CTC Laboratories, Inc.

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TEST REPORT

Report No. .....:	**CTC20240774E08**
FCC ID.....:	**2APN5-ECAM**
Applicant .....:	**Shenzhen Sonoff Technologies Co.,Ltd.**
Address.....:	3F & 6F, Bldg A, No. 663, Bulong Rd, Shenzhen, Guangdong, China
Manufacturer.....:	Shenzhen Sonoff Technologies Co.,Ltd.
Address.....:	3F & 6F, Bldg A, No. 663, Bulong Rd, Shenzhen, Guangdong, China
Product Name .....:	**Wi-Fi Smart Security Camera**
Trade Mark .....:	SONOFF, Sonoff
Model/Type reference.....:	E-CAM
Listed Model(s).....:	/
Standard .....:	**FCC CFR Title 47 Part 15 Subpart C Section 15.247**
Date of receipt of test sample.....:	Mar. 15, 2024
Date of testing.....:	Mar. 15, 2024 to May 9, 2024
Date of issue.....:	Jul. 17, 2024
Result.....:	**PASS**

Compiled by: (Printed name+signature)	Jim Jiang	Jim Jiang
Supervised by: (Printed name+signature)	Eric Zhang	Eric Zhang
Approved by: (Printed name+signature)	Totti Zhao	Totti Zhao

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1. TEST SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Operation within the bands 902–928MHz, 2400–2483.5MHz, and 5725–5850MHz.
RSS-247 Issue 3: Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices.
RSS-Gen Issue 5: General Requirements for Compliance of Radio Apparatus.
ANSI C63.10-2013: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

1.2. Report Version

Revised No.	Report No.	Date of issue	Description
01	CTC20240774E08	Jul. 17, 2024	Original

1.3. Test Description

FCC Part 15 Subpart C (15.247) / RSS-247 Issue 3				
Test Item	Standard Section		Result	Test Engineer
	FCC	IC		
Antenna Requirement	15.203	RSS-Gen 6.8	Pass	Jim Jiang
Conducted Emission	15.207	RSS-Gen 8.8	Pass	Seth Chen
Conducted Band Edge and Spurious Emissions	15.247(d)	RSS-247 5.5	Pass	Jim Jiang
Radiated Band Edge and Spurious Emissions	15.205&15.209& 15.247(d)	RSS-247 5.5	Pass	Jim Jiang
6dB Bandwidth	15.247(a)(2)	RSS-247 5.2 (a)	Pass	Jim Jiang
Conducted Max Output Power	15.247(b)(3)	RSS-247 5.4 (d)	Pass	Jim Jiang
Power Spectral Density	15.247(e)	RSS-247 5.2 (b)	Pass	Jim Jiang
Transmitter Radiated Spurious	15.209&15.247(d)	RSS-247 5.5& RSS-Gen 8.9	Pass	Jim Jiang

Note:
1. The measurement uncertainty is not included in the test result.
2. N/A: means this test item is not applicable for this device according to the technology characteristic of device.

1.4. Test Facility

Address of the report laboratory

CTC Laboratories, Inc.

Add: Room 101 Building B, Room 107, 108, 207, 208, 303 Building A, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China (formerly 2/F., Building 1 and 1-2/F., Building 2, Jiaquan Building, High-Tech Park, Guanlan Sub-District, Longhua New District, Shenzhen, Guangdong, China)

Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

A2LA-Lab Cert. No.: 4340.01

CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

Industry Canada (Registration No.: 9783A, CAB Identifier: CN0029)

CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

FCC (Registration No.: 951311, Designation Number CN1208)

CTC Laboratories, Inc. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 951311, Aug 26, 2017.

1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 “Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1” and TR-100028-02 “Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2” and is documented in the CTC Laboratories, Inc. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Below is the best measurement capability for CTC Laboratories, Inc.

Test Items	Measurement Uncertainty	Notes
DTS Bandwidth	±0.0196%	(1)
Maximum Conducted Output Power	±0.686 dB	(1)
Maximum Power Spectral Density Level	±0.743 dB	(1)
Band-edge Compliance	±1.328 dB	(1)
Unwanted Emissions In Non-restricted Freq Bands	9kHz-1GHz: ±0.746dB 1GHz-26GHz: ±1.328dB	(1)
Conducted Emissions 9kHz~30MHz	±3.08 dB	(1)
Radiated Emissions 30~1000MHz	±4.51 dB	(1)
Radiated Emissions 1~18GHz	±5.84 dB	(1)
Radiated Emissions 18~40GHz	±6.12 dB	(1)

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.6. Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15 °C to 35 °C
Relative Humidity:	20 % to 75 %
Air Pressure:	101 kPa

2. GENERAL INFORMATION

2.1. Client Information

Applicant:	Shenzhen Sonoff Technologies Co.,Ltd.
Address:	3F & 6F, Bldg A, No. 663, Bulong Rd, Shenzhen, Guangdong, China
Manufacturer:	Shenzhen Sonoff Technologies Co.,Ltd.
Address:	3F & 6F, Bldg A, No. 663, Bulong Rd, Shenzhen, Guangdong, China

2.2. General Description of EUT

Product Name:	Wi-Fi Smart Security Camera
Trade Mark:	SONOFF, Sonoff
Model/Type reference:	E-CAM
Listed Model(s):	/
Model Difference:	/
Power Supply:	Input: 5V⎓2A
Hardware Version:	V04
Software Version:	V1.6.8
2.4G WiFi	
Modulation:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/ n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
Operation Frequency:	802.11b/ g/ n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz
Channel Number:	802.11b/ g/ n(HT20): 11 channels 802.11n(HT40): 7 channels
Channel Separation:	5MHz
Antenna 1&2 type:	FPC Antenna
Antenna 1 gain:	3.98dBi
Antenna 2 gain:	3.47dBi
Directional Gain:	6.74dBi

2.3. Accessory Equipment Information

Equipment Information			
Name	Model	S/N	Manufacturer
Notebook	ThinkPad T460s	/	Lenovo
Cable Information			
Name	Shielded Type	Ferrite Core	Length
USB Cable	Unshielded	NO	100cm
Test Software Information			
Name	Version	/	/
adb tool	/	/	/

2.4. Operation State

Operation Frequency List: The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

Operation Frequency List:

Channel	Frequency (MHz)
01	2412
02	2417
03	2422
04	2427
05	2432
06	2437
07	2442
08	2447
09	2452
10	2457
11	2462

Note: CH 01~CH 11 for 802.11b/g/n(HT20), CH 03~CH 09 for 802.11n(HT40).

Data Rated:

Preliminary tests were performed in different data rate, and found which the below bit rate is worst case mode, so only show data which it is a worst case mode.

Test Mode	Data Rate (worst mode)
802.11b	1Mbps
802.11g	6Mbps
802.11n(HT20)/(HT40)	HT-MCS0

Test Mode:

For RF test items:
The engineering test program was provided and enabled to make EUT continuous transmit.
For AC power line conducted emissions:
The EUT was set to connect with the WLAN AP under large package sizes transmission.
For Radiated spurious emissions test item:
The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

The worse case configurations:

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band		
Test Software	adb tool	
Modulation Mode	Test Channel	TX Power
802.11b	01	54
	06	54
	11	54
802.11g	01	54
	06	54
	11	54
802.11n(HT20)	01	46
	06	46
	11	46
802.11n(HT40)	03	46
	06	46
	09	46

2.5. Measurement Instruments List

Tonscend RF Test System					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Spectrum Analyzer	R&S	FSV40-N	101331	Mar. 21, 2025
2	Spectrum Analyzer	R&S	FSV40-N	101654	Aug. 07, 2024
3	Spectrum Analyzer	R&S	FSU26	100105	Dec. 12, 2024
4	MXA Signal Analyzer	Keysight	N9020A	MY46471737	Dec. 12, 2024
5	MXA Signal Analyzer	Keysight	N9020A	MY52091402	Aug. 22, 2024
6	MXG Vector Signal Generator	Agilent	N5182A	MY47420864	Dec. 12, 2024
7	PSG Analog Signal Generator	Agilent	E8257D	MY46521908	Dec. 12, 2024
8	EXG Analog Signal Generator	Keysight	N5173B	MY59100842	Dec. 12, 2024
9	MXG Vector Signal Generator	Keysight	N5182B	MY59100212	Dec. 12, 2024
10	USB Wideband Power Sensor	Keysight	U2021XA	MY55130004	Mar. 21, 2025
11	USB Wideband Power Sensor	Keysight	U2021XA	MY55130006	Mar. 21, 2025
12	Wideband Radio Communication Tester	R&S	CMW500	102257	May 25, 2024
13	Wideband Radio Communication Tester	R&S	CMW500	102414	Dec. 12, 2024
14	RF Control Unit	Tonscend	JS0806-2	/	Aug. 22, 2024
15	High and low temperature test chamber	ESPEC	MT3035	/	Mar. 21, 2025

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9163	01026	Dec. 18, 2024
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-647	Sep. 25, 2025
3	Test Receiver	Keysight	N9038A	MY56400071	Dec. 12, 2024
4	Broadband Amplifier	SCHWARZBECK	BBV9743B	259	Dec. 12, 2024
5	Mirowave Broadband Amplifier	SCHWARZBECK	BBV9718C	111	Dec. 12, 2024
6	3m chamber 3	YIHENG	EE106	/	Aug. 28, 2026
7	Test Software	FARA	EZ-EMC	FA-03A2	/

Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	LISN	R&S	ENV216	101112	Dec. 12, 2024
2	LISN	R&S	ENV216	101113	Dec. 12, 2024
3	EMI Test Receiver	R&S	ESCS30	100353	Dec. 12, 2024
4	ISN CAT6	Schwarzbeck	NTFM 8158	CAT6-8158-0046	Dec. 12, 2024
5	ISN CAT5	Schwarzbeck	NTFM 8158	CAT5-8158-0046	Dec. 12, 2024
6	Test Software	R&S	EMC32	6.10.10	/

Note: 1. The Cal. Interval was one year.

2. The Cal. Interval was three years of the antenna.

3. The cable loss has been calculated in test result which connection between each test instruments.

3. TEST ITEM AND RESULTS

3.1. Conducted Emission

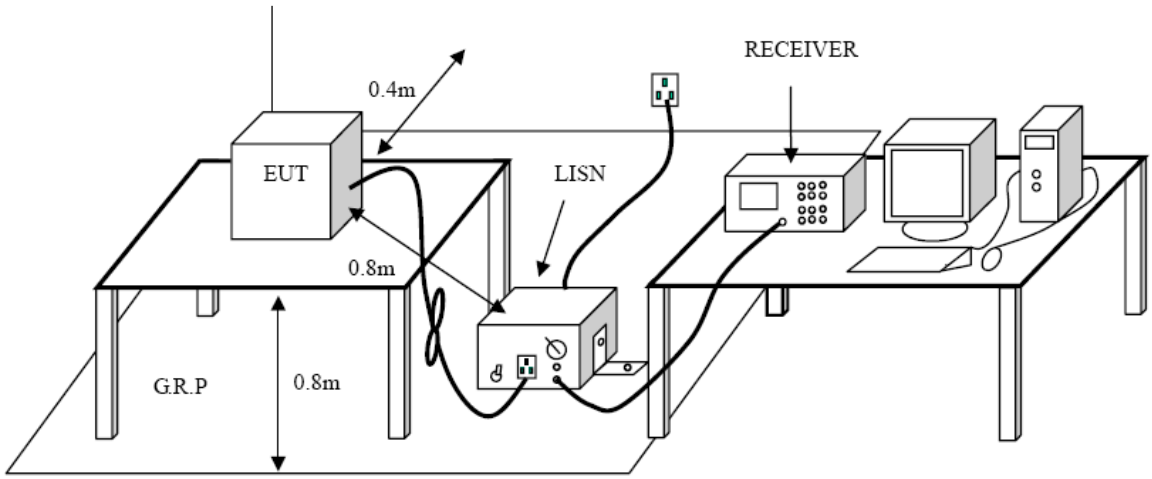
Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.207 / RSS-Gen 8.8

Frequency (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50

* Decreases with the logarithm of the frequency.

Test Configuration



Test Procedure

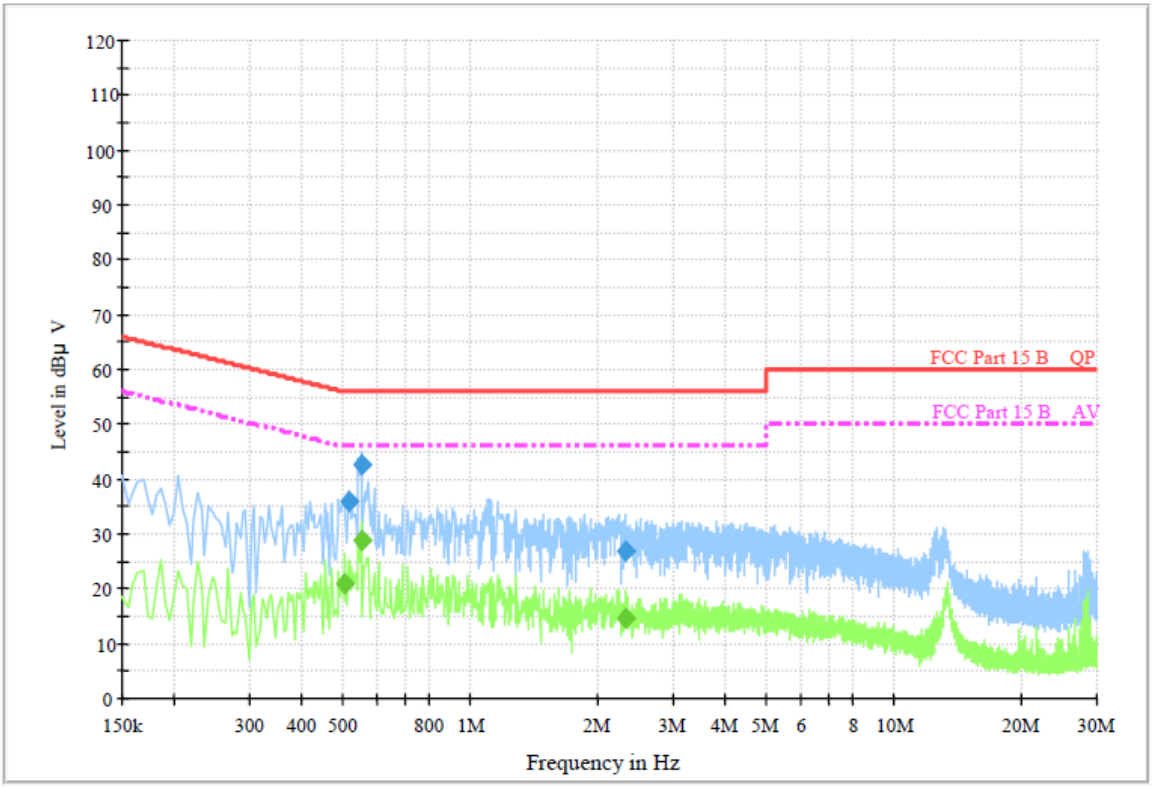
1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm / 50 μH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

Test Mode

Please refer to the clause 2.4.

Test Result

Test Voltage:	AC 120V/60Hz
Terminal:	Line
Remark:	Only worse case is reported



Final Measurement Detector 1

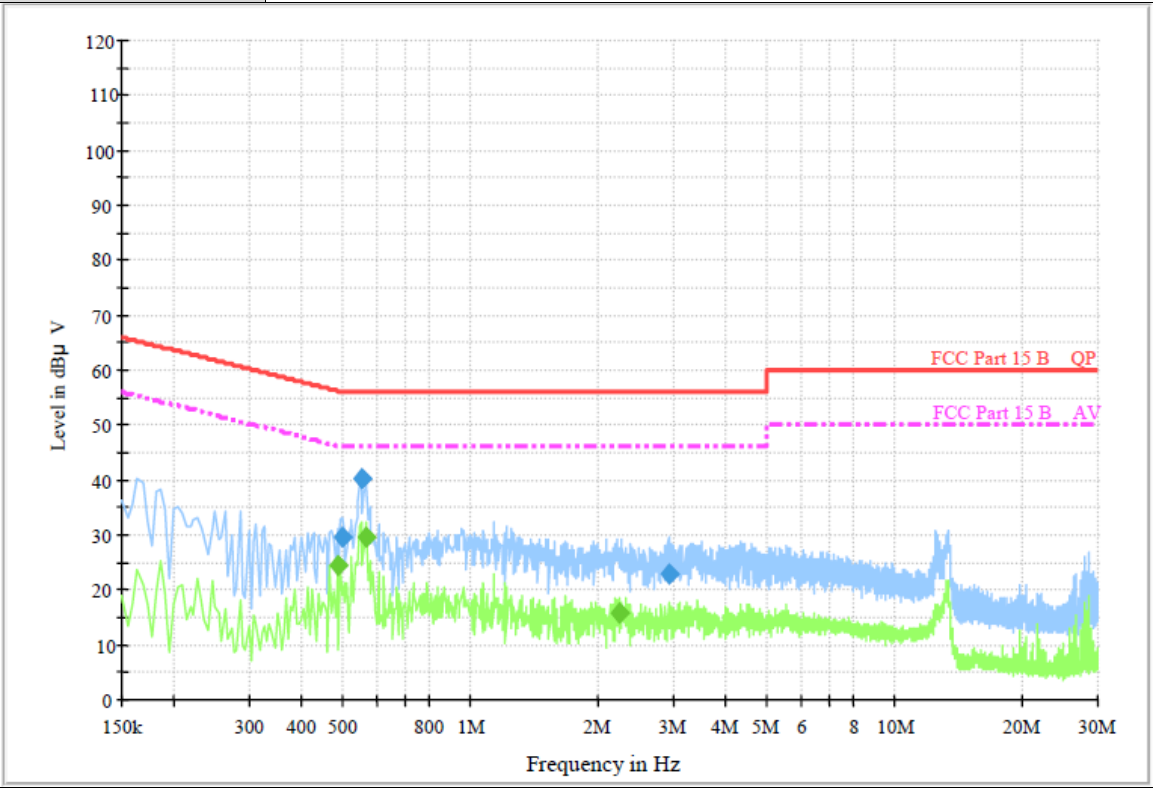
Frequency (MHz)	QuasiPeak (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.514500	35.9	1000.00	9.000	On	L1	9.5	20.1	56.0	
0.550500	42.8	1000.00	9.000	On	L1	9.5	13.2	56.0	
2.323500	26.7	1000.00	9.000	On	L1	9.5	29.3	56.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.505500	20.8	1000.00	9.000	On	L1	9.5	25.2	46.0	
0.550500	28.7	1000.00	9.000	On	L1	9.5	17.3	46.0	
2.323500	14.8	1000.00	9.000	On	L1	9.5	31.2	46.0	

