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TEST REPORT

Report No. ……:	**CTC20222250E01**
FCC ID……..:	**2AR9L0081**
Applicant……:	**Fujian Newland Communication Science Technology Co., Ltd.**
Address……:	F5, Hongzhuo Bldg., 1, Rujiangxi Rd., Fuzhou, Fujian, China
Manufacturer……:	Fujian Newland Communication Science Technology Co., Ltd.
Address……:	Building 6 and 2-4/F of Building 5, 70 Rujiang East Road (SCUD Industrial Park), Mawei District, Fuzhou, Fujian, China
Product Name……:	**Router**
Trade Mark……:	Claro, NEWLAND
Model/Type reference……:	NL-81
Listed Model(s) ……:	NL-82, NL-WR8103
Standard……:	**FCC CFR Title 47 Part 15 Subpart C Section 15.247**
Date of receipt of test sample…:	Dec. 15, 2022
Date of testing……..:	Dec. 15, 2022 to Dec. 30, 2022
Date of issue……....:	Dec. 30, 2022
Result……:	**PASS**

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

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1. TEST SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.
RSS 247 Issue 2: Standard Specifications for Frequency Hopping Systems (FHSs) and Digital Transmission Systems (DTSs) Operating in the Bands 902-928MHz, 2400-2483.5MHz and 5725-5850MHz.
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

1.2. Report Version

Revised No.	Date of issue	Description
01	Dec. 30, 2022	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	/	Pass	Jim Jiang
Conducted Emission	15.207	RSS-Gen 8.8	Pass	Jim Jiang
Band Edge Emissions	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: The measurement uncertainty is not included in the test result.

1.4. Test Facility

CTC Laboratories, Inc.

Add: 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, 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 inour 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
Transmitter power conducted	0.42 dB	(1)
Transmitter power Radiated	2.14 dB	(1)
Conducted spurious emissions 9kHz~40GHz	1.60 dB	(1)
Radiated spurious emissions 9kHz~40GHz	2.20 dB	(1)
Conducted Emissions 9kHz~30MHz	3.20 dB	(1)
Radiated Emissions 30~1000MHz	4.70 dB	(1)
Radiated Emissions 1~18GHz	5.00 dB	(1)
Radiated Emissions 18~40GHz	5.54 dB	(1)
Occupied Bandwidth	---------	(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:	21°C~27°C
Relative Humidity:	40%~60%
Atmospheric Pressure:	101kPa

2. GENERAL INFORMATION

2.1. Client Information

Applicant:	Fujian Newland Communication Science Technology Co., Ltd.
Address:	F5, Hongzhuo Bldg., 1, Rujiangxi Rd., Fuzhou, Fujian, China
Manufacturer:	Fujian Newland Communication Science Technology Co., Ltd.
Address:	Building 6 and 2-4/F of Building 5, 70 Rujiang East Road (SCUD Industrial Park), Mawei District, Fuzhou, Fujian, China

2.2. General Description of EUT

Product Name:	Router
Trade Mark:	Claro, NEWLAND
Model/Type reference:	NL-81
Listed Model(s):	NL-82, NL-WR8103
Model Differences:	All these models are identical in the same PCB, layout, electrical circuit and enclosure. The difference is the model name.
Power supply:	DC12V 1A from adapter
Hardware version:	/
Software version:	/

Technical index for 2.4G WIFI	
Modulation:	802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g/n: OFDM(BPSK, QPSK, 16QAM, 64QAM)
Operation frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz
Channel number:	802.11b/g/n(HT20): 11 channels 802.11n(HT40): 7 channels
Channel separation:	5MHz
Antenna 1&2 type:	Internal Antenna
Antenna 1 gain:	4.44dBi
Antenna 2 gain:	4.03dBi
Antenna 1 + 2 Directional gain:	7.25dBi

2.3. Accessory Equipment Information

Equipment Information			
Name	Model	S/N	Manufacturer
Notebook	ThinkPad T460s	/	Lenovo
Adapter	PSA126-120100U	/	Nanning Ovation Electronics Technology Co Ltd
Adapter	SA12BV-120100U	/	Dongguan Sunun Power Co Ltd
Adapter	AD-0121200100US-2	/	Shenzhen AMC Technology Co., Ltd.
Cable Information			
Name	Shielded Type	Ferrite Core	Length
LAN Cable	Unshielded	NO	150cm
Test Software Information			
Name	Version	/	/
SecureCRTPortable	7.1.1	/	/

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.

Mode	Data rate (worst mode)
802.11b	1Mbps
802.11g	6Mbps
802.11n(HT20)	HT-MCS0
802.11n(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.

2.5. Measurement Instruments List

Tonscend JS0806-2 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. 15, 2023
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. 15, 2023
7	Power Sensor	Keysight	U2021XA	MY55130006	Mar. 15, 2023
8	Wideband Radio Communication Tester	R&S	CMW500	102414	Dec. 16, 2023
9	High and low temperature box	ESPEC	MT3035	/	Mar. 24, 2023
10	JS1120 RF Test system	TONSCEND	v2.6	/	/

Radiated emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-759	Mar. 30, 2024
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-647	Dec. 01, 2024
3	Test Receiver	Keysight	N9038A	MY56400071	Dec. 16, 2023
4	Broadband Premplifier	SCHWARZBECK	BBV9743B	259	Dec. 16, 2023
5	Mirowave Broadband Amplifier	SCHWARZBECK	BBV9718C	111	Dec. 16, 2023
6	3m chamber 3	YIHENG	EE106	/	Sep. 09, 2023

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

3. TEST ITEM AND RESULTS

3.1. Conducted Emission

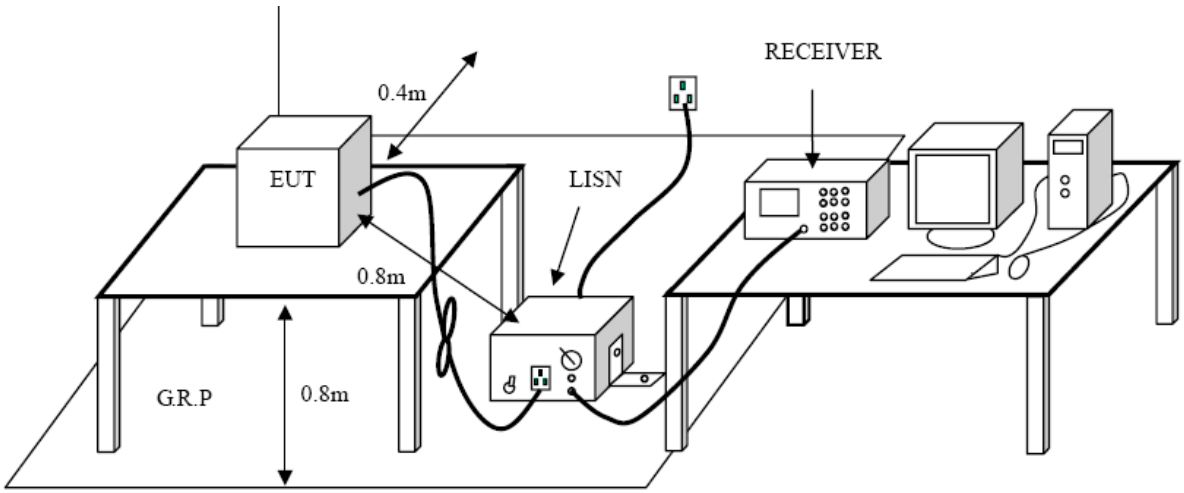
Limit

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

Frequency range (MHz)	Limit (dBuV)	
	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

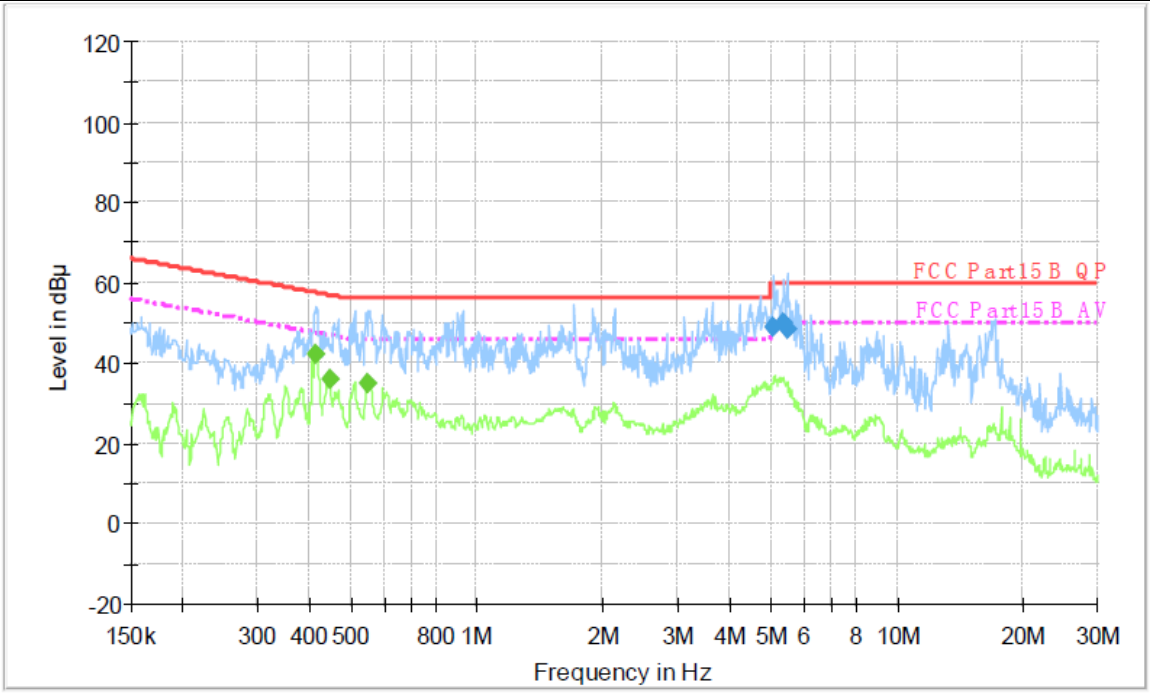
1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50ohm /50uH coupling impedance for the measuring equipment. 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)
4. 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.
5. 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.
6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
7. During the above scans, the emissions were maximized by cable manipulation.

Test Mode:

Please refer to the clause 2.4.

Test Results

Test Voltage:	AC 120V/60 Hz
Terminal:	Line
Remark:	Use the adapter (PSA126-120100U) with the router to test and get the worst test data. Only worse case is reported.



Final Measurement Detector 1

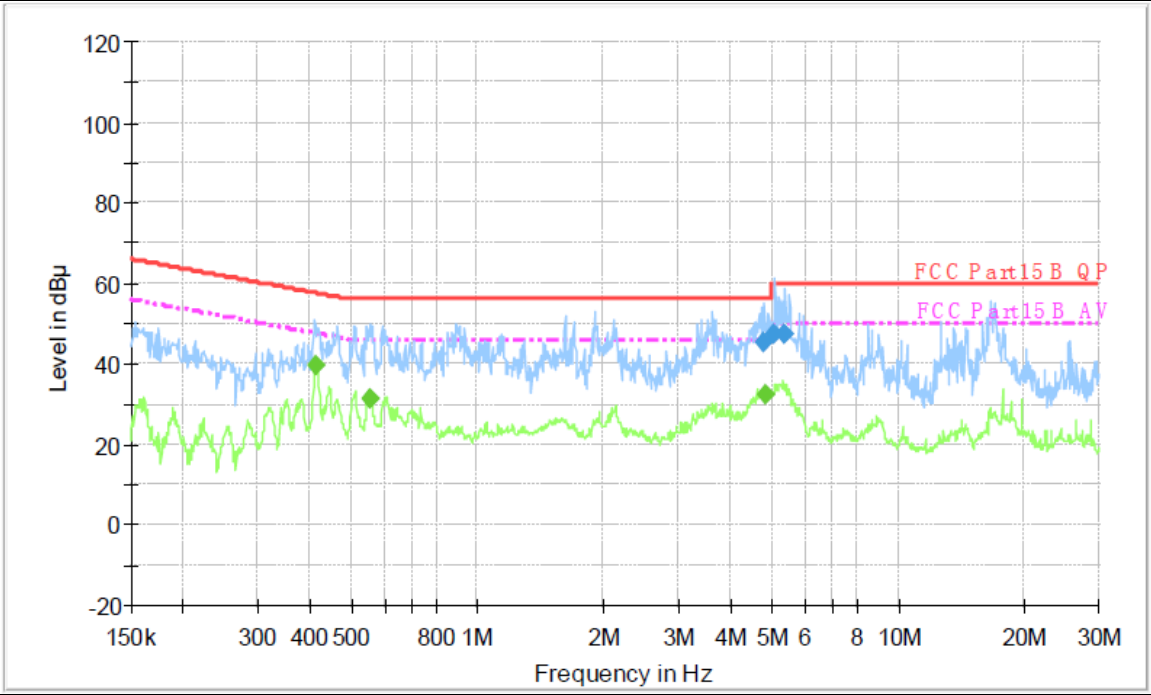
Frequency (MHz)	QuasiPeak (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
5.092840	49.0	1000.00	9.000	On	L1	9.7	11.0	60.0	
5.385570	50.0	1000.00	9.000	On	L1	9.7	10.0	60.0	
5.472260	48.5	1000.00	9.000	On	L1	9.7	11.5	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.413480	42.1	1000.00	9.000	On	L1	9.7	5.5	47.6	
0.446060	36.2	1000.00	9.000	On	L1	9.7	10.7	46.9	
0.551170	34.8	1000.00	9.000	On	L1	9.7	11.2	46.0	

Emission Level = Read Level + Correct Factor

Test Voltage:	AC 120V/60 Hz
Terminal:	Neutral
Remark:	Use the adapter (PSA126-120100U) with the router to test and get the worst test data. 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
4.816020	45.3	1000.00	9.000	On	N	10.0	10.7	56.0	
5.092840	47.6	1000.00	9.000	On	N	10.0	12.4	60.0	
5.385570	47.6	1000.00	9.000	On	N	10.0	12.4	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
0.413480	39.8	1000.00	9.000	On	N	10.0	7.8	47.6	
0.557810	31.4	1000.00	9.000	On	N	10.0	14.6	46.0	
4.835280	32.5	1000.00	9.000	On	N	10.0	13.5	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

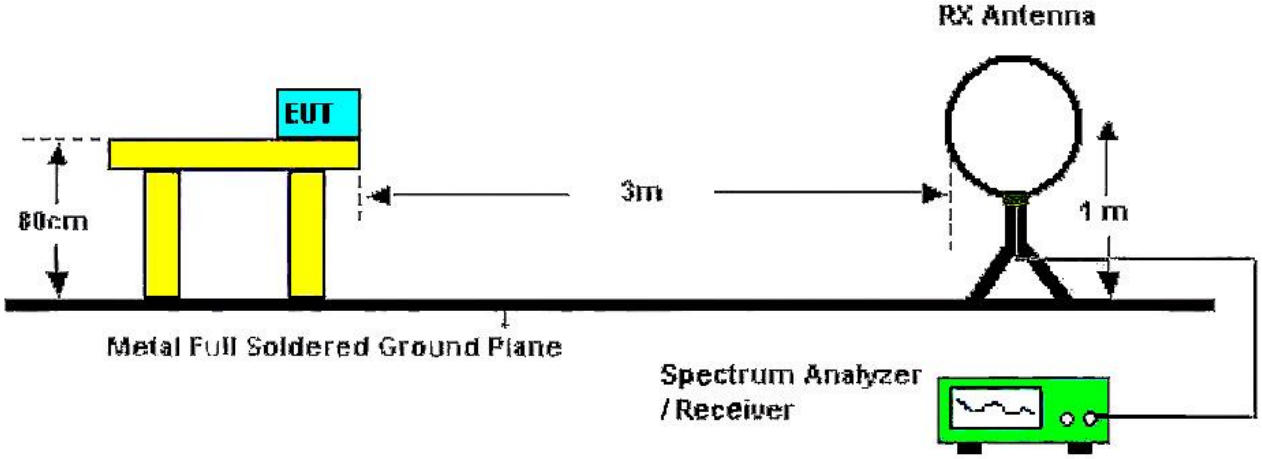
Frequency (MHz)	dB(uV/m) (at 3 meters)	
	Peak	Average
Above 1000	74	54

Note:

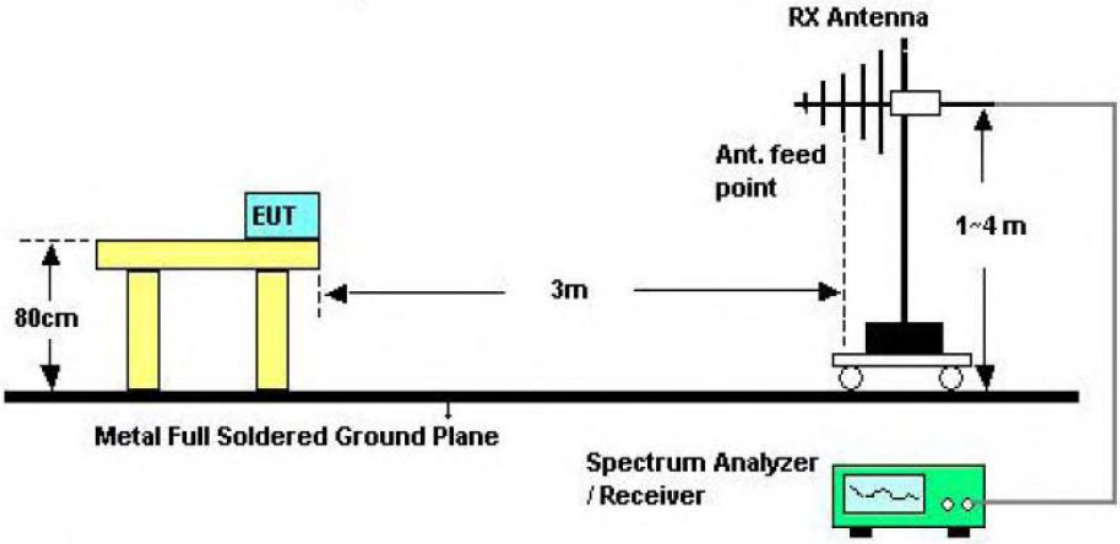
(1) The tighter limit applies at the band edges.

