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TEST REPORT

Report No. .....:	**CTC20231642E02**
FCC ID.....:	**2APN5-T54C**
IC .....:	**29127-T54C**
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 .....:	**Smart Touch Wall Switch**
Trade Mark .....:	Sonoff
Model/Type reference.....:	T5-4C-120
Listed Model(s) .....:	/
Standard .....:	**FCC CFR Title 47 Part 15 Subpart C Section 15.247 RSS-247 Issue 2**
Date of receipt of test sample.....:	Jul. 27, 2023
Date of testing.....:	Jul. 27, 2023 to Aug. 20, 2023
Date of issue.....:	Aug. 21, 2023
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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Table of Contents Page

1. TEST SUMMARY 3

1.1. TEST STANDARDS 3
1.2. REPORT VERSION 3
1.3. TEST DESCRIPTION 3
1.4. TEST FACILITY 4
1.5. MEASUREMENT UNCERTAINTY 5
1.6. ENVIRONMENTAL CONDITIONS 5

2. GENERAL INFORMATION 6

2.1. CLIENT INFORMATION 6
2.2. GENERAL DESCRIPTION OF EUT 6
2.3. ACCESSORY EQUIPMENT INFORMATION 7
2.4. OPERATION STATE 8
2.5. MEASUREMENT INSTRUMENTS LIST 10

3. TEST ITEM AND RESULTS 11

3.1. CONDUCTED EMISSION 11
3.2. RADIATED EMISSION 14
3.3. BAND EDGE EMISSIONS (RADIATED) 31
3.4. BAND EDGE AND SPURIOUS EMISSIONS (CONDUCTED) 48
3.5. DTS BANDWIDTH 65
3.6. PEAK OUTPUT POWER 75
3.7. POWER SPECTRAL DENSITY 81
3.8. DUTY CYCLE 87
3.9. ANTENNA REQUIREMENT 93

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 2: 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.	Date of issue	Description
01	Aug. 21, 2023	Original

1.3. Test Description

FCC Part 15 Subpart C (15.247) / RSS-247 Issue 2				
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	Jim Jiang
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: 2/F., Building 1 and 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, 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 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:	Smart Touch Wall Switch
Trade Mark:	Sonoff
Model/Type reference:	T5-4C-120
Listed Model(s):	/
Model Difference:	/
Power Supply:	Input: 100-240V~ 50/60Hz Max 16A Output: 100-240V~ 50/60Hz Max 4A/Gang 16A/Total
Hardware Version:	V1.0.2
Software Version:	V1.2.0
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 Type:	FPC Antenna
Directional Gain:	2.82dBi

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	/	/
EspRFTestTool	v2.8	/	/

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	EspRFTestTool_v2.8	
Modulation Mode	Test Channel	Attenuation
802.11b	01	15
	06	15
	11	15
802.11g	01	15
	06	15
	11	15
802.11n(HT20)	01	15
	06	15
	11	15
802.11n(HT40)	03	15
	06	15
	09	15

2.5. Measurement Instruments List

Tonscend RF Test System					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	MXA Signal Analyzer	Keysight	N9020A	MY46471737	Dec. 16, 2023
2	Spectrum Analyzer	R&S	FSU26	100105	Dec. 16, 2023
3	Spectrum Analyzer	R&S	FSV40-N	101331	Mar. 14, 2024
4	MXG Vector Signal Generator	Agilent	N5182A	MY47420864	Dec. 16, 2023
5	PSG Analog Signal Generator	Agilent	E8257D	MY46521908	Dec. 16, 2023
6	Power Sensor	Keysight	U2021XA	MY55130004	Mar. 14, 2024
7	Power Sensor	Keysight	U2021XA	MY55130006	Mar. 14, 2024
8	Wideband Radio Communication Tester	R&S	CMW500	102414	Dec. 16, 2023
9	High and low temperature box	ESPEC	MT3035	/	Mar. 24, 2024
10	JS1120 RF Test System	TONSCEND	v2.6	/	/

Radiated Emission (3m chamber 2)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-1013	Dec. 07, 2024
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-648	Dec. 07, 2024
3	Loop Antenna	ETS	6507	1446	Dec. 13, 2023
4	Spectrum Analyzer	R&S	FSU26	100105	Dec. 16, 2023
5	Spectrum Analyzer	R&S	FSV40-N	101331	Mar. 14, 2024
6	Pre-Amplifier	SONOMA	310	186194	Dec. 16, 2023
7	Low Noise Pre-Amplifier	EMCI	EMC051835	980075	Dec. 16, 2023
8	Test Receiver	R&S	ESCI7	100967	Dec. 16, 2023
9	3m chamber 2	Frankonia	EE025	/	Oct. 23, 2024

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

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

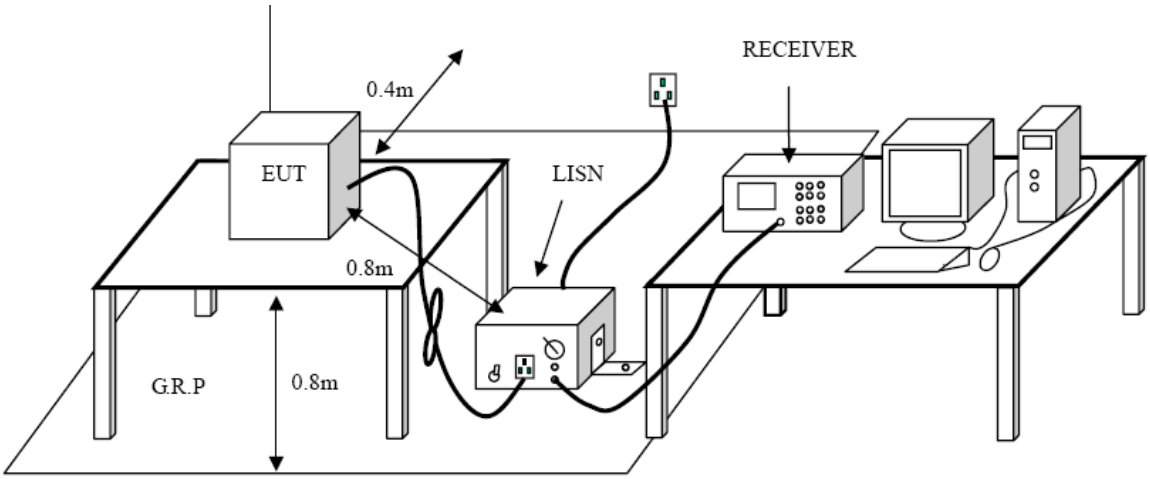
Limit

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

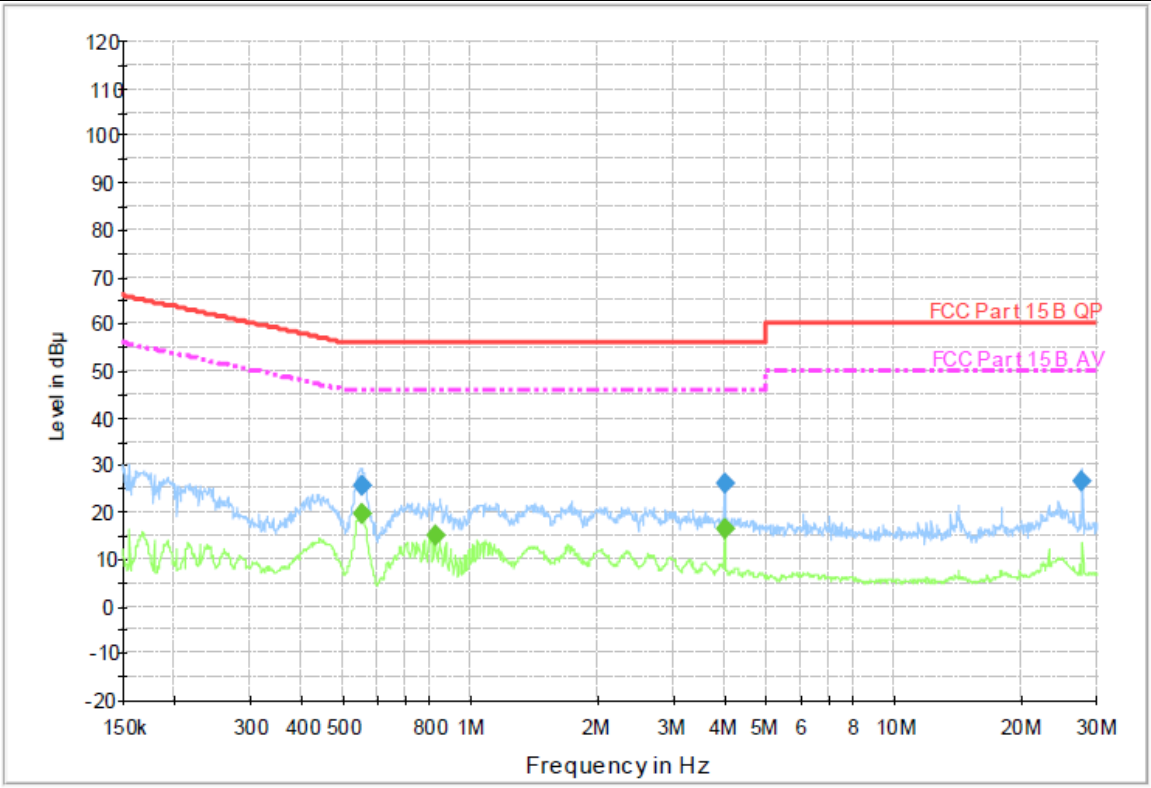
1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from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

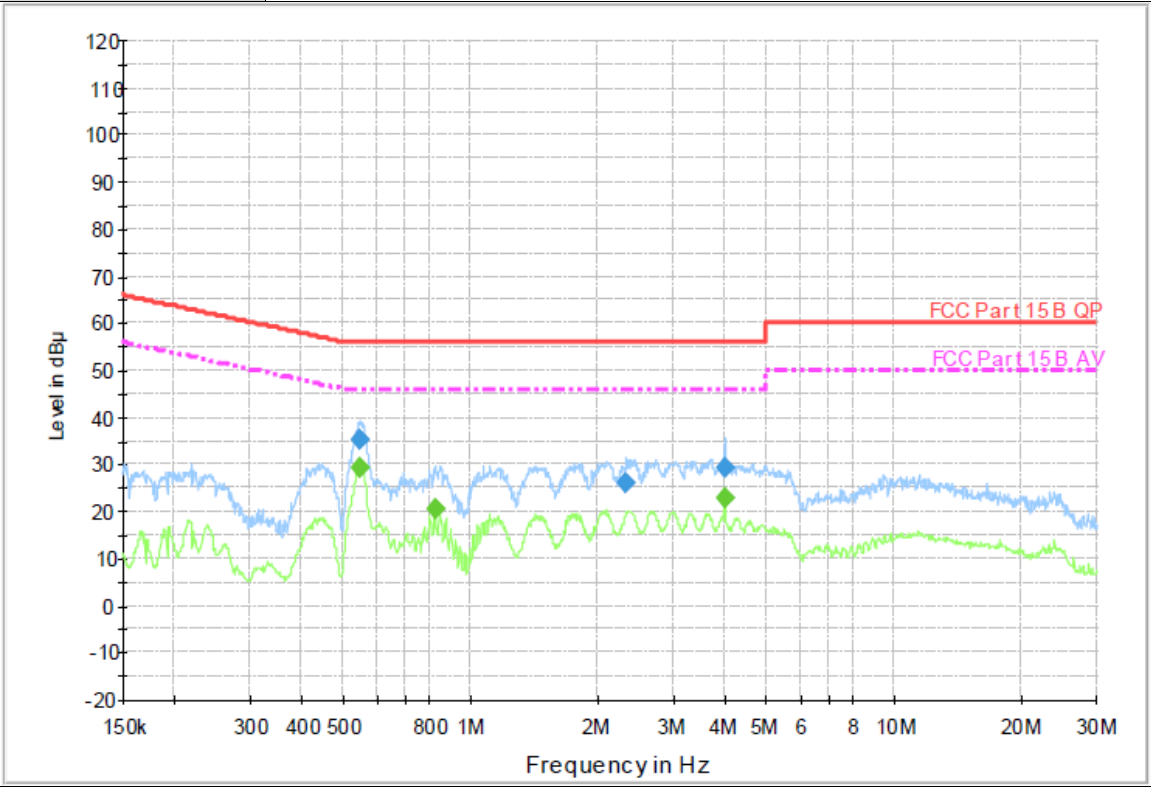
Frequency (MHz)	QuasiPeak (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.553370	25.4	1000.00	9.000	On	L1	9.7	30.6	56.0	
3.960370	26.3	1000.00	9.000	On	L1	9.7	29.8	56.0	
27.783560	26.3	1000.00	9.000	On	L1	10.0	33.7	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.551170	19.6	1000.00	9.000	On	L1	9.7	26.4	46.0	
0.821590	14.8	1000.00	9.000	On	L1	9.7	31.2	46.0	
3.960370	16.4	1000.00	9.000	On	L1	9.7	29.6	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
0.546780	35.3	1000.00	9.000	On	N	10.0	20.7	56.0	
2.319630	25.9	1000.00	9.000	On	N	10.0	30.1	56.0	
3.960370	29.3	1000.00	9.000	On	N	10.0	26.7	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
0.546780	29.1	1000.00	9.000	On	N	10.0	16.9	46.0	
0.821590	20.7	1000.00	9.000	On	N	10.0	25.3	46.0	
3.960370	22.9	1000.00	9.000	On	N	10.0	23.1	46.0	

Emission Level = Read Level + Correct Factor

3.2. Radiated Emission

Limit

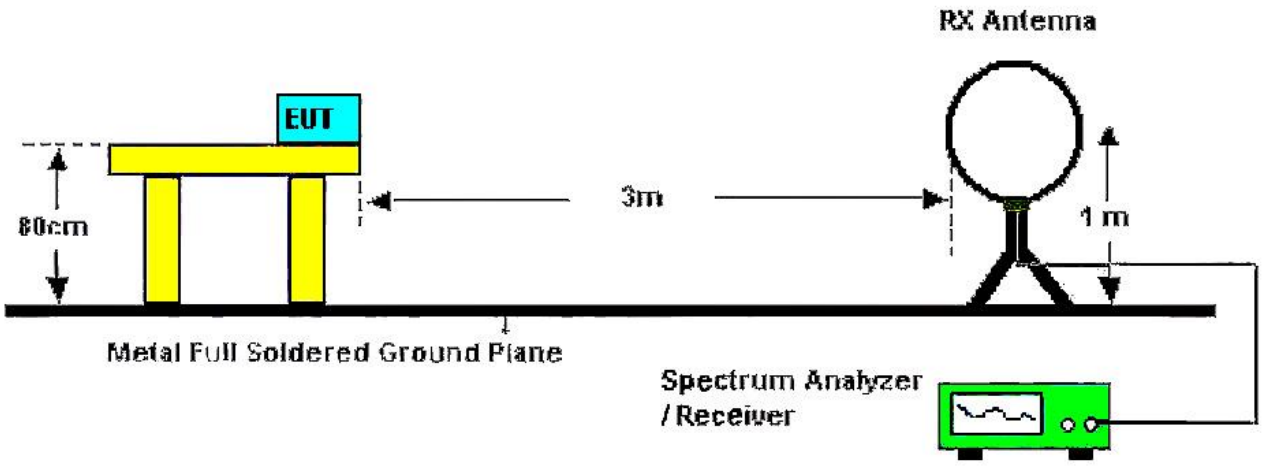
FCC CFR Title 47 Part 15 Subpart C Section 15.209 / RSS-Gen 8.9

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

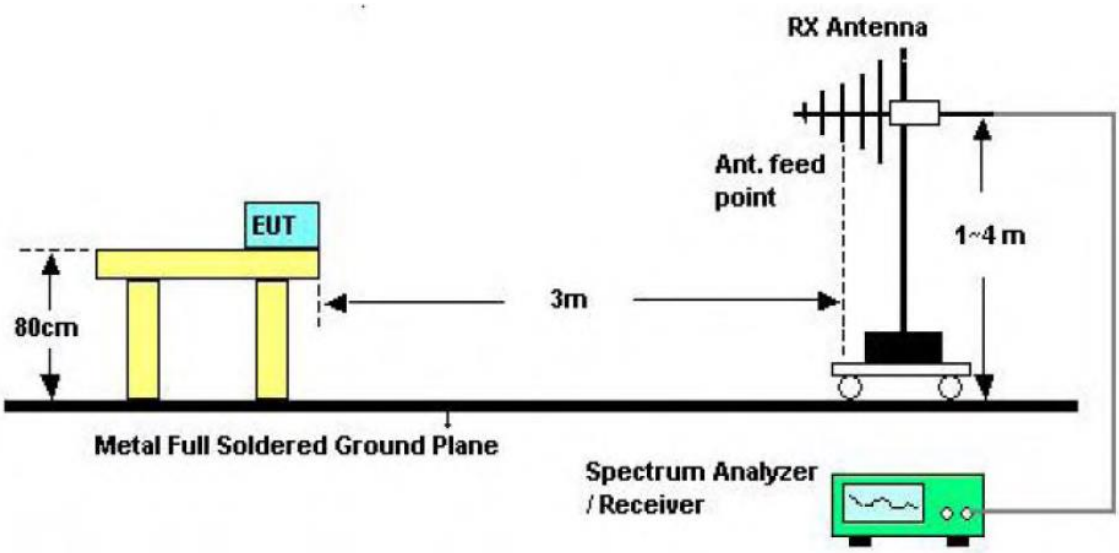
Frequency Range (MHz)	dBμV/m (at 3 meters)	
	Peak	Average
Above 1000	74	54

