CTC Laboratories, Inc.

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TEST REPORT

Report No. .....:	**CTC20231666E13**
FCC ID.....:	**2AR24-XBOX**
Applicant .....:	**Shenzhen Absen Optoelectronic Co.,Ltd**
Address.....:	18-20/F, Tower A, Building 3, Phase I, Tian An Cloud Park, N0.2018, Xuegang Rd, Bantian, Longgang District, Shenzhen, Guangdong, P.R. China
Manufacturer.....:	Shenzhen Absen Optoelectronic Co.,Ltd
Address.....:	18-20/F, Tower A, Building 3, Phase I, Tian An Cloud Park, N0.2018, Xuegang Rd, Bantian, Longgang District, Shenzhen, Guangdong, P.R. China
Product Name .....:	**LED Multimedia Processor**
Trade Mark .....:	Absen
Model/Type reference.....:	X-Box
Listed Model(s) .....:	/
Standard .....:	**FCC CFR Title 47 Part 15 Subpart C Section 15.247**
Date of receipt of test sample.....:	Aug. 18, 2023
Date of testing.....:	Aug. 19, 2023 ~ Dec. 3, 2023
Date of issue.....:	Aug. 09, 2024
Result.....:	**PASS**

Compiled by: (Printed name+signature)	Lucy Lan	Lucy Lan
Supervised by: (Printed name+signature)	Eric Zhang	Eric Zhang
Approved by: (Printed name+signature)	Totti Zhao	Totti Zhao

Testing Laboratory Name .....:	**CTC Laboratories, Inc.**
Address.....:	2/F., Building 1 and 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Longhua District, Shenzhen, Guangdong, China

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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.

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	CTC20231666E13	Aug. 09, 2024	Original

1.3. Test Description

FCC Part 15 Subpart C (15.247)			
Test Item	**Standard Section**	**Result**	**Test Engineer**
Antenna Requirement	15.203	Pass	Lucy Lan
Conducted Emission	15.207	Pass	Lucy Lan
Conducted Band Edge and Spurious Emissions	15.247(d)	Pass	Lucy Lan
Radiated Band Edge and Spurious Emissions	15.205&15.209& 15.247(d)	Pass	Lucy Lan
6dB Bandwidth	15.247(a)(2)	Pass	Lucy Lan
Conducted Max Output Power	15.247(b)(3)	Pass	Lucy Lan
Power Spectral Density	15.247(e)	Pass	Lucy Lan
Transmitter Radiated Spurious	15.209&15.247(d)	Pass	Lucy Lan

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 of Building B, Room 107, 108, 207, 208 of Building A, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua 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 Absen Optoelectronic Co.,Ltd
Address:	18-20/F, Tower A, Building 3, Phase I, Tian An Cloud Park, N0.2018, Xuegang Rd, Bantian, Longgang District, Shenzhen, Guangdong, P.R. China
Manufacturer:	Shenzhen Absen Optoelectronic Co.,Ltd
Address:	18-20/F, Tower A, Building 3, Phase I, Tian An Cloud Park, N0.2018, Xuegang Rd, Bantian, Longgang District, Shenzhen, Guangdong, P.R. China
Factory:	Huizhou Absen Optoelectronic Limited.
Address:	No. 03, Donghua South road, Dongjiang Hi-tech Industry Park, Huizhou. Guangdong, China

2.2. General Description of EUT

Product Name:	LED Multimedia Processor
Trade Mark:	Absen
Model/Type reference:	X-Box
Listed Model(s):	/
Model Difference:	/
Power Supply:	AC 100-240V~2.6A 50/60Hz
RF Module Model:	AP6275S
Hardware Version:	/
Software Version:	/
2.4G Wi-Fi	
Modulation:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/ n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Operation Frequency:	802.11b/ g/ n(HT20)/ ax(HE20): 2412MHz~2462MHz
Channel Number:	802.11b/ g/ n(HT20)/ ax(HE20): 11 channels
Channel Separation:	5MHz
Antenna Type:	PCB Antenna
Antenna Gain:	Ant 0: 3.52dBi Ant 1: 3.50dBi

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	150cm
Test Software Information			
Name	Version	/	/
adb.exe	/	/	/

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)/ax(HE20)

Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain(dBi)
0	NA	NA	External Antenna	IPEX	3.52
1	NA	NA	External Antenna	IPEX	3.50

For 2.4G, this EUT supports MIMO 2X2 with the unequal antenna gain, and any transmit signals are correlated with each other.

According to KDB 662911 D01, Directional Gain = 10 log[(10G1 /20 + 10G2 /20 + … + 10GN /20) 2 /N] dBi, that is Directional Gain = 10 log[((10^(3.52/20)+10^(3.5/20))^2)/2]=6.52dBi. So output power limit is 30-6.52+6=**29.48**dBm, the power spectral density limit is 8-6.52+6=**7.48**dBm/3kHz.

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 the worst case mode.

Test Mode	Data Rate (worst mode)
802.11b	1Mbps
802.11g	6Mbps
802.11n(HT20)	HT-MCS0
802.11ax(HE20)	HE-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.

RU Configuration:

Operating Mode	Resource Unit	26 Tone (2M)
802.11ax(HE20)	Specific Resource Unit	0
		⋮
		4
		⋮
		8
	Resource Unit	52 Tone (4M)
	Specific Resource Unit	37
		38
		39
		40
	Resource Unit	106 Tone (8M)
	Specific Resource Unit	53
		54
	Resource Unit	242 Tone (20M)
	Specific Resource Unit	61

2.5. Measurement Instruments List

RF Test System					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	MXA Signal Analyzer	Keysight	N9020A	MY46471737	Dec. 16, 2023
2	High and low temperature test chamber	ESPEC	MT3035	/	Mar. 24, 2024
3	Test Software	WCS	WCS-WCN	2023.08.04	/

Radiated Emission (3m chamber 3)					
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	Dec. 01, 2024
3	Test Receiver	Keysight	N9038A	MY56400071	Dec. 16, 2023
4	Broadband Amplifier	SCHWARZBECK	BBV9743B	259	Dec. 16, 2023
5	Mirowave Broadband Amplifier	SCHWARZBECK	BBV9718C	111	Dec. 16, 2023
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. 16, 2023
2	LISN	R&S	ENV216	101113	Dec. 16, 2023
3	EMI Test Receiver	R&S	ESCS30	100353	Dec. 16, 2023
4	ISN CAT6	Schwarzbeck	NTFM 8158	CAT6-8158-0046	Dec. 16, 2023
5	ISN CAT5	Schwarzbeck	NTFM 8158	CAT5-8158-0046	Dec. 16, 2023
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

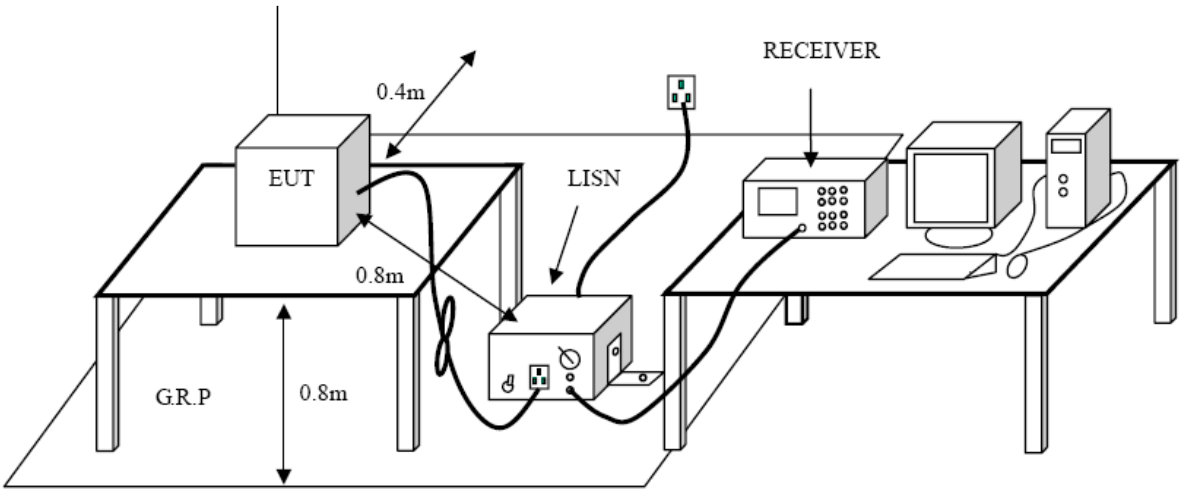
Limit

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

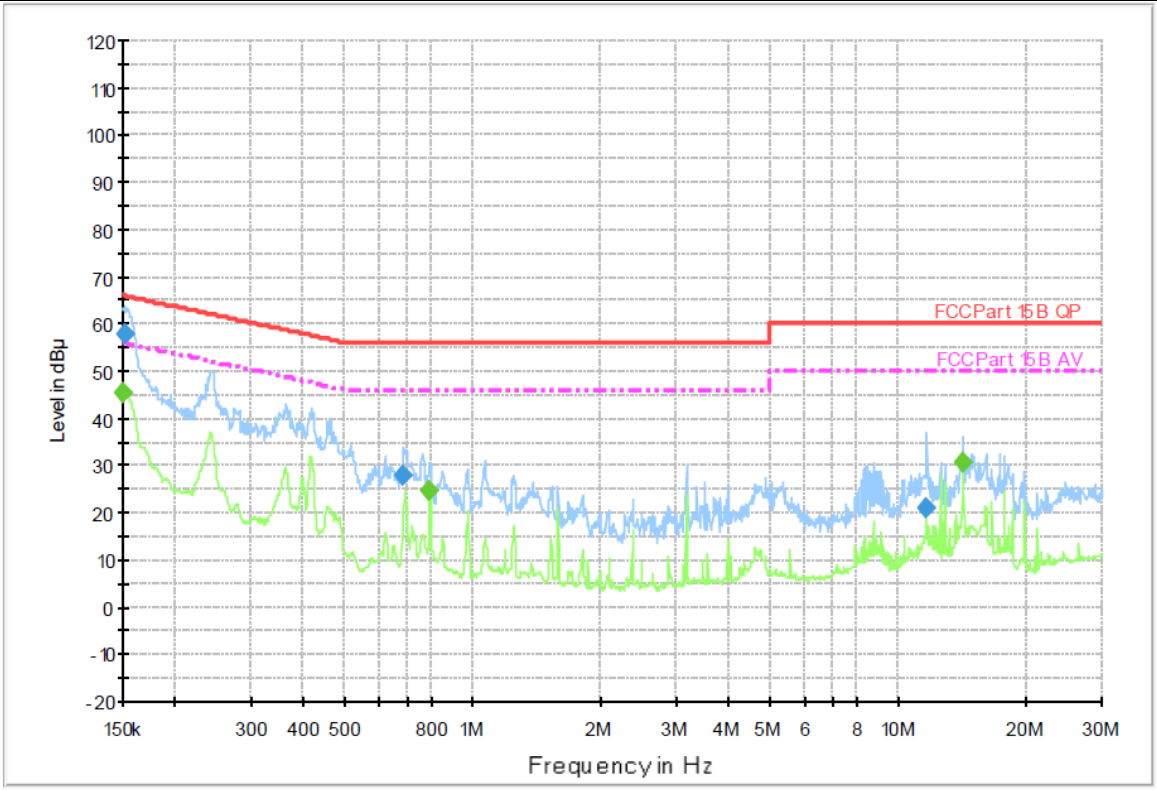
1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from 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

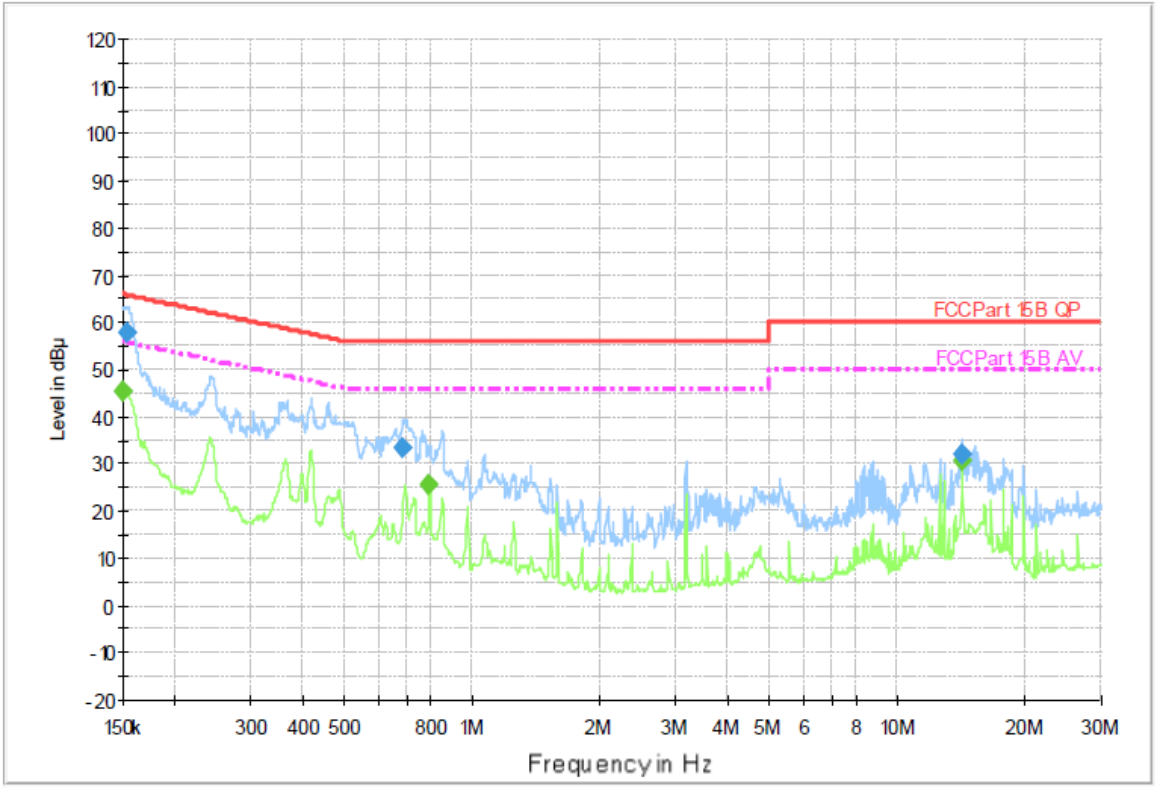
Frequency (MHz)	QuasiPeak (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.151810	58.0	1000.00	9.000	On	L1	9.4	7.9	65.9	
0.686490	27.7	1000.00	9.000	On	L1	9.5	28.3	56.0	
11.636930	21.1	1000.00	9.000	On	L1	9.7	38.9	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.150000	45.3	1000.00	9.000	On	L1	9.4	10.7	56.0	
0.789430	24.7	1000.00	9.000	On	L1	9.5	21.3	46.0	
14.151110	30.7	1000.00	9.000	On	L1	9.8	19.3	50.0	

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 (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.153640	58.0	1000.00	9.000	On	N	9.3	7.8	65.8	
0.686490	33.3	1000.00	9.000	On	N	9.4	22.7	56.0	
14.151110	32.2	1000.00	9.000	On	N	9.6	27.8	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.150600	45.5	1000.00	9.000	On	N	9.3	10.5	56.0	
0.789430	25.7	1000.00	9.000	On	N	9.4	20.3	46.0	
14.151110	30.9	1000.00	9.000	On	N	9.6	19.1	50.0	

Emission Level = Read Level + Correct Factor

3.2. Radiated Emission

Limit

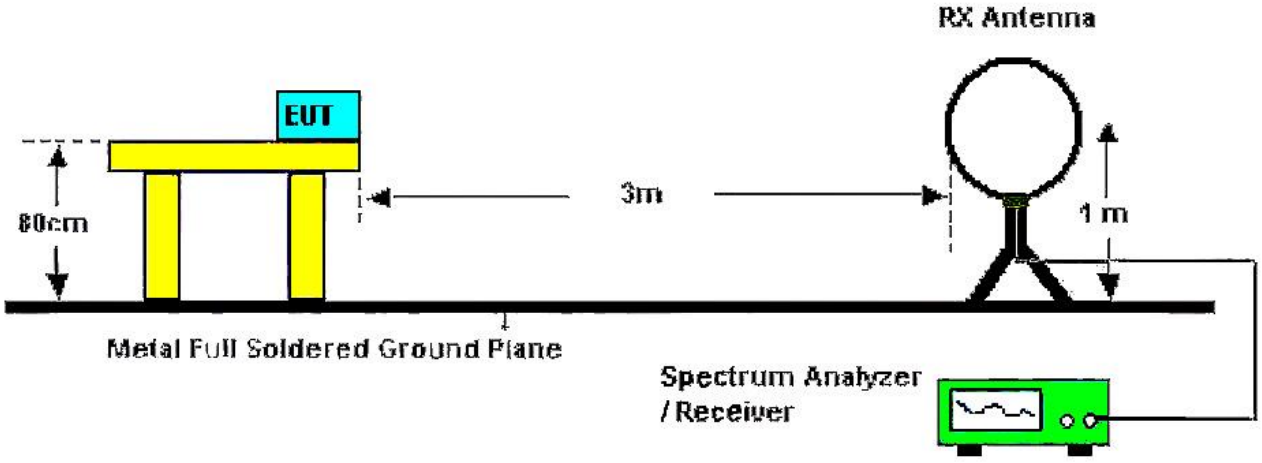
FCC CFR Title 47 Part 15 Subpart C Section 15.209 / RSS-Gen 8.9

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

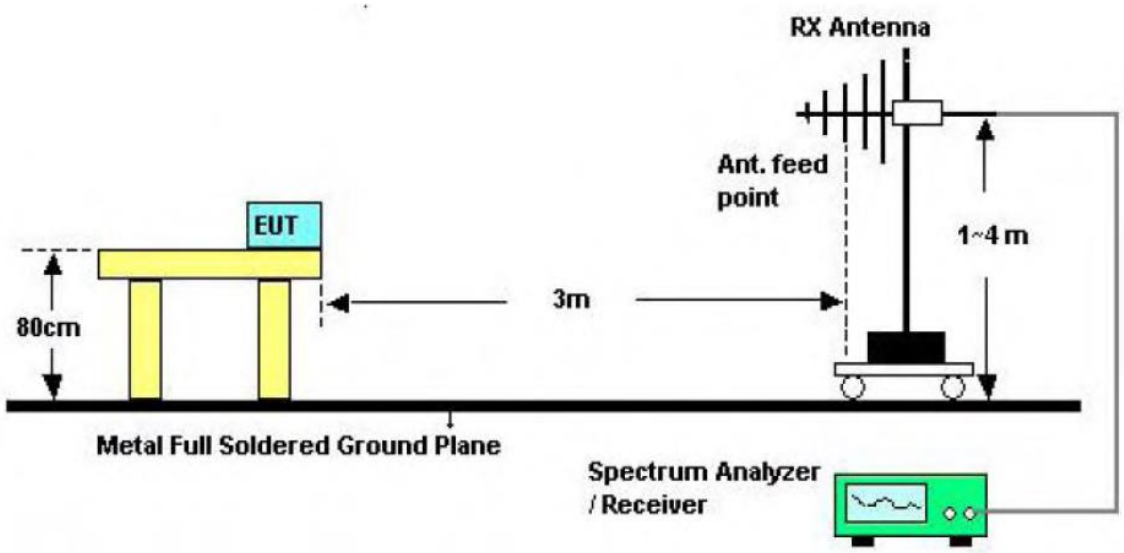
Frequency Range (MHz)	dBμV/m (at 3 meters)	
	Peak	Average
Above 1000	74	54

