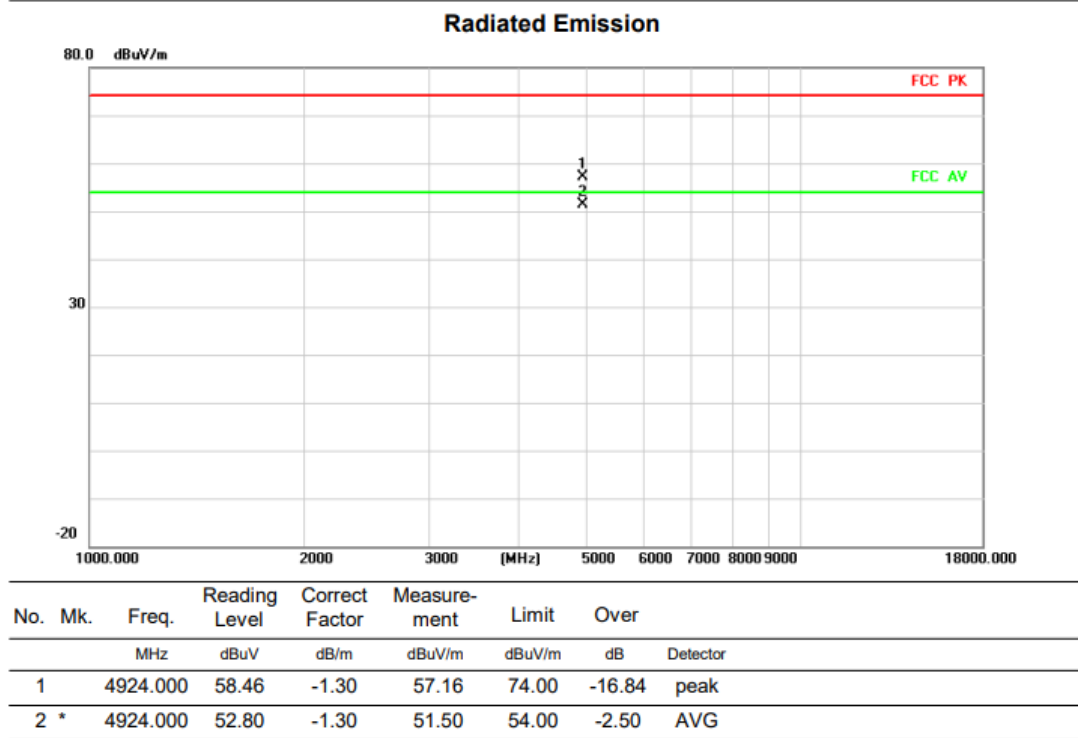
- (1) Measurement Value = Reading Level + Correct Factor.  
 (2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11B Mode 2462 MHz	Polarization	Horizontal
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**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

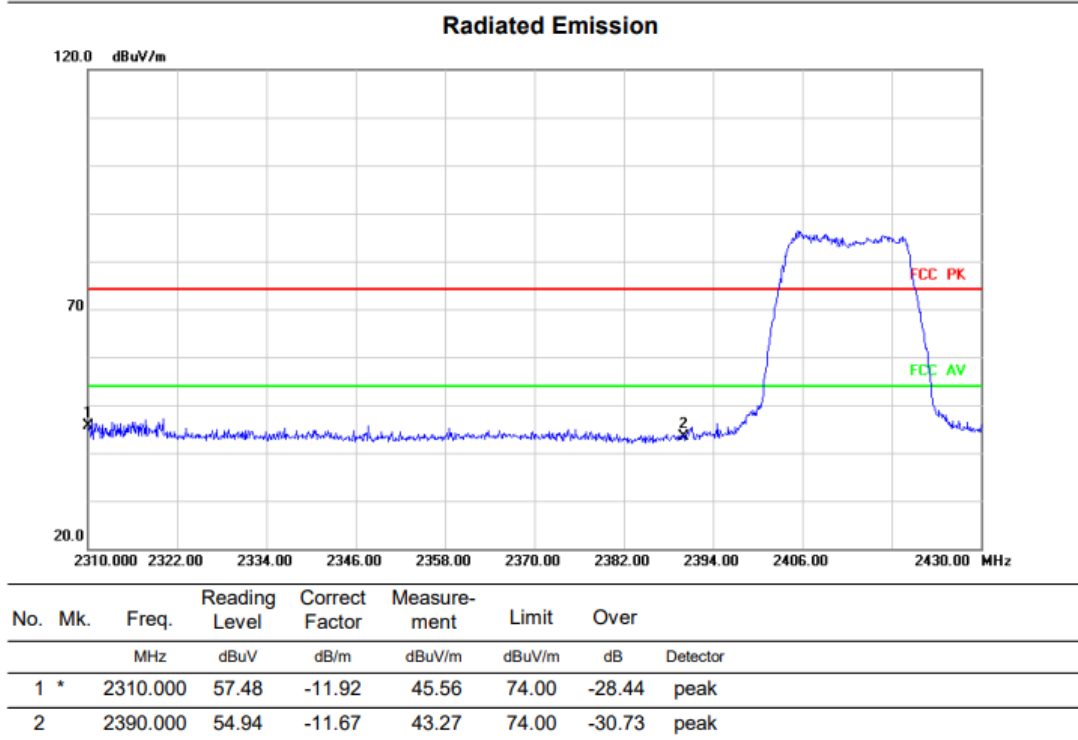
Test Mode	TX 11B Mode 2462 MHz	Polarization	Horizontal
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**REMARKS:**

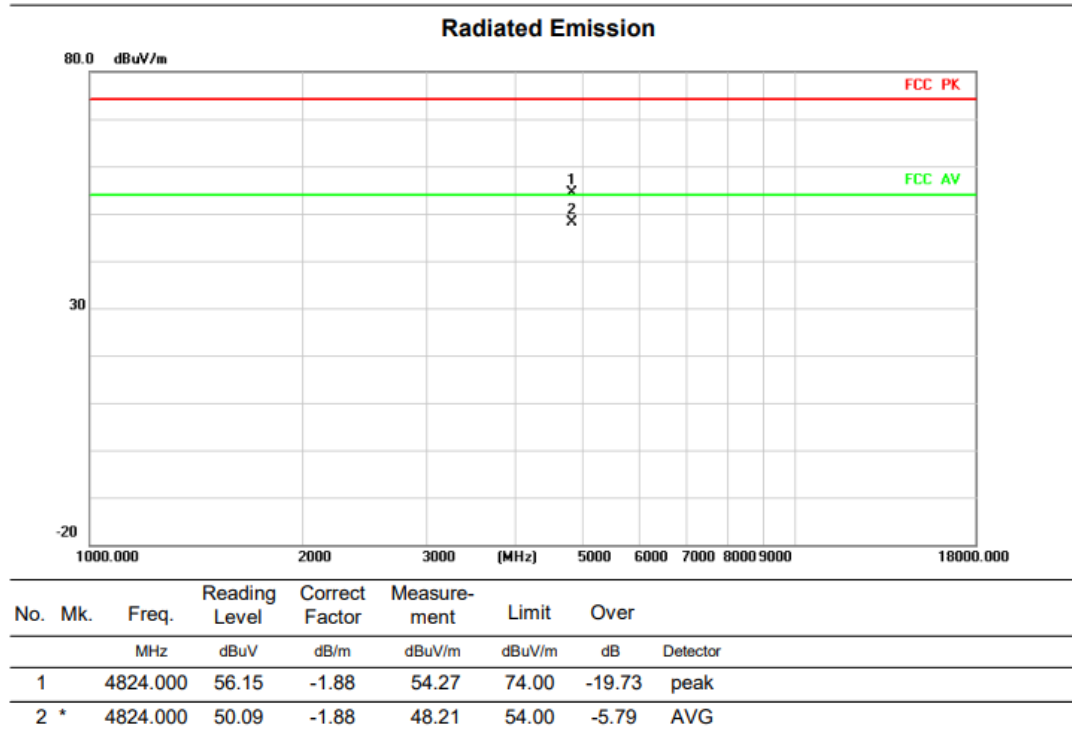
- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11G Mode 2412 MHz	Polarization	Vertical
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**REMARKS:**

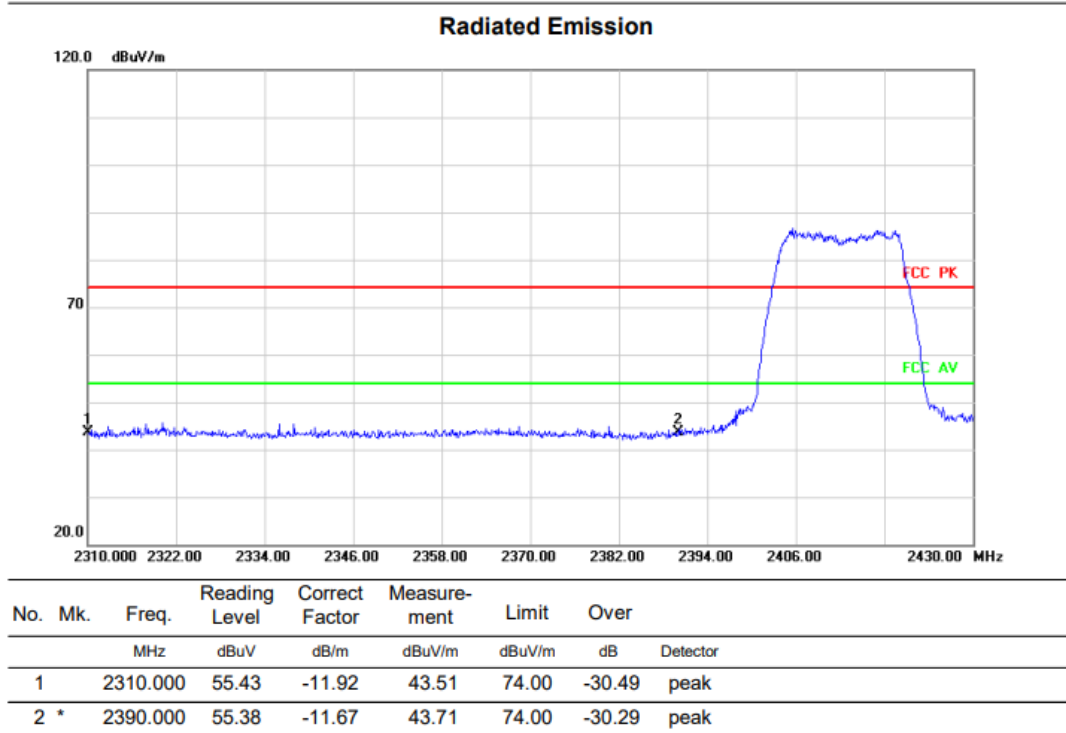
- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11G Mode 2412 MHz	Polarization	Vertical
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**REMARKS:**

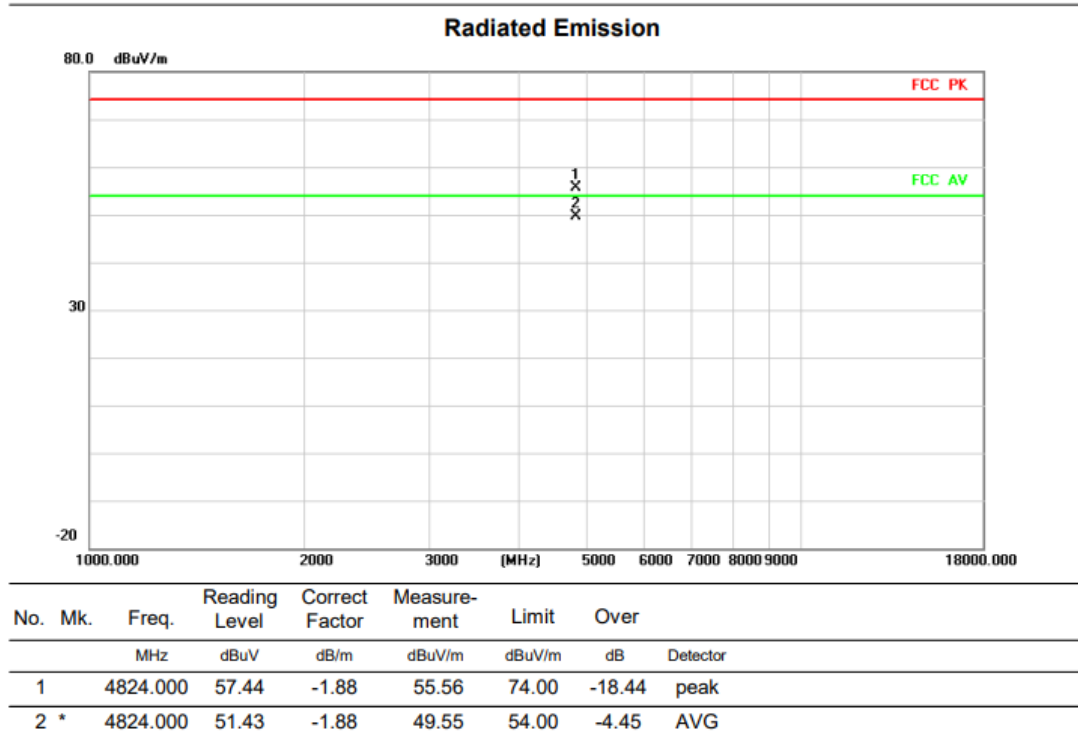
- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11G Mode 2412 MHz	Polarization	Horizontal
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**REMARKS:**