(2) Emission Level (dBuV/m)=20log Emission Level (uV/m).

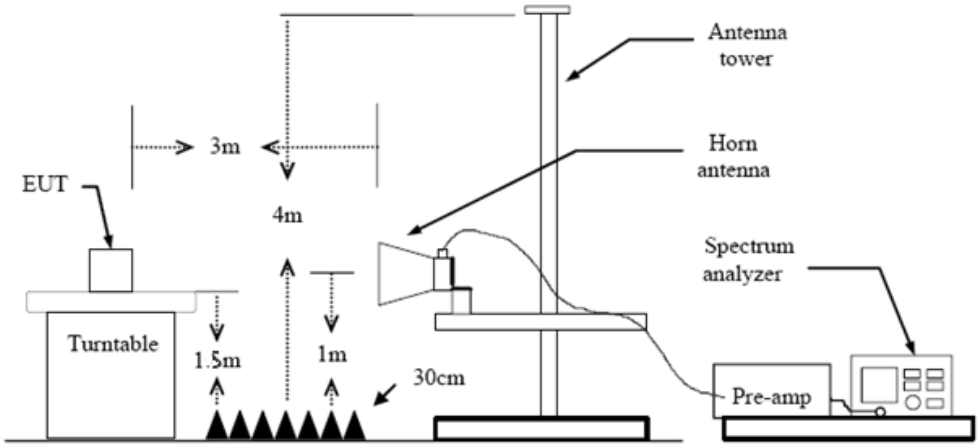
Test Configuration



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) Below 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.
(3) From 1 GHz to 10th harmonic:
RBW=1MHz, VBW=3MHz Peak detector for Peak value.
RBW=1MHz, VBW≥1/T Peak detector for Average value.
Note 1: For the 1/T& Duty Cycle please refer to clause Duty Cycle.

Test Mode

Please refer to the clause 2.4.

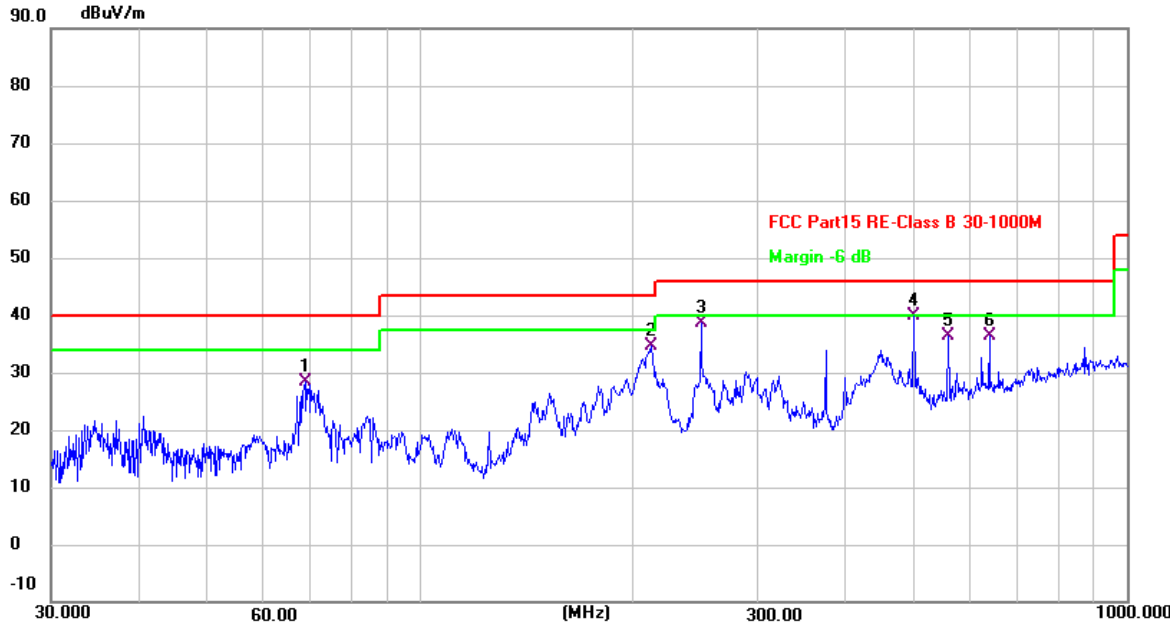
Test Result

9 KHz~30 MHz

From 9 KHz to 30 MHz: Conclusion: PASS
Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Pre-scan all antenna, only show the test data for worse case antenna on the test report.

30MHz-1GHz

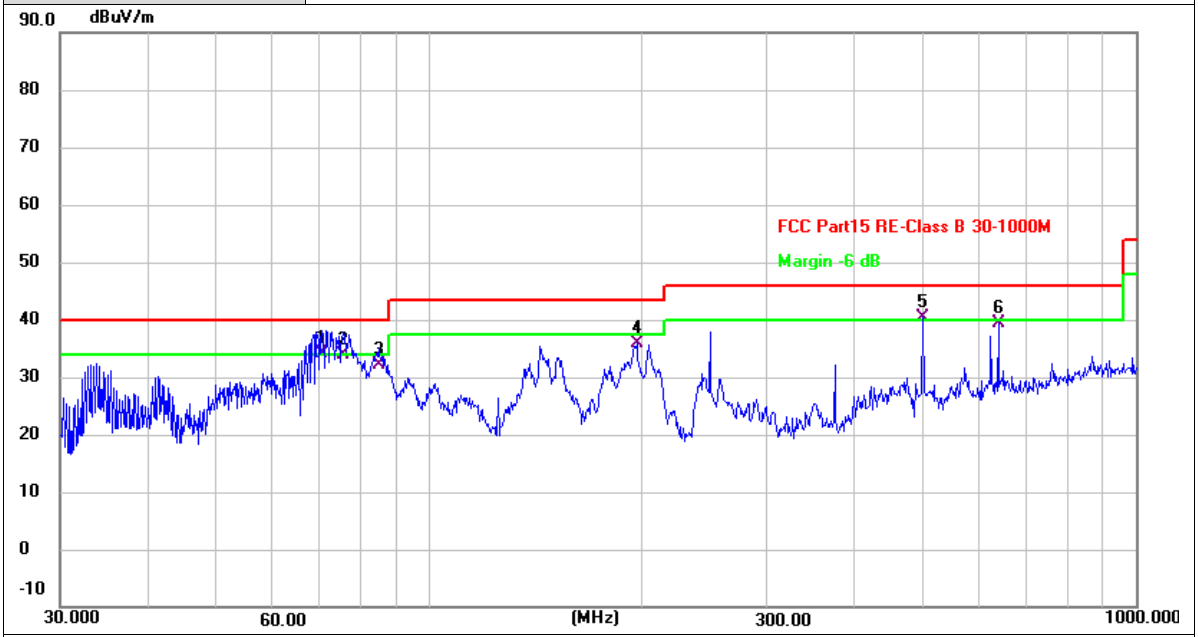
Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	ANT1 802.11b Mode 2412MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	68.6310	44.96	-16.54	28.42	40.00	-11.58	QP
2	212.2694	51.64	-17.11	34.53	43.50	-8.97	QP
3	249.4250	54.04	-15.35	38.69	46.00	-7.31	QP
4 *	499.4246	48.74	-8.90	39.84	46.00	-6.16	QP
5	558.7301	43.67	-7.24	36.43	46.00	-9.57	QP
6	638.3686	41.88	-5.49	36.39	46.00	-9.61	QP

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

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	ANT1 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 !	70.3365	50.97	-16.78	34.19	40.00	-5.81	QP
2	75.4462	52.00	-18.14	33.86	40.00	-6.14	QP
3	84.7018	51.48	-19.25	32.23	40.00	-7.77	QP
4	196.5098	53.24	-17.35	35.89	43.50	-7.61	QP
5 *	499.4246	49.26	-8.90	40.36	46.00	-5.64	QP
6	638.3686	44.81	-5.49	39.32	46.00	-6.68	QP

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

Adobe 1GHz

Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX B 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	4823.932	45.83	2.20	48.03	74.00	-25.97	peak
2 *	4823.949	41.00	2.20	43.20	54.00	-10.80	AVG

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

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX B 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	4823.931	47.03	2.20	49.23	74.00	-24.77	peak
2 *	4823.942	43.42	2.20	45.62	54.00	-8.38	AVG

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

Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX B 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 *	4873.094	40.56	2.30	42.86	54.00	-11.14	AVG
2	4874.774	45.49	2.30	47.79	74.00	-26.21	peak

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

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX B 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	4873.473	46.36	2.30	48.66	74.00	-25.34	peak
2 *	4873.553	41.80	2.30	44.10	54.00	-9.90	AVG

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

Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX B 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 *	4923.307	40.39	2.41	42.80	54.00	-11.20	AVG
2	4923.917	45.30	2.41	47.71	74.00	-26.29	peak

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

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX B 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 *	4924.529	46.89	2.41	49.30	54.00	-4.70	AVG
2	4924.771	42.23	2.41	44.64	74.00	-29.36	peak

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

Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX G 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	4823.941	45.19	2.20	47.39	74.00	-26.61	peak
2 *	4824.010	39.99	2.20	42.19	54.00	-11.81	AVG

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

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX G 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 *	4823.953	43.57	2.20	45.77	54.00	-8.23	AVG
2	4823.979	47.15	2.20	49.35	74.00	-24.65	peak

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

Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX G 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	4874.764	44.94	2.30	47.24	74.00	-26.76	peak
2 *	4874.839	39.97	2.30	42.27	54.00	-11.73	AVG

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

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX G 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 *	4873.564	42.49	2.30	44.79	54.00	-9.21	AVG
2	4873.689	46.52	2.30	48.82	74.00	-25.18	peak

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

Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX G 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	4924.627	44.66	2.41	47.07	74.00	-26.93	peak
2 *	4924.722	39.41	2.41	41.82	54.00	-12.18	AVG

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

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX G 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 *	4924.072	42.10	2.41	44.51	54.00	-9.49	AVG
2	4924.991	47.02	2.41	49.43	74.00	-24.57	peak

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

Ant No.	ANT1 + ANT2
Ant. Pol.	Horizontal
Test Mode:	TX N20 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 *	4823.975	39.94	2.20	42.14	54.00	-11.86	AVG
2	4824.015	44.72	2.20	46.92	74.00	-27.08	peak

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

Ant No.	ANT1 + ANT2
Ant. Pol.	Vertical
Test Mode:	TX N20 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 *	4823.932	42.02	2.20	44.22	54.00	-9.78	AVG
2	4824.053	46.56	2.20	48.76	74.00	-25.24	peak

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

Ant No.	ANT1 + ANT2
Ant. Pol.	Horizontal
Test Mode:	TX N20 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 *	4873.426	40.27	2.30	42.57	54.00	-11.43	AVG
2	4873.685	45.29	2.30	47.59	74.00	-26.41	peak

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

Ant No.	ANT1 + ANT2
Ant. Pol.	Vertical
Test Mode:	TX N20 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	4873.868	45.95	2.30	48.25	74.00	-25.75	peak
2 *	4874.686	41.76	2.30	44.06	54.00	-9.94	AVG

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

Ant No.	ANT1 + ANT2
Ant. Pol.	Horizontal
Test Mode:	TX N20 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	4923.309	44.71	2.41	47.12	74.00	-26.88	peak
2 *	4923.851	39.36	2.41	41.77	54.00	-12.23	AVG

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

Ant No.	ANT1 + ANT2
Ant. Pol.	Vertical
Test Mode:	TX N20 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	4923.819	46.14	2.41	48.55	74.00	-25.45	peak
2 *	4924.158	41.91	2.41	44.32	54.00	-9.68	AVG

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

Ant No.	ANT1 + ANT2
Ant. Pol.	Horizontal
Test Mode:	TX N40 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	4843.306	44.39	2.24	46.63	74.00	-27.37	peak
2 *	4844.890	39.71	2.24	41.95	54.00	-12.05	AVG

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

Ant No.	ANT1 + ANT2
Ant. Pol.	Vertical
Test Mode:	TX N40 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	4843.622	45.68	2.24	47.92	74.00	-26.08	peak
2 *	4844.039	41.49	2.24	43.73	54.00	-10.27	AVG

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

Ant No.	ANT1 + ANT2
Ant. Pol.	Horizontal
Test Mode:	TX N40 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	4873.129	44.48	2.30	46.78	74.00	-27.22	peak
2 *	4873.602	39.33	2.30	41.63	54.00	-12.37	AVG

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

Ant No.	ANT1 + ANT2
Ant. Pol.	Vertical
Test Mode:	TX N40 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 *	4874.171	45.48	2.30	47.78	54.00	-6.22	AVG
2	4874.905	41.30	2.30	43.60	74.00	-30.40	peak

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

Ant No.	ANT1 + ANT2
Ant. Pol.	Horizontal
Test Mode:	TX N40 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 *	4903.189	39.09	2.36	41.45	54.00	-12.55	AVG
2	4903.741	44.23	2.36	46.59	74.00	-27.41	peak

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

Ant No.	ANT1 + ANT2
Ant. Pol.	Vertical
Test Mode:	TX N40 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	4903.083	45.19	2.36	47.55	74.00	-26.45	peak
2 *	4903.455	40.78	2.36	43.14	54.00	-10.86	AVG

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)

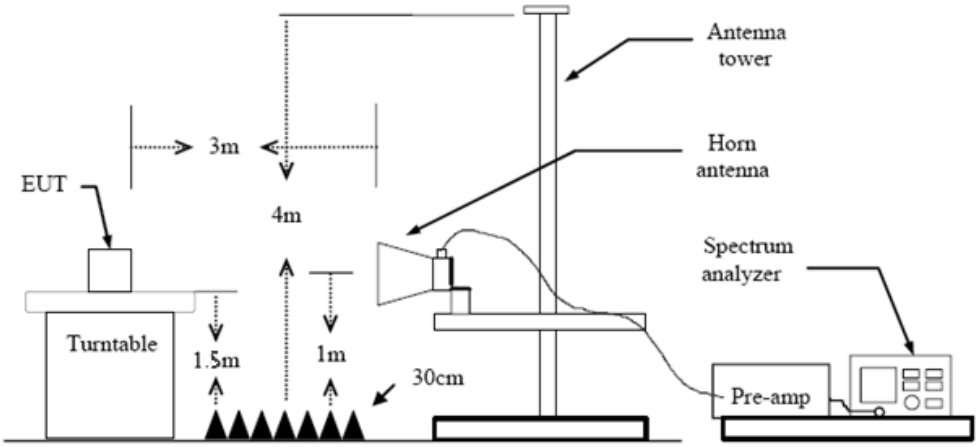
Limit

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

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

Conducted band edge limit: The highest point of the operating frequency waveform down 20dB

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.
   2: Duty Cycle> 98%, VBW=10Hz.