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

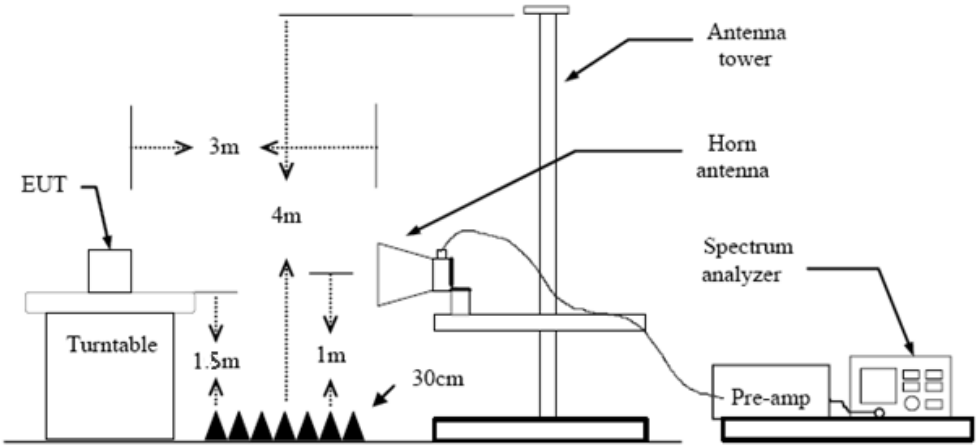
Test Configuration



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

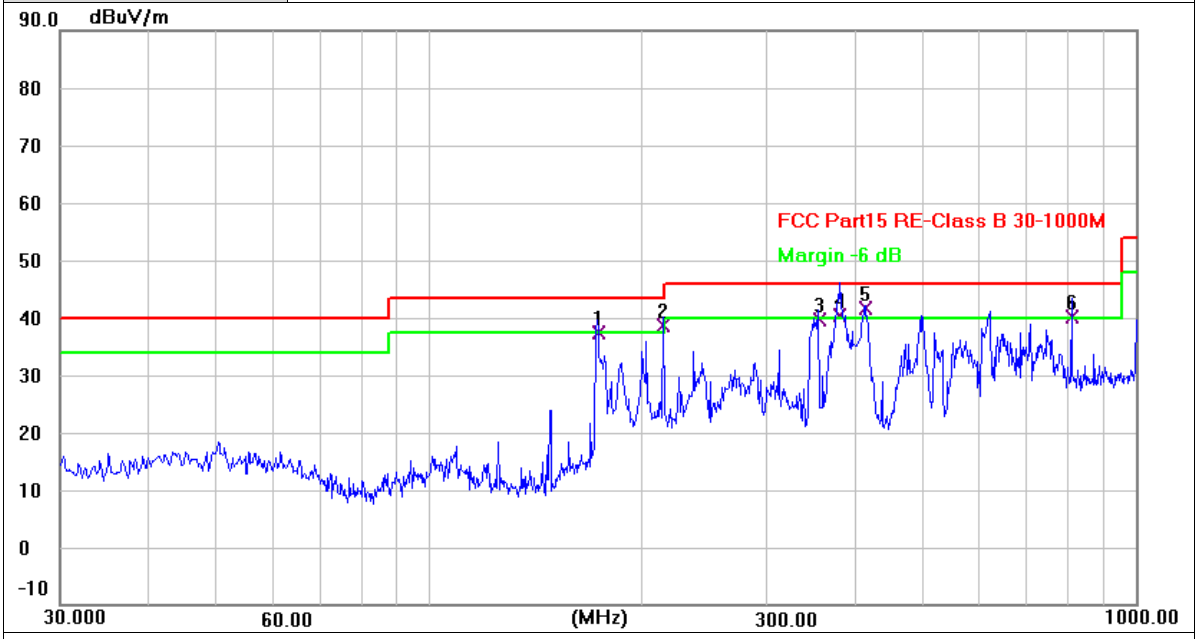
9 kHz~30 MHz

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

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

30MHz-1GHz

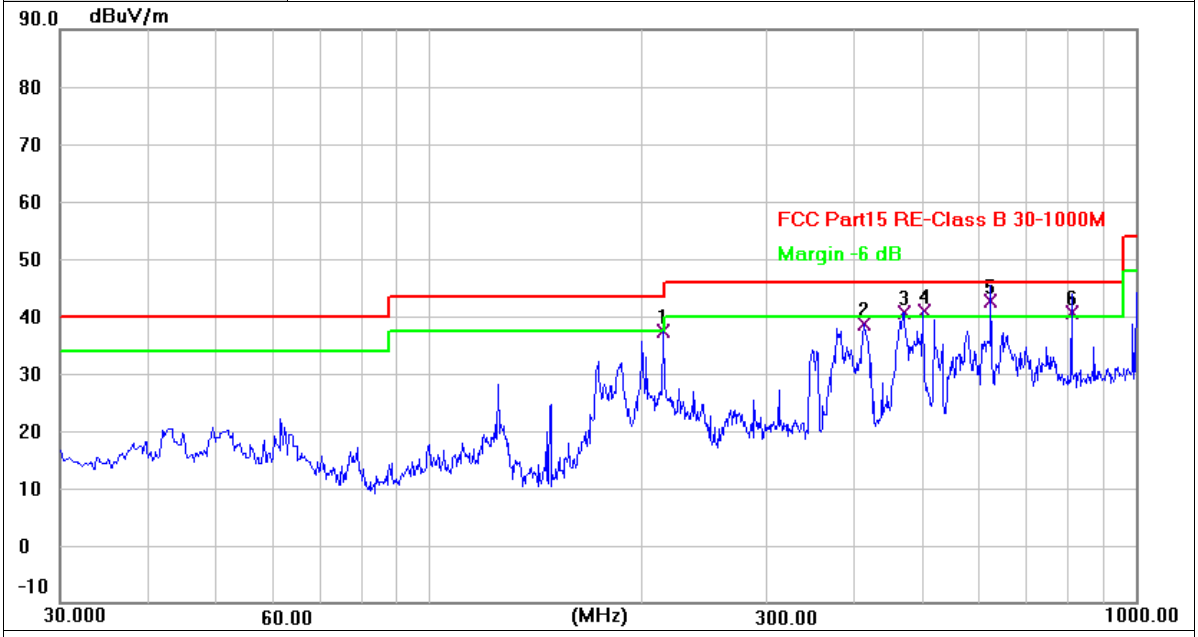
Ant. No.	Ant 0
Ant. Pol.	Horizontal
Test Mode:	TX 802.11b Mode 2412MHz
Remark:	Only worse case is reported.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	172.9133	55.61	-18.33	37.28	43.50	-6.22	QP
2 !	214.6233	54.21	-15.54	38.67	43.50	-4.83	QP
3	355.5967	51.38	-11.76	39.62	46.00	-6.38	QP
4 !	382.1099	51.66	-11.38	40.28	46.00	-5.72	QP
5 *	413.7967	52.57	-10.90	41.67	46.00	-4.33	QP
6 !	812.4667	44.33	-4.15	40.18	46.00	-5.82	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 0
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	214.6233	52.99	-15.54	37.45	43.50	-6.05	QP
2	413.1500	49.50	-10.91	38.59	46.00	-7.41	QP
3 !	470.0567	50.64	-9.90	40.74	46.00	-5.26	QP
4 !	500.1267	50.29	-9.29	41.00	46.00	-5.00	QP
5 *	624.9333	49.37	-6.81	42.56	46.00	-3.44	QP
6 !	812.4667	44.73	-4.15	40.58	46.00	-5.42	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 0
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 *	4823.926	35.99	2.11	38.10	54.00	-15.90	AVG
2	4823.929	43.25	2.11	45.36	74.00	-28.64	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 0
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 *	4824.047	24.50	2.11	26.61	54.00	-27.39	AVG
2	4824.277	39.82	2.11	41.93	74.00	-32.07	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 0
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 *	4873.939	33.51	2.18	35.69	54.00	-18.31	AVG
2	4873.997	42.40	2.18	44.58	74.00	-29.42	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 0
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 *	4874.213	23.40	2.18	25.58	54.00	-28.42	AVG
2	4874.291	38.46	2.18	40.64	74.00	-33.36	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 0
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	4923.799	39.33	2.26	41.59	74.00	-32.41	peak
2 *	4923.877	27.19	2.26	29.45	54.00	-24.55	AVG

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

Ant. No.	Ant 0
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	4923.492	37.54	2.26	39.80	74.00	-34.20	peak
2 *	4924.099	23.13	2.26	25.39	54.00	-28.61	AVG

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

Ant. No.	Ant 0
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	4823.877	40.62	2.11	42.73	74.00	-31.27	peak
2 *	4824.266	25.12	2.11	27.23	54.00	-26.77	AVG

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

Ant. No.	Ant 0
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	4823.565	39.35	2.11	41.46	74.00	-32.54	peak
2 *	4824.327	24.03	2.11	26.14	54.00	-27.86	AVG

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

Ant. No.	Ant 0
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 *	4873.039	23.66	2.18	25.84	54.00	-28.16	AVG
2	4873.757	38.53	2.18	40.71	74.00	-33.29	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 0
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	4873.339	39.10	2.18	41.28	74.00	-32.72	peak
2 *	4874.382	23.55	2.18	25.73	54.00	-28.27	AVG

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

Ant. No.	Ant 0
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 *	4923.264	23.58	2.25	25.83	54.00	-28.17	AVG
2	4923.743	38.96	2.26	41.22	74.00	-32.78	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 0
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 *	4923.712	23.04	2.26	25.30	54.00	-28.70	AVG
2	4924.721	38.83	2.26	41.09	74.00	-32.91	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 0 + Ant 1
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 *	4823.133	24.85	2.10	26.95	54.00	-27.05	AVG
2	4823.318	39.89	2.10	41.99	74.00	-32.01	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 0 + Ant 1
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	4823.500	39.48	2.11	41.59	74.00	-32.41	peak
2 *	4824.329	24.65	2.11	26.76	54.00	-27.24	AVG

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

Ant. No.	Ant 0 + Ant 1
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	4873.867	38.82	2.18	41.00	74.00	-33.00	peak
2 *	4874.751	23.45	2.18	25.63	54.00	-28.37	AVG

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

Ant. No.	Ant 0 + Ant 1
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 *	4873.099	23.59	2.18	25.77	54.00	-28.23	AVG
2	4873.375	39.25	2.18	41.43	74.00	-32.57	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 0 + Ant 1
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	4923.117	38.67	2.25	40.92	74.00	-33.08	peak
2 *	4923.622	23.25	2.26	25.51	54.00	-28.49	AVG

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

Ant. No.	Ant 0 + Ant 1
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 *	4923.063	23.48	2.25	25.73	54.00	-28.27	AVG
2	4924.777	38.91	2.26	41.17	74.00	-32.83	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 0 + Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11ax(HE20) Mode 2412MHz 242/61
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 *	4823.998	25.32	2.11	27.43	54.00	-26.57	AVG
2	4824.642	39.15	2.11	41.26	74.00	-32.74	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 0 + Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11ax(HE20) Mode 2412MHz 242/61
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 *	4824.455	23.67	2.11	25.78	54.00	-28.22	AVG
2	4824.624	39.30	2.11	41.41	74.00	-32.59	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 0 + Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11ax(HE20) Mode 2437MHz 242/61
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 *	4873.763	25.60	2.18	27.78	54.00	-26.22	AVG
2	4874.604	39.02	2.18	41.20	74.00	-32.80	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 0 + Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11ax(HE20) Mode 2437MHz 242/61
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	4874.647	39.80	2.18	41.98	74.00	-32.02	peak
2 *	4874.820	23.59	2.18	25.77	54.00	-28.23	AVG

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

Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11ax(HE20) Mode 2462MHz 242/61
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	4923.817	38.03	2.26	40.29	74.00	-33.71	peak
2 *	4924.746	24.84	2.26	27.10	54.00	-26.90	AVG

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

Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11ax(HE20) Mode 2462MHz 242/61
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 *	4923.971	23.17	2.26	25.43	54.00	-28.57	AVG
2	4924.763	38.84	2.26	41.10	74.00	-32.90	peak

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

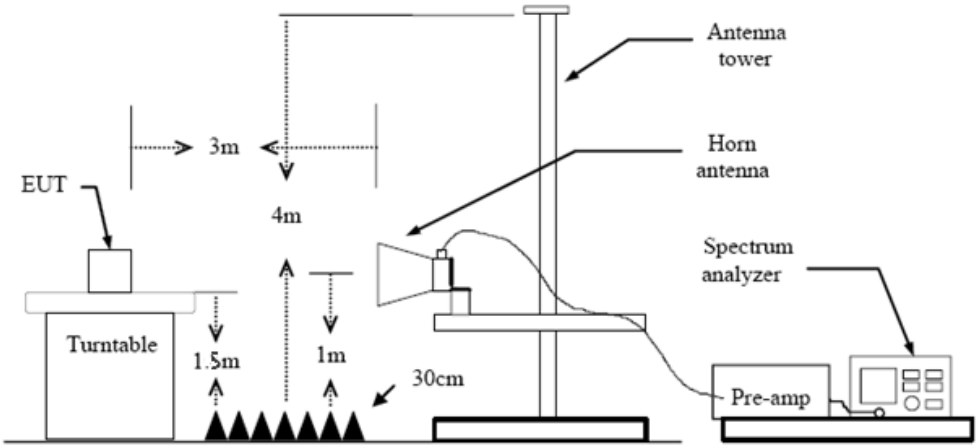
3.3. Band Edge Emissions (Radiated)

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d)

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.

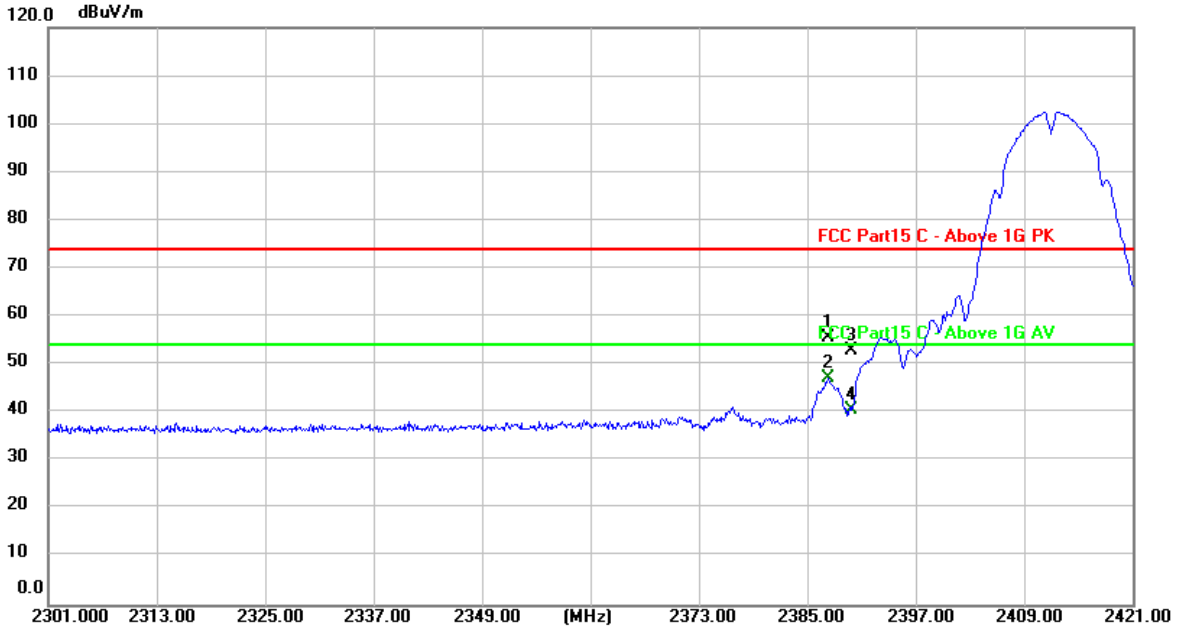
Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.8 Duty Cycle.

Test Mode

Please refer to the clause 2.4.

Test Result

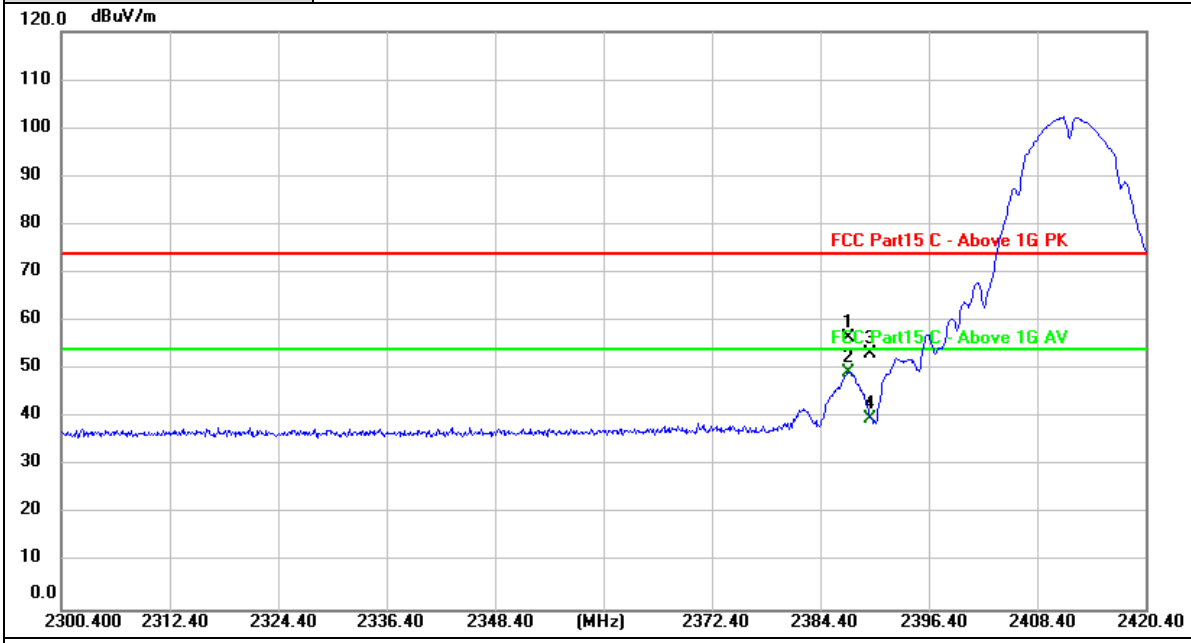
Ant. No.	Ant 0
Ant. Pol.	Horizontal
Test Mode:	TX 802.11b Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2387.280	24.33	31.31	55.64	74.00	-18.36	peak
2 *	2387.280	15.81	31.31	47.12	54.00	-6.88	AVG
3	2390.000	21.52	31.31	52.83	74.00	-21.17	peak
4	2390.000	9.21	31.31	40.52	54.00	-13.48	AVG

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

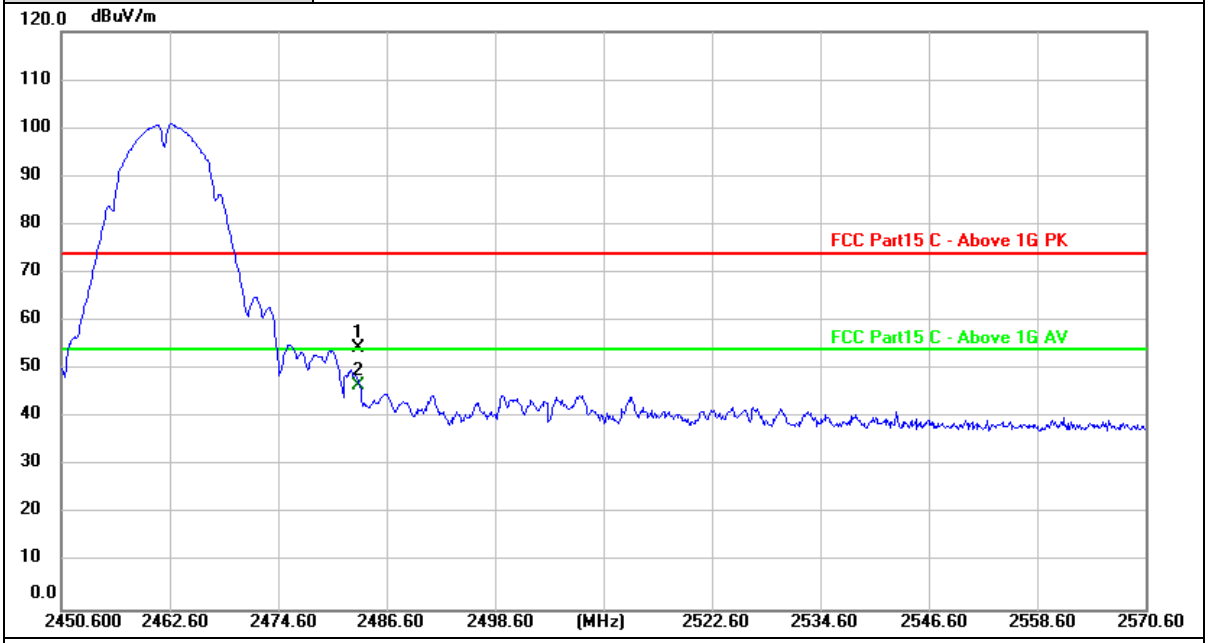
Ant. No.	Ant 0
Ant. Pol.	Vertical
Test Mode:	TX 802.11b Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2387.640	25.36	31.31	56.67	74.00	-17.33	peak
2 *	2387.640	18.17	31.31	49.48	54.00	-4.52	AVG
3	2390.000	21.95	31.31	53.26	74.00	-20.74	peak
4	2390.000	8.56	31.31	39.87	54.00	-14.13	AVG

