


Product Name: Notebook Computer	Report No: FCC022023-0679RF1
Product Model: IPASON P3	Security Classification: Open
Version: V1.0	Total Page: 81

# TIRT Testing Report



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# FCC Radio Test Report

## FCC ID: 2ATY8-IPASONP3

This report concerns: Original Grant

**Equipment** : Notebook Computer  
**Brand Name** : **IPASON**  
**Test Model** : IPASON P3  
**Series Model** : N/A  
**Applicant** : Wuhan Ipson Technology Co., Ltd  
**Address** : 5th Floor, Multifunctional Building, No. 1, Ipson Avenue, Shekou Street, Huangpi District, Wuhan City, Hubei Province, China  
**Manufacturer** : Wuhan Ipson Technology Co., Ltd  
**Address** : 5th Floor, Multifunctional Building, No. 1, Ipson Avenue, Shekou Street, Huangpi District, Wuhan City, Hubei Province, China  
**Date of Receipt** : Mar. 01, 2023  
**Date of Test** : Mar. 01, 2023~ Mar. 14, 2023  
**Issued Date** : Mar. 15, 2023  
**Report Version** : V1.0  
**Test Sample** : Engineering Sample No.: 20230227002812  
**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
FCC022023-0679RF1	V1.0	Original Report.	2023.03.15	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	$\pm 142.12$ KHz
RF power conducted	$\pm 0.74$ dB
RF power radiated	$\pm 3.25$ dB
Spurious emissions, conducted	$\pm 1.78$ dB
Spurious emissions, radiated (30MHz~1GHz)	$\pm 4.6$ dB
Spurious emissions, radiated (1GHz~18GHz)	$\pm 4.9$ dB
Conduction Emissions(150kHz~30MHz)	$\pm 3.1$ 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	25°C	53%	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	24.5°C	52%	AC 120V/60Hz	Stone Tang
Maximum Output Power	24.5°C	52%	AC 120V/60Hz	Stone Tang
Conducted Spurious Emissions	24.5°C	52%	AC 120V/60Hz	Stone Tang
Power Spectral Density	24.5°C	52%	AC 120V/60Hz	Stone Tang

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	Notebook Computer
Brand Name	<b>IPASON</b>
Test Model	IPASON P3
Series Model	N/A
Model Difference(s)	N/A
Software Version	22H2
Hardware Version	1F943C06
Power Source	DC voltage supplied from AC/DC adapter.
Power Rating	DC 20V-2.25A from Adapter
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 Peak Power	IEEE 802.11B: 19.80 dBm (0.0955 W)

Note:

- 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) CH03 - CH09 for IEEE 802.11n(HT40)							
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	N/A	PIFA	N/A	2.7

Note:

- The antenna gain is provided by the manufacturer.
- The antenna is for testing purposes only.



## 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
Mode 4	TX N(HT40) Mode Channel 03/06/09
Mode 5	TX G Mode Channel 01

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 5	TX G Mode Channel 01

Radiated emissions test - Below 1GHz	
Final Test Mode	Description
Mode 5	TX G Mode Channel 01

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
Mode 4	TX N(HT40) Mode Channel 03/06/09

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
Mode 4	TX N(HT40) Mode Channel 03/06/09

**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~18GHz and 18GHz~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.

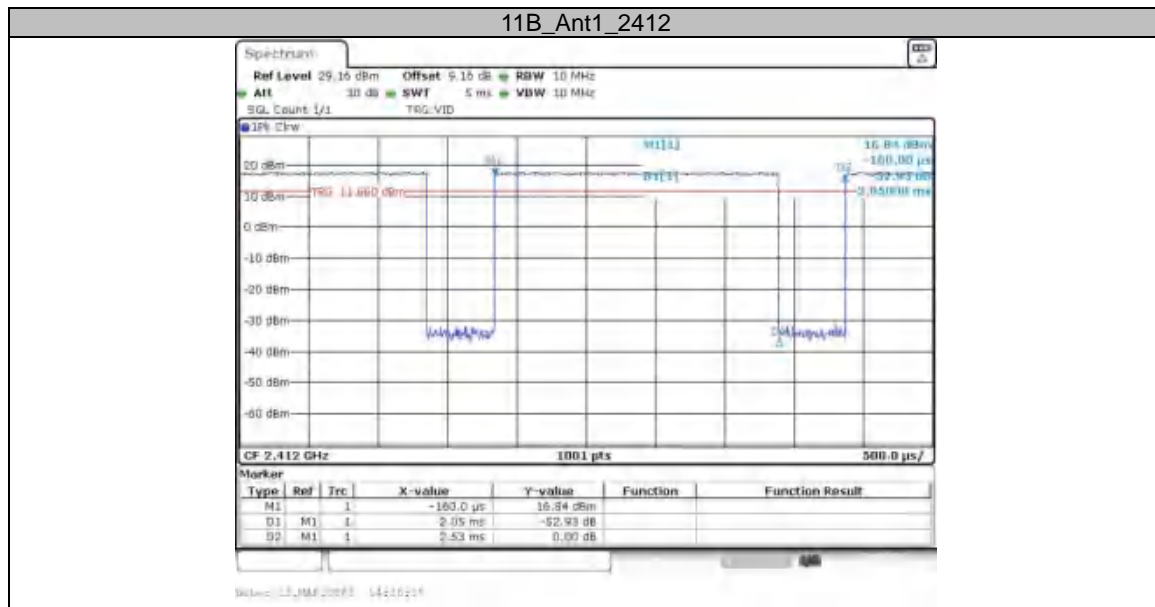
## 2.3 PARAMETERS OF TEST SOFTWARE

Frequency (MHz)	2412	2437	2462
/	Power setting		
Test Software Version	DRTU_3.0		
IEEE 802.11b	90	90	90
IEEE 802.11g	80	80	80
IEEE 802.11n(HT20)	70	70	70
Frequency (MHz)	2422	2437	2452
IEEE 802.11n(HT40)	60	60	60

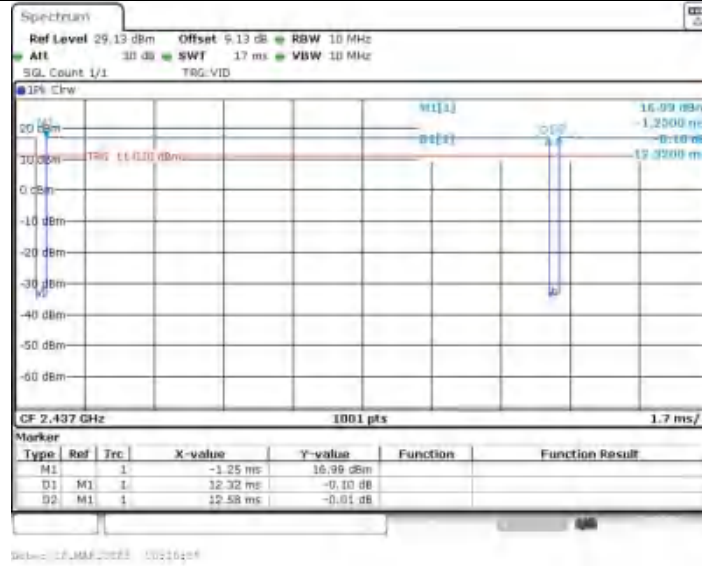
## 2.4 DUTY CYCLE

TestMode	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11B	2412	2.05	2.53	81.03
	2437	12.32	12.58	97.93
	2462	7.00	7.00	100.00
11G	2412	2.05	2.10	97.62
	2437	2.05	2.10	97.62
	2462	2.05	2.09	98.09
11N20SISO	2412	1.90	1.95	97.44
	2437	1.92	1.96	97.96
	2462	1.91	1.94	98.45
11N40SISO	2422	0.94	0.97	96.91
	2437	0.94	0.98	95.92
	2452	0.93	0.97	95.88