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

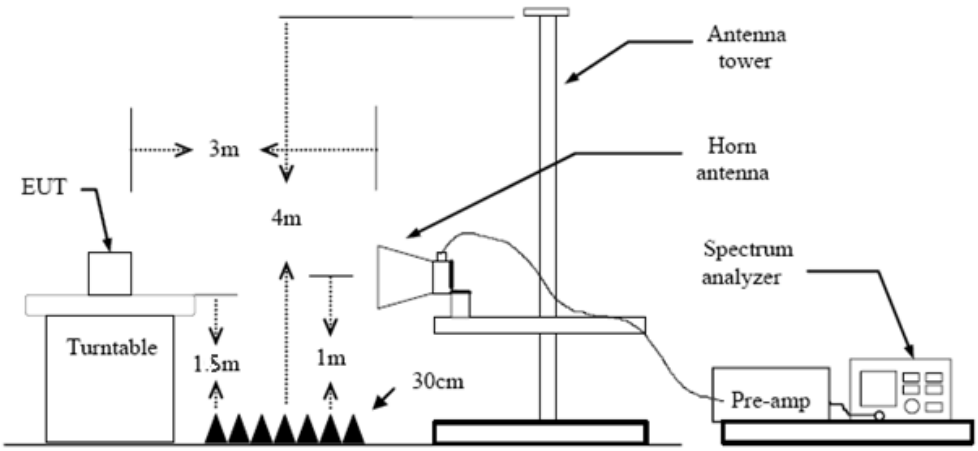
Test Configuration



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

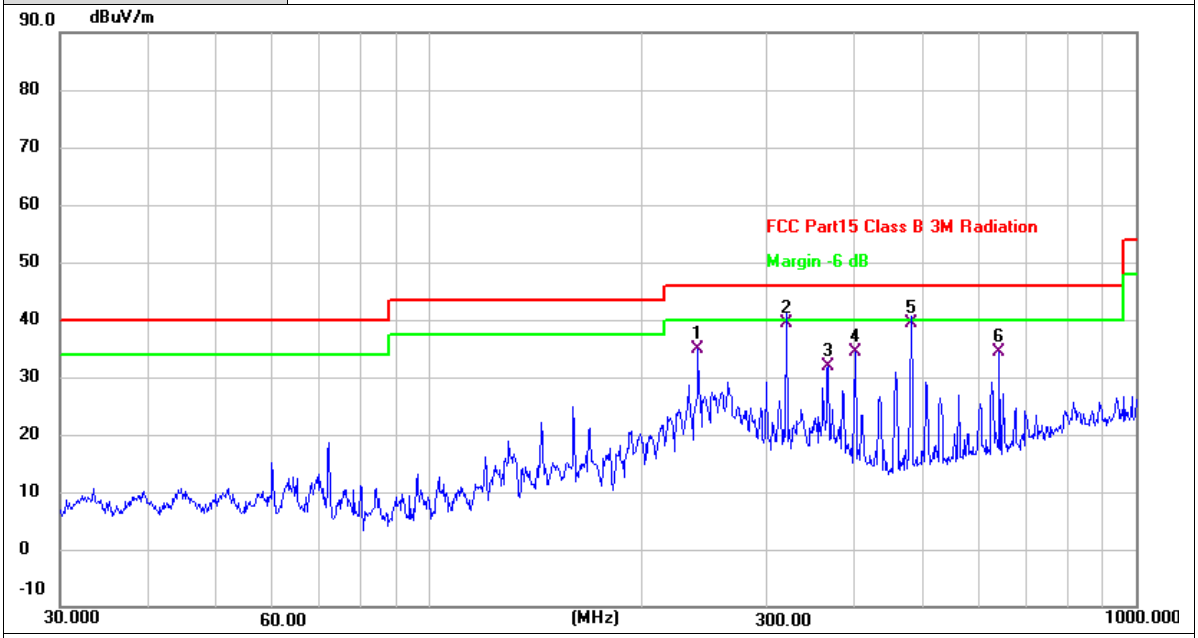
9 kHz~30 MHz

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

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

30MHz-1GHz

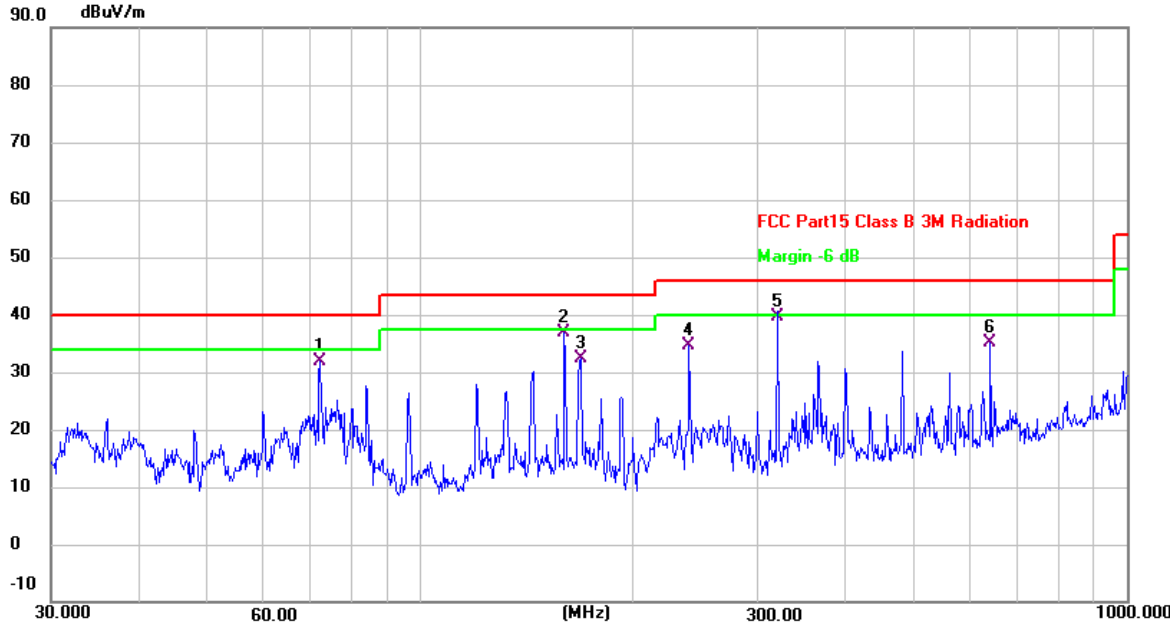
Ant. Pol.	Horizontal
Test Mode:	TX 802.11b Mode 2412MHz
Remark:	Only worse case is reported.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	239.9873	53.84	-18.95	34.89	46.00	-11.11	QP
2 *	319.9369	56.12	-16.71	39.41	46.00	-6.59	QP
3	366.8231	47.55	-15.58	31.97	46.00	-14.03	QP
4	400.4318	49.10	-14.83	34.27	46.00	-11.73	QP
5	480.5276	52.31	-12.95	39.36	46.00	-6.64	QP
6	640.6110	44.47	-9.98	34.49	46.00	-11.51	QP

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
Remark:	Only worse case is reported.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	72.0843	52.79	-20.81	31.98	40.00	-8.02	QP
2	159.7844	54.05	-17.09	36.96	43.50	-6.54	QP
3	168.4137	50.11	-17.81	32.30	43.50	-11.20	QP
4	239.9873	53.63	-18.95	34.68	46.00	-11.32	QP
5 *	319.9369	56.25	-16.71	39.54	46.00	-6.46	QP
6	640.6110	45.22	-9.98	35.24	46.00	-10.76	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. 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	1998.750	57.83	-9.41	48.42	74.00	-25.58	peak
2	3220.750	53.08	-6.85	46.23	74.00	-27.77	peak
3	4818.750	55.42	-2.38	53.04	74.00	-20.96	peak
4	7544.750	47.92	3.89	51.81	74.00	-22.19	peak
5 *	9718.500	46.46	6.80	53.26	74.00	-20.74	peak
6	12350.500	43.07	9.95	53.02	74.00	-20.98	peak

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
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	1998.750	62.75	-9.41	53.34	74.00	-20.66	peak
2	4818.750	61.63	-2.38	59.25	74.00	-14.75	peak
3 *	4818.750	52.28	-2.38	49.90	54.00	-4.10	AVG
4	6005.500	48.52	1.10	49.62	74.00	-24.38	peak
5	7474.250	48.40	3.74	52.14	74.00	-21.86	peak
6	9530.500	45.78	7.14	52.92	74.00	-21.08	peak
7	10917.000	43.60	9.76	53.36	74.00	-20.64	peak

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 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	1998.750	55.36	-9.41	45.95	74.00	-28.05	peak
2	3244.250	54.16	-6.83	47.33	74.00	-26.67	peak
3 *	4877.500	55.53	-2.12	53.41	74.00	-20.59	peak
4	7556.500	48.86	3.91	52.77	74.00	-21.23	peak
5	9800.750	46.14	6.66	52.80	74.00	-21.20	peak
6	12421.000	43.19	10.02	53.21	74.00	-20.79	peak

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 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	1998.750	63.47	-9.41	54.06	74.00	-19.94	peak
2	1998.750	48.55	-9.41	39.14	54.00	-14.86	AVG
3	4877.500	60.86	-2.12	58.74	74.00	-15.26	peak
4 *	4877.500	52.09	-2.12	49.97	54.00	-4.03	AVG
5	5982.000	48.22	1.05	49.27	74.00	-24.73	peak
6	7920.750	46.81	4.64	51.45	74.00	-22.55	peak
7	9718.500	46.44	6.80	53.24	74.00	-20.76	peak
8	11152.000	43.13	10.31	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. 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	1987.000	59.70	-9.49	50.21	74.00	-23.79	peak
2	3279.500	54.62	-6.80	47.82	74.00	-26.18	peak
3 *	4924.500	55.91	-1.93	53.98	74.00	-20.02	peak
4	8249.750	47.31	5.12	52.43	74.00	-21.57	peak
5	9812.500	46.64	6.64	53.28	74.00	-20.72	peak
6	11998.000	43.58	9.60	53.18	74.00	-20.82	peak

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
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	1998.750	64.17	-9.41	54.76	74.00	-19.24	peak
2	1998.750	49.06	-9.41	39.65	54.00	-14.35	AVG
3	3326.500	52.08	-6.77	45.31	74.00	-28.69	peak
4	4924.500	60.90	-1.93	58.97	74.00	-15.03	peak
5 *	4924.500	51.93	-1.93	50.00	54.00	-4.00	AVG
6	7521.250	48.95	3.84	52.79	74.00	-21.21	peak
7	10376.500	46.20	6.70	52.90	74.00	-21.10	peak
8	12644.250	42.98	10.24	53.22	74.00	-20.78	peak

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
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	1987.000	57.15	-9.49	47.66	74.00	-26.34	peak
2	3220.750	53.29	-6.85	46.44	74.00	-27.56	peak
3	4818.750	52.26	-2.38	49.88	74.00	-24.12	peak
4	7556.500	47.76	3.91	51.67	74.00	-22.33	peak
5 *	9201.500	46.58	6.78	53.36	74.00	-20.64	peak
6	12679.500	43.08	10.28	53.36	74.00	-20.64	peak

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
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	1998.750	64.33	-9.41	54.92	74.00	-19.08	peak
2	1998.750	49.54	-9.41	40.13	54.00	-13.87	AVG
3	4818.750	59.77	-2.38	57.39	74.00	-16.61	peak
4 *	4818.750	51.63	-2.38	49.25	54.00	-4.75	AVG
5	6005.500	48.45	1.10	49.55	74.00	-24.45	peak
6	7568.250	49.02	3.94	52.96	74.00	-21.04	peak
7	10400.000	46.40	6.72	53.12	74.00	-20.88	peak
8	11492.750	43.00	10.23	53.23	74.00	-20.77	peak

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 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	1998.750	58.03	-9.41	48.62	74.00	-25.38	peak
2	3244.250	53.92	-6.83	47.09	74.00	-26.91	peak
3	4877.500	52.45	-2.12	50.33	74.00	-23.67	peak
4	7474.250	47.60	3.74	51.34	74.00	-22.66	peak
5	8755.000	47.04	5.99	53.03	74.00	-20.97	peak
6 *	11140.250	42.79	10.31	53.10	74.00	-20.90	peak

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 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	1998.750	60.30	-9.41	50.89	74.00	-23.11	peak
2	4865.750	57.25	-2.18	55.07	74.00	-18.93	peak
3 *	4865.750	51.16	-2.18	48.98	54.00	-5.02	AVG
4	5970.250	48.31	1.02	49.33	74.00	-24.67	peak
5	7474.250	48.50	3.74	52.24	74.00	-21.76	peak
6	10364.750	46.51	6.68	53.19	74.00	-20.81	peak
7	12409.250	43.37	10.01	53.38	74.00	-20.62	peak

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
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	1987.000	59.66	-9.49	50.17	74.00	-23.83	peak
2	3279.500	54.02	-6.80	47.22	74.00	-26.78	peak
3	4924.500	50.78	-1.93	48.85	74.00	-25.15	peak
4	7544.750	47.62	3.89	51.51	74.00	-22.49	peak
5	8696.250	47.18	5.86	53.04	74.00	-20.96	peak
6 *	11163.750	42.93	10.30	53.23	74.00	-20.77	peak

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
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	1998.750	62.29	-9.41	52.88	74.00	-21.12	peak
2	3326.500	52.94	-6.77	46.17	74.00	-27.83	peak
3	4924.500	56.75	-1.93	54.82	74.00	-19.18	peak
4 *	4924.500	48.61	-1.93	46.68	54.00	-7.32	AVG
5	7544.750	47.87	3.89	51.76	74.00	-22.24	peak
6	9166.250	45.84	6.74	52.58	74.00	-21.42	peak
7	10893.500	43.56	9.60	53.16	74.00	-20.84	peak

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
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	1987.000	57.93	-9.49	48.44	74.00	-25.56	peak
2	3220.750	52.31	-6.85	45.46	74.00	-28.54	peak
3	4818.750	51.98	-2.38	49.60	74.00	-24.40	peak
4	7580.000	48.60	3.96	52.56	74.00	-21.44	peak
5	10341.250	46.28	6.66	52.94	74.00	-21.06	peak
6 *	12679.500	42.83	10.28	53.11	74.00	-20.89	peak

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
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	1987.000	59.39	-9.49	49.90	74.00	-24.10	peak
2	4818.750	58.55	-2.38	56.17	74.00	-17.83	peak
3 *	4818.750	51.24	-2.38	48.86	54.00	-5.14	AVG
4	6734.000	48.57	2.08	50.65	74.00	-23.35	peak
5	7544.750	48.01	3.89	51.90	74.00	-22.10	peak
6	9119.250	46.83	6.66	53.49	74.00	-20.51	peak
7	11692.500	42.93	9.99	52.92	74.00	-21.08	peak

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 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	1987.000	58.65	-9.49	49.16	74.00	-24.84	peak
2	3244.250	54.55	-6.83	47.72	74.00	-26.28	peak
3	4865.750	51.25	-2.18	49.07	74.00	-24.93	peak
4	7556.500	48.91	3.91	52.82	74.00	-21.18	peak
5 *	9131.000	46.60	6.68	53.28	74.00	-20.72	peak
6	11175.500	42.93	10.31	53.24	74.00	-20.76	peak

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 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	1998.750	62.36	-9.41	52.95	74.00	-21.05	peak
2	4877.500	58.16	-2.12	56.04	74.00	-17.96	peak
3 *	4877.500	50.23	-2.12	48.11	54.00	-5.89	AVG
4	5935.000	48.64	0.93	49.57	74.00	-24.43	peak
5	7004.250	48.53	2.81	51.34	74.00	-22.66	peak
6	9718.500	46.28	6.80	53.08	74.00	-20.92	peak
7	12056.750	43.49	9.66	53.15	74.00	-20.85	peak

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
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	1998.750	55.36	-9.41	45.95	74.00	-28.05	peak
2	3279.500	54.23	-6.80	47.43	74.00	-26.57	peak
3	4924.500	51.21	-1.93	49.28	74.00	-24.72	peak
4	7568.250	48.57	3.94	52.51	74.00	-21.49	peak
5	10341.250	46.41	6.66	53.07	74.00	-20.93	peak
6 *	11692.500	43.23	9.99	53.22	74.00	-20.78	peak

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
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	1998.750	60.90	-9.41	51.49	74.00	-22.51	peak
2	4936.250	57.80	-1.88	55.92	74.00	-18.08	peak
3 *	4936.250	50.08	-1.88	48.20	54.00	-5.80	AVG
4	6111.250	48.69	1.17	49.86	74.00	-24.14	peak
5	7615.250	48.67	4.03	52.70	74.00	-21.30	peak
6	8766.750	47.21	6.01	53.22	74.00	-20.78	peak
7	11492.750	42.97	10.23	53.20	74.00	-20.80	peak

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
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	1987.000	61.10	-9.49	51.61	74.00	-22.39	peak
2	3232.500	53.01	-6.83	46.18	74.00	-27.82	peak
3	4842.250	49.54	-2.28	47.26	74.00	-26.74	peak
4	6005.500	48.20	1.10	49.30	74.00	-24.70	peak
5	7568.250	48.66	3.94	52.60	74.00	-21.40	peak
6 *	11739.500	43.29	9.92	53.21	74.00	-20.79	peak

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
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	2045.750	57.09	-9.20	47.89	74.00	-26.11	peak
2	3326.500	50.98	-6.77	44.21	74.00	-29.79	peak
3	4842.250	54.68	-2.28	52.40	74.00	-21.60	peak
4	6005.500	48.67	1.10	49.77	74.00	-24.23	peak
5	7638.750	48.00	4.08	52.08	74.00	-21.92	peak
6 *	10846.500	43.93	9.27	53.20	74.00	-20.80	peak