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

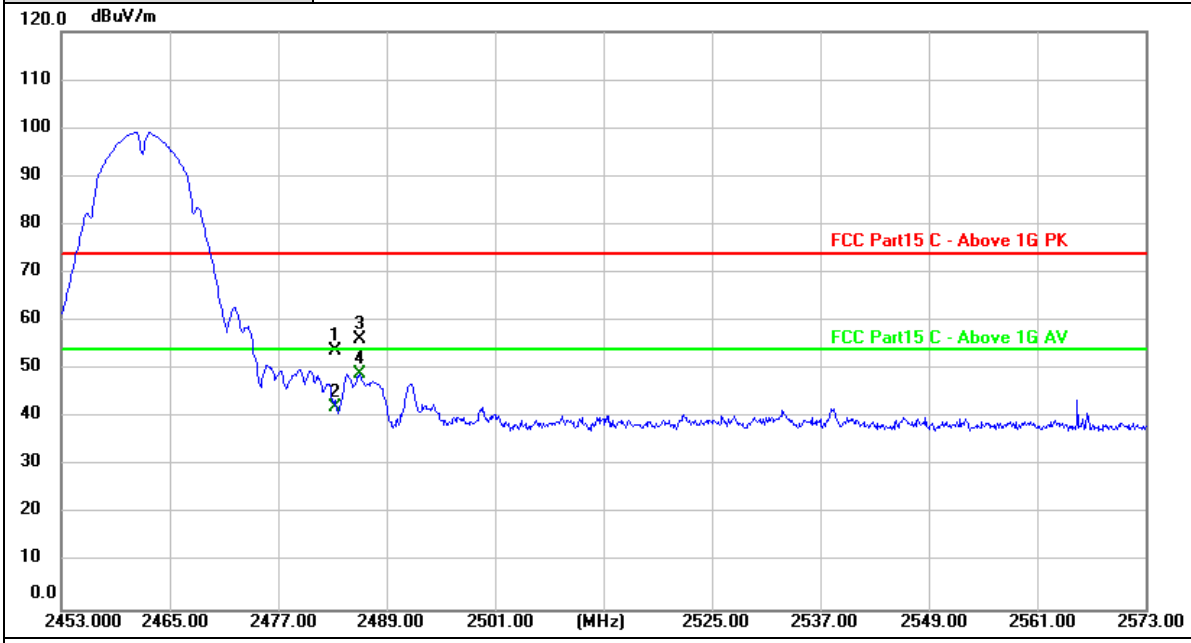
Ant. No.	Ant 0
Ant. Pol.	Horizontal
Test Mode:	TX 802.11b Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	22.98	31.48	54.46	74.00	-19.54	peak
2 *	2483.500	15.26	31.48	46.74	54.00	-7.26	AVG

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

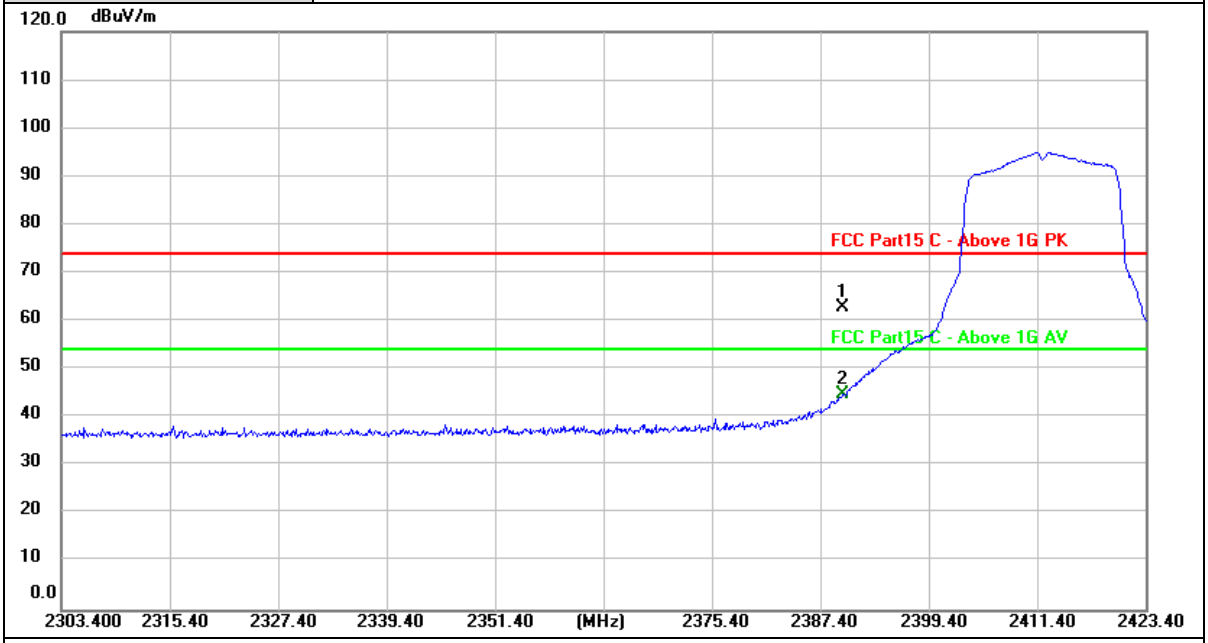
Ant. No.	Ant 0
Ant. Pol.	Vertical
Test Mode:	TX 802.11b Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	22.26	31.48	53.74	74.00	-20.26	peak
2	2483.500	10.76	31.48	42.24	54.00	-11.76	AVG
3	2486.040	24.88	31.49	56.37	74.00	-17.63	peak
4 *	2486.040	17.49	31.49	48.98	54.00	-5.02	AVG

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

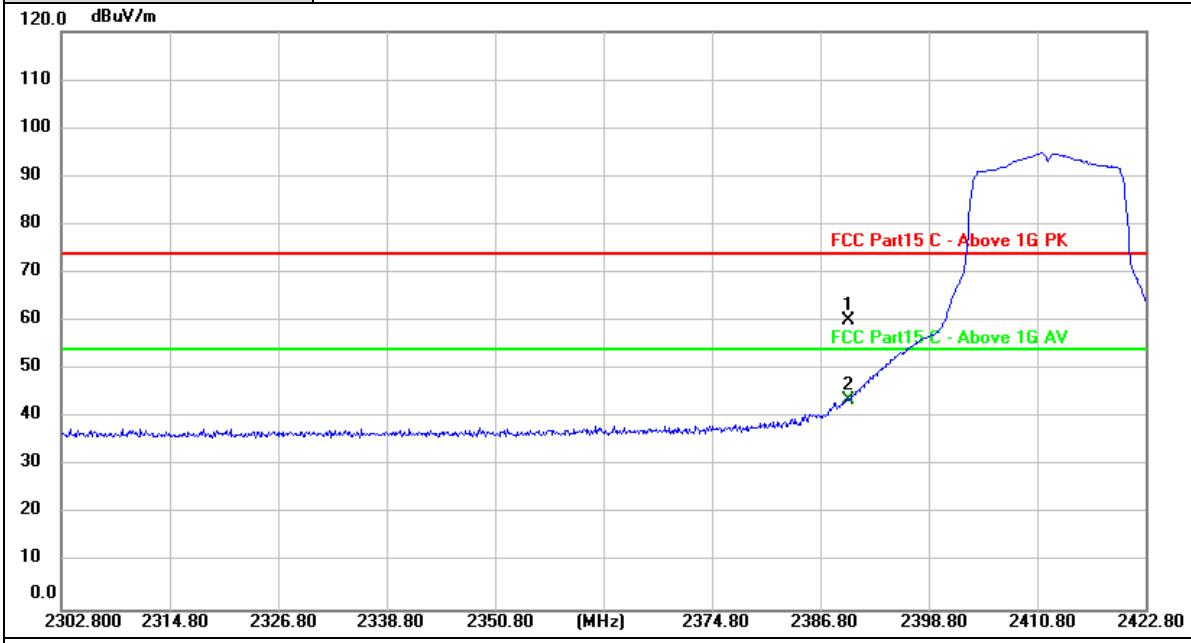
Ant. No.	Ant 0
Ant. Pol.	Horizontal
Test Mode:	TX 802.11g Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	31.67	31.31	62.98	74.00	-11.02	peak
2 *	2390.000	13.68	31.31	44.99	54.00	-9.01	AVG

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

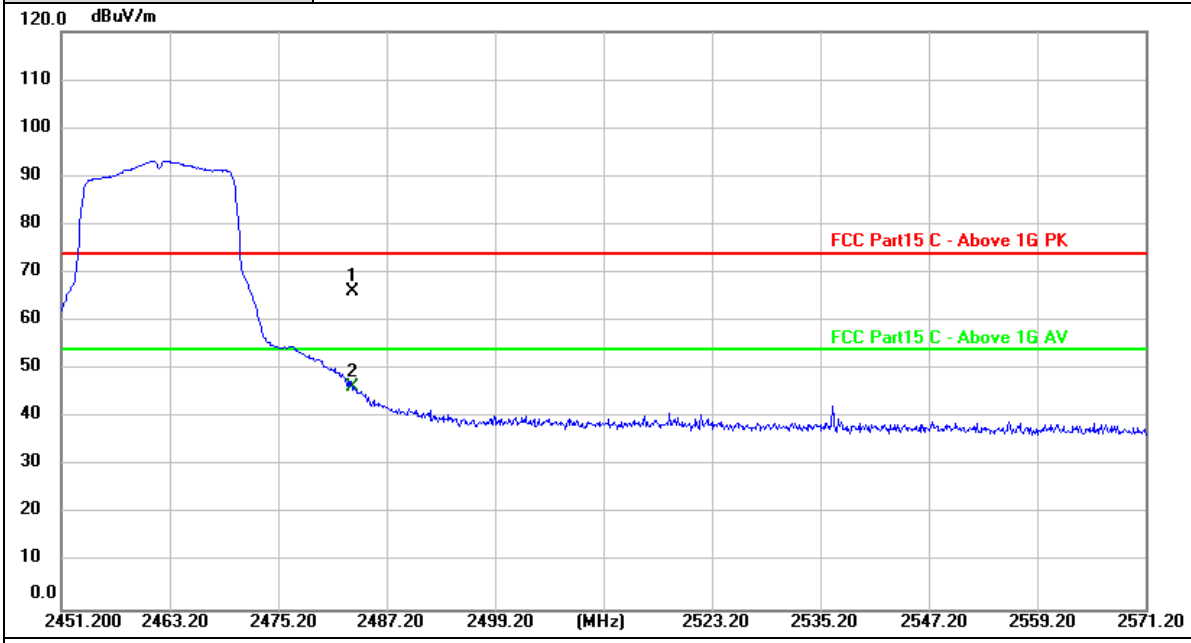
Ant. No.	Ant 0
Ant. Pol.	Vertical
Test Mode:	TX 802.11g Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	28.86	31.31	60.17	74.00	-13.83	peak
2 *	2390.000	12.40	31.31	43.71	54.00	-10.29	AVG

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

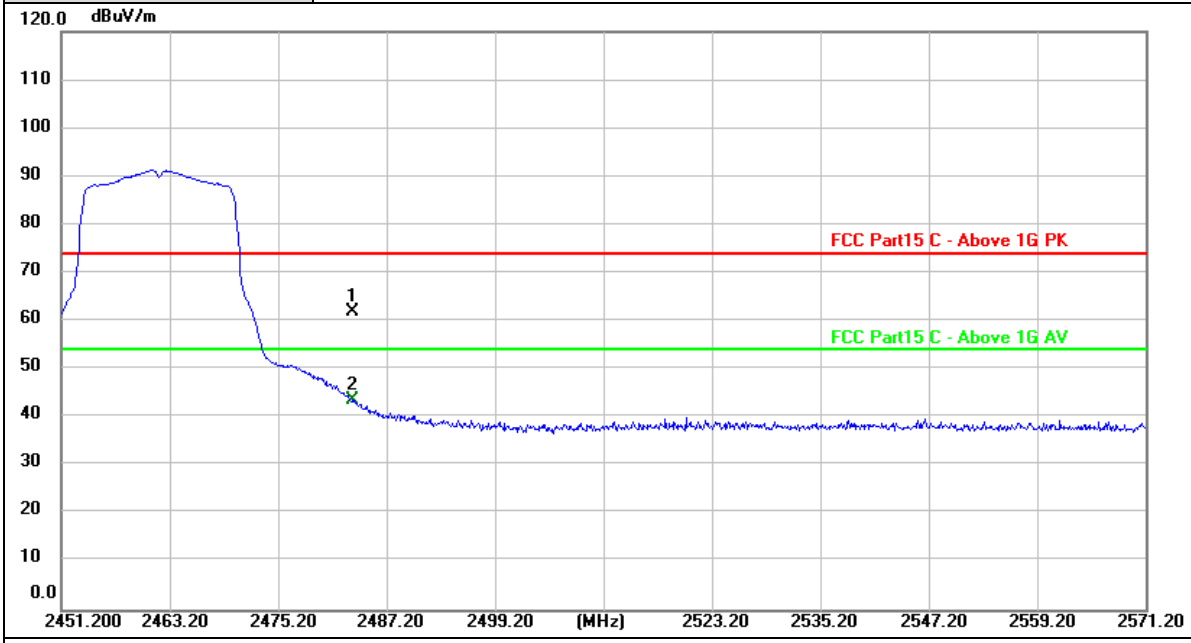
Ant. No.	Ant 0
Ant. Pol.	Horizontal
Test Mode:	TX 802.11g Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	34.69	31.48	66.17	74.00	-7.83	peak
2 *	2483.500	15.01	31.48	46.49	54.00	-7.51	AVG

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

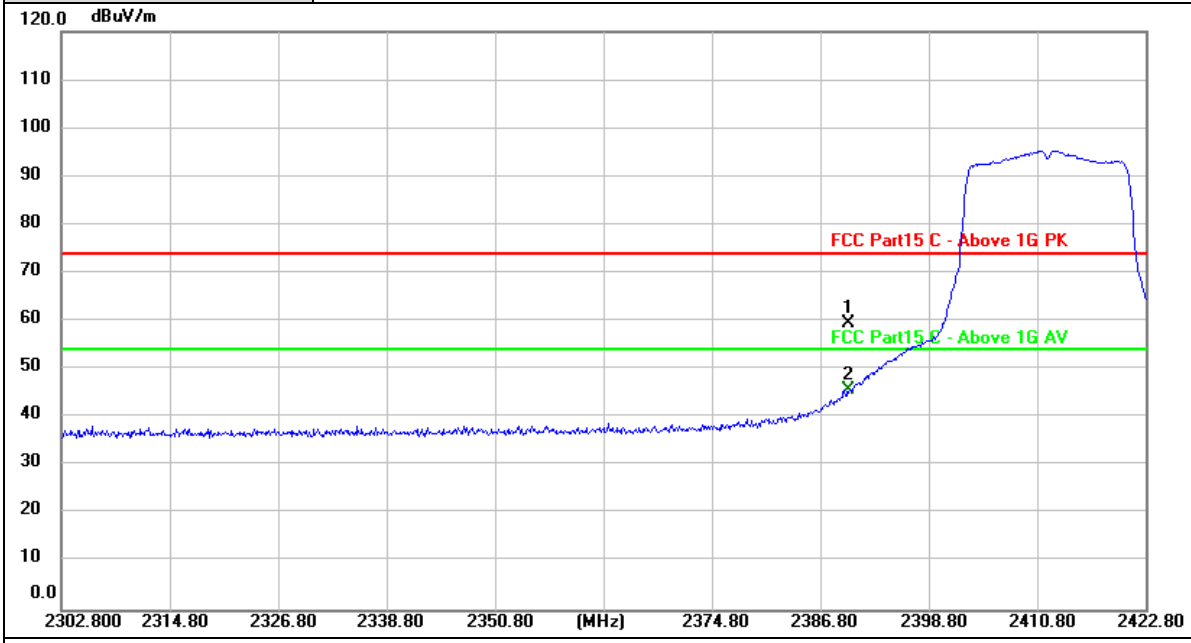
Ant. No.	Ant 0
Ant. Pol.	Vertical
Test Mode:	TX 802.11g Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	30.57	31.48	62.05	74.00	-11.95	peak
2 *	2483.500	12.18	31.48	43.66	54.00	-10.34	AVG

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

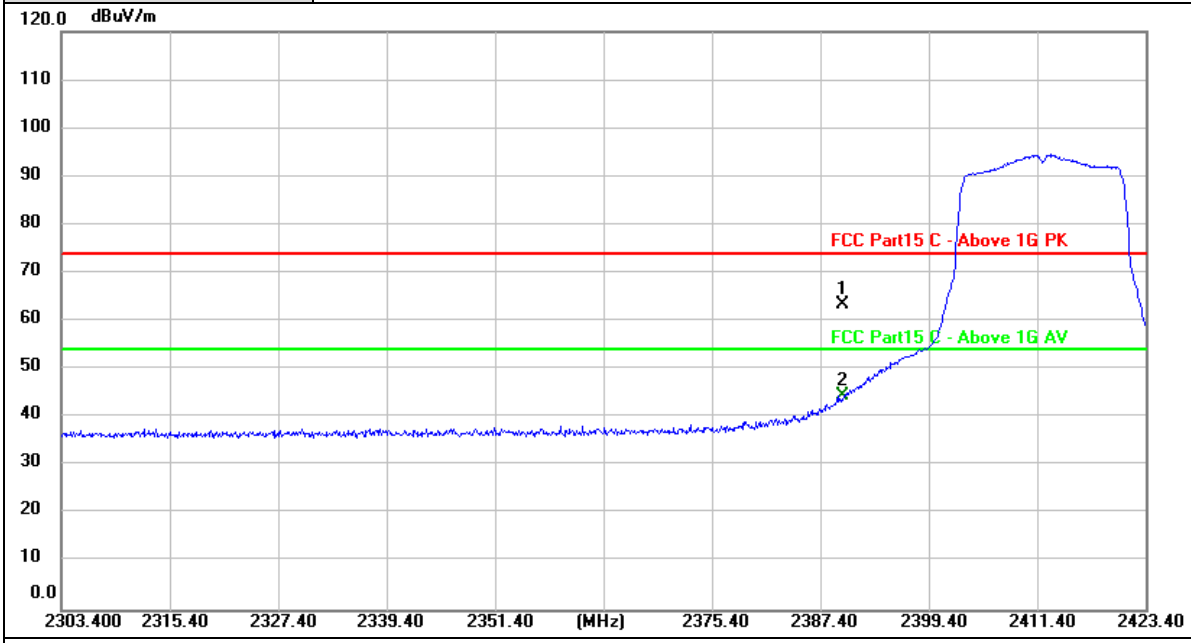
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT20) Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	28.24	31.31	59.55	74.00	-14.45	peak
2 *	2390.000	14.57	31.31	45.88	54.00	-8.12	AVG