Emission Level = Read Level + Correct Factor

Test Voltage:	AC 120V/60Hz
Terminal:	Neutral
Remark:	Only worse case is reported



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.496500	29.7	1000.00	9.000	On	N	9.4	26.4	56.1	
0.550500	40.4	1000.00	9.000	On	N	9.4	15.6	56.0	
2.917500	22.9	1000.00	9.000	On	N	9.4	33.1	56.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.483000	24.5	1000.00	9.000	On	N	9.4	21.8	46.3	
0.564000	29.7	1000.00	9.000	On	N	9.4	16.3	46.0	
2.242500	16.0	1000.00	9.000	On	N	9.4	30.0	46.0	

Emission Level = Read Level + Correct Factor

3.2. Radiated Emission

Limit

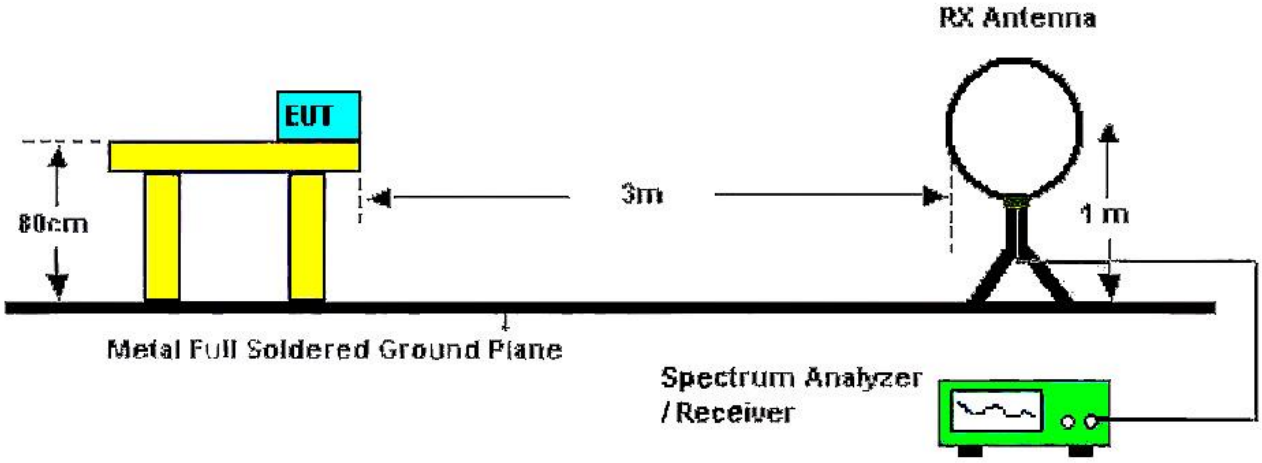
FCC CFR Title 47 Part 15 Subpart C Section 15.209 / RSS-Gen 8.9

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F (kHz)	300
0.490~1.705	24000/F (kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

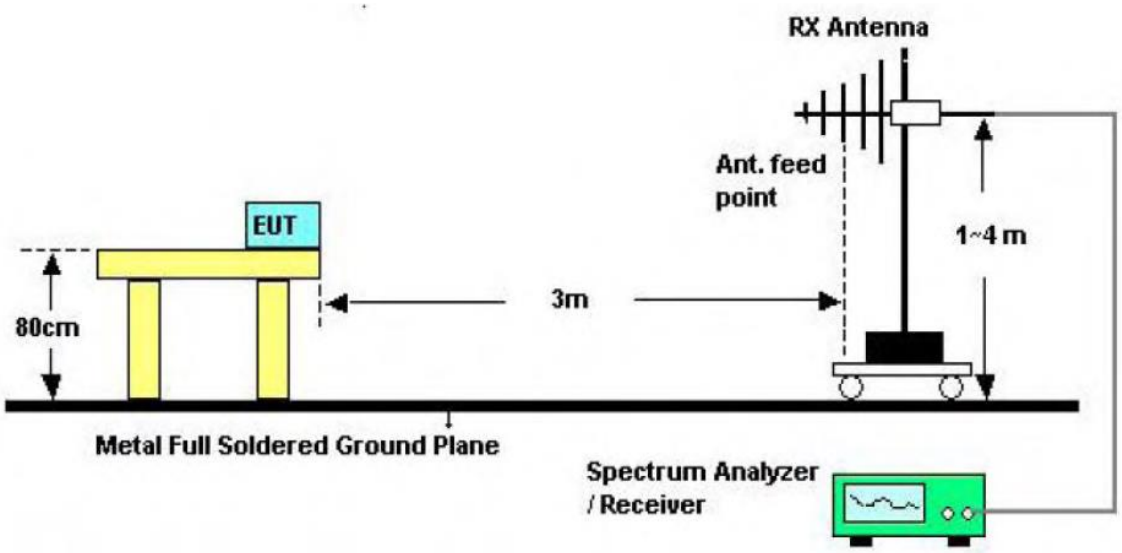
Frequency Range (MHz)	dBμV/m (at 3 meters)	
	Peak	Average
Above 1000	74	54

Note:
(1) The tighter limit applies at the band edges.
(2) Emission Level (dBμV/m)=20log Emission Level (μV/m).

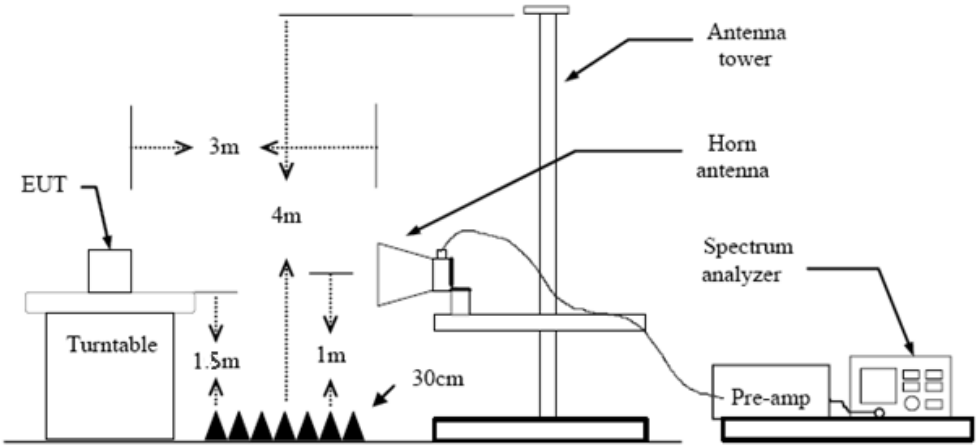
Test Configuration



Below 30MHz Test Setup



30-1000MHz Test Setup



Above 1GHz Test Setup

Test Procedure

1. The EUT was setup and tested according to ANSI C63.10:2013.
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings

(1) Span shall wide enough to fully capture the emission being measured;

(2) 9k – 150kHz:
RBW=300 Hz, VBW=1 kHz, Sweep=auto, Detector function=peak, Trace=max hold
(3) 0.15M – 30MHz:
RBW=10 kHz, VBW=30 kHz, Sweep=auto, Detector function=peak, Trace=max hold
(4) 30M - 1 GHz:
RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold
If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
(5) From 1 GHz to 10th harmonic:
RBW=1MHz, VBW=3MHz Peak detector for Peak value.
RBW=1MHz, VBW see note 1 with Peak Detector for Average Value.
Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.8 Duty Cycle.

Test Mode

Please refer to the clause 2.4.

Test Result

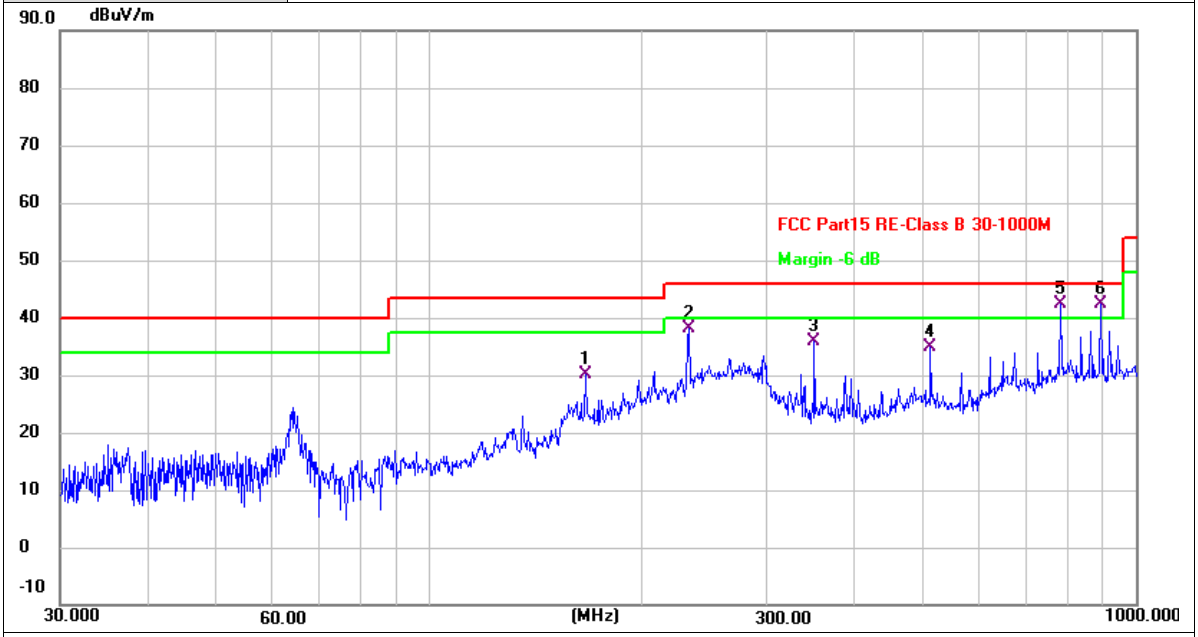
9 kHz~30 MHz

From 9 kHz to 30 MHz: The conclusion is PASS.

Note:
1. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
2. Pre-scan all antenna, only show the test data for worse case antenna on the test report.

30MHz-1GHz

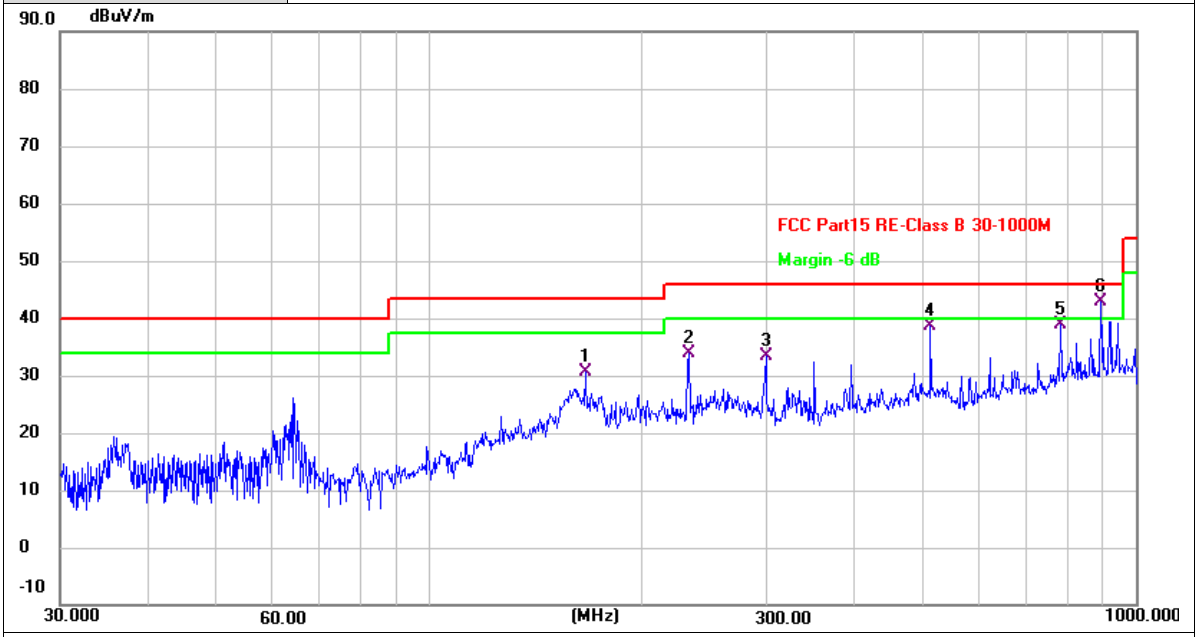
Ant. No.	Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11b Mode 2412MHz
Remark:	Only worse case is reported.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	166.0680	50.53	-20.48	30.05	43.50	-13.45	QP
2	233.3486	54.77	-16.72	38.05	46.00	-7.95	QP
3	350.4767	49.14	-13.34	35.80	46.00	-10.20	QP
4	511.8351	45.14	-10.28	34.86	46.00	-11.14	QP
5 !	782.3452	47.97	-5.59	42.38	46.00	-3.62	QP
6 *	890.7277	46.57	-4.15	42.42	46.00	-3.58	QP

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11b Mode 2412MHz
Remark:	Only worse case is reported.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	166.0680	51.01	-20.48	30.53	43.50	-12.97	QP
2	233.3487	50.72	-16.72	34.00	46.00	-12.00	QP
3	299.3158	48.47	-15.08	33.39	46.00	-12.61	QP
4	511.8352	48.93	-10.28	38.65	46.00	-7.35	QP
5	782.3453	44.47	-5.59	38.88	46.00	-7.12	QP
6 *	891.0367	47.04	-4.15	42.89	46.00	-3.11	QP