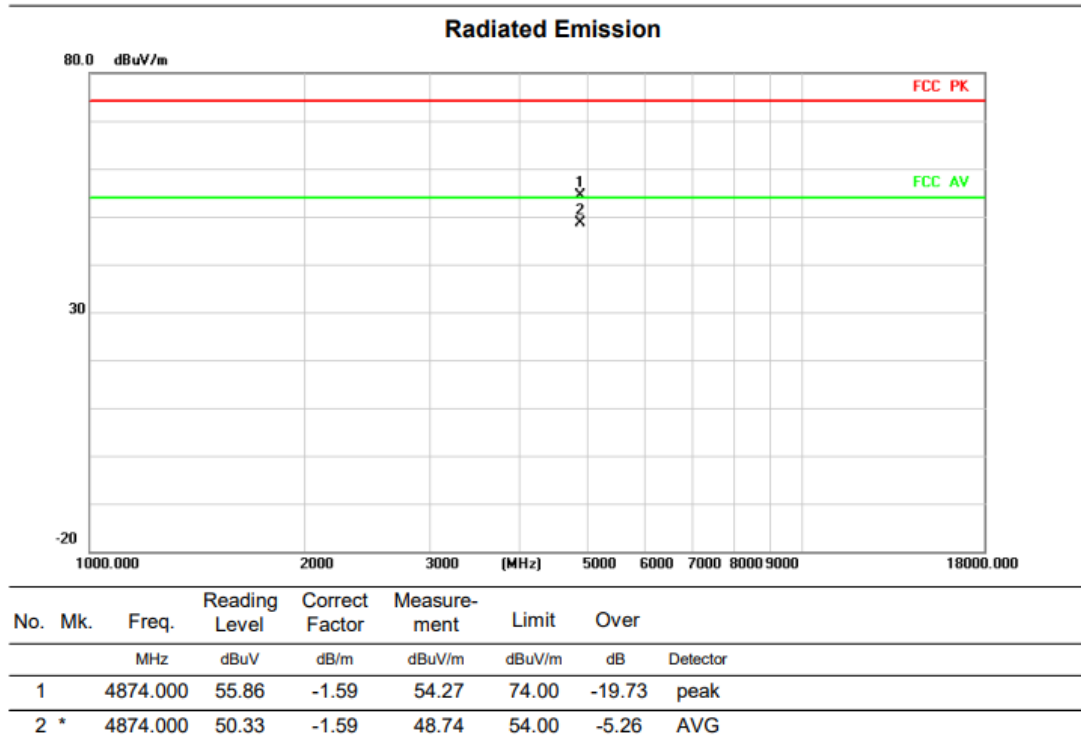
- (1) Measurement Value = Reading Level + Correct Factor.  
 (2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11G Mode 2412 MHz	Polarization	Horizontal
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**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

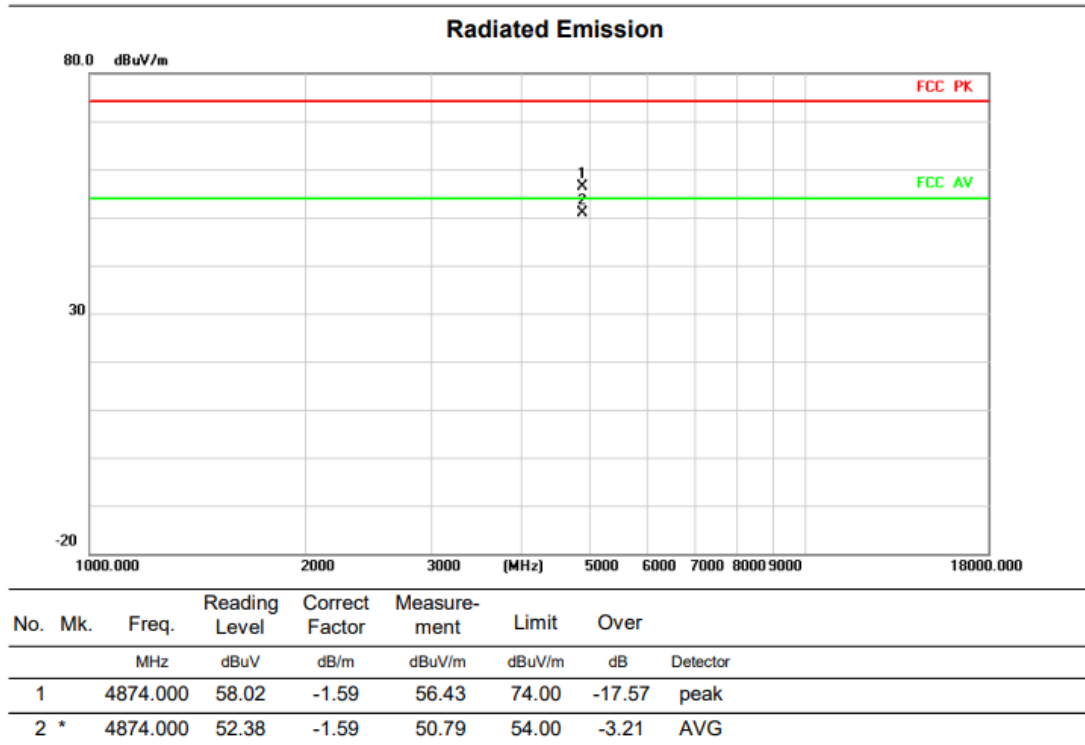
Test Mode	TX 11G Mode 2437 MHz	Polarization	Vertical
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**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

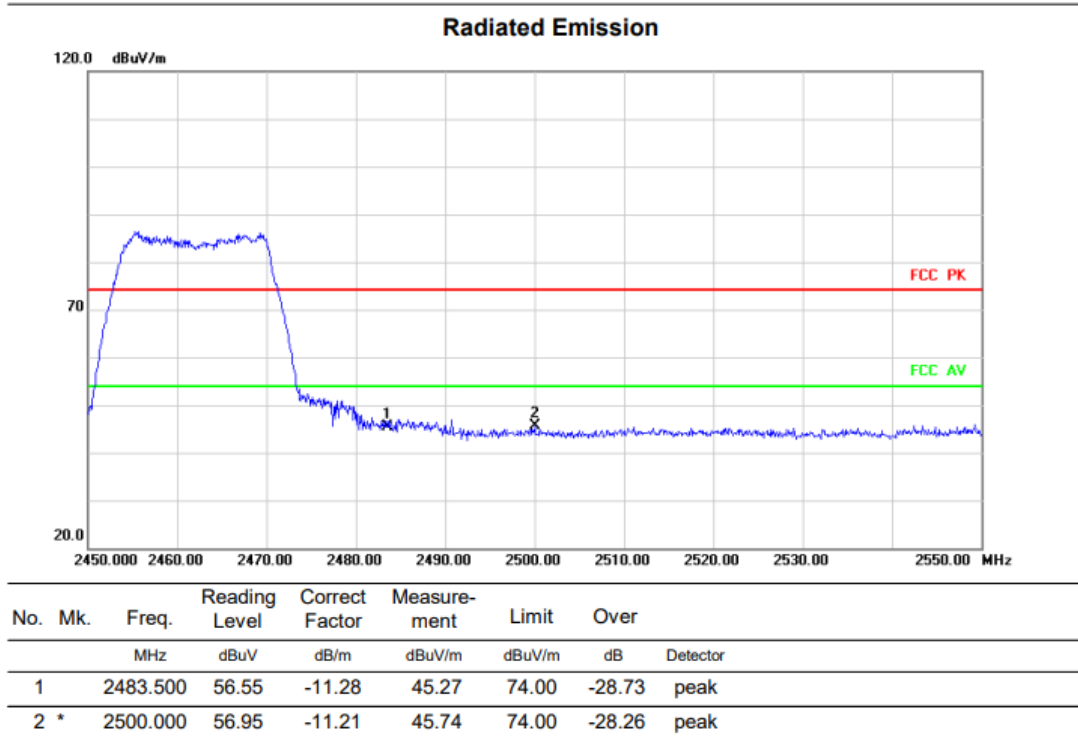


Test Mode	TX 11G Mode 2437 MHz	Polarization	Horizontal
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**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

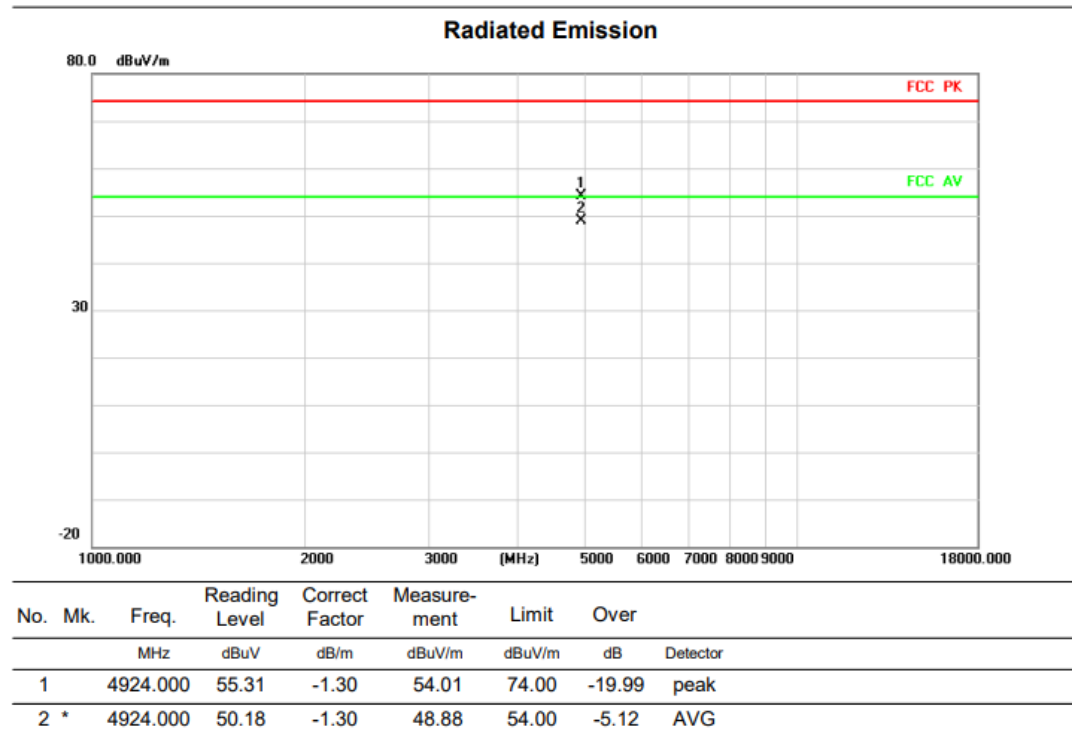
Test Mode	TX 11G Mode 2462 MHz	Polarization	Vertical
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**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

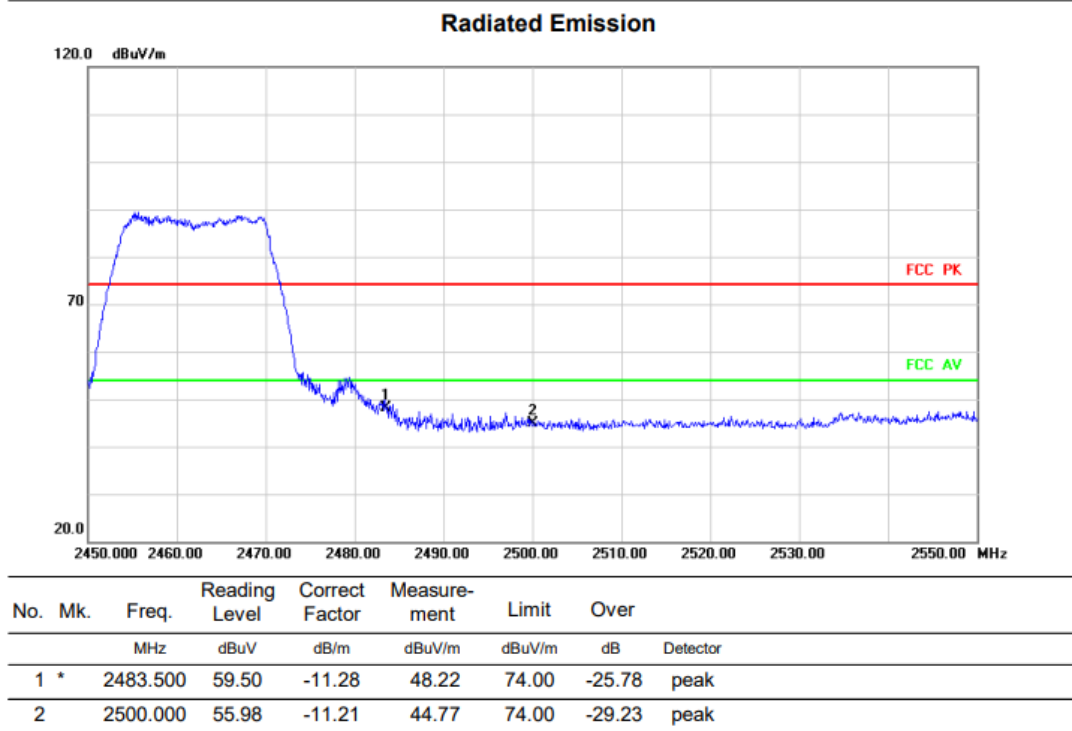
Test Mode	TX 11G Mode 2462 MHz	Polarization	Vertical
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# REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