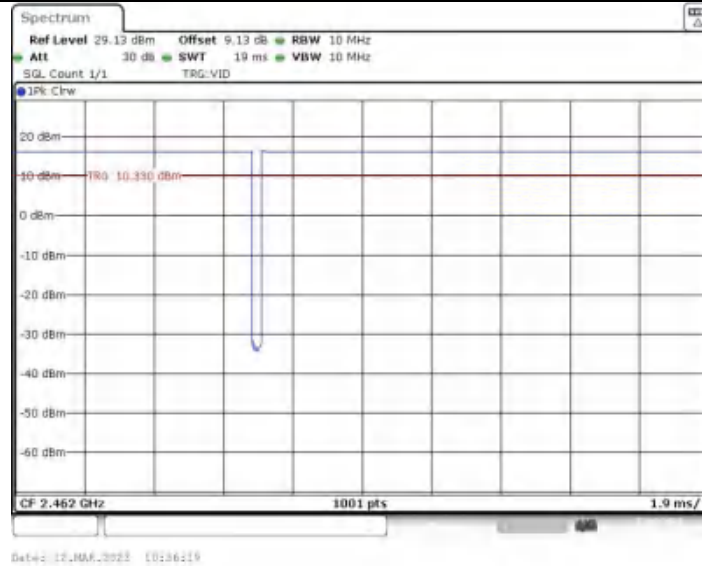
## Test Graphs



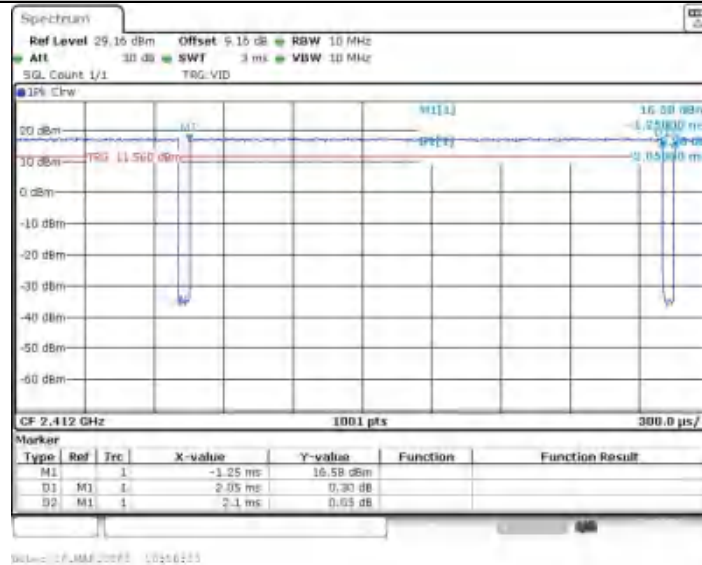
### 11B\_Ant1\_2437



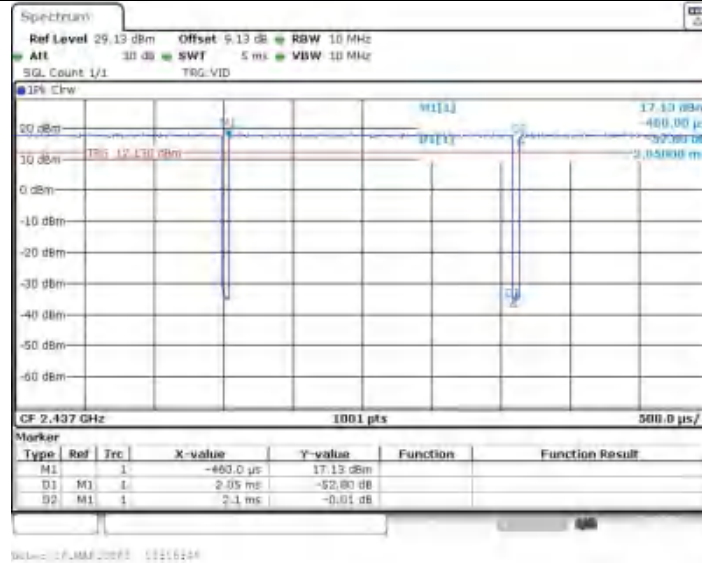
### 11B\_Ant1\_2462



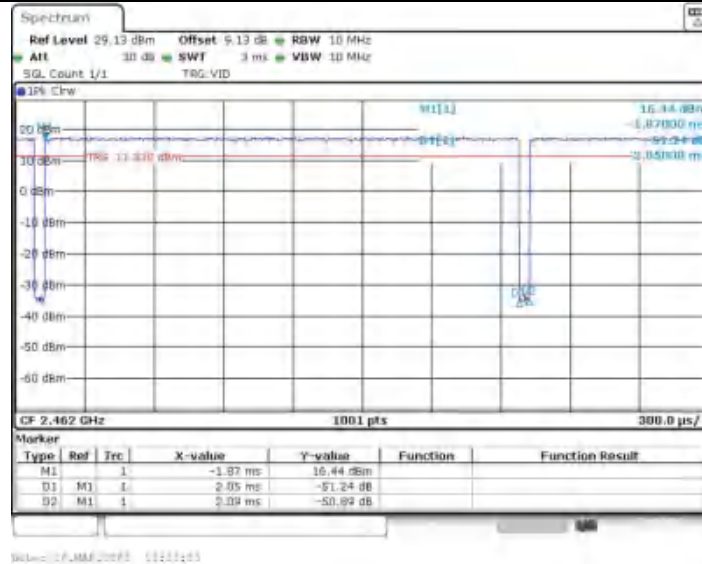
### 11G\_Ant1\_2412



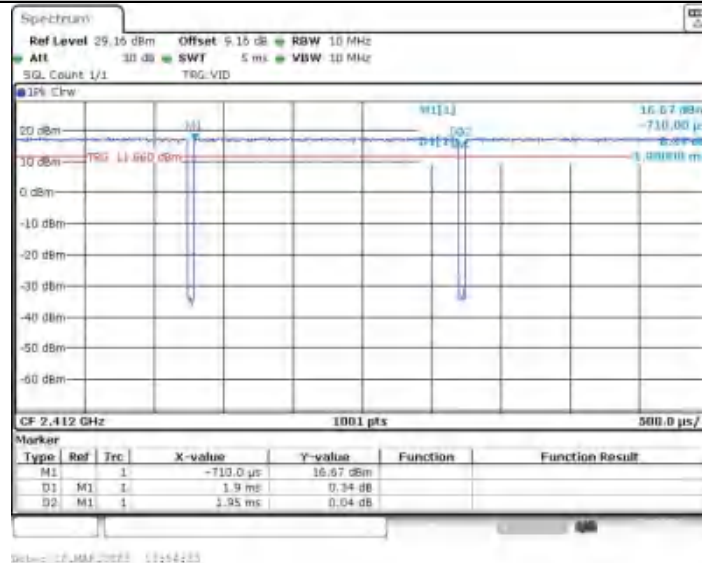
### 11G\_Ant1\_2437



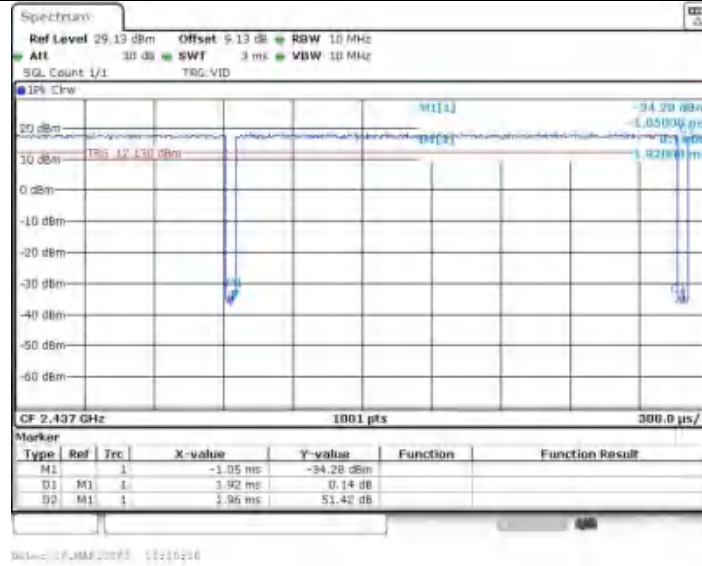
### 11G\_Ant1\_2462



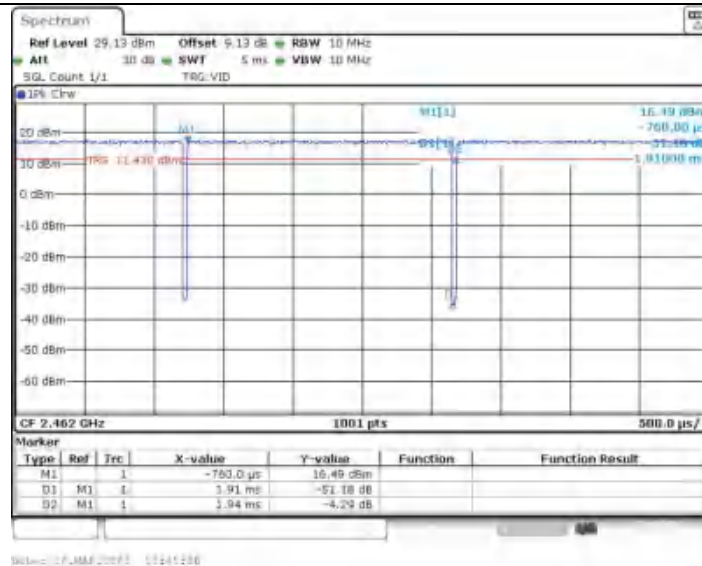
### 11N20SISO\_Ant1\_2412



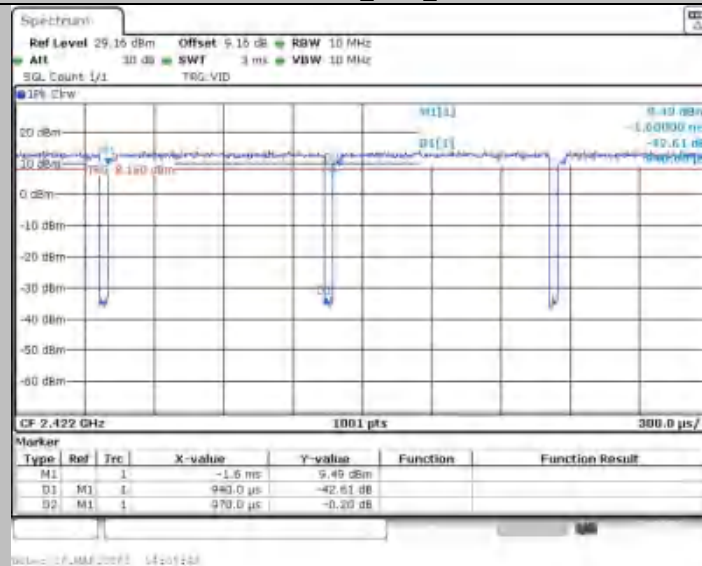
## 11N20SISO\_Ant1\_2437



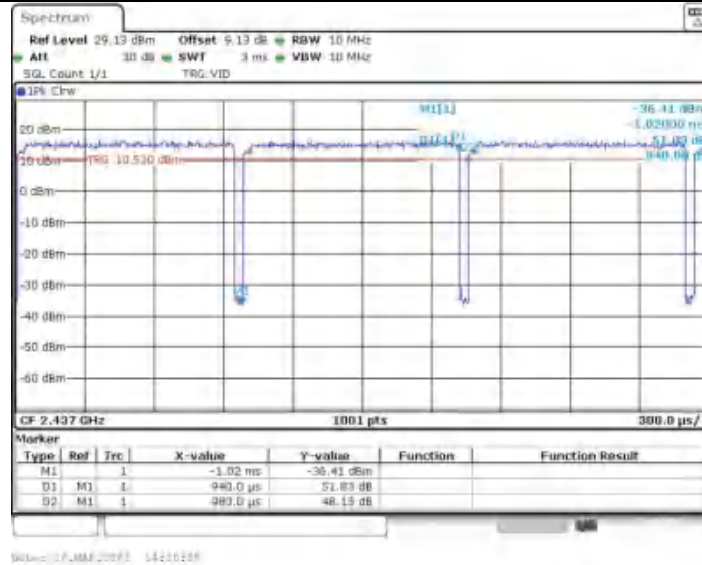
## 11N20SISO\_Ant1\_2462



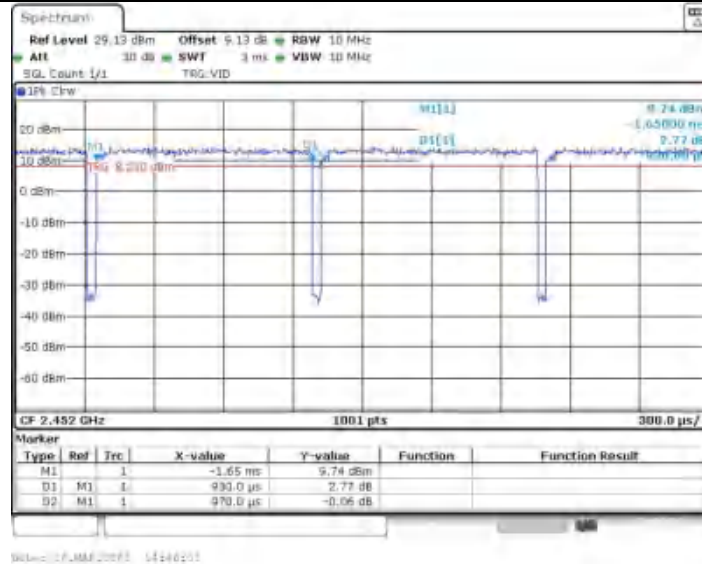
## 11N40SISO\_Ant1\_2422



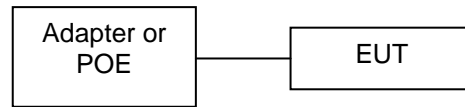
### 11N40SISO\_Ant1\_2437



### 11N40SISO\_Ant1\_2452



## 2.5 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



## 2.6 SUPPORT UNITS

Support Equipment				
No.	Equipment	Brand Name	Model Name	Remarks
1	/	/	/	/



### 3. AC POWER LINE CONDUCTED EMISSIONS

#### 3.1 LIMIT

Frequency of Emission (MHz)	Limit (dBμV)	
	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.

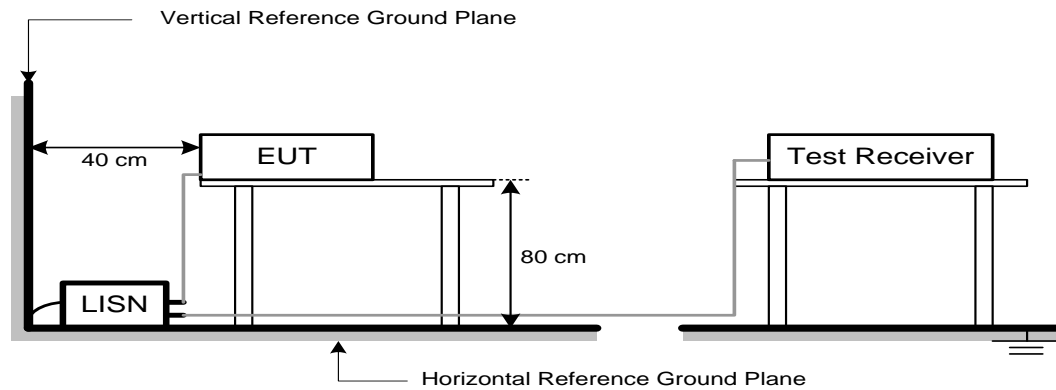
The following table is the setting of the receiver:

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

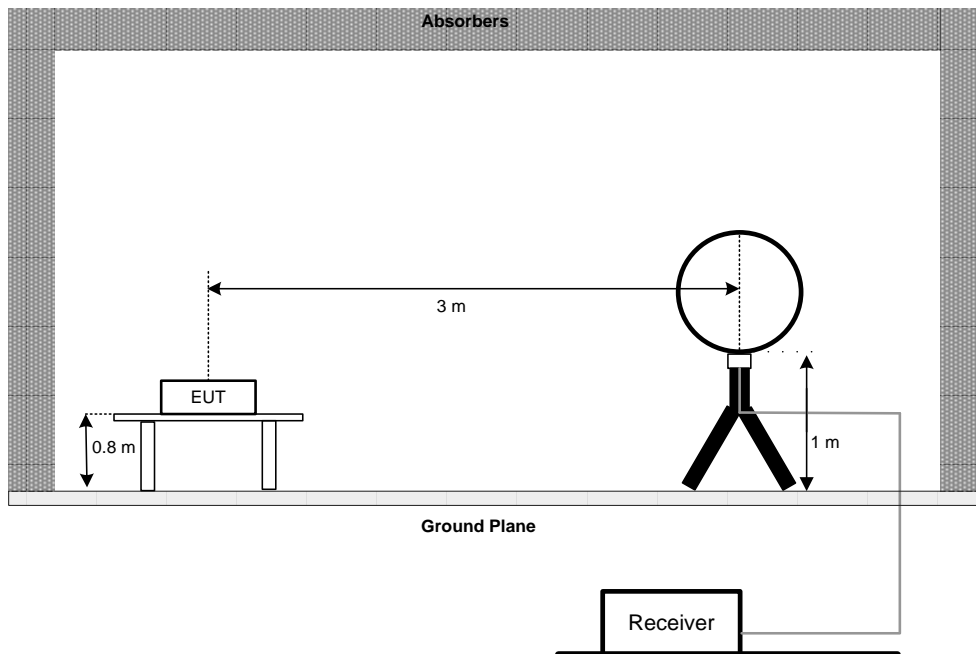
Receiver Parameters	Setting
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30 MHz~1000 MHz for QP detector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

### 4.3 DEVIATION FROM TEST STANDARD

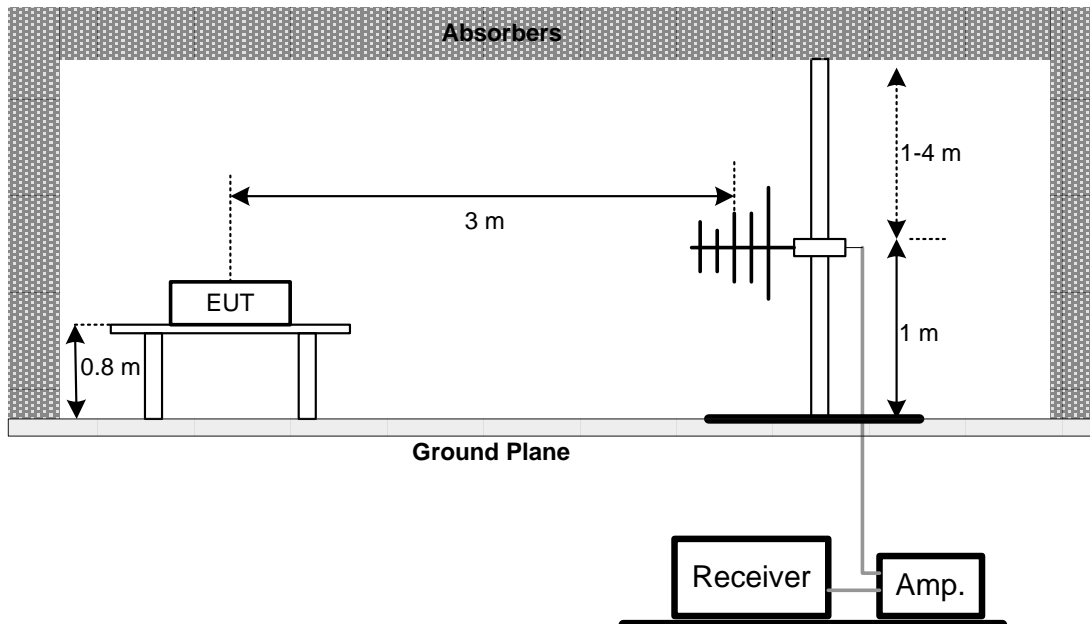
No deviation.

### 4.4 TEST SETUP

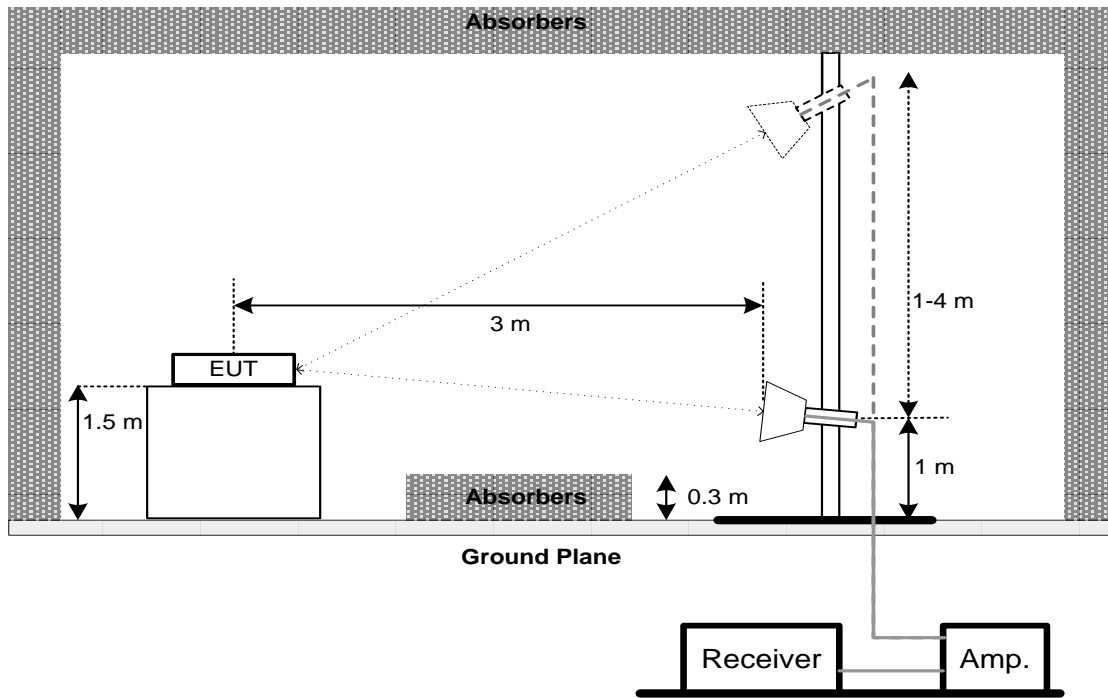
#### 9 kHz to 30 MHz



#### 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 tonscend test system 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

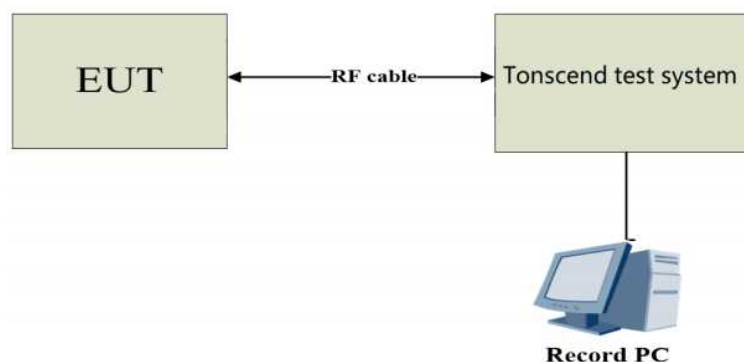
For 99% Emission Bandwidth:

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

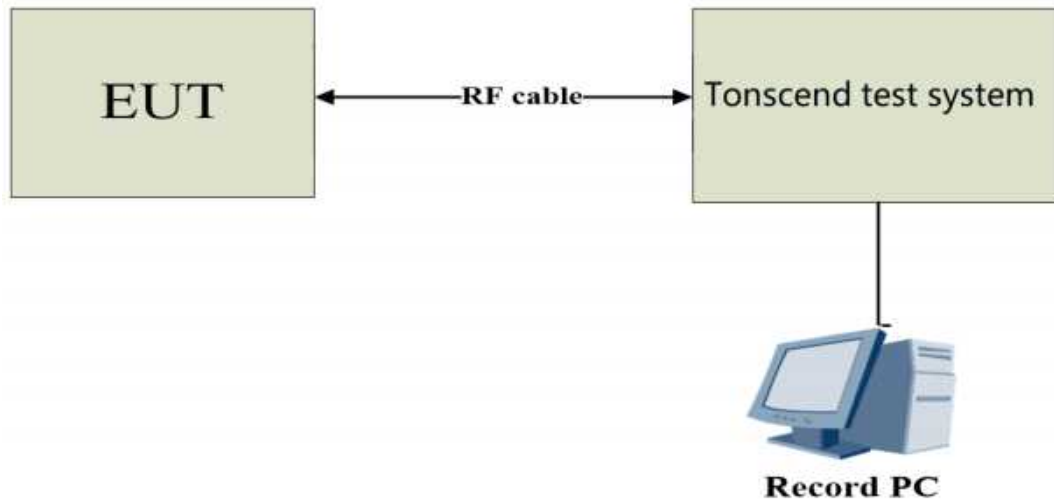
### 6.2 TEST PROCEDURE

- The EUT was directly connected to the tonskend test system and antenna output port as show in the block diagram below.
- The maximum conducted output power was performed in accordance with method 11.9.1.3 (for peak power) of ANSI C63.10-2013 and FCC KDB 662911 D01 v02r01 Multiple Transmitter Output.

### 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

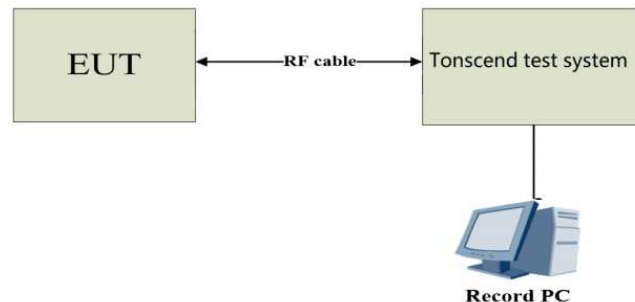
- The EUT was directly connected to the tonscend test system and antenna output port as show in the block diagram below.
- The following table is the setting of the spectrum analyzer:

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

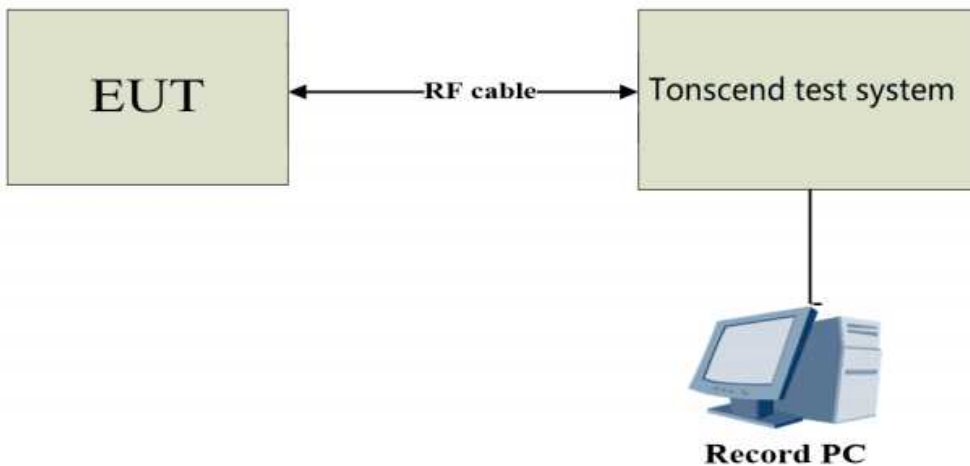
- The EUT was directly connected to the tonscend test system and antenna output port as show in the block diagram below.
- The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting
Span Frequency	1.5 times the DTS bandwidth
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.	Name	Version number.	Type	Manufacturer	Cal. Date	Due Date
1	Tonscend Test System	V2.6.77	RF Test System	Tonscend	N/A	N/A
<b>RF Test System</b>						
No.	Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
1	Integrated Tester	120434	CMW500	R&S	2023/01/05	2024/01/04
2	Spectrum Analyzer	101722	FSV40	R&S	2022/07/21	2023/07/20
3	Mobile Communications DC Source	MY40003243	E3642A	Agilent	2021.06.22	2022.06.21
4	VSG Vector Signal Generator	MY56200458	N5182B	Agilent	2023/01/05	2024/01/04
5	PSG Analog Signal Generator	3610A02458	83752A	Agilent	2022/07/21	2023/07/20
6	RF control unit	20G8060288	JS0806-2	Tonscend	2023/01/05	2024/01/04
7	EMI Receiver	/	ESIB 40	R&S	2023/01/05	2024/01/04
8	Integral Antenna	01314	VULB 9168	Schwarzbeck	2022/12/11	2023/12/10
9	Integral Antenna	RSM2991424	HF907	Schwarzbeck	2022/12/11	2023/12/10
10	Preamplifier	02017	RP01A	Emtrace	2023/01/05	2024/01/04
11	Preamplifier	00143	BBV9744	Schwarzbeck	2022/12/11	2023/12/10