Test Mode

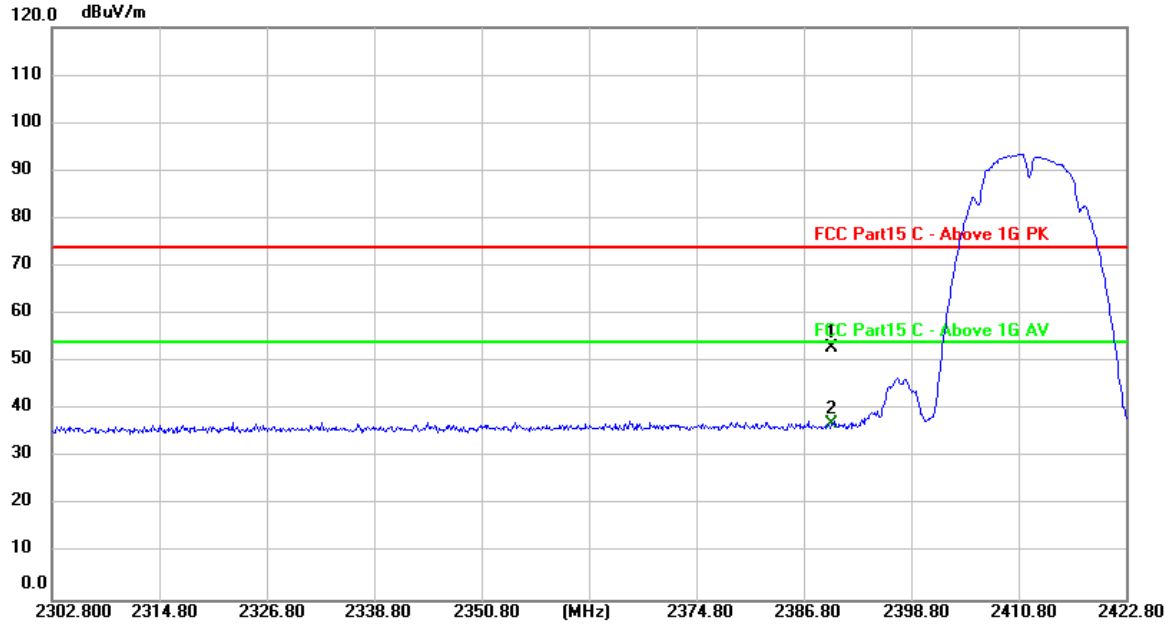
Please refer to the clause 2.4.

Test Results

Note: Pre-scan all antenna, only show the test data for worse case antenna on the test report.

(1) Radiation Test

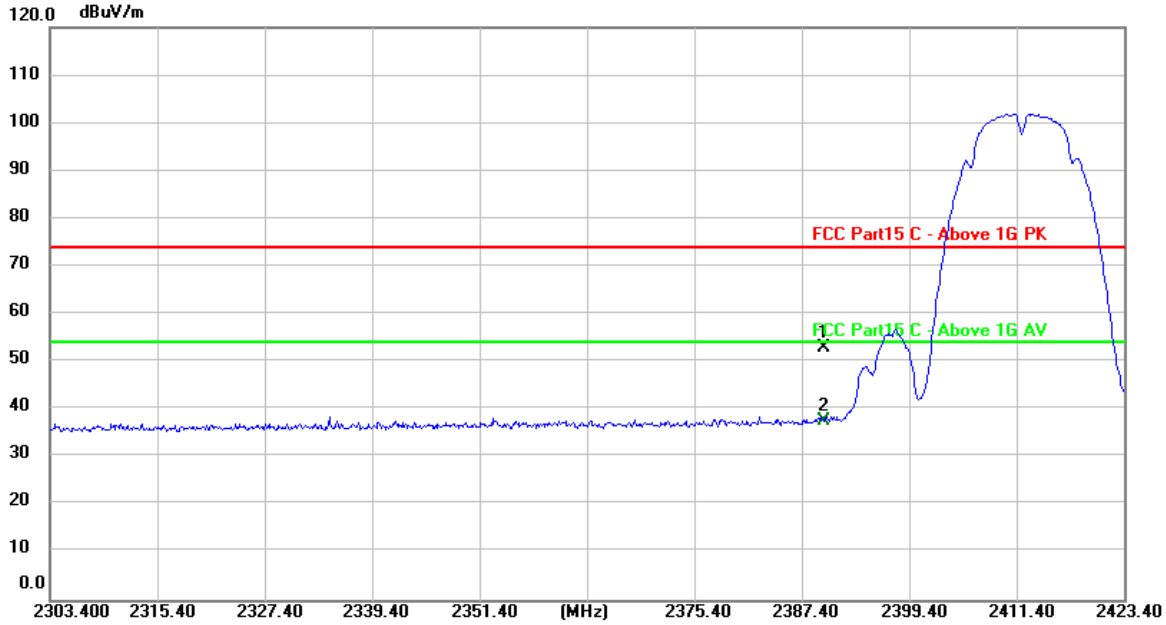
(2) Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	B Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	22.12	30.84	52.96	74.00	-21.04	peak
2 *	2390.000	6.28	30.84	37.12	54.00	-16.88	AVG

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

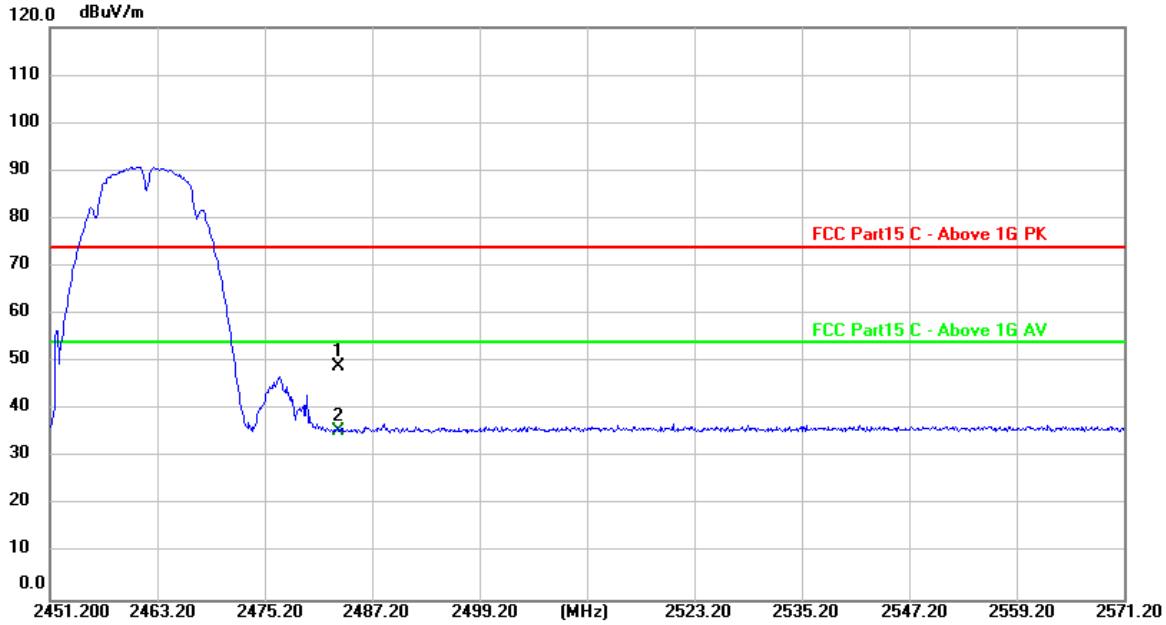
Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	B Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	22.11	30.84	52.95	74.00	-21.05	peak
2 *	2390.000	6.96	30.84	37.80	54.00	-16.20	AVG

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

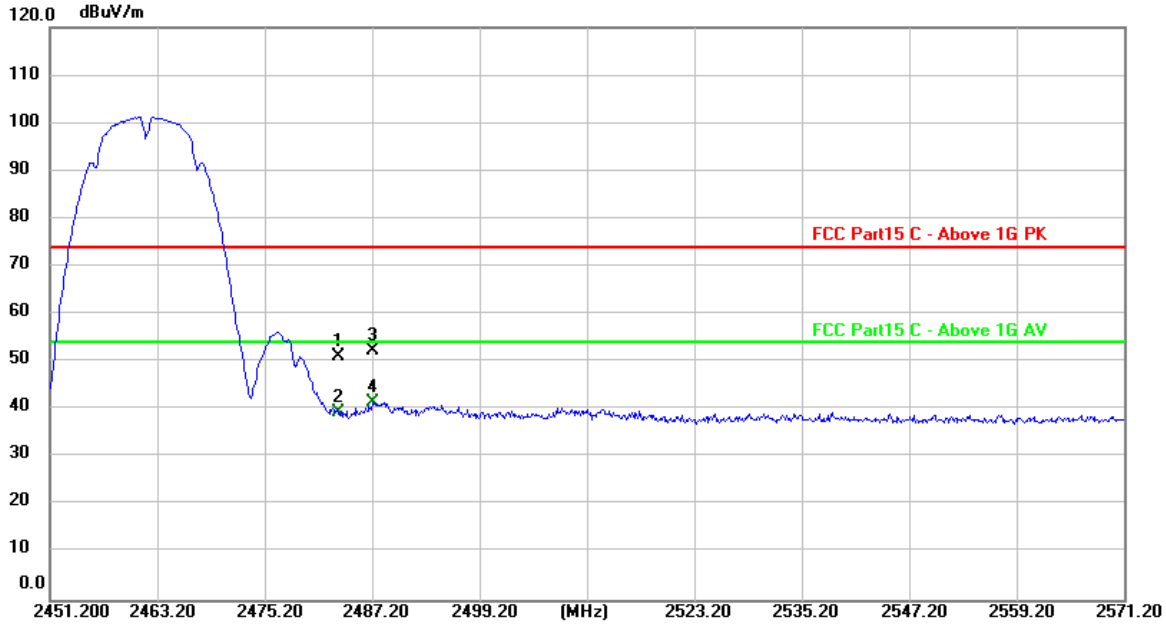
Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	B Mode 2462 MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	17.87	31.24	49.11	74.00	-24.89	peak
2 *	2483.500	4.20	31.24	35.44	54.00	-18.56	AVG

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

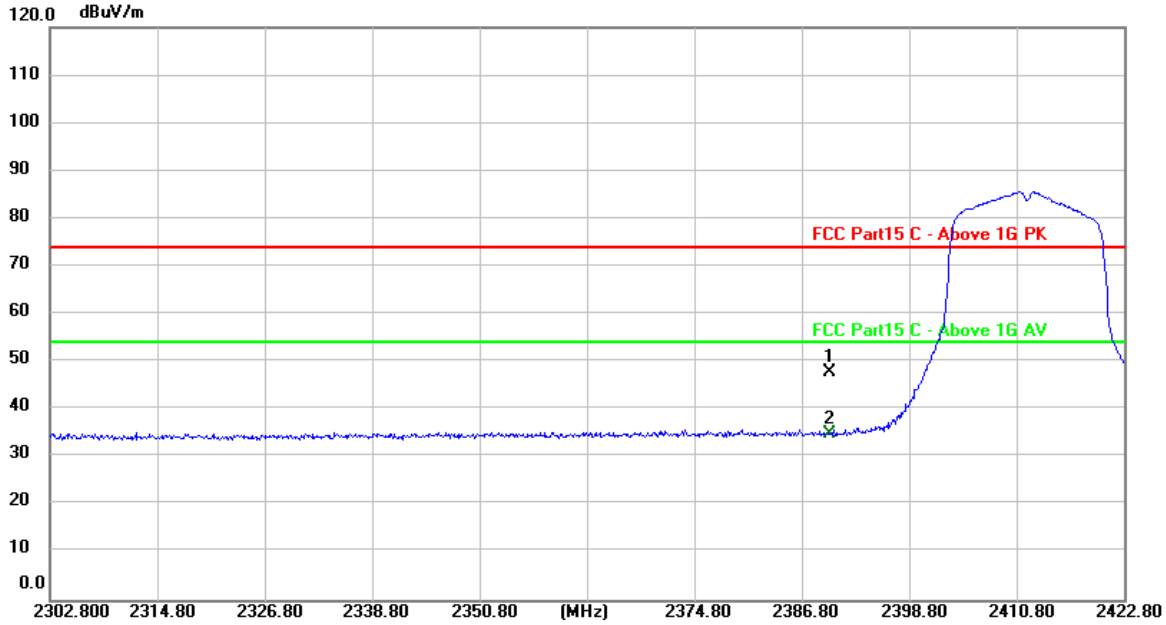
Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	B Mode 2462 MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	20.02	31.24	51.26	74.00	-22.74	peak
2	2483.500	8.19	31.24	39.43	54.00	-14.57	AVG
3	2487.280	21.24	31.26	52.50	74.00	-21.50	peak
4 *	2487.280	10.23	31.26	41.49	54.00	-12.51	AVG

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

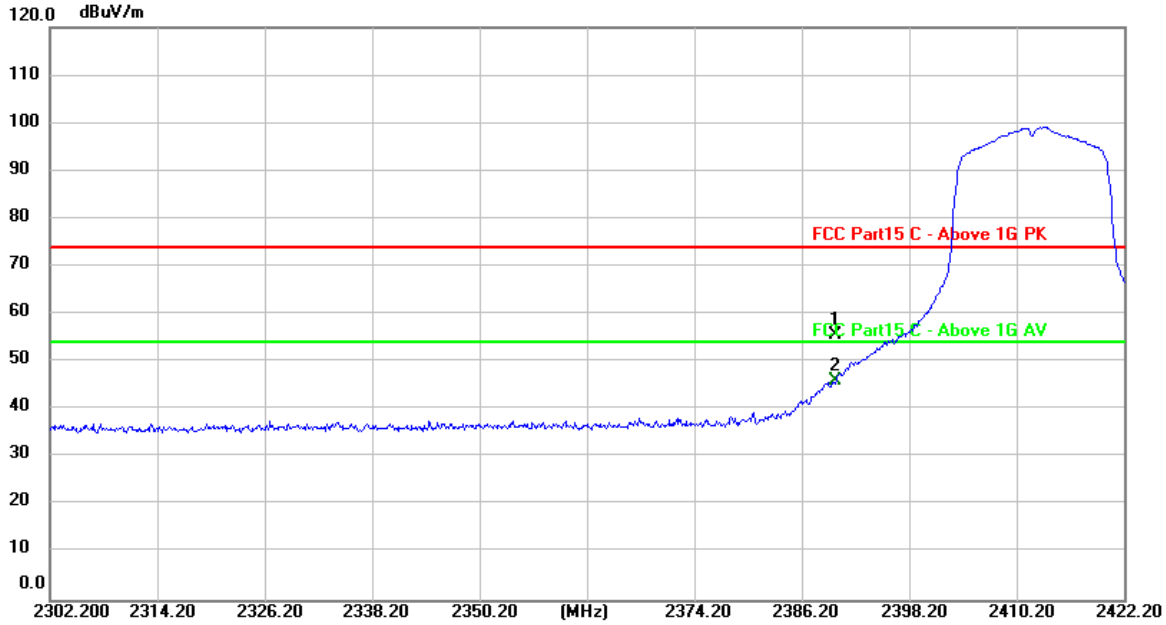
Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	G Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	16.92	30.84	47.76	74.00	-26.24	peak
2 *	2390.000	4.03	30.84	34.87	54.00	-19.13	AVG

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

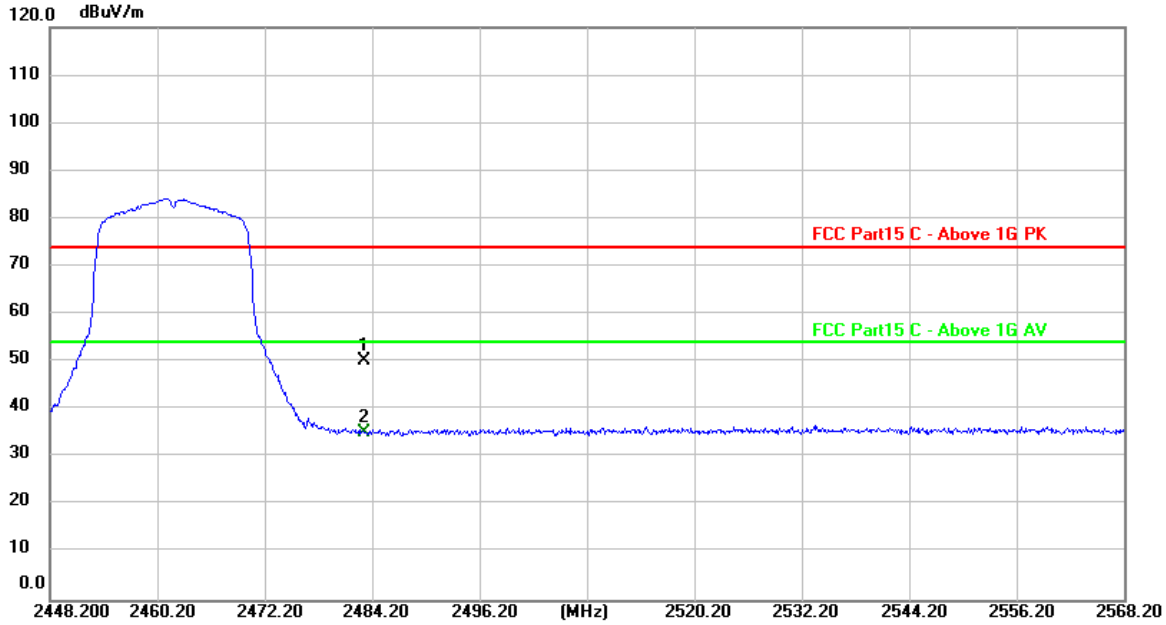
Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	G Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	24.95	30.84	55.79	74.00	-18.21	peak
2 *	2390.000	15.25	30.84	46.09	54.00	-7.91	AVG