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

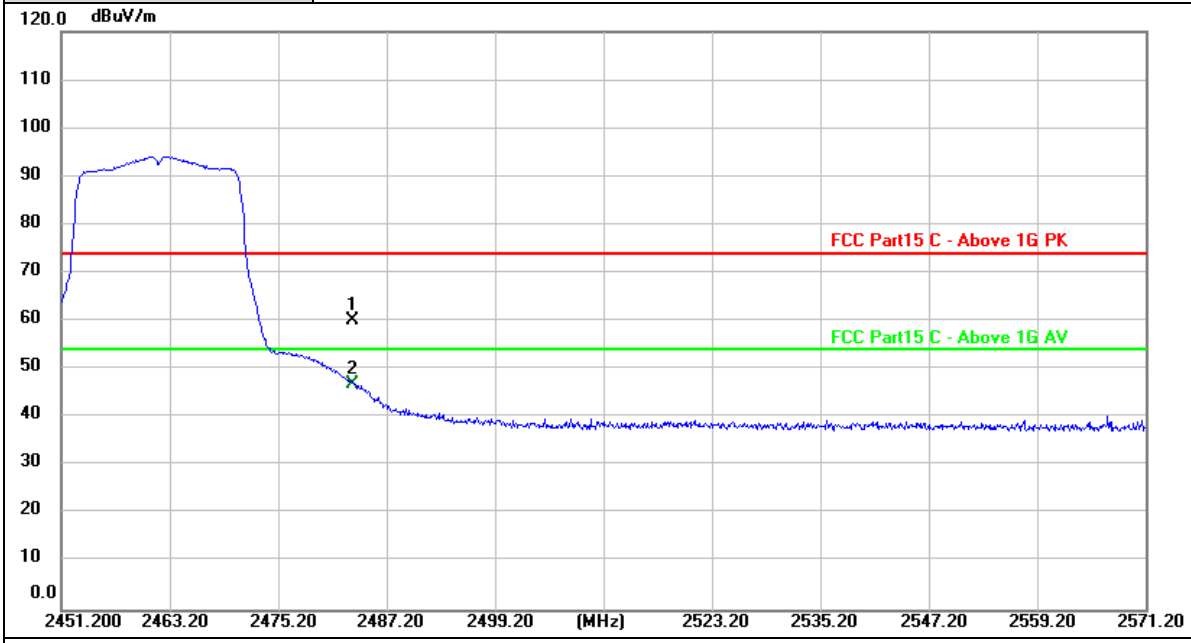
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT20) Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	32.02	31.31	63.33	74.00	-10.67	peak
2 *	2390.000	13.24	31.31	44.55	54.00	-9.45	AVG

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

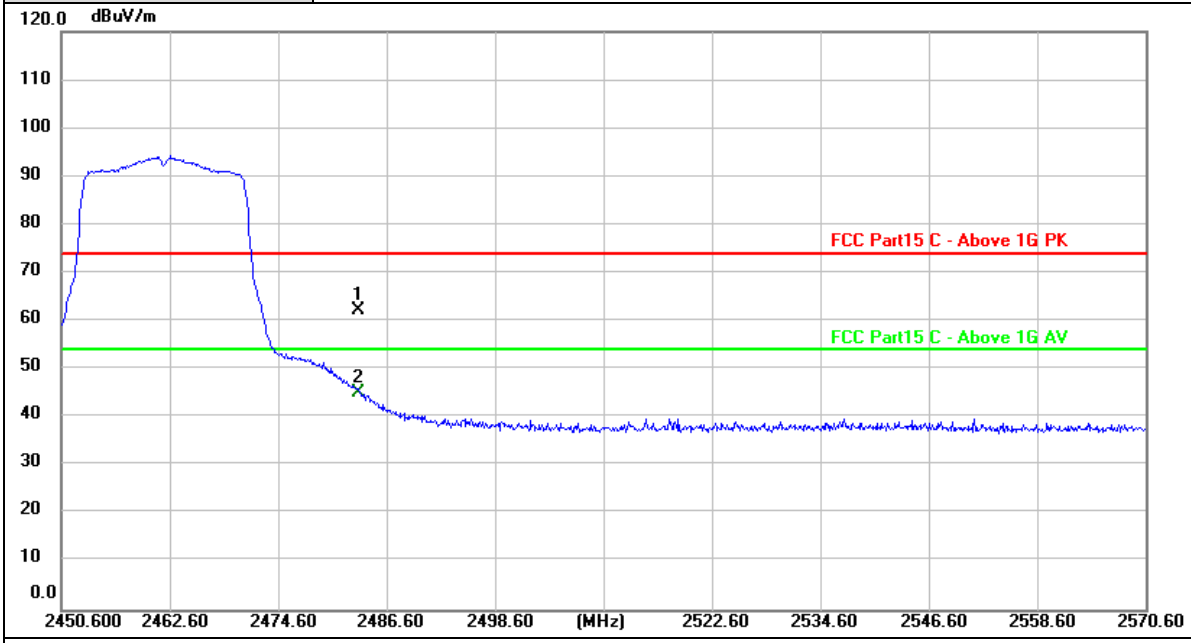
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT20) Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	28.71	31.48	60.19	74.00	-13.81	peak
2 *	2483.500	15.35	31.48	46.83	54.00	-7.17	AVG

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

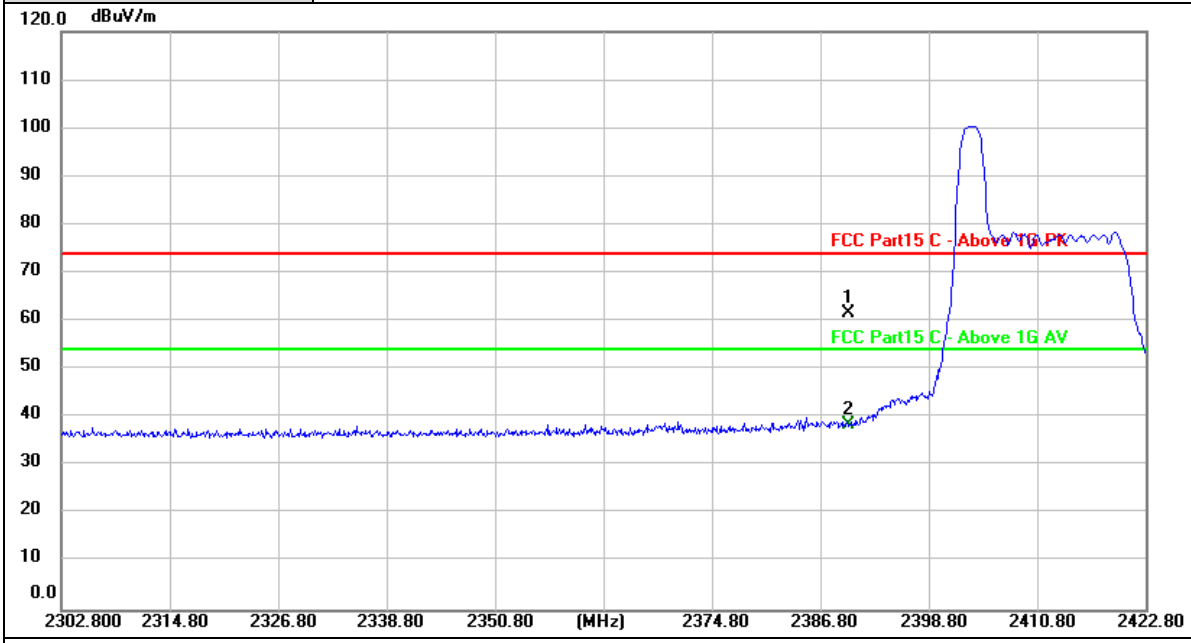
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT20) Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	30.76	31.48	62.24	74.00	-11.76	peak
2 *	2483.500	13.73	31.48	45.21	54.00	-8.79	AVG

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

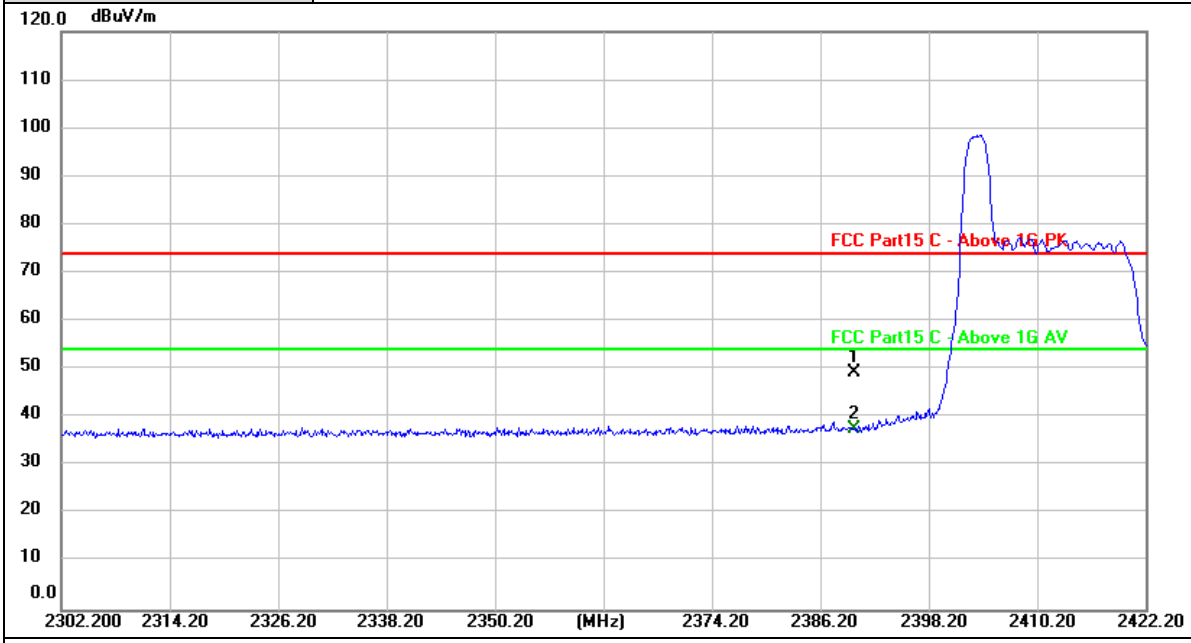
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11ax(HE20) Mode 2412MHz 26/0



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	2390.000	30.40	31.31	61.71	74.00	-12.29	peak
2	2390.000	7.32	31.31	38.63	54.00	-15.37	AVG

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

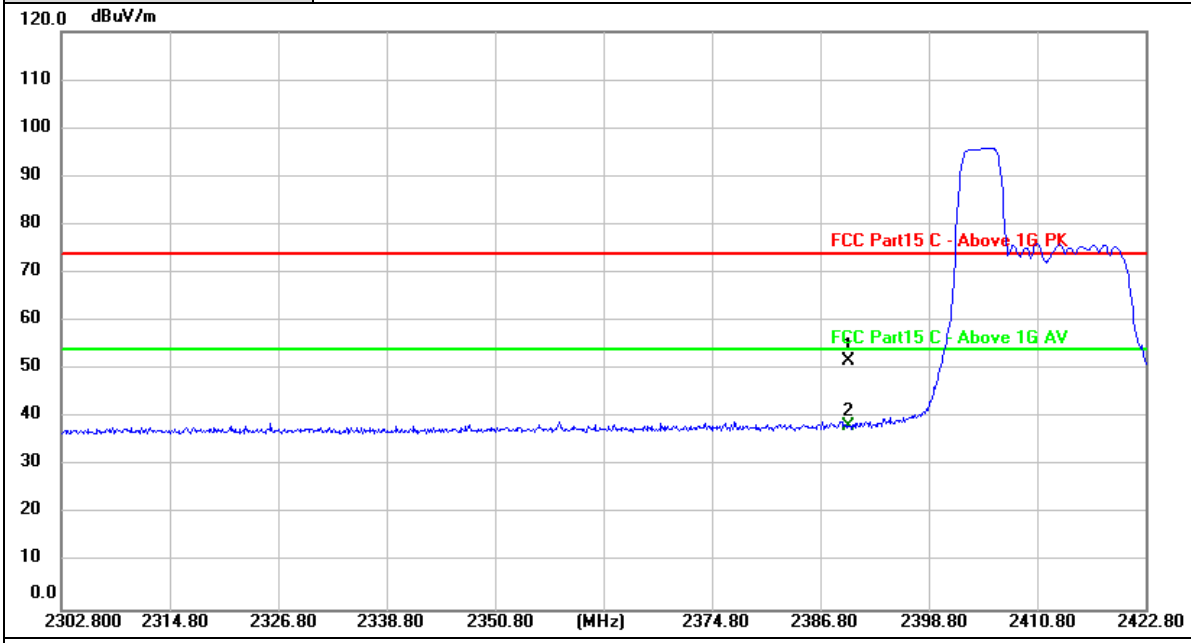
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11ax(HE20) Mode 2412MHz 26/0



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	18.17	31.31	49.48	74.00	-24.52	peak
2 *	2390.000	6.38	31.31	37.69	54.00	-16.31	AVG

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

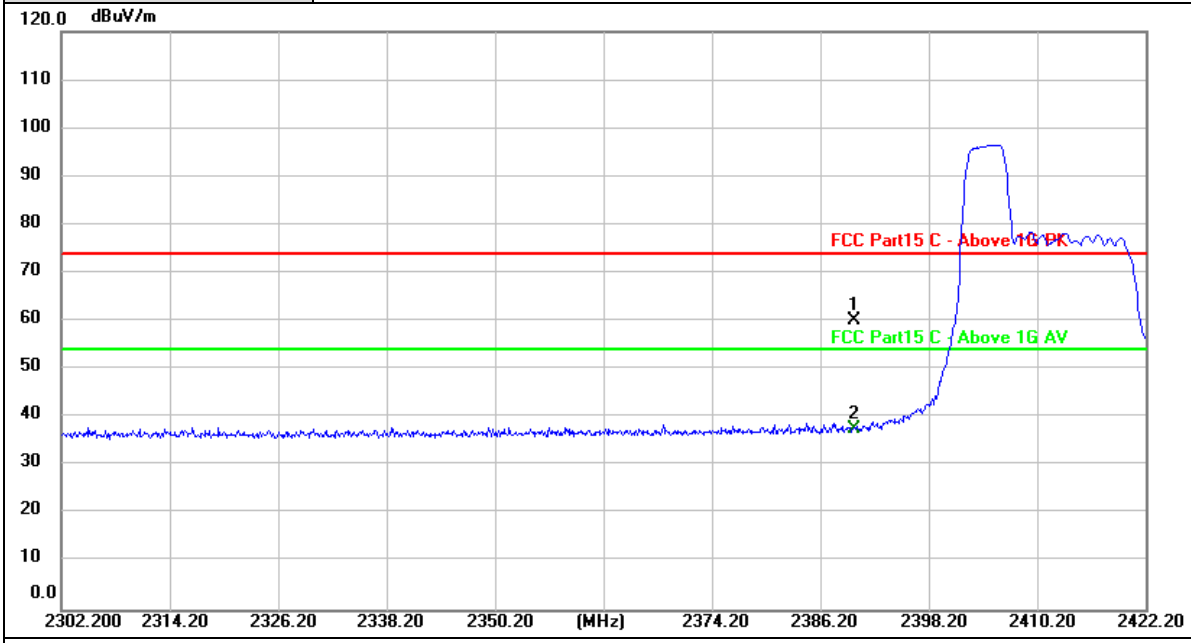
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11ax(HE20) Mode 2412MHz 52/37



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	20.43	31.31	51.74	74.00	-22.26	peak
2 *	2390.000	6.97	31.31	38.28	54.00	-15.72	AVG

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

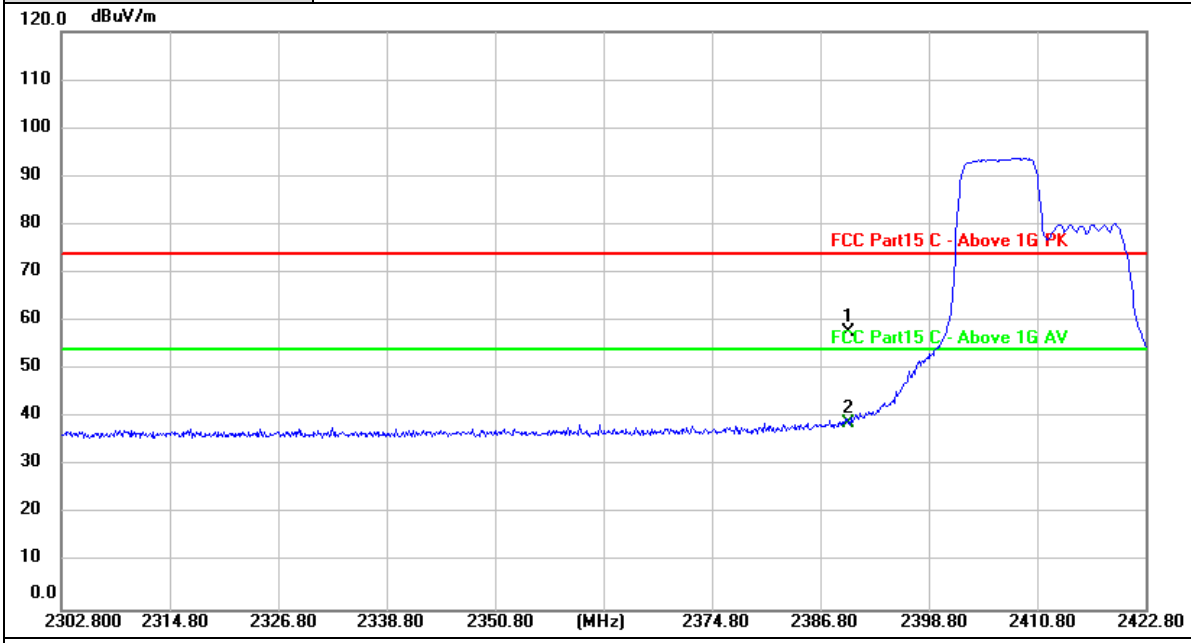
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11ax(HE20) Mode 2412MHz 52/37



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	2390.000	28.87	31.31	60.18	74.00	-13.82	peak
2	2390.000	6.31	31.31	37.62	54.00	-16.38	AVG

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

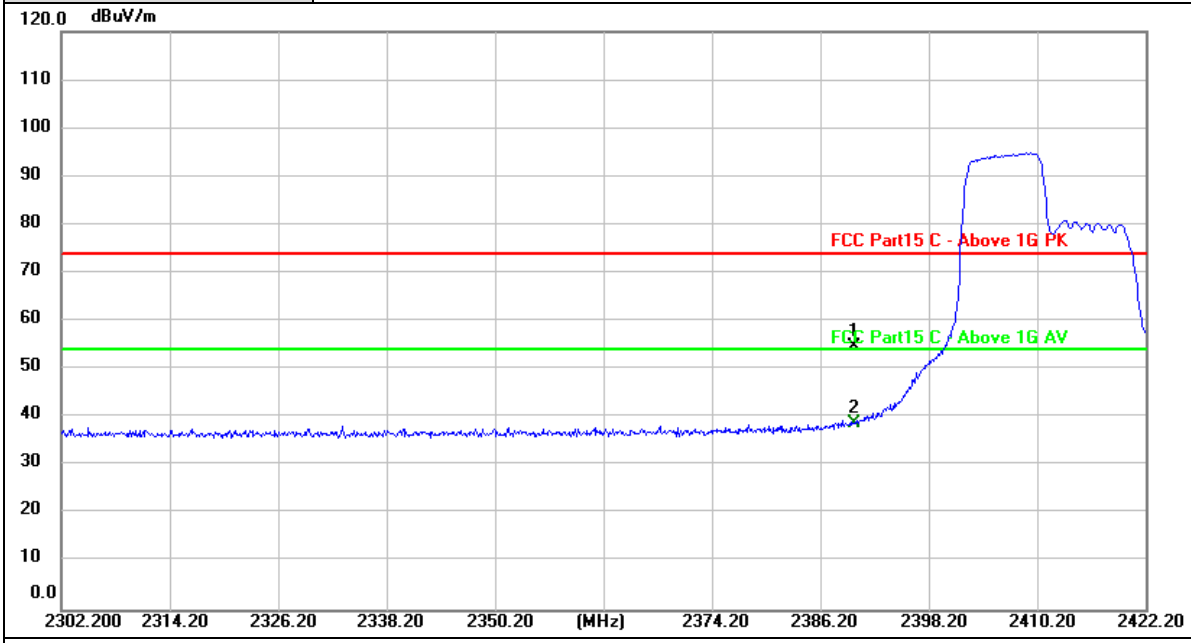
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11ax(HE20) Mode 2412MHz 106/53