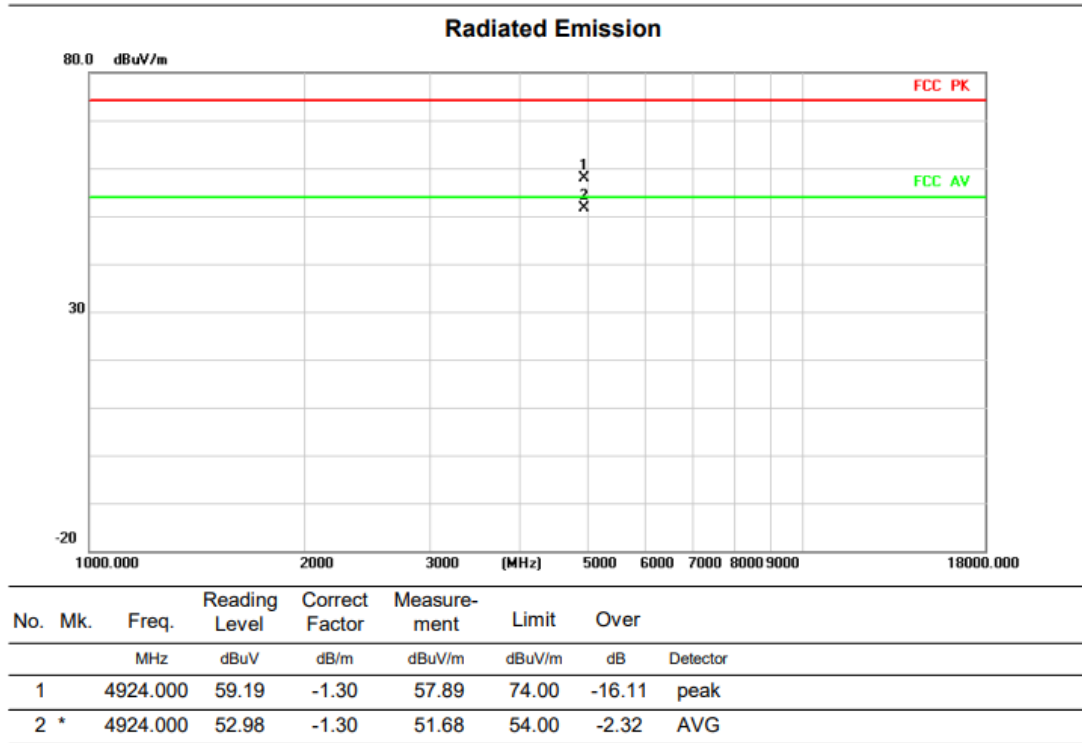
Test Mode	TX 11G Mode 2462 MHz	Polarization	Horizontal
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**REMARKS:**

(1) Measurement Value = Reading Level + Correct Factor.

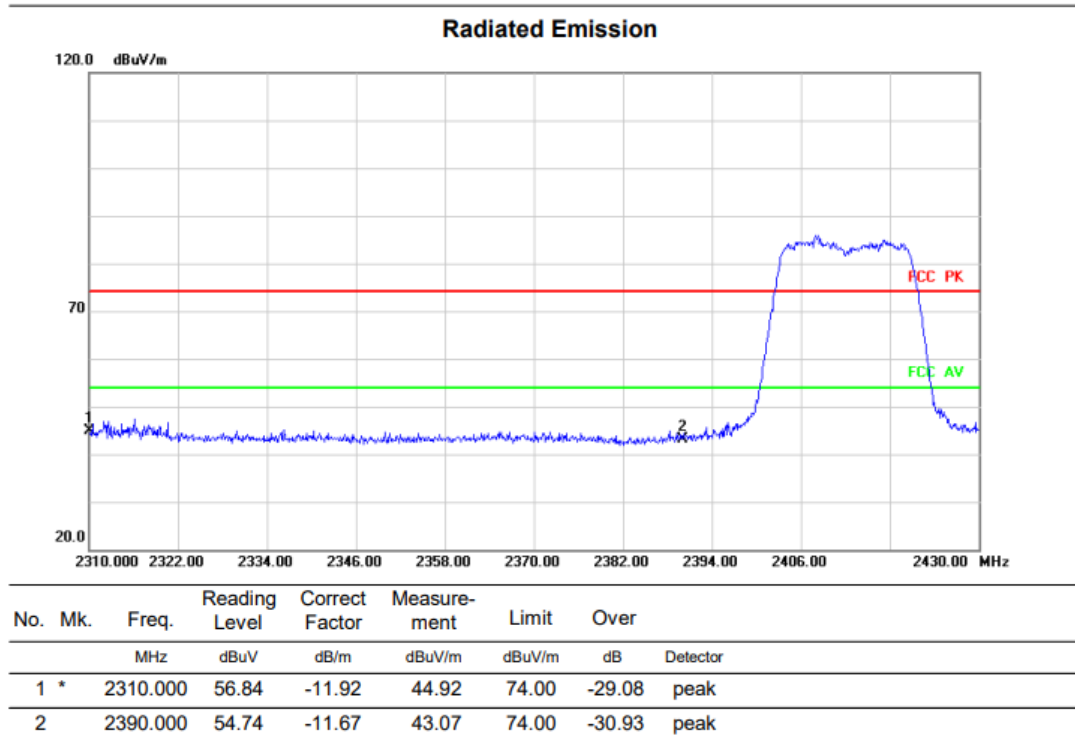
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11G Mode 2462 MHz	Polarization	Horizontal
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**REMARKS:**

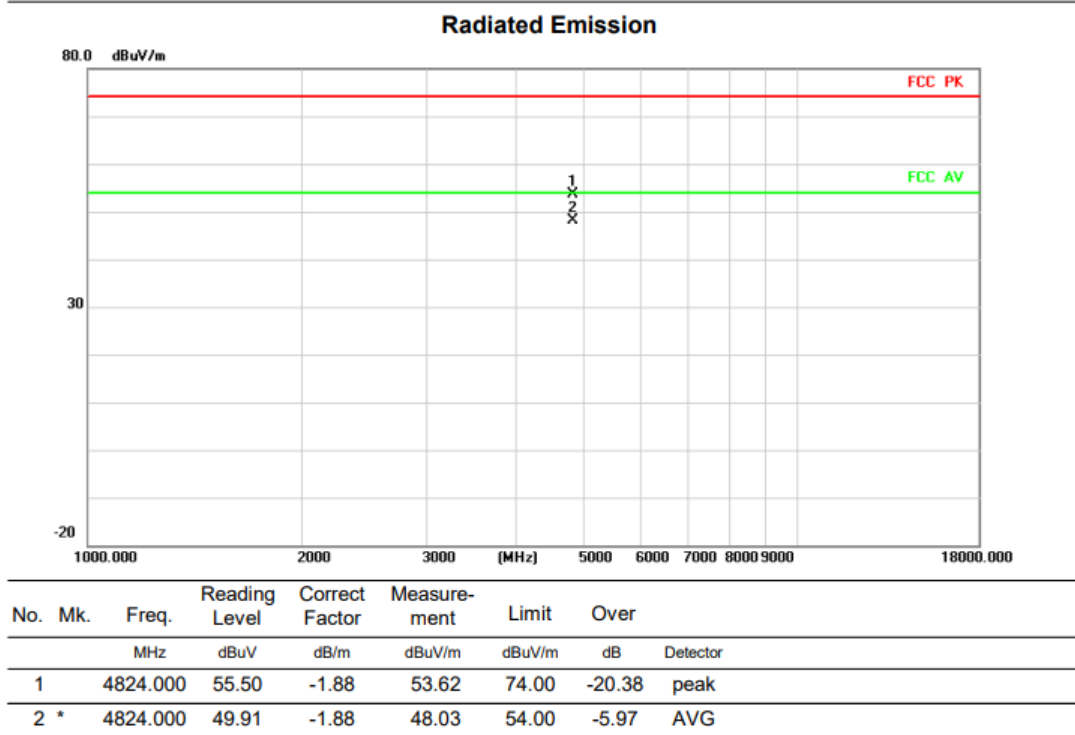
- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11N(HT20) Mode 2412 MHz	Polarization	Vertical
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**REMARKS:**

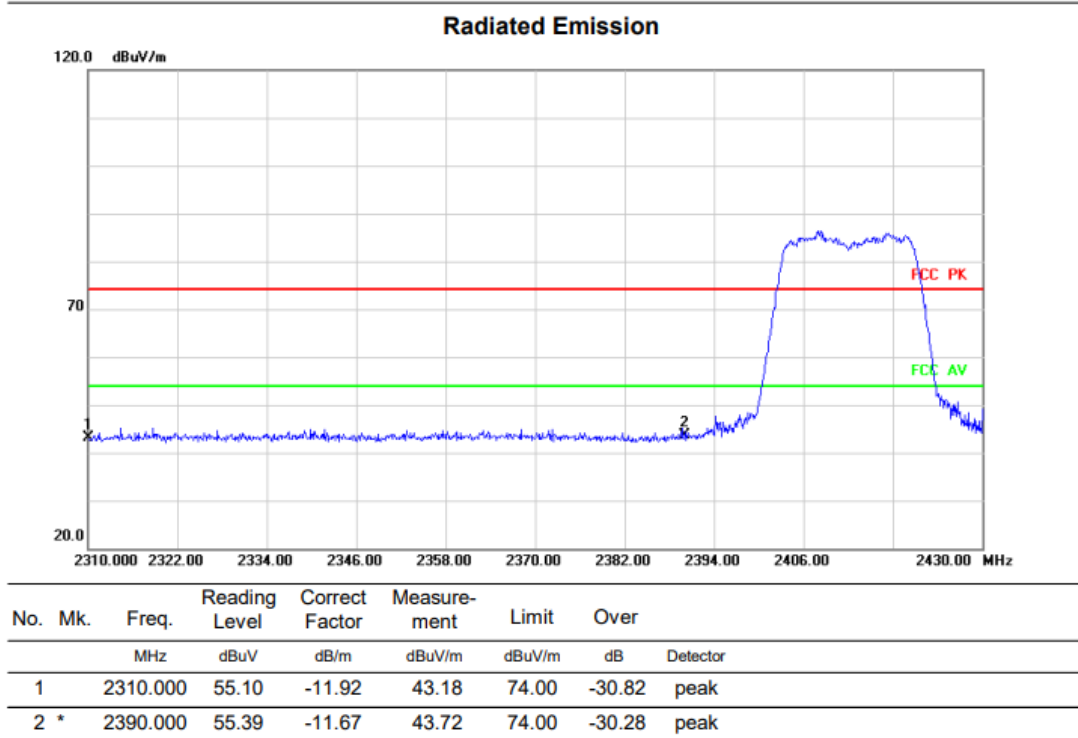
- (1) Measurement Value = Reading Level + Correct Factor.  
 (2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11N(HT20) Mode 2412 MHz	Polarization	Vertical
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**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

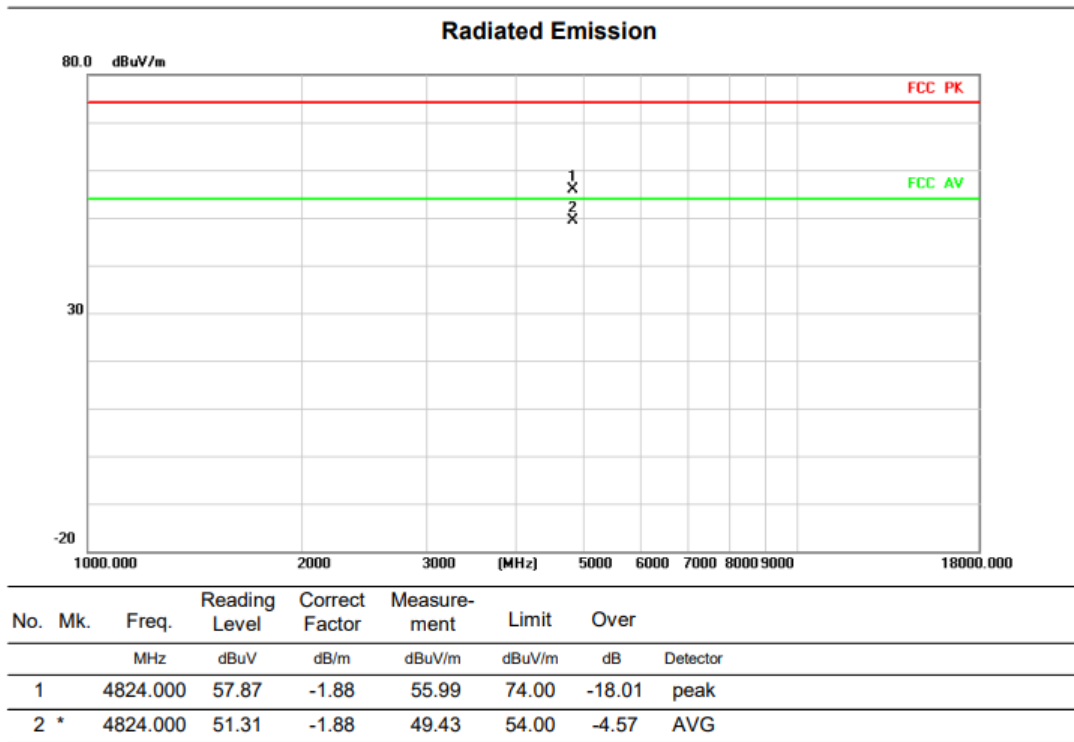
Test Mode	TX 11N(HT20) Mode 2412 MHz	Polarization	Horizontal
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**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.  
 (2) Margin Level = Measurement Value - Limit Value.