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

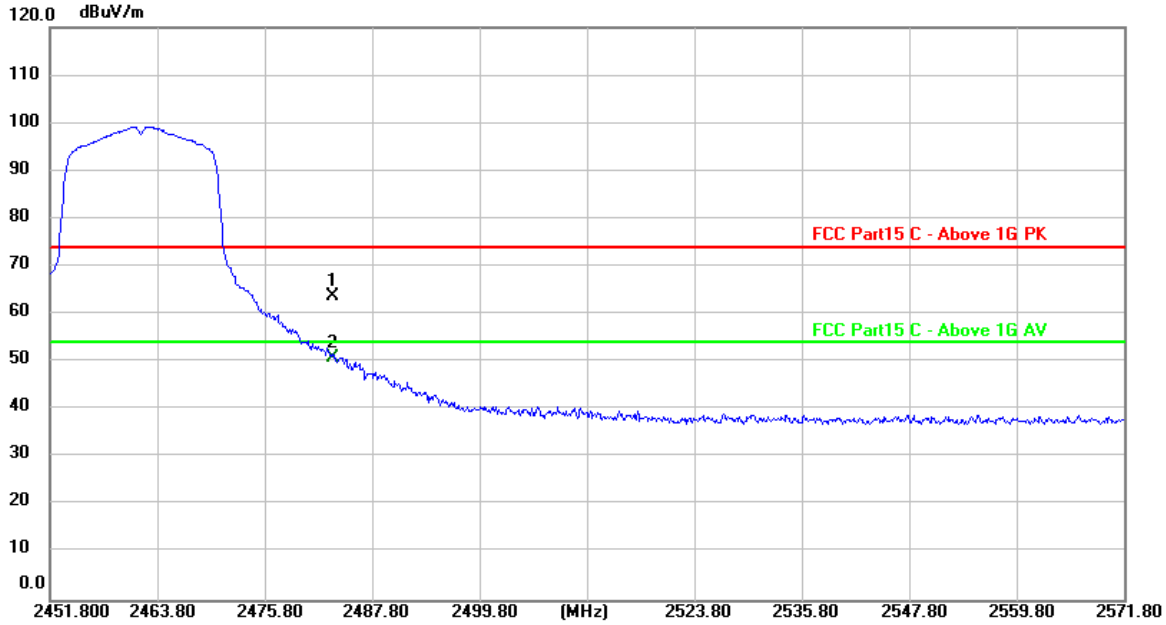
Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	G Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	19.06	31.24	50.30	74.00	-23.70	peak
2 *	2483.500	3.87	31.24	35.11	54.00	-18.89	AVG

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

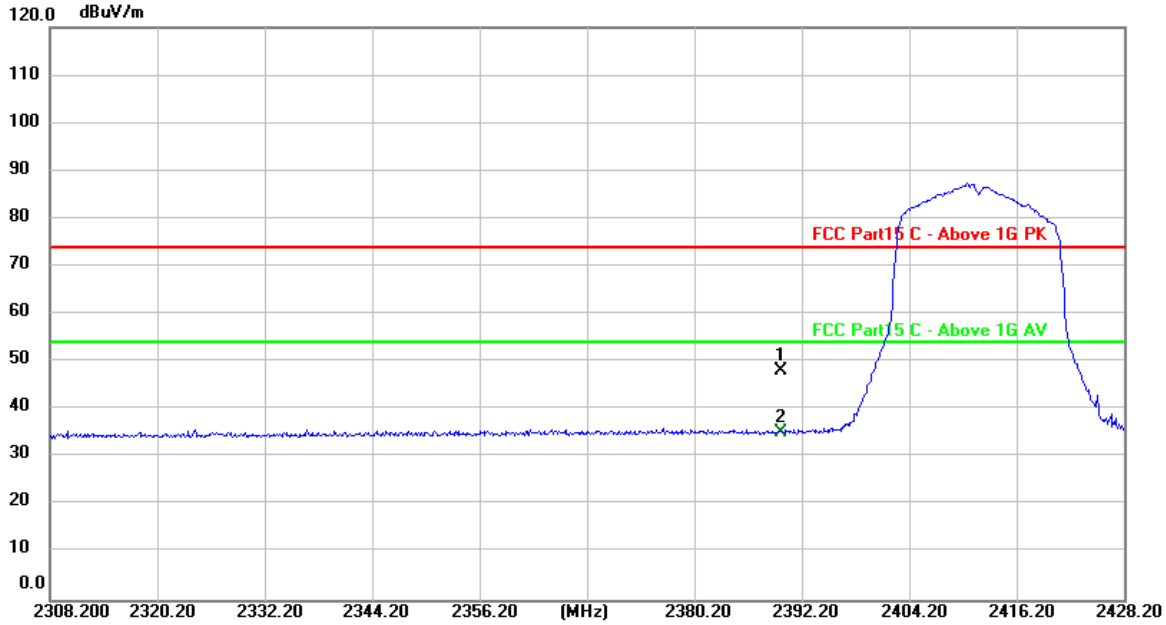
Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	G Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	32.57	31.24	63.81	74.00	-10.19	peak
2 *	2483.500	19.48	31.24	50.72	54.00	-3.28	AVG

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

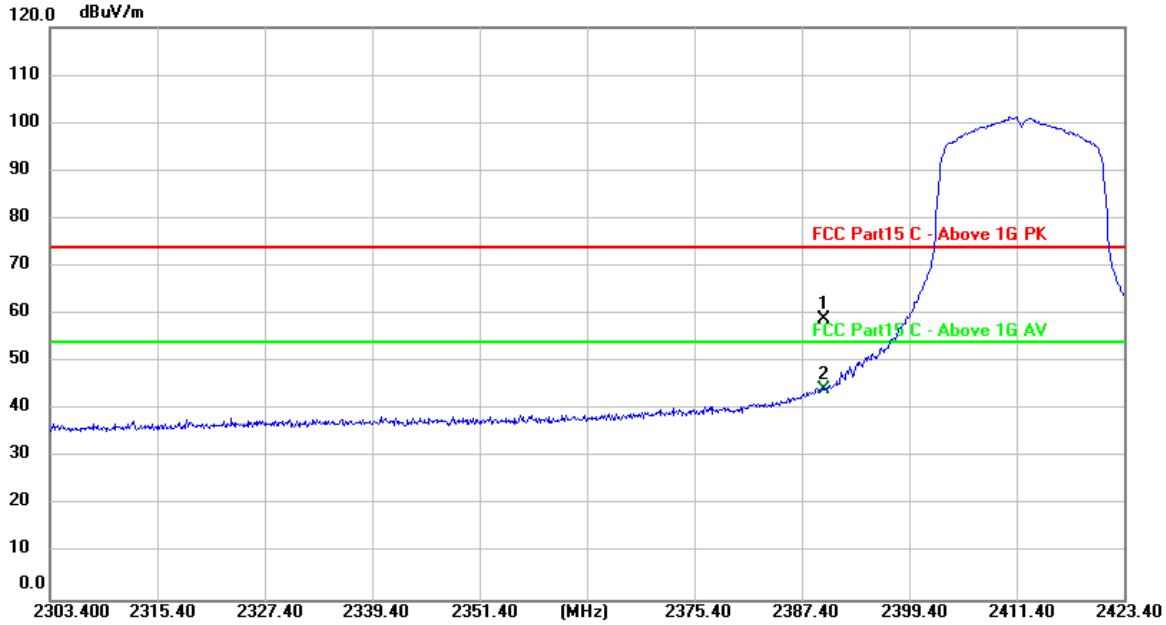
Ant No.	ANT1 + ANT2
Ant. Pol.	Horizontal
Test Mode:	N(HT20) Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	17.18	30.84	48.02	74.00	-25.98	peak
2 *	2390.000	4.29	30.84	35.13	54.00	-18.87	AVG

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

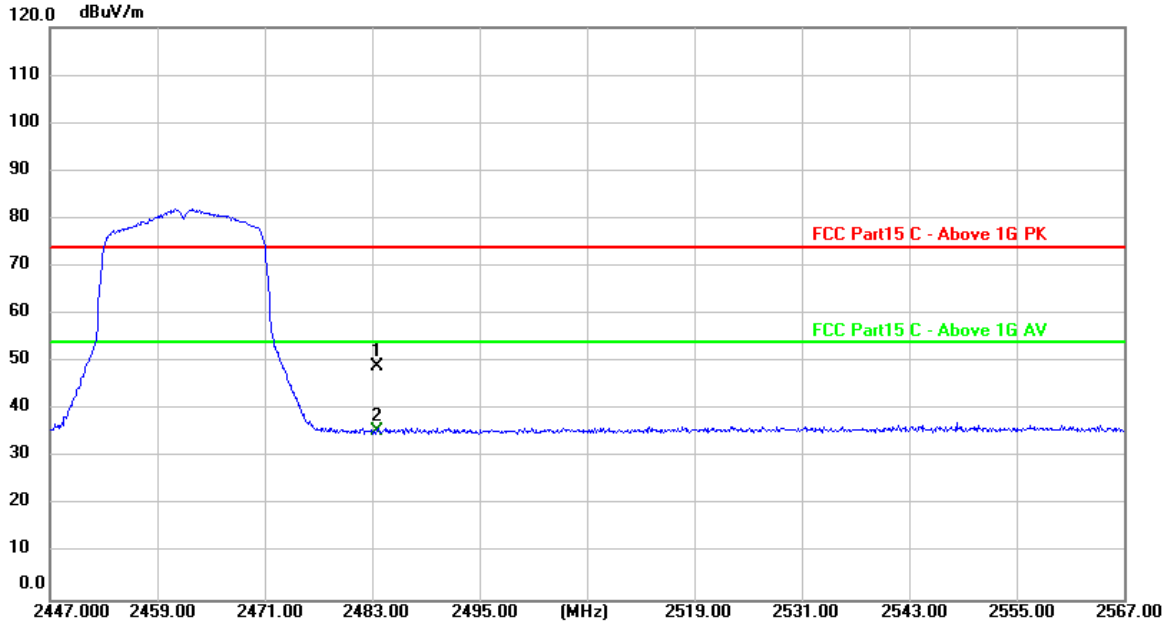
Ant No.	ANT1 + ANT2
Ant. Pol.	Vertical
Test Mode:	N(HT20) Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	28.10	30.84	58.94	74.00	-15.06	peak
2 *	2390.000	13.50	30.84	44.34	54.00	-9.66	AVG

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

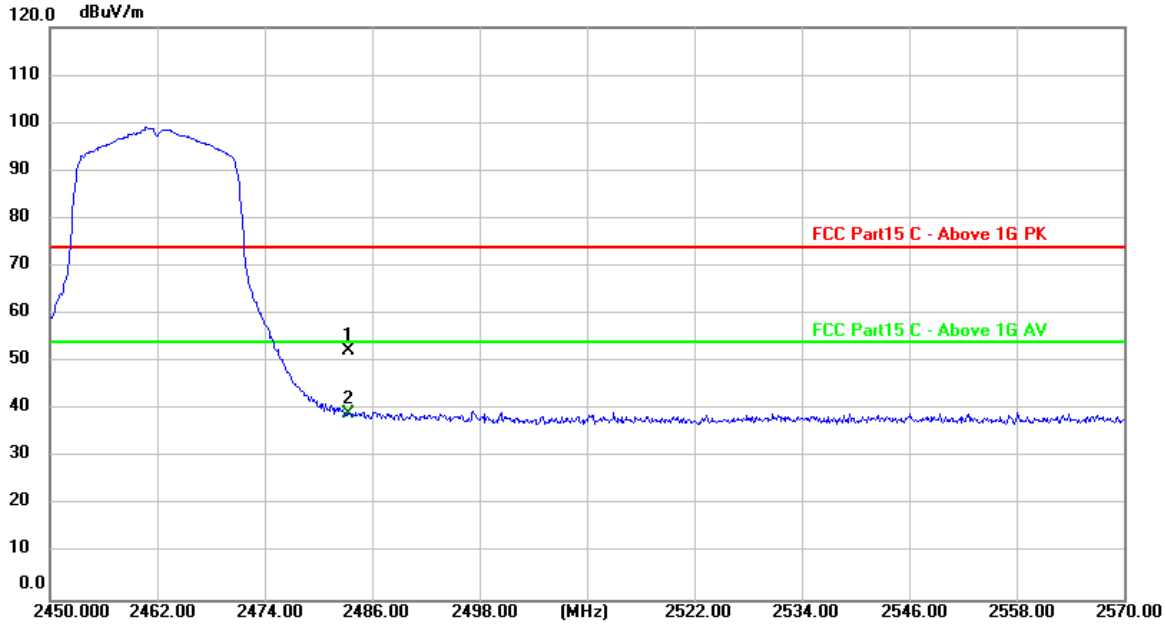
Ant No.	ANT1 + ANT2
Ant. Pol.	Horizontal
Test Mode:	N(HT20) Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	17.92	31.24	49.16	74.00	-24.84	peak
2 *	2483.500	4.18	31.24	35.42	54.00	-18.58	AVG

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

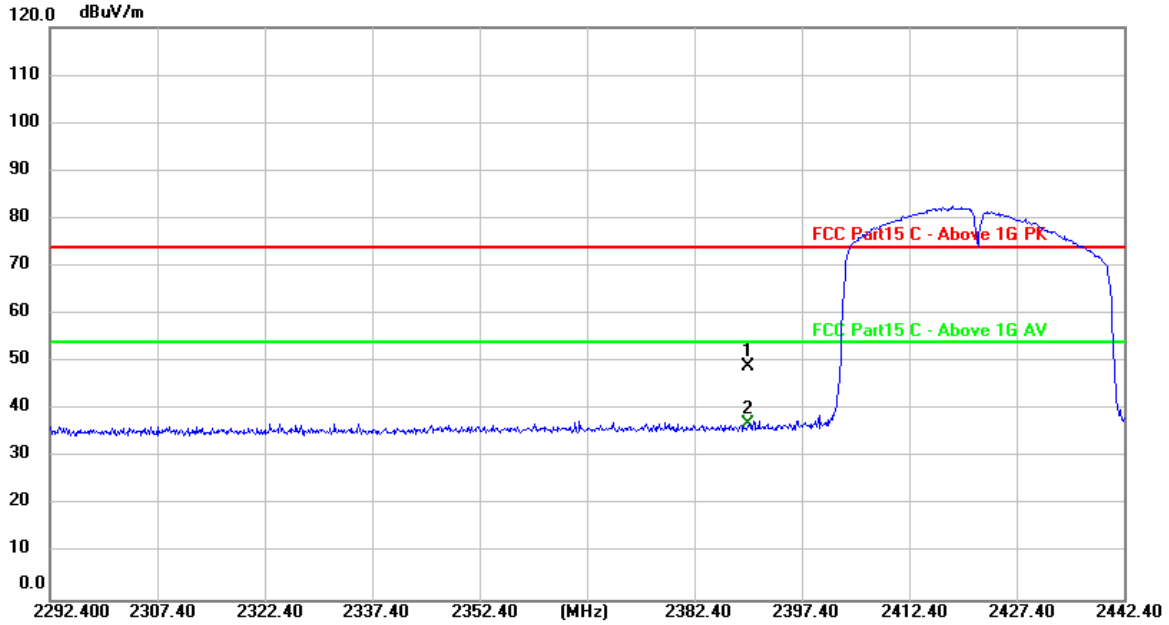
Ant No.	ANT1 + ANT2
Ant. Pol.	Vertical
Test Mode:	N(HT20) Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	21.17	31.24	52.41	74.00	-21.59	peak
2 *	2483.500	7.78	31.24	39.02	54.00	-14.98	AVG