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 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	1998.750	60.99	-9.41	51.58	74.00	-22.42	peak
2	3244.250	53.92	-6.83	47.09	74.00	-26.91	peak
3	4865.750	49.74	-2.18	47.56	74.00	-26.44	peak
4	5946.750	48.34	0.96	49.30	74.00	-24.70	peak
5 *	8073.500	48.55	4.89	53.44	74.00	-20.56	peak
6	11951.000	43.55	9.66	53.21	74.00	-20.79	peak

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 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	1998.750	60.54	-9.41	51.13	74.00	-22.87	peak
2	3244.250	50.88	-6.83	44.05	74.00	-29.95	peak
3	4877.500	53.41	-2.12	51.29	74.00	-22.71	peak
4	6017.250	48.07	1.12	49.19	74.00	-24.81	peak
5	7439.000	48.26	3.68	51.94	74.00	-22.06	peak
6 *	10341.250	46.70	6.66	53.36	74.00	-20.64	peak

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
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	1987.000	57.56	-9.49	48.07	74.00	-25.93	peak
2	3267.750	54.19	-6.82	47.37	74.00	-26.63	peak
3	5124.250	49.11	-1.25	47.86	74.00	-26.14	peak
4	7556.500	48.21	3.91	52.12	74.00	-21.88	peak
5	8696.250	47.12	5.86	52.98	74.00	-21.02	peak
6 *	11492.750	43.25	10.23	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. 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	1987.000	61.94	-9.49	52.45	74.00	-21.55	peak
2	3326.500	51.01	-6.77	44.24	74.00	-29.76	peak
3	4901.000	52.11	-2.03	50.08	74.00	-23.92	peak
4	7544.750	48.82	3.89	52.71	74.00	-21.29	peak
5	8696.250	47.02	5.86	52.88	74.00	-21.12	peak
6 *	10317.750	46.85	6.63	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

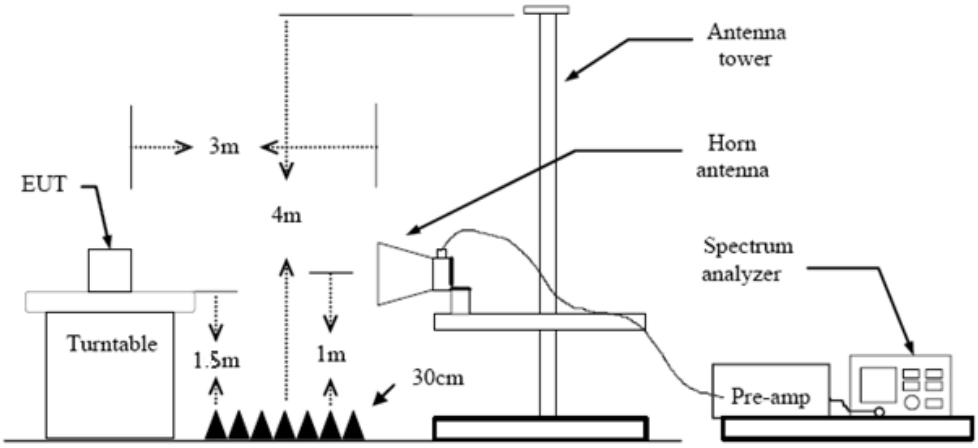
3.3. Band Edge Emissions (Radiated)

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.

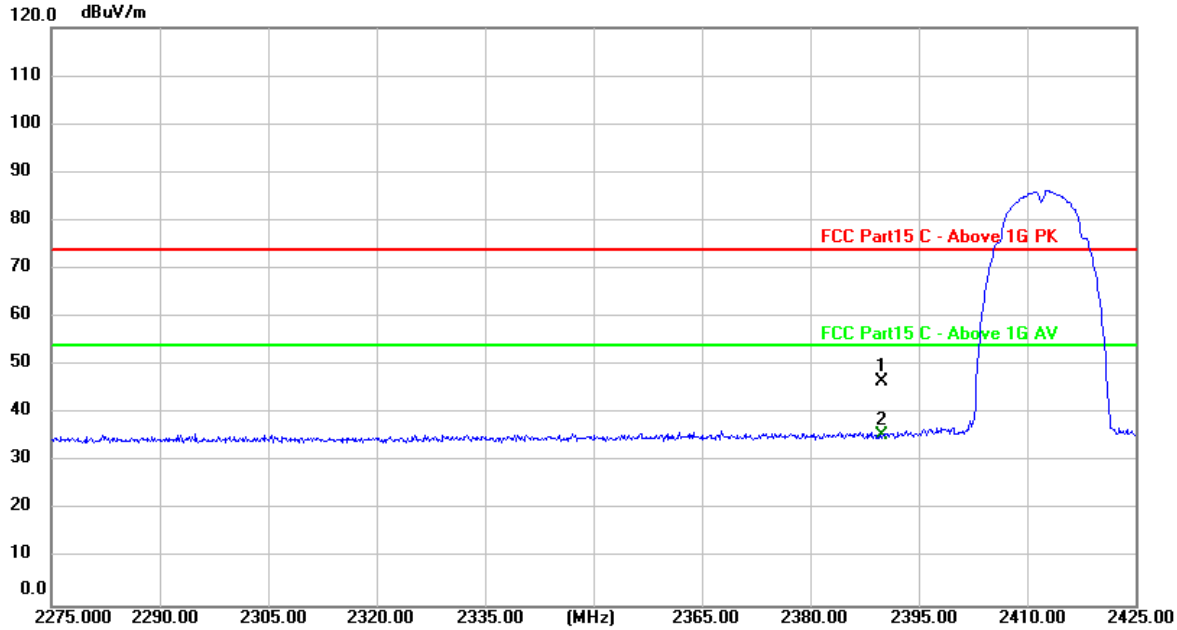
Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.8 Duty Cycle.

Test Mode

Please refer to the clause 2.4.

Test Result

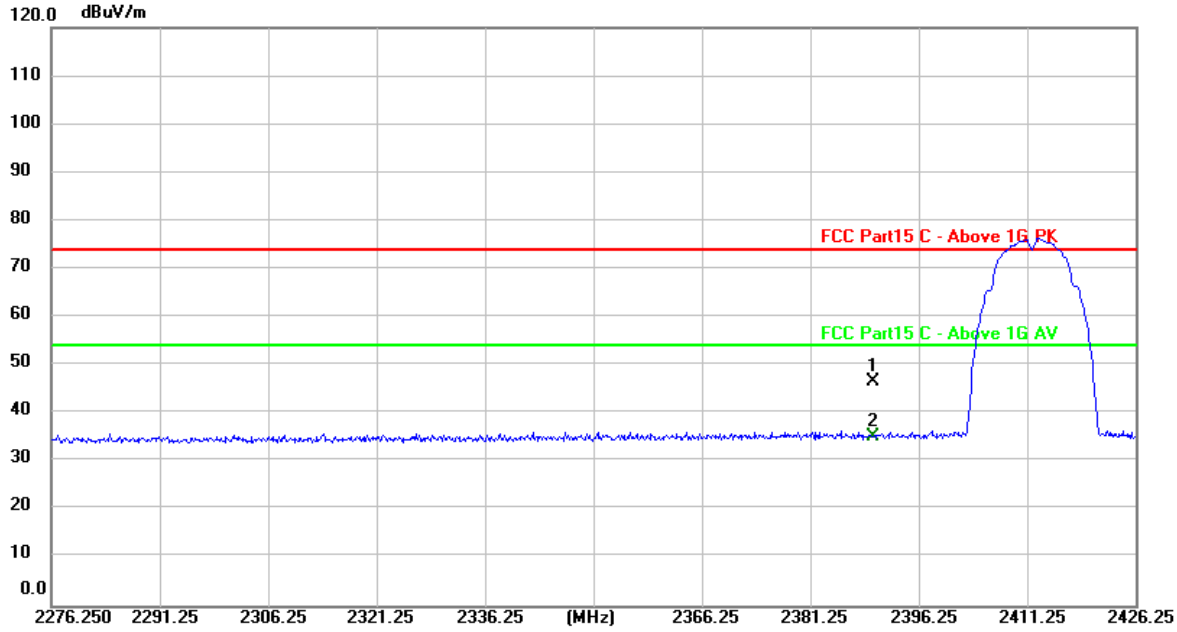
Ant. Pol.	Horizontal
Test Mode:	TX 802.11b Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	15.90	30.84	46.74	74.00	-27.26	peak
2 *	2390.000	4.57	30.84	35.41	54.00	-18.59	AVG

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

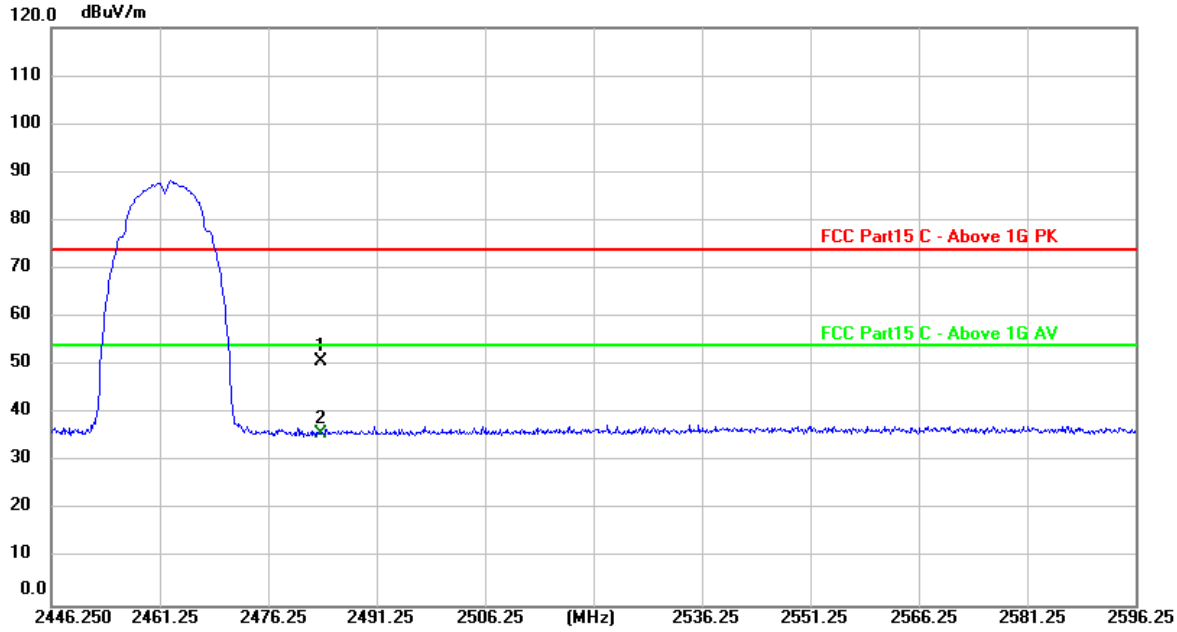
Ant. Pol.	Vertical
Test Mode:	TX 802.11b Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	15.68	30.84	46.52	74.00	-27.48	peak
2 *	2390.000	4.34	30.84	35.18	54.00	-18.82	AVG

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

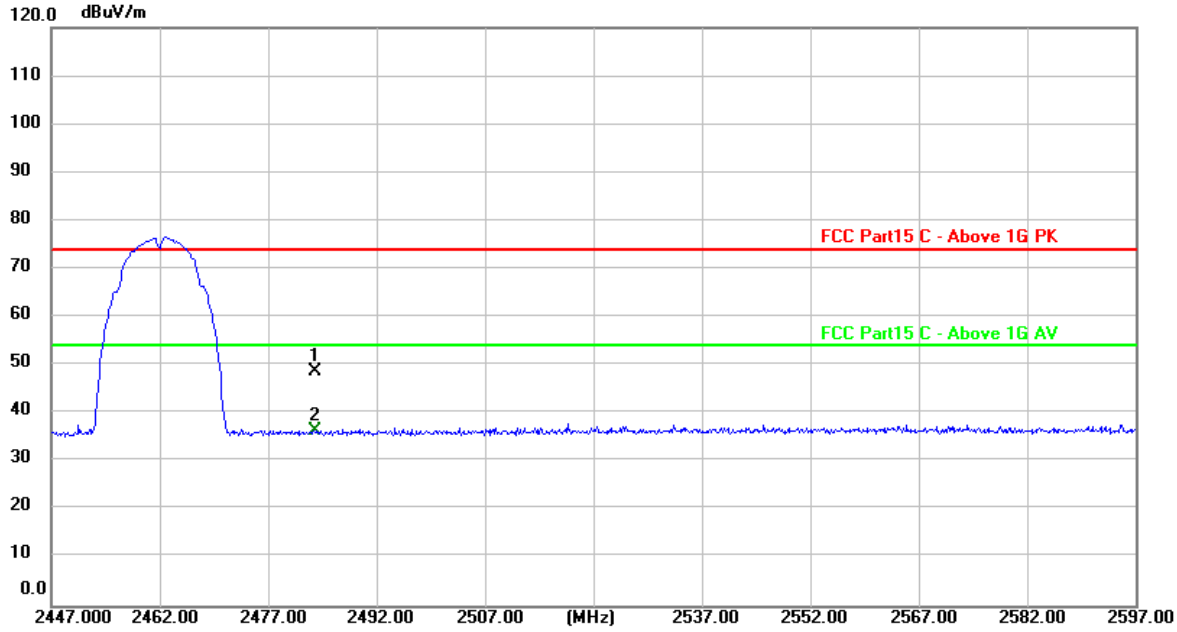
Ant. Pol.	Horizontal
Test Mode:	TX 802.11b Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	19.61	31.24	50.85	74.00	-23.15	peak
2 *	2483.500	4.46	31.24	35.70	54.00	-18.30	AVG

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

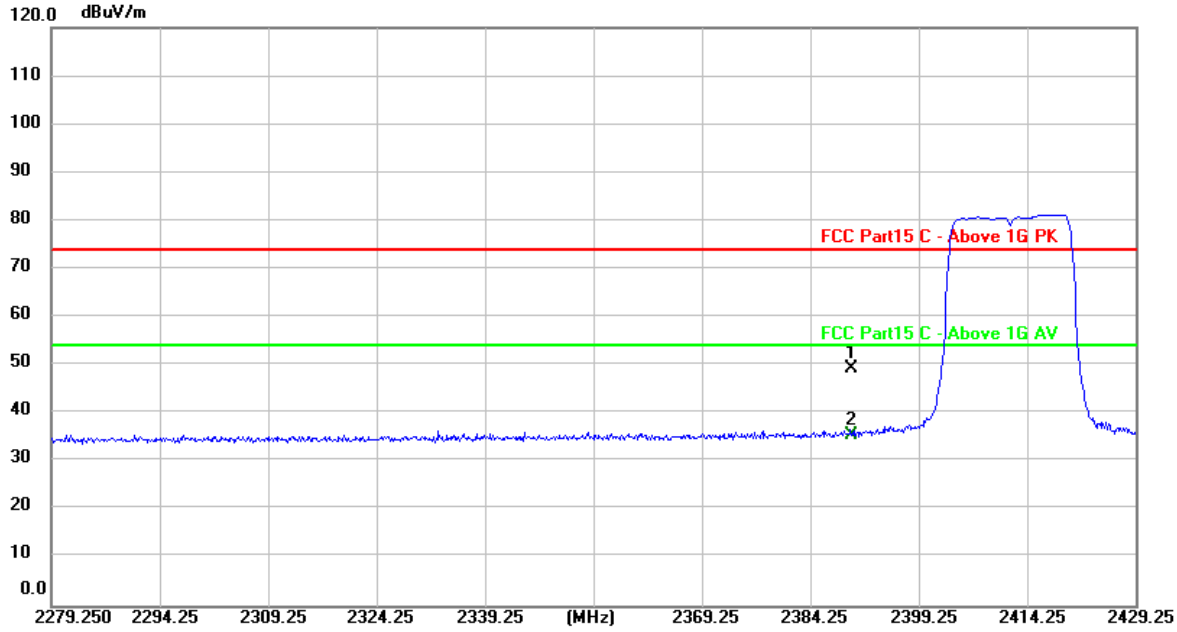
Ant. Pol.	Vertical
Test Mode:	TX 802.11b Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	17.60	31.24	48.84	74.00	-25.16	peak
2 *	2483.500	5.35	31.24	36.59	54.00	-17.41	AVG

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

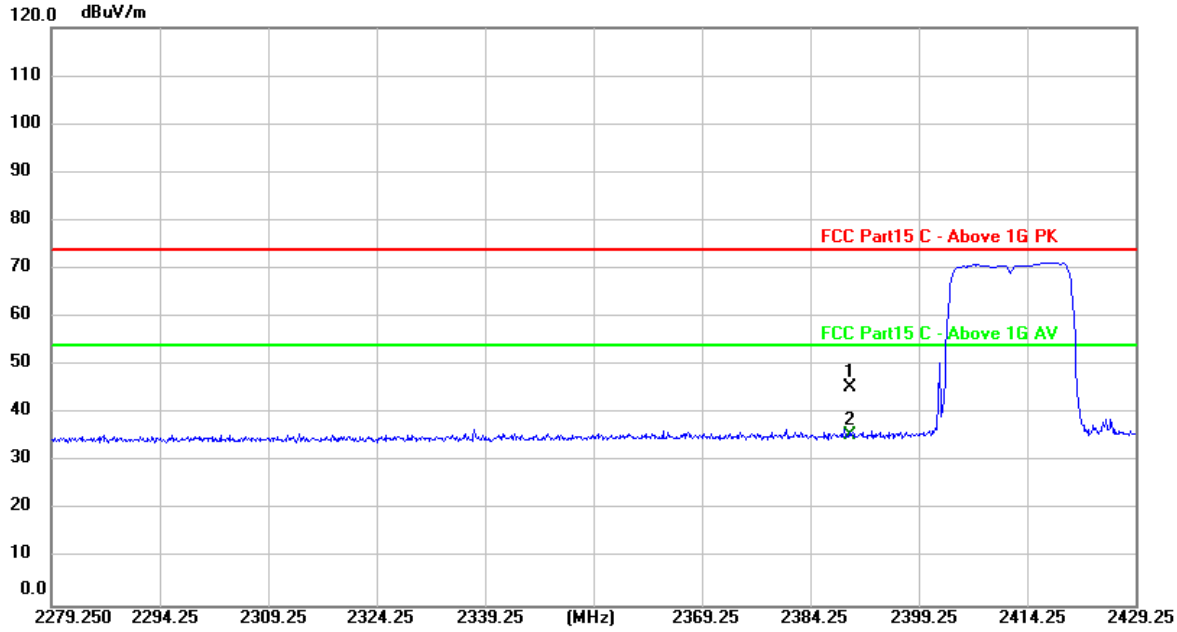
Ant. Pol.	Horizontal
Test Mode:	TX 802.11g Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	18.46	30.84	49.30	74.00	-24.70	peak
2 *	2390.000	4.63	30.84	35.47	54.00	-18.53	AVG