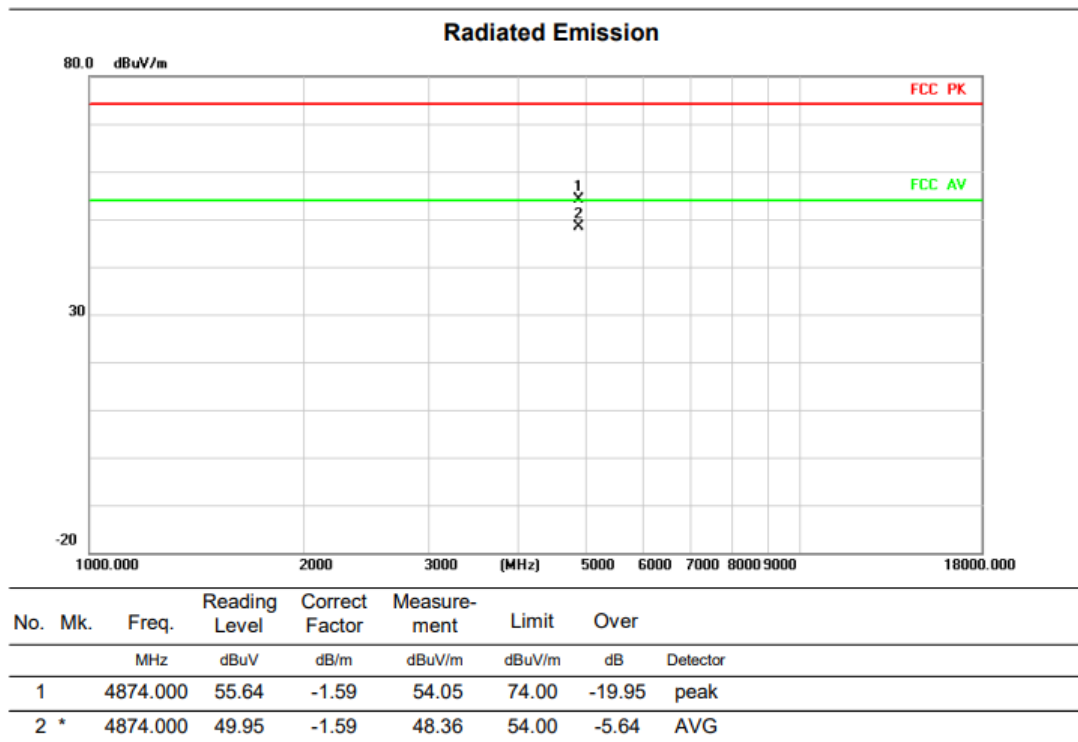


Test Mode	TX 11N(HT20) Mode 2412 MHz	Polarization	Horizontal
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**REMARKS:**

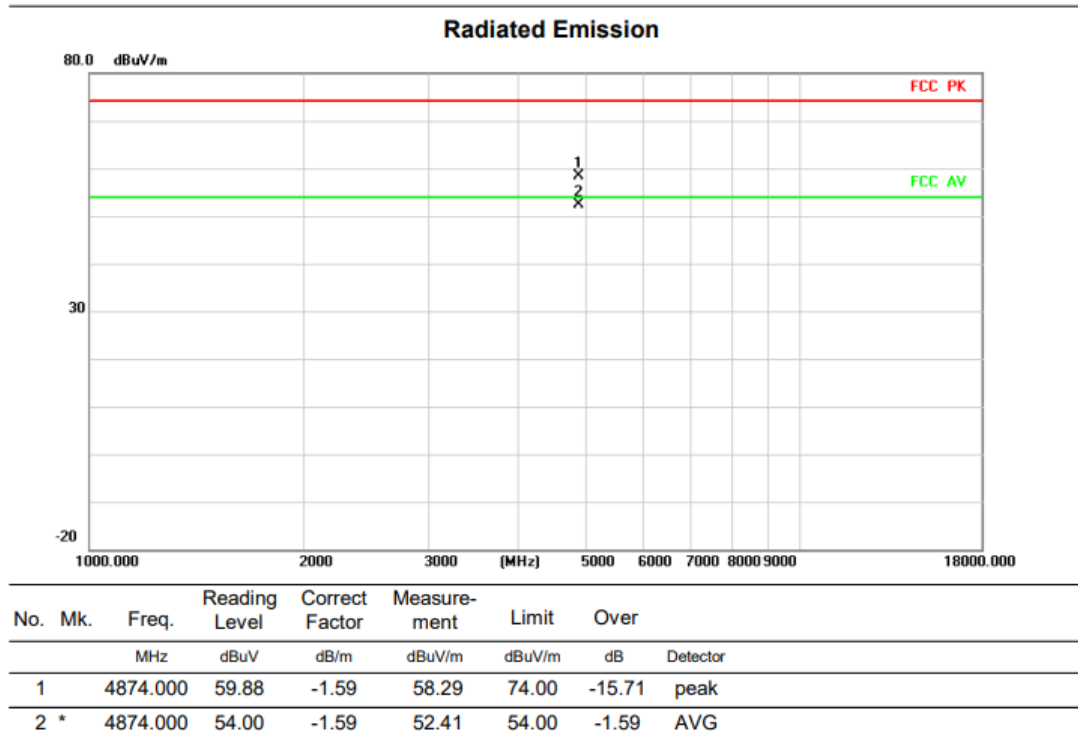
- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11N(HT20) Mode 2437 MHz	Polarization	Vertical
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**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

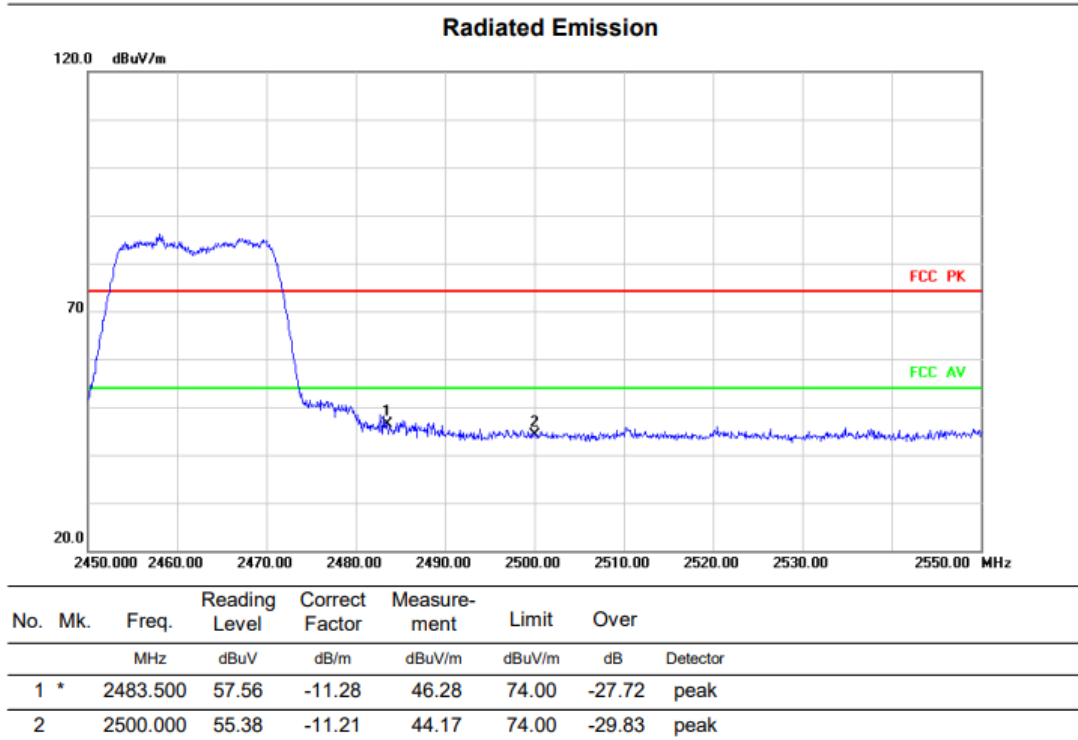
Test Mode	TX 11N(HT20) Mode 2437 MHz	Polarization	Horizontal
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**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.  
 (2) Margin Level = Measurement Value - Limit Value.

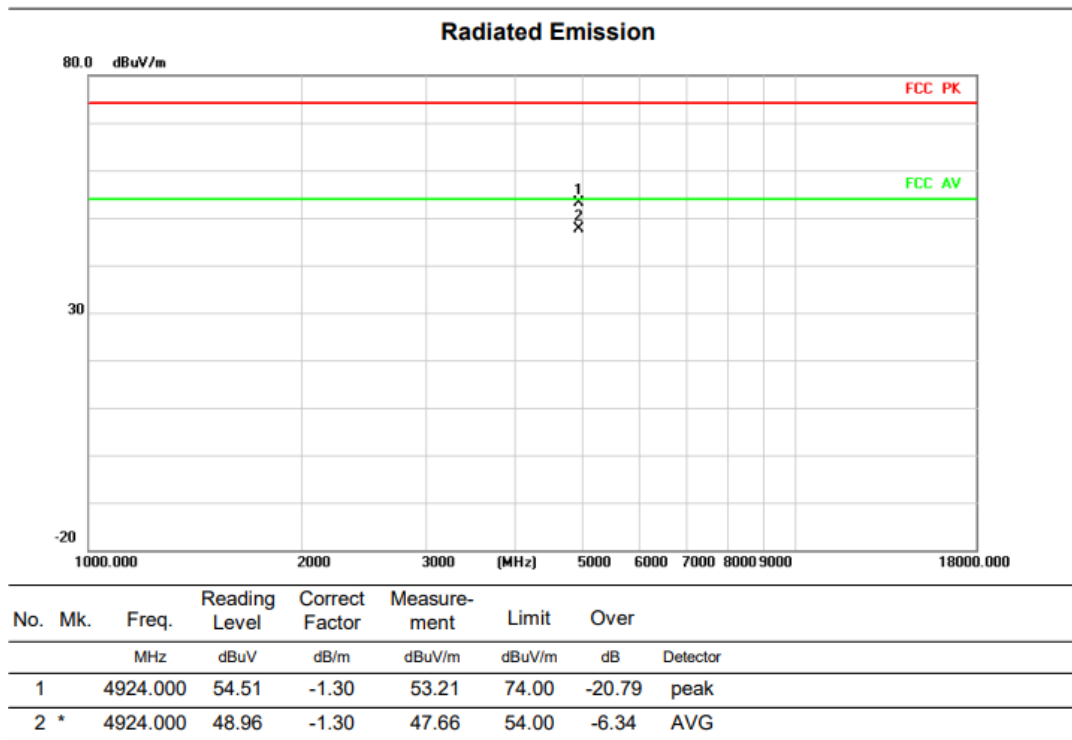
Test Mode	TX 11N(HT20) Mode 2462 MHz	Polarization	Vertical
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**REMARKS:**