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

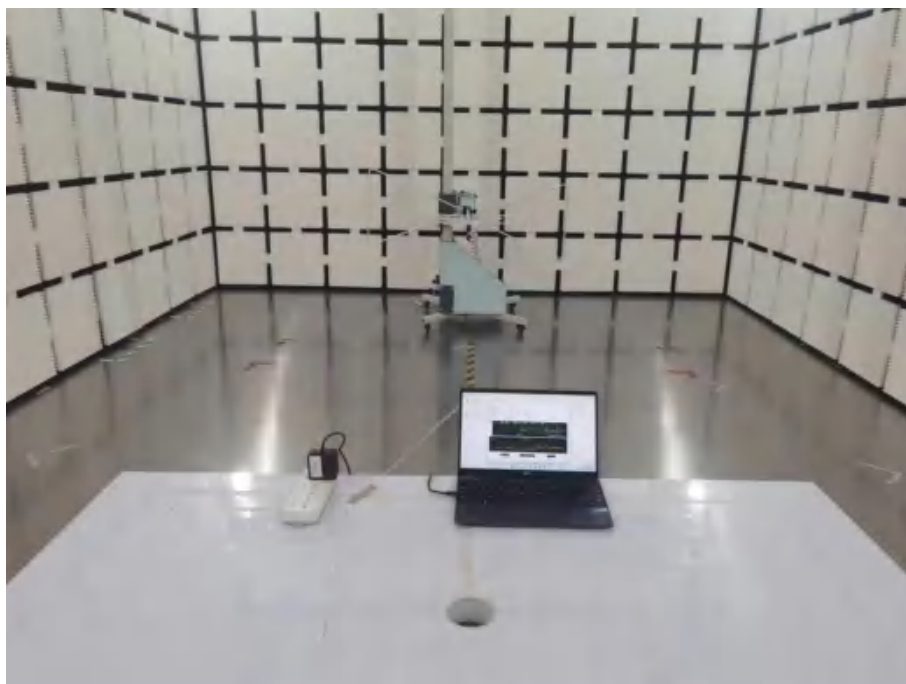
## 10. EUT TEST PHOTO

### AC Power Line Conducted Emissions Test Photos



### Radiated Emissions Test Photos

#### 30 MHz to 1 GHz

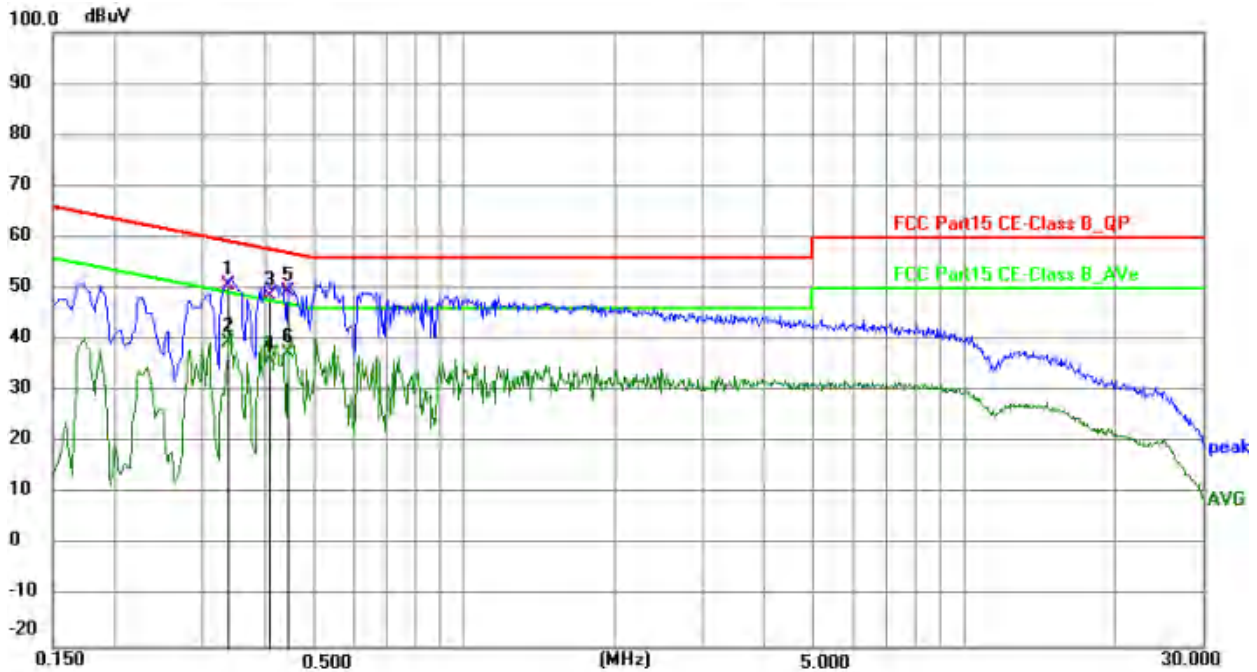


**Radiated Emissions Test Photos****Above 1 GHz**

**Conducted Test Photos**

## APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS

Test Mode	TX G Mode Channel 01	Phase	Line
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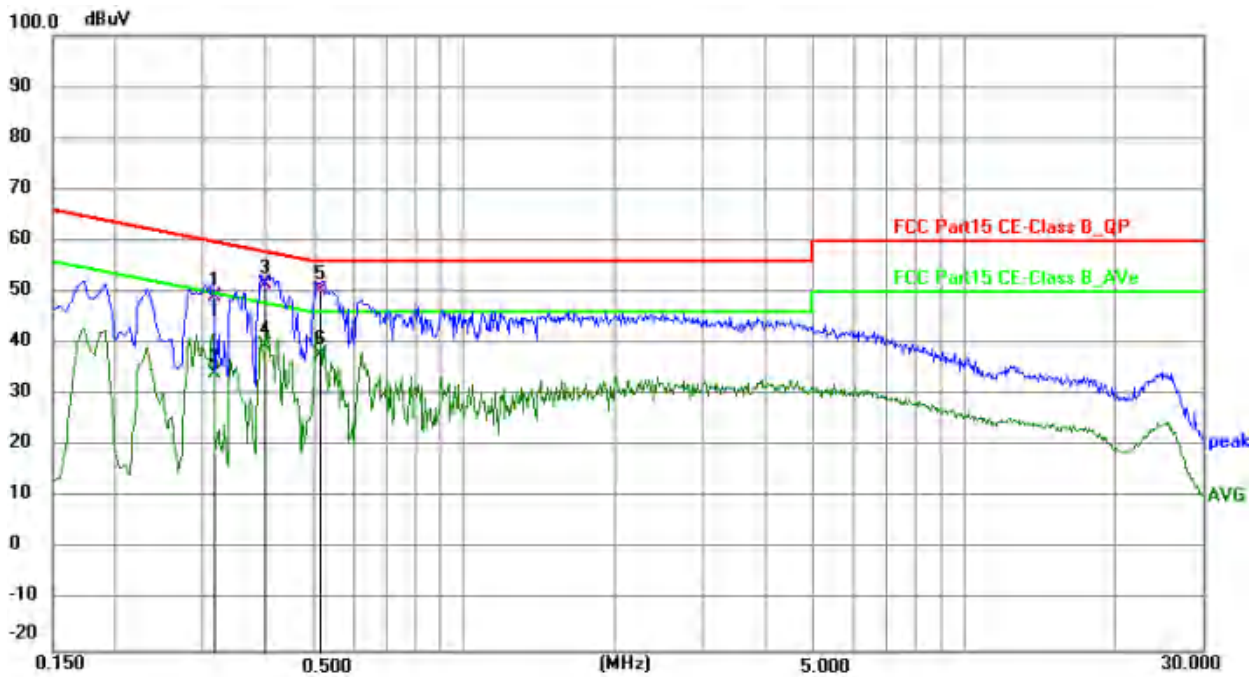
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.3349	41.04	9.63	50.67	59.33	-8.66	QP	P
2	0.3349	29.90	9.63	39.53	49.33	-9.80	AVG	P
3	0.4071	38.99	9.63	48.62	57.71	-9.09	QP	P
4	0.4071	26.45	9.63	36.08	47.71	-11.63	AVG	P
5 *	0.4459	39.79	9.63	49.42	56.95	-7.53	QP	P
6	0.4459	27.88	9.63	37.51	46.95	-9.44	AVG	P

### REMARKS:

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



Test Mode	TX G Mode Channel 01	Phase	Neutral
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No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.3158	39.50	9.62	49.12	59.82	-10.70	QP	P
2	0.3158	24.43	9.62	34.05	49.82	-15.77	AVG	P
3	0.3996	41.87	9.62	51.49	57.86	-6.37	QP	P
4	0.3996	29.88	9.62	39.50	47.86	-8.36	AVG	P
5 *	0.5127	40.69	9.62	50.31	56.00	-5.69	QP	P
6	0.5127	28.13	9.62	37.75	46.00	-8.25	AVG	P

**REMARKS:**

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

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

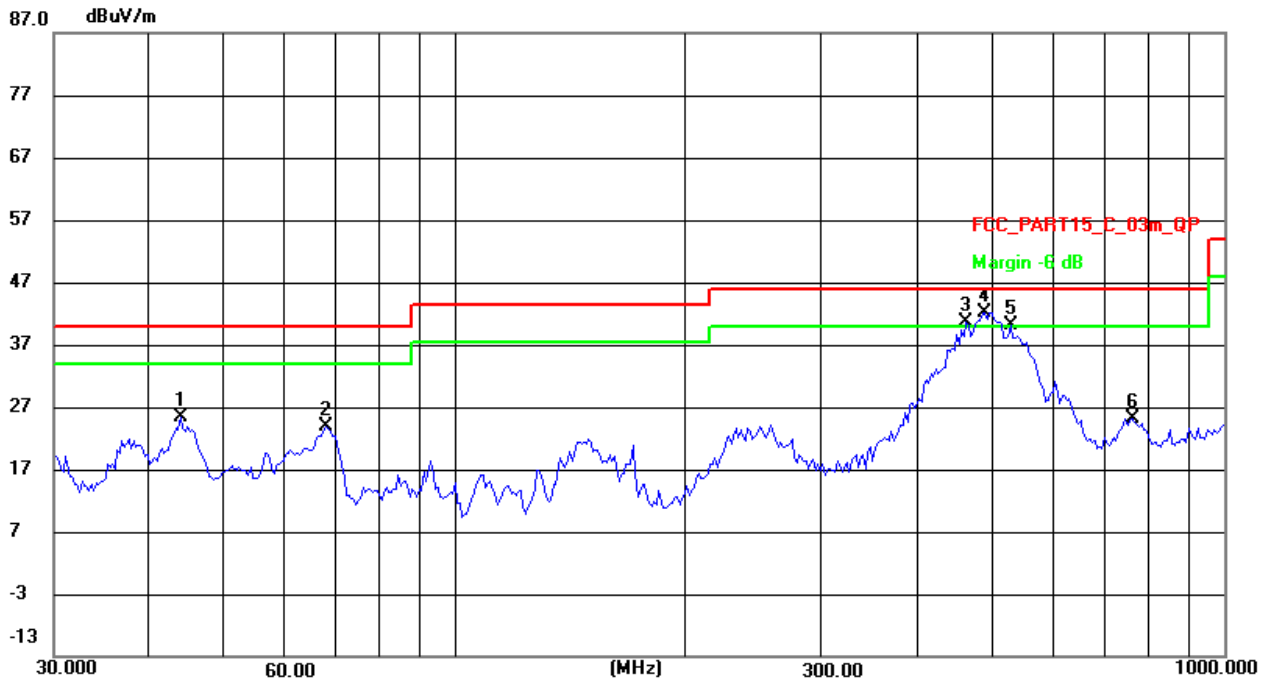
## **APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ**

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 G Mode Channel 01	Polarization	Vertical
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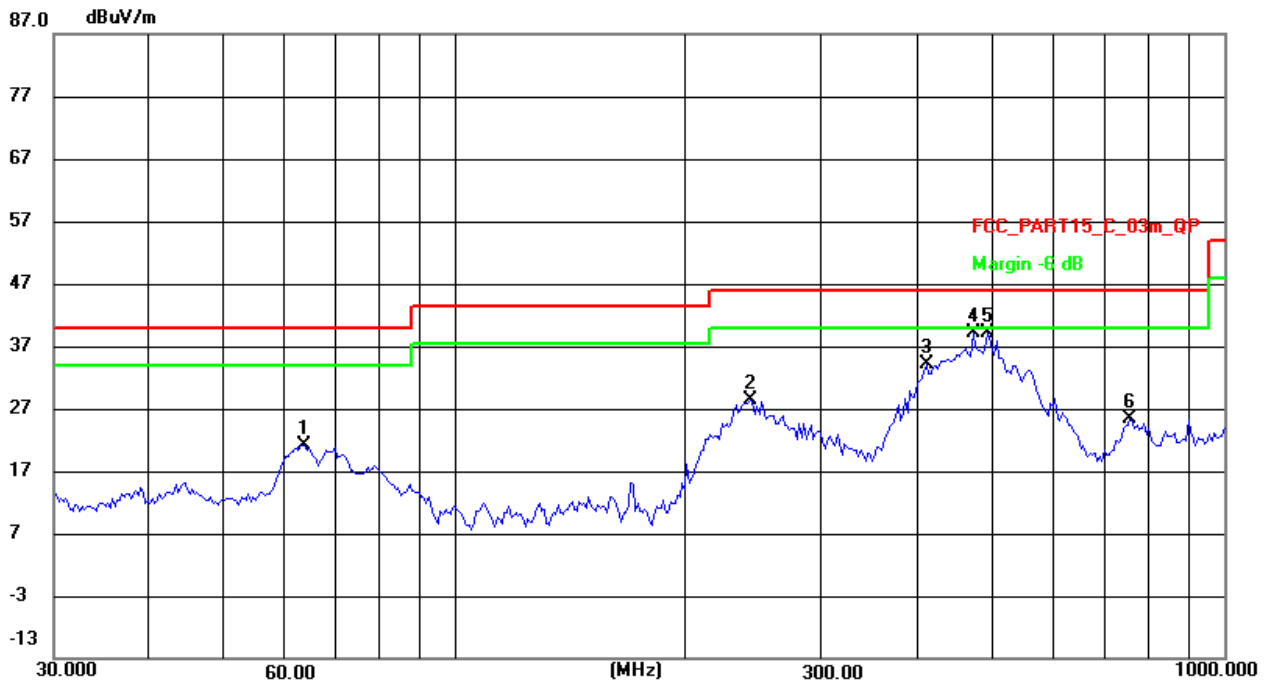
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F
1	43.8452	44.70	-19.44	25.26	40.00	-14.74	peak	100	97	P
2	67.7856	45.46	-21.68	23.78	40.00	-16.22	peak	100	191	P
3 !	461.6313	58.54	-17.84	40.70	46.00	-5.30	peak	200	348	P
4 *	488.3263	59.55	-17.30	42.25	46.00	-3.75	peak	200	348	P
5 !	527.5707	56.61	-16.54	40.07	46.00	-5.93	peak	200	348	P
6	760.2867	35.88	-10.67	25.21	46.00	-20.79	peak	100	118	P

### REMARKS:

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

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

Test Mode	TX G Mode Channel 01	Polarization	Horizontal
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No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F
1	63.6312	42.12	-20.94	21.18	40.00	-18.82	peak	200	1	P
2	241.8377	52.46	-24.16	28.30	46.00	-17.70	peak	200	87	P
3	409.6506	53.35	-19.14	34.21	46.00	-11.79	peak	100	169	P
4	471.4665	56.69	-17.64	39.05	46.00	-6.95	peak	100	262	P
5 *	491.7700	56.40	-17.25	39.15	46.00	-6.85	peak	200	284	P
6	754.9628	36.22	-10.80	25.42	46.00	-20.58	peak	200	247	P

# REMARKS:

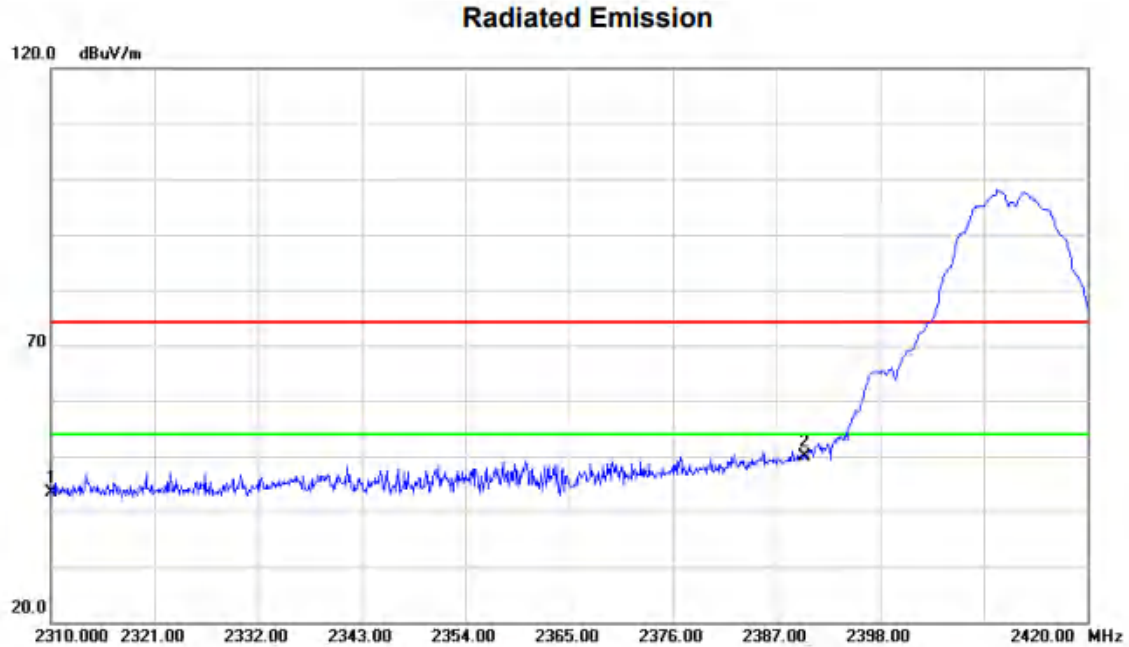
(1) Measurement Value = Reading Level + Correct Factor.