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

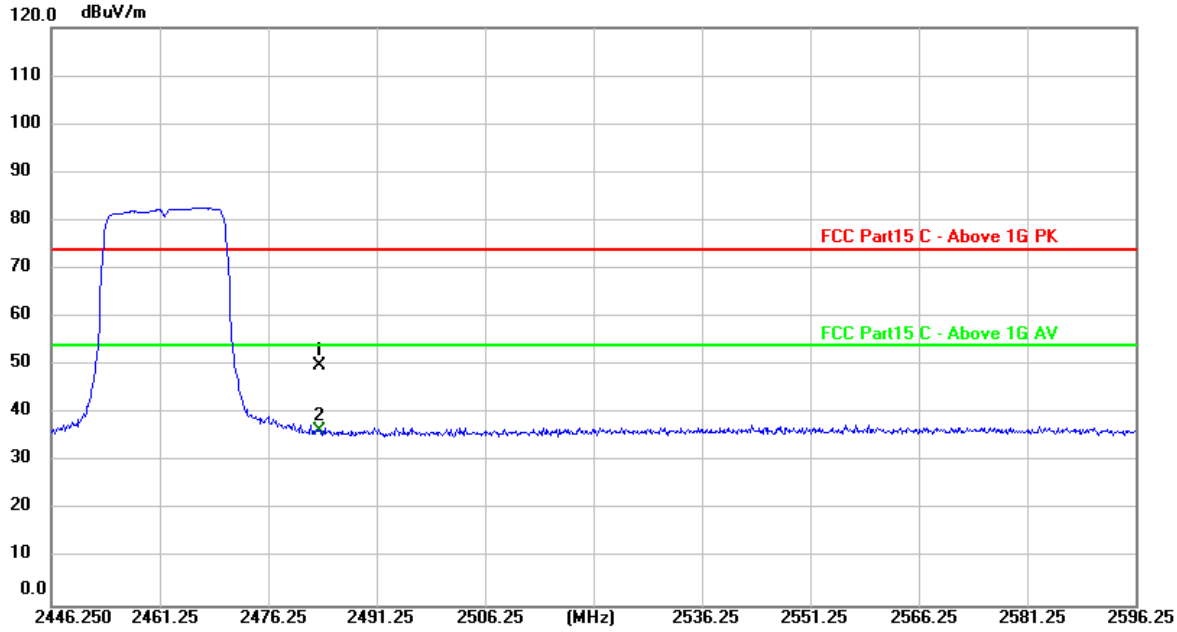
Ant. Pol.	Vertical
Test Mode:	TX 802.11g Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	14.74	30.84	45.58	74.00	-28.42	peak
2 *	2390.000	4.63	30.84	35.47	54.00	-18.53	AVG

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

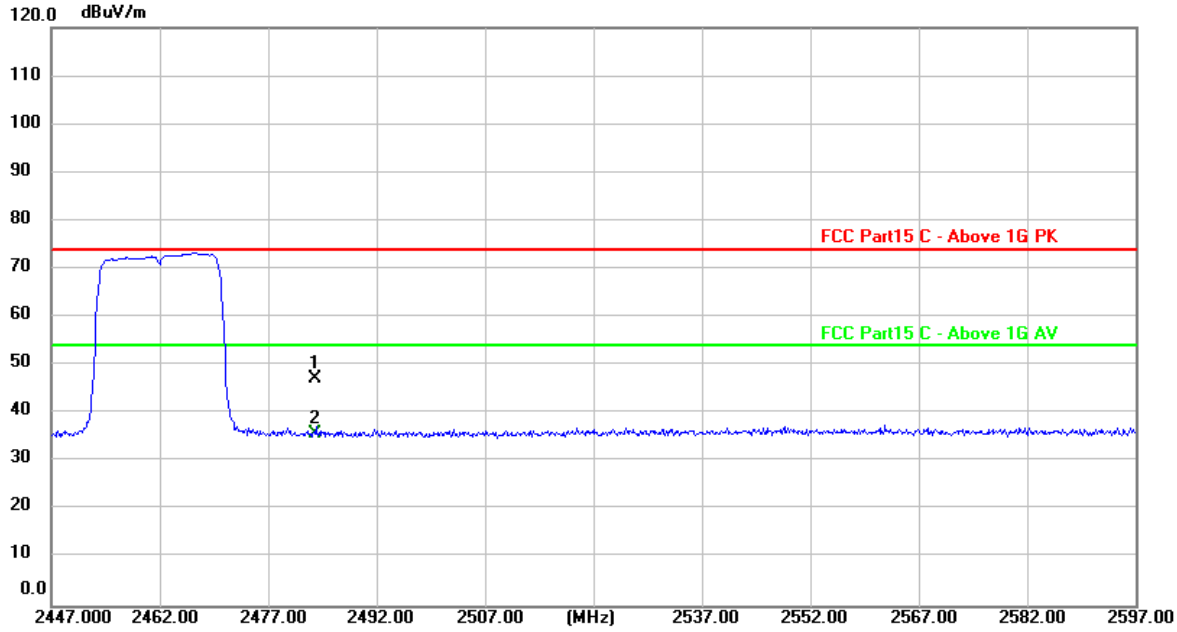
Ant. Pol.	Horizontal
Test Mode:	TX 802.11g Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	18.59	31.24	49.83	74.00	-24.17	peak
2 *	2483.500	5.07	31.24	36.31	54.00	-17.69	AVG

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

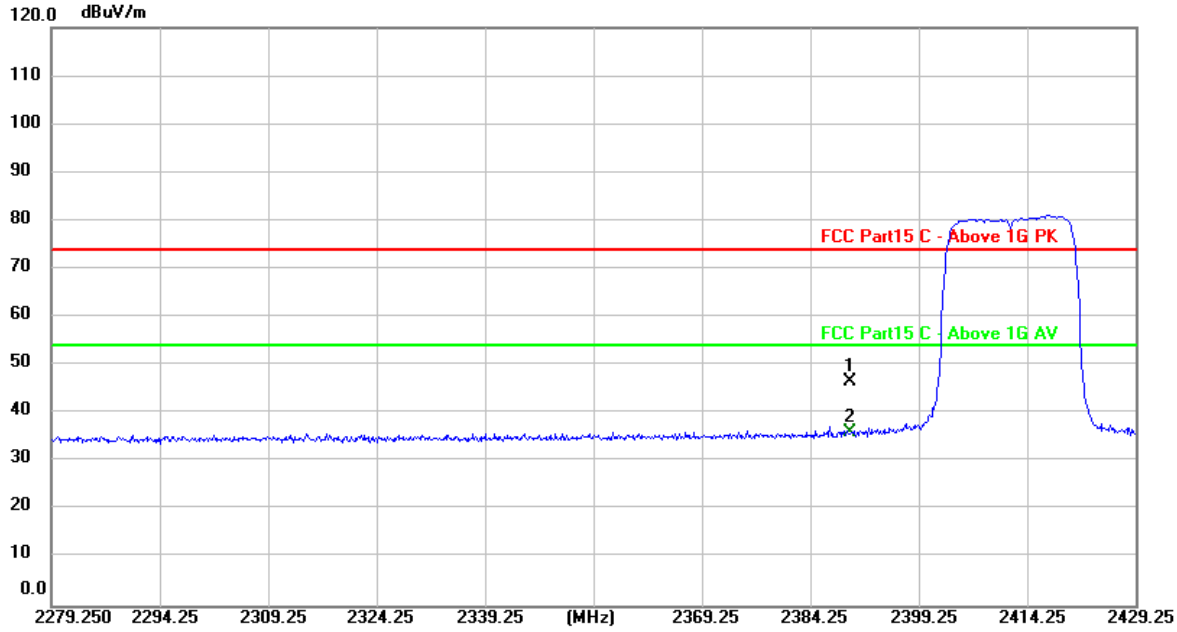
Ant. Pol.	Vertical
Test Mode:	TX 802.11g Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	15.95	31.24	47.19	74.00	-26.81	peak
2 *	2483.500	4.56	31.24	35.80	54.00	-18.20	AVG

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

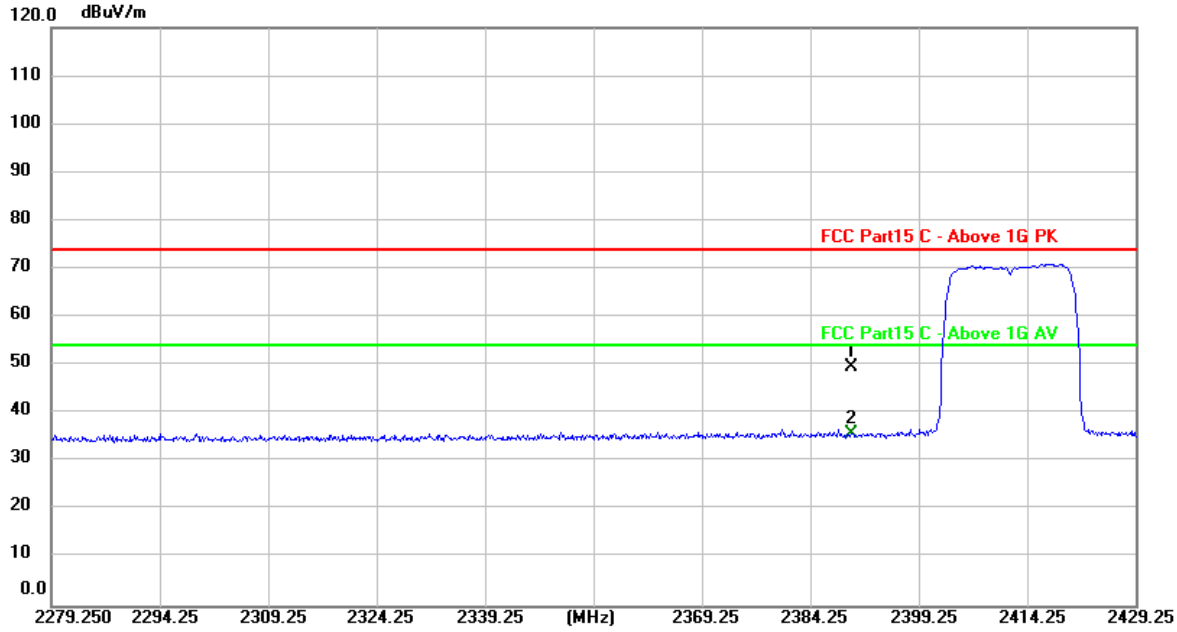
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT20) Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	15.90	30.84	46.74	74.00	-27.26	peak
2 *	2390.000	5.21	30.84	36.05	54.00	-17.95	AVG

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

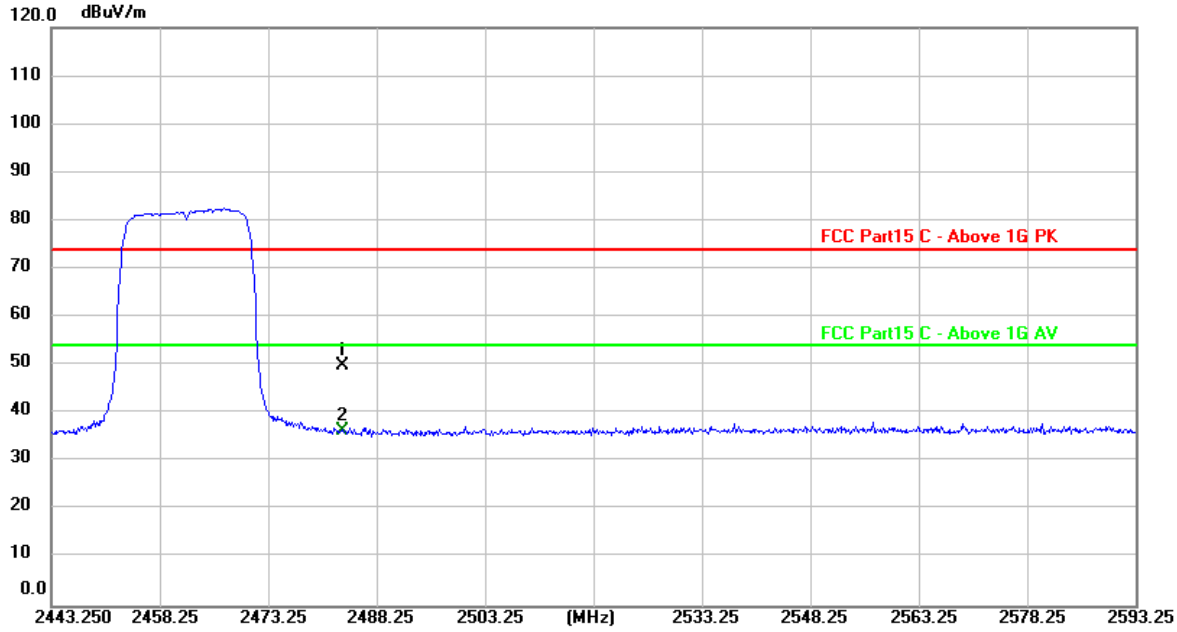
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT20) Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	18.67	30.84	49.51	74.00	-24.49	peak
2 *	2390.000	5.11	30.84	35.95	54.00	-18.05	AVG

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

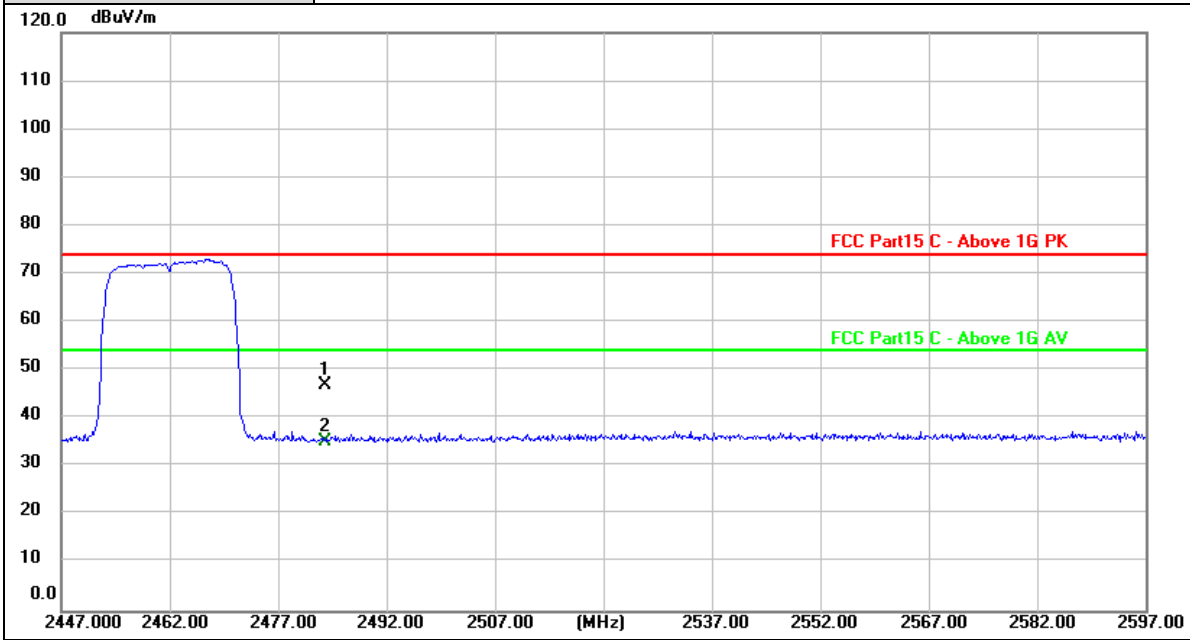
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT20) Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	18.86	31.24	50.10	74.00	-23.90	peak
2 *	2483.500	5.07	31.24	36.31	54.00	-17.69	AVG