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

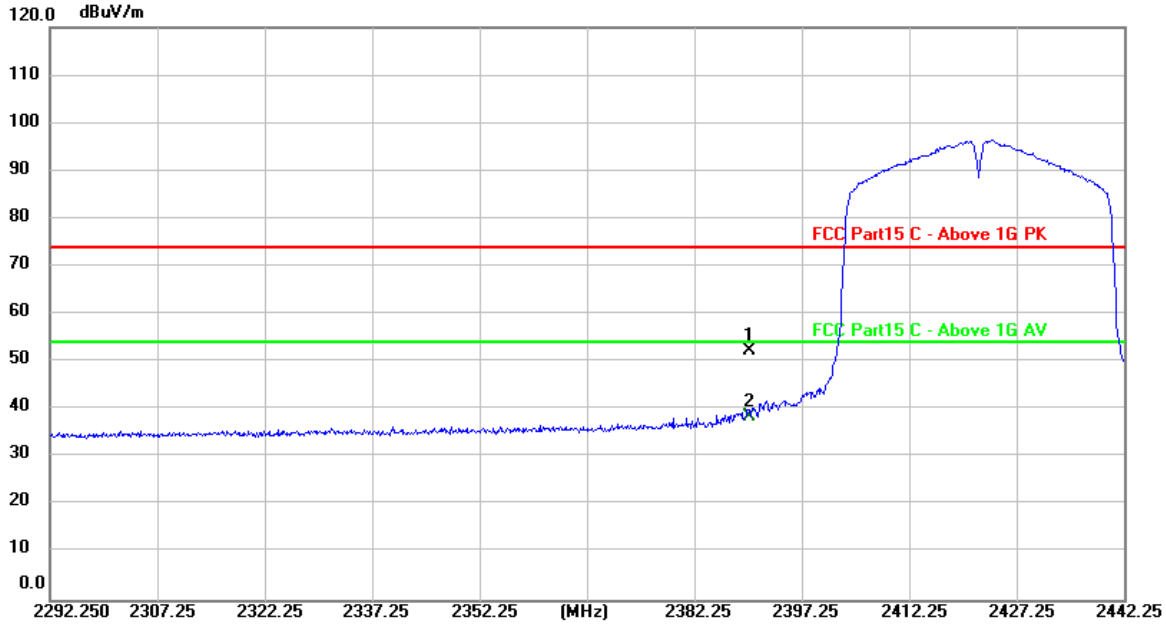
Ant No.	ANT1 + ANT2
Ant. Pol.	Horizontal
Test Mode:	N(HT40) Mode 2422MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	18.35	30.84	49.19	74.00	-24.81	peak
2 *	2390.000	6.23	30.84	37.07	54.00	-16.93	AVG

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

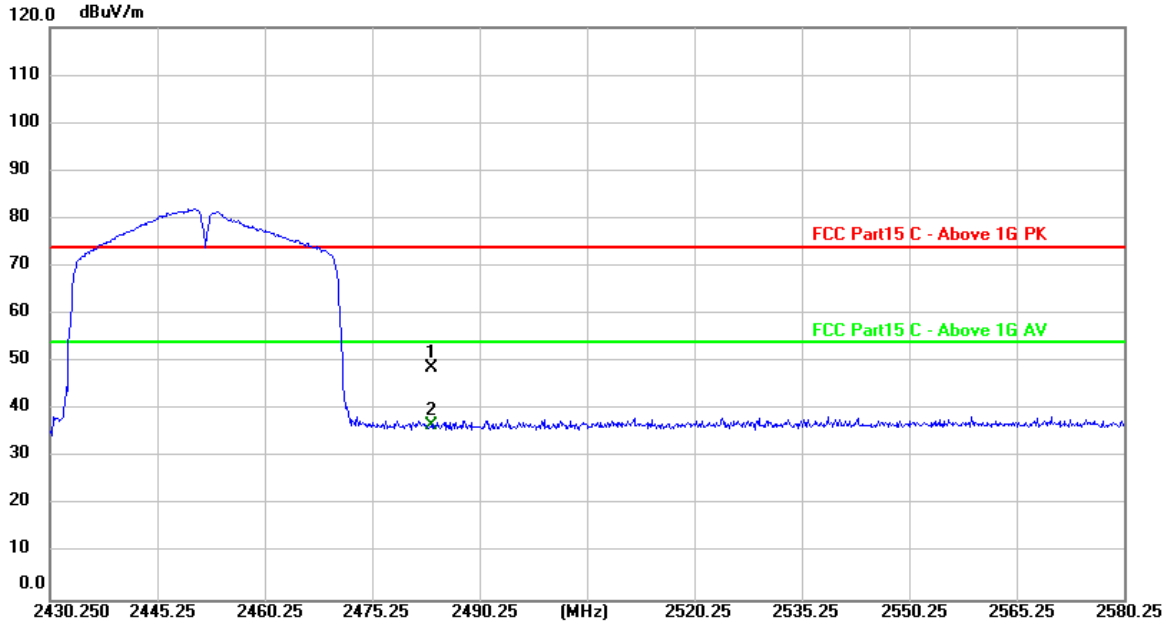
Ant No.	ANT1 + ANT2
Ant. Pol.	Vertical
Test Mode:	N(HT40) Mode 2422MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	21.37	30.84	52.21	74.00	-21.79	peak
2 *	2390.000	7.75	30.84	38.59	54.00	-15.41	AVG

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

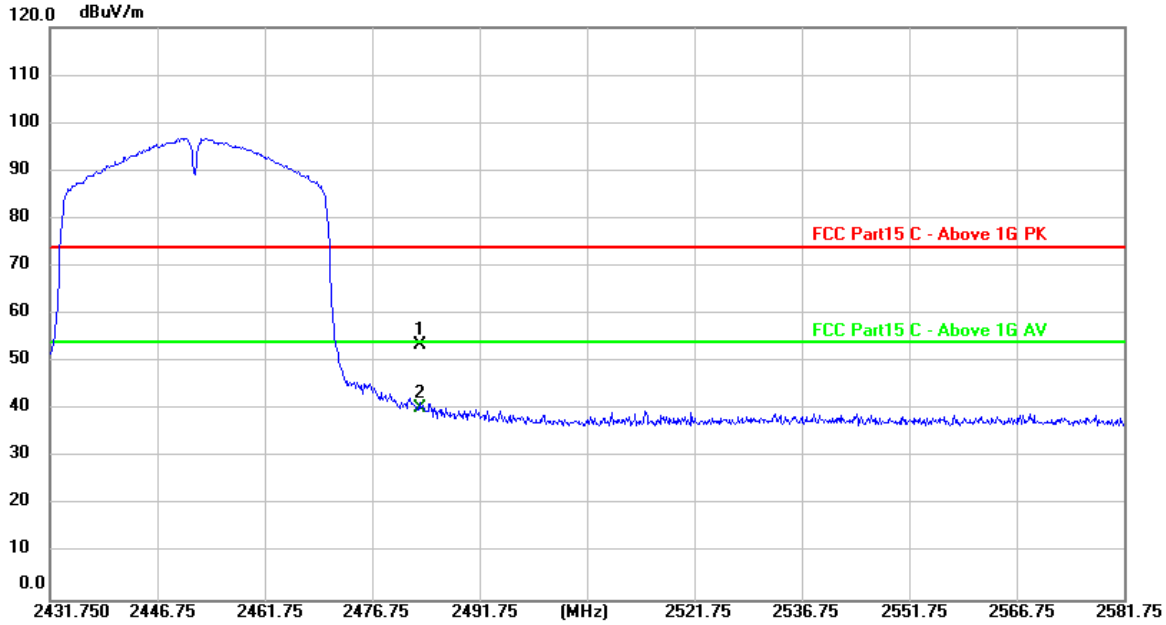
Ant No.	ANT1 + ANT2
Ant. Pol.	Horizontal
Test Mode:	N(HT40) Mode 2452MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	17.50	31.24	48.74	74.00	-25.26	peak
2 *	2483.500	5.63	31.24	36.87	54.00	-17.13	AVG

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

Ant No.	ANT1 + ANT2
Ant. Pol.	Vertical
Test Mode:	N(HT40) Mode 2452MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	22.18	31.24	53.42	74.00	-20.58	peak
2 *	2483.500	9.25	31.24	40.49	54.00	-13.51	AVG

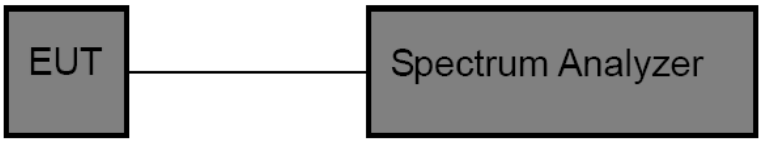
Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

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.

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.

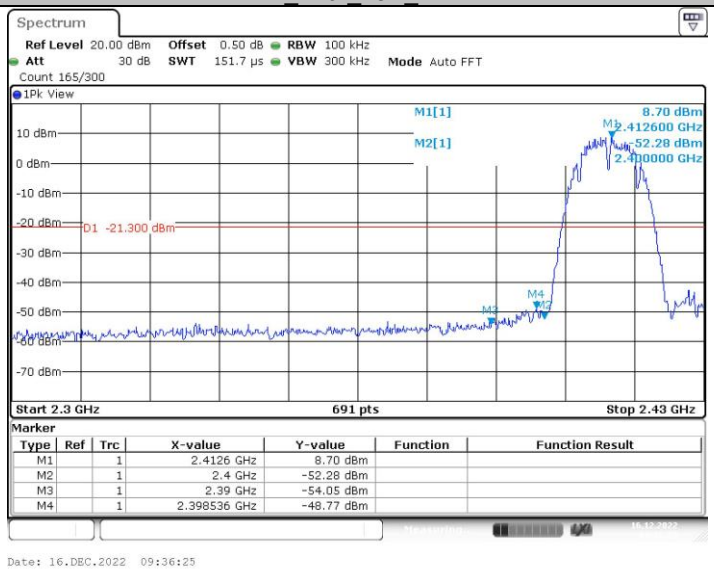
Test Results

(1) Band edge Conducted Test

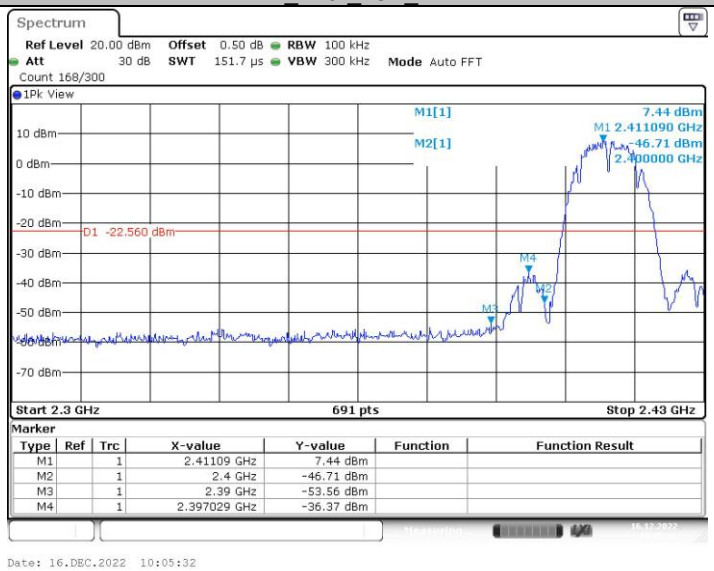
Test Mode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	8.70	-48.77	≤-21.30	PASS
	Ant2	Low	2412	7.44	-36.37	≤-22.56	PASS
	Ant1	High	2462	8.48	-49.00	≤-21.52	PASS
	Ant2	High	2462	7.99	-49.83	≤-22.01	PASS
11G	Ant1	Low	2412	6.59	-26.00	≤-23.41	PASS
	Ant2	Low	2412	9.03	-22.76	≤-20.97	PASS
	Ant1	High	2462	5.72	-39.69	≤-24.28	PASS
	Ant2	High	2462	6.13	-37.00	≤-23.87	PASS
11N20MIMO	Ant1	Low	2412	4.33	-31.88	≤-25.67	PASS
	Ant2	Low	2412	0.10	-38.77	≤-29.90	PASS
	Ant1	High	2462	4.25	-48.65	≤-25.75	PASS
	Ant2	High	2462	-0.30	-53.51	≤-30.30	PASS
11N40MIMO	Ant1	Low	2422	3.81	-41.03	≤-26.19	PASS
	Ant2	Low	2422	-1.80	-47.38	≤-31.80	PASS
	Ant1	High	2452	2.91	-44.48	≤-27.09	PASS
	Ant2	High	2452	-0.63	-53.77	≤-30.63	PASS

Test plot as follows:

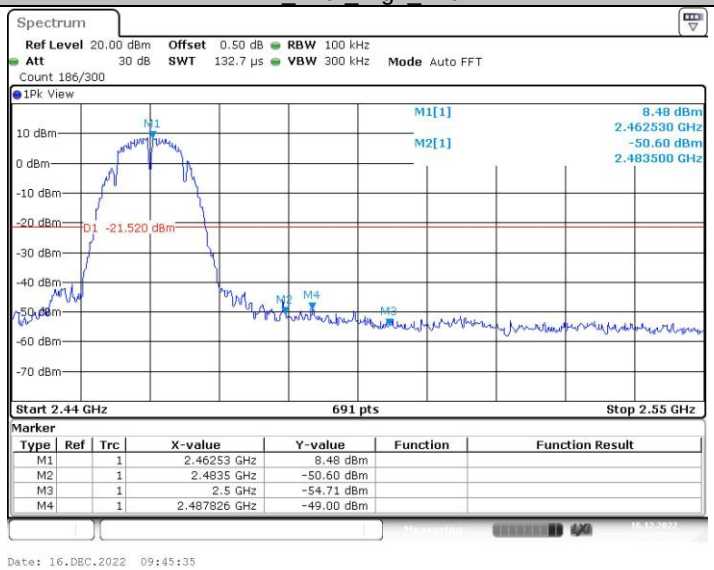
11B_Ant1_Low_2412



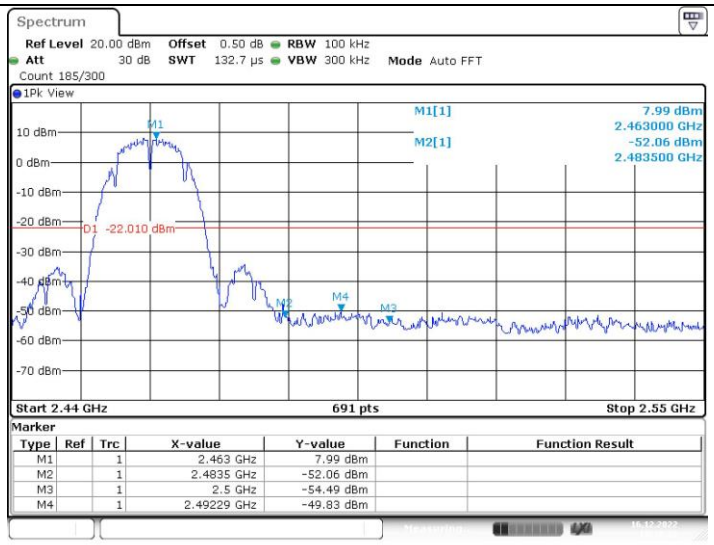
11B_Ant2_Low_2412



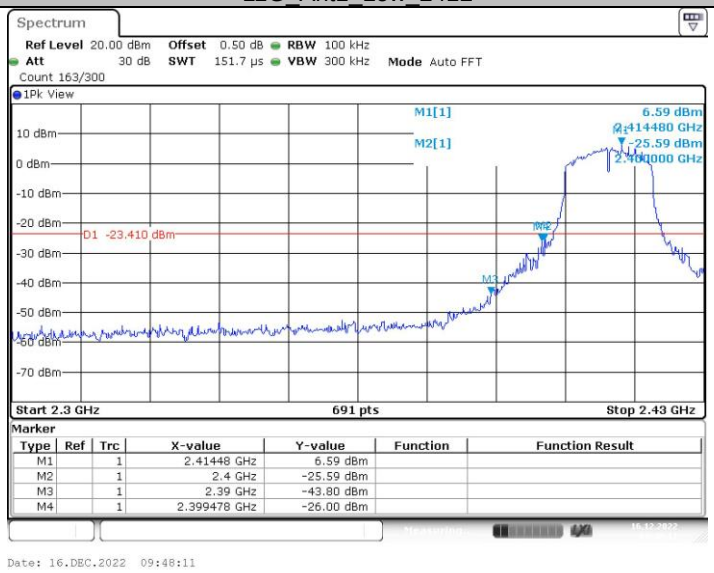
11B_Ant1_High_2462



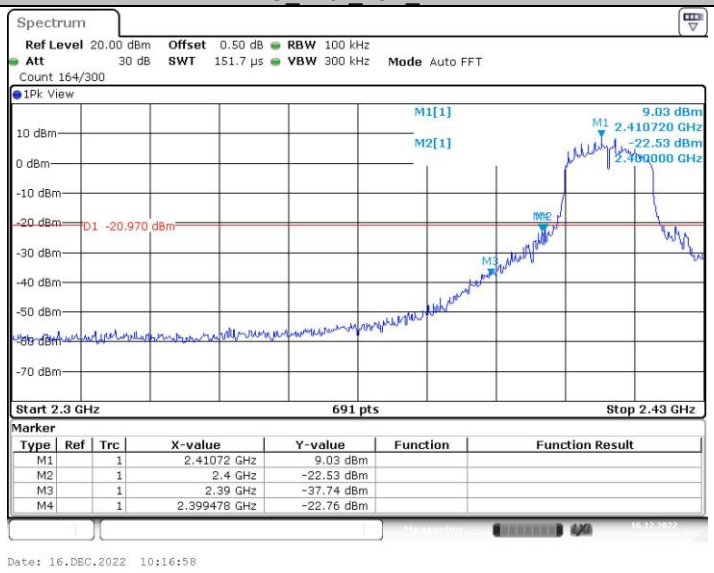
11B_Ant2_High_2462



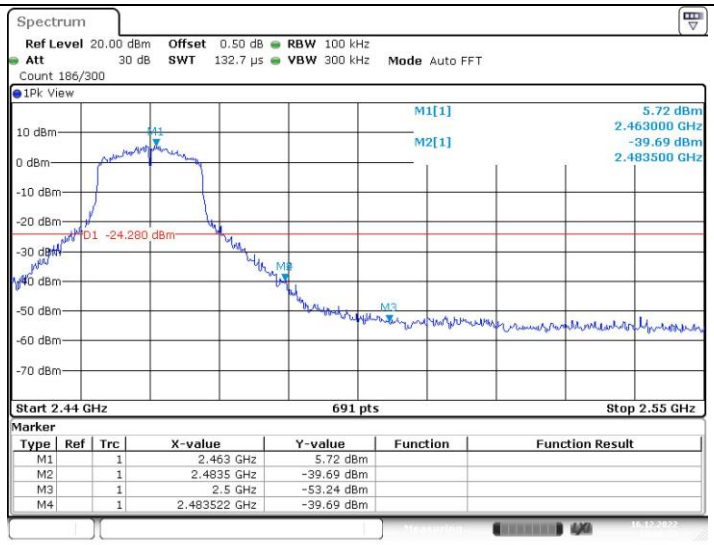
11G_Ant1_Low_2412



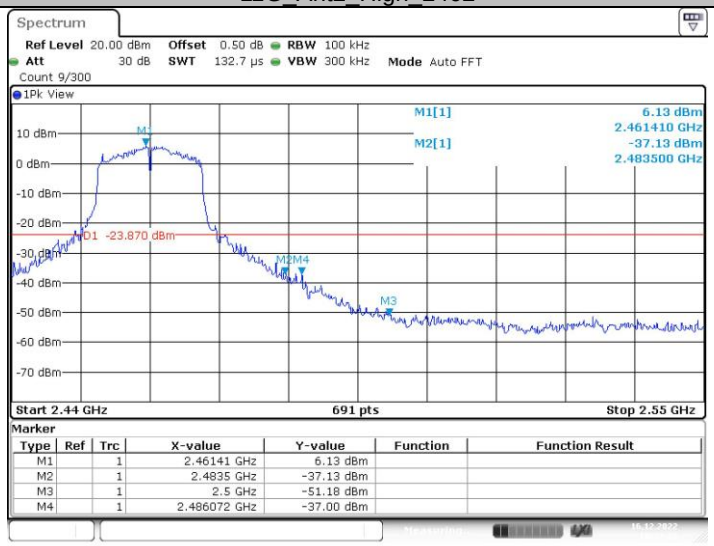
11G_Ant2_Low_2412



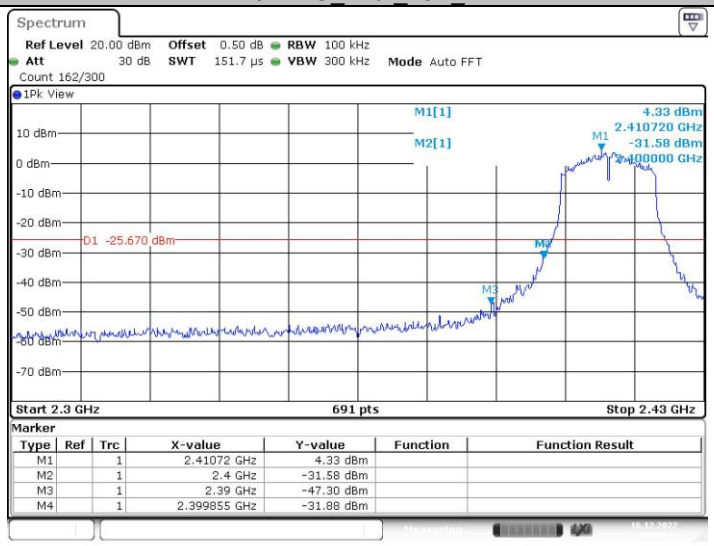
11G_Ant1_High_2462



11G_Ant2_High_2462



11N20MIMO_Ant1_Low_2412



11N20MIMO_Ant2_Low_2412

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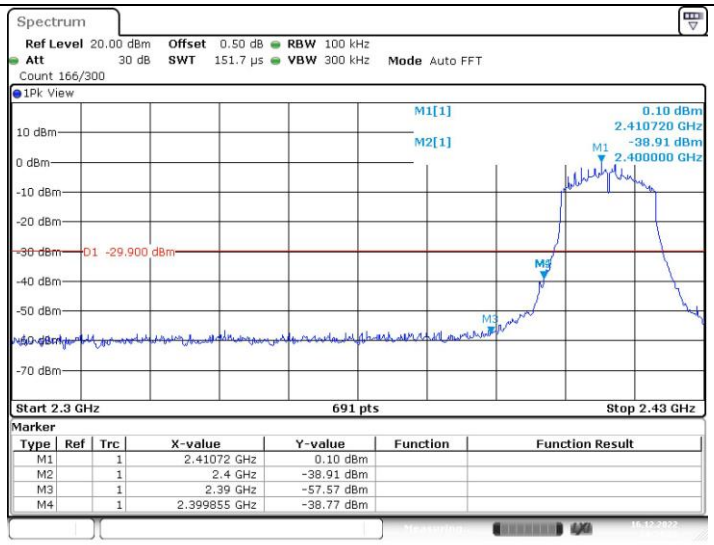
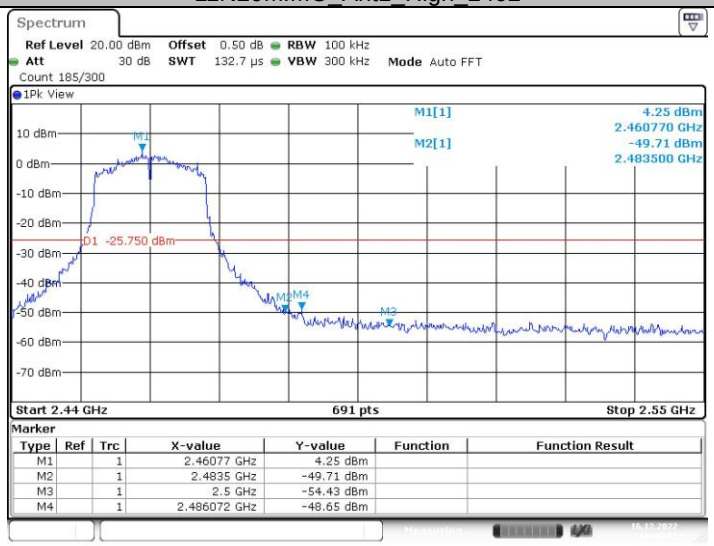
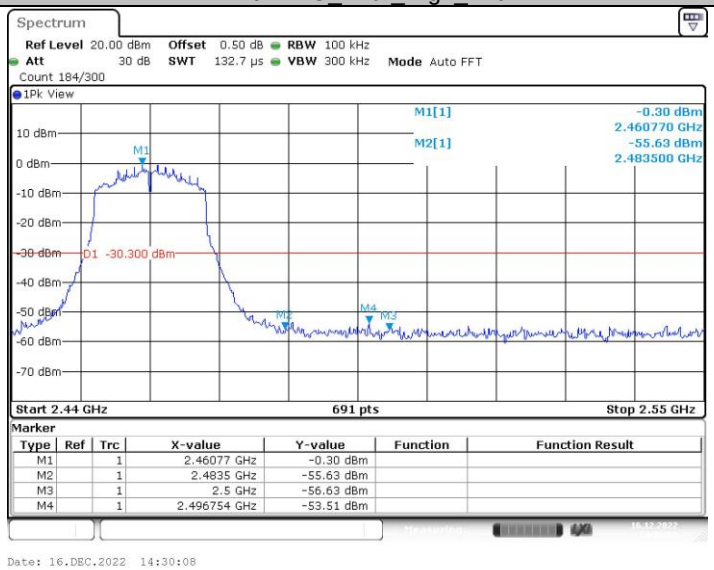


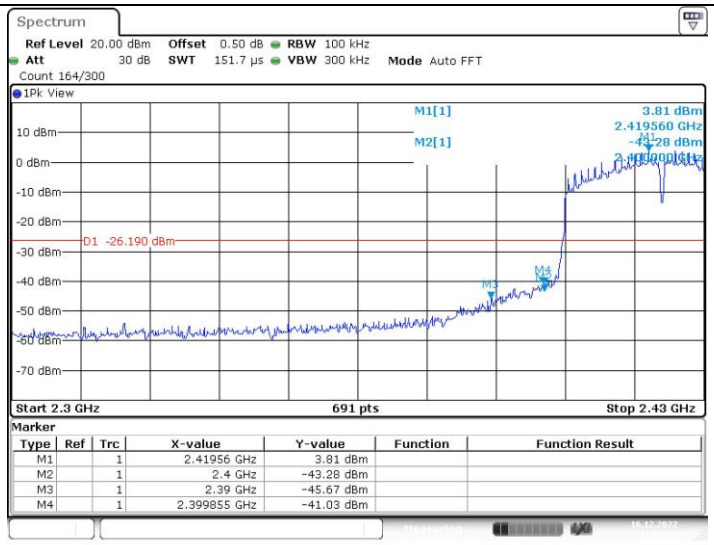
11N20MIMO_Ant1_High_2462



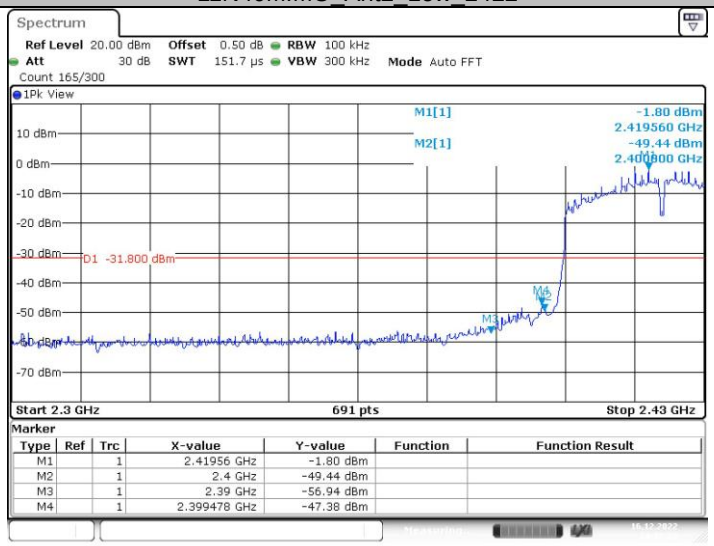
11N20MIMO_Ant2_High_2462



11N40MIMO_Ant1_Low_2422

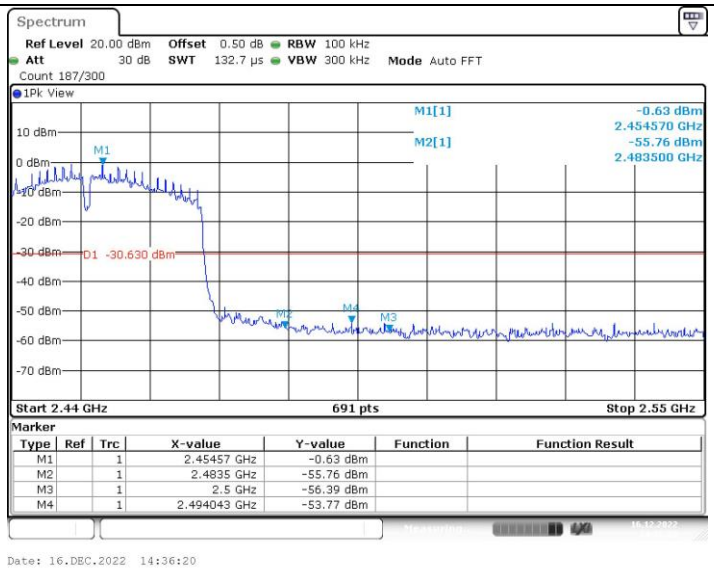


11N40MIMO_Ant2_Low_2422



11N40MIMO_Ant1_High_2452

11N40MIMO_Ant2_High_2452


Spectrum
Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz
Att 30 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
Count 187/300
1Pk View
M1[1] -0.63 dBm 2.454570 GHz
M2[1] -55.76 dBm 2.483500 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
D1 -30.630 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
M2
M3
M4
Start 2.44 GHz 691 pts Stop 2.55 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.45457 GHz -0.63 dBm
M2 1 2.4835 GHz -55.76 dBm
M3 1 2.5 GHz -56.39 dBm
M4 1 2.494043 GHz -53.77 dBm
Date: 16.DEC.2022 14:36:20

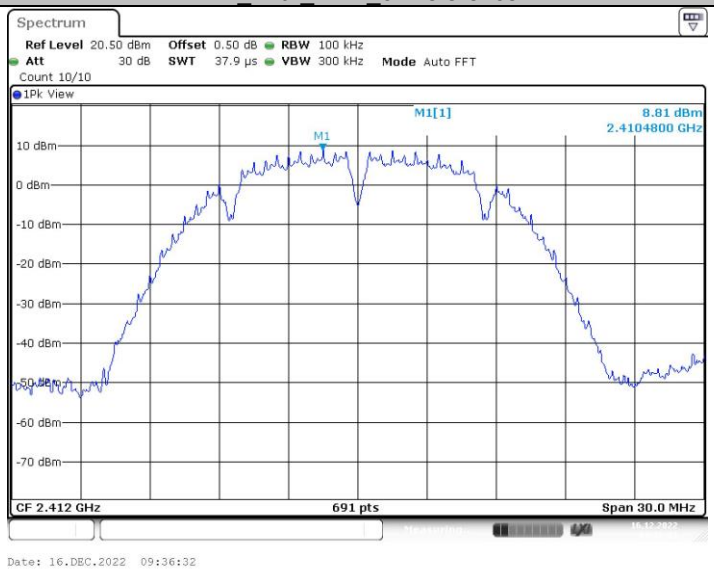
(2) Conducted Spurious Emissions Test

Test Mode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	8.81	8.81	---	PASS
			30~1000	8.81	-55.82	≤-21.19	PASS
			1000~26500	8.81	-42.07	≤-21.19	PASS
	Ant2	2412	Reference	8.32	8.32	---	PASS
			30~1000	8.32	-53.81	≤-21.68	PASS
			1000~26500	8.32	-33.82	≤-21.68	PASS
	Ant1	2437	Reference	8.49	8.49	---	PASS
			30~1000	8.49	-56.54	≤-21.51	PASS
			1000~26500	8.49	-40.31	≤-21.51	PASS
	Ant2	2437	Reference	8.83	8.83	---	PASS
			30~1000	8.83	-54.70	≤-21.17	PASS
			1000~26500	8.83	-33.48	≤-21.17	PASS
	Ant1	2462	Reference	8.85	8.85	---	PASS
			30~1000	8.85	-56.54	≤-21.15	PASS
			1000~26500	8.85	-41.05	≤-21.15	PASS
	Ant2	2462	Reference	9.05	9.05	---	PASS
			30~1000	9.05	-54.79	≤-20.95	PASS
			1000~26500	9.05	-34.10	≤-20.95	PASS
11G	Ant1	2412	Reference	8.61	8.61	---	PASS
			30~1000	8.61	-55.52	≤-21.39	PASS
			1000~26500	8.61	-41.35	≤-21.39	PASS
	Ant2	2412	Reference	5.99	5.99	---	PASS
			30~1000	5.99	-53.77	≤-24.01	PASS
			1000~26500	5.99	-41.79	≤-24.01	PASS
	Ant1	2437	Reference	8.23	8.23	---	PASS
			30~1000	8.23	-55.72	≤-21.77	PASS
			1000~26500	8.23	-42.12	≤-21.77	PASS
	Ant2	2437	Reference	7.60	7.60	---	PASS
			30~1000	7.60	-54.85	≤-22.40	PASS
			1000~26500	7.60	-42.65	≤-22.40	PASS
	Ant1	2462	Reference	9.19	9.19	---	PASS
			30~1000	9.19	-55.85	≤-20.81	PASS
			1000~26500	9.19	-41.78	≤-20.81	PASS
	Ant2	2462	Reference	8.87	8.87	---	PASS
			30~1000	8.87	-56.06	≤-21.13	PASS
			1000~26500	8.87	-41.42	≤-21.13	PASS
11N20MIMO	Ant1	2412	Reference	6.11	6.11	---	PASS
			30~1000	6.11	-56.20	≤-23.89	PASS
			1000~26500	6.11	-42.26	≤-23.89	PASS
	Ant2	2412	Reference	0.38	0.38	---	PASS
			30~1000	0.38	-55.56	≤-29.62	PASS
			1000~26500	0.38	-41.60	≤-29.62	PASS
	Ant1	2437	Reference	6.61	6.61	---	PASS
			30~1000	6.61	-56.82	≤-23.39	PASS
			1000~26500	6.61	-41.75	≤-23.39	PASS
	Ant2	2437	Reference	0.23	0.23	---	PASS
			30~1000	0.23	-56.04	≤-29.77	PASS
			1000~26500	0.23	-41.78	≤-29.77	PASS
	Ant1	2462	Reference	5.09	5.09	---	PASS
			30~1000	5.09	-57.09	≤-24.91	PASS
			1000~26500	5.09	-41.13	≤-24.91	PASS
	Ant2	2462	Reference	-0.05	-0.05	---	PASS
			30~1000	-0.05	-56.05	≤-30.05	PASS
			1000~26500	-0.05	-41.49	≤-30.05	PASS
11N40MIMO	Ant1	2422	Reference	3.53	3.53	---	PASS
			30~1000	3.53	-54.63	≤-26.47	PASS