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

## APPENDIX D - RADIATED EMISSION- ABOVE 1000 MHZ

Test Result of Radiated Spurious at Band edges.

Test Mode	TX B Mode 2412 MHz	Polarization	Vertical
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No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2310.000	55.24	-11.92	43.32	74.00	-30.68	peak		
2 *		2390.000	61.51	-11.67	49.84	74.00	-24.16	peak		

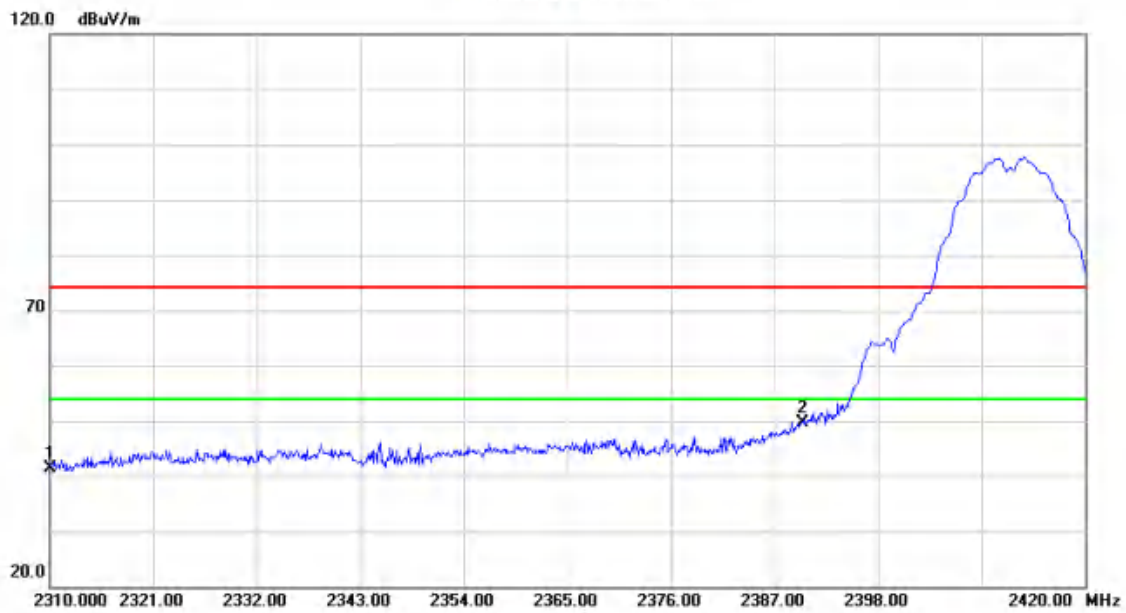
### REMARKS:

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

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

Test Mode	TX B Mode 2412 MHz	Polarization	Horizontal
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### Radiated Emission



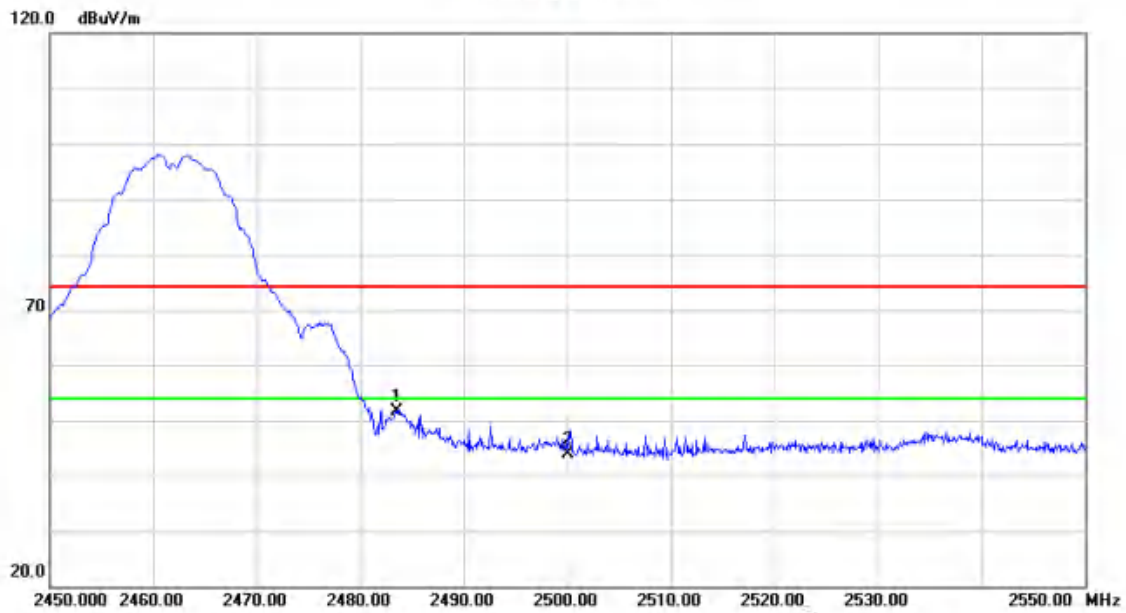
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2310.000	53.39	-11.92	41.47	74.00	-32.53	peak		
2 *		2390.000	61.29	-11.67	49.62	74.00	-24.38	peak		

#### REMARKS:

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

Test Mode	TX B Mode 2462 MHz	Polarization	Vertical
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### Radiated Emission



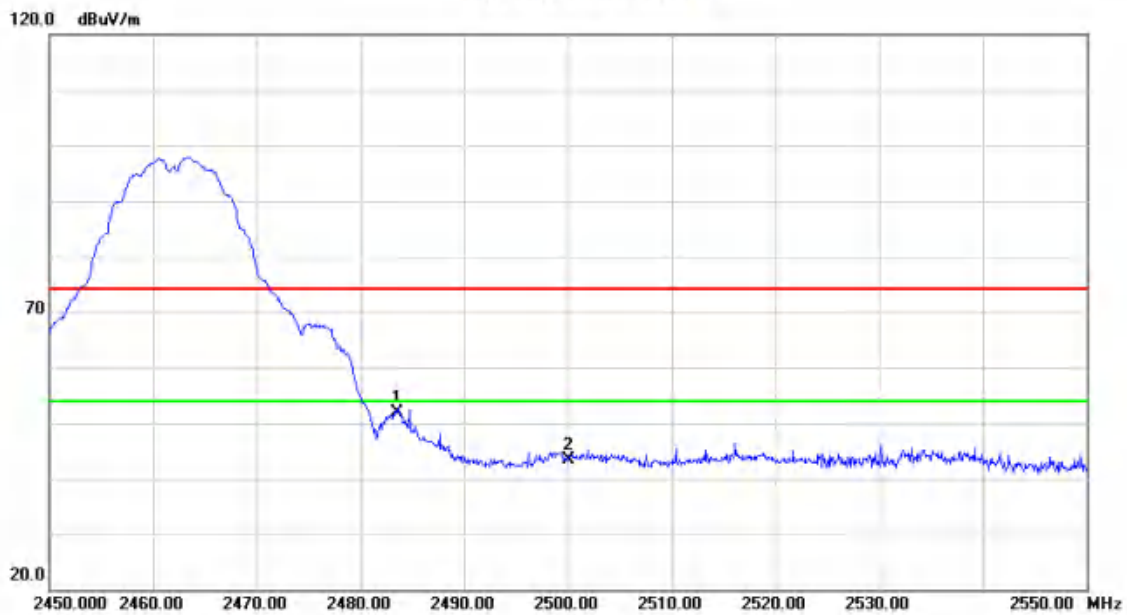
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	2483.500	62.90	-11.28	51.62	74.00	-22.38	peak		
2		2500.000	55.04	-11.21	43.83	74.00	-30.17	peak		

#### REMARKS:

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

Test Mode	TX B Mode 2462 MHz	Polarization	Horizontal
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### Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1	*	2483.500	63.27	-11.28	51.99	74.00	-22.01	peak		
2		2500.000	54.60	-11.21	43.39	74.00	-30.61	peak		

#### REMARKS:

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

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



Test Mode	TX G Mode 2412 MHz	Polarization	Vertical
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### Radiated Emission



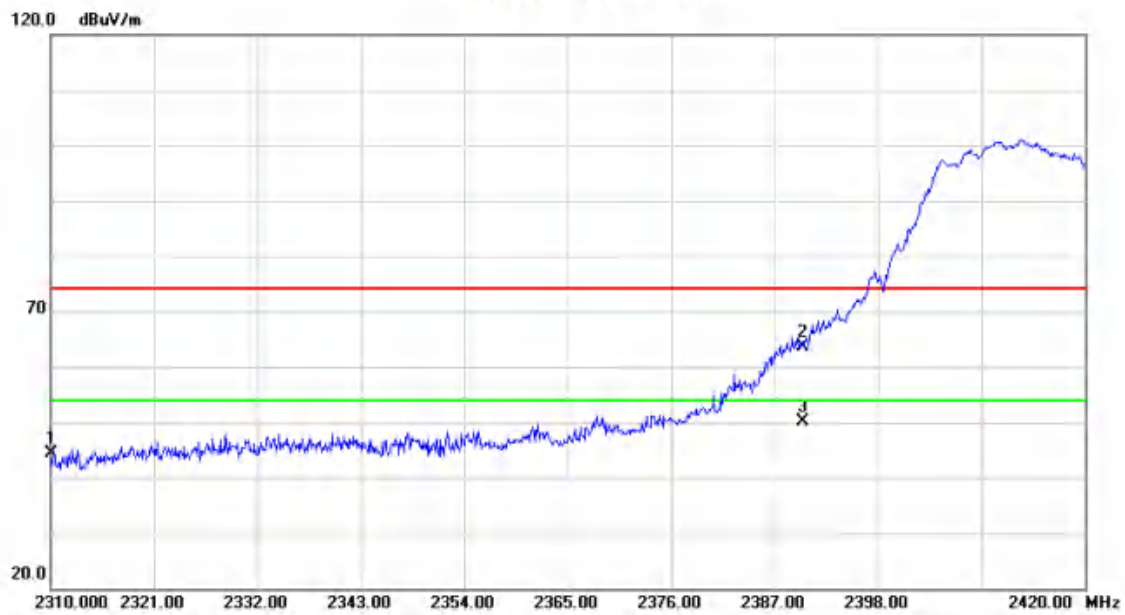
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		2310.000	54.33	-11.92	42.41	74.00	-31.59	peak		
2		2390.000	72.48	-11.67	60.81	74.00	-13.19	peak		
3 *		2390.000	59.21	-11.67	47.54	54.00	-6.46	AVG		

#### REMARKS:

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

Test Mode	TX G Mode 2412 MHz	Polarization	Horizontal
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### Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2310.000	56.32	-11.92	44.40	74.00	-29.60	peak		
2		2390.000	75.18	-11.67	63.51	74.00	-10.49	peak		
3	*	2390.000	61.80	-11.67	50.13	54.00	-3.87	AVG		

#### REMARKS:

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

Test Mode	TX G Mode 2462 MHz	Polarization	Vertical
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### Radiated Emission



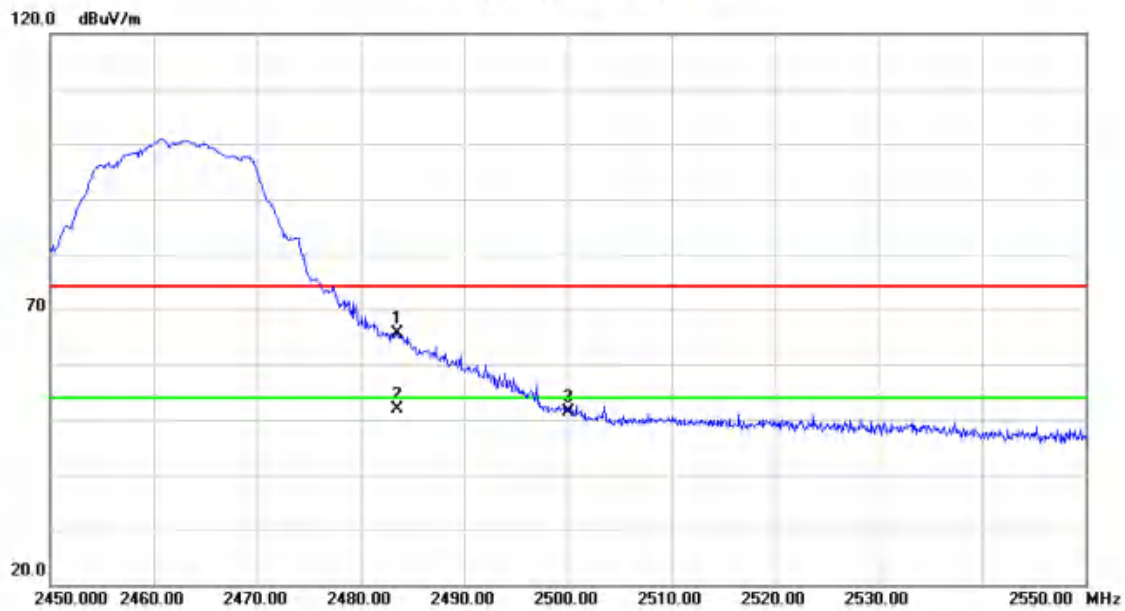
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2483.500	76.84	-11.28	65.56	74.00	-8.44			peak
2 *		2483.500	62.74	-11.28	51.46	54.00	-2.54			AVG
3		2500.000	63.20	-11.21	51.99	74.00	-22.01			peak

#### REMARKS:

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

Test Mode	TX G Mode 2462 MHz	Polarization	Horizontal
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### Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2483.500	76.86	-11.28	65.58	74.00	-8.42	peak		
2 *		2483.500	63.05	-11.28	51.77	54.00	-2.23	AVG		
3		2500.000	62.60	-11.21	51.39	74.00	-22.61	peak		

#### REMARKS:

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

Test Mode	TX N(HT20) Mode 2412 MHz	Polarization	Vertical
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### Radiated Emission



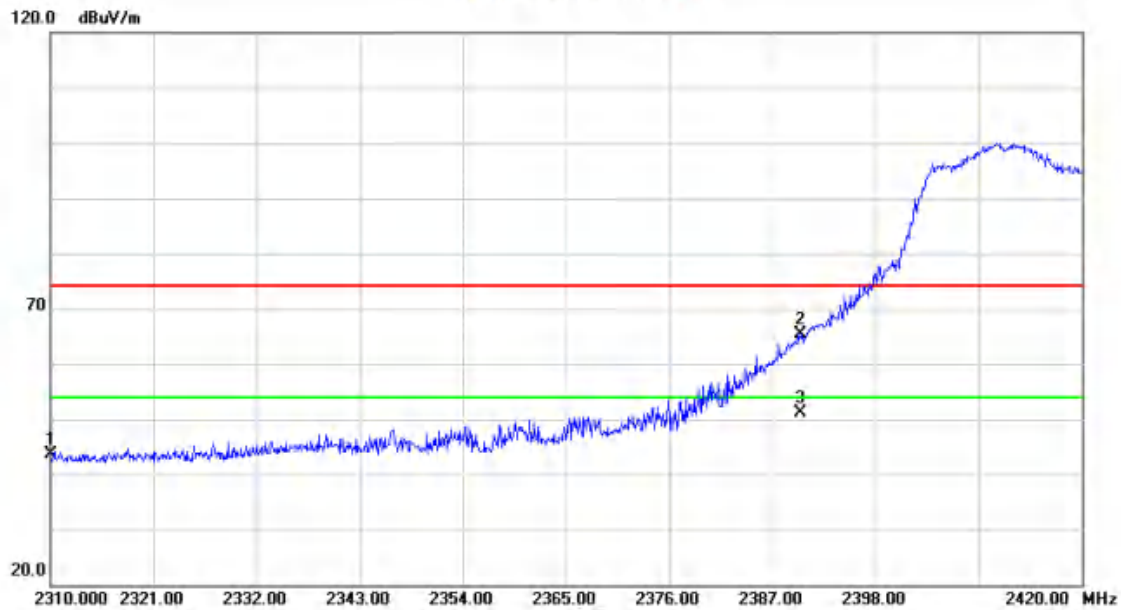
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		2310.000	55.47	-11.92	43.55	74.00	-30.45	peak		
2		2390.000	73.46	-11.67	61.79	74.00	-12.21	peak		
3 *		2390.000	60.74	-11.67	49.07	54.00	-4.93	AVG		

#### REMARKS:

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

Test Mode	TX N(HT20) Mode 2412 MHz	Polarization	Horizontal
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### Radiated Emission