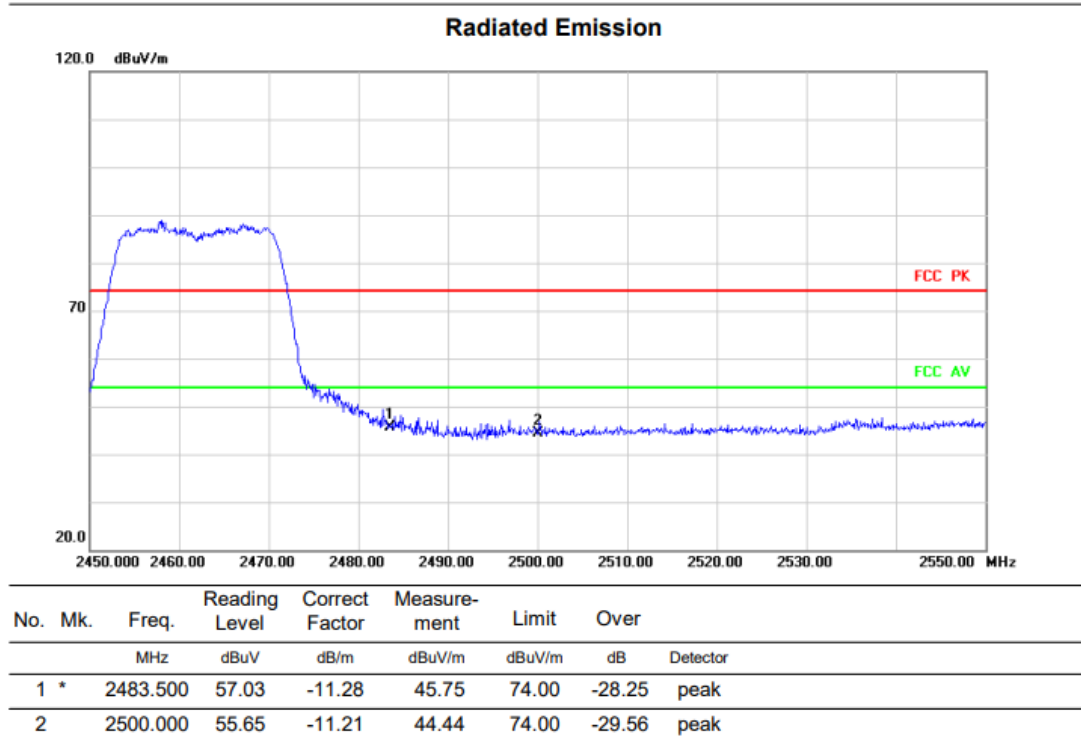
- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11N(HT20) Mode 2462 MHz	Polarization	Vertical
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**REMARKS:**

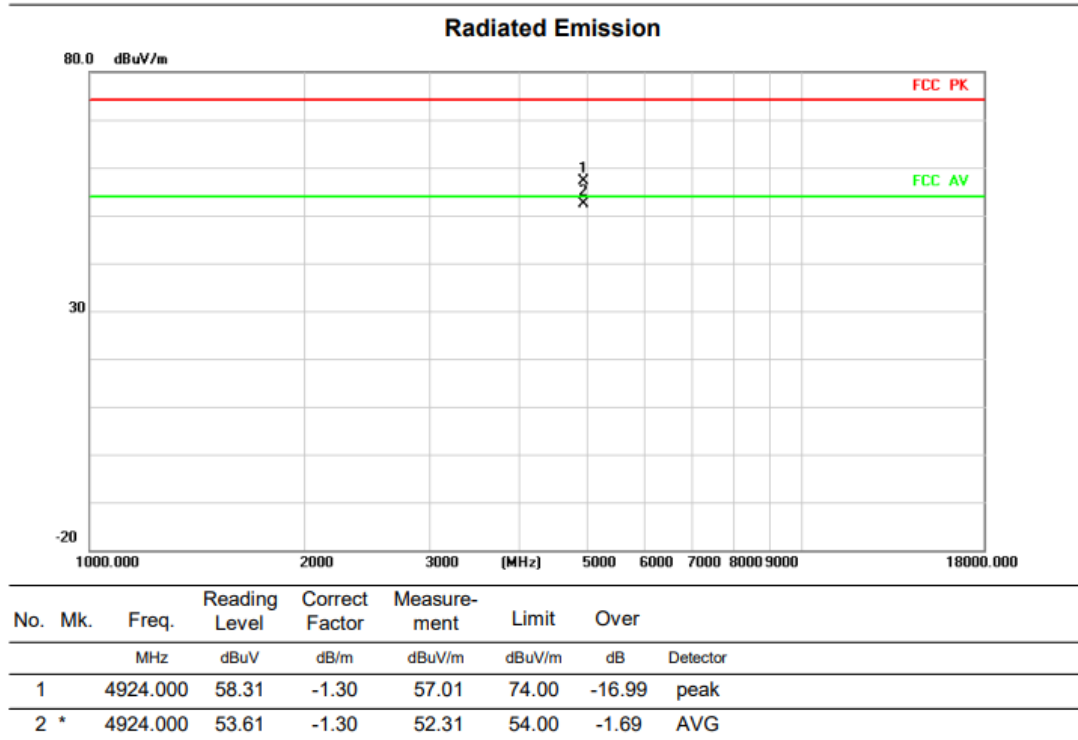
- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11N(HT20) Mode 2462 MHz	Polarization	Horizontal
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**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX 11N(HT20) Mode 2462 MHz	Polarization	Horizontal
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**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.  
(2) Margin Level = Measurement Value - Limit Value.