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Above 1GHz

Ant. No.	Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11b Mode 2412MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4736.500	42.11	1.86	43.97	74.00	-30.03	peak
2	6624.333	38.99	7.62	46.61	74.00	-27.39	peak
3	8104.833	39.28	10.60	49.88	74.00	-24.12	peak
4	9193.667	39.47	12.34	51.81	74.00	-22.19	peak
5	11324.333	38.53	14.82	53.35	74.00	-20.65	peak
6 *	12750.000	37.21	16.44	53.65	74.00	-20.35	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11b Mode 2412MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1501.333	51.16	-6.88	44.28	74.00	-29.72	peak
2	6365.833	40.50	6.93	47.43	74.00	-26.57	peak
3	8014.750	39.02	10.83	49.85	74.00	-24.15	peak
4	9769.417	39.37	12.89	52.26	74.00	-21.74	peak
5 *	11316.500	38.85	14.82	53.67	74.00	-20.33	peak
6	12397.500	38.02	15.50	53.52	74.00	-20.48	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11b Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1501.333	50.07	-6.88	43.19	74.00	-30.81	peak
2	3933.583	41.02	0.28	41.30	74.00	-32.70	peak
3	7160.917	39.53	9.81	49.34	74.00	-24.66	peak
4	9369.917	39.51	12.52	52.03	74.00	-21.97	peak
5	11175.500	38.42	14.75	53.17	74.00	-20.83	peak
6 *	12233.000	38.08	15.69	53.77	74.00	-20.23	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11b Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1497.417	49.28	-6.88	42.40	74.00	-31.60	peak
2	7235.333	40.79	10.03	50.82	74.00	-23.18	peak
3	7983.417	39.83	10.83	50.66	74.00	-23.34	peak
4	9918.250	39.30	13.08	52.38	74.00	-21.62	peak
5 *	10936.583	38.85	14.61	53.46	74.00	-20.54	peak
6	12526.750	37.60	15.85	53.45	74.00	-20.55	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11b Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1493.500	51.64	-6.88	44.76	74.00	-29.24	peak
2	4897.083	41.58	2.12	43.70	74.00	-30.30	peak
3	8433.833	40.84	10.61	51.45	74.00	-22.55	peak
4	9620.583	40.10	12.63	52.73	74.00	-21.27	peak
5	10858.250	38.50	14.52	53.02	74.00	-20.98	peak
6 *	12076.333	38.17	15.55	53.72	74.00	-20.28	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11b Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1199.750	50.45	-7.71	42.74	74.00	-31.26	peak
2	4215.583	41.26	0.76	42.02	74.00	-31.98	peak
3	7235.333	38.77	10.03	48.80	74.00	-25.20	peak
4	9174.083	38.76	12.28	51.04	74.00	-22.96	peak
5	10956.167	38.84	14.62	53.46	74.00	-20.54	peak
6 *	12193.833	37.78	15.71	53.49	74.00	-20.51	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11g Mode 2412MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4008.000	41.23	0.55	41.78	74.00	-32.22	peak
2	5821.417	40.03	5.00	45.03	74.00	-28.97	peak
3	8617.917	40.52	11.05	51.57	74.00	-22.43	peak
4	9659.750	40.10	12.70	52.80	74.00	-21.20	peak
5	10917.000	38.85	14.58	53.43	74.00	-20.57	peak
6 *	12021.500	38.25	15.48	53.73	74.00	-20.27	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11g Mode 2412MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1497.417	51.02	-6.88	44.14	74.00	-29.86	peak
2	5159.500	40.90	2.76	43.66	74.00	-30.34	peak
3	6428.500	39.98	7.14	47.12	74.00	-26.88	peak
4	7862.000	38.79	10.56	49.35	74.00	-24.65	peak
5	10909.167	38.80	14.57	53.37	74.00	-20.63	peak
6 *	12374.000	38.00	15.52	53.52	74.00	-20.48	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11g Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1497.417	48.01	-6.88	41.13	74.00	-32.87	peak
2	3910.083	41.55	0.18	41.73	74.00	-32.27	peak
3	7172.667	39.46	9.87	49.33	74.00	-24.67	peak
4	8582.667	40.39	10.98	51.37	74.00	-22.63	peak
5	9863.417	38.73	13.01	51.74	74.00	-22.26	peak
6 *	12170.333	37.79	15.68	53.47	74.00	-20.53	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11g Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1195.833	54.31	-7.73	46.58	74.00	-27.42	peak
2	5163.417	40.59	2.76	43.35	74.00	-30.65	peak
3	7160.917	39.92	9.81	49.73	74.00	-24.27	peak
4	9722.417	39.54	12.81	52.35	74.00	-21.65	peak
5 *	10850.417	39.00	14.52	53.52	74.00	-20.48	peak
6	12440.583	37.87	15.61	53.48	74.00	-20.52	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11g Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1493.500	50.81	-6.88	43.93	74.00	-30.07	peak
2	6416.750	39.71	7.11	46.82	74.00	-27.18	peak
3	7803.250	38.43	10.43	48.86	74.00	-25.14	peak
4	9663.667	38.85	12.70	51.55	74.00	-22.45	peak
5 *	11387.000	38.69	14.85	53.54	74.00	-20.46	peak
6	12381.833	37.82	15.52	53.34	74.00	-20.66	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11g Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	3585.000	43.44	-0.90	42.54	74.00	-31.46	peak
2	7219.667	40.11	10.03	50.14	74.00	-23.86	peak
3	7979.500	39.89	10.82	50.71	74.00	-23.29	peak
4	9134.917	39.58	12.15	51.73	74.00	-22.27	peak
5 *	11253.833	38.92	14.79	53.71	74.00	-20.29	peak
6	12421.000	38.16	15.55	53.71	74.00	-20.29	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT20) Mode 2412MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4348.750	40.12	1.03	41.15	74.00	-32.85	peak
2	6056.417	39.61	5.82	45.43	74.00	-28.57	peak
3	7157.000	39.97	9.78	49.75	74.00	-24.25	peak
4	8884.250	39.49	11.53	51.02	74.00	-22.98	peak
5	9886.917	38.92	13.04	51.96	74.00	-22.04	peak
6 *	11716.000	38.26	15.11	53.37	74.00	-20.63	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT20) Mode 2412MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1497.417	52.95	-6.88	46.07	74.00	-27.93	peak
2	5269.167	40.78	3.05	43.83	74.00	-30.17	peak
3	6663.500	39.58	7.68	47.26	74.00	-26.74	peak
4	8817.667	39.65	11.43	51.08	74.00	-22.92	peak
5 *	10924.833	39.12	14.59	53.71	74.00	-20.29	peak
6	12041.083	37.94	15.51	53.45	74.00	-20.55	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT20) Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1199.750	51.02	-7.71	43.31	74.00	-30.69	peak
2	4916.667	41.70	2.15	43.85	74.00	-30.15	peak
3	6463.750	40.90	7.23	48.13	74.00	-25.87	peak
4	9369.917	39.73	12.52	52.25	74.00	-21.75	peak
5	10862.167	39.03	14.52	53.55	74.00	-20.45	peak
6 *	11994.083	38.26	15.44	53.70	74.00	-20.30	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT20) Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1497.417	52.07	-6.88	45.19	74.00	-28.81	peak
2	3596.750	43.17	-0.84	42.33	74.00	-31.67	peak
3	7251.000	39.15	10.04	49.19	74.00	-24.81	peak
4	9189.750	38.63	12.33	50.96	74.00	-23.04	peak
5	10650.667	39.54	14.15	53.69	74.00	-20.31	peak
6 *	12064.583	38.19	15.54	53.73	74.00	-20.27	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT20) Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4736.500	40.90	1.86	42.76	74.00	-31.24	peak
2	6381.500	39.21	7.00	46.21	74.00	-27.79	peak
3	8018.667	39.86	10.81	50.67	74.00	-23.33	peak
4	9330.750	38.65	12.48	51.13	74.00	-22.87	peak
5 *	11206.833	38.88	14.77	53.65	74.00	-20.35	peak
6	12225.167	37.73	15.69	53.42	74.00	-20.58	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT20) Mode 2462MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1497.417	51.50	-6.88	44.62	74.00	-29.38	peak
2	4889.250	41.50	2.11	43.61	74.00	-30.39	peak
3	7889.417	38.49	10.62	49.11	74.00	-24.89	peak
4	9178.000	38.51	12.30	50.81	74.00	-23.19	peak
5 *	10873.917	38.92	14.53	53.45	74.00	-20.55	peak
6	11763.000	38.35	15.09	53.44	74.00	-20.56	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT40) Mode 2422MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1199.750	50.69	-7.71	42.98	74.00	-31.02	peak
2	5018.500	40.96	2.32	43.28	74.00	-30.72	peak
3	7282.333	38.70	10.05	48.75	74.00	-25.25	peak
4	9189.750	38.80	12.33	51.13	74.00	-22.87	peak
5	10568.417	39.19	14.00	53.19	74.00	-20.81	peak
6 *	12636.417	37.42	16.16	53.58	74.00	-20.42	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT40) Mode 2422MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1497.417	52.50	-6.88	45.62	74.00	-28.38	peak
2	4290.000	40.87	0.91	41.78	74.00	-32.22	peak
3	7223.583	39.56	10.03	49.59	74.00	-24.41	peak
4	9710.667	39.62	12.79	52.41	74.00	-21.59	peak
5	11128.500	38.54	14.73	53.27	74.00	-20.73	peak
6 *	11923.583	38.26	15.31	53.57	74.00	-20.43	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT40) Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1497.417	49.97	-6.88	43.09	74.00	-30.91	peak
2	4763.917	40.37	1.92	42.29	74.00	-31.71	peak
3	6393.250	39.36	7.04	46.40	74.00	-27.60	peak
4	9185.833	38.87	12.31	51.18	74.00	-22.82	peak
5 *	10913.083	39.05	14.58	53.63	74.00	-20.37	peak
6	12475.833	37.73	15.71	53.44	74.00	-20.56	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT40) Mode 2437MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1493.500	53.25	-6.88	46.37	74.00	-27.63	peak
2	5128.167	41.20	2.66	43.86	74.00	-30.14	peak
3	7180.500	39.78	9.91	49.69	74.00	-24.31	peak
4	8496.500	40.27	10.72	50.99	74.00	-23.01	peak
5	10407.833	39.06	13.89	52.95	74.00	-21.05	peak
6 *	11696.417	38.55	15.12	53.67	74.00	-20.33	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT40) Mode 2452MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1493.500	49.57	-6.88	42.69	74.00	-31.31	peak
2	6397.167	39.55	7.05	46.60	74.00	-27.40	peak
3	8038.250	39.60	10.77	50.37	74.00	-23.63	peak
4	8723.667	40.48	11.25	51.73	74.00	-22.27	peak
5	10172.833	39.39	13.53	52.92	74.00	-21.08	peak
6 *	11394.833	38.47	14.85	53.32	74.00	-20.68	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. No.	Ant 1 + Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT40) Mode 2452MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4716.917	41.46	1.83	43.29	74.00	-30.71	peak
2	6471.583	40.04	7.24	47.28	74.00	-26.72	peak
3	8379.000	39.68	10.52	50.20	74.00	-23.80	peak
4	9890.833	38.26	13.05	51.31	74.00	-22.69	peak
5	10858.250	38.76	14.52	53.28	74.00	-20.72	peak
6 *	12421.000	38.12	15.55	53.67	74.00	-20.33	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

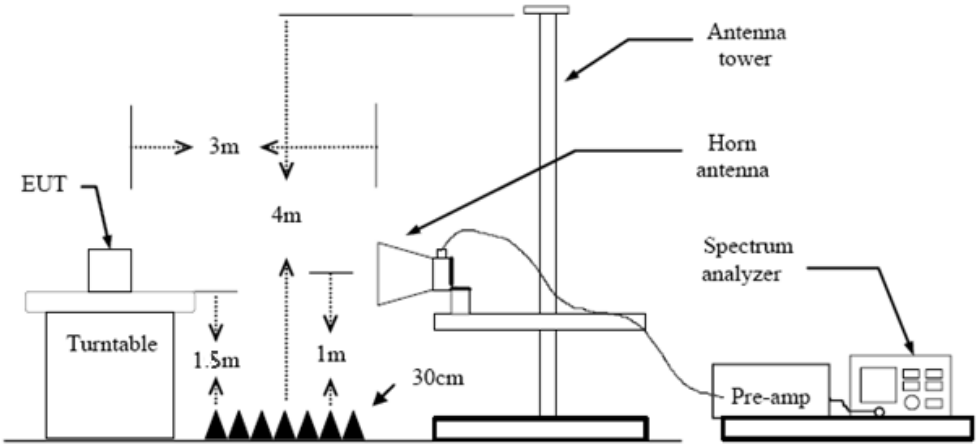
3.3. Band Edge Emissions (Radiated)

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d) / RSS-247 5.5

Restricted Frequency Band (MHz)	(dBμV/m) (at 3m)	
	Peak	Average
2310 ~ 2390	74	54
2483.5 ~ 2500	74	54

Test Configuration



Test Procedure

1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.
2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
5. The receiver set as follow:

RBW=1MHz, VBW=3MHz Peak detector for Peak value.
RBW=1MHz, VBW see note 1 with Peak Detector for Average Value.

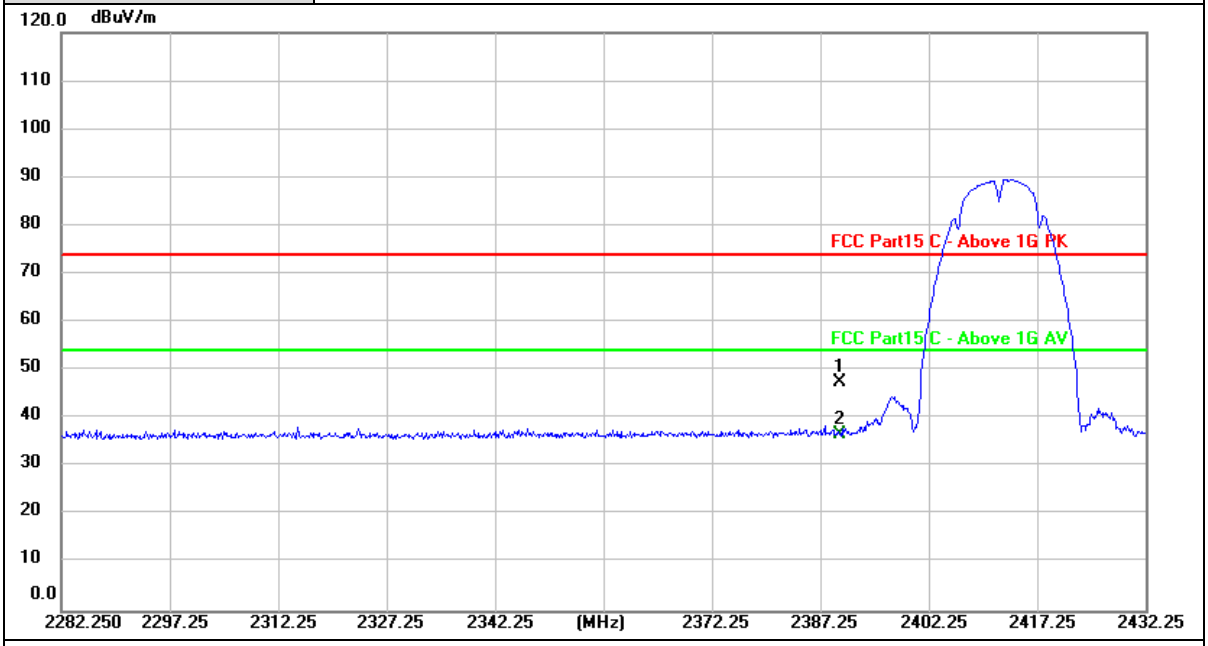
Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.8 Duty Cycle.

Test Mode

Please refer to the clause 2.4.

Test Result

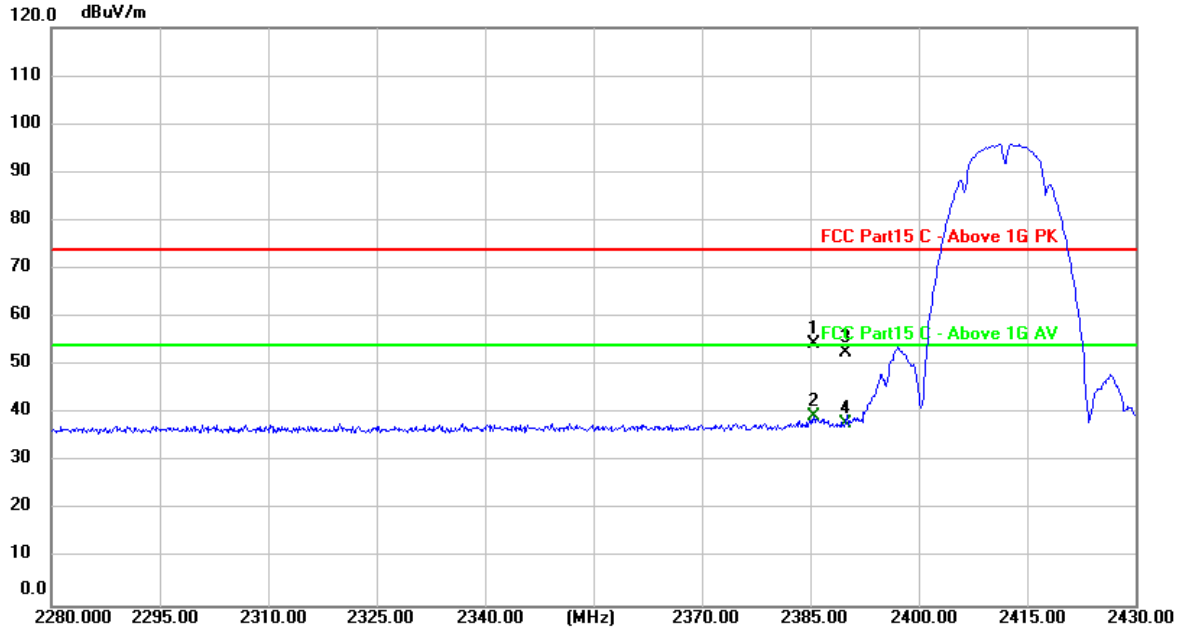
Ant. Pol.	Horizontal
Test Mode:	TX 802.11b Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	16.23	31.31	47.54	74.00	-26.46	peak
2 *	2390.000	5.45	31.31	36.76	54.00	-17.24	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

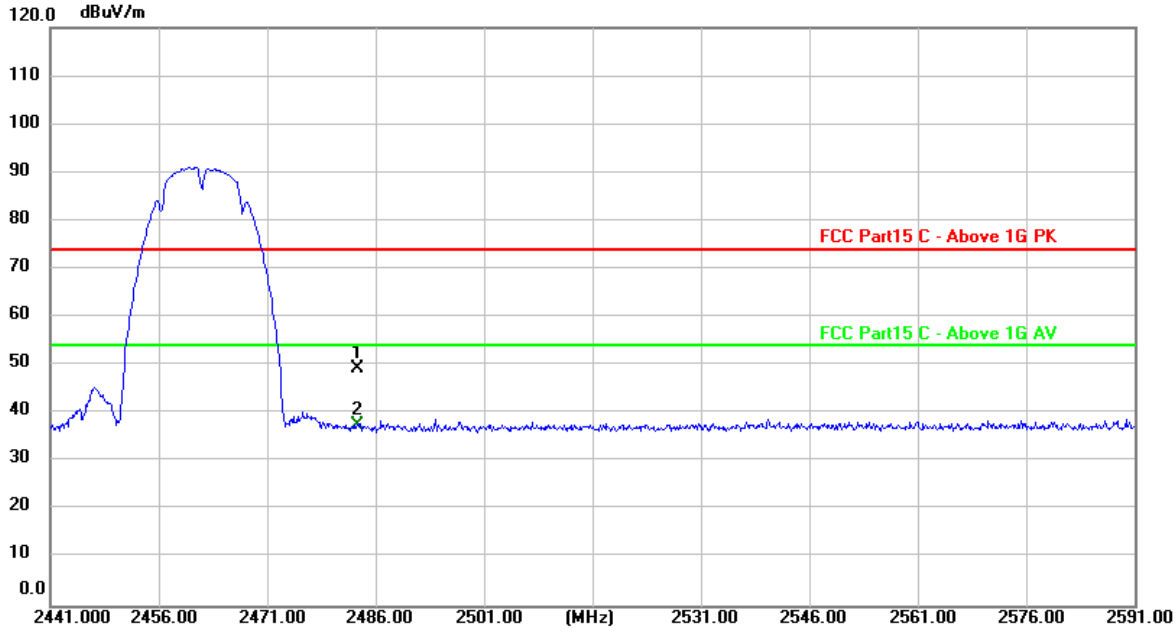
Ant. Pol.	Vertical
Test Mode:	TX 802.11b Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2385.450	23.13	31.31	54.44	74.00	-19.56	peak
2 *	2385.450	8.21	31.31	39.52	54.00	-14.48	AVG
3	2390.000	21.37	31.31	52.68	74.00	-21.32	peak
4	2390.000	6.61	31.31	37.92	54.00	-16.08	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