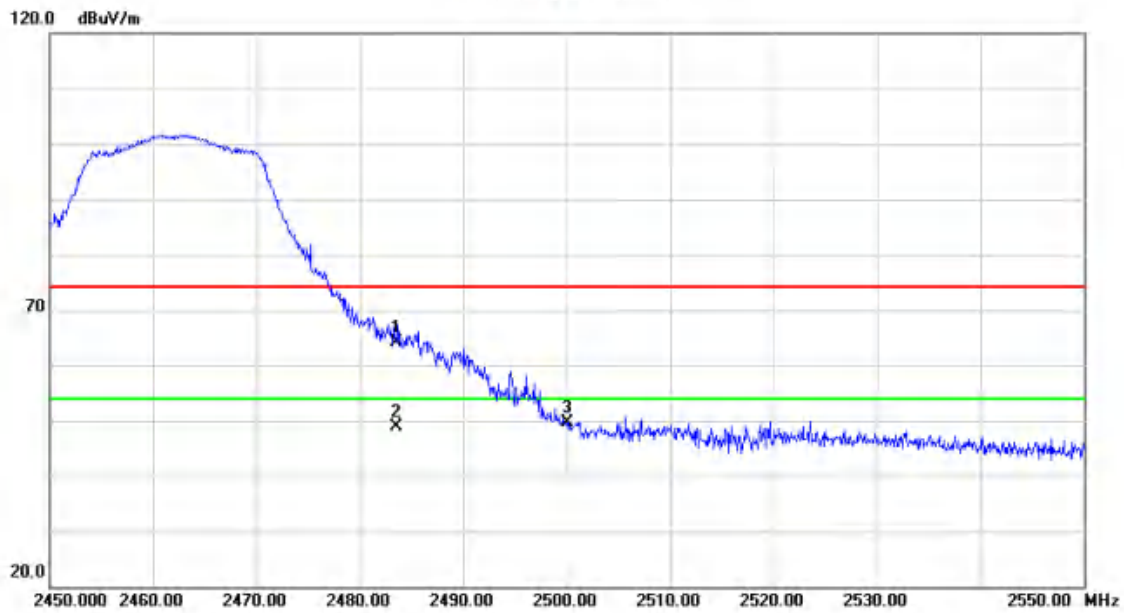
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2310.000	55.53	-11.92	43.61	74.00	-30.39			peak
2		2390.000	77.03	-11.67	65.36	74.00	-8.64			peak
3	*	2390.000	62.86	-11.67	51.19	54.00	-2.81			AVG

#### REMARKS:

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

Test Mode	TX N(HT20) Mode 2462 MHz	Polarization	Vertical
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### Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2483.500	75.48	-11.28	64.20	74.00	-9.80	peak		
2 *		2483.500	60.20	-11.28	48.92	54.00	-5.08	AVG		
3		2500.000	60.77	-11.21	49.56	74.00	-24.44	peak		

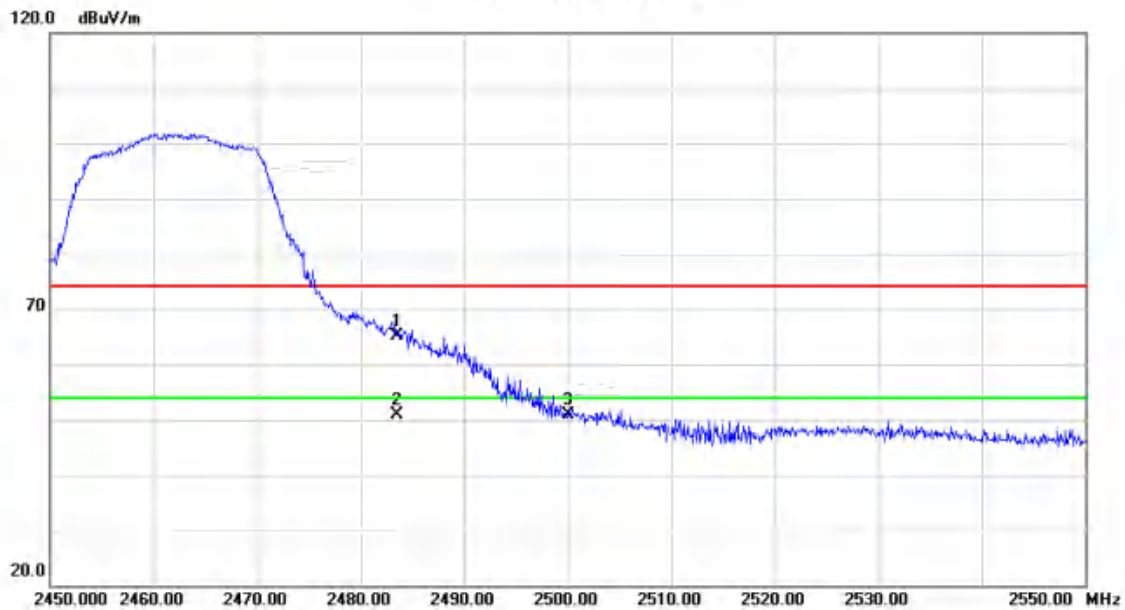
#### REMARKS:

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



Test Mode	TX N(HT20) Mode 2462 MHz	Polarization	Horizontal
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### Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2483.500	76.52	-11.28	65.24	74.00	-8.76	peak		
2 *		2483.500	62.25	-11.28	50.97	54.00	-3.03	AVG		
3		2500.000	61.99	-11.21	50.78	74.00	-23.22	peak		

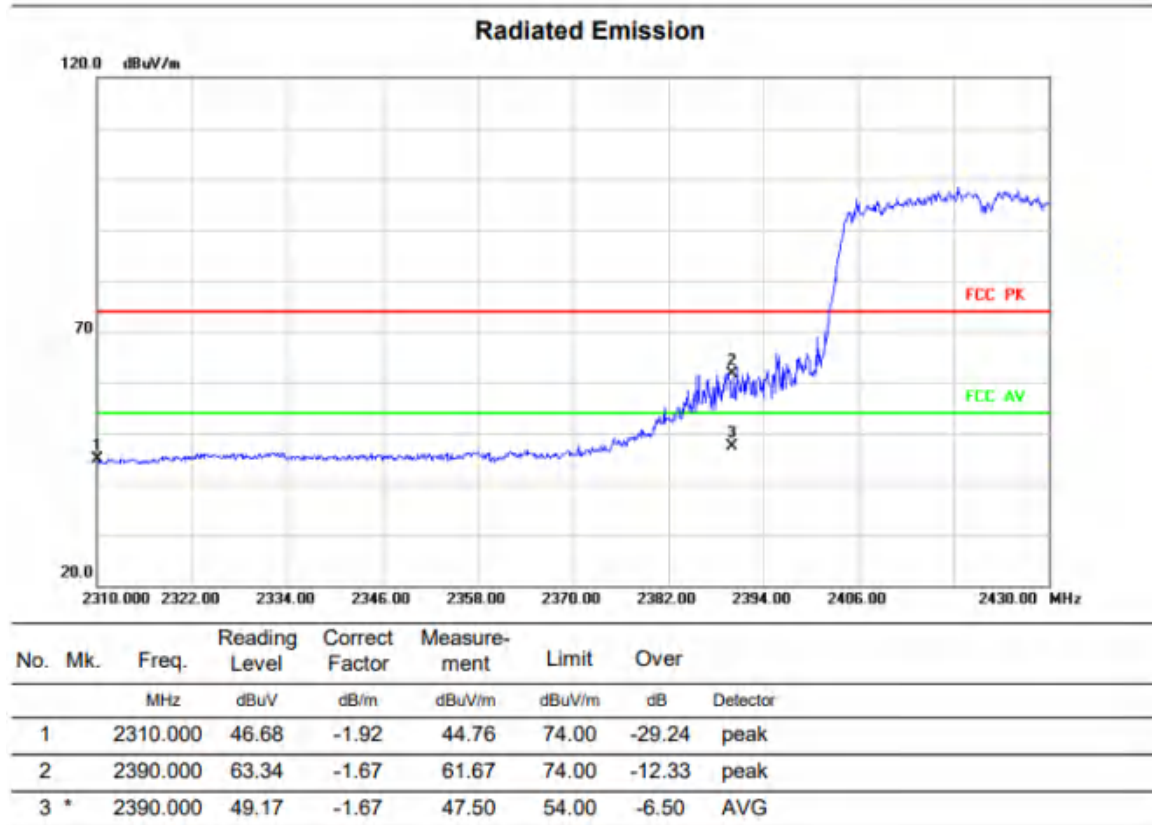
#### REMARKS:

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

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

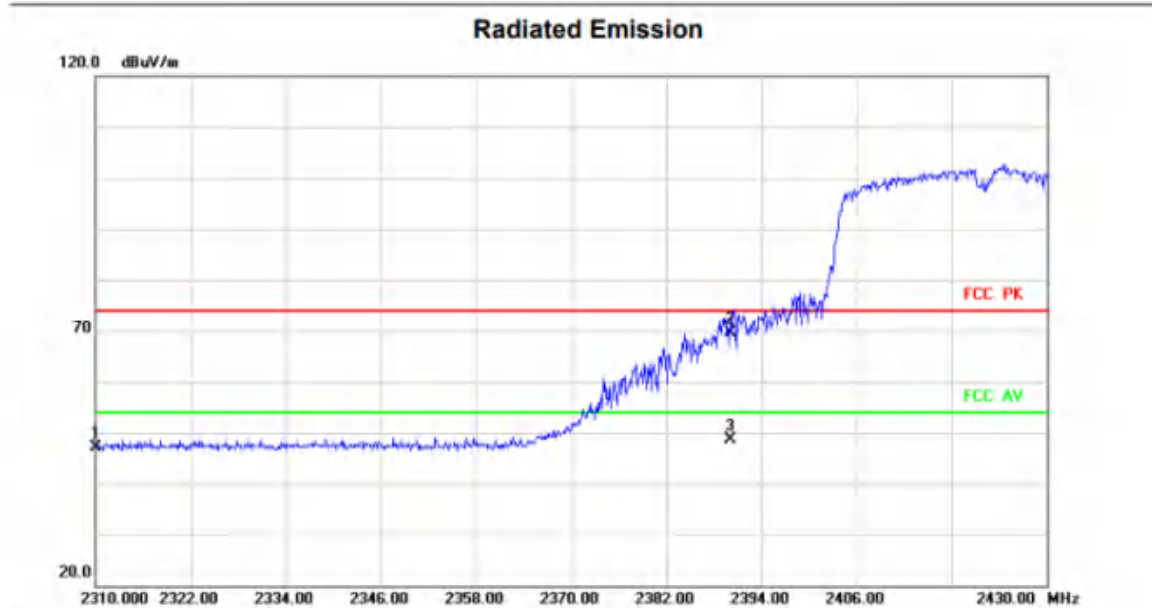


Test Mode	TX N(HT40) Mode 2422 MHz	Polarization	Vertical
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**REMARKS:**

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

Test Mode	TX N(HT40) Mode 2422 MHz	Polarization	Horizontal
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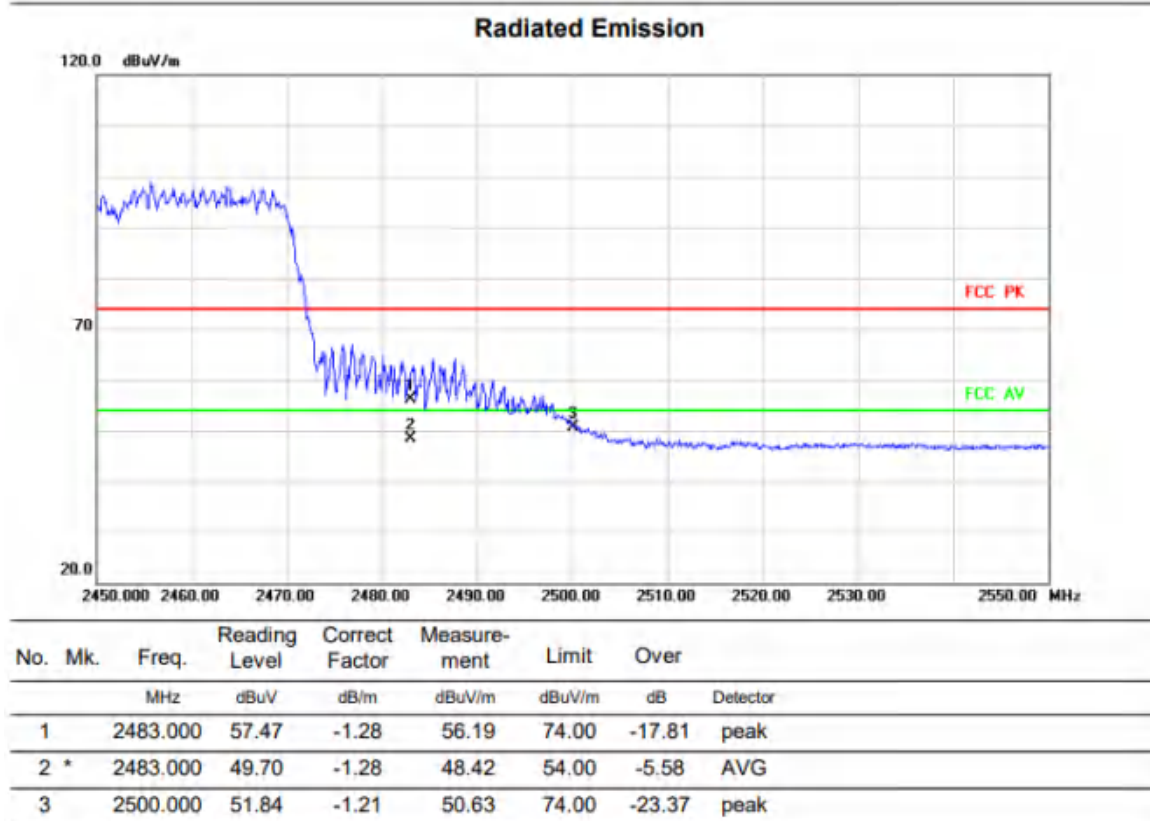


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2310.000	49.07	-1.92	47.15	74.00	-26.85	peak
2	*	2390.000	71.33	-1.67	69.66	74.00	-4.34	peak
3		2390.000	50.30	-1.67	48.63	54.00	-5.37	AVG

**REMARKS:**

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

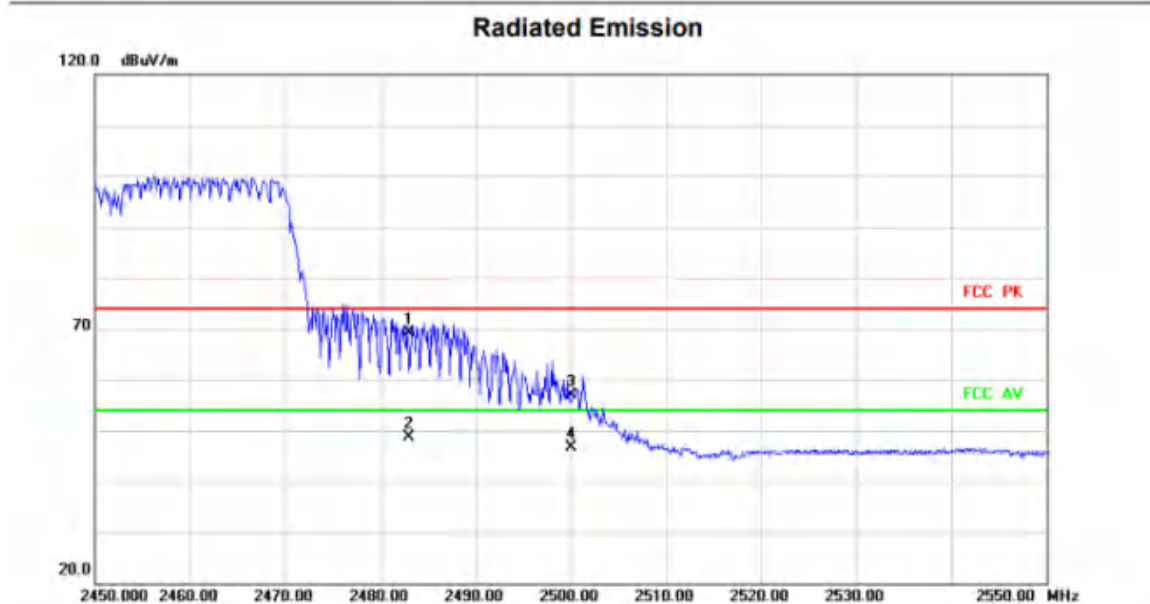
Test Mode	TX N(HT40) Mode 2452 MHz	Polarization	Vertical
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**REMARKS:**

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

Test Mode	TX N(HT40) Mode 2422 MHz	Polarization	Horizontal
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No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	*	2483.000	70.31	-1.28	69.03	74.00	-4.97	peak
2		2483.000	49.91	-1.28	48.63	54.00	-5.37	AVG
3		2500.000	57.98	-1.21	56.77	74.00	-17.23	peak
4		2500.000	47.73	-1.21	46.52	54.00	-7.48	AVG

#### REMARKS:

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

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

ABOVE 1000 MHz

Note: All the modes have been tested and recorded worst mode in the report.