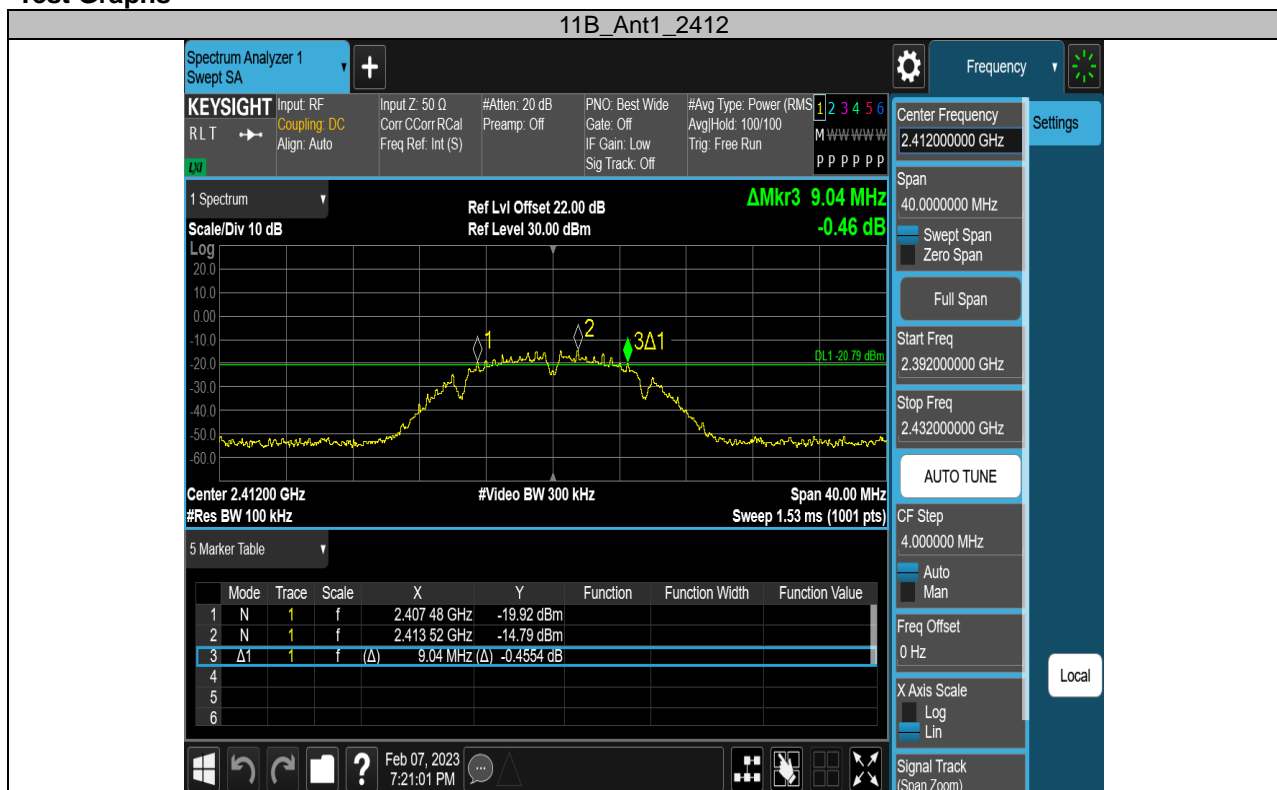
## APPENDIX E - BANDWIDTH



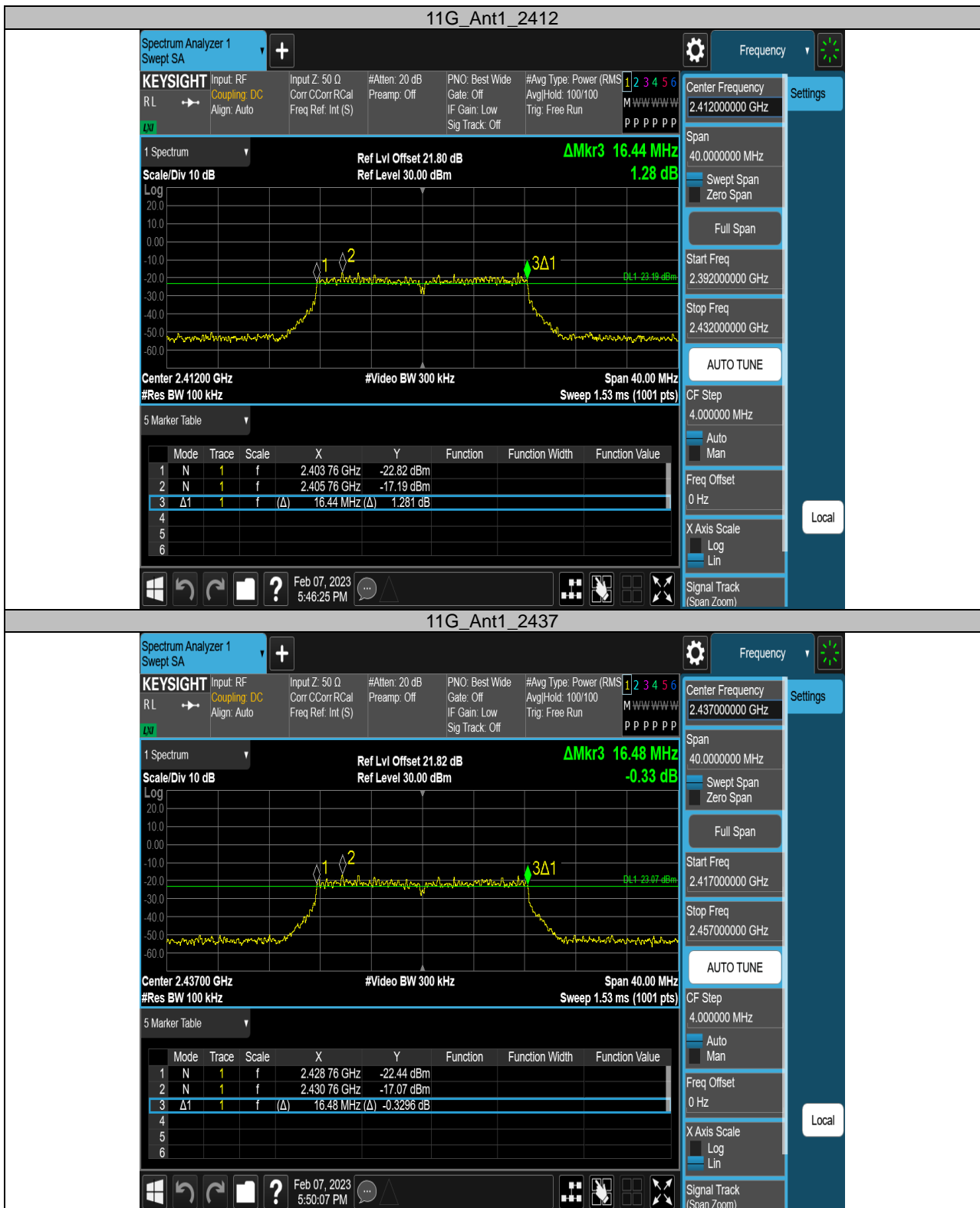
## DTS Bandwidth

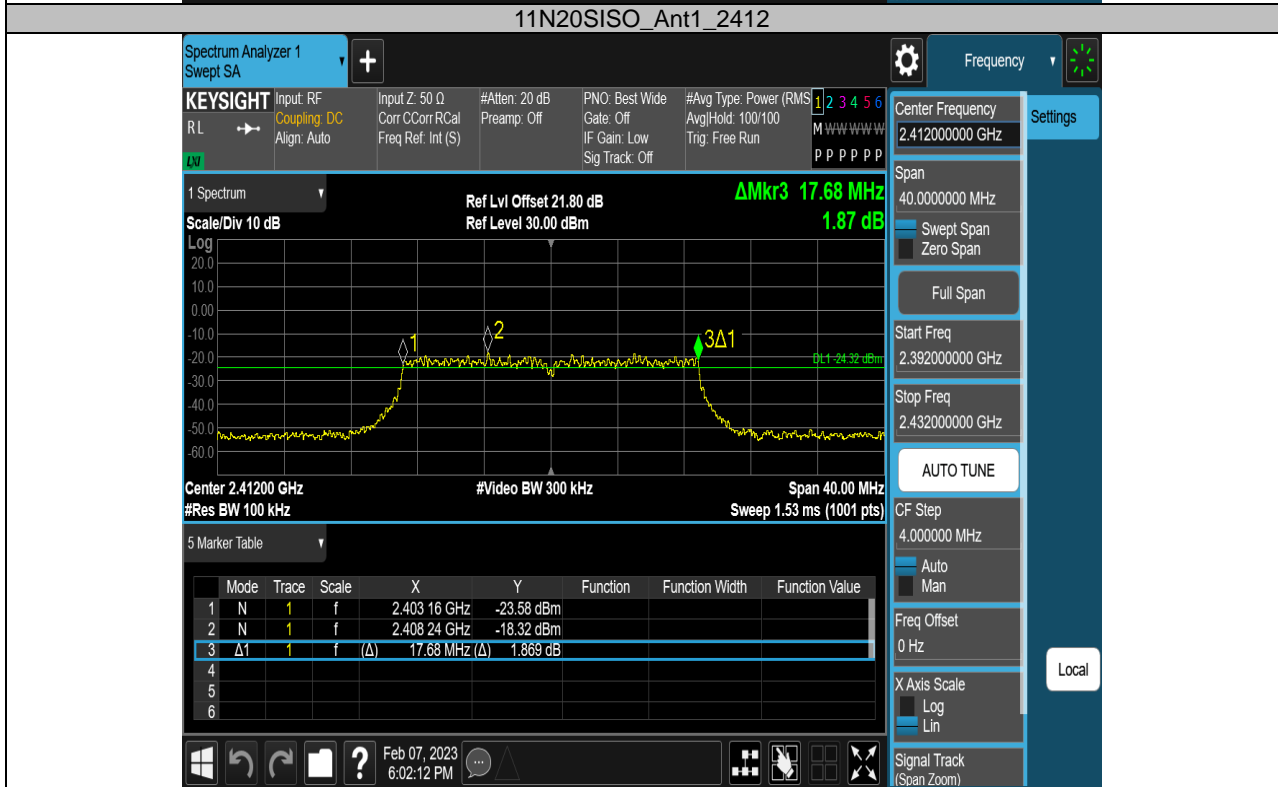
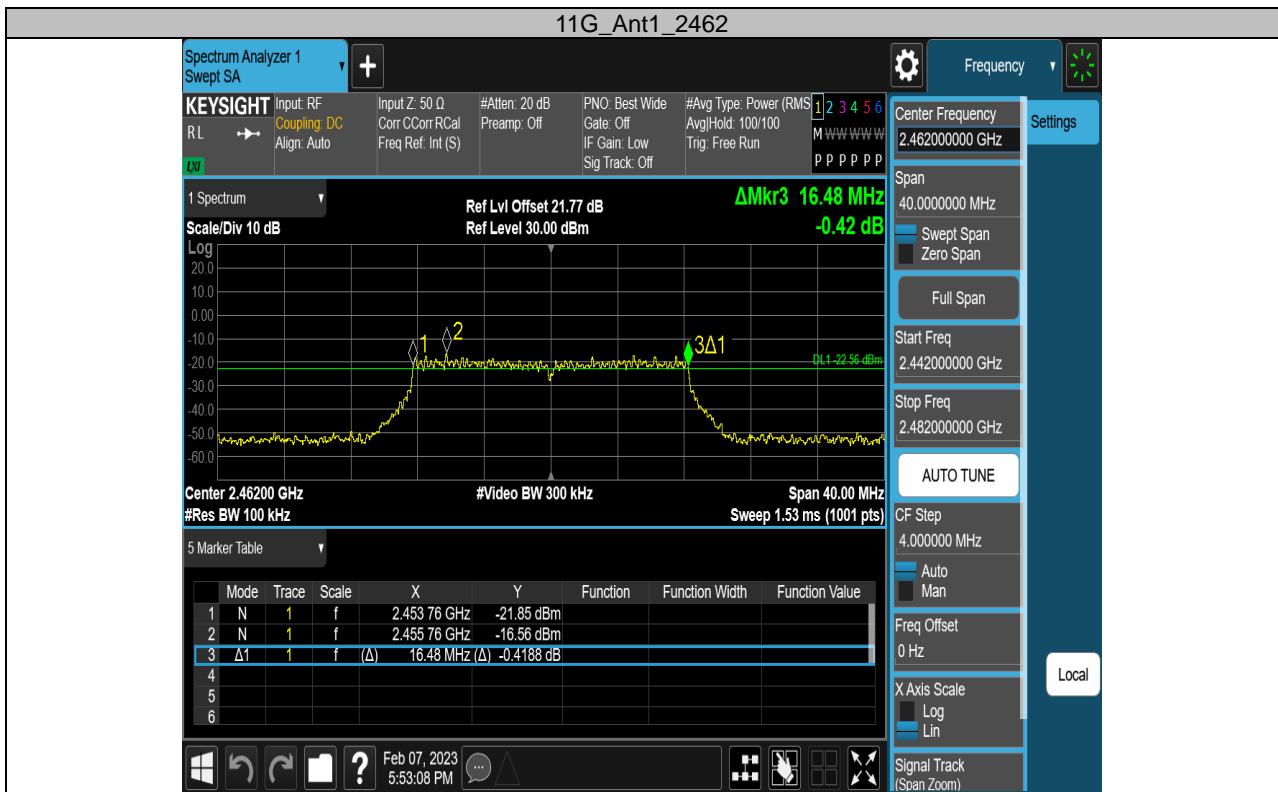
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.040	2407.480	2416.520	0.5	PASS
		2437	8.040	2433.000	2441.040	0.5	PASS
		2462	8.560	2457.480	2466.040	0.5	PASS
11G	Ant1	2412	16.440	2403.760	2420.200	0.5	PASS
		2437	16.480	2428.760	2445.240	0.5	PASS
		2462	16.480	2453.760	2470.240	0.5	PASS
11N20SISO	Ant1	2412	17.680	2403.160	2420.840	0.5	PASS
		2437	17.680	2428.160	2445.840	0.5	PASS
		2462	17.680	2453.200	2470.880	0.5	PASS