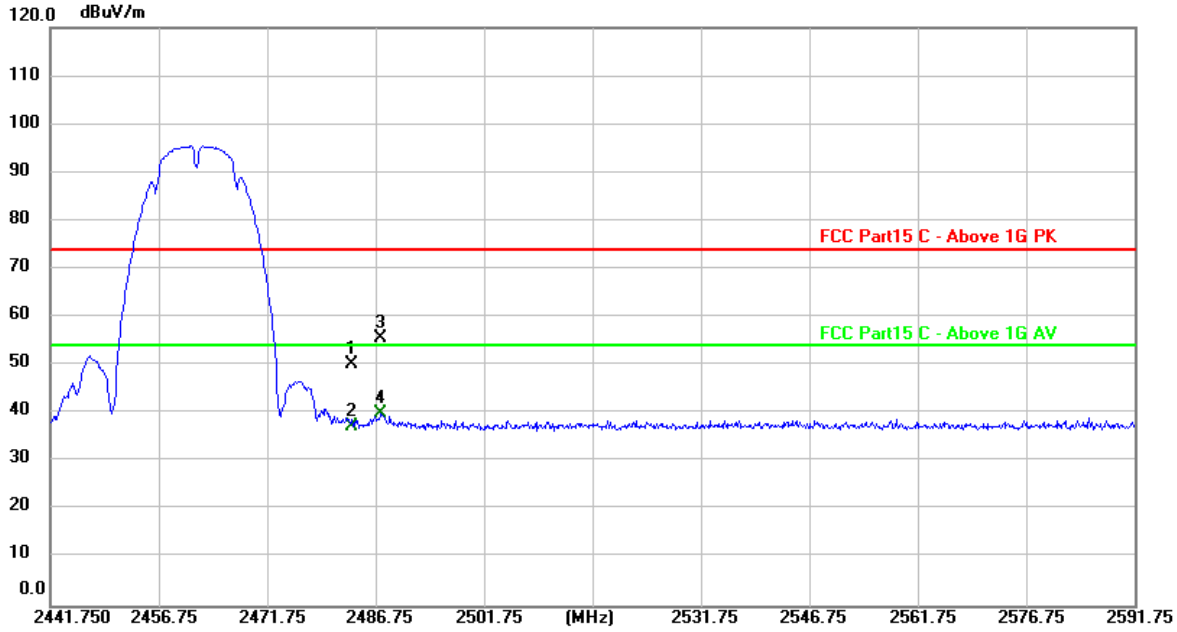
Ant. Pol.	Horizontal
Test Mode:	TX 802.11b Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	17.88	31.48	49.36	74.00	-24.64	peak
2 *	2483.500	6.09	31.48	37.57	54.00	-16.43	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

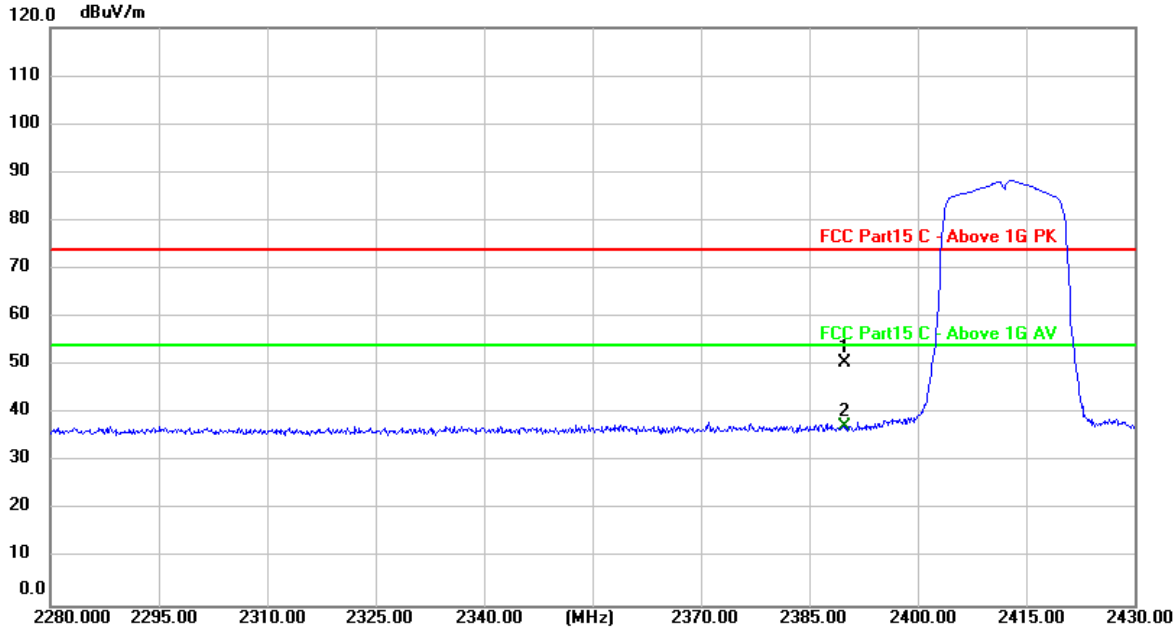
Ant. Pol.	Vertical
Test Mode:	TX 802.11b Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	18.81	31.48	50.29	74.00	-23.71	peak
2	2483.500	6.00	31.48	37.48	54.00	-16.52	AVG
3	2487.500	24.15	31.49	55.64	74.00	-18.36	peak
4 *	2487.500	8.62	31.49	40.11	54.00	-13.89	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

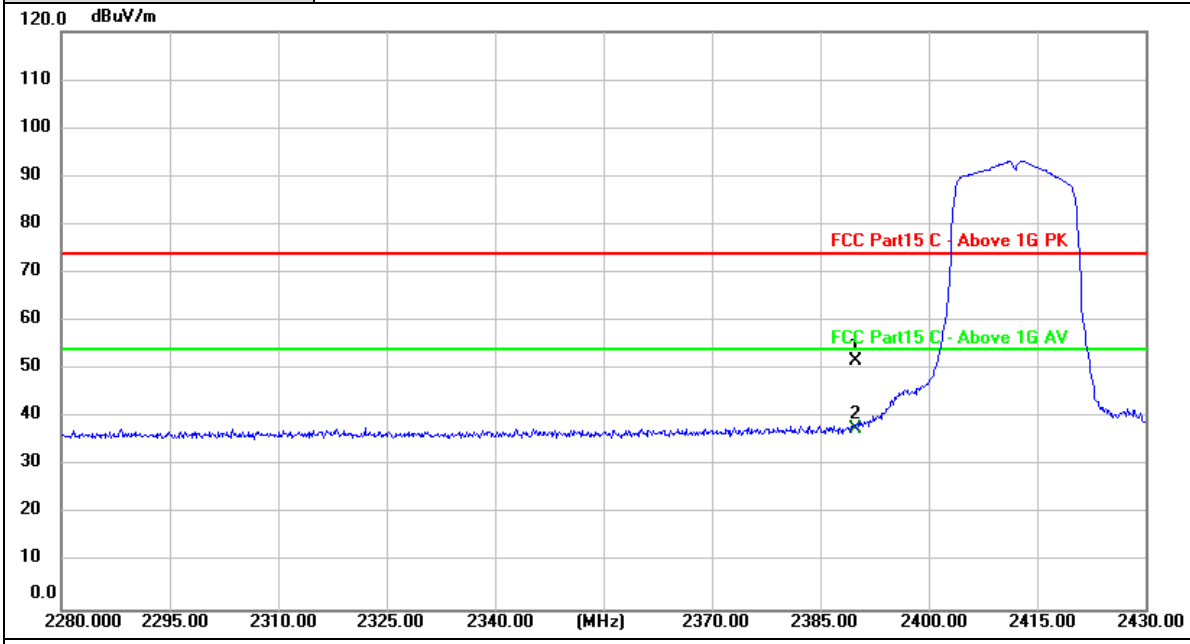
Ant. Pol.	Horizontal
Test Mode:	TX 802.11g Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	19.21	31.31	50.52	74.00	-23.48	peak
2 *	2390.000	6.04	31.31	37.35	54.00	-16.65	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

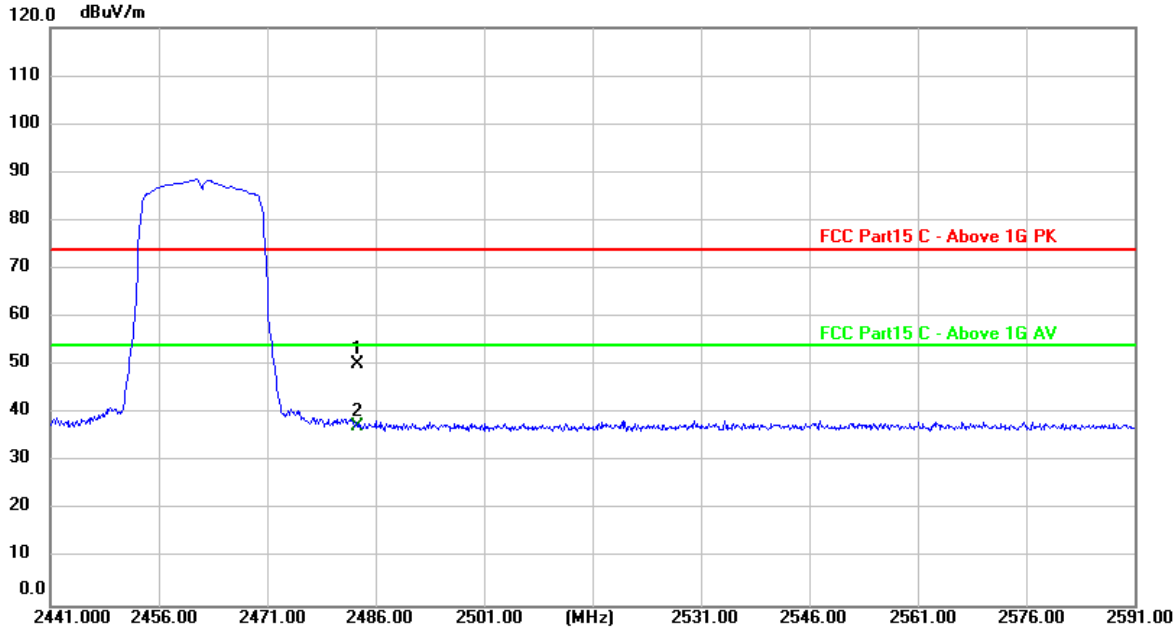
Ant. Pol.	Vertical
Test Mode:	TX 802.11g Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	20.52	31.31	51.83	74.00	-22.17	peak
2 *	2390.000	6.39	31.31	37.70	54.00	-16.30	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

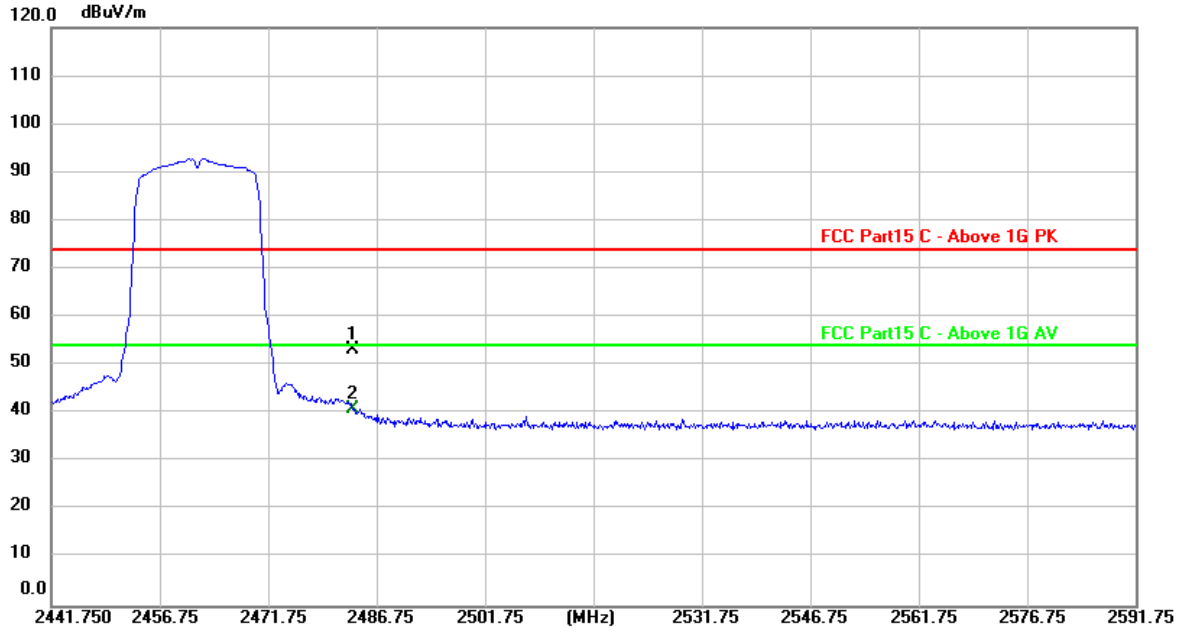
Ant. Pol.	Horizontal
Test Mode:	TX 802.11g Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	18.83	31.48	50.31	74.00	-23.69	peak
2 *	2483.500	5.88	31.48	37.36	54.00	-16.64	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

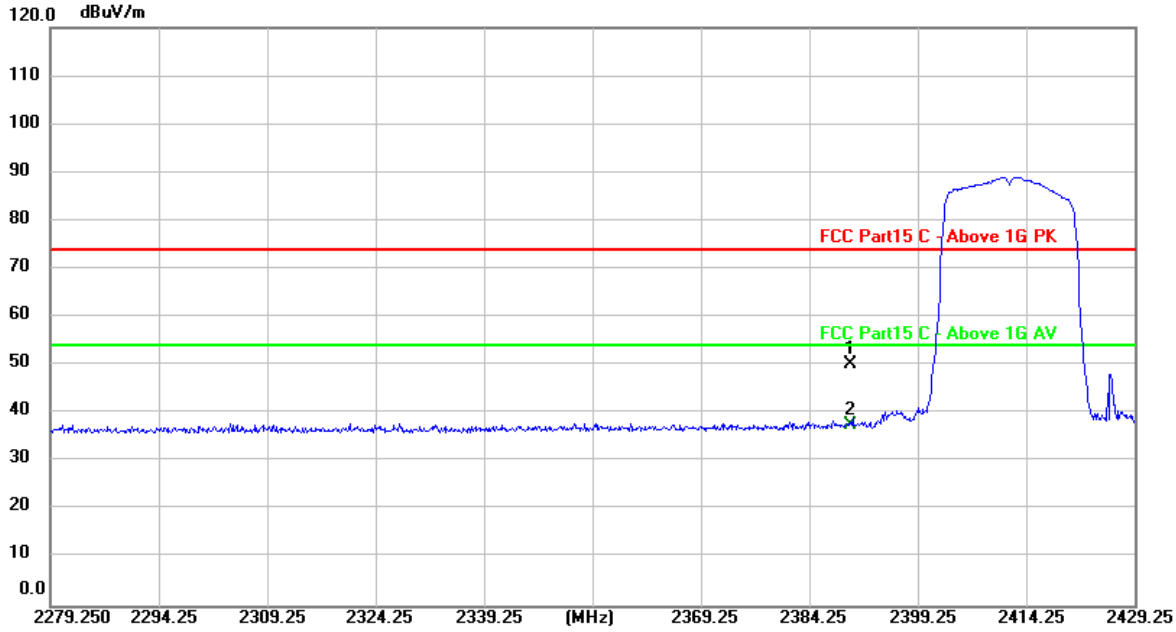
Ant. Pol.	Vertical
Test Mode:	TX 802.11g Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	21.83	31.48	53.31	74.00	-20.69	peak
2 *	2483.500	9.53	31.48	41.01	54.00	-12.99	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

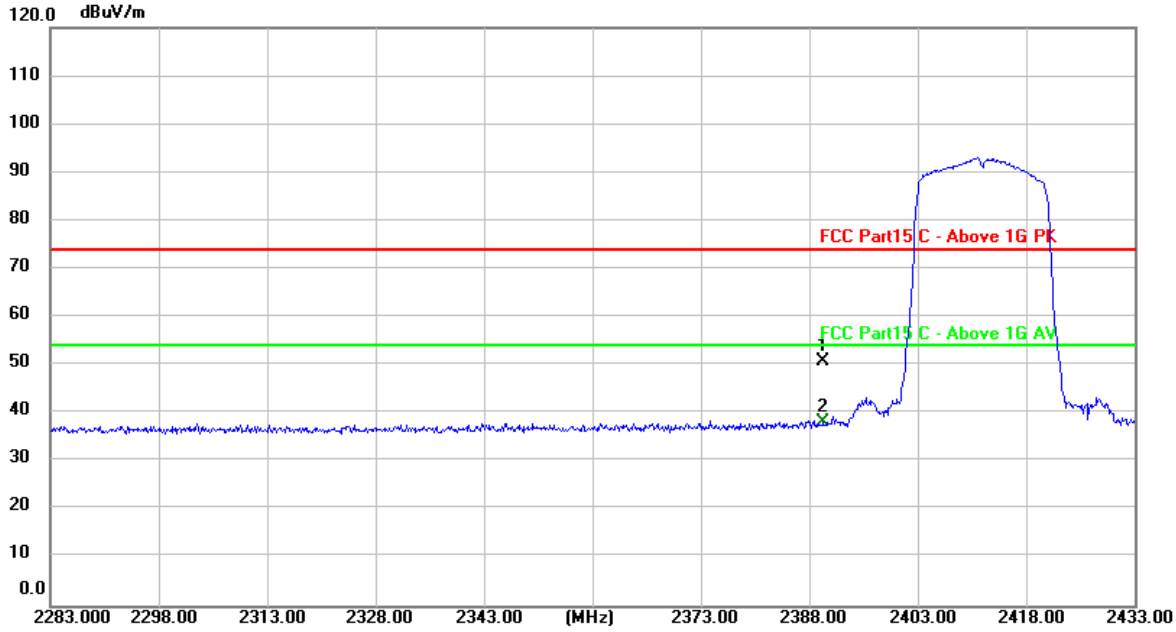
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT20) Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	18.92	31.31	50.23	74.00	-23.77	peak
2 *	2390.000	6.26	31.31	37.57	54.00	-16.43	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