			1000~26500	3.53	-41.39	≤-26.47	PASS
	Ant2	2422	Reference	-1.60	-1.60	---	PASS
			30~1000	-1.60	-53.14	≤-31.60	PASS
			1000~26500	-1.60	-42.22	≤-31.60	PASS
	Ant1	2437	Reference	4.46	4.46	---	PASS
			30~1000	4.46	-54.13	≤-25.54	PASS
			1000~26500	4.46	-42.01	≤-25.54	PASS
	Ant2	2437	Reference	-2.79	-2.79	---	PASS
			30~1000	-2.79	-53.35	≤-32.79	PASS
			1000~26500	-2.79	-42.10	≤-32.79	PASS
	Ant1	2452	Reference	2.99	2.99	---	PASS
			30~1000	2.99	-54.82	≤-27.01	PASS
			1000~26500	2.99	-42.44	≤-27.01	PASS
	Ant2	2452	Reference	-1.34	-1.34	---	PASS
			30~1000	-1.34	-53.49	≤-31.34	PASS
			1000~26500	-1.34	-42.27	≤-31.34	PASS

Test plot as follows:

11B_Ant1_2412_0~Reference



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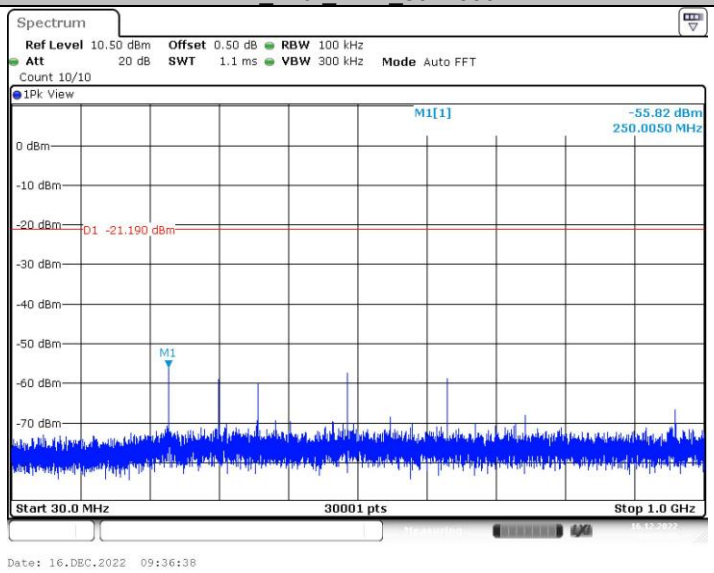

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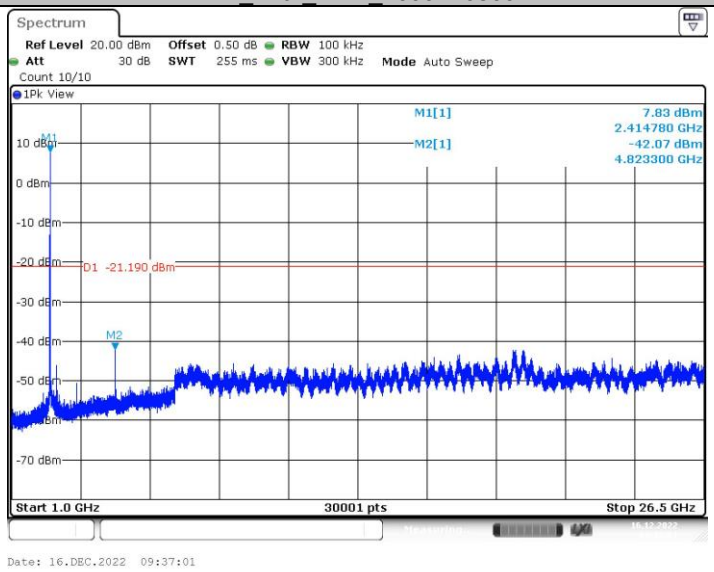

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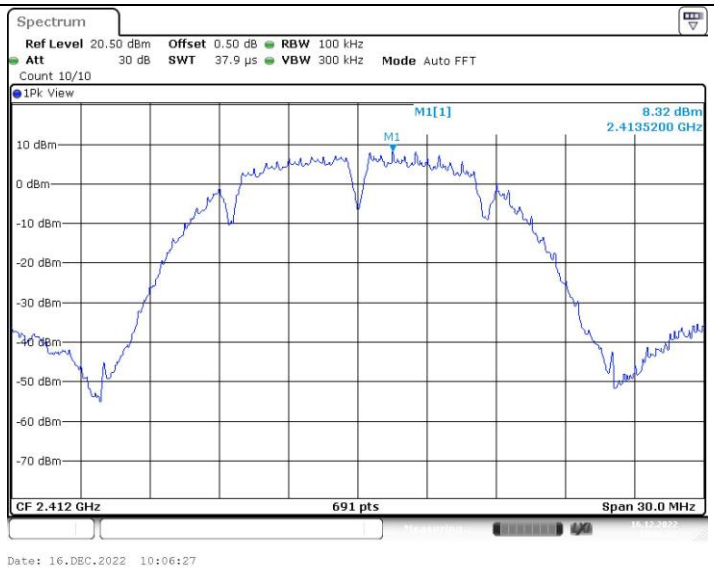

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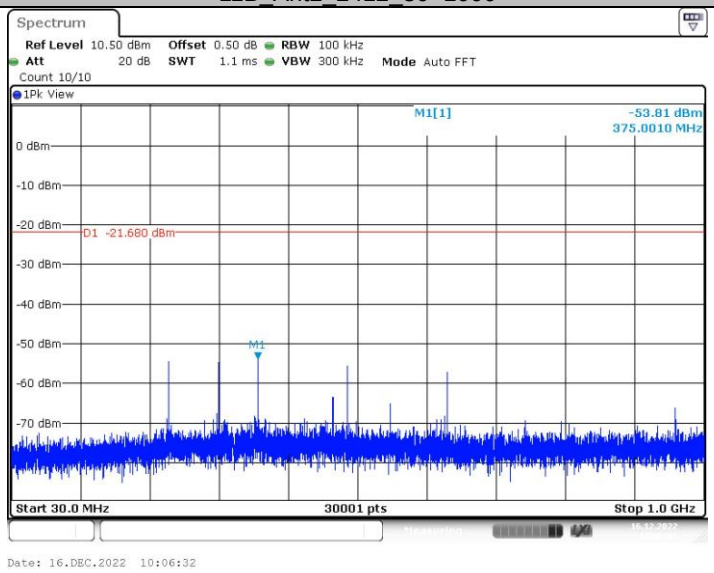

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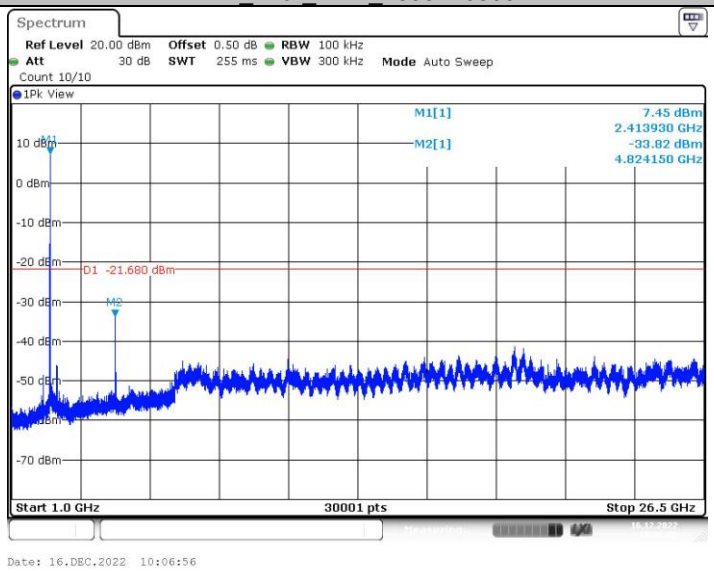

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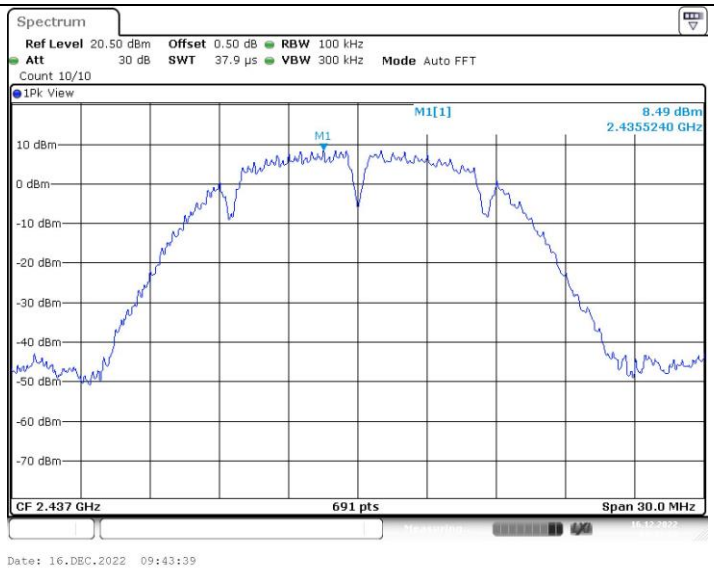

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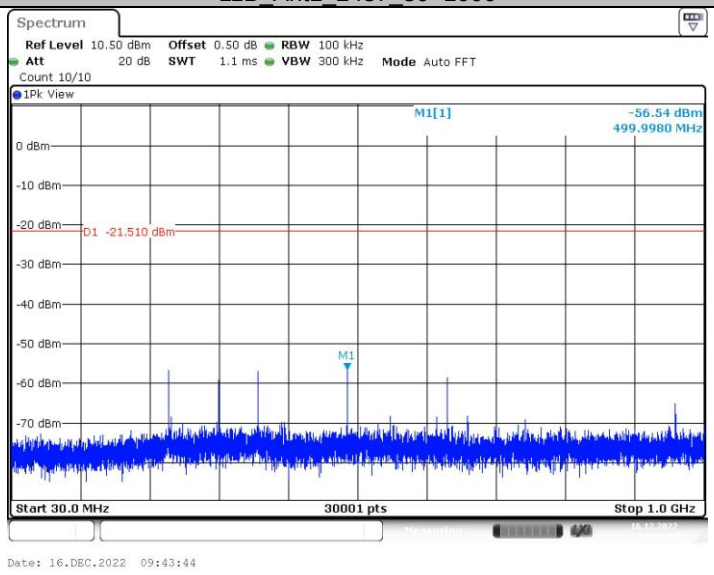

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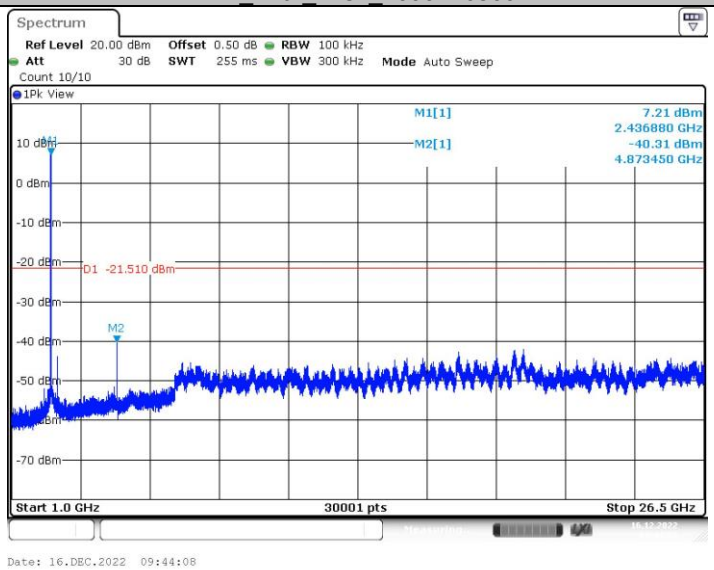

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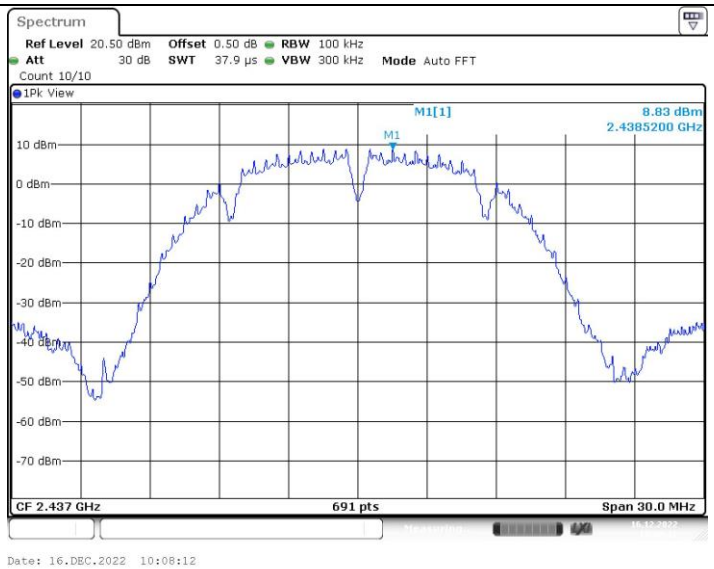

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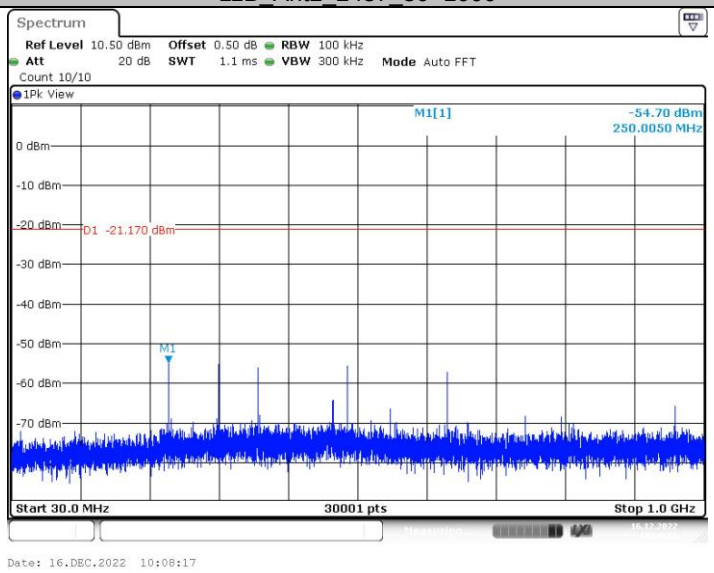

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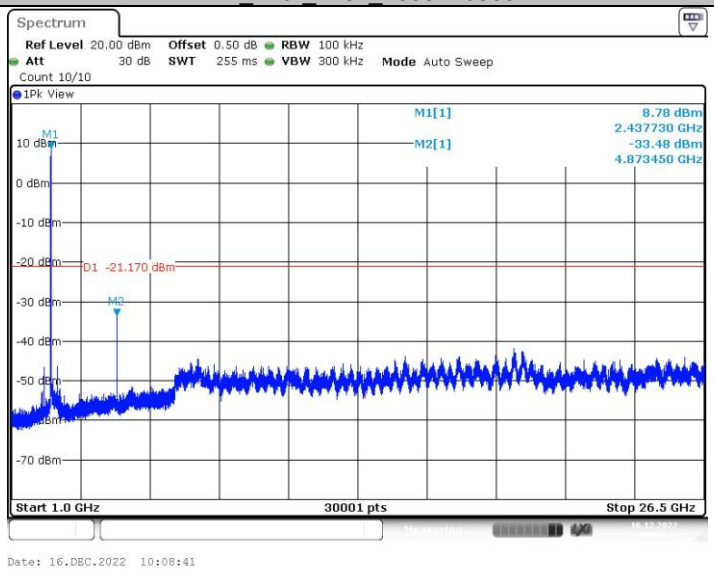