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	26.50	31.31	57.81	74.00	-16.19	peak
2 *	2390.000	7.48	31.31	38.79	54.00	-15.21	AVG

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

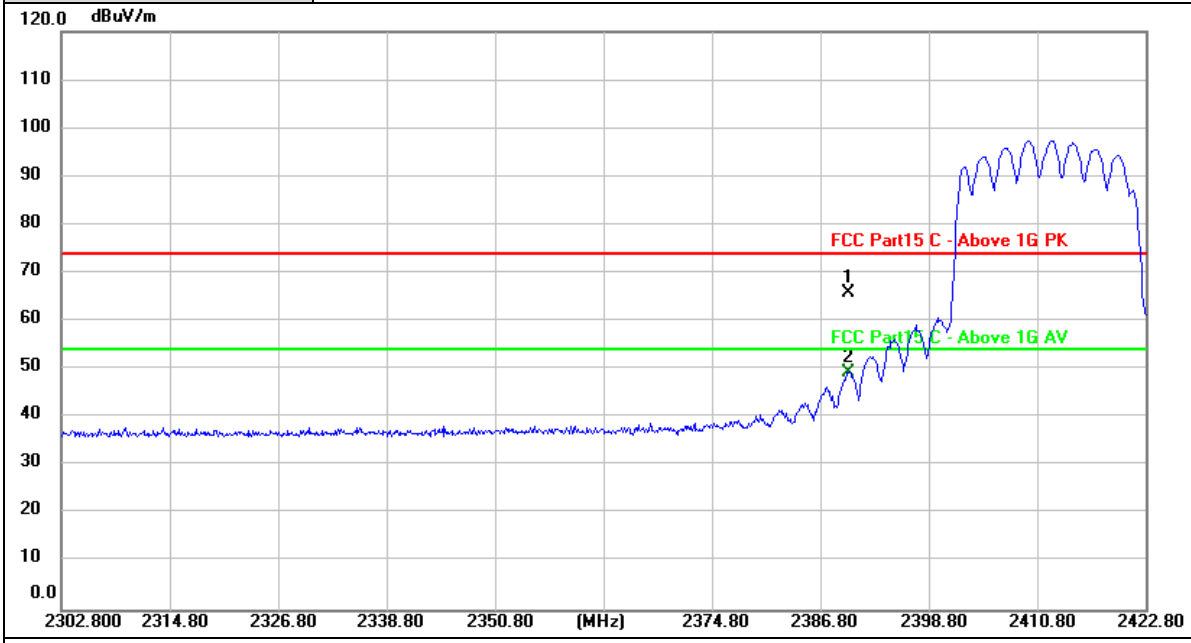
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11ax(HE20) Mode 2412MHz 106/53



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	23.39	31.31	54.70	74.00	-19.30	peak
2 *	2390.000	7.51	31.31	38.82	54.00	-15.18	AVG

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

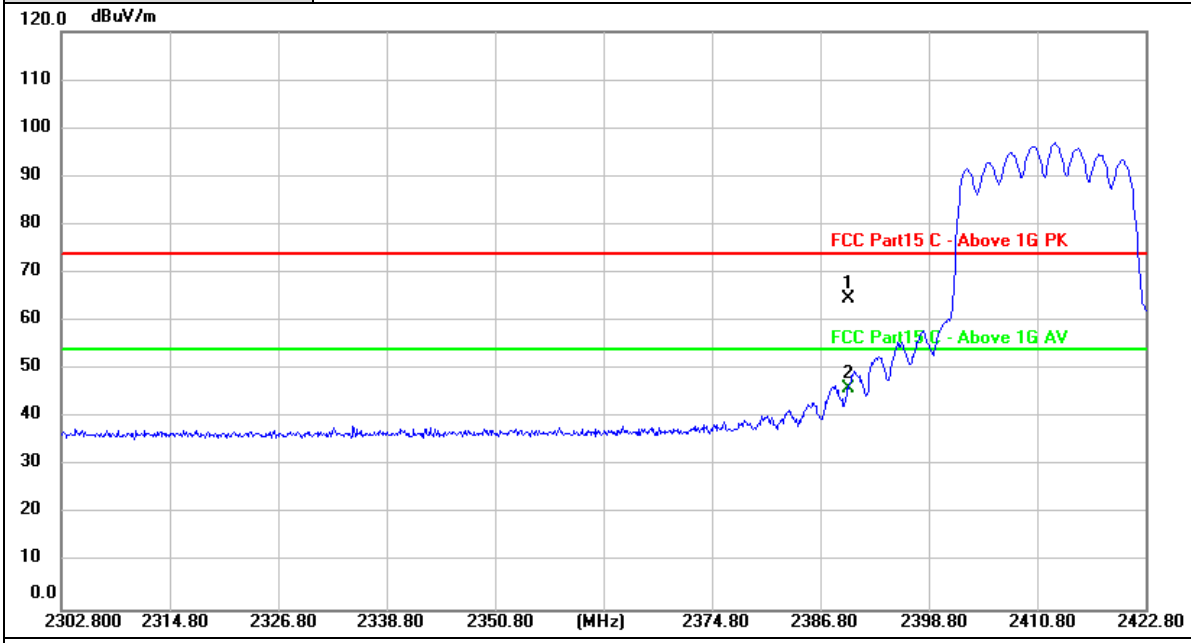
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11ax(HE20) Mode 2412MHz 242/61



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	34.61	31.31	65.92	74.00	-8.08	peak
2 *	2390.000	18.10	31.31	49.41	54.00	-4.59	AVG

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

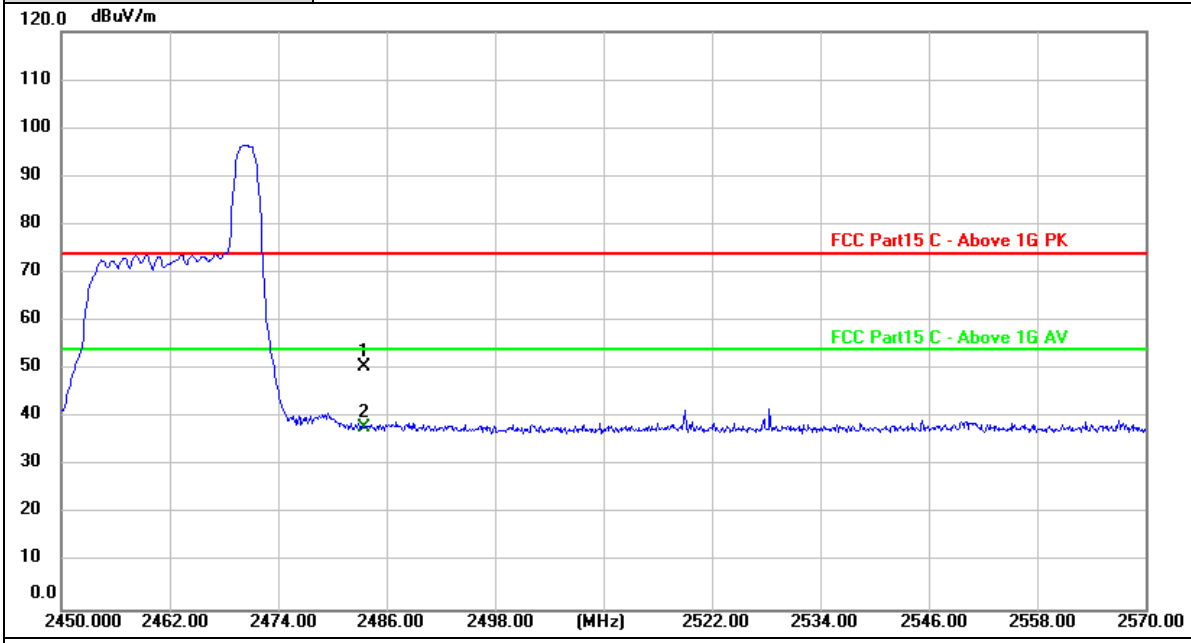
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11ax(HE20) Mode 2412MHz 242/61



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	33.36	31.31	64.67	74.00	-9.33	peak
2 *	2390.000	14.82	31.31	46.13	54.00	-7.87	AVG

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

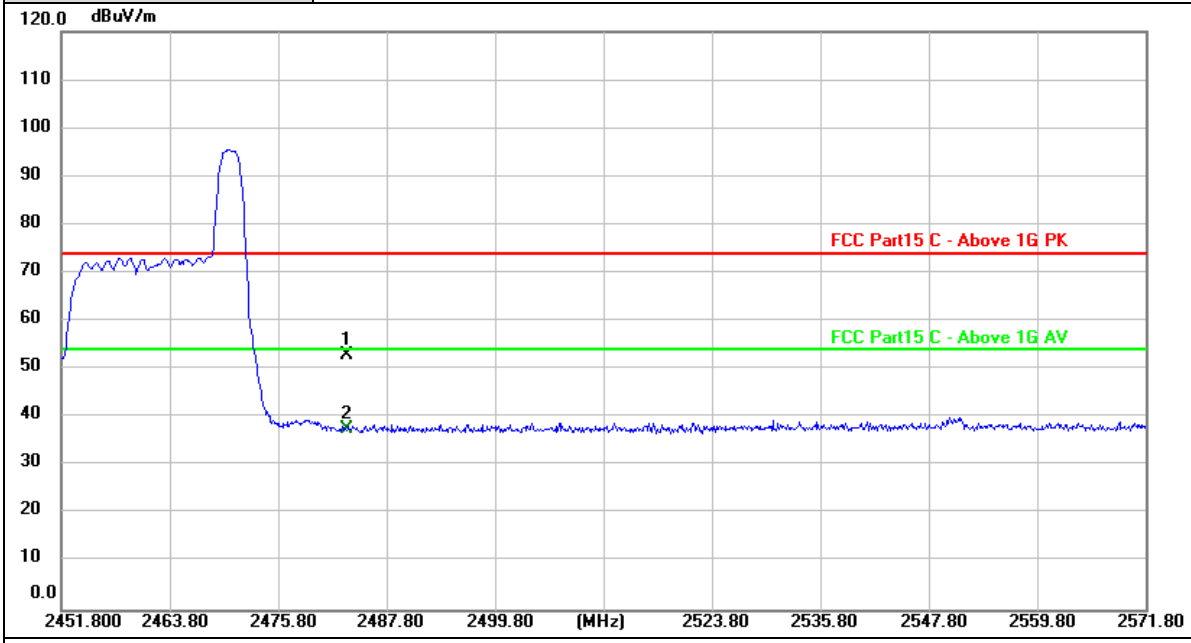
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11ax(HE20) Mode 2462MHz 26/8



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	19.12	31.48	50.60	74.00	-23.40	peak
2 *	2483.500	6.56	31.48	38.04	54.00	-15.96	AVG

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

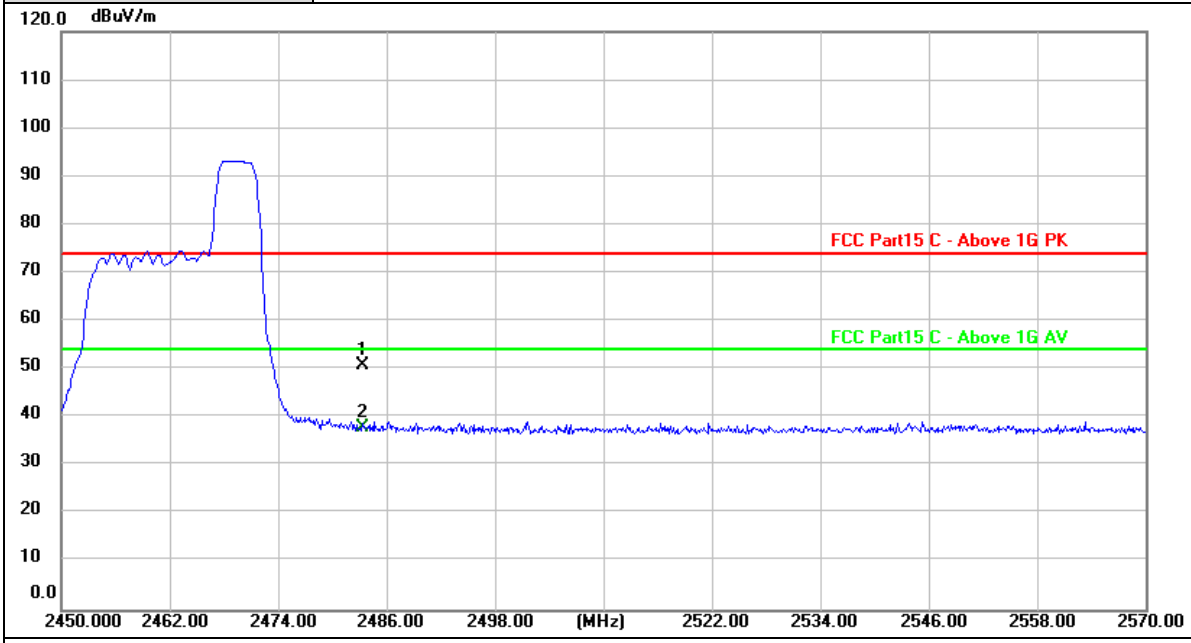
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11ax(HE20) Mode 2462MHz 26/8



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	21.60	31.48	53.08	74.00	-20.92	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

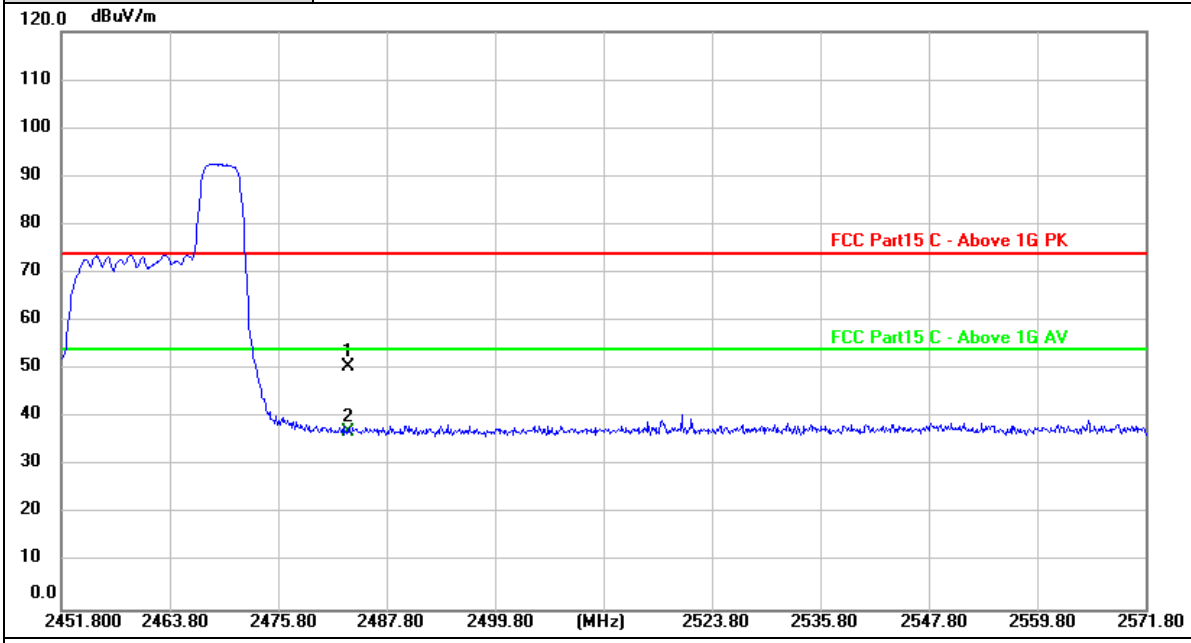
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11ax(HE20) Mode 2462MHz 52/40



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	19.23	31.48	50.71	74.00	-23.29	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

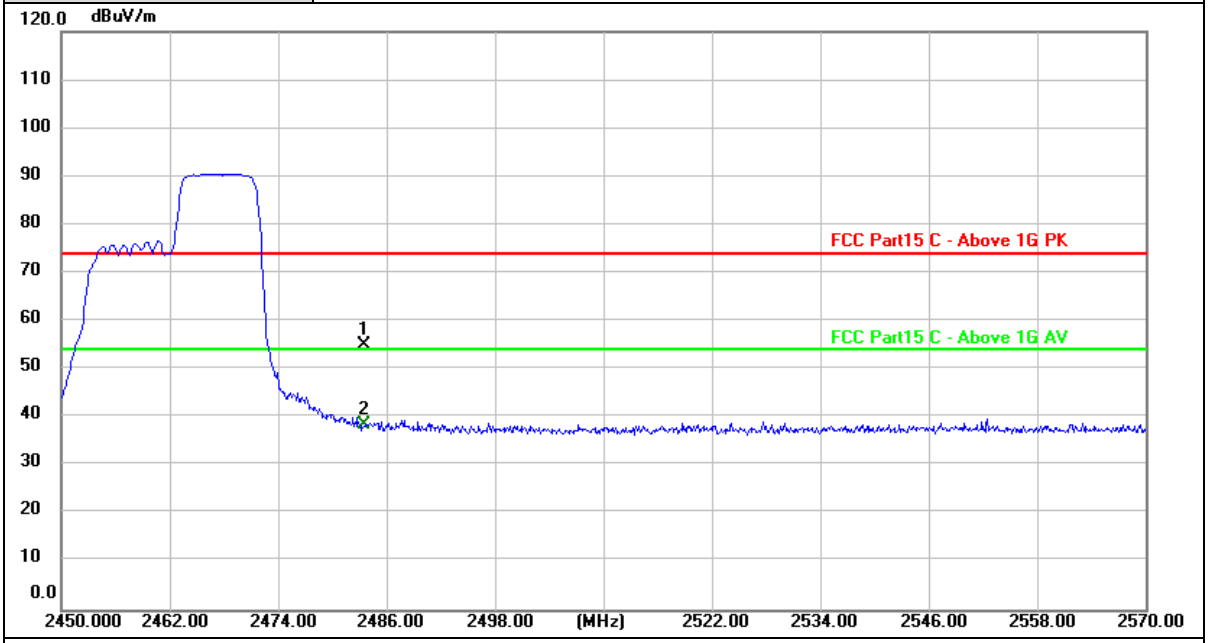
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11ax(HE20) Mode 2462MHz 52/40



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	19.02	31.48	50.50	74.00	-23.50	peak
2 *	2483.500	5.50	31.48	36.98	54.00	-17.02	AVG