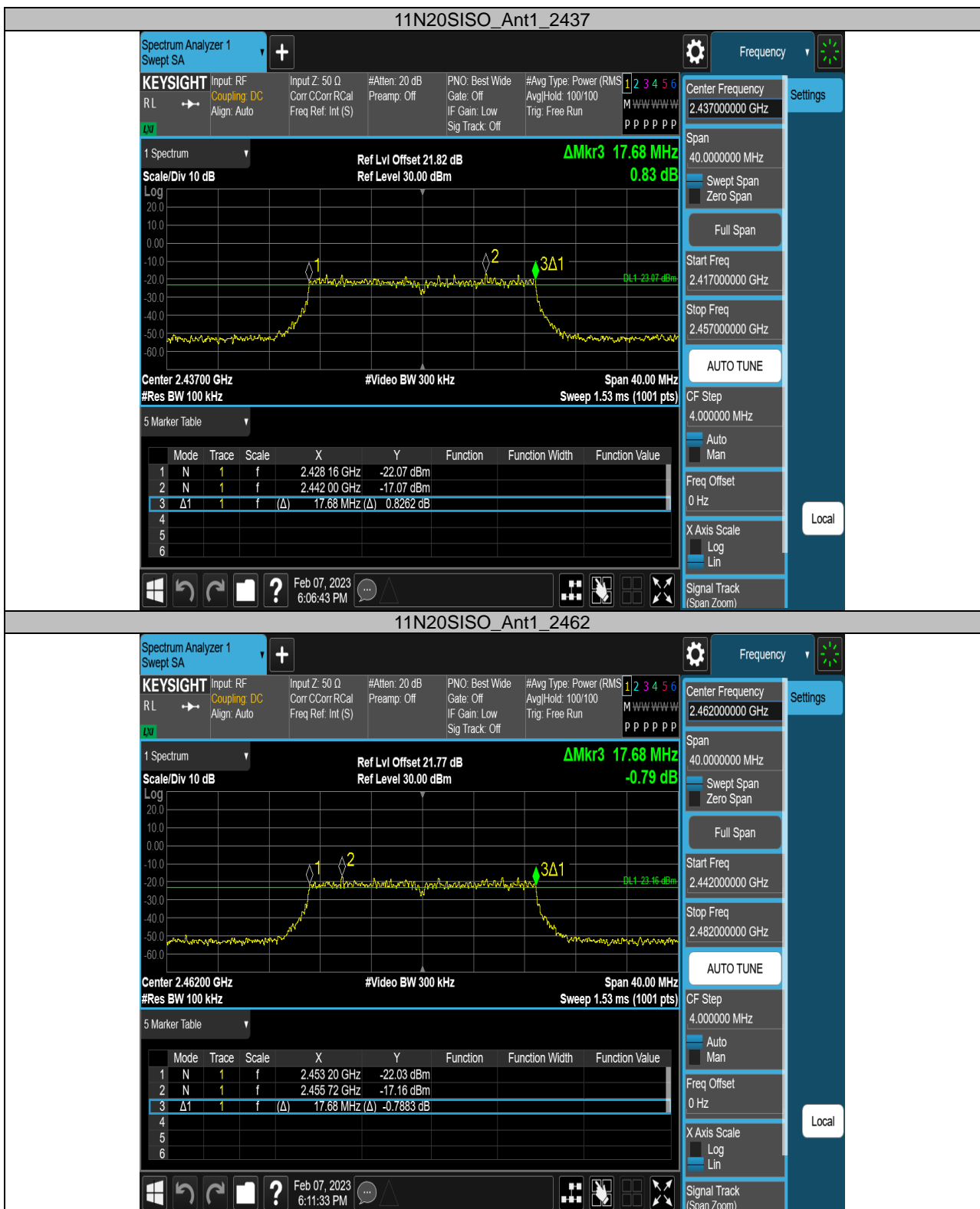
## Test Graphs







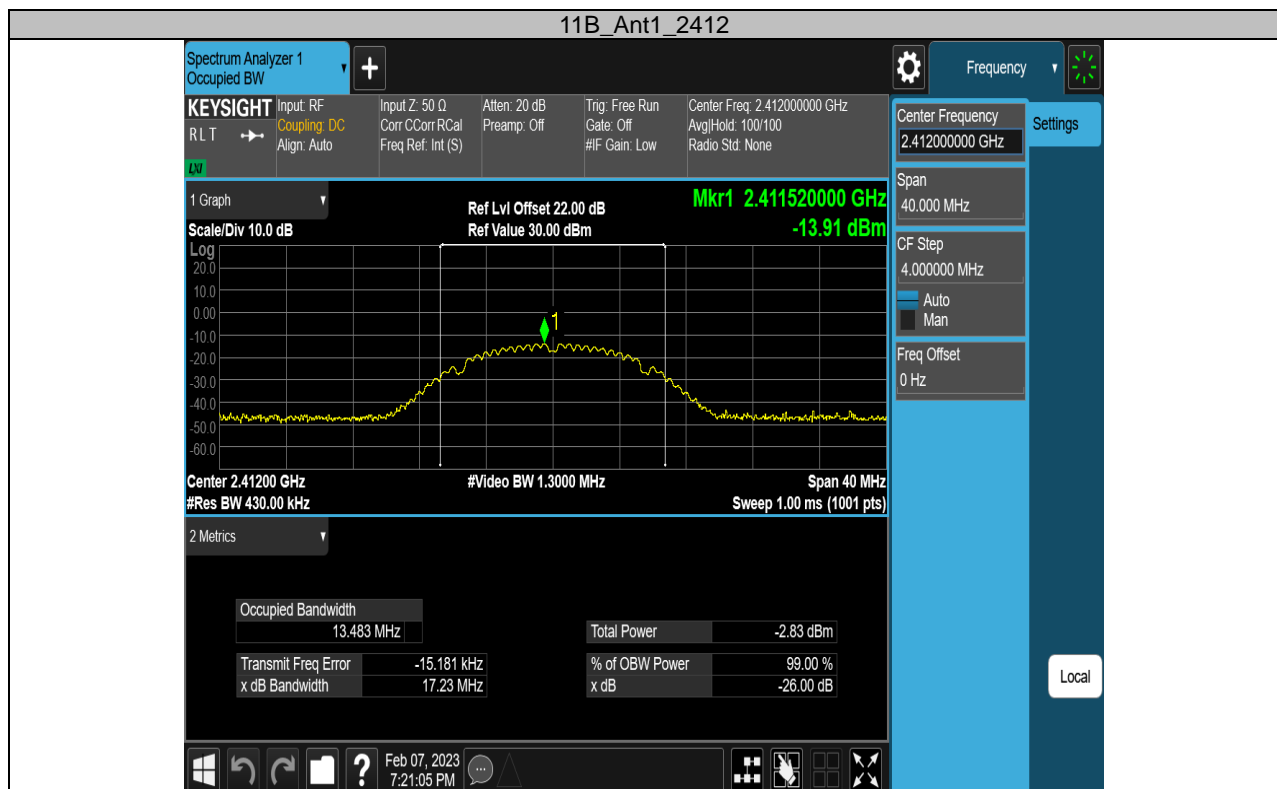




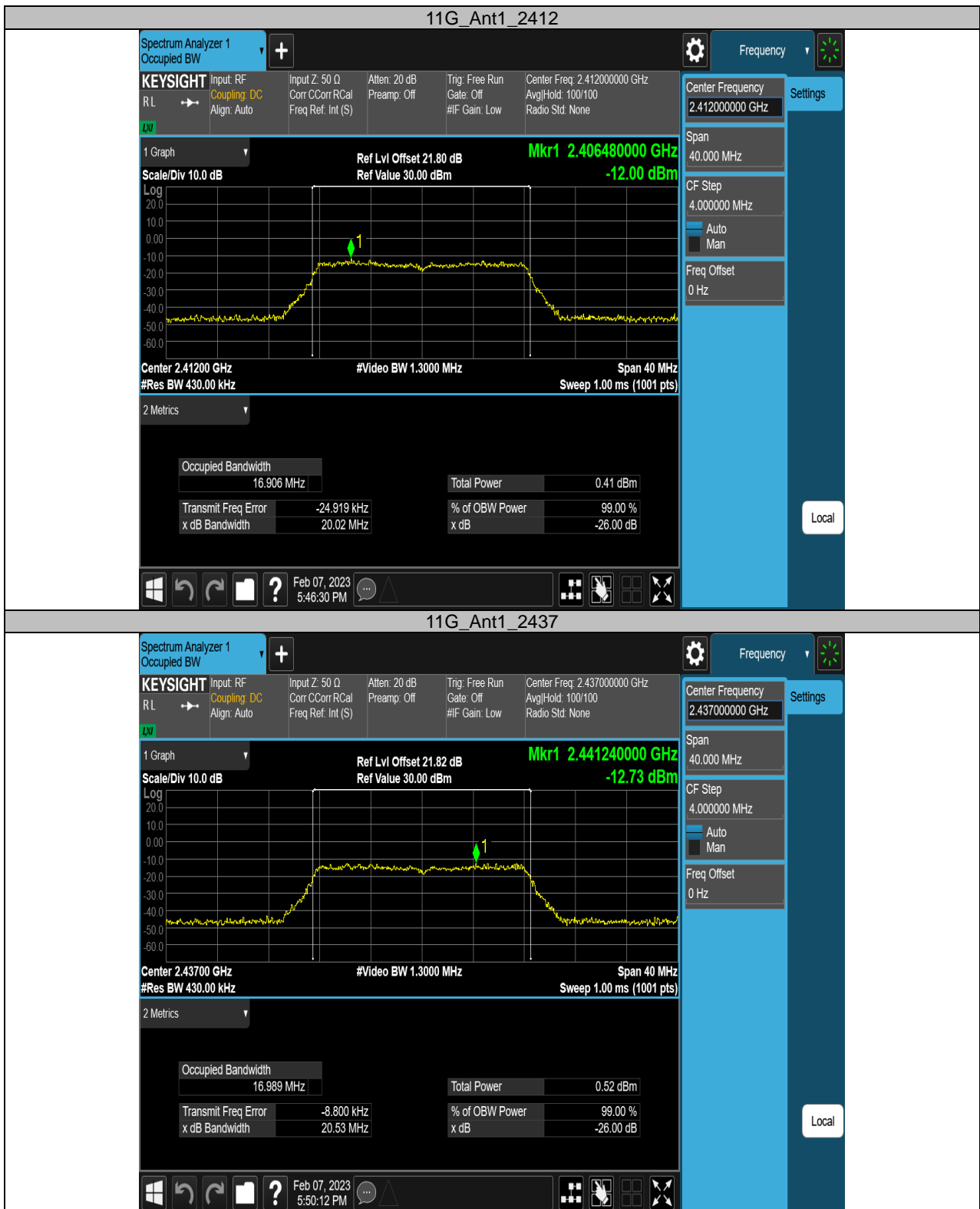
## Occupied Channel Bandwidth

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	13.483	2405.2433	2418.7263	---	---
		2437	13.406	2430.2740	2443.6800	---	---
		2462	13.446	2455.2653	2468.7113	---	---
11G	Ant1	2412	16.906	2403.5221	2420.4281	---	---
		2437	16.989	2428.4967	2445.4857	---	---
		2462	16.862	2453.5711	2470.4331	---	---
11N20SISO	Ant1	2412	18.009	2402.9904	2420.9994	---	---
		2437	18.028	2428.0017	2446.0297	---	---
		2462	17.966	2453.0235	2470.9895	---	---