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

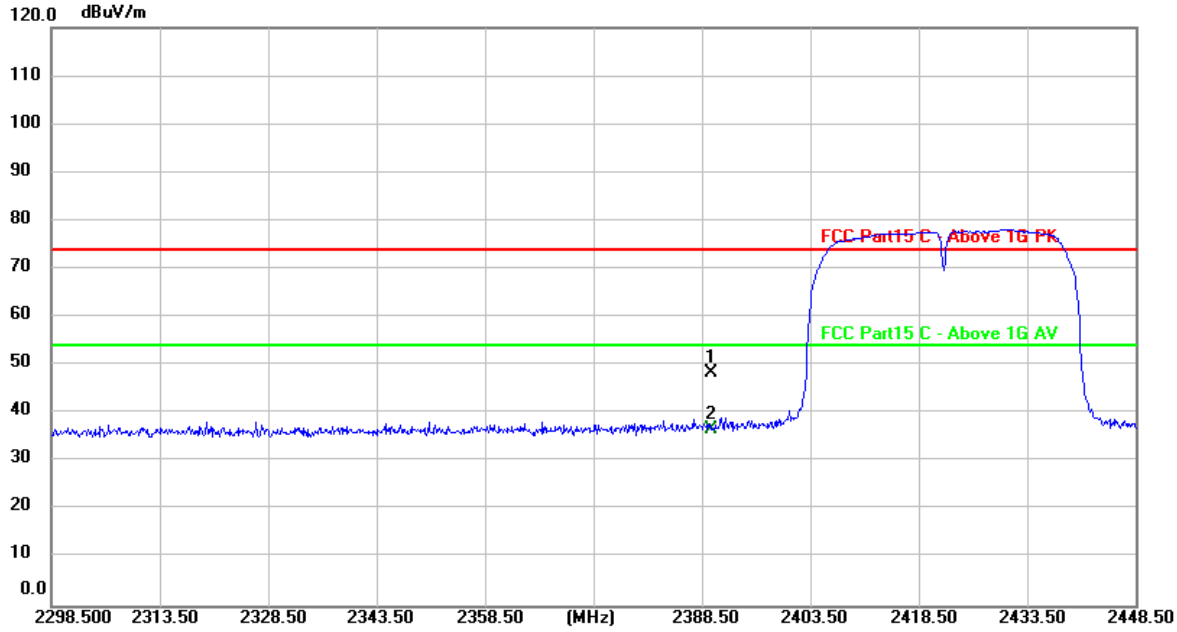
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT20) Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	15.81	31.24	47.05	74.00	-26.95	peak
2 *	2483.500	4.03	31.24	35.27	54.00	-18.73	AVG

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

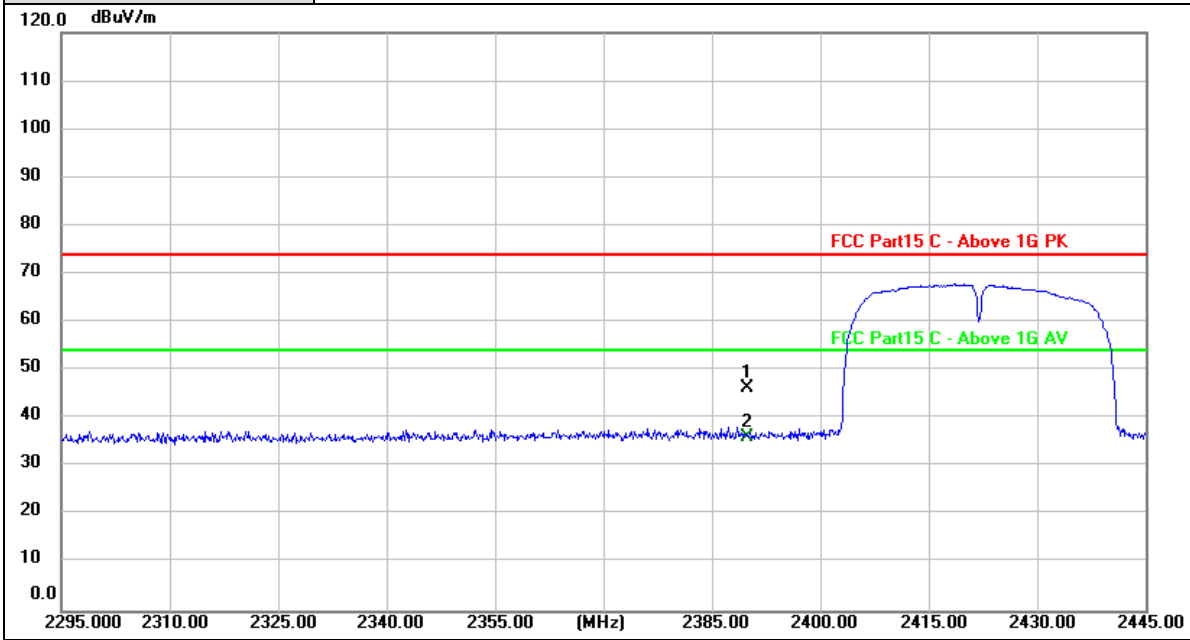
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT40) Mode 2422MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	17.57	30.84	48.41	74.00	-25.59	peak
2 *	2390.000	5.97	30.84	36.81	54.00	-17.19	AVG

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

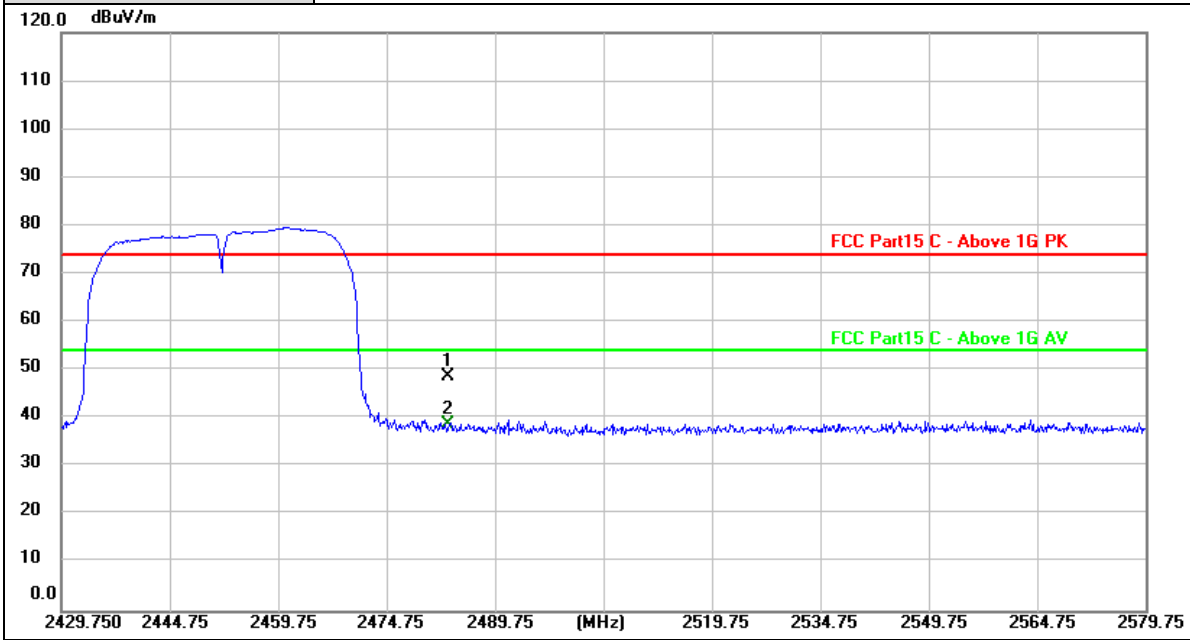
Ant. Pol.	Vertical
Test Mode:	TX 802.11n(HT40) Mode 2422MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	15.63	30.84	46.47	74.00	-27.53	peak
2 *	2390.000	5.30	30.84	36.14	54.00	-17.86	AVG

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

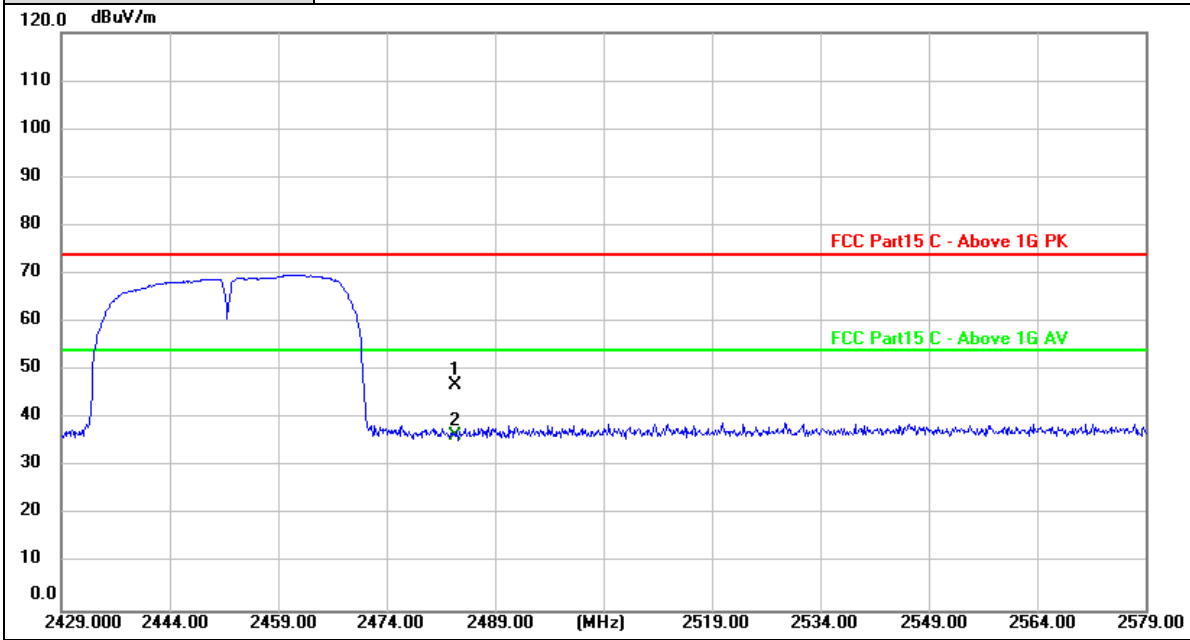
Ant. Pol.	Horizontal
Test Mode:	TX 802.11n(HT40) Mode 2452MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	17.52	31.24	48.76	74.00	-25.24	peak
2 *	2483.500	7.59	31.24	38.83	54.00	-15.17	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	15.80	31.24	47.04	74.00	-26.96	peak
2 *	2483.500	5.16	31.24	36.40	54.00	-17.60	AVG

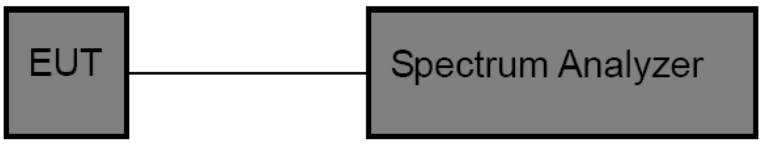
Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

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.

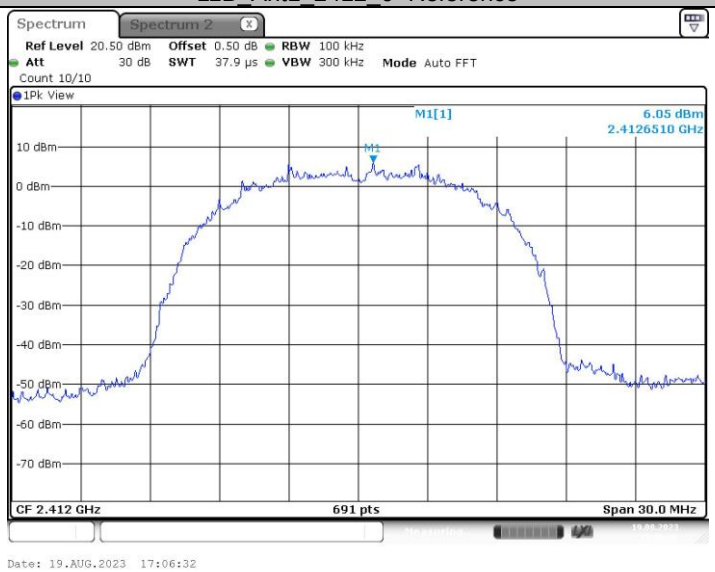
Test Result

(1) Conducted Spurious Emission

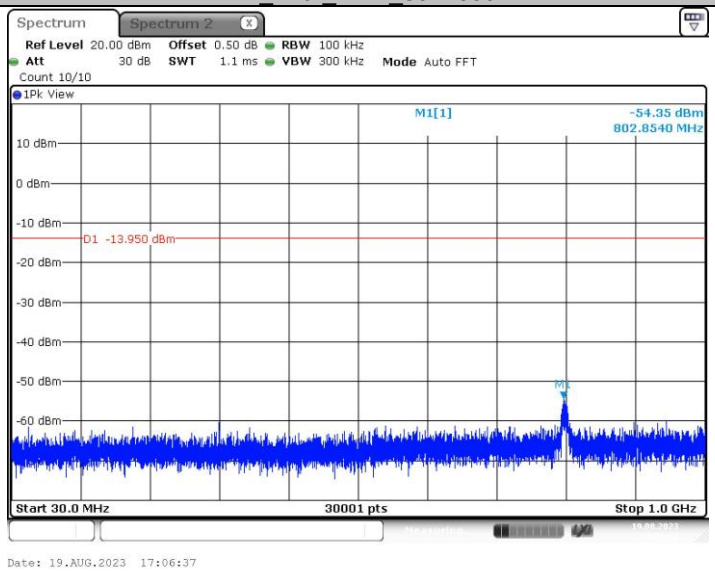
Test Mode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	6.05	6.05	---	PASS
			30~1000	6.05	-54.35	≤-13.95	PASS
			1000~26500	6.05	-44.48	≤-13.95	PASS
		2437	Reference	5.74	5.74	---	PASS
			30~1000	5.74	-53.54	≤-14.26	PASS
			1000~26500	5.74	-46.72	≤-14.26	PASS
		2462	Reference	4.52	4.52	---	PASS
			30~1000	4.52	-55.45	≤-15.48	PASS
			1000~26500	4.52	-46.56	≤-15.48	PASS
11G	Ant1	2412	Reference	-0.64	-0.64	---	PASS
			30~1000	-0.64	-57.60	≤-20.64	PASS
			1000~26500	-0.64	-43.74	≤-20.64	PASS
		2437	Reference	-0.16	-0.16	---	PASS
			30~1000	-0.16	-56.57	≤-20.16	PASS
			1000~26500	-0.16	-46.23	≤-20.16	PASS
		2462	Reference	-0.47	-0.47	---	PASS
			30~1000	-0.47	-57.24	≤-20.47	PASS
			1000~26500	-0.47	-46.11	≤-20.47	PASS
11N20SISO	Ant1	2412	Reference	-0.74	-0.74	---	PASS
			30~1000	-0.74	-56.97	≤-20.74	PASS
			1000~26500	-0.74	-44.17	≤-20.74	PASS
		2437	Reference	-1.18	-1.18	---	PASS
			30~1000	-1.18	-57.38	≤-21.18	PASS
			1000~26500	-1.18	-45.63	≤-21.18	PASS
		2462	Reference	-1.32	-1.32	---	PASS
			30~1000	-1.32	-56.92	≤-21.32	PASS
			1000~26500	-1.32	-46.31	≤-21.32	PASS
11N40SISO	Ant1	2422	Reference	-3.81	-3.81	---	PASS
			30~1000	-3.81	-58.06	≤-23.81	PASS
			1000~26500	-3.81	-44.09	≤-23.81	PASS
		2437	Reference	-4.07	-4.07	---	PASS
			30~1000	-4.07	-58.54	≤-24.07	PASS
			1000~26500	-4.07	-46.33	≤-24.07	PASS
		2452	Reference	-3.80	-3.80	---	PASS
			30~1000	-3.80	-57.95	≤-23.80	PASS
			1000~26500	-3.80	-46.75	≤-23.80	PASS

Test Graphs:

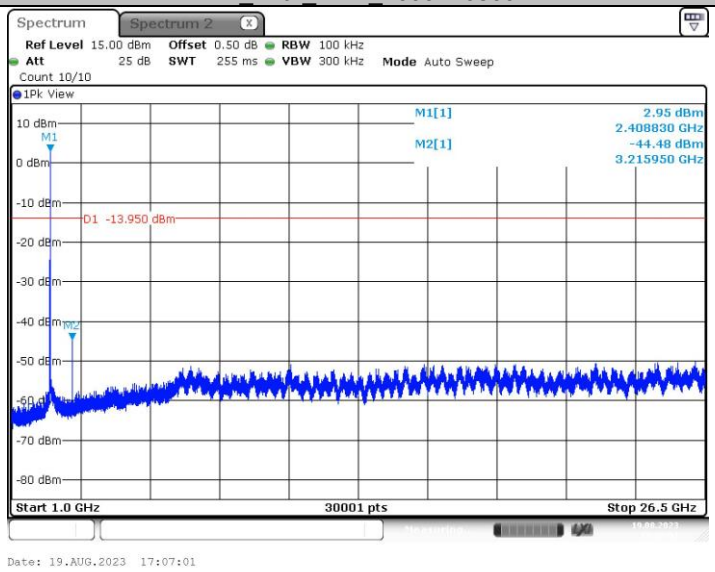
11B_Ant1_2412_0~Reference



11B_Ant1_2412_30~1000

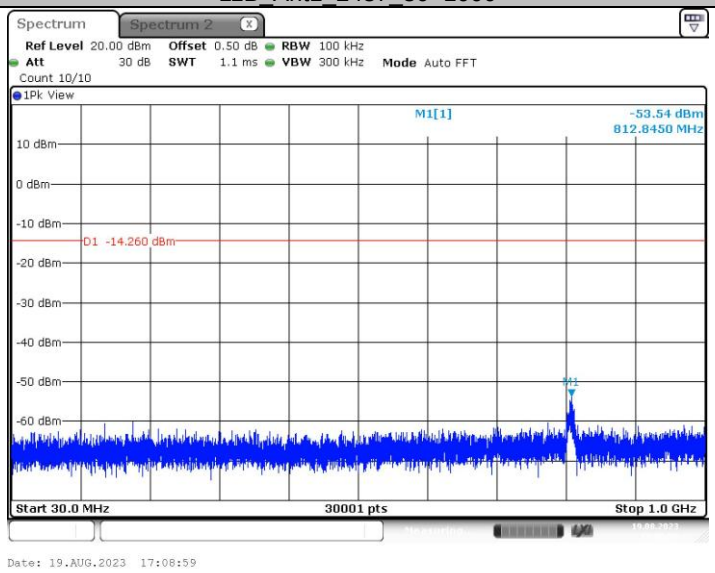


11B_Ant1_2412_1000~26500

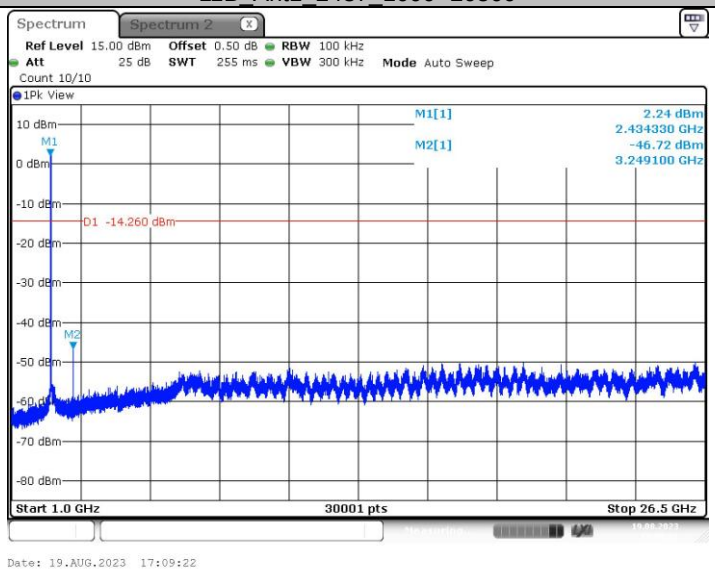


11B_Ant1_2437_0~Reference

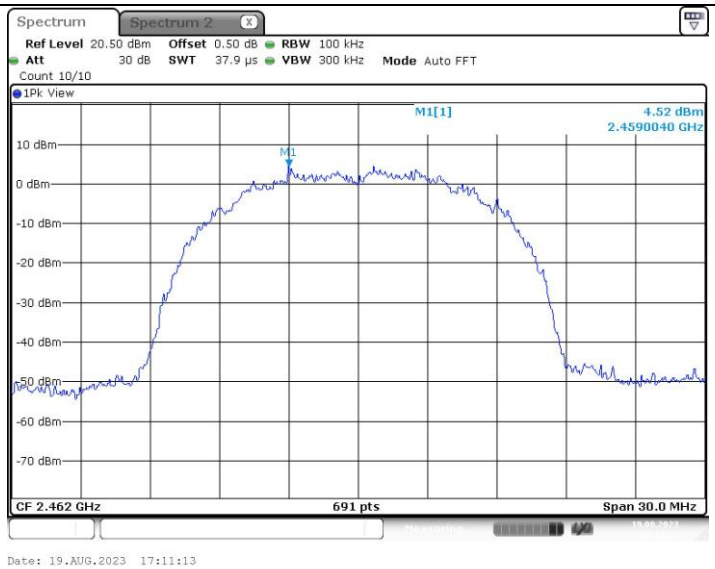
11B_Ant1_2437_30~1000



11B_Ant1_2437_1000~26500



11B_Ant1_2462_0~Reference



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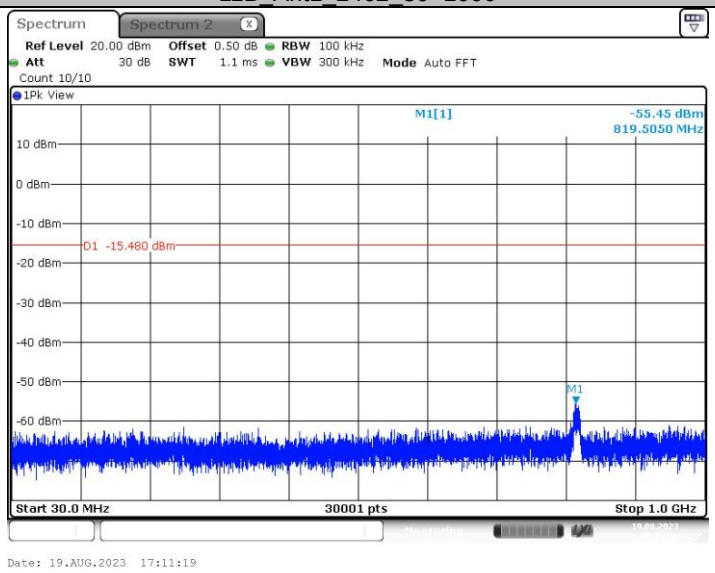
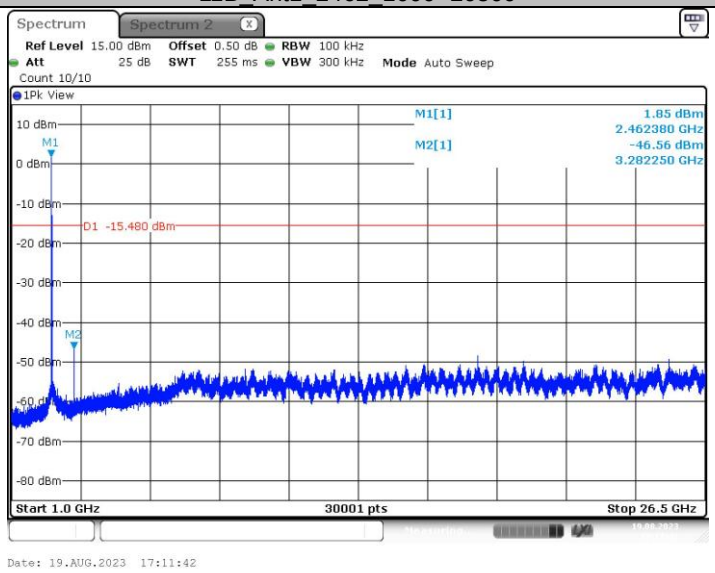
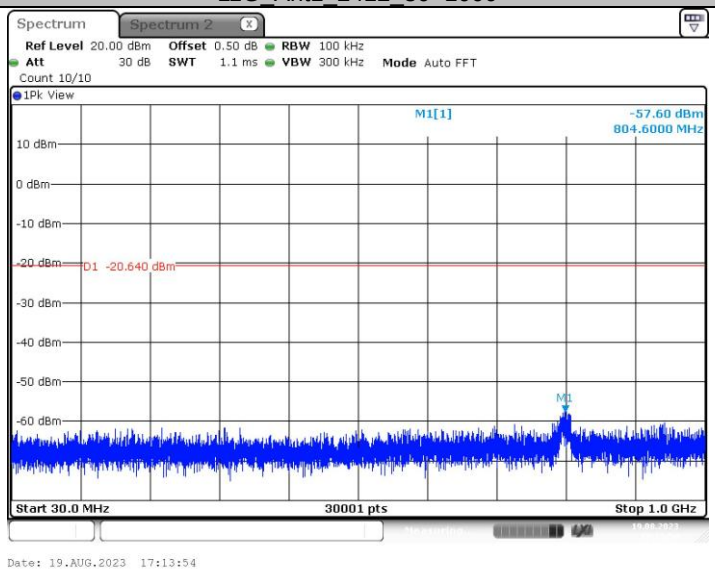


11B_Ant1_2462_1000~26500



11G_Ant1_2412_0~Reference

11G_Ant1_2412_30~1000



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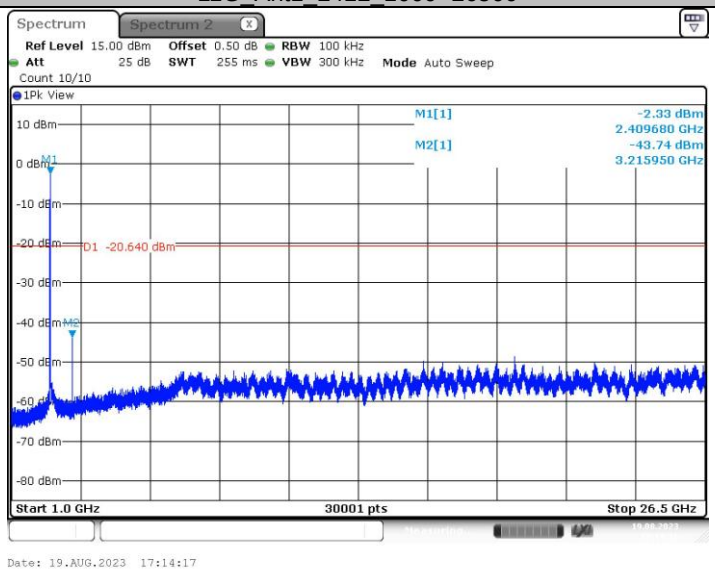

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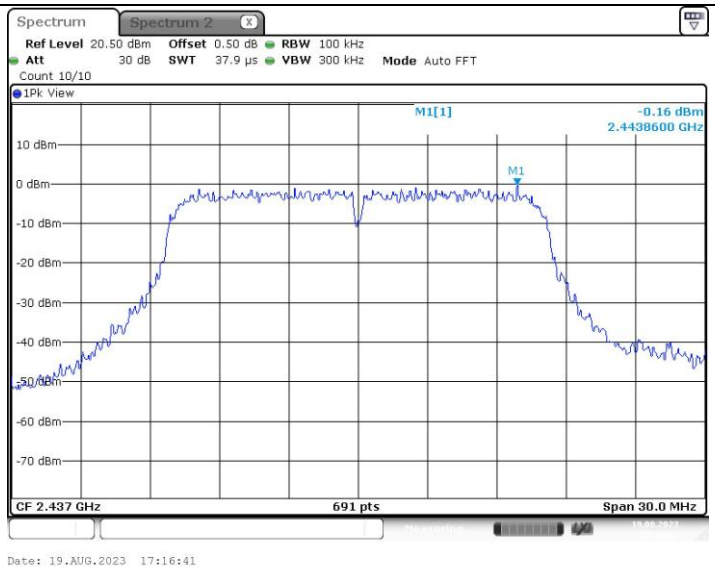

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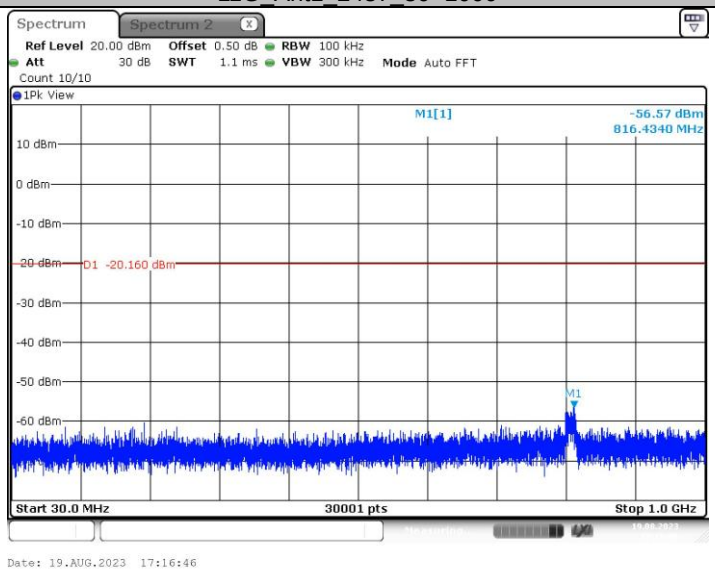

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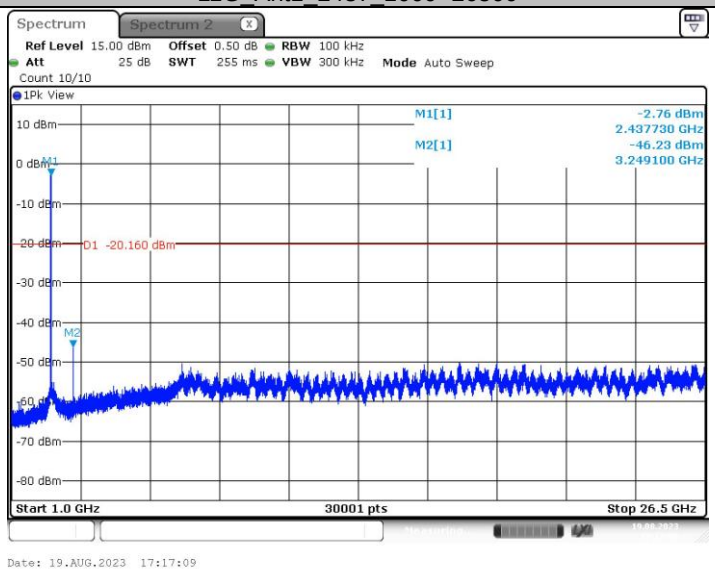

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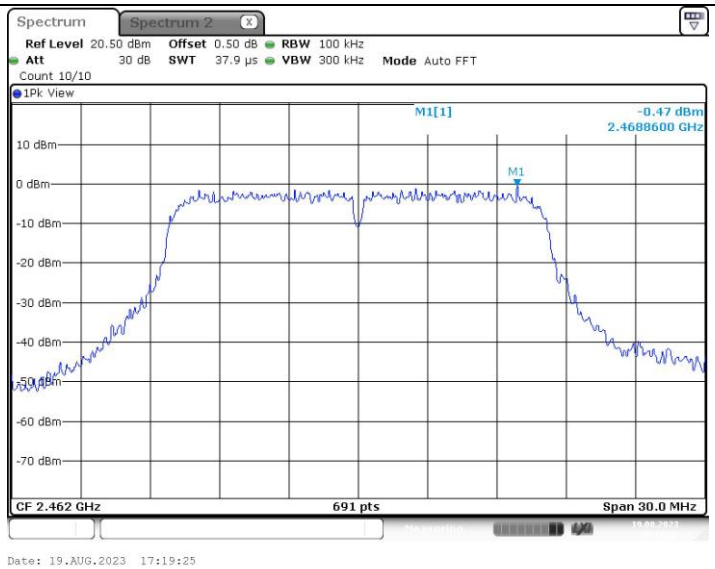
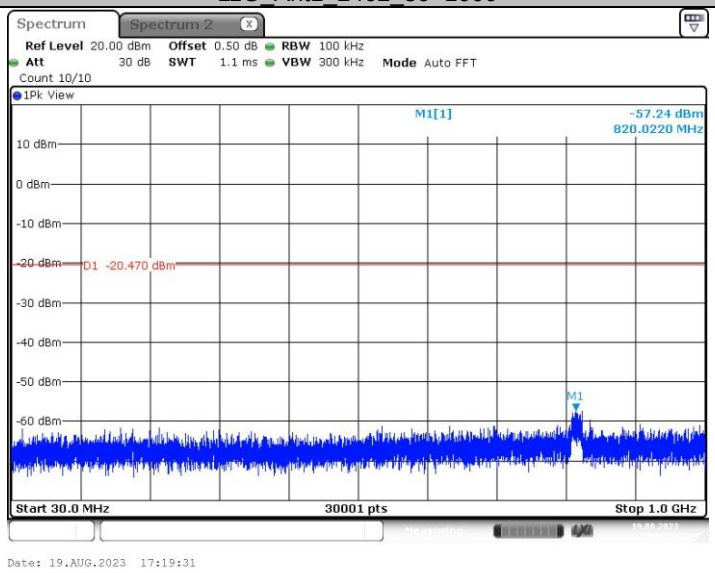
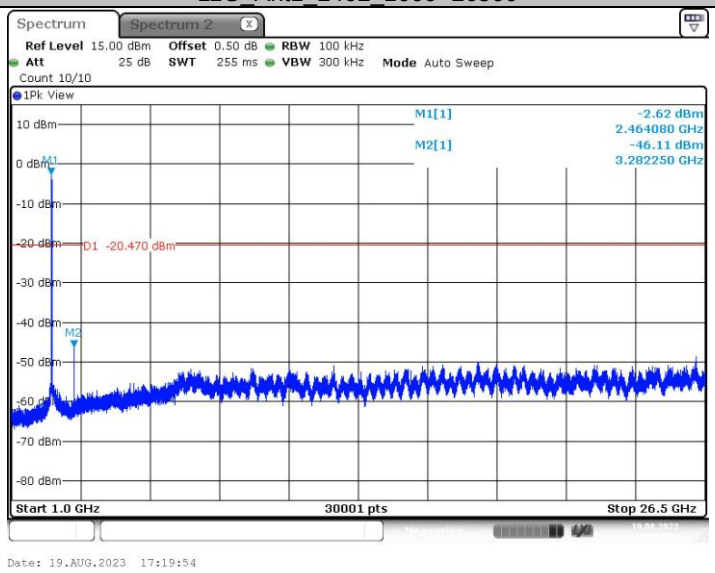