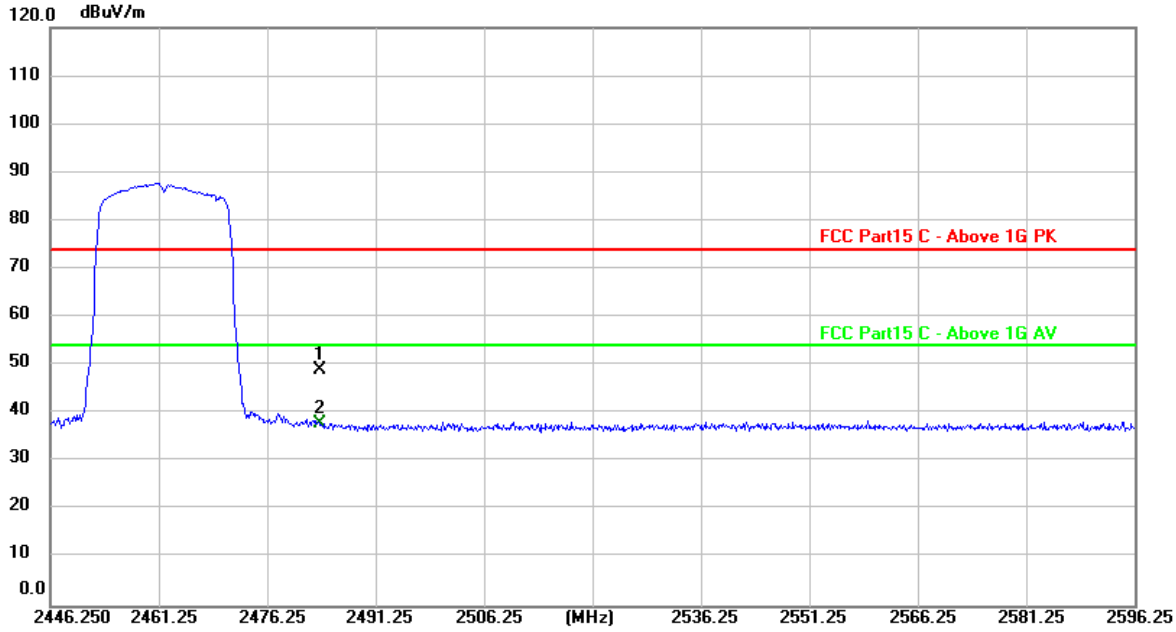
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT20) Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	19.68	31.31	50.99	74.00	-23.01	peak
2 *	2390.000	6.79	31.31	38.10	54.00	-15.90	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

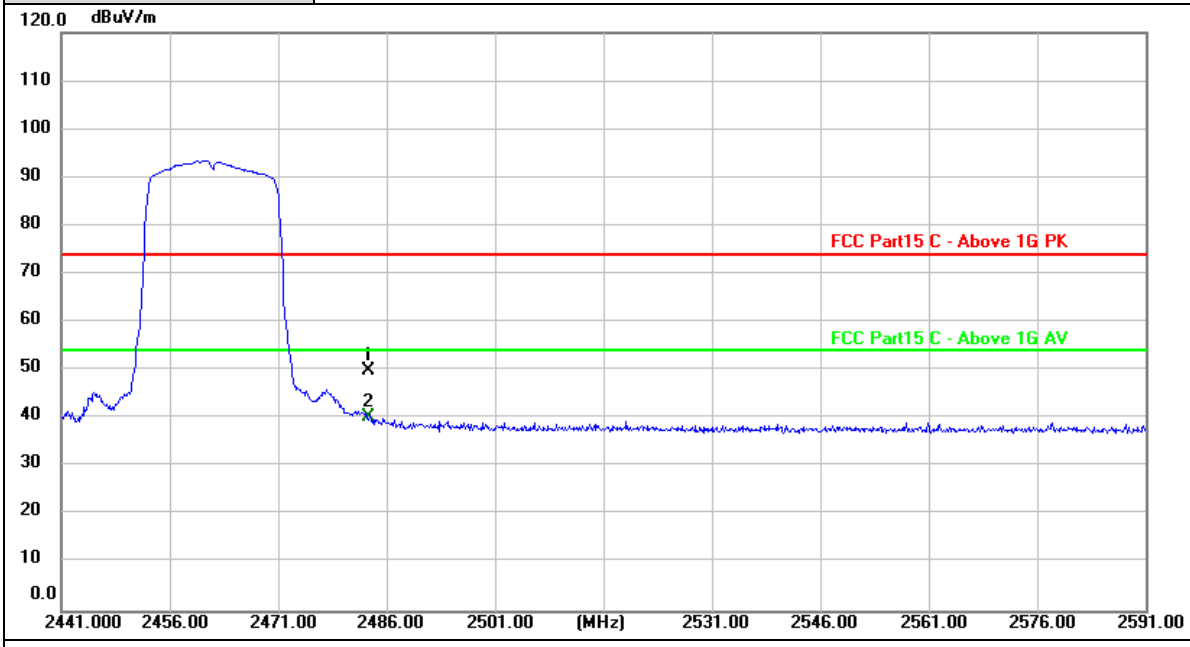
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT20) Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	17.60	31.48	49.08	74.00	-24.92	peak
2 *	2483.500	6.37	31.48	37.85	54.00	-16.15	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

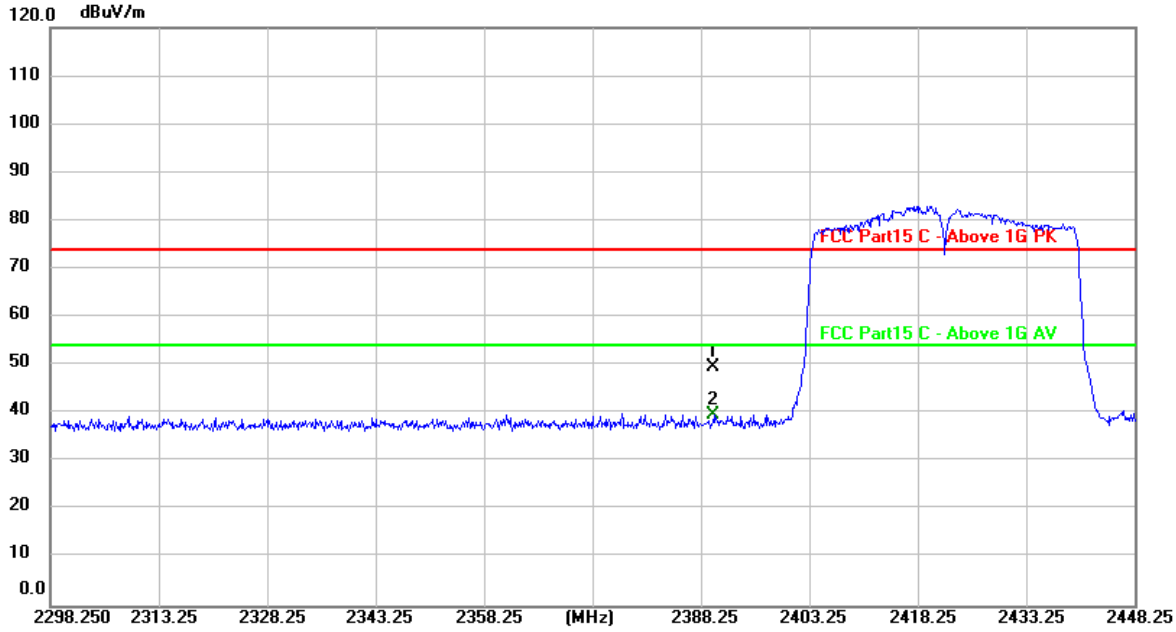
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT20) Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	18.51	31.48	49.99	74.00	-24.01	peak
2 *	2483.500	8.89	31.48	40.37	54.00	-13.63	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

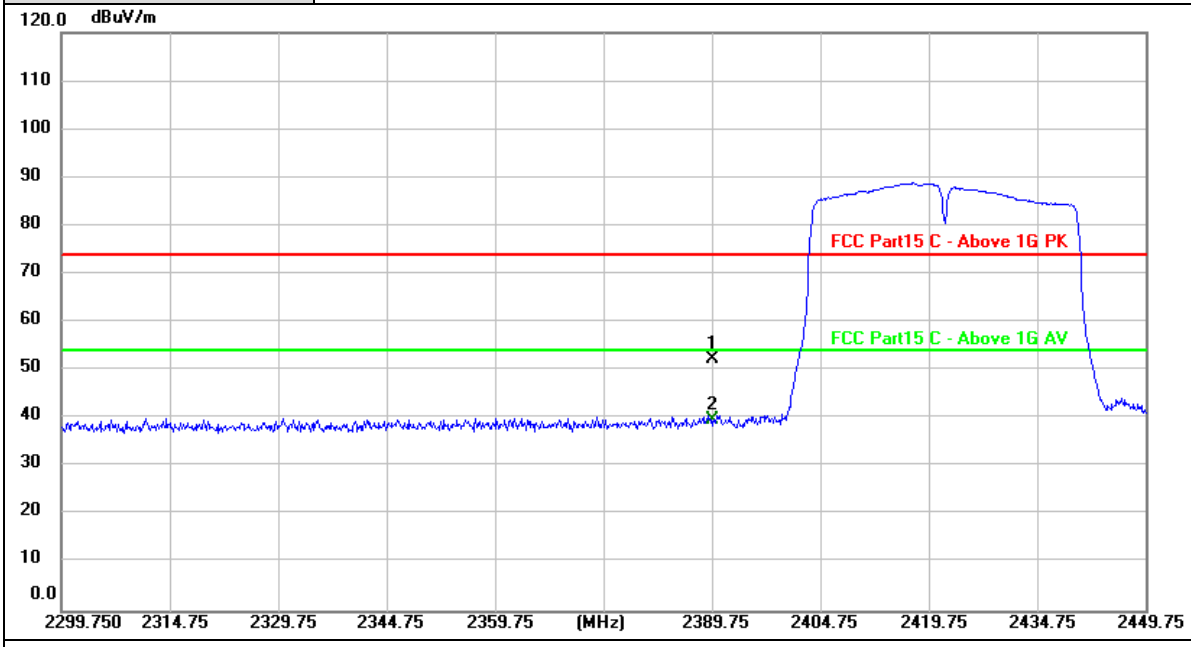
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT40) Mode 2422MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	18.34	31.31	49.65	74.00	-24.35	peak
2 *	2390.000	8.33	31.31	39.64	54.00	-14.36	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

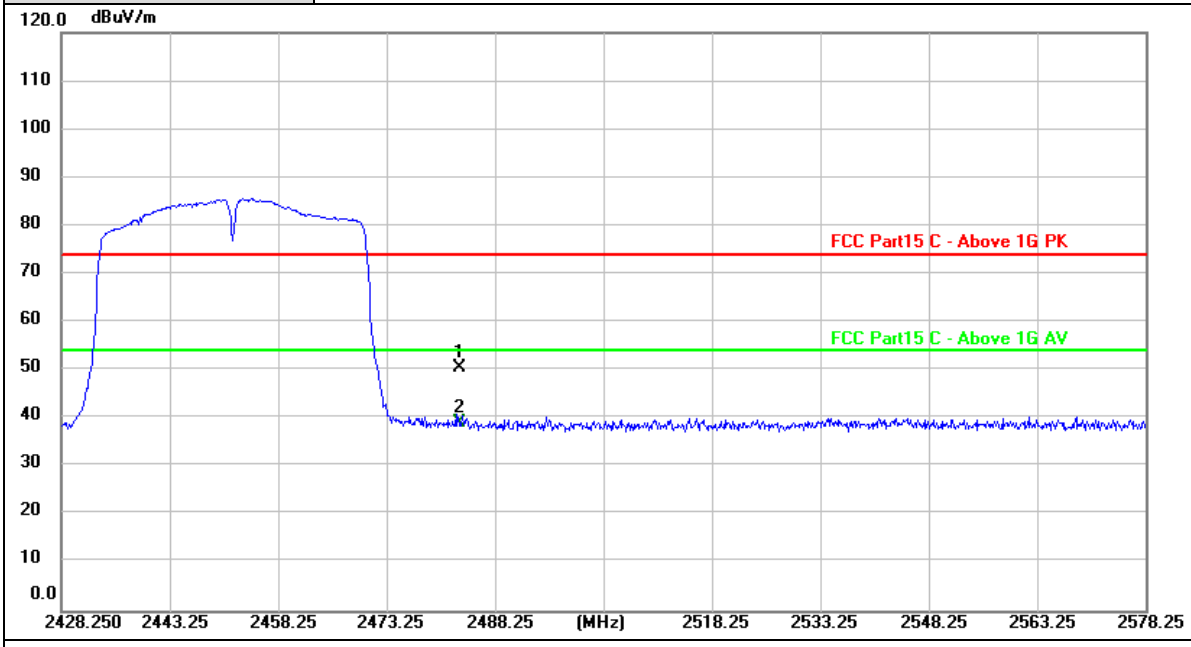
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT40) Mode 2422MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	20.90	31.31	52.21	74.00	-21.79	peak
2 *	2390.000	8.38	31.31	39.69	54.00	-14.31	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

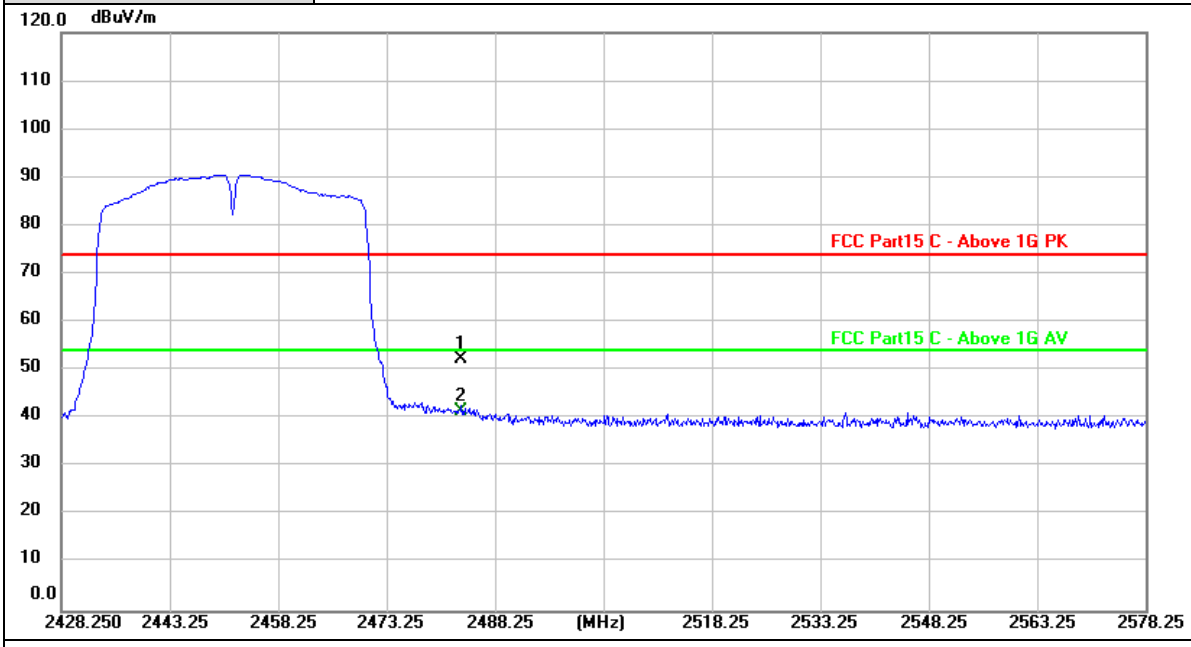
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT40) Mode 2452MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	19.04	31.48	50.52	74.00	-23.48	peak
2 *	2483.500	7.67	31.48	39.15	54.00	-14.85	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT40) Mode 2452MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	20.95	31.48	52.43	74.00	-21.57	peak
2 *	2483.500	10.09	31.48	41.57	54.00	-12.43	AVG

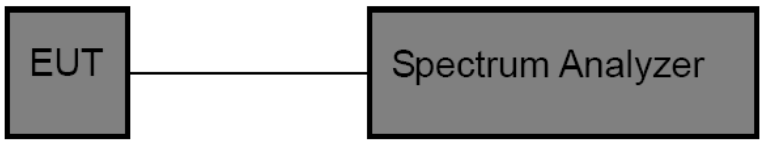
Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

3.4. Band Edge and Spurious Emissions (Conducted)

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d) / RSS-247 5.5
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Test Configuration



Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Use the following spectrum analyzer settings:
   RBW = 100 kHz, VBW ≥ RBW, scan up through 10th harmonic.
   Sweep = auto, Detector function = peak, Trace = max hold.
4. Measure and record the results in the test report.

Test Mode

Please refer to the clause 2.4.