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

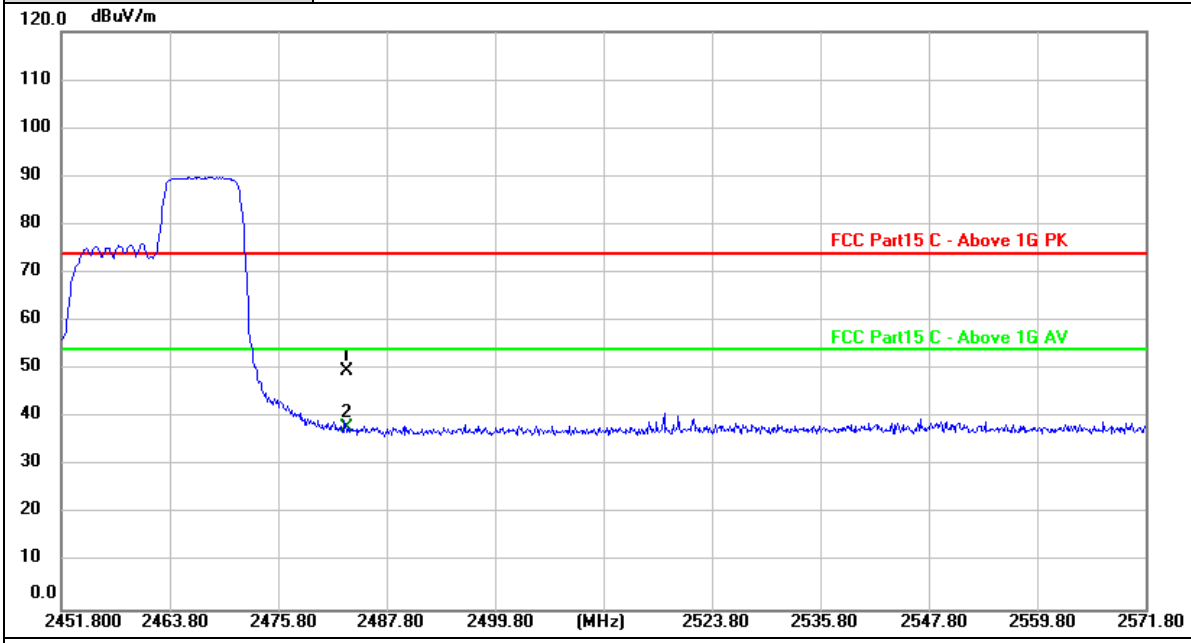
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11ax(HE20) Mode 2462MHz 106/54



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	23.61	31.48	55.09	74.00	-18.91	peak
2 *	2483.500	7.00	31.48	38.48	54.00	-15.52	AVG

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

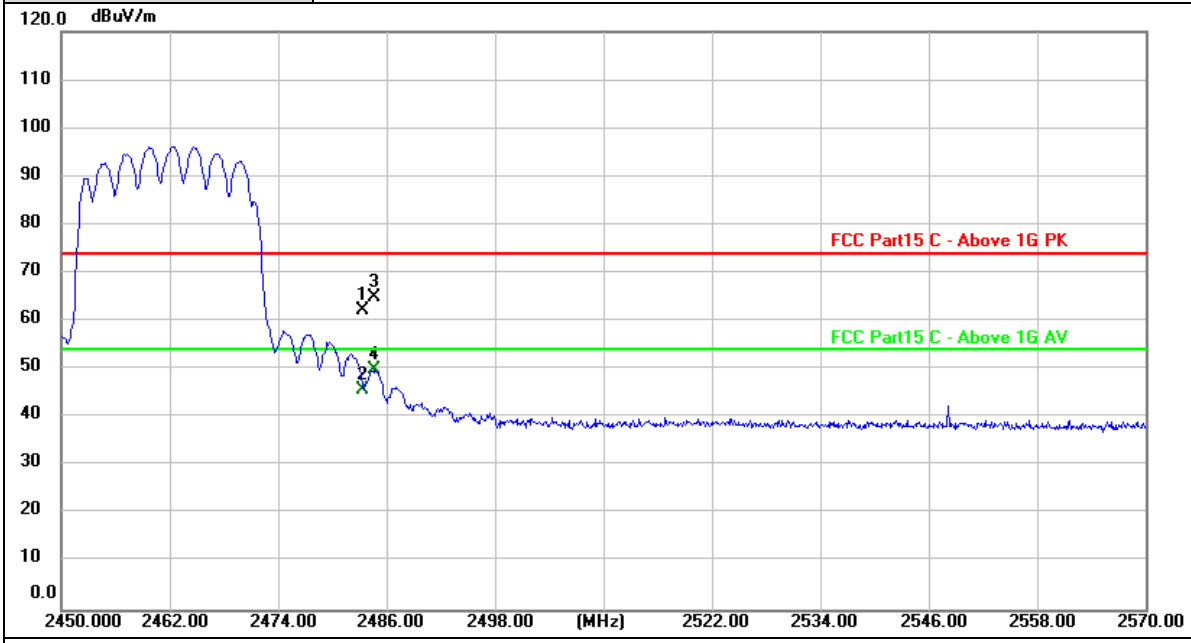
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11ax(HE20) Mode 2462MHz 106/54



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	18.03	31.48	49.51	74.00	-24.49	peak
2 *	2483.500	6.40	31.48	37.88	54.00	-16.12	AVG

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

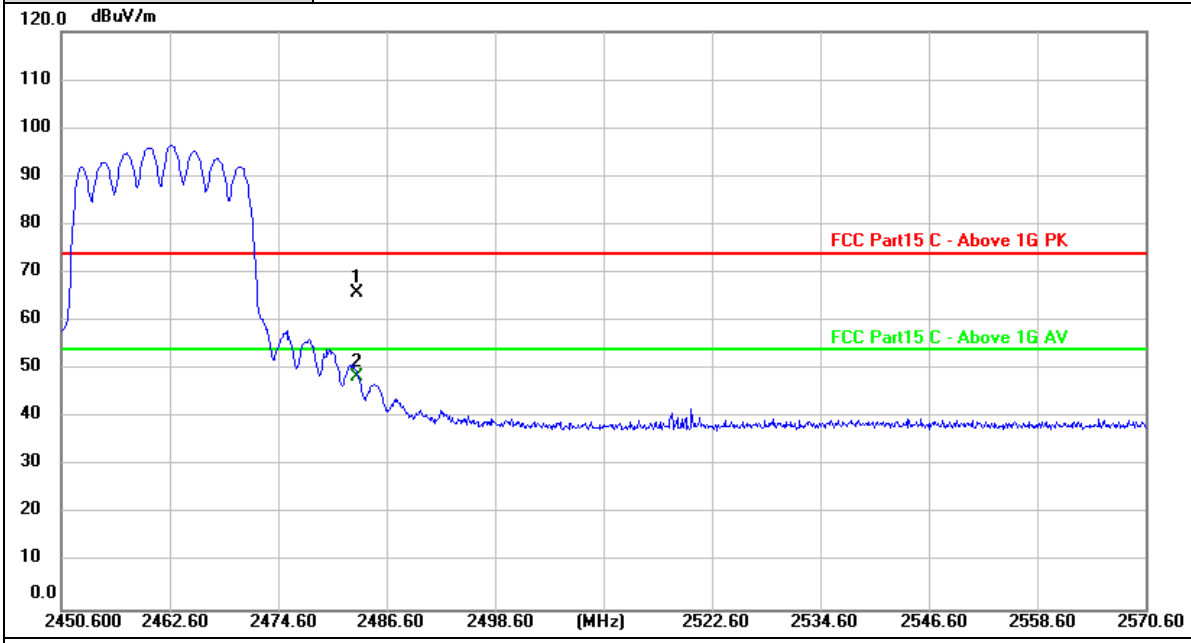
Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Horizontal
Test Mode:	TX 802.11ax(HE20) Mode 2462MHz 242/61



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	30.64	31.48	62.12	74.00	-11.88	peak
2	2483.500	14.41	31.48	45.89	54.00	-8.11	AVG
3	2484.760	33.48	31.48	64.96	74.00	-9.04	peak
4 *	2484.760	18.47	31.48	49.95	54.00	-4.05	AVG

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

Ant. No.	Ant 0 + Ant 1
Ant. Pol.	Vertical
Test Mode:	TX 802.11ax(HE20) Mode 2462MHz 242/61



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	34.37	31.48	65.85	74.00	-8.15	peak
2 *	2483.500	17.01	31.48	48.49	54.00	-5.51	AVG

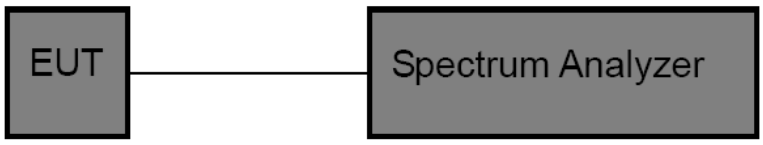
Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

3.4. Band Edge and Spurious Emissions (Conducted)

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d)
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

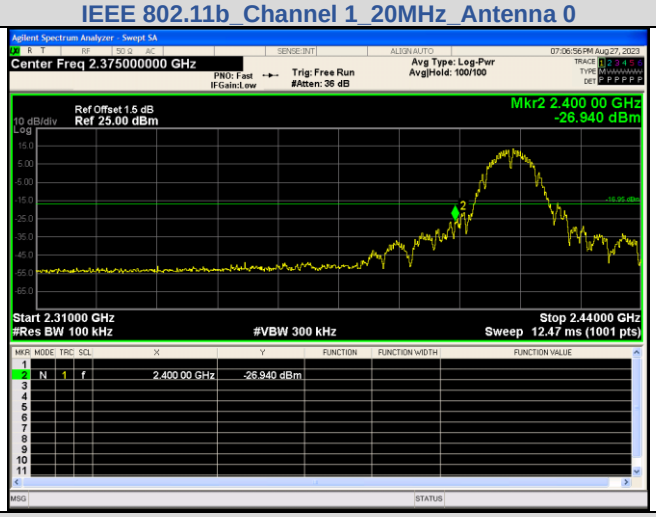
(1) Band Edge Conducted Test & Conducted Spurious Emissions Test

Mode	Channel	Ant.	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Result
IEEE 802.11b	1	0	2400.00	-26.940	-16.95	PASS
			24819.6	-43.155	-16.95	PASS
		1	2400.00	-42.546	-17.06	PASS
			2398.92	-37.310	-17.06	PASS
			7235.30	-41.725	-17.06	PASS
	6	0	23791.4	-42.581	-17.14	PASS
		1	24829.0	-42.673	-16.76	PASS
	11	0	2483.50	-42.878	-16.17	PASS
			24863.3	-43.115	-16.17	PASS
		1	2483.50	-44.119	-17.43	PASS
			23427.5	-42.511	-17.43	PASS
IEEE 802.11g	1	0	2400.00	-27.735	-24.23	PASS
			2398.27	-26.847	-24.23	PASS
			23643.5	-42.741	-24.23	PASS
		1	2400.00	-29.263	-25.23	PASS
			24825.2	-43.087	-25.23	PASS
	6	0	24828.3	-42.292	-24.38	PASS
		1	24894.5	-42.674	-24.69	PASS
	11	0	2483.50	-38.749	-24.56	PASS
			24872.0	-42.748	-24.56	PASS
		1	2483.50	-38.142	-25.21	PASS
			24935.1	-42.614	-25.21	PASS
IEEE 802.11n_20	1	0	2400.00	-28.774	-25.74	PASS
			2397.62	-28.614	-25.74	PASS
			23614.8	-42.713	-25.74	PASS
		1	2400.00	-31.277	-26.08	PASS
			2397.62	-29.641	-26.08	PASS
			23780.2	-41.964	-26.08	PASS
	6	0	23716.5	-43.099	-26.23	PASS
		1	23751.5	-42.635	-26.12	PASS
	11	0	2483.50	-36.293	-26.0	PASS
			2528.31	-52.403	-26.0	PASS
		1	2483.50	-37.836	-26.09	PASS
			23664.1	-42.801	-26.09	PASS

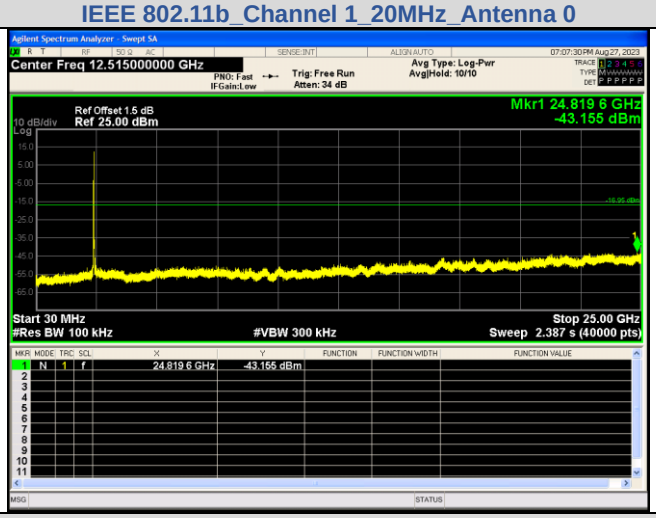
Mode	Channel	RU & Index	Ant.	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Result
EEE 802.11ax_20	1	242RU61	0	2400.00	-29.673	-25.67	PASS
				2398.01	-28.134	-25.67	PASS
				23401.3	-43.329	-25.67	PASS
			1	2400.00	-32.811	-25.78	PASS
				2398.92	-31.341	-25.78	PASS
				23661.6	-42.781	-25.78	PASS
		26RU0	0	2400.00	-35.319	-18.17	PASS
				24139.1	-43.511	-18.17	PASS
			1	2400.00	-37.616	-20.51	PASS
				23866.3	-43.601	-20.51	PASS
		52RU37	0	2400.00	-30.932	-20.71	PASS
				23235.2	-43.006	-20.71	PASS
			1	2400.00	-32.830	-21.02	PASS
				24226.5	-43.057	-21.02	PASS
		106RU53	0	2400.00	-27.891	-22.96	PASS
				2398.27	-27.813	-22.96	PASS
				24883.9	-43.377	-22.96	PASS
			1	2400.00	-29.780	-23.19	PASS
				2396.97	-29.542	-23.19	PASS
				23531.1	-43.477	-23.19	PASS
	6	242RU61	0	24793.4	-43.267	-25.89	PASS
			1	23729.0	-42.600	-25.55	PASS
	11	242RU61	0	2483.50	-33.850	-25.21	PASS
				23585.4	-42.740	-25.21	PASS
			1	2483.50	-39.848	-25.85	PASS
				24706.0	-42.861	-25.85	PASS
		26RU8	0	2483.50	-27.110	-16.71	PASS
				24960.0	-43.397	-16.71	PASS
			1	2483.50	-50.866	-19.57	PASS
				23554.2	-42.970	-19.57	PASS
		52RU40	0	2483.50	-27.476	-20.0	PASS
				23827.0	-43.490	-20.0	PASS
			1	2483.50	-48.662	-23.24	PASS
				24977.5	-42.489	-23.24	PASS
		106RU54	0	2483.50	-41.873	-23.33	PASS
				23553.0	-43.252	-23.33	PASS
			1	2483.50	-42.553	-25.09	PASS
				24775.3	-43.258	-25.09	PASS

Test plot as follows:

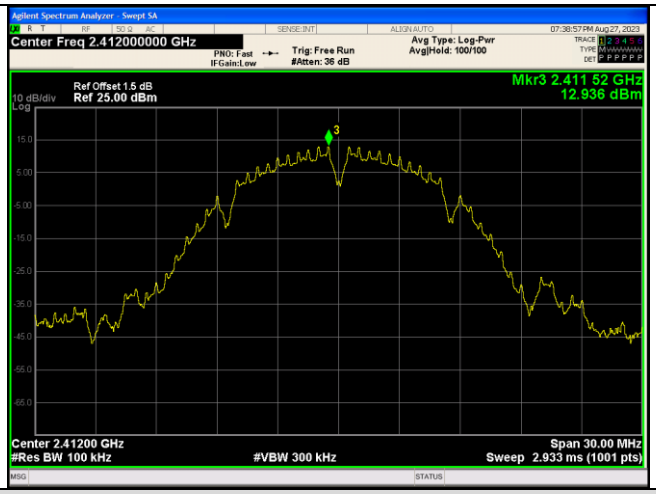
In-Band Reference Level
IEEE 802.11b_Channel 1_20MHz_Antenna 0



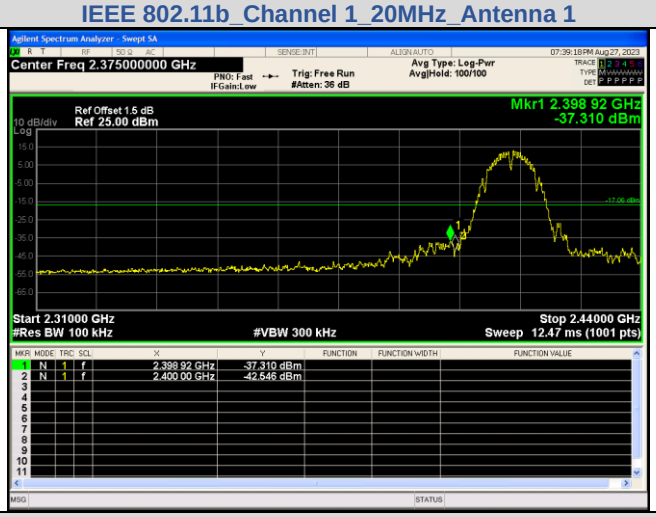
Out Of Band Emission
IEEE 802.11b_Channel 1_20MHz_Antenna 0



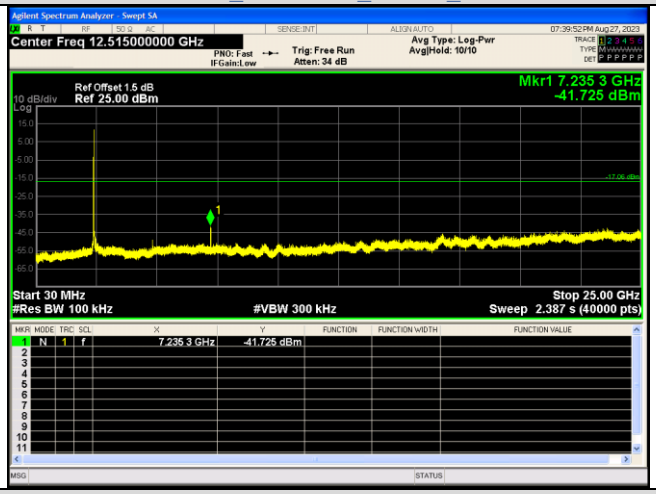
Spurious Emission
IEEE 802.11b_Channel 1_20MHz_Antenna 0



In-Band Reference Level
IEEE 802.11b_Channel 1_20MHz_Antenna 1

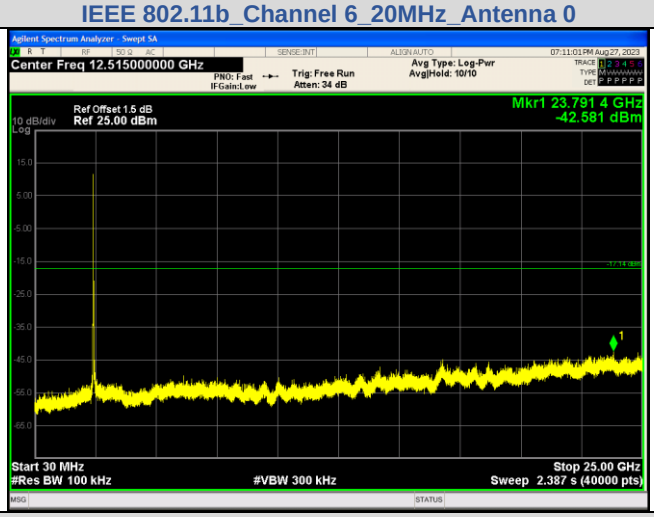


Out Of Band Emission
IEEE 802.11b_Channel 1_20MHz_Antenna 1

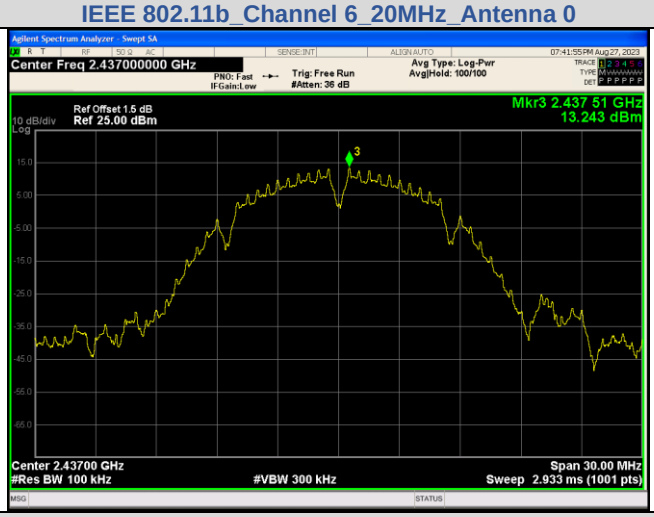


Spurious Emission
IEEE 802.11b_Channel 1_20MHz_Antenna 1

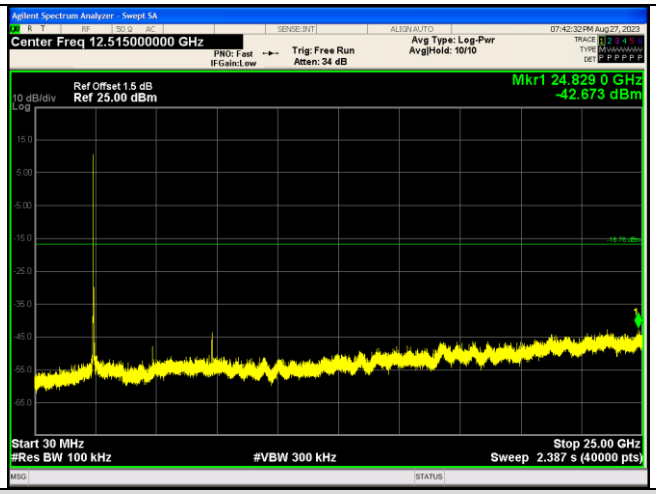
In-Band Reference Level
IEEE 802.11b_Channel 6_20MHz_Antenna 0