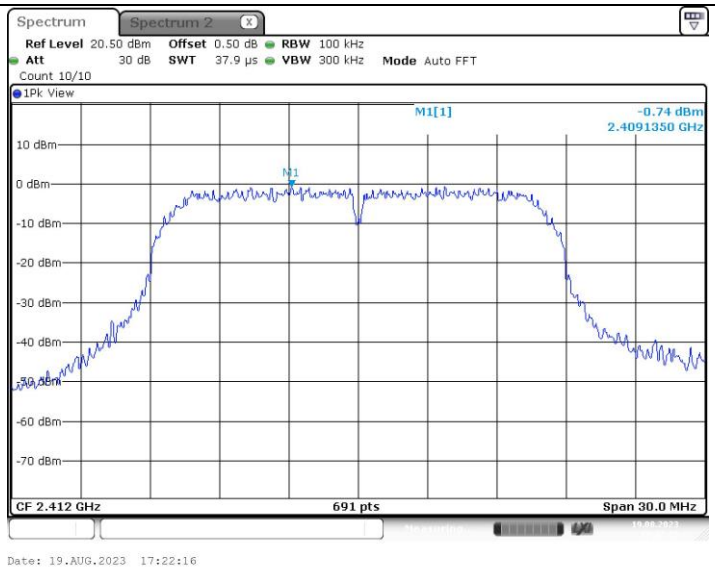
11G_Ant1_2462_30~1000



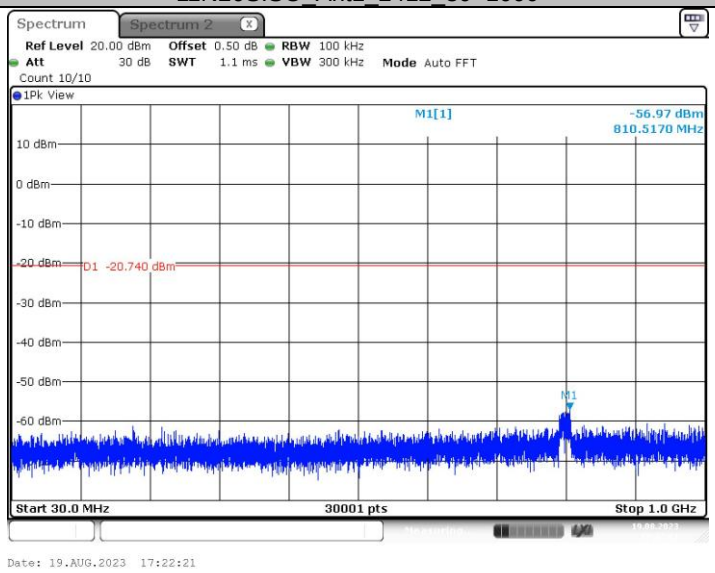
11G_Ant1_2462_1000~26500



11N20SISO_Ant1_2412_0~Reference



11N20SISO_Ant1_2412_30~1000



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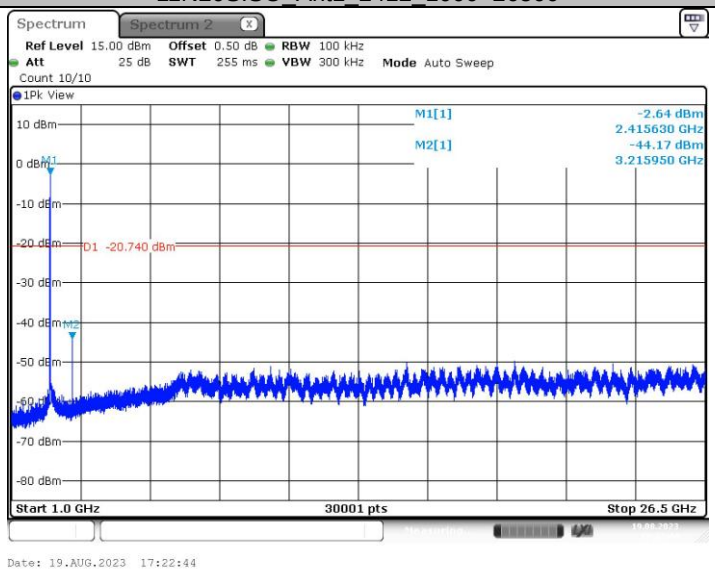
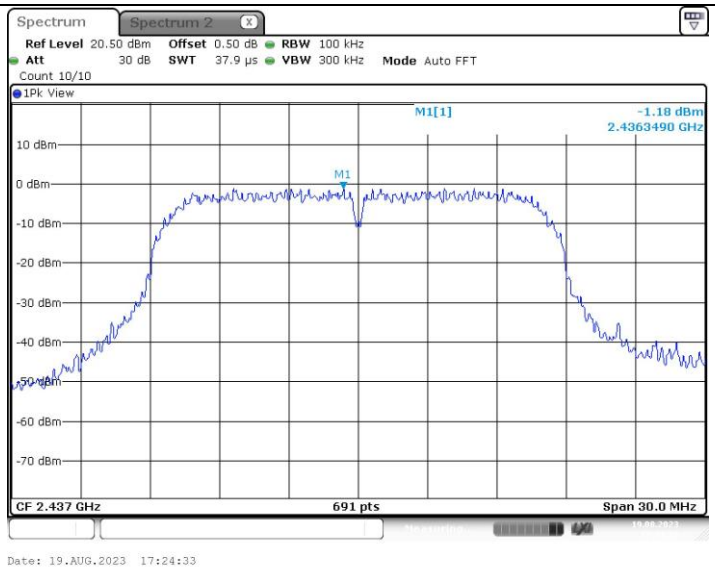
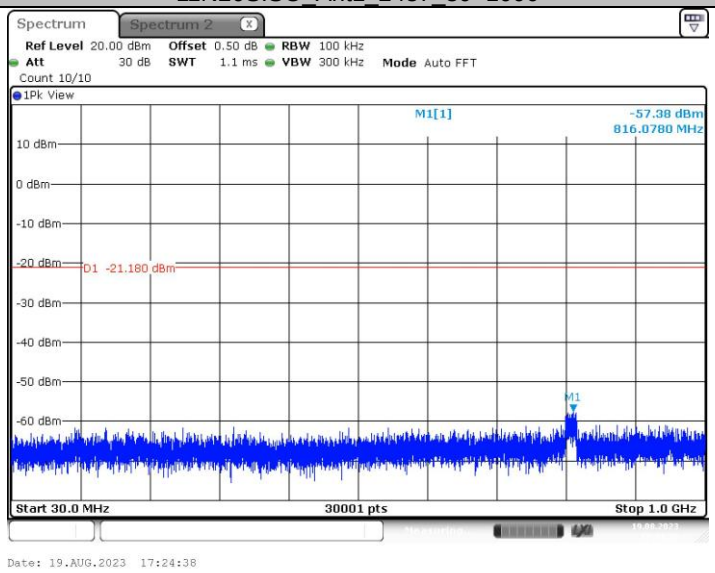


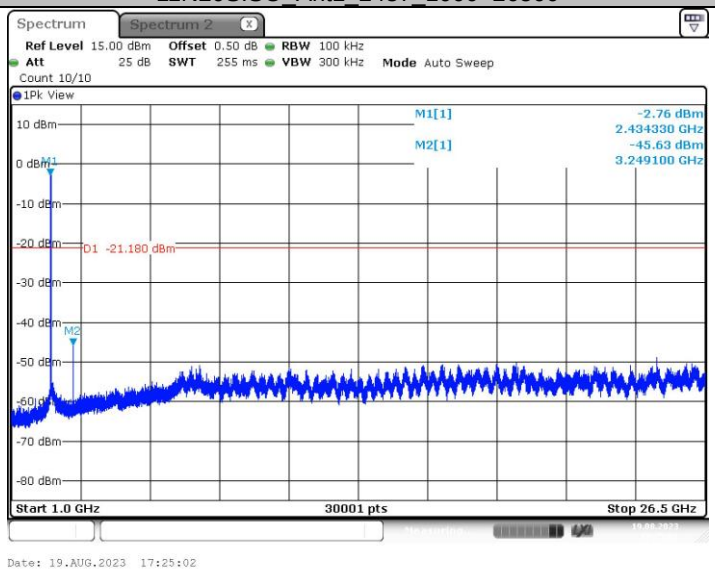
11N20SISO_Ant1_2437_0~Reference



11N20SISO_Ant1_2437_30~1000



11N20SISO_Ant1_2437_1000~26500



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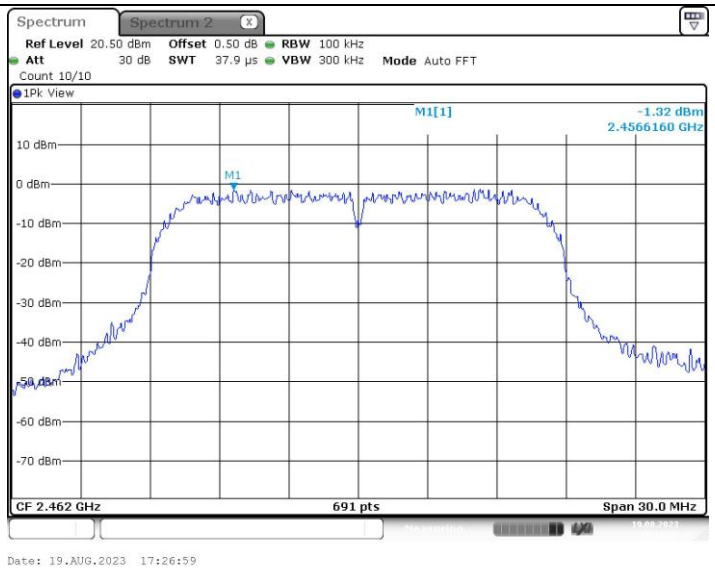
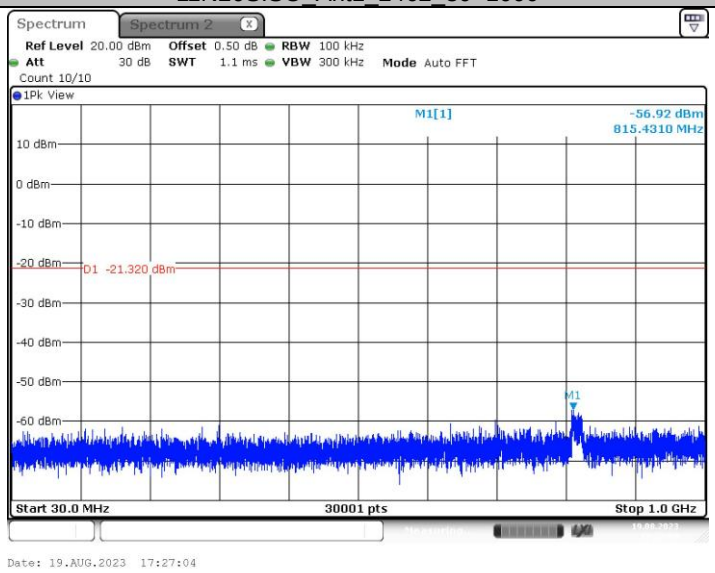
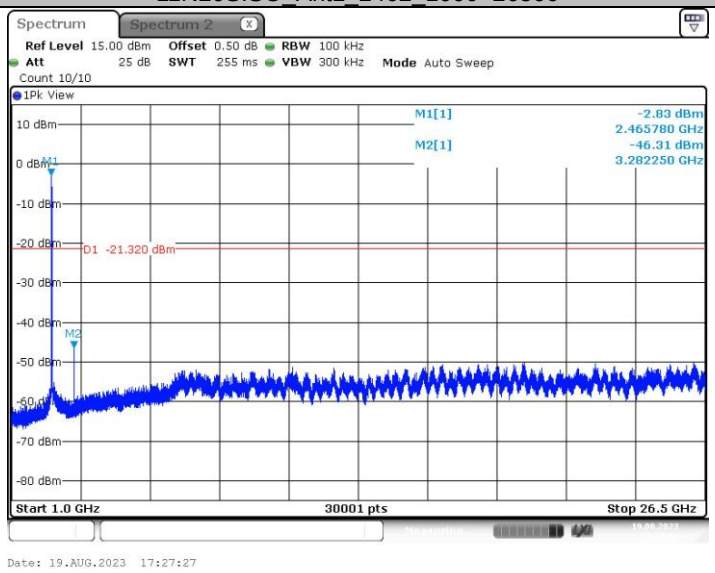


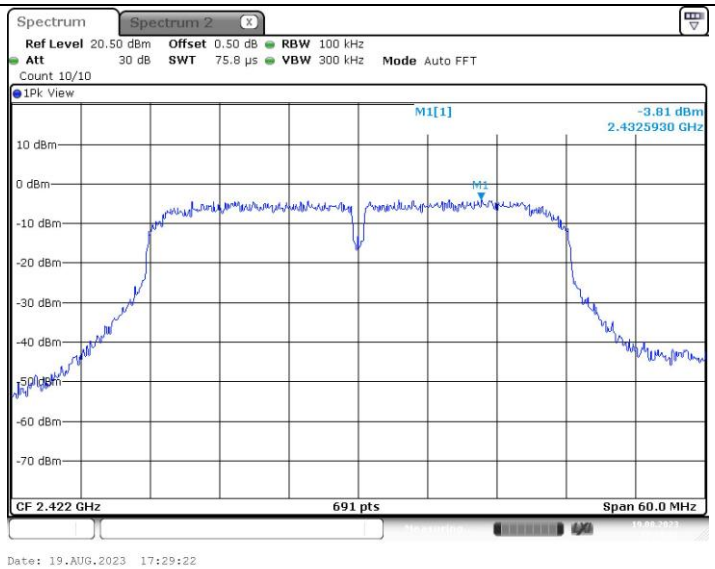
11N20SISO_Ant1_2462_30~1000



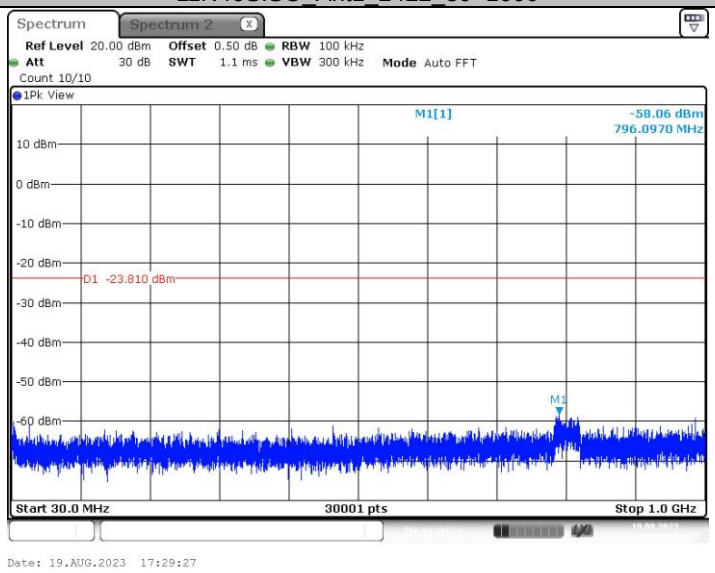
11N20SISO_Ant1_2462_1000~26500



11N40SISO_Ant1_2422_0~Reference



11N40SISO_Ant1_2422_30~1000



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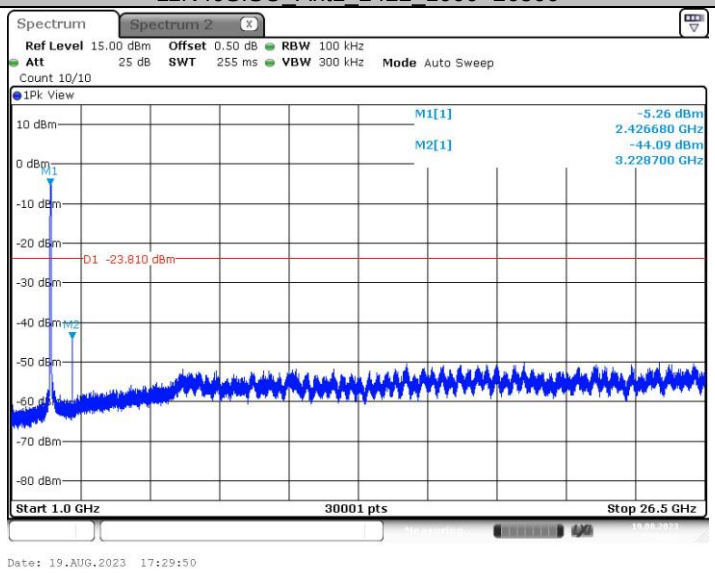

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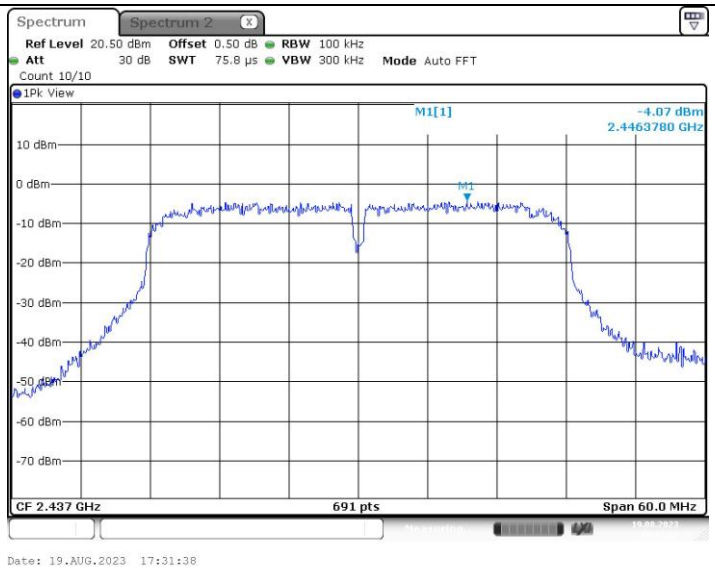