Modulation Type: 802.11b

Channel 1 / 2412 MHz

Frequency	Ant.Pol. H/V	Peak reading (dBuV)	AV reading (dBuV)	Correction Factor	Emission Level		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
4824.00	H	56.34	51.60	-1.88	54.46	49.72	74	54	-4.28
7236.00	H	41.70	---	7.80	49.50	---	74	54	-24.50
---	H	---	---	---	---	---	---	---	---
4824.00	V	54.34	---	-1.88	52.46	---	74	54	-21.54
7236.00	V	40.58	---	7.80	48.38	---	74	54	-25.62
---	V	---	---	---	---	---	---	---	---

Channel 6 / 2437 MHz

Frequency	Ant.Pol. H/V	Peak reading (dBuV)	AV reading (dBuV)	Correction Factor	Emission Level		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
4874.00	H	57.80	52.93	-1.59	56.21	51.34	74	54	-2.66
7311.00	H	41.62	---	8.10	49.72	---	74	54	-24.28
---	H	---	---	---	---	---	---	---	---
4874.00	V	55.35	---	-1.59	53.76	---	74	54	-20.24
7311.00	V	40.58	---	8.10	48.68	---	74	54	-25.32
---	V	---	---	---	---	---	---	---	---

Channel 11 / 2462 MHz

Frequency	Ant.Pol. H/V	Peak reading (dBuV)	AV reading (dBuV)	Correction Factor	Emission Level		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
4924.00	H	56.73	52.08	-1.30	55.43	50.78	74	54	-3.22
7386.00	H	42.74	---	9.00	51.74	---	74	54	-22.26
---	H	---	---	---	---	---	---	---	---
4924.00	V	54.31	---	-1.30	53.01	---	74	54	-20.99
7386.00	V	41.66	---	9.00	50.66	---	74	54	-23.34
---	V	---	---	---	---	---	---	---	---

Notes:

- 1). Radiated emissions measured in frequency range from 9 KHz~10th harmonic or 26.5GHz (which is less) were made with an instrument using Peak detector mode.
- 2). Data of measurement within this frequency range shown "—" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3). Worst case data at 1Mbps at IEEE 802.11b.
- 4). Measured Level = Reading Level + Factor, Margin = Measured Level – Limit

## 1. DTS Bandwidth

TestMode	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	2412	8.040	2407.960	2416.000	0.5	PASS
	2437	7.560	2433.440	2441.000	0.5	PASS
	2462	8.520	2457.440	2465.960	0.5	PASS
11G	2412	15.160	2404.400	2419.560	0.5	PASS
	2437	16.320	2428.840	2445.160	0.5	PASS
	2462	15.040	2454.520	2469.560	0.5	PASS
11N20SISO	2412	15.080	2404.400	2419.480	0.5	PASS
	2437	17.520	2428.240	2445.760	0.5	PASS
	2462	16.120	2453.600	2469.720	0.5	PASS
11N40SISO	2422	30.72	2408.80	2439.52	0.5	PASS
	2437	30.40	2424.12	2454.52	0.5	PASS
	2452	31.52	2438.00	2469.52	0.5	PASS

# 11B\_Ant1\_2412

Spectrum

Ref Level 30.00 dBm Offset 9.16 dB RBW 100 kHz  
 Alt 40 dB BWI 56.9  $\mu$ s YBW 300 kHz Mode Auto FFT  
 Count 100/100

10% View

20 dBm  
10 dBm  
0 dBm  
-10 dBm  
-20 dBm  
-30 dBm  
-40 dBm  
-50 dBm  
-60 dBm

0.1 -4.000 dBm

M1 M2 D3

2.408000 GHz 2.412000 GHz 2.416000 GHz

CF 2.412 GHz 1001 pts Span 40.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4080 GHz	-4.83 dBm		
M2		1	2.4120 GHz	1.01 dBm		
D3	M1	1	15.36 MHz	0.54 dB		

Wave: 11B\_Ant1\_2412 14100199

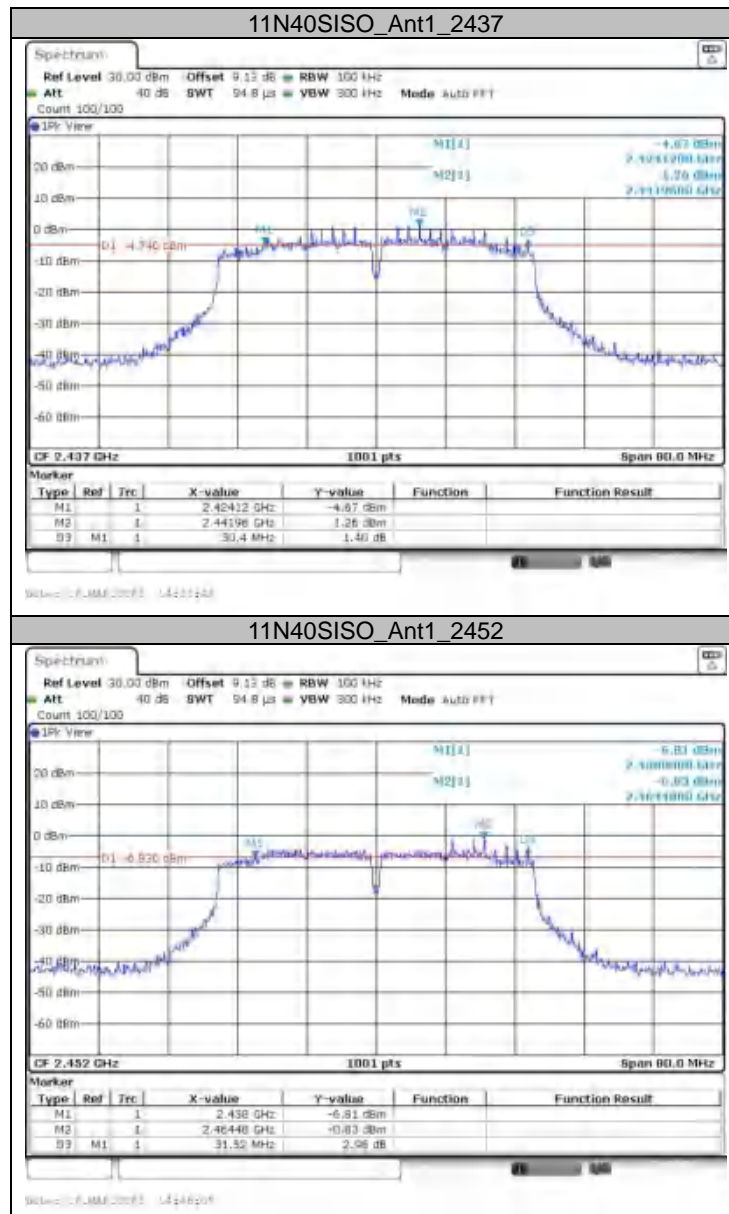












## 2. Occupied Channel Bandwidth

TestMode	Channel Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	2412	16.943	2403.4486	2420.3916	---	---
	2437	13.347	2430.3666	2443.7133	---	---
	2462	13.506	2455.3267	2468.8332	---	---
11G	2412	16.823	2403.5285	2420.3516	---	---
	2437	17.023	2428.5285	2445.5514	---	---
	2462	17.063	2453.6883	2470.7512	---	---
11N20SISO	2412	17.982	2403.0490	2421.0310	---	---
	2437	17.942	2427.9690	2445.9111	---	---
	2462	17.902	2453.0889	2470.9910	---	---
11N40SISO	2422	36.204	2403.9381	2440.1419	---	---
	2437	36.044	2419.0180	2455.0619	---	---
	2452	36.204	2433.8581	2470.0619	---	---

## Test Graphs













## APPENDIX F - MAXIMUM OUTPUT POWER

Test Mode	Frequency[MHz]	Average power [dBm]	Duty Cycle [%]	DC Factor [dBm]	Result [dBm]	Limit [dBm]	Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Verdict
11B	2412	14.14	81.03	0.91	15.05	≤30.00	2.7	17.75	≤36.00	PASS
	2437	15.02	97.93	0.09	15.11	≤30.00	2.7	17.81	≤36.00	PASS
	2462	14.26	100.00	0.00	14.26	≤30.00	2.7	16.96	≤36.00	PASS
11G	2412	14.30	97.62	0.10	14.40	≤30.00	2.7	17.10	≤36.00	PASS
	2437	14.60	97.62	0.10	14.70	≤30.00	2.7	17.40	≤36.00	PASS
	2462	14.16	98.09	0.08	14.24	≤30.00	2.7	16.94	≤36.00	PASS
11N20SISO	2412	14.21	97.44	0.11	14.32	≤30.00	2.7	17.02	≤36.00	PASS
	2437	14.62	97.96	0.09	14.71	≤30.00	2.7	17.41	≤36.00	PASS
	2462	14.21	98.45	0.07	14.28	≤30.00	2.7	16.98	≤36.00	PASS
11N40SISO	2422	12.67	96.91	0.14	12.81	≤30.00	2.7	15.51	≤36.00	PASS
	2437	14.32	95.92	0.18	14.50	≤30.00	2.7	17.20	≤36.00	PASS
	2452	13.00	95.88	0.18	13.18	≤30.00	2.7	15.88	≤36.00	PASS

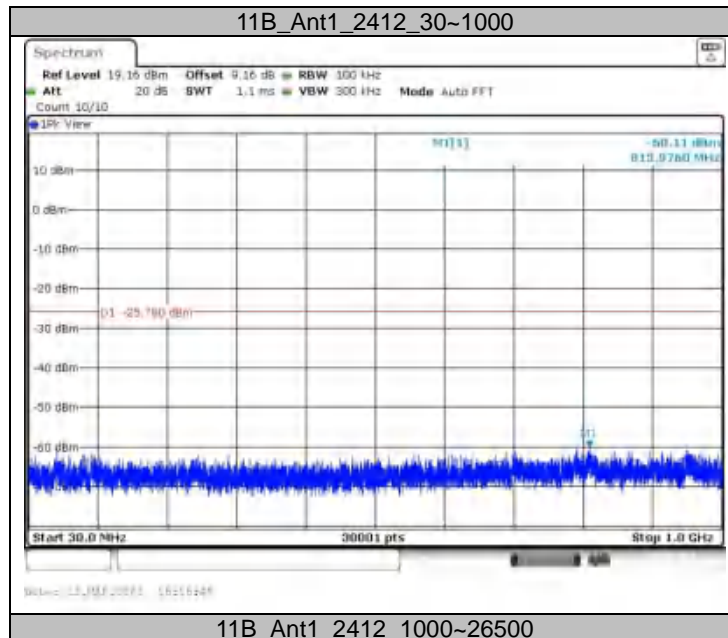


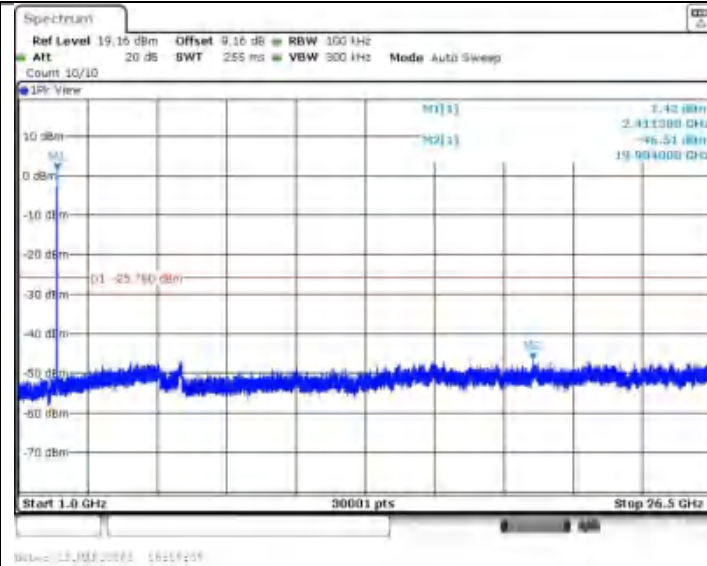
## APPENDIX G - CONDUCTED SPURIOUS EMISSIONS

### 1. Conducted Spurious Emission

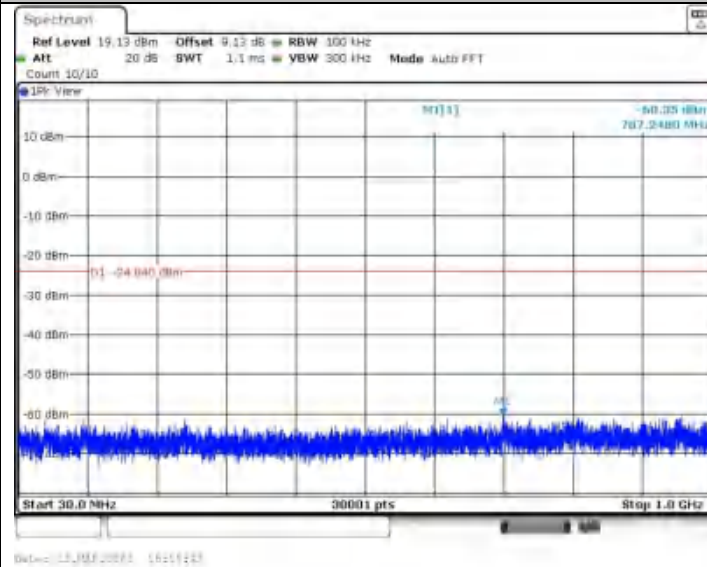
TestMode	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	2412	30~1000	4.22	-60.11	≤-25.78	PASS
		1000~26500	4.22	-46.51	≤-25.78	PASS
	2437	30~1000	5.96	-60.35	≤-24.04	PASS
		1000~26500	5.96	-46.19	≤-24.04	PASS
	2462	30~1000	5.07	-59.64	≤-24.93	PASS
		1000~26500	5.07	-45.17	≤-24.93	PASS
11G	2412	30~1000	4.20	-60.42	≤-25.8	PASS
		1000~26500	4.20	-46.44	≤-25.8	PASS
	2437	30~1000	4.08	-60.7	≤-25.92	PASS
		1000~26500	4.08	-46.3	≤-25.92	PASS
	2462	30~1000	4.10	-60.06	≤-25.9	PASS
		1000~26500	4.10	-45.5	≤-25.9	PASS
11N20SISO	2412	30~1000	3.75	-59.47	≤-26.25	PASS
		1000~26500	3.75	-46.33	≤-26.25	PASS
	2437	30~1000	4.26	-60.41	≤-25.74	PASS
		1000~26500	4.26	-46.3	≤-25.74	PASS
	2462	30~1000	3.63	-60.16	≤-26.37	PASS
		1000~26500	3.63	-46.88	≤-26.37	PASS
11N40SISO	2422	30~1000	-0.76	-60.09	≤-30.76	PASS
		1000~26500	-0.76	-45.88	≤-30.76	PASS
	2437	30~1000	1.26	-59.94	≤-28.74	PASS
		1000~26500	1.26	-46.34	≤-28.74	PASS
	2452	30~1000	-0.44	-59.3	≤-30.44	PASS
		1000~26500	-0.44	-45.94	≤-30.44	PASS