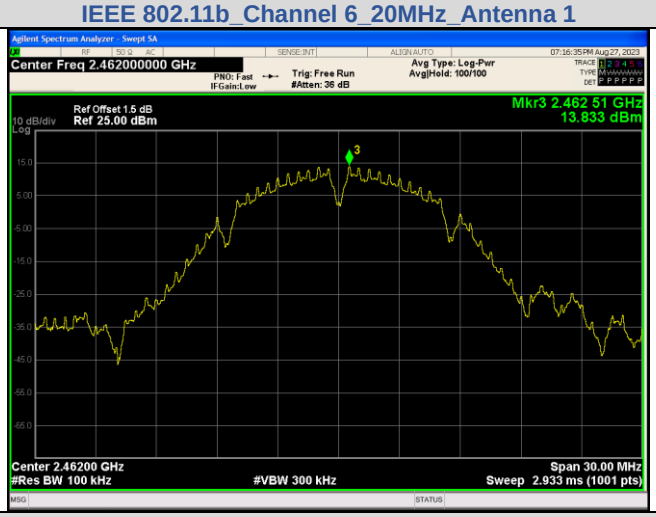
Spurious Emissions
IEEE 802.11b_Channel 6_20MHz_Antenna 0



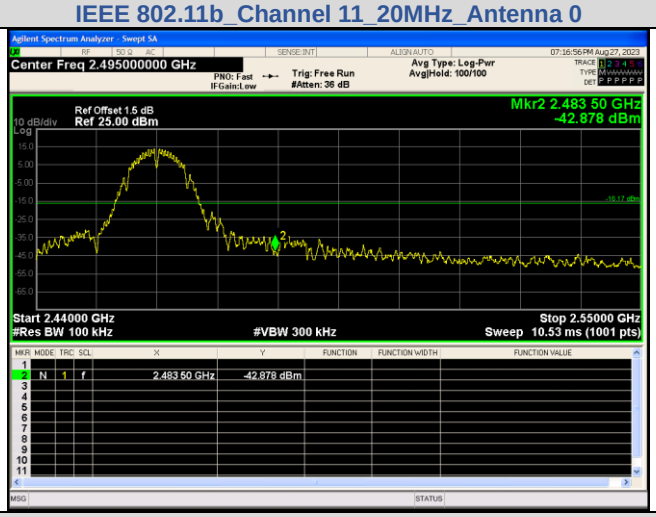
In-Band Reference Level
IEEE 802.11b_Channel 6_20MHz_Antenna 1



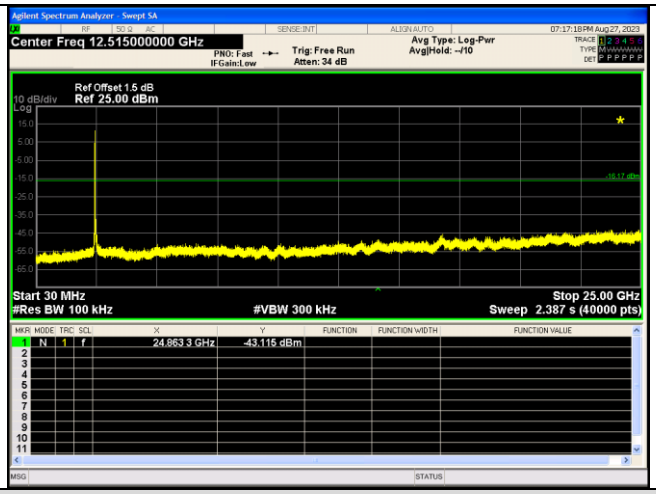
Spurious Emissions
IEEE 802.11b_Channel 6_20MHz_Antenna 1



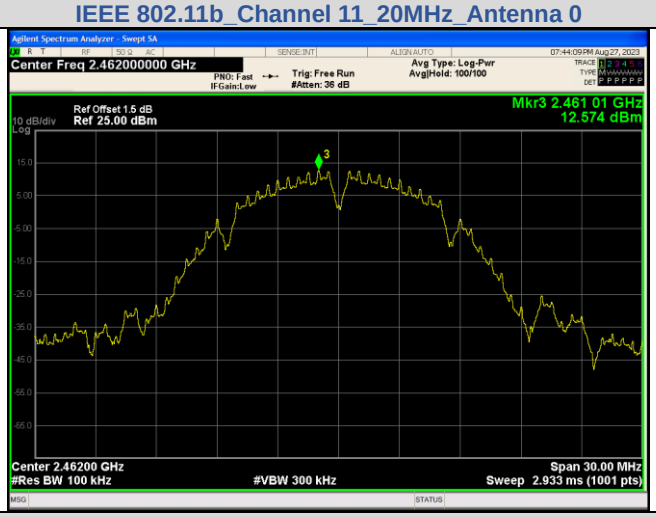
In-Band Reference Level
IEEE 802.11b_Channel 11_20MHz_Antenna 0



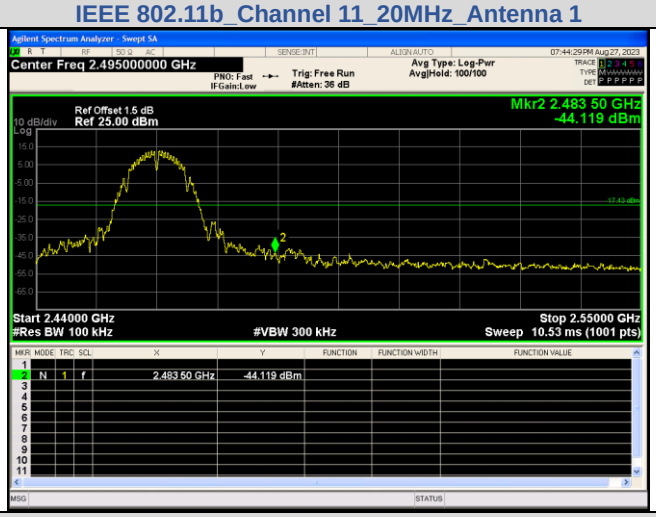
Out Of Band Emission
IEEE 802.11b_Channel 11_20MHz_Antenna 0



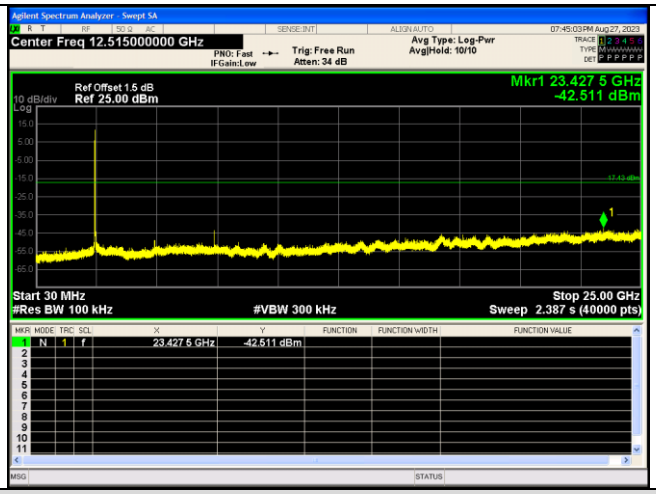
Spurious Emission
IEEE 802.11b_Channel 11_20MHz_Antenna 0



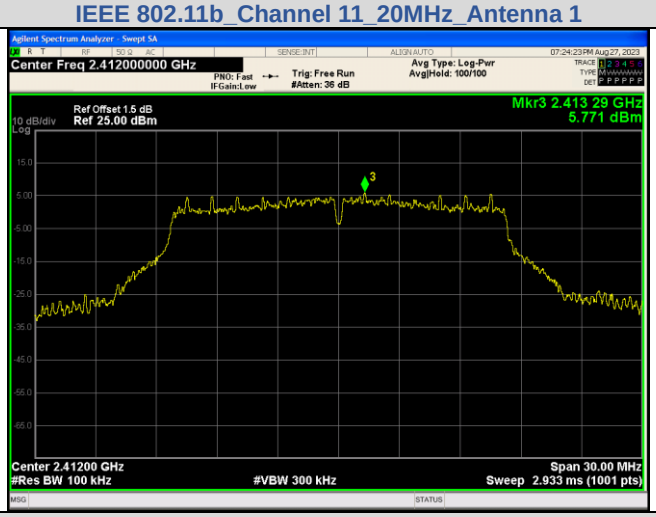
In-Band Reference Level
IEEE 802.11b_Channel 11_20MHz_Antenna 1



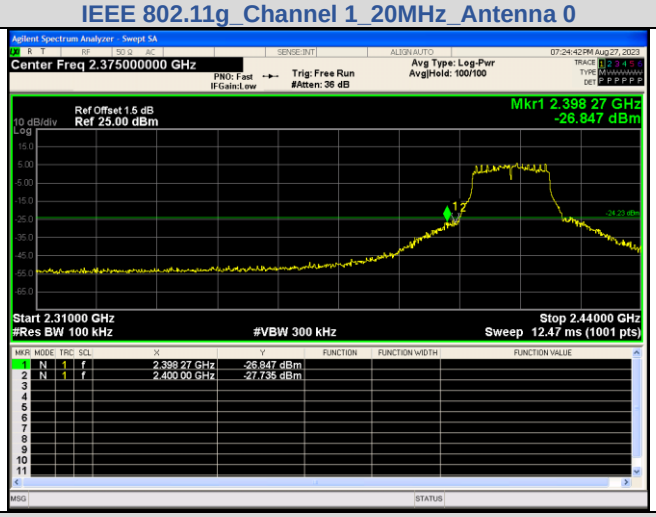
Out Of Band Emission
IEEE 802.11b_Channel 11_20MHz_Antenna 1



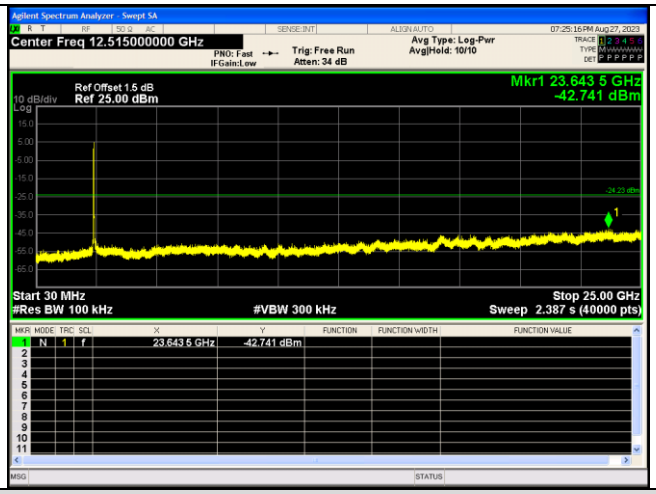
Spurious Emission
IEEE 802.11b_Channel 11_20MHz_Antenna 1



In-Band Reference Level
IEEE 802.11g_Channel 1_20MHz_Antenna 0



Out Of Band Emission
IEEE 802.11g_Channel 1_20MHz_Antenna 0



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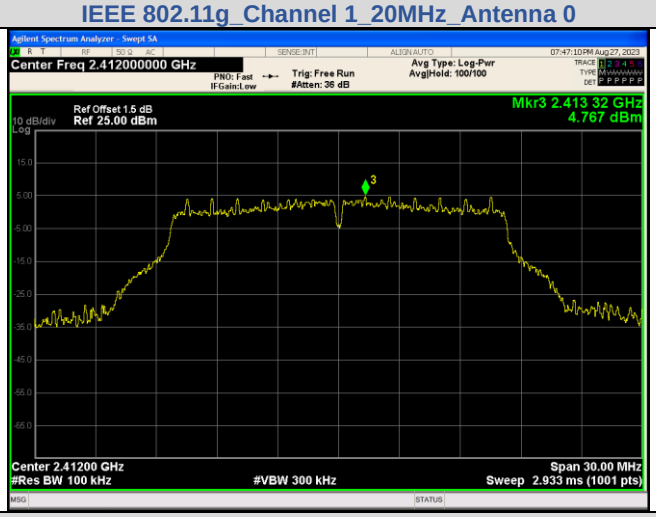
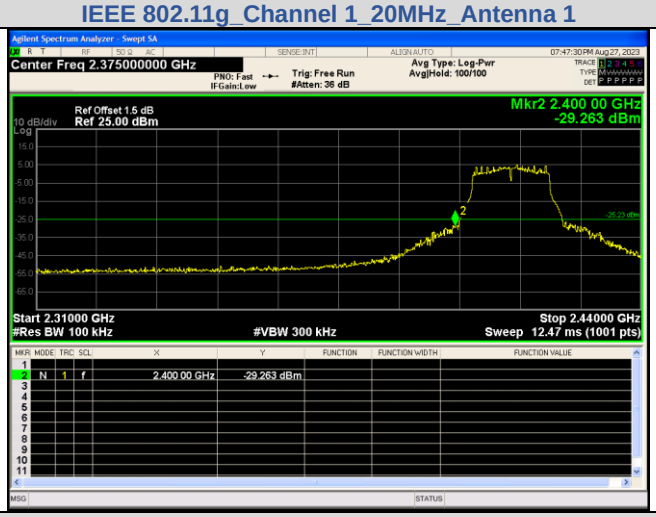
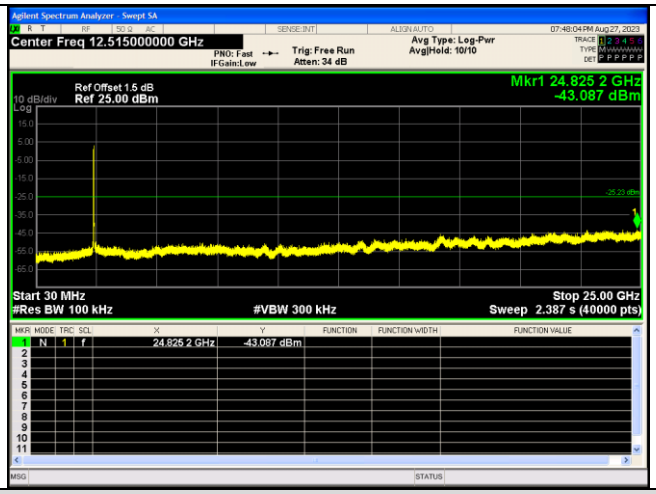
IEEE 802.11g_Channel 1_20MHz_Antenna 0



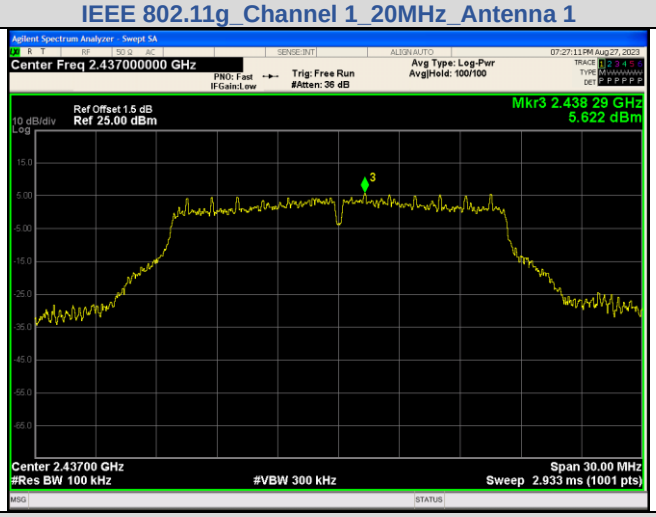
In-Band Reference Level
IEEE 802.11g_Channel 1_20MHz_Antenna 1



Out Of Band Emission
IEEE 802.11g_Channel 1_20MHz_Antenna 1



Spurious Emission
IEEE 802.11g_Channel 1_20MHz_Antenna 1



In-Band Reference Level
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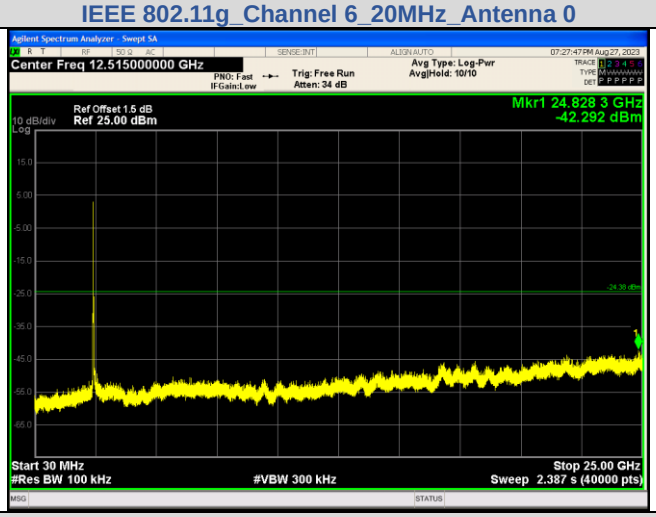
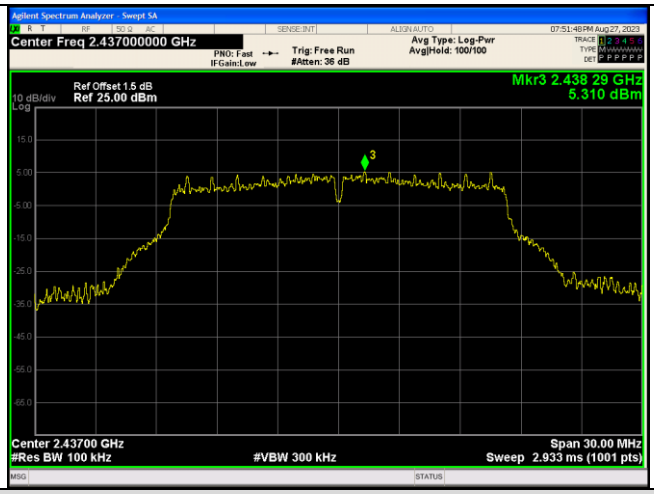
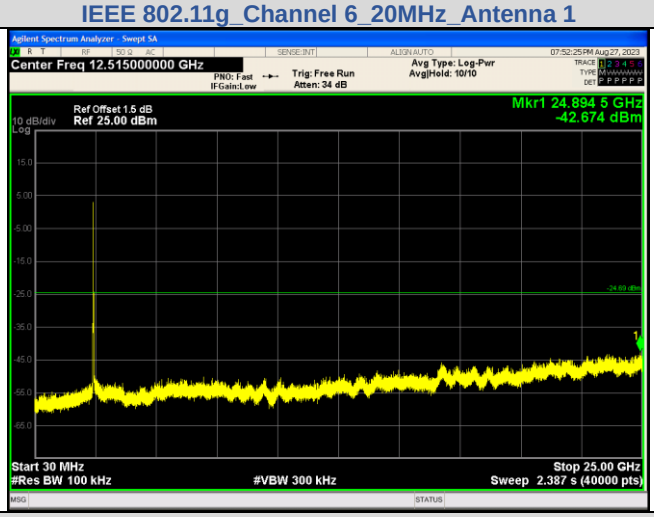