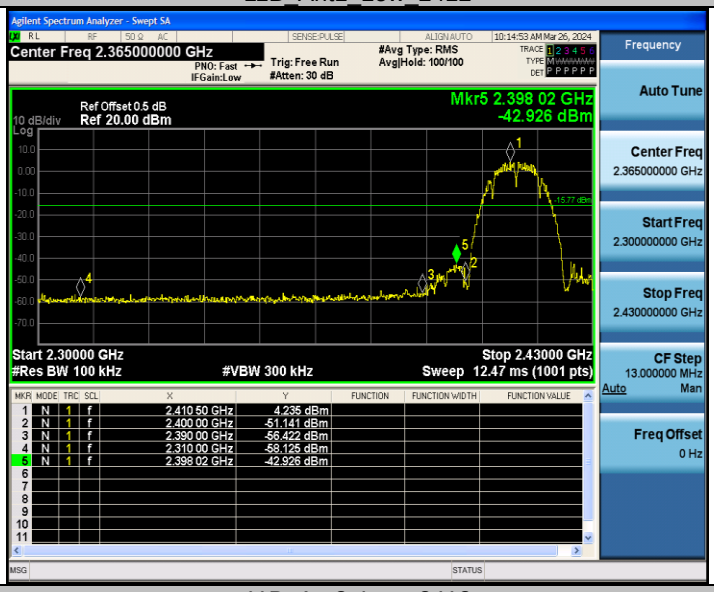
Test Result

Conducted Band edge

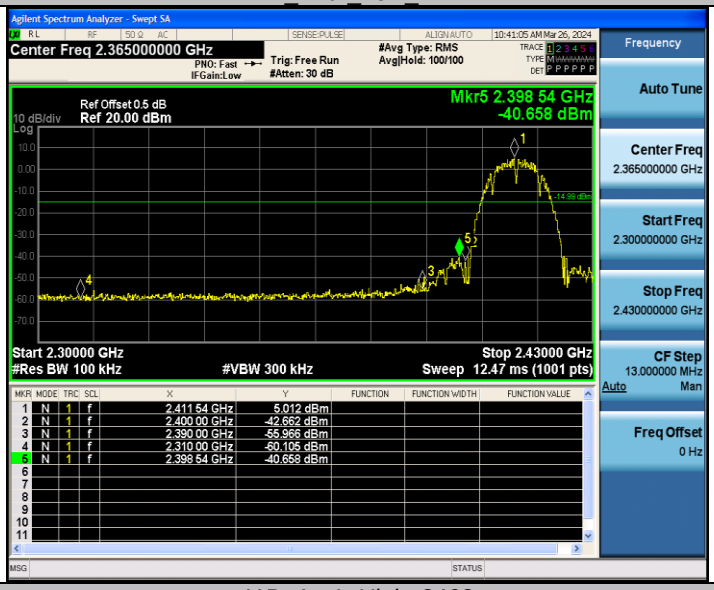
Test Mode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	4.24	-42.93	≤-15.77	PASS
	Ant2	Low	2412	5.01	-40.66	≤-14.99	PASS
	Ant1	High	2462	4.28	-53.96	≤-15.72	PASS
	Ant2	High	2462	5.15	-52.9	≤-14.85	PASS
11G	Ant1	Low	2412	1.67	-44.41	≤-18.34	PASS
	Ant2	Low	2412	3.93	-44.23	≤-16.07	PASS
	Ant1	High	2462	1.99	-49.37	≤-18.02	PASS
	Ant2	High	2462	3.57	-49.91	≤-16.43	PASS
11N20MIMO	Ant1	Low	2412	-0.01	-47.90	≤-20.01	PASS
	Ant2	Low	2412	-0.54	-45.21	≤-20.54	PASS
	Ant1	High	2462	-0.26	-53.34	≤-20.26	PASS
	Ant2	High	2462	0.58	-52.05	≤-19.42	PASS
11N40MIMO	Ant1	Low	2422	-3.30	-52.04	≤-23.30	PASS
	Ant2	Low	2422	-1.91	-52.17	≤-21.91	PASS
	Ant1	High	2452	-3.89	-48.85	≤-23.89	PASS
	Ant2	High	2452	-2.41	-45.81	≤-22.41	PASS

Test Graphs:

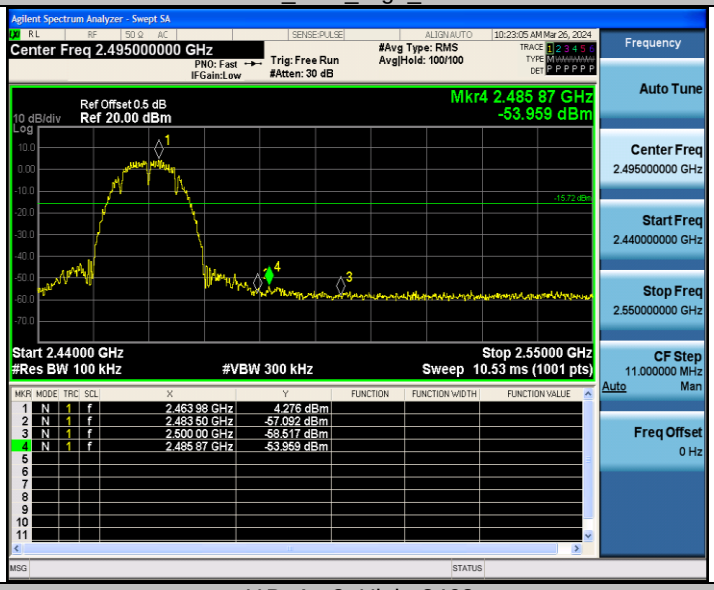
11B_Ant1_Low_2412



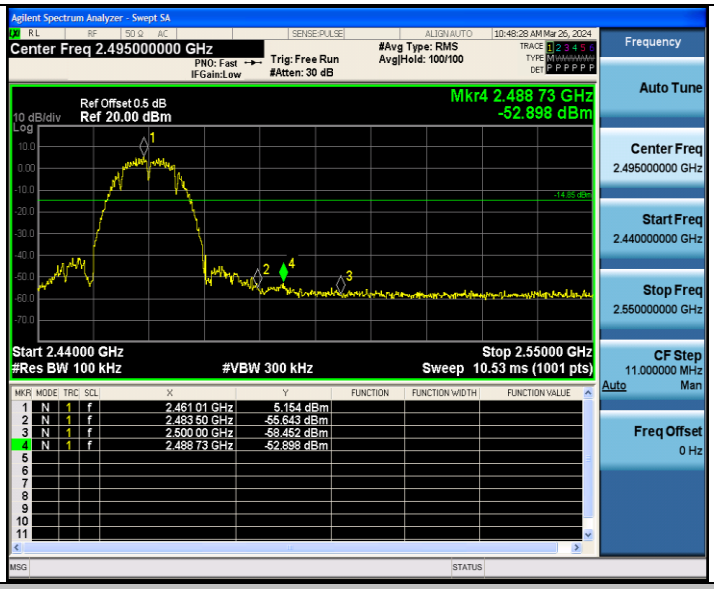
11B_Ant2_Low_2412



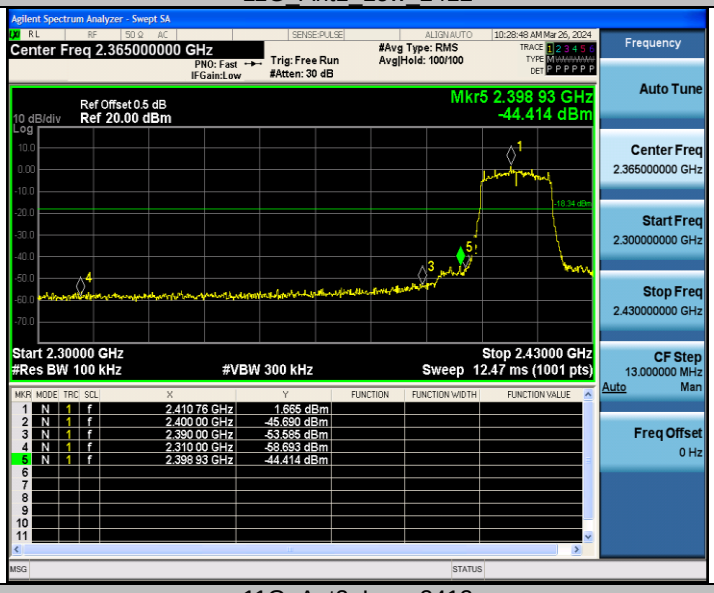
11B_Ant1_High_2462



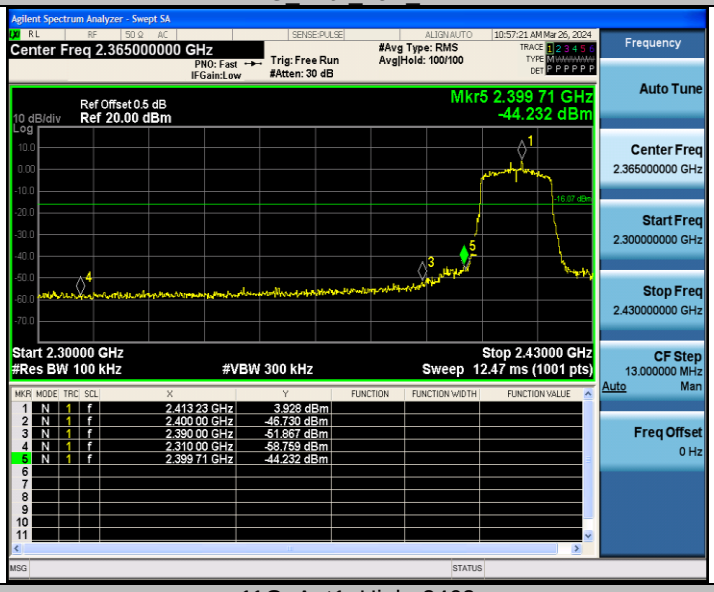
11B_Ant2_High_2462



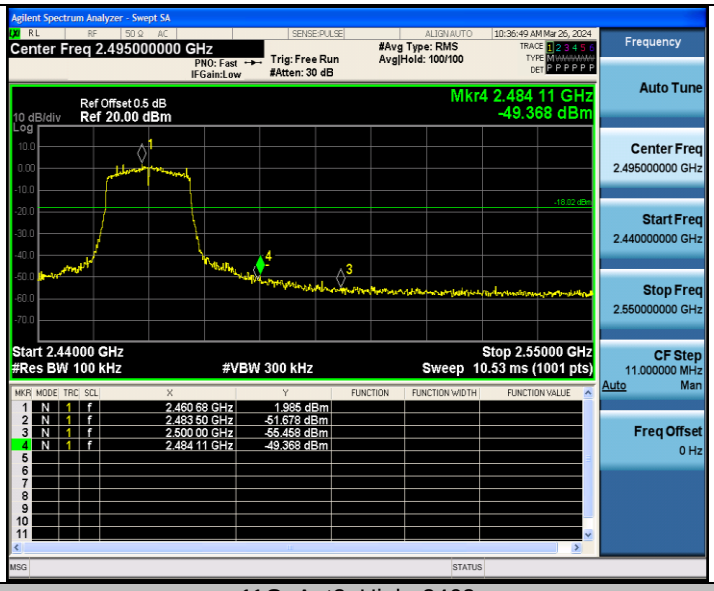
11G_Ant1_Low_2412



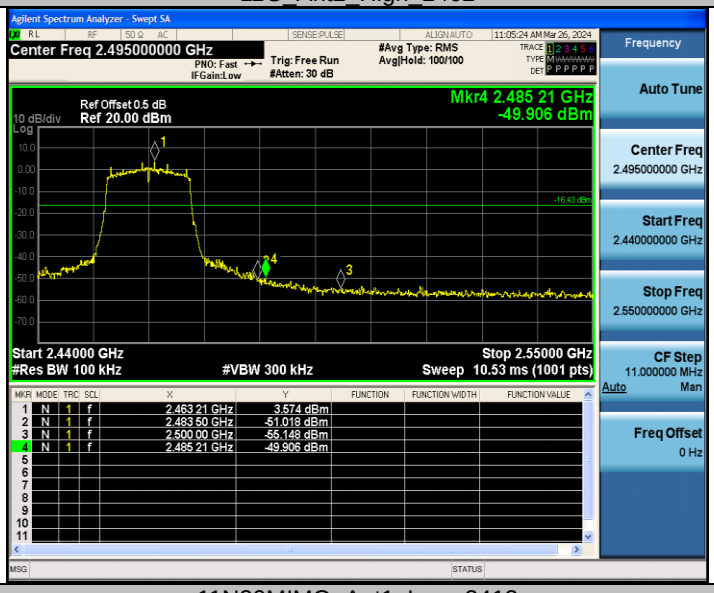
11G_Ant2_Low_2412



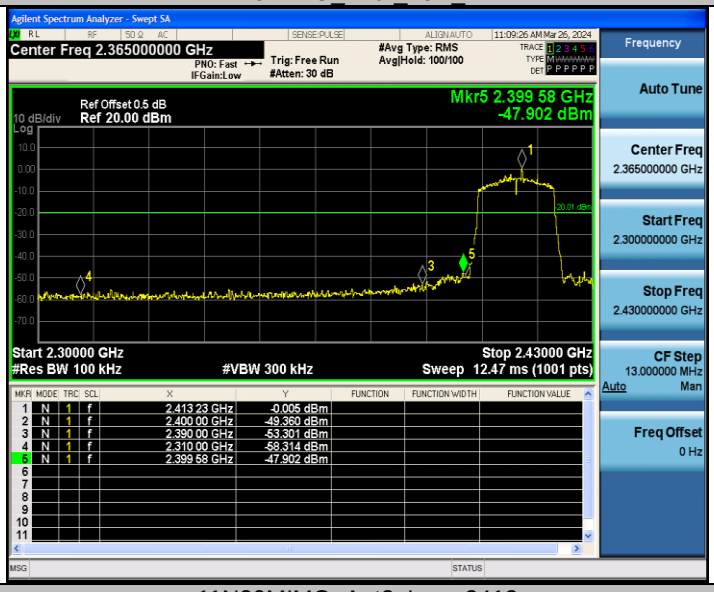
11G_Ant1_High_2462



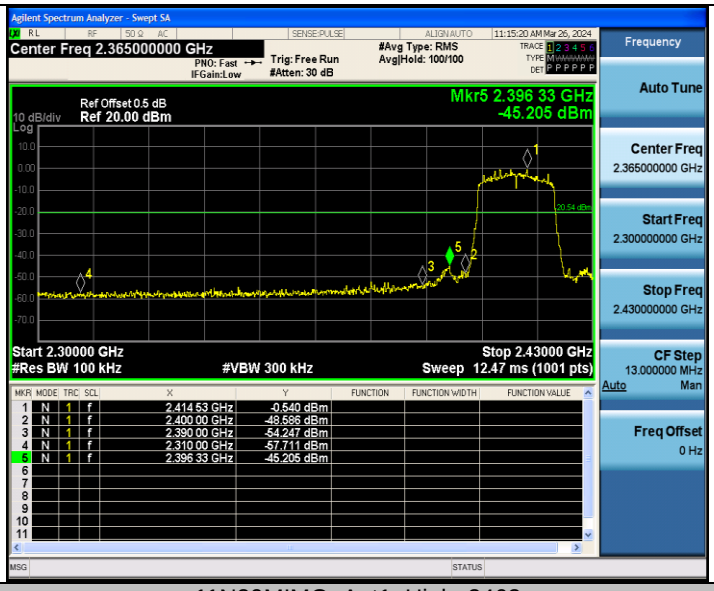
11G_Ant2_High_2462



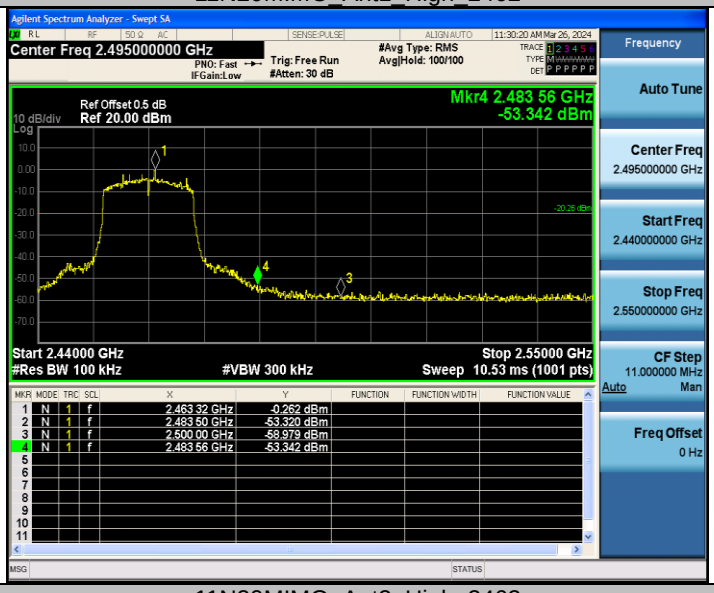
11N20MIMO_Ant1_Low_2412



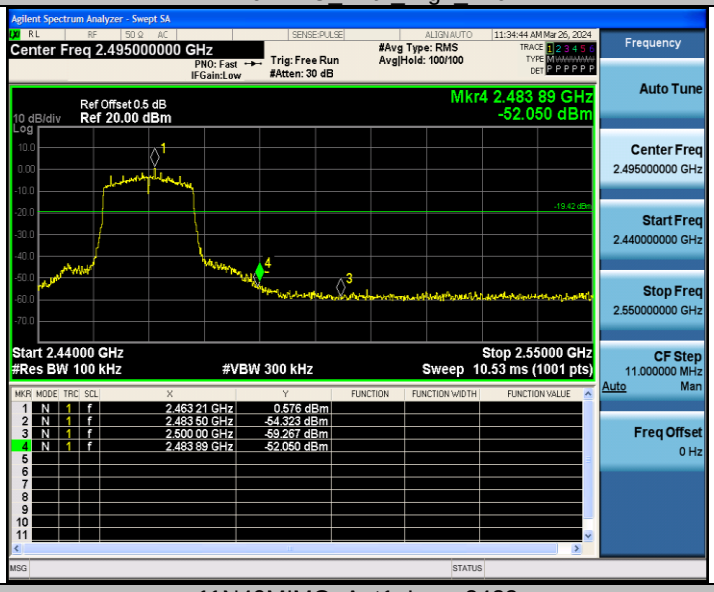
11N20MIMO_Ant2_Low_2412



11N20MIMO_Ant1_High_2462

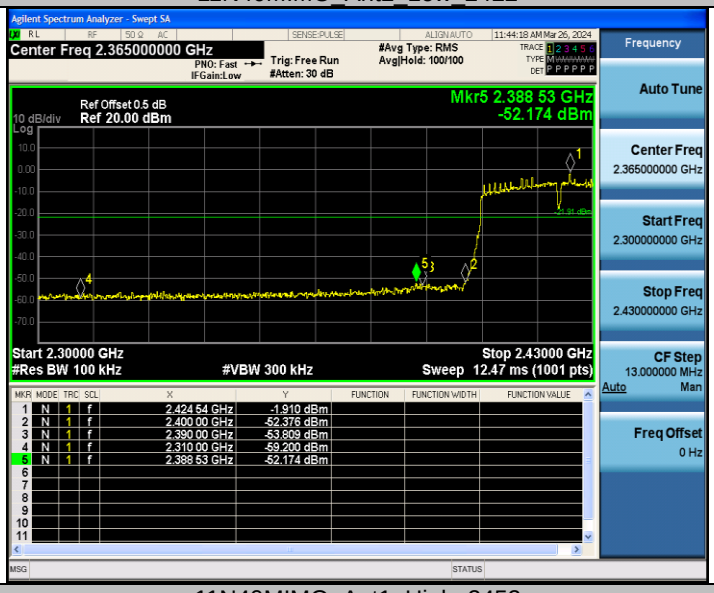


11N20MIMO_Ant2_High_2462

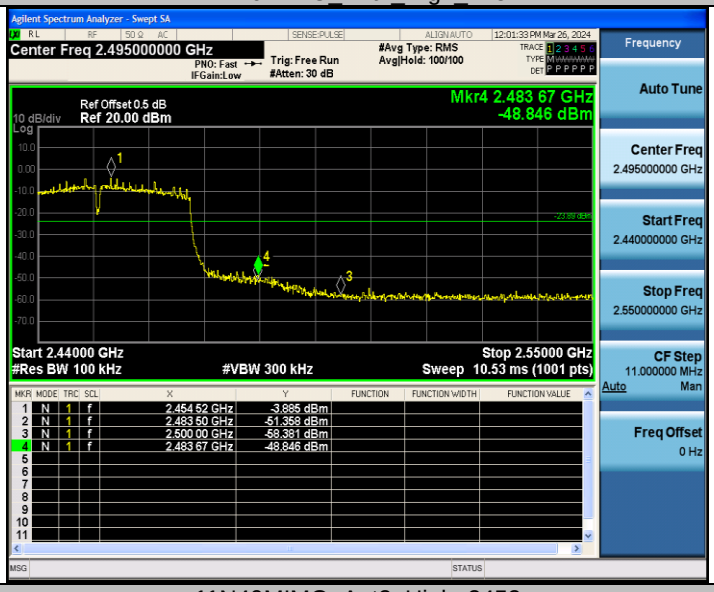


11N40MIMO_Ant1_Low_2422

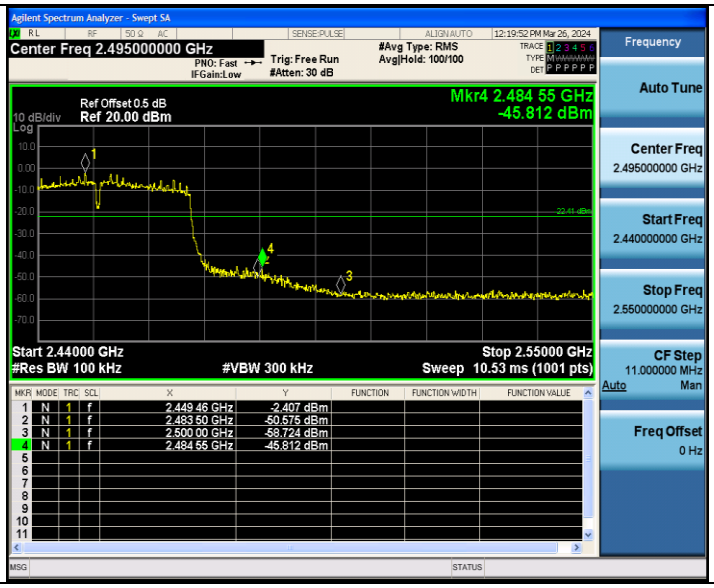
11N40MIMO_Ant2_Low_2422



11N40MIMO_Ant1_High_2452



11N40MIMO_Ant2_High_2452


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.495000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 100/100
12:19:52 PM Mar 26, 2024
Ref Offset 0.5 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr4 2.484 55 GHz
-45.812 dBm
Start 2.44000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.55000 GHz
Sweep 10.53 ms (1001 pts)
1 N 1 f 2.449 46 GHz -2.407 dBm
2 N 1 f 2.483 50 GHz -50.575 dBm
3 N 1 f 2.500 00 GHz -58.724 dBm
4 N 1 f 2.484 55 GHz -45.812 dBm
Frequency
Auto Tune
Center Freq
2.495000000 GHz
Start Freq
2.440000000 GHz
Stop Freq
2.550000000 GHz
CF Step
11.000000 MHz
Auto
Man
Freq Offset
0 Hz

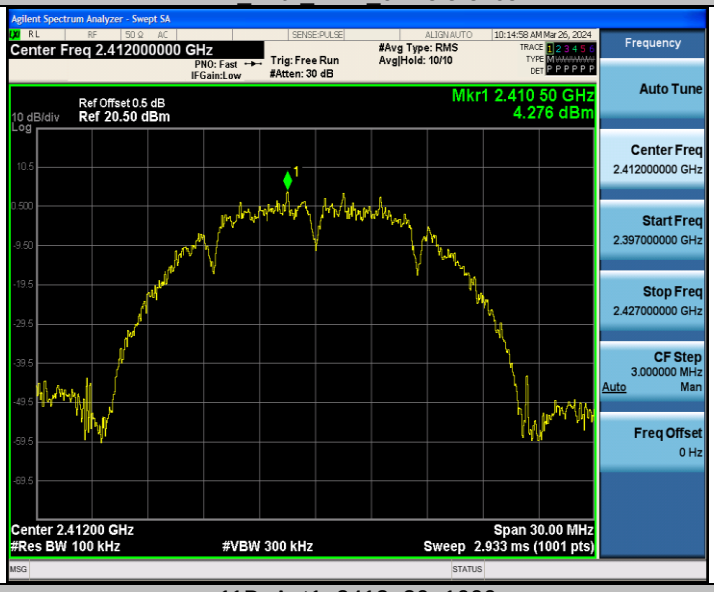
Conducted Spurious Emission

Test Mode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	4.28	4.28	---	PASS
			30~1000	4.28	-68.39	≤-15.72	PASS
			1000~26500	4.28	-47.81	≤-15.72	PASS
	Ant2	2412	Reference	3.05	3.05	---	PASS
			30~1000	3.05	-68.10	≤-16.95	PASS
			1000~26500	3.05	-48.75	≤-16.95	PASS
	Ant1	2437	Reference	3.65	3.65	---	PASS
			30~1000	3.65	-65.74	≤-16.35	PASS
			1000~26500	3.65	-48.94	≤-16.35	PASS
	Ant2	2437	Reference	3.22	3.22	---	PASS
			30~1000	3.22	-67.71	≤-16.78	PASS
			1000~26500	3.22	-48.65	≤-16.78	PASS
	Ant1	2462	Reference	4.33	4.33	---	PASS
			30~1000	4.33	-63.50	≤-15.67	PASS
			1000~26500	4.33	-48.93	≤-15.67	PASS
	Ant2	2462	Reference	4.09	4.09	---	PASS
			30~1000	4.09	-65.43	≤-15.91	PASS
			1000~26500	4.09	-48.50	≤-15.91	PASS
11G	Ant1	2412	Reference	-0.49	-0.49	---	PASS
			30~1000	-0.49	-66.91	≤-20.49	PASS
			1000~26500	-0.49	-48.63	≤-20.49	PASS
	Ant2	2412	Reference	0.32	0.32	---	PASS
			30~1000	0.32	-66.29	≤-19.68	PASS
			1000~26500	0.32	-48.72	≤-19.68	PASS
	Ant1	2437	Reference	-0.37	-0.37	---	PASS
			30~1000	-0.37	-65.46	≤-20.37	PASS
			1000~26500	-0.37	-46.82	≤-20.37	PASS
	Ant2	2437	Reference	3.00	3.00	---	PASS
			30~1000	3.00	-66.53	≤-17.00	PASS
			1000~26500	3.00	-48.68	≤-17.00	PASS
	Ant1	2462	Reference	-0.26	-0.26	---	PASS
			30~1000	-0.26	-65.07	≤-20.26	PASS
			1000~26500	-0.26	-48.01	≤-20.26	PASS
	Ant2	2462	Reference	0.74	0.74	---	PASS
			30~1000	0.74	-64.74	≤-19.26	PASS
			1000~26500	0.74	-48.26	≤-19.26	PASS
11N20MIMO	Ant1	2412	Reference	-4.35	-4.35	---	PASS
			30~1000	-4.35	-68.12	≤-24.35	PASS
			1000~26500	-4.35	-48.10	≤-24.35	PASS
	Ant2	2412	Reference	-2.34	-2.34	---	PASS
			30~1000	-2.34	-65.54	≤-22.34	PASS
			1000~26500	-2.34	-48.72	≤-22.34	PASS
	Ant1	2437	Reference	-4.81	-4.81	---	PASS
			30~1000	-4.81	-66.01	≤-24.81	PASS
			1000~26500	-4.81	-48.43	≤-24.81	PASS
	Ant2	2437	Reference	-2.51	-2.51	---	PASS
			30~1000	-2.51	-66.29	≤-22.51	PASS
			1000~26500	-2.51	-48.40	≤-22.51	PASS
	Ant1	2462	Reference	-0.29	-0.29	---	PASS
			30~1000	-0.29	-66.43	≤-20.29	PASS
			1000~26500	-0.29	-47.93	≤-20.29	PASS
	Ant2	2462	Reference	-3.96	-3.96	---	PASS
			30~1000	-3.96	-58.07	≤-23.96	PASS
			1000~26500	-3.96	-48.21	≤-23.96	PASS
11N40MIMO	Ant1	2422	Reference	-6.69	-6.69	---	PASS
			30~1000	-6.69	-63.50	≤-26.69	PASS
			1000~26500	-6.69	-45.65	≤-26.69	PASS

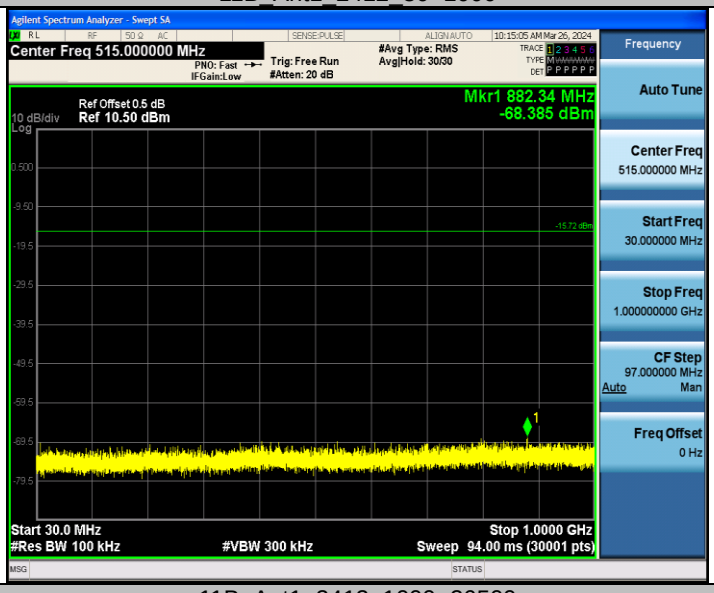
	Ant2	2422	Reference	-5.22	-5.22	---	PASS
			30~1000	-5.22	-63.07	≤-25.22	PASS
			1000~26500	-5.22	-48.50	≤-25.22	PASS
	Ant1	2437	Reference	-4.97	-4.97	---	PASS
			30~1000	-4.97	-63.57	≤-24.97	PASS
			1000~26500	-4.97	-48.77	≤-24.97	PASS
	Ant2	2437	Reference	-3.37	-3.37	---	PASS
			30~1000	-3.37	-63.42	≤-23.37	PASS
			1000~26500	-3.37	-46.83	≤-23.37	PASS
	Ant1	2452	Reference	-4.76	-4.76	---	PASS
			30~1000	-4.76	-63.70	≤-24.76	PASS
			1000~26500	-4.76	-48.67	≤-24.76	PASS
	Ant2	2452	Reference	-6.24	-6.24	---	PASS
			30~1000	-6.24	-63.21	≤-26.24	PASS
			1000~26500	-6.24	-48.01	≤-26.24	PASS

Test Graphs:

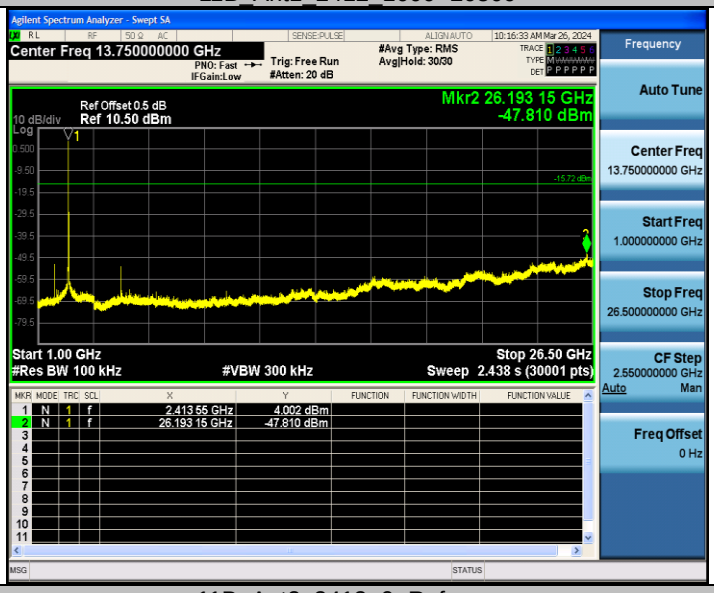
11B_Ant1_2412_0~Reference



11B_Ant1_2412_30~1000

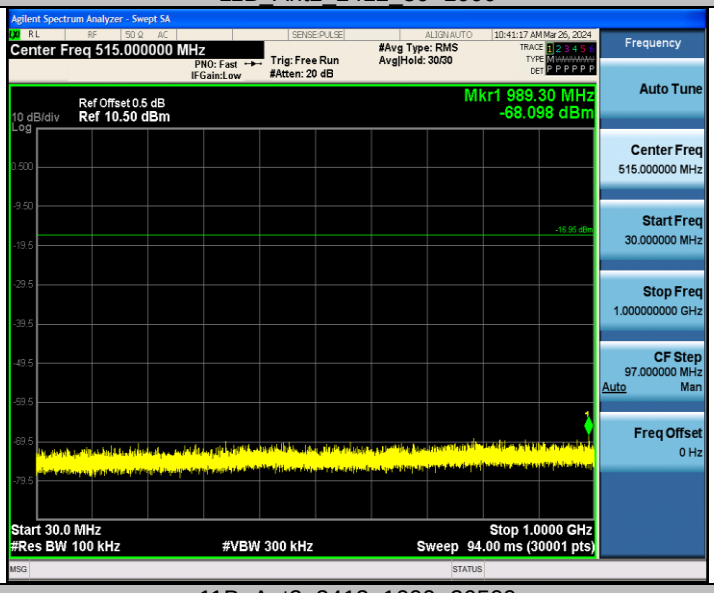


11B_Ant1_2412_1000~26500

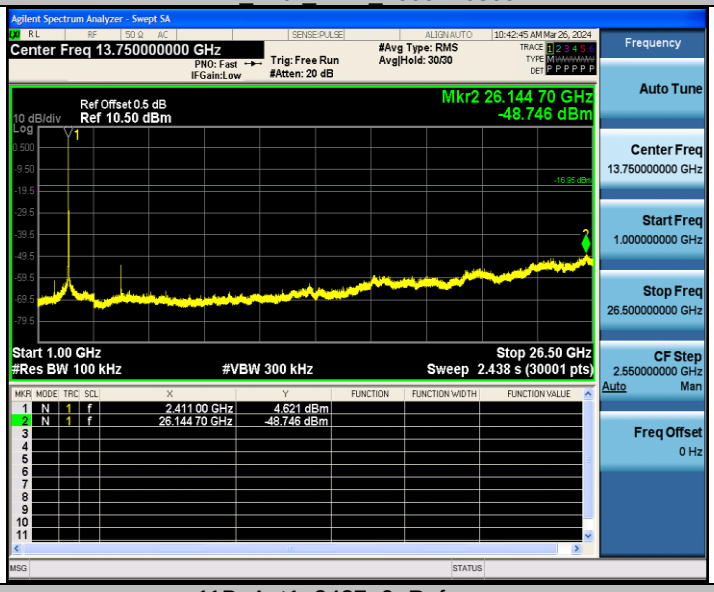


11B_Ant2_2412_0~Reference

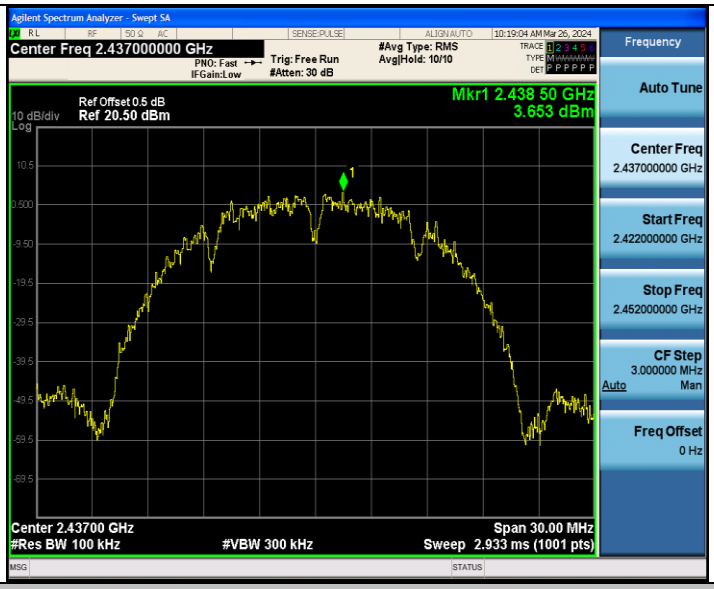
11B_Ant2_2412_30~1000



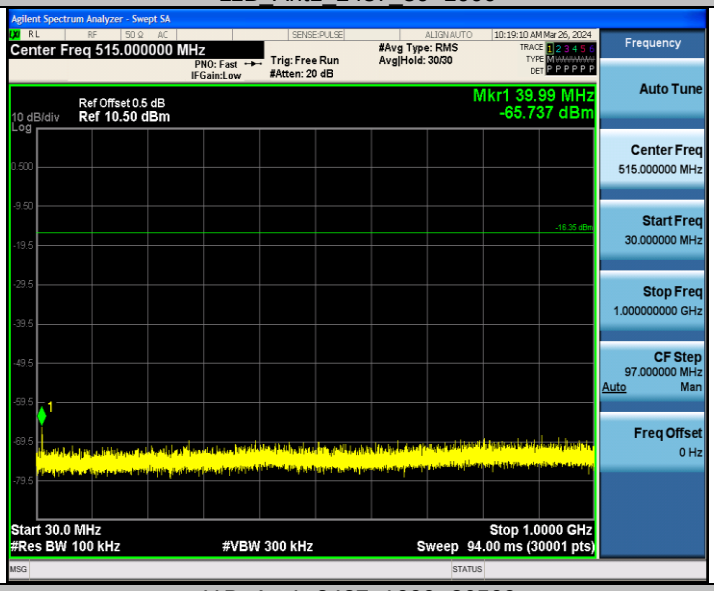
11B_Ant2_2412_1000~26500



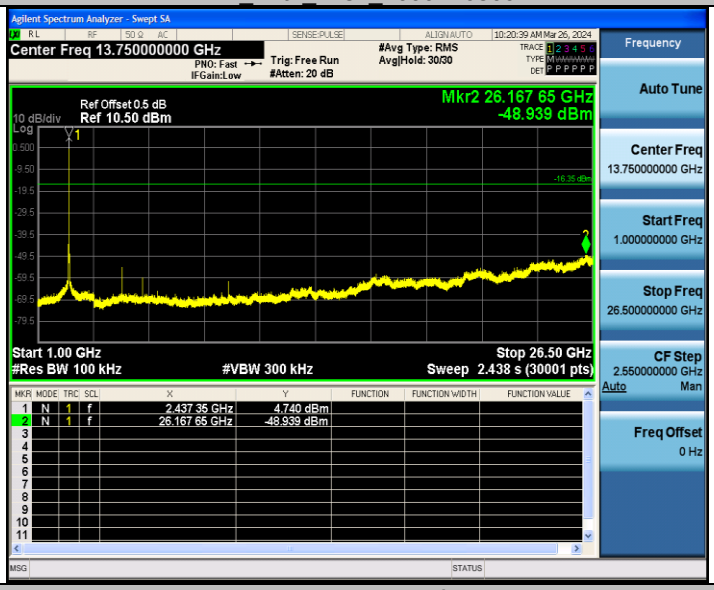
11B_Ant1_2437_0~Reference



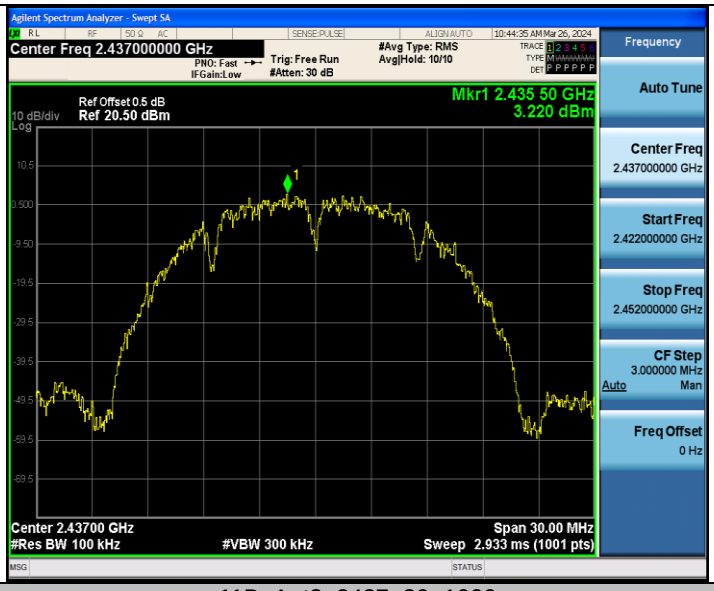
11B_Ant1_2437_30~1000



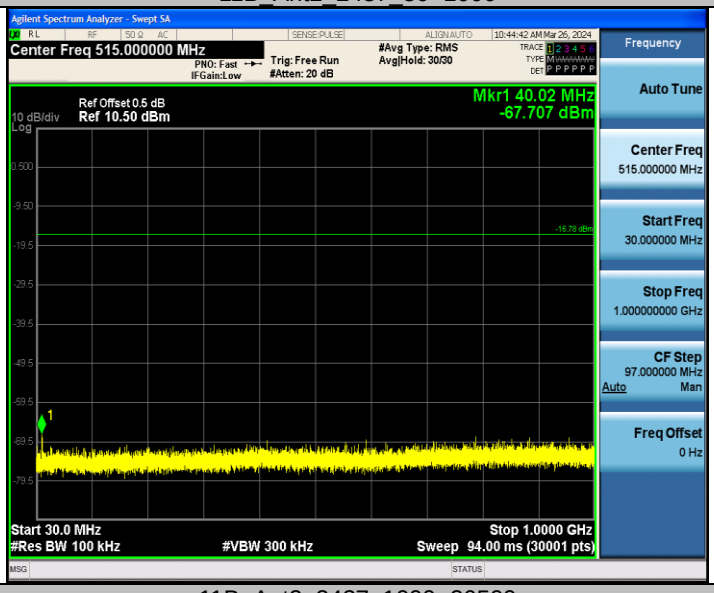
11B_Ant1_2437_1000~26500



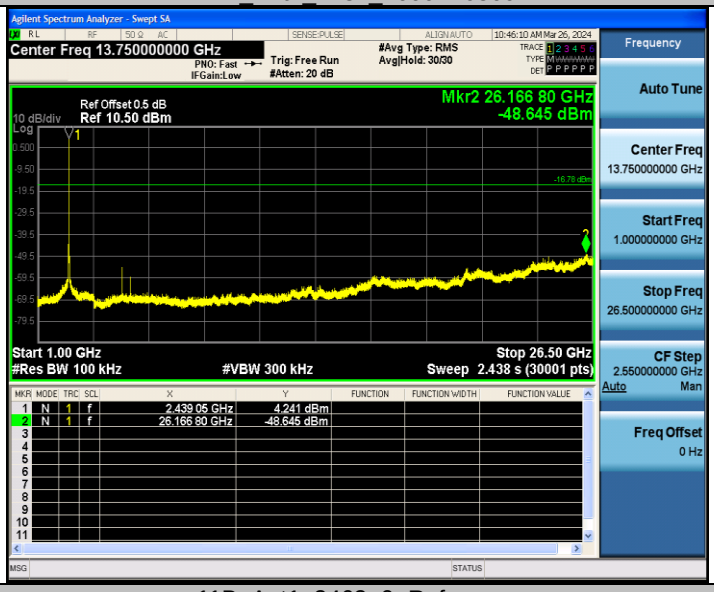
11B_Ant2_2437_0~Reference



11B_Ant2_2437_30~1000

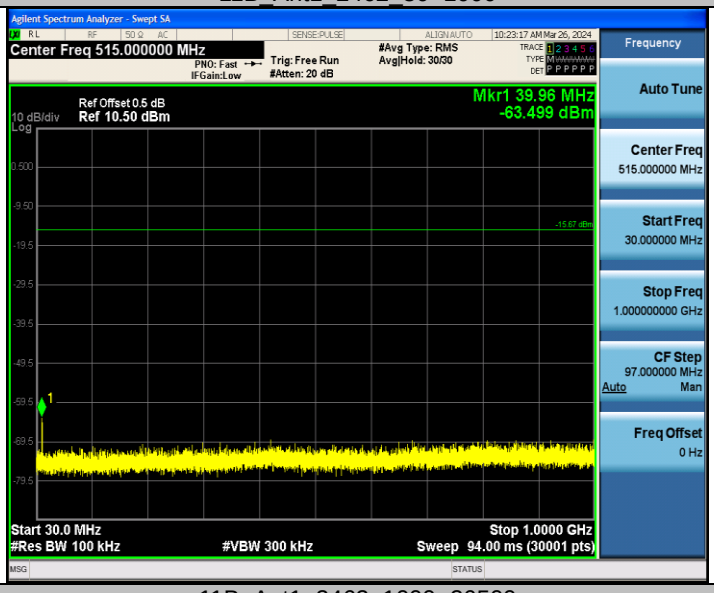


11B_Ant2_2437_1000~26500

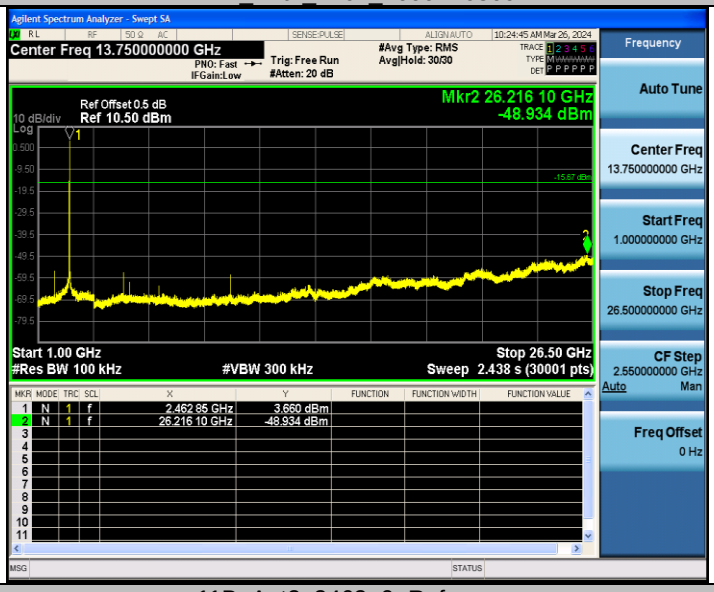


11B_Ant1_2462_0~Reference

11B_Ant1_2462_30~1000

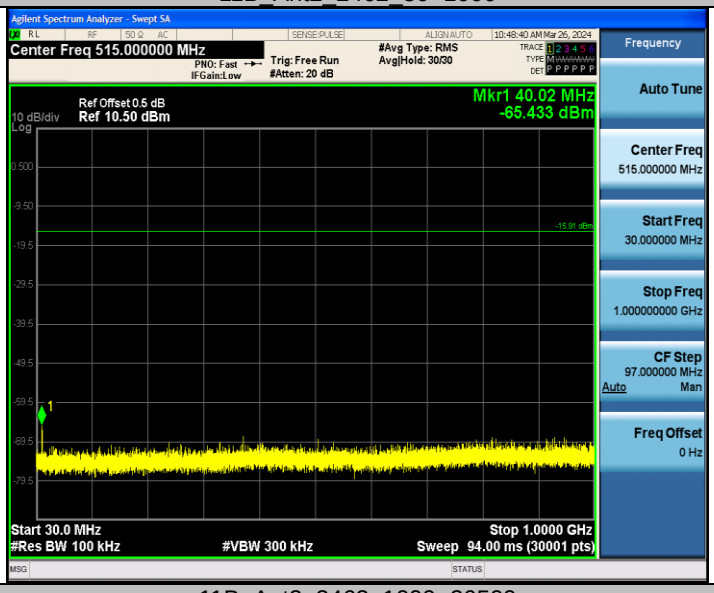


11B_Ant1_2462_1000~26500

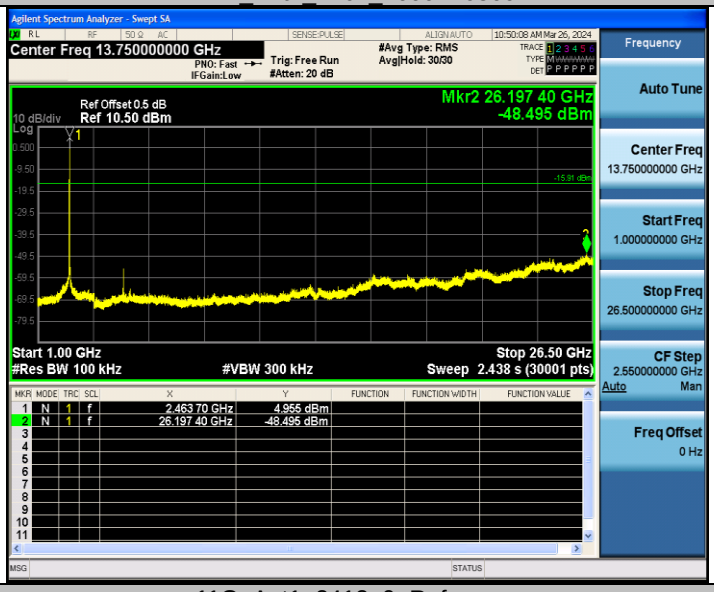


11B_Ant2_2462_0~Reference

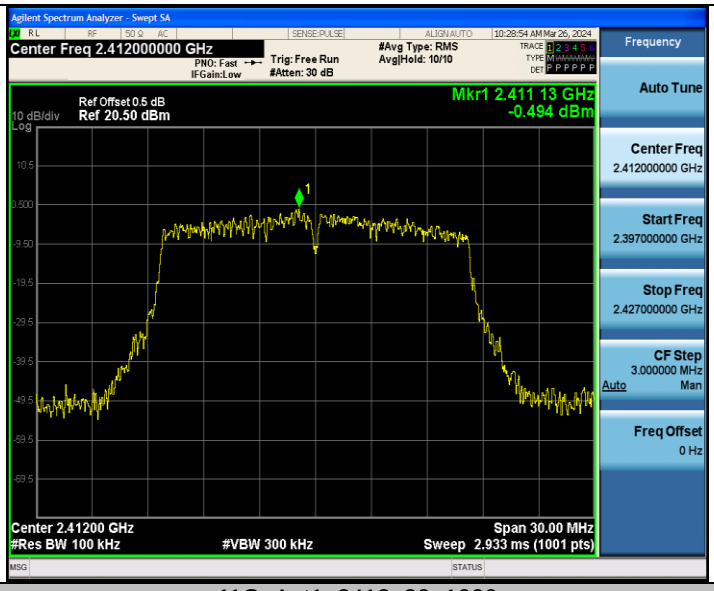
11B_Ant2_2462_30~1000



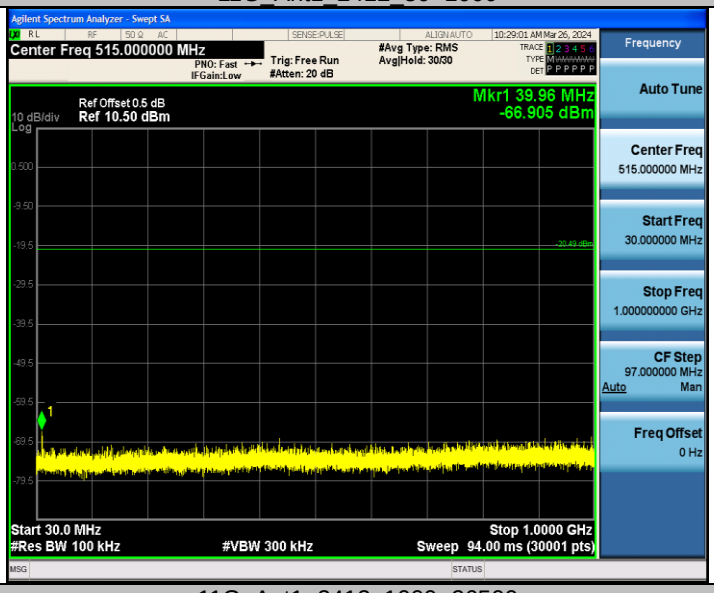
11B_Ant2_2462_1000~26500



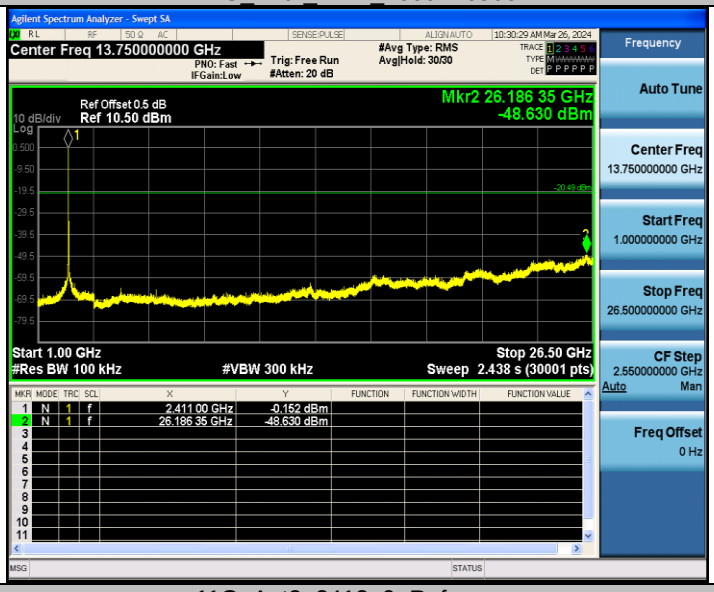
11G_Ant1_2412_0~Reference



11G_Ant1_2412_30~1000



11G_Ant1_2412_1000~26500



11G_Ant2_2412_0~Reference