### Test Graphs

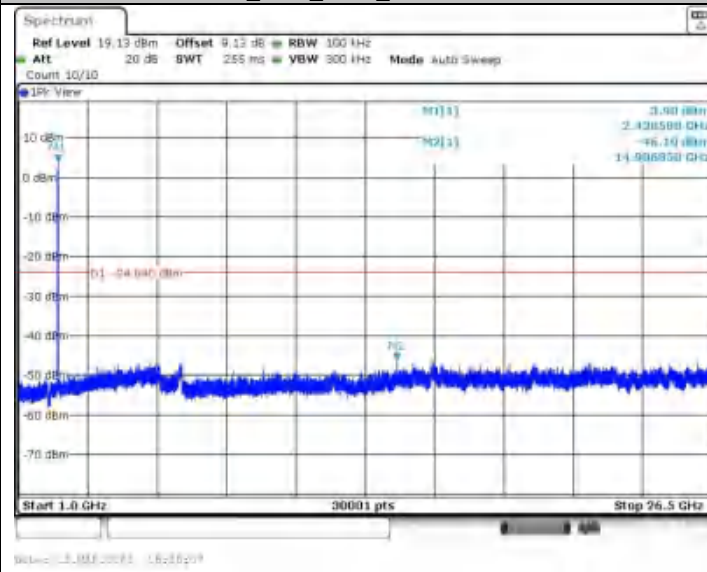


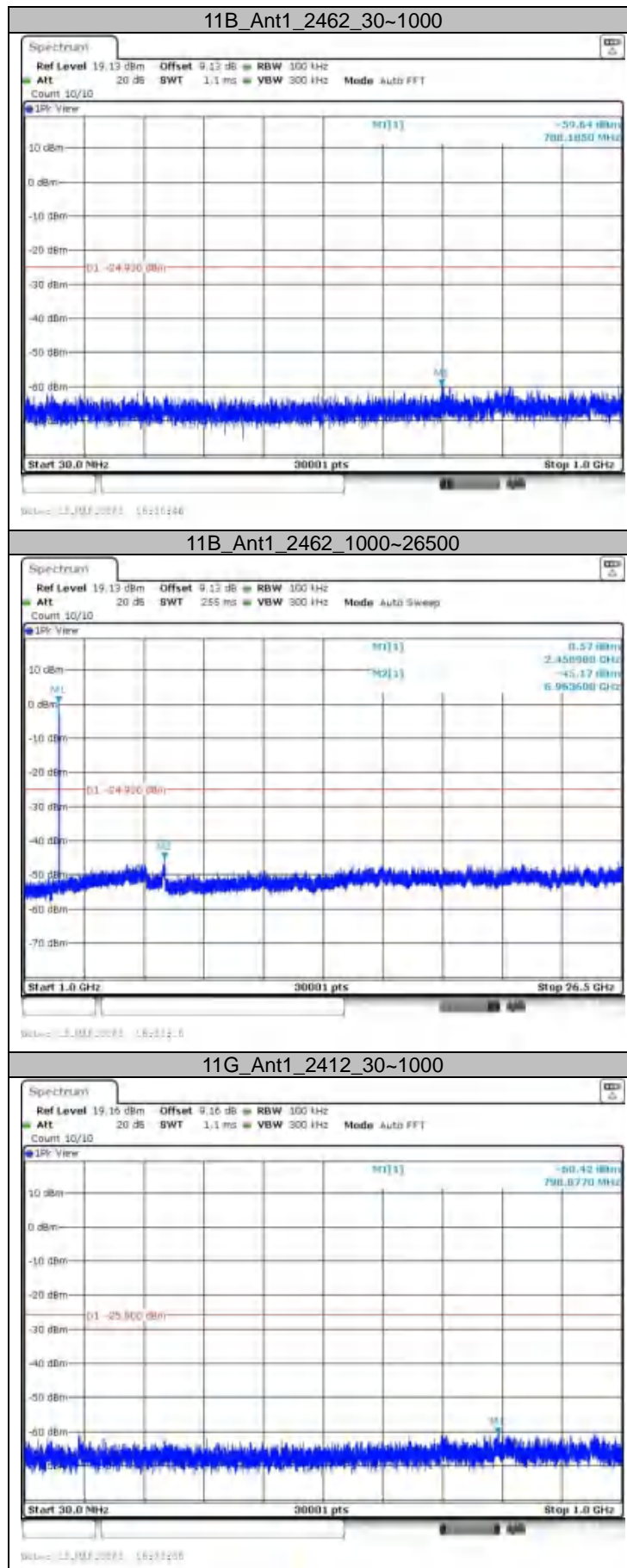


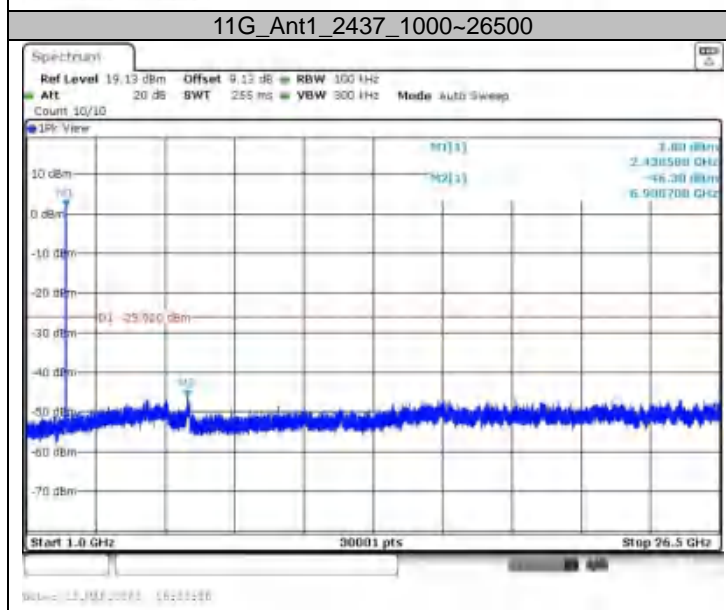
11B\_Ant1\_2437\_30~1000

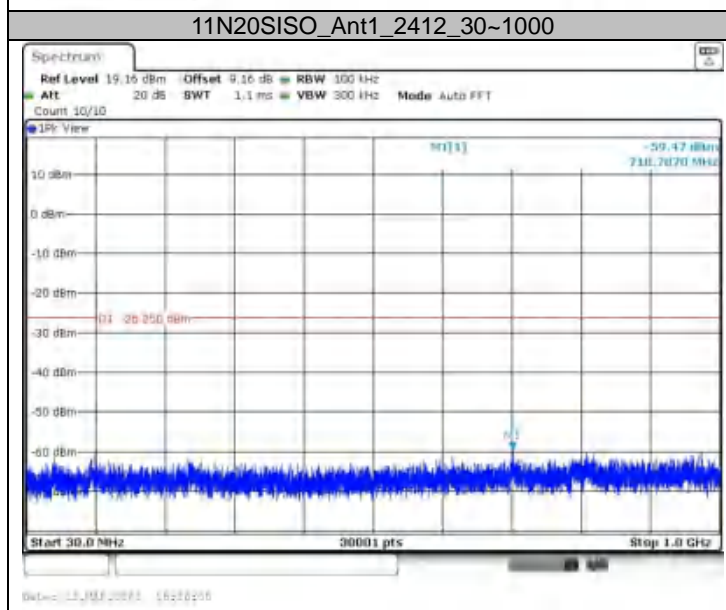
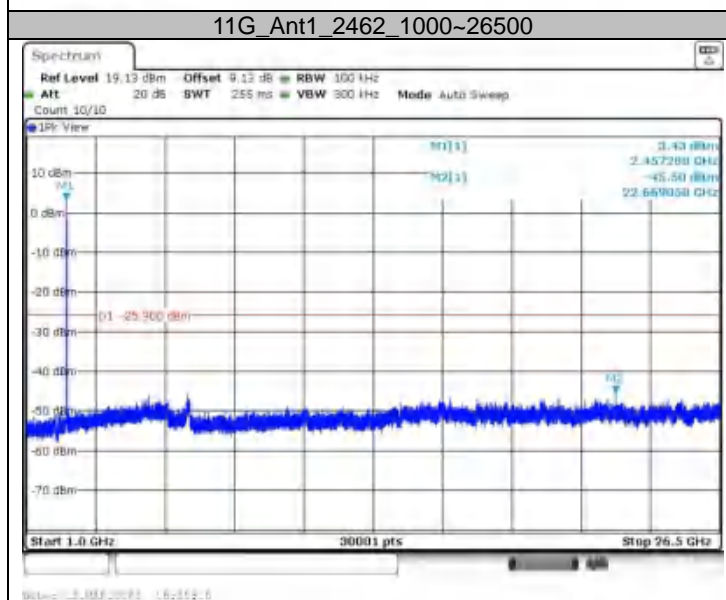
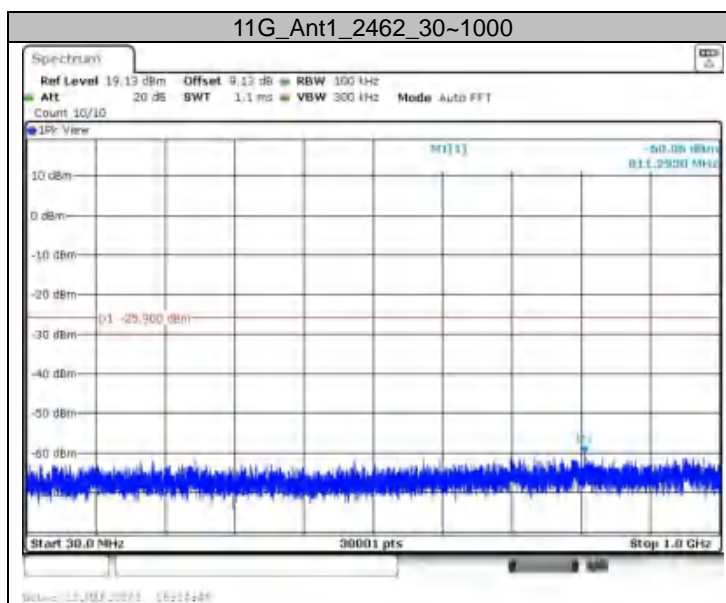