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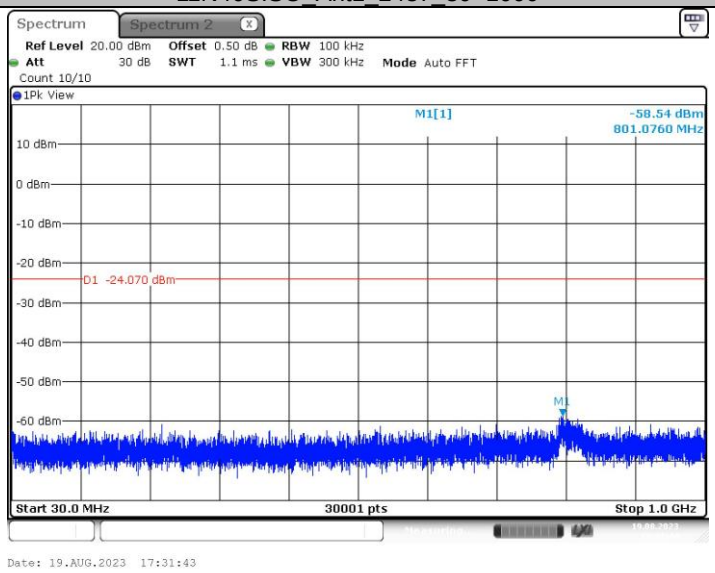

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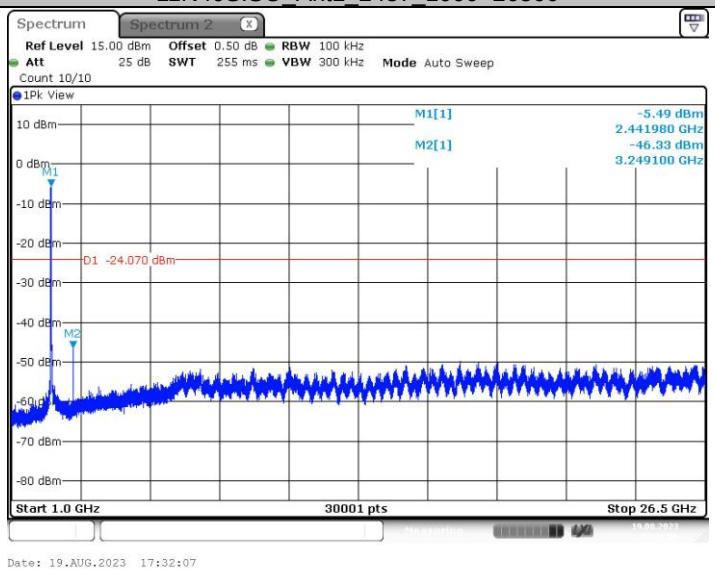
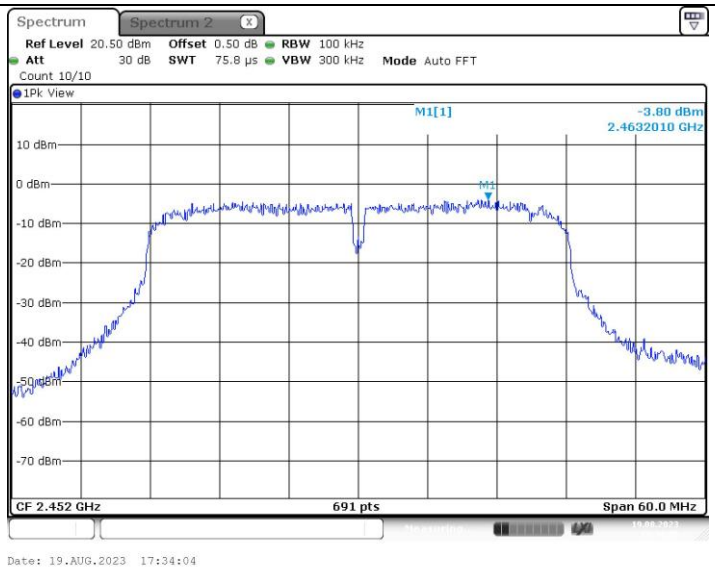


11N40SISO_Ant1_2452_0~Reference



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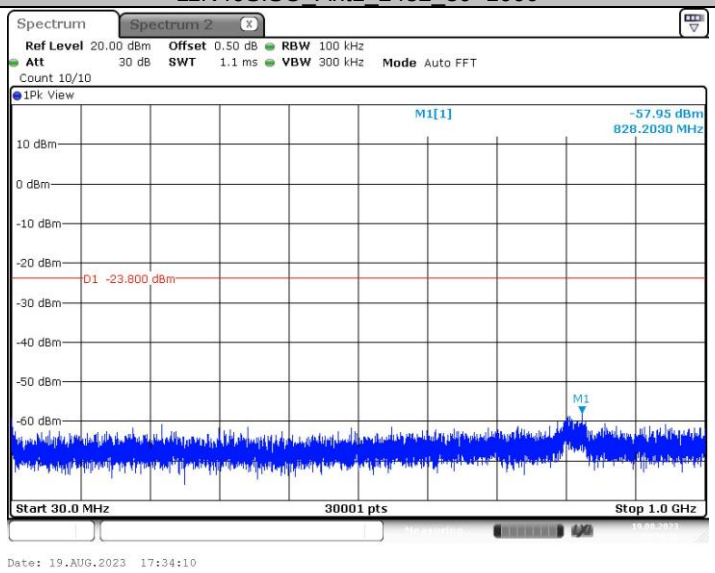

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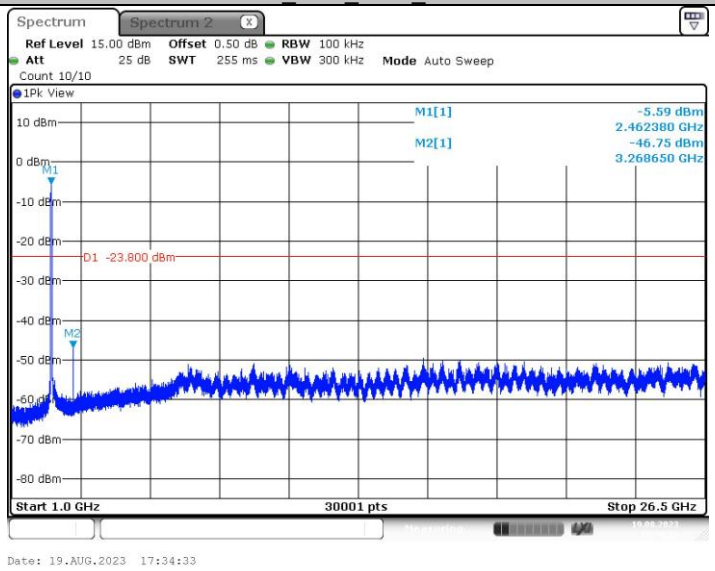
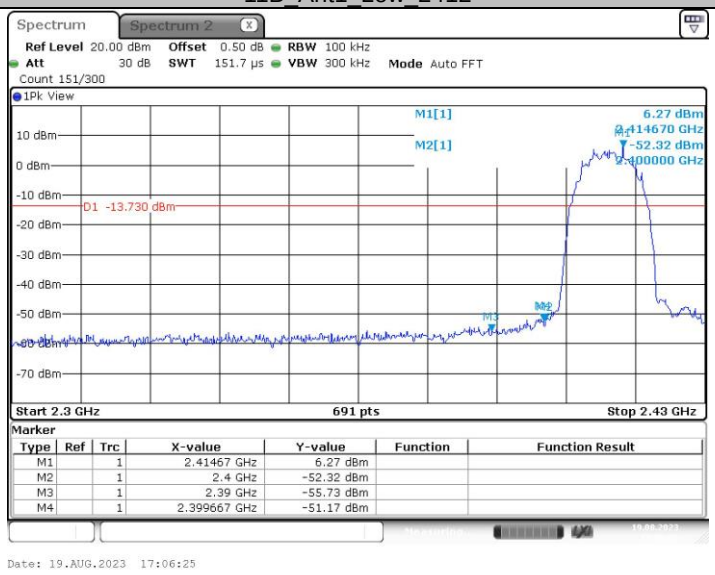


(2) Conducted Band Edge

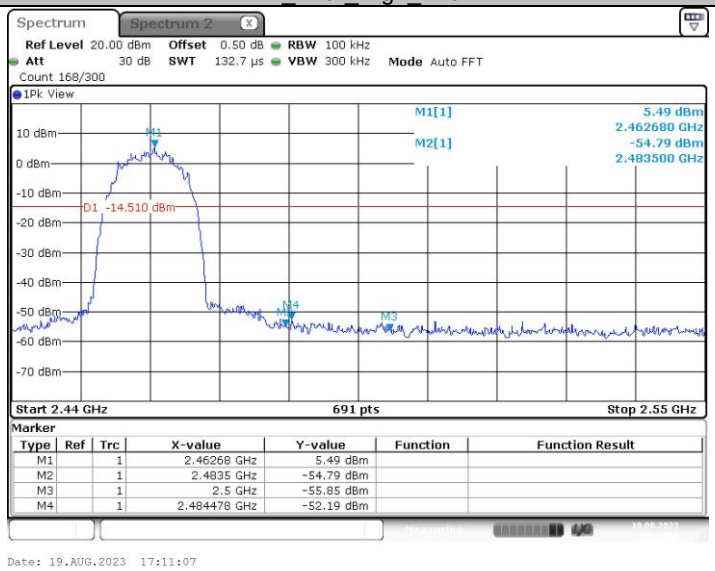
Test Mode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	6.27	-51.17	≤-13.73	PASS
		High	2462	5.49	-52.19	≤-14.51	PASS
11G	Ant1	Low	2412	-0.53	-44.38	≤-20.53	PASS
		High	2462	-0.82	-52.12	≤-20.82	PASS
11N20SISO	Ant1	Low	2412	-0.76	-44.22	≤-20.76	PASS
		High	2462	-1.36	-51.73	≤-21.36	PASS
11N40SISO	Ant1	Low	2422	-3.80	-38.02	≤-23.80	PASS
		High	2452	-4.08	-42.74	≤-24.08	PASS

Test Graphs:

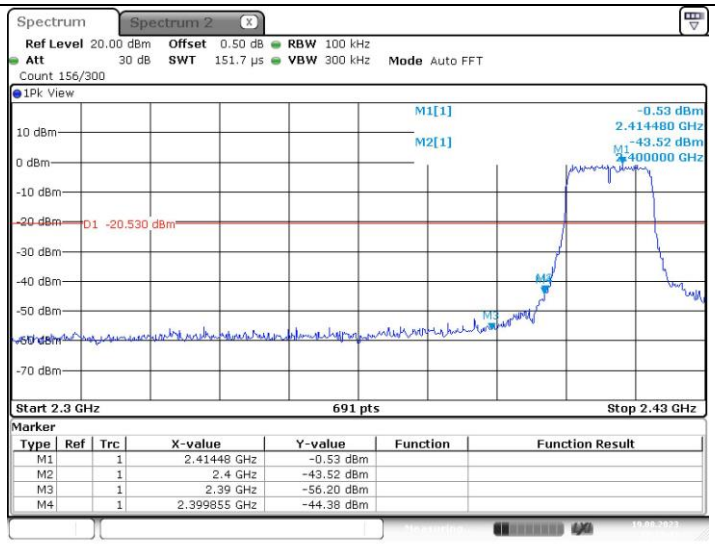
11B_Ant1_Low_2412



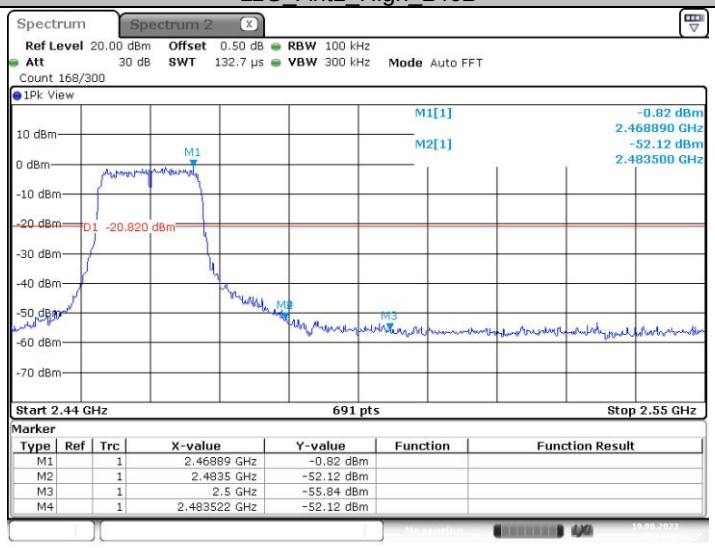
11B_Ant1_High_2462



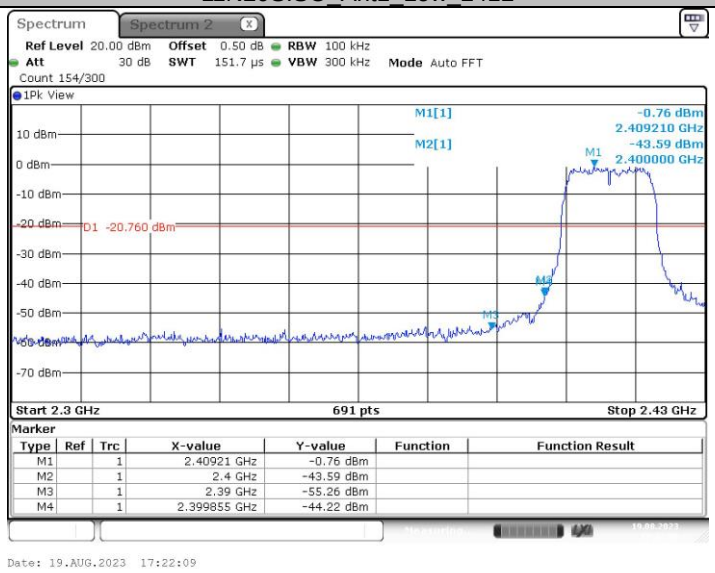
11G_Ant1_Low_2412



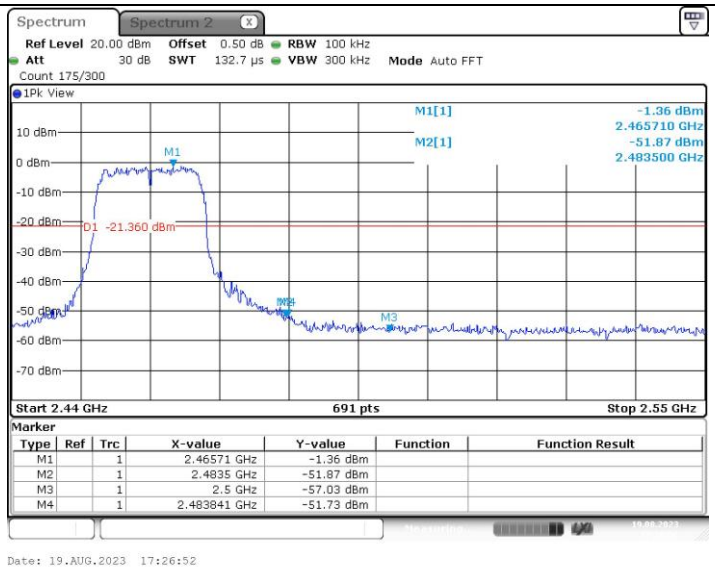
11G_Ant1_High_2462



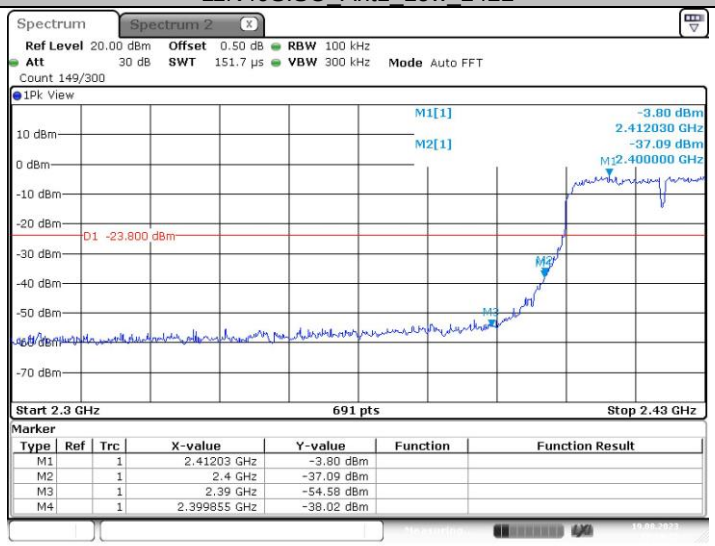
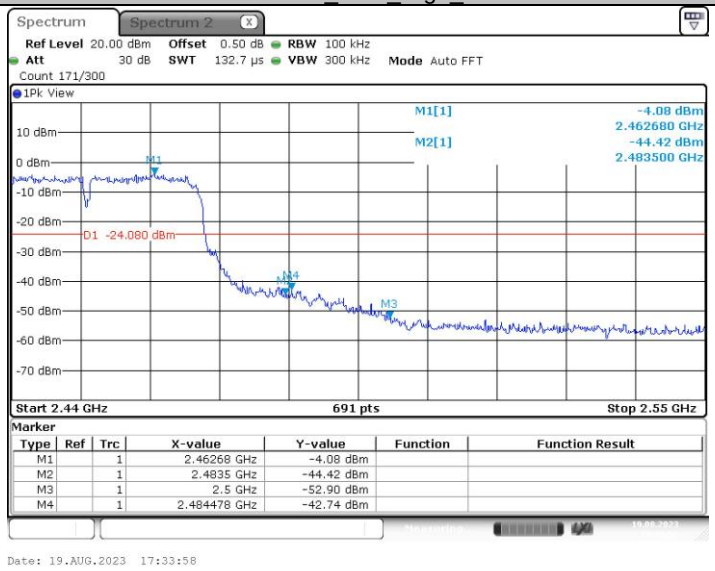
11N20SISO_Ant1_Low_2412



11N20SISO_Ant1_High_2462



11N40SISO_Ant1_Low_2422



11N40SISO_Ant1_High_2452