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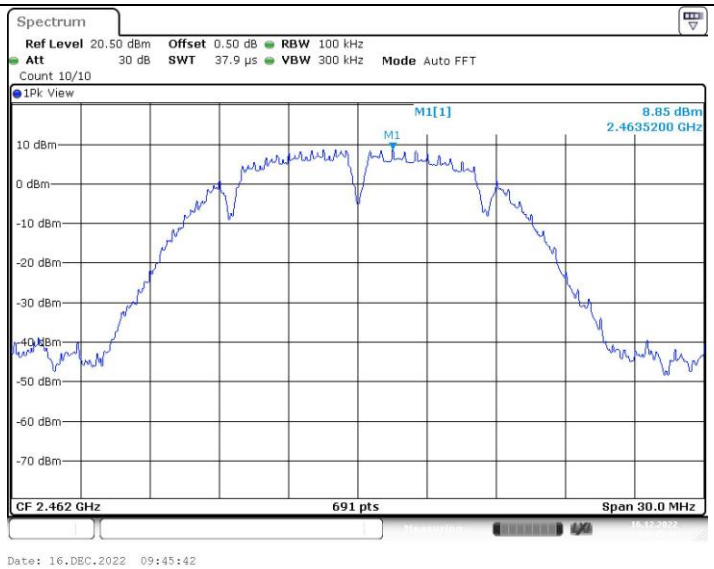

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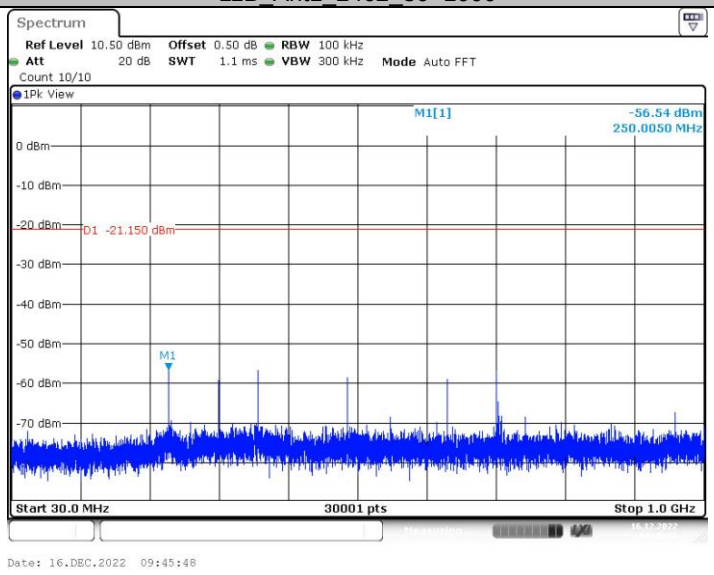

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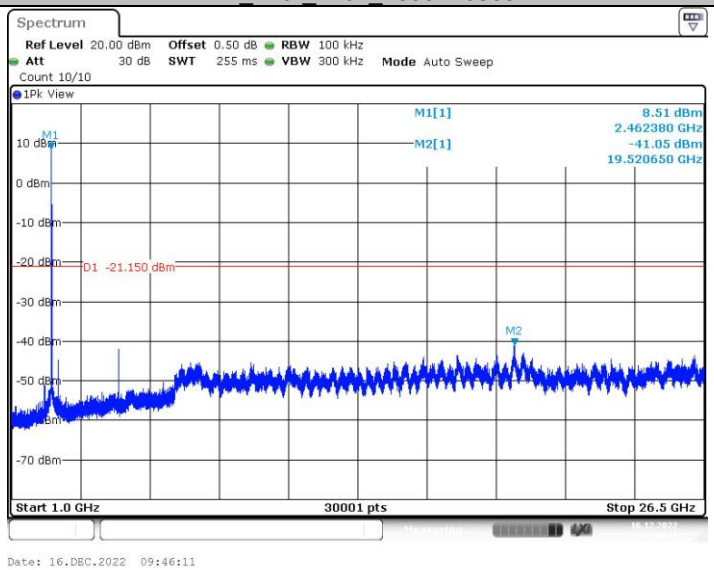

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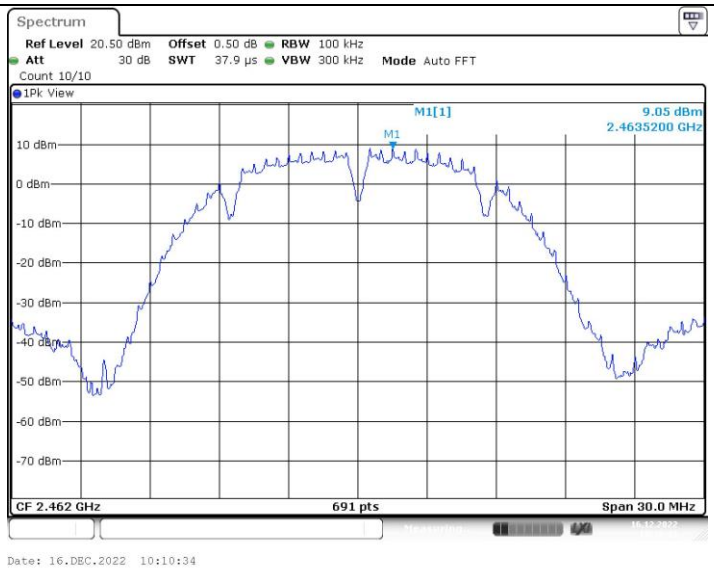

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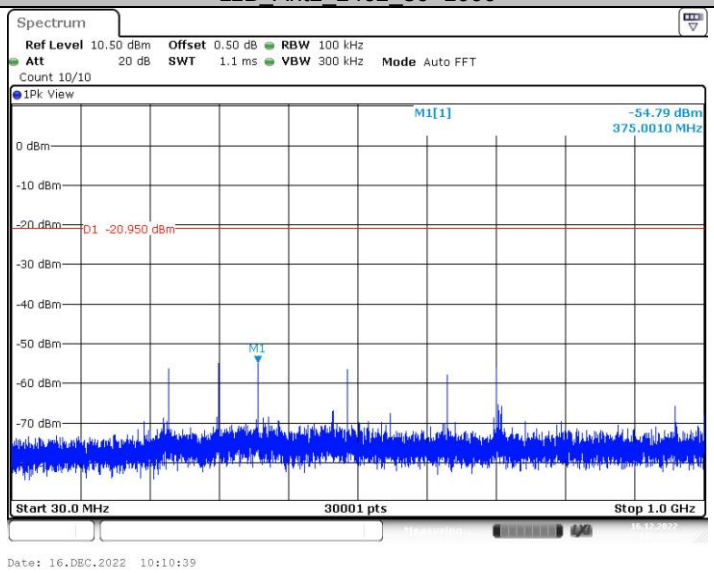

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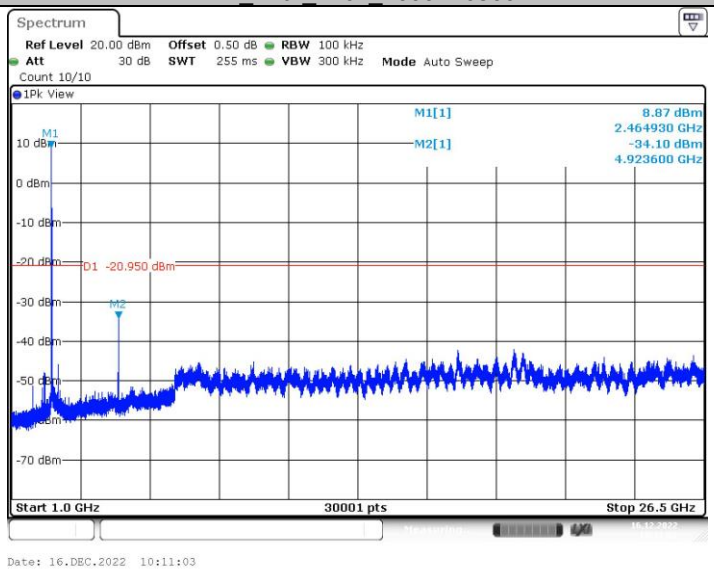

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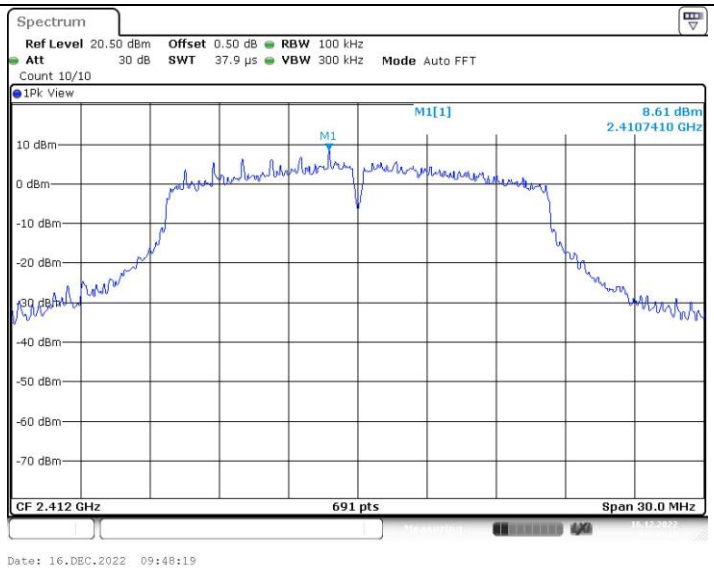

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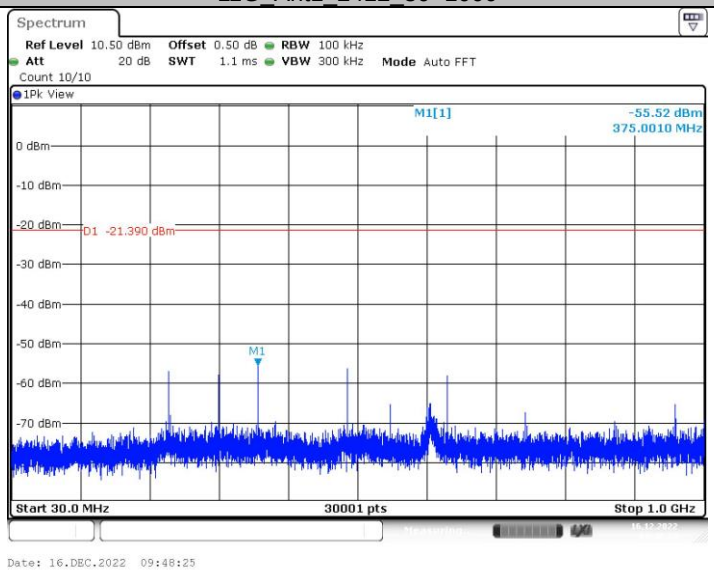

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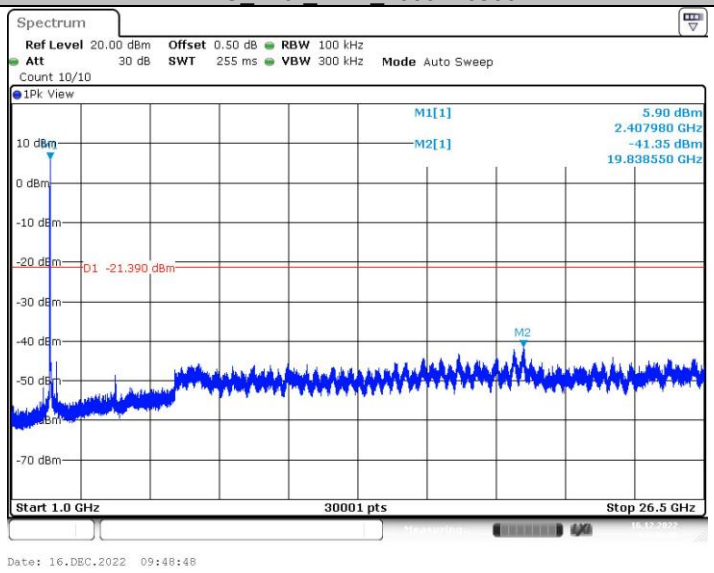

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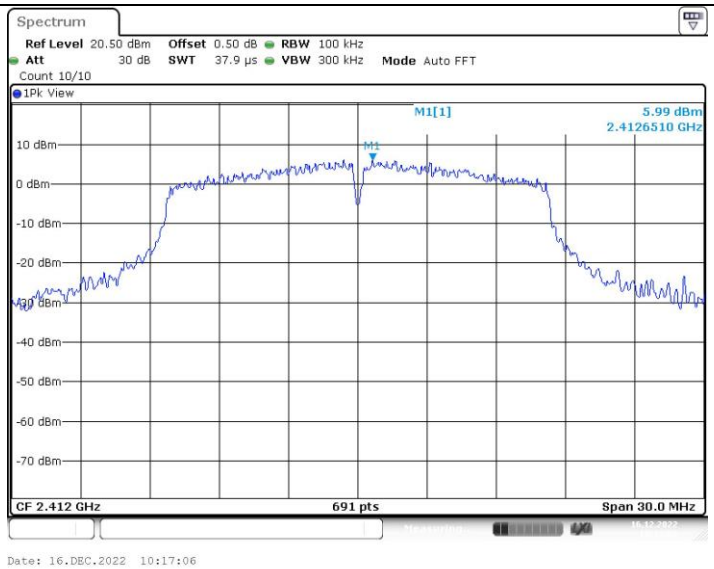

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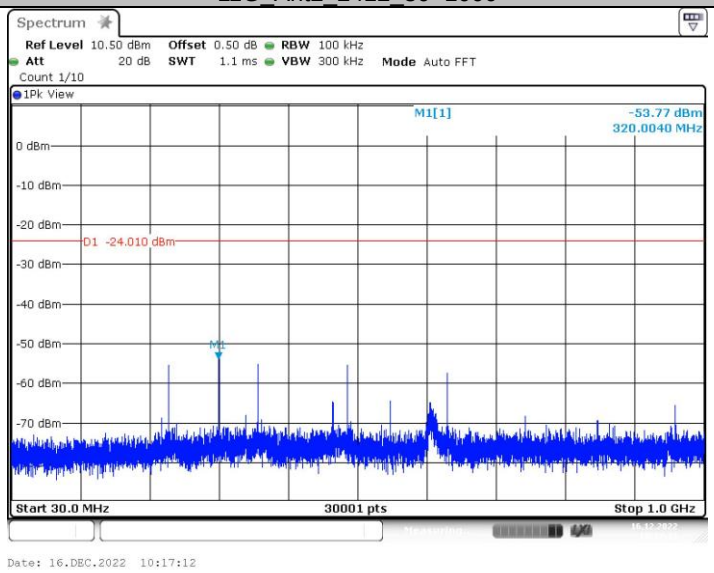

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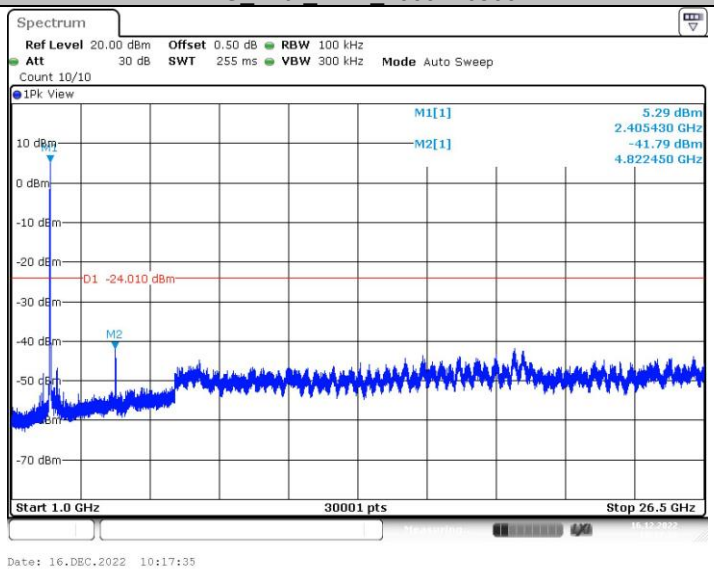

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