11B\_Ant1\_2437\_1000~26500

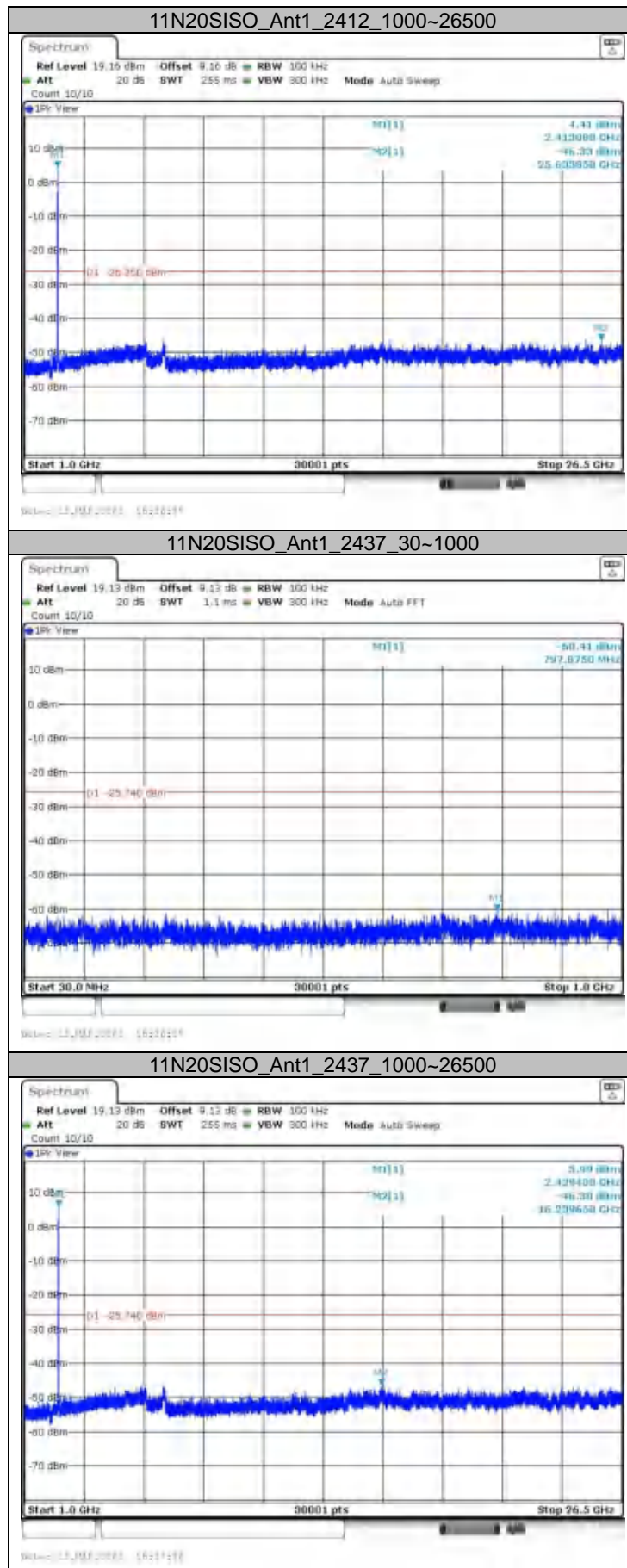


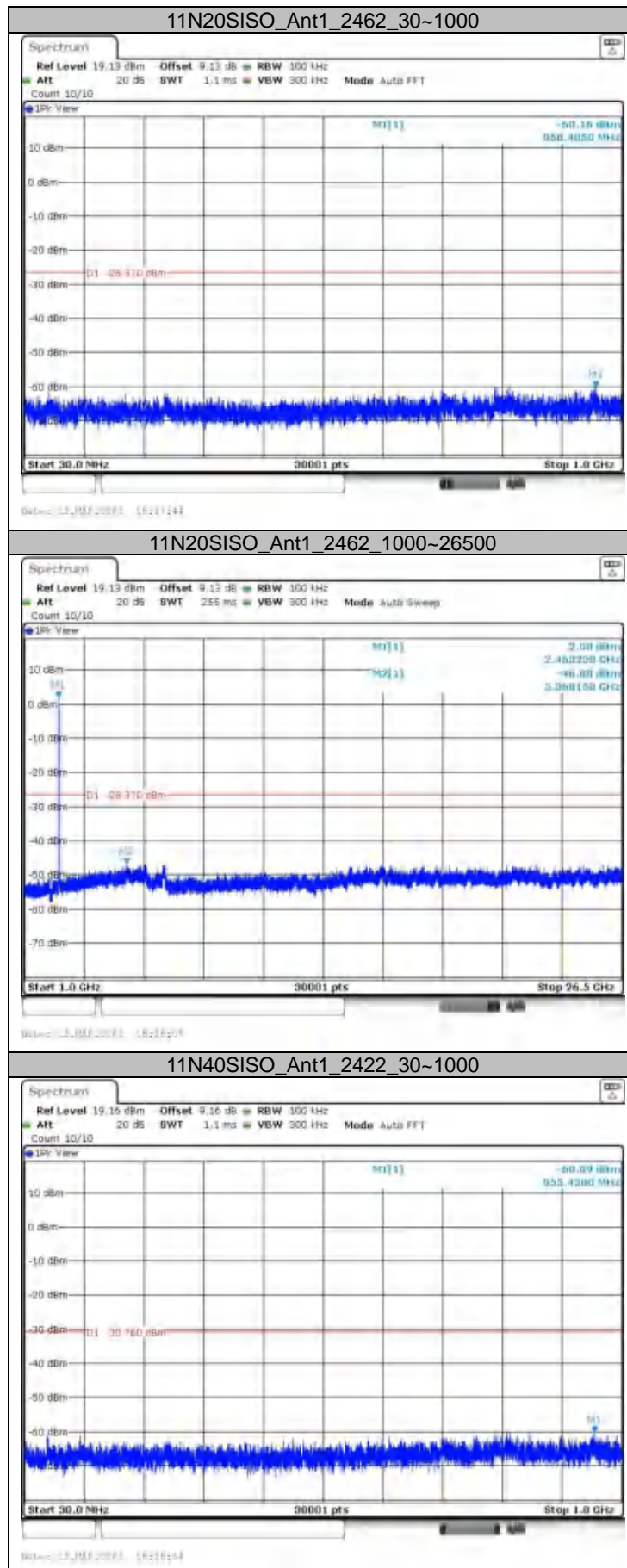


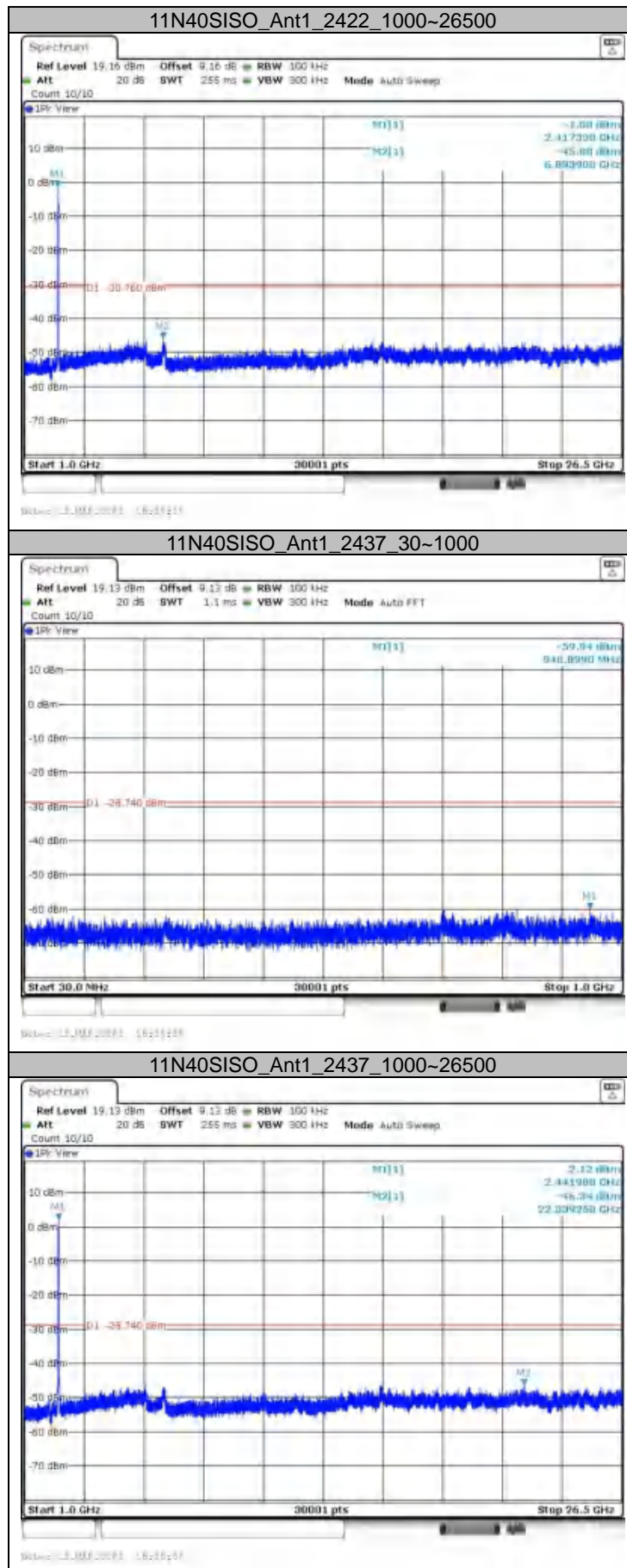




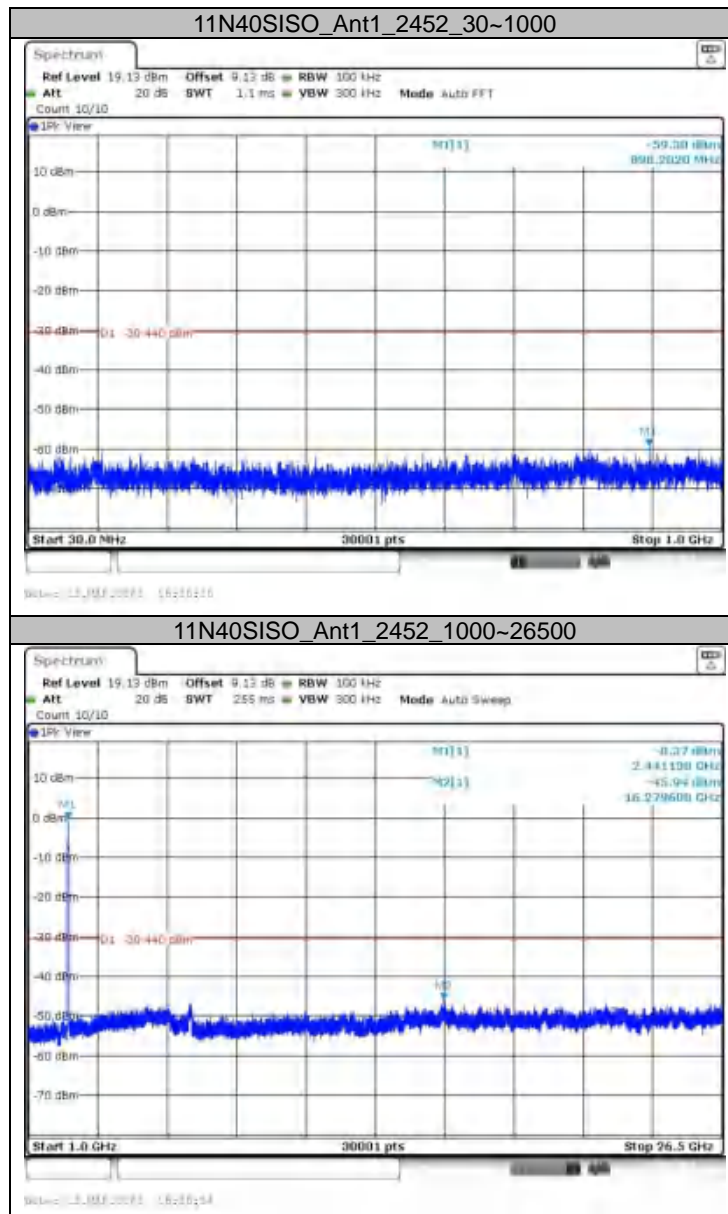




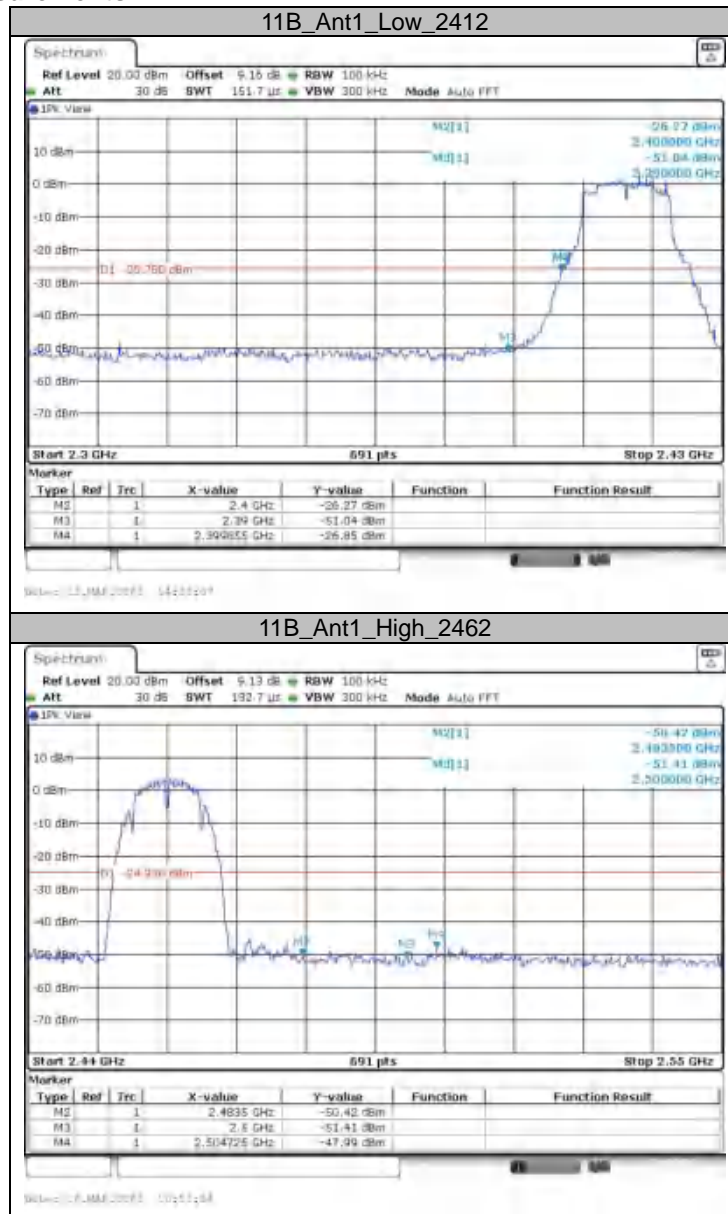


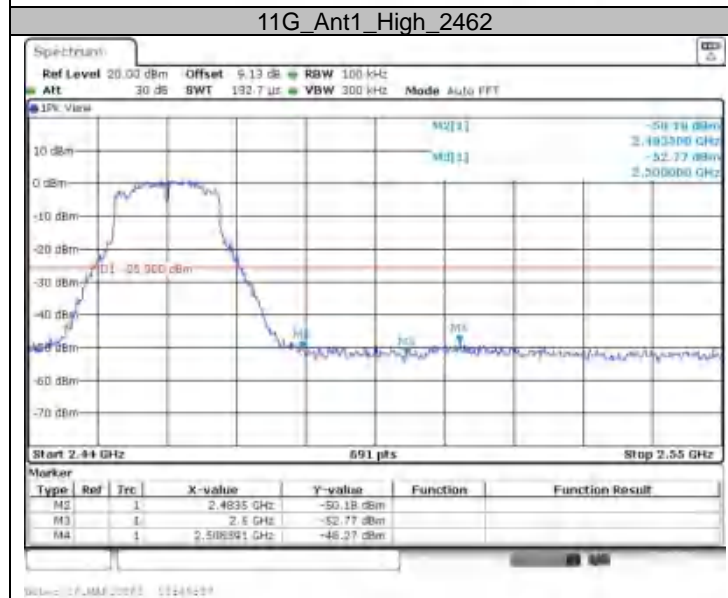


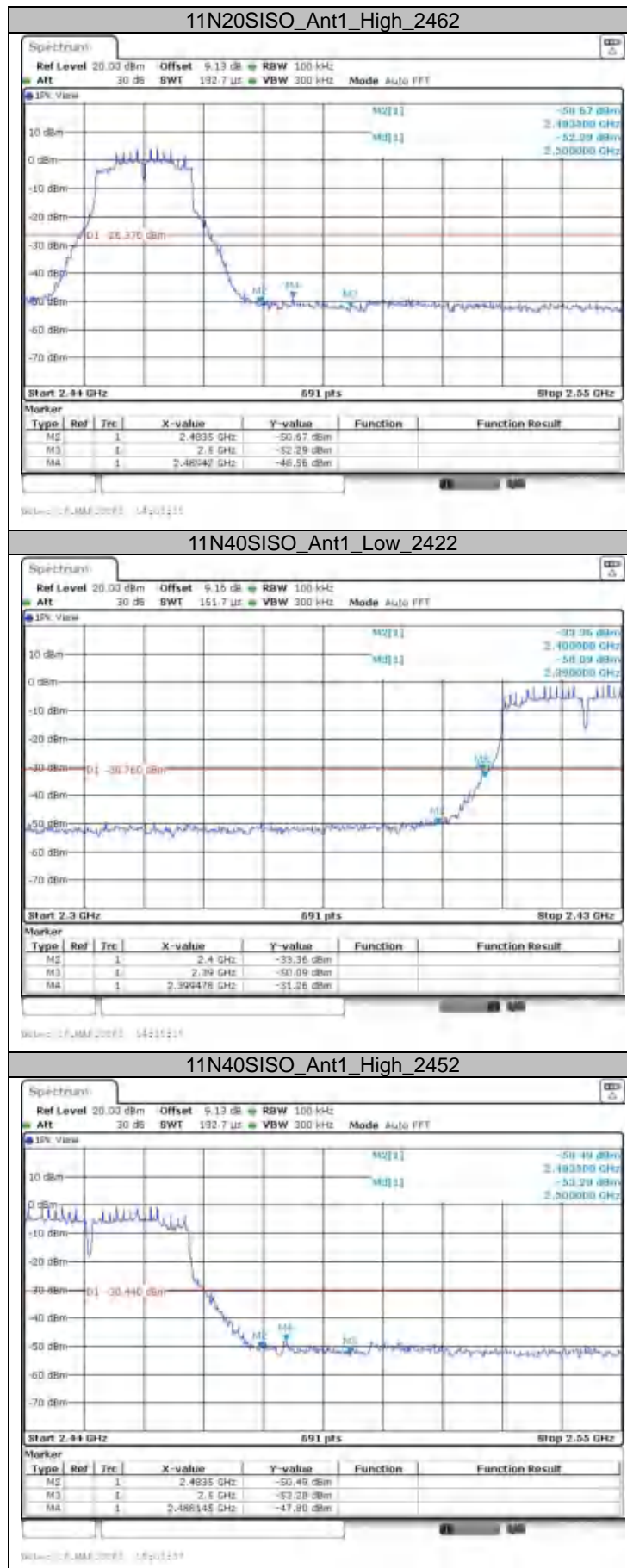




## 2. Band edge measurements



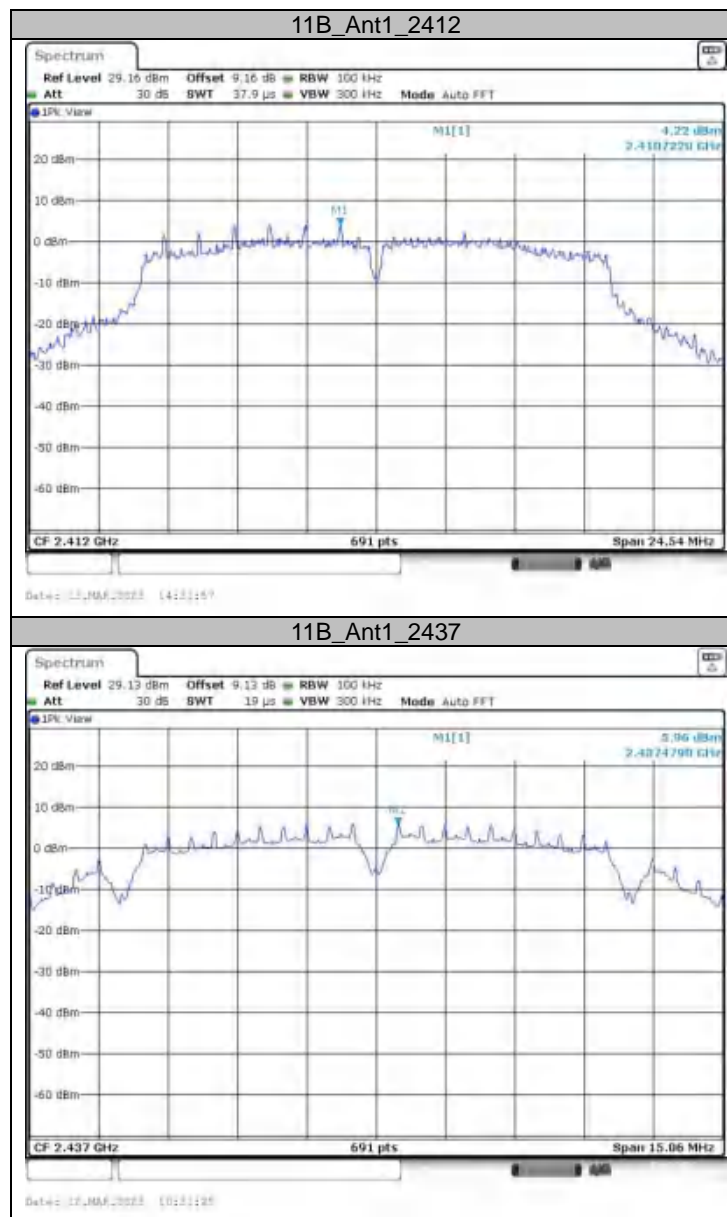


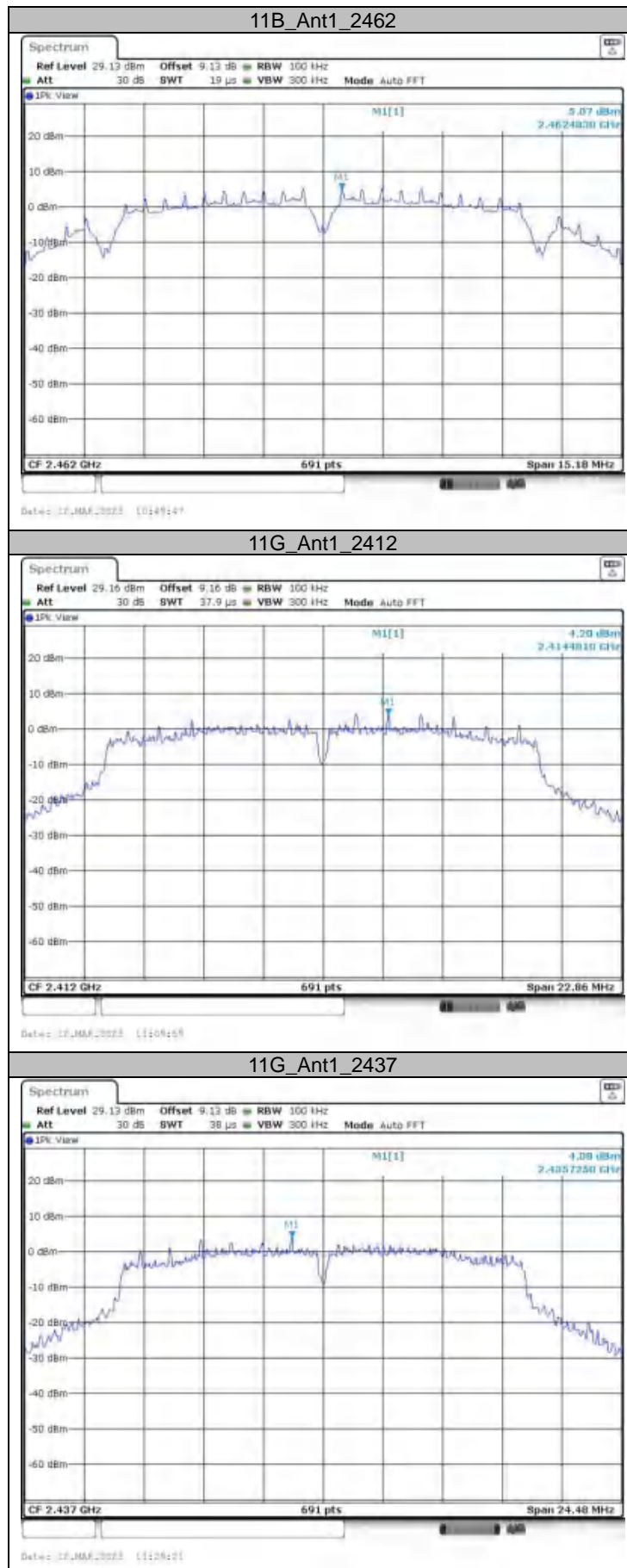


## APPENDIX H - POWER SPECTRAL DENSITY

TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	4.22	≤8.00	PASS
		2437	5.96	≤8.00	PASS
		2462	5.07	≤8.00	PASS
11G	Ant1	2412	4.20	≤8.00	PASS
		2437	4.08	≤8.00	PASS
		2462	4.10	≤8.00	PASS
11N20SISO	Ant1	2412	3.75	≤8.00	PASS
		2437	4.26	≤8.00	PASS
		2462	3.63	≤8.00	PASS

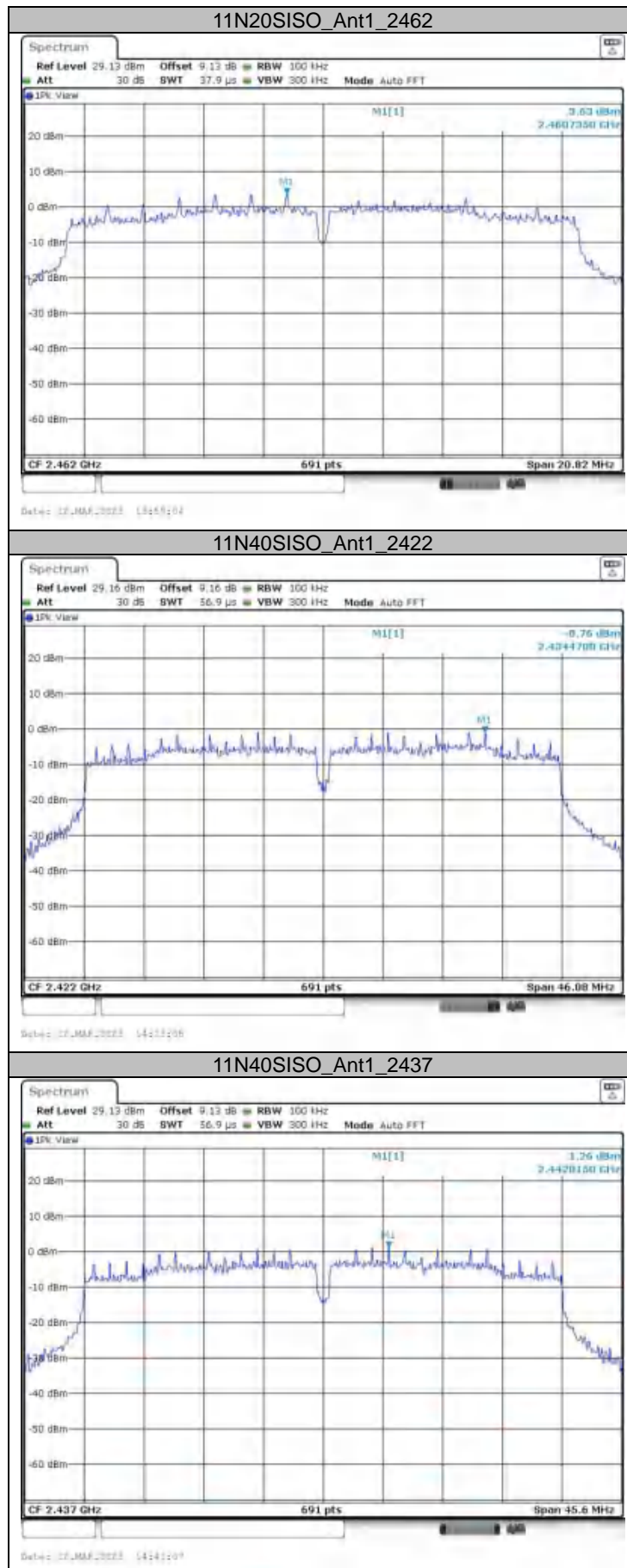
### Test Graphs



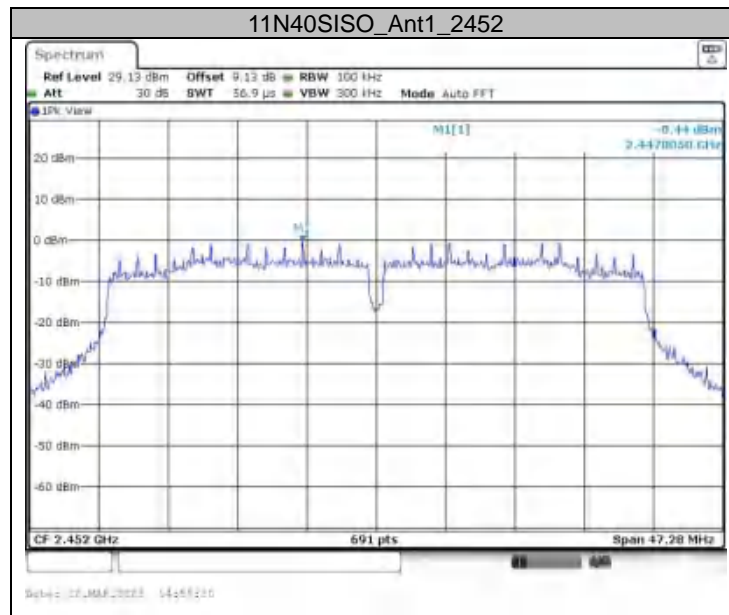












**End of Test Report**