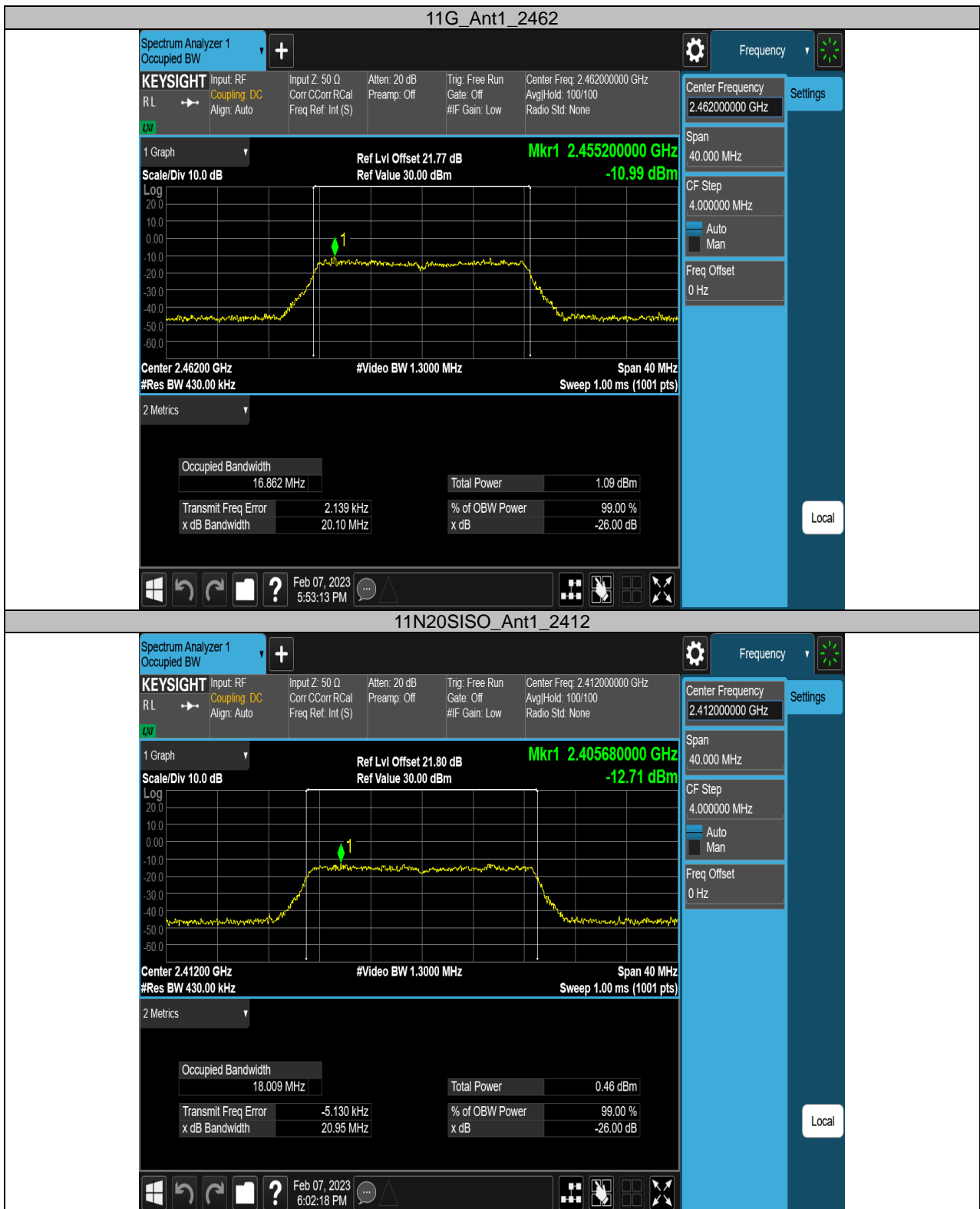
## Test Graphs

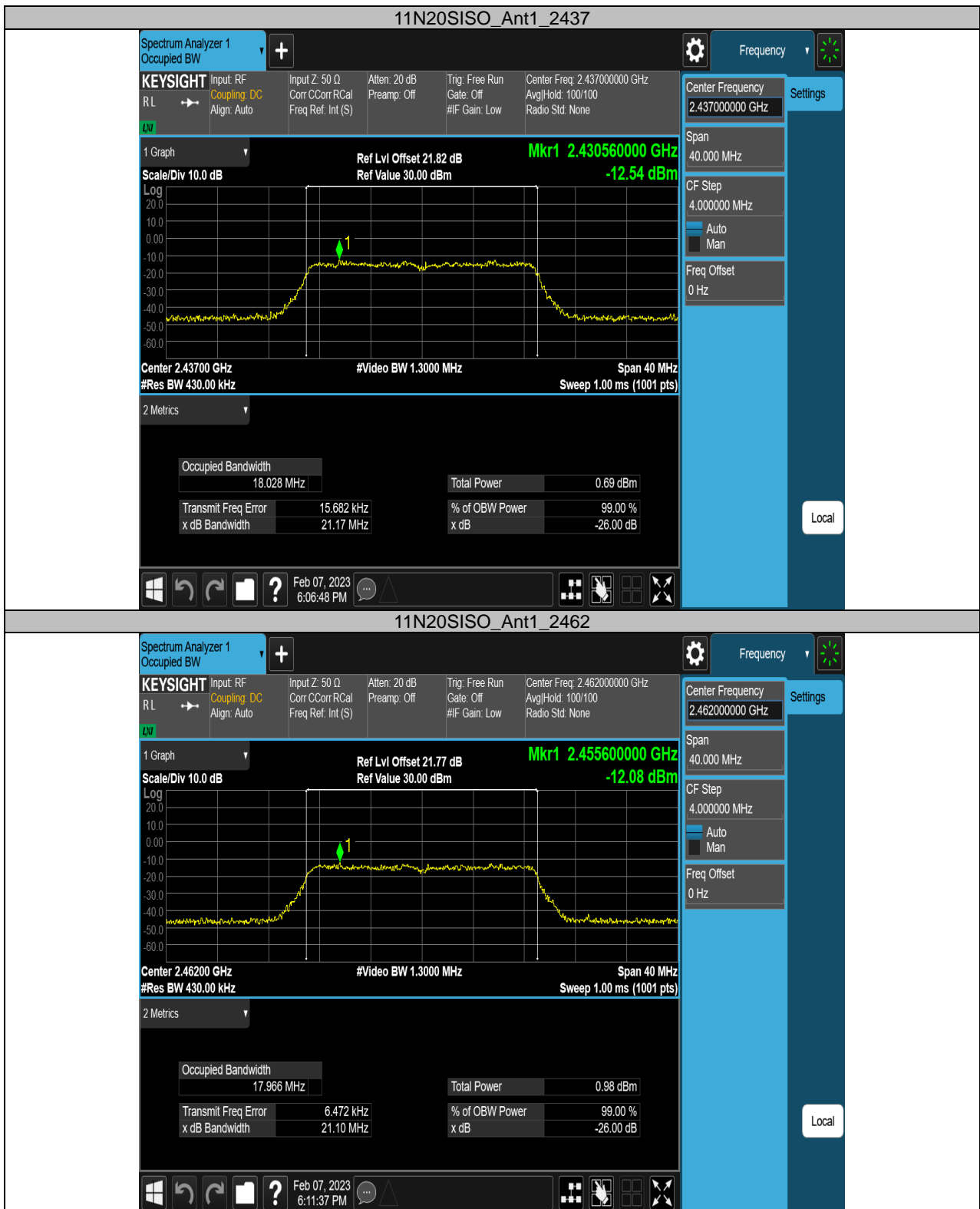












## **APPENDIX F - MAXIMUM OUTPUT POWER**

### Non Beamforming

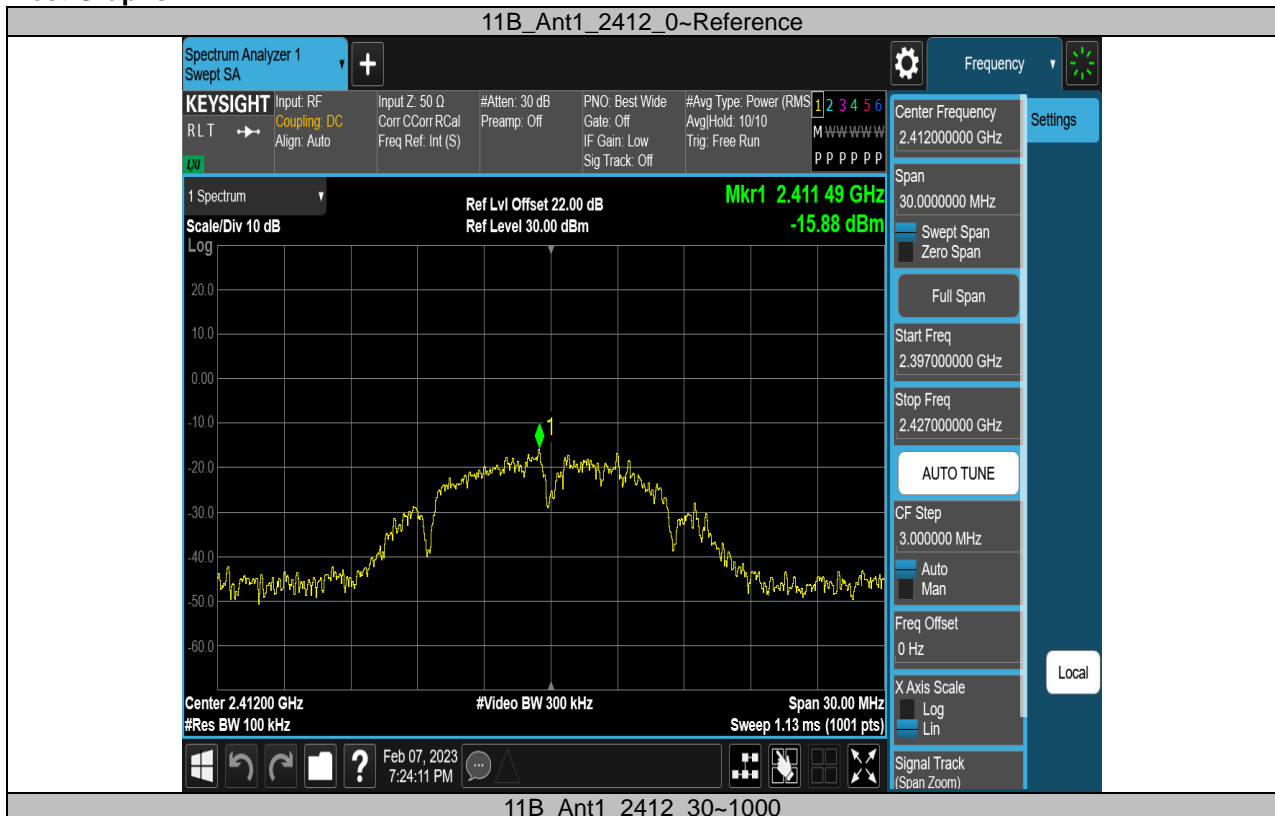
TestMode	Antenna	Channel	Power setting	Conducted output power [dBm]	Conducted Limit[dBm]	Verdict
11B	Ant1	2412	9	-3.08	≤30.00	PASS
		2437	9	-3.11	≤30.00	PASS
		2462	9	-2.78	≤30.00	PASS
11G	Ant1	2412	9	1.08	≤30.00	PASS
		2437	9	1.42	≤30.00	PASS
		2462	9	1.59	≤30.00	PASS
11N20SISO	Ant1	2412	9	1.32	≤30.00	PASS
		2437	9	1.43	≤30.00	PASS
		<b>2462</b>	9	<b>1.75</b>	≤30.00	PASS

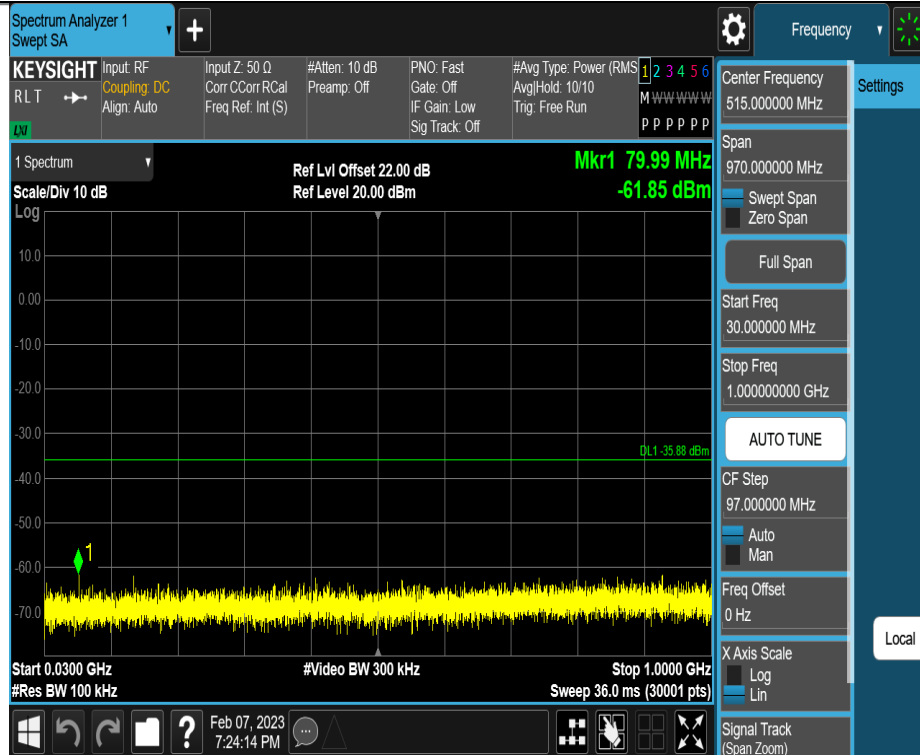
## **APPENDIX G - CONDUCTED SPURIOUS EMISSIONS**

### Conducted Spurious Emission

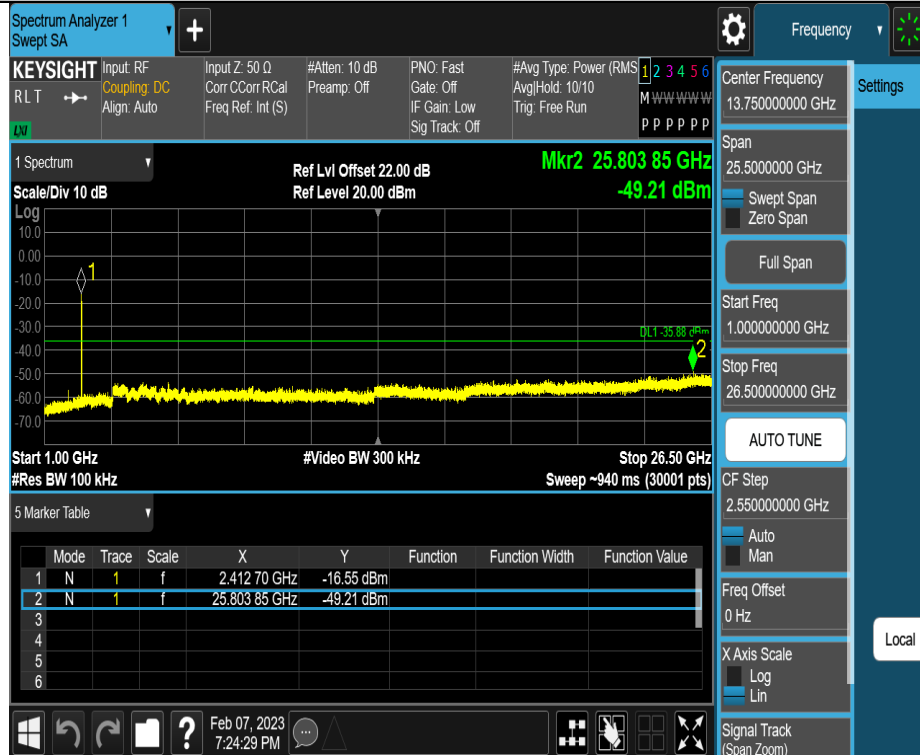
TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	-15.88	-15.88	---	PASS
			30~1000	-15.88	-61.85	≤-35.88	PASS
			1000~26500	-15.88	-49.21	≤-35.88	PASS
		2437	Reference	-16.71	-16.71	---	PASS
			30~1000	-16.71	-60.16	≤-36.71	PASS
			1000~26500	-16.71	-49.74	≤-36.71	PASS
		2462	Reference	-14.89	-14.89	---	PASS
			30~1000	-14.89	-60.89	≤-34.89	PASS
			1000~26500	-14.89	-49.94	≤-34.89	PASS
11G	Ant1	2412	Reference	-19.22	-19.22	---	PASS
			30~1000	-19.22	-54.88	≤-39.22	PASS
			1000~26500	-19.22	-57.43	≤-39.22	PASS
		2437	Reference	-16.91	-16.91	---	PASS
			30~1000	-16.91	-51.86	≤-36.91	PASS
			1000~26500	-16.91	-57.7	≤-36.91	PASS
		2462	Reference	-17.28	-17.28	---	PASS
			30~1000	-17.28	-55.11	≤-37.28	PASS
			1000~26500	-17.28	-57.85	≤-37.28	PASS
11N20SISO	Ant1	2412	Reference	-17.48	-17.48	---	PASS
			30~1000	-17.48	-54.3	≤-37.48	PASS
			1000~26500	-17.48	-49.22	≤-37.48	PASS
		2437	Reference	-17.56	-17.56	---	PASS
			30~1000	-17.56	-54.7	≤-37.56	PASS
			1000~26500	-17.56	-57.36	≤-37.56	PASS
		2462	Reference	-16.63	-16.63	---	PASS
			30~1000	-16.63	-54.89	≤-36.63	PASS
			1000~26500	-16.63	-49.26	≤-36.63	PASS

### Test Graphs

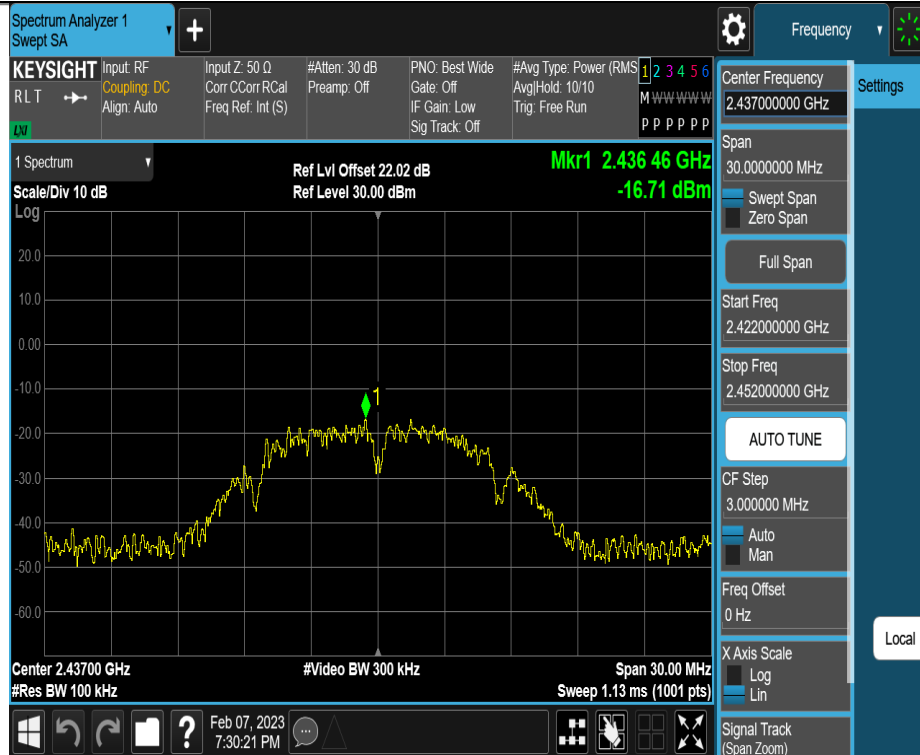




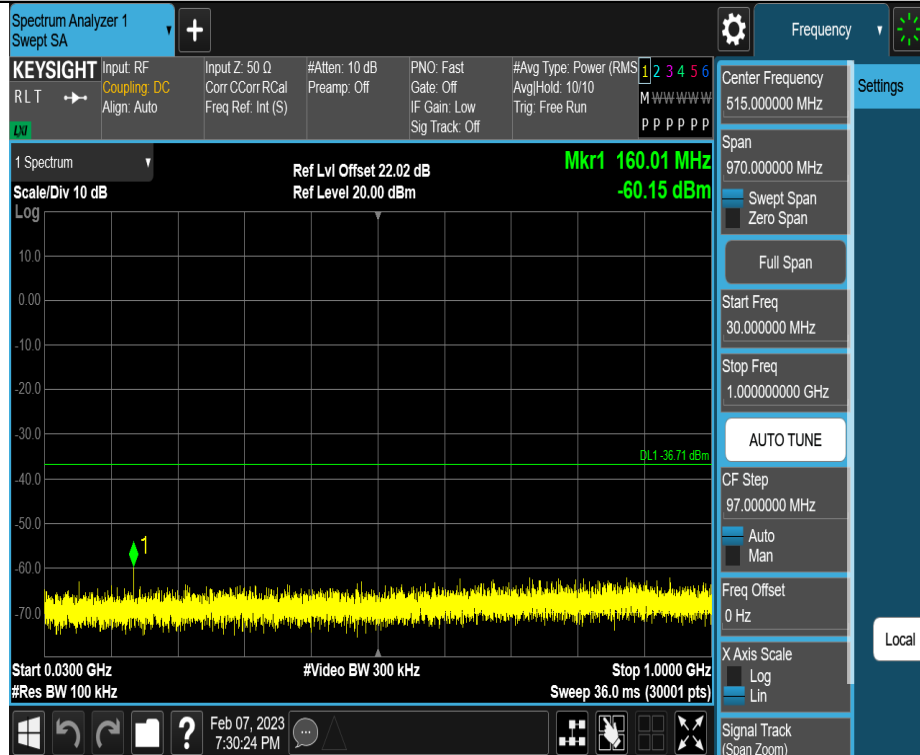
11B\_Ant1\_2412\_1000~26500



11B\_Ant1\_2437\_0~Reference



11B\_Ant1\_2437\_30~1000



11B\_Ant1\_2437\_1000~26500