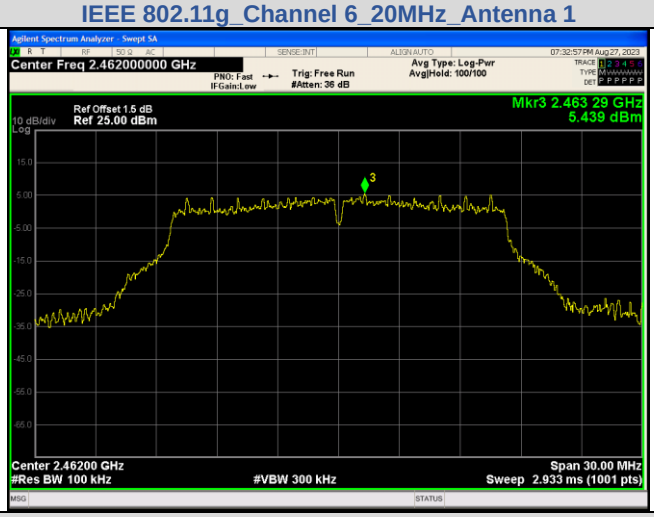
Spurious Emissions
IEEE 802.11g_Channel 6_20MHz_Antenna 0



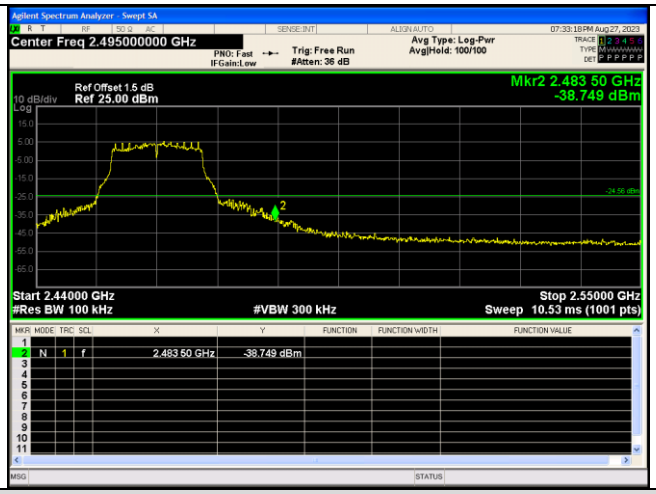
In-Band Reference Level
IEEE 802.11g_Channel 6_20MHz_Antenna 1



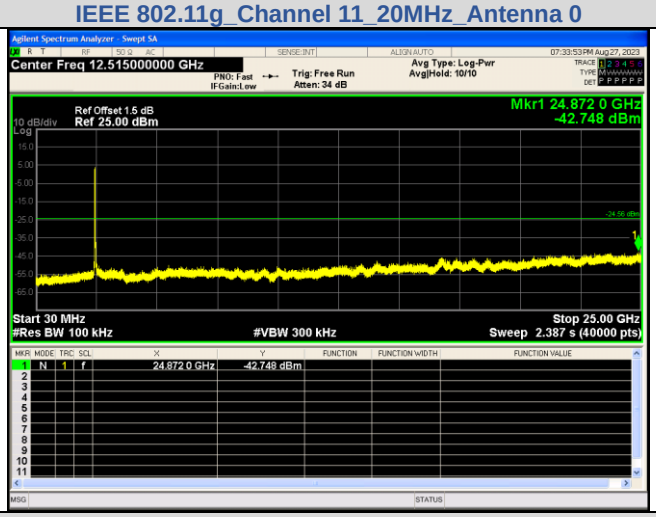
Spurious Emissions
IEEE 802.11g_Channel 6_20MHz_Antenna 1



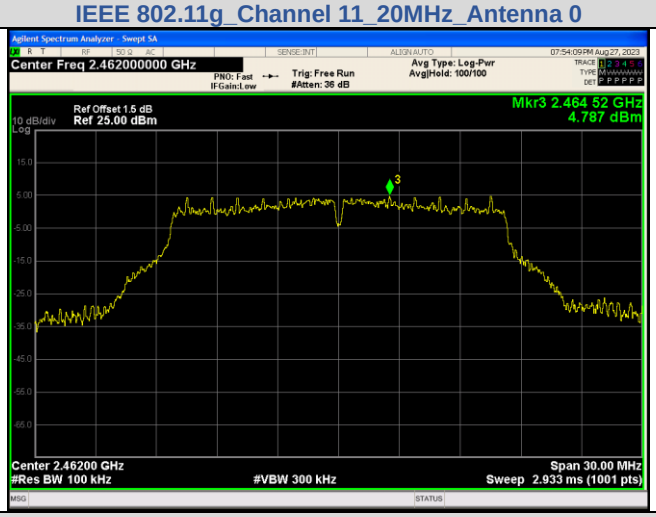
In-Band Reference Level
IEEE 802.11g_Channel 11_20MHz_Antenna 0



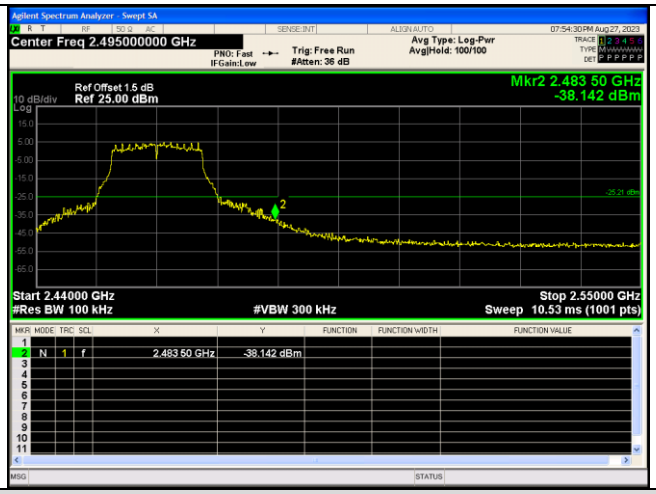
Out Of Band Emission
IEEE 802.11g_Channel 11_20MHz_Antenna 0



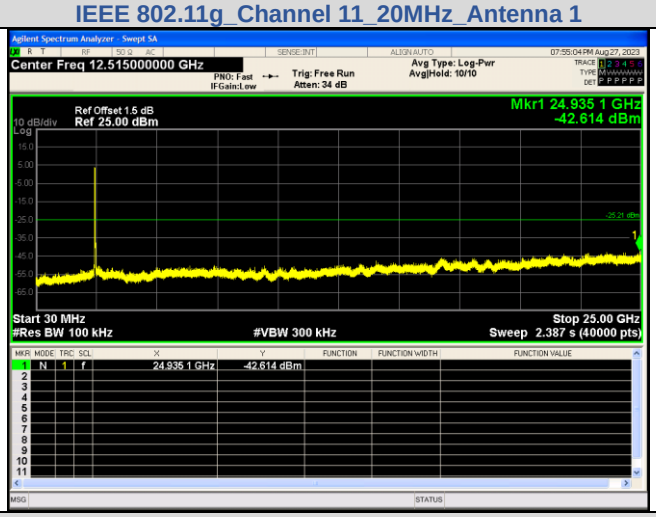
Spurious Emission
IEEE 802.11g_Channel 11_20MHz_Antenna 0



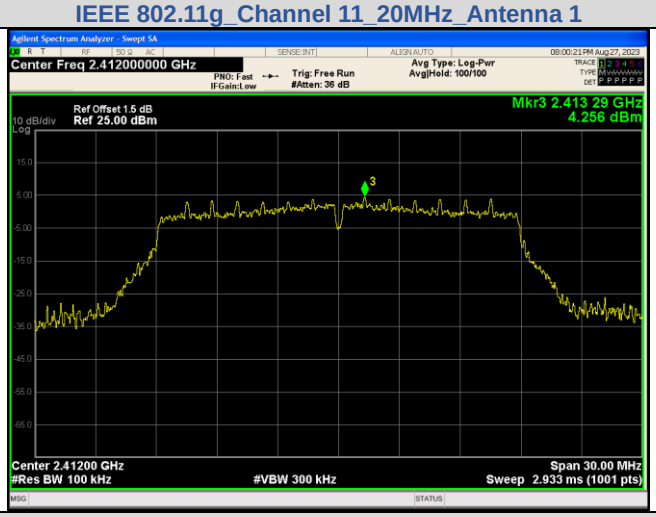
In-Band Reference Level
IEEE 802.11g_Channel 11_20MHz_Antenna 1



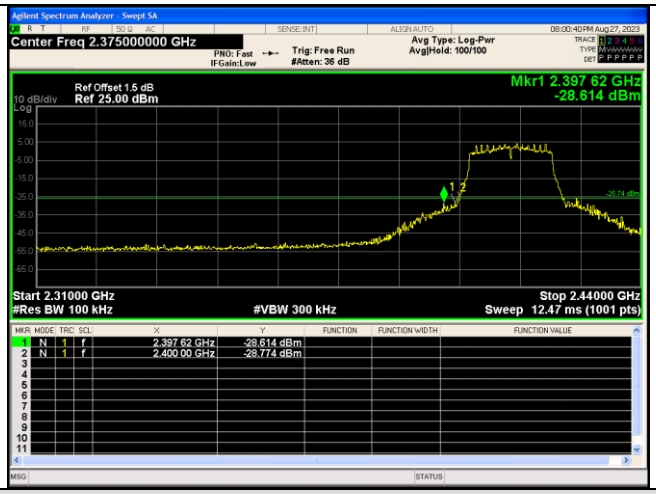
Out Of Band Emission
IEEE 802.11g_Channel 11_20MHz_Antenna 1



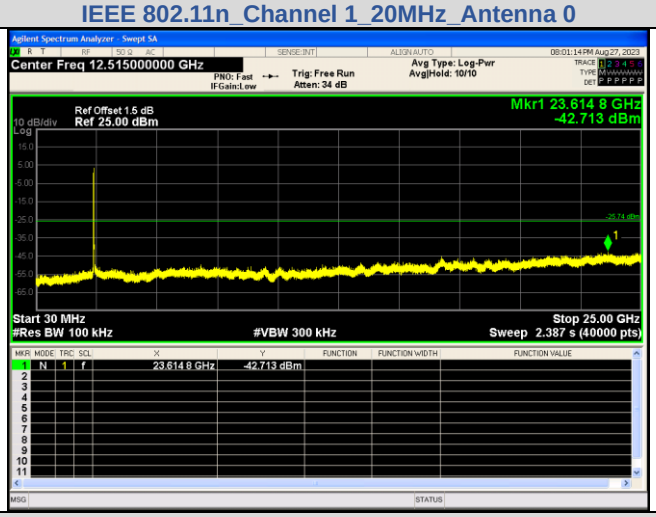
Spurious Emission
IEEE 802.11g_Channel 11_20MHz_Antenna 1



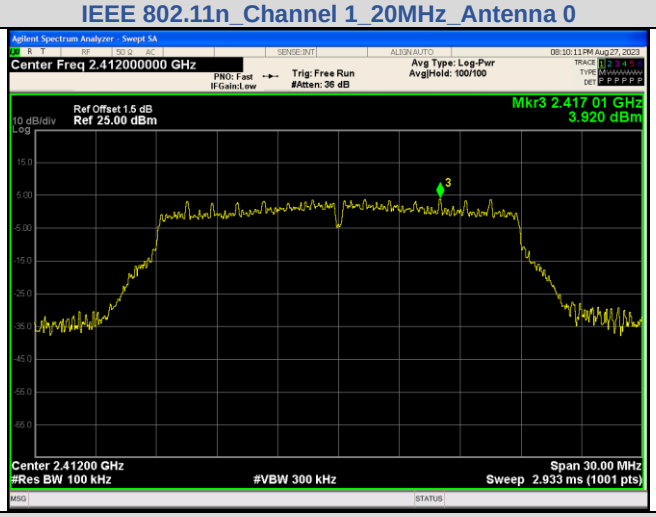
In-Band Reference Level
IEEE 802.11n_Channel 1_20MHz_Antenna 0



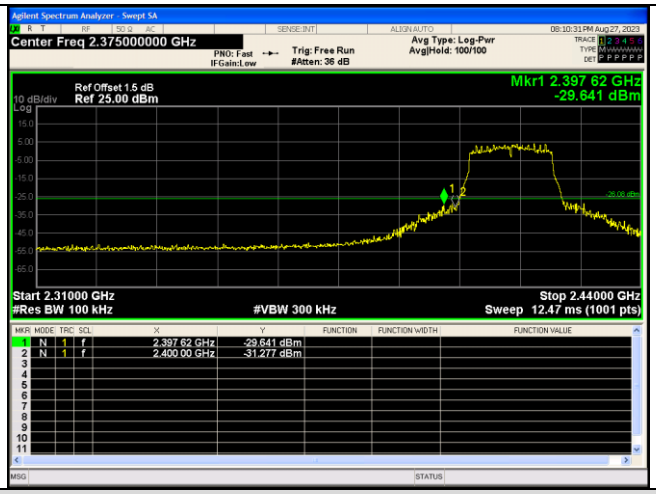
Out Of Band Emission
IEEE 802.11n_Channel 1_20MHz_Antenna 0



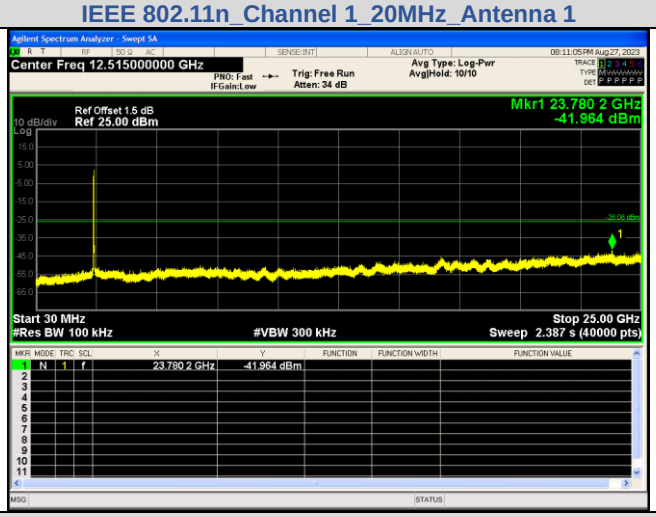
Spurious Emission
IEEE 802.11n_Channel 1_20MHz_Antenna 0



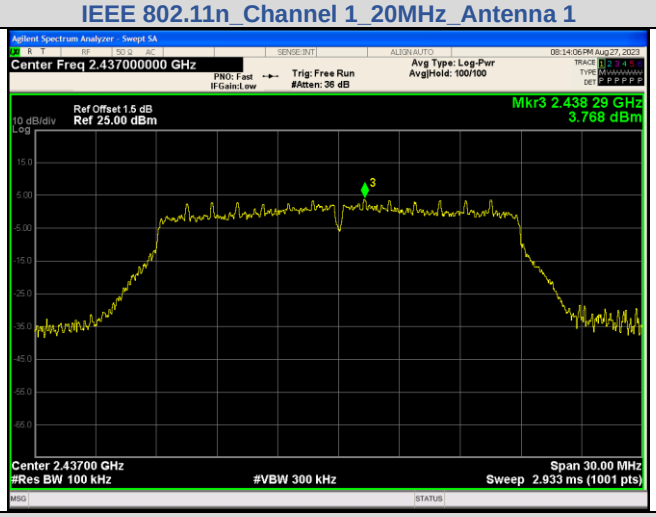
In-Band Reference Level
IEEE 802.11n_Channel 1_20MHz_Antenna 1



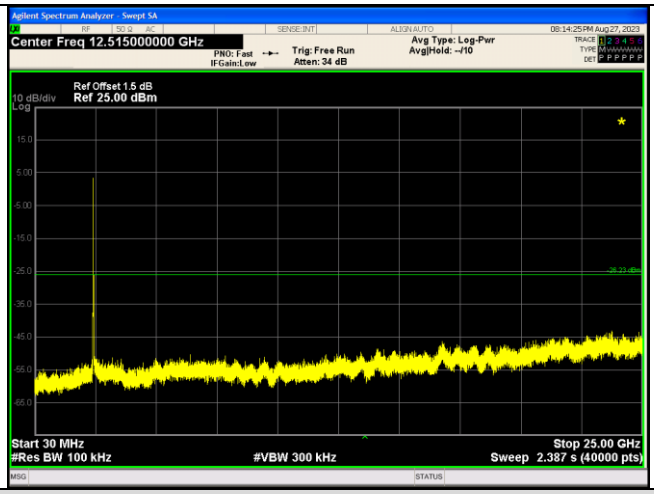
Out Of Band Emission
IEEE 802.11n_Channel 1_20MHz_Antenna 1



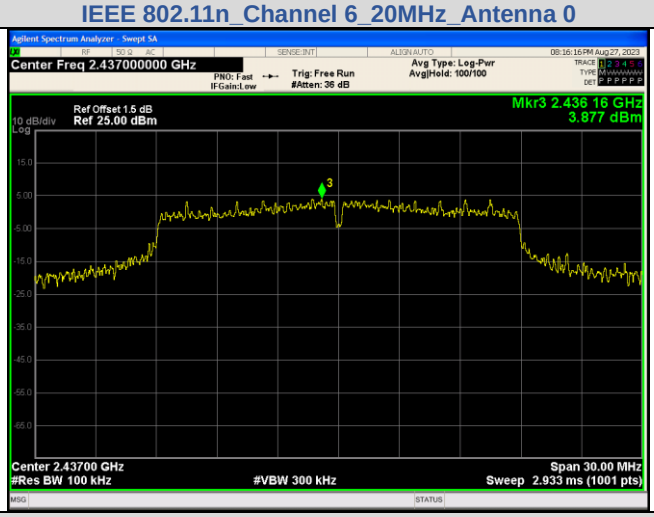
Spurious Emission
IEEE 802.11n_Channel 1_20MHz_Antenna 1



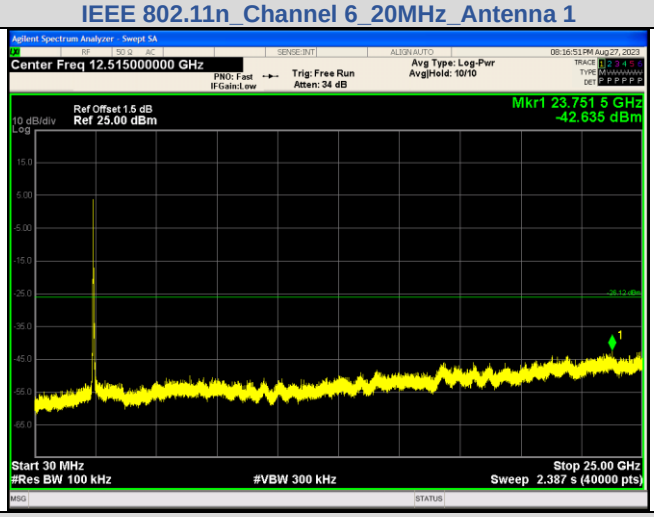
In-Band Reference Level
IEEE 802.11n_Channel 6_20MHz_Antenna 0



Spurious Emissions
IEEE 802.11n_Channel 6_20MHz_Antenna 0



In-Band Reference Level
IEEE 802.11n_Channel 6_20MHz_Antenna 1



Spurious Emissions
IEEE 802.11n_Channel 6_20MHz_Antenna 1