CTC Laboratories, Inc.

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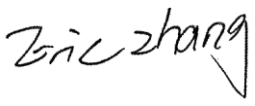
TEST REPORT

Report No. ……:	**CTC20230301E03**
FCC ID……..:	**2AR24-AIBOX410**
Applicant……:	**Shenzhen Absen Optoelectronic Co.,Ltd**
Address……:	18-20/F,Tower A,Building 3,Phase I,Tian An Cloud Park,N0.2018,Xuegang Rd,Bantian,Longgang District,Shenzhen,Guangdong,P.R.China
Manufacturer……:	Shenzhen Absen Optoelectronic Co.,Ltd
Address……:	18-20/F,Tower A,Building 3,Phase I,Tian An Cloud Park,N0.2018,Xuegang Rd,Bantian,Longgang District,Shenzhen,Guangdong,P.R.China
Product Name……:	**LED Multimedia Processor**
Trade Mark……:	/
Model/Type reference……:	Ai Box 410
Listed Model(s) ……:	/
Standard……:	**FCC CFR Title 47 Part 15 Subpart C Section 15.247**
Date of receipt of test sample…:	Mar. 02, 2023
Date of testing……..:	Mar. 02, 2023 to Mar. 27, 2023
Date of issue……....:	Jun. 02, 2023
Result……:	**PASS**

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

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

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1. TEST SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Operation within the bands 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	Jun. 02, 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	/	Pass	Lucy Lan
Conducted Emission	15.207	RSS-Gen 8.8	Pass	Lucy Lan
Radiated Band Edge and Spurious Emissions	15.205&15.209& 15.247(d)	RSS 247 5.5	Pass	Lucy Lan
Conducted Band Edge and Spurious Emissions	15.247(d)	RSS 247 5.5	Pass	Lucy Lan
6dB Bandwidth	15.247(a)(2)	RSS 247 5.2 (a)	Pass	Lucy Lan
Conducted Max Output Power	15.247(b)(3)	RSS 247 5.4 (d)	Pass	Lucy Lan
Power Spectral Density	15.247(e)	RSS 247 5.2 (b)	Pass	Lucy Lan
Transmitter Radiated Spurious	15.209&15.247(d)	RSS 247 5.5& RSS-Gen 8.9	Pass	Lucy Lan

Note:

1.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:

CNAS-Lab Code: L5365
CTC Laboratories, Inc. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation. Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

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
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%
Air Pressure:	101kPa

2. GENERAL INFORMATION

2.1. Client Information

Applicant:	Shenzhen Absen Optoelectronic Co.,Ltd
Address:	18-20/F,Tower A,Building 3,Phase I,Tian An Cloud Park,N0.2018,Xuegang Rd,Bantian,Longgang District,Shenzhen,Guangdong,P.R.China
Manufacturer:	Shenzhen Absen Optoelectronic Co.,Ltd
Address:	18-20/F,Tower A,Building 3,Phase I,Tian An Cloud Park,N0.2018,Xuegang Rd,Bantian,Longgang District,Shenzhen,Guangdong,P.R.China

2.2. General Description of EUT

Product Name:	LED Multimedia Processor
Trade Mark:	Absen
Model/Type reference:	Ai Box 410
Listed Model(s):	/
Model Difference:	/
Power supply:	100-240V~ 50/60Hz
RF Module Model:	ZK-7632A
Hardware version:	/
Software version:	/
WIFI 802.11b/ g/ n(HT20)/ n(HT40)	
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 or 2 type:	External Antenna
Antenna 1 or 2 gain:	5dBi

2.3. Accessory Equipment Information

Equipment Information			
Name	Model	S/N	Manufacturer
Notebook	X220	/	Lenovo
Cable Information			
Name	Shielded Type	Ferrite Core	Length
USB Cable	Unshielded	NO	150cm
AC Cable	Unshielded	NO	120cm
Test Software Information			
Name	Software version	/	/
MT7662 QA	V1.0.3.14	/	/

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)

Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain(dBi)
1	NA	NA	External Antenna	IPEX	5
2	NA	NA	External Antenna	IPEX	5

Note: Antenna Gain=5dBi. For 2.4G, this EUT supports MIMO 2X2, any transmit signals are correlated with each other, so Directional gain =$G_{Ant.}$+10log(N)dBi, that is Directional gain=5+10log(2)dBi=8dBi.So output power limit is 30-8+6=28dBm, the power spectral density limit is 8-8+6=6dBm/3KHz. The power spectral density limit is 8-8+6=6dBm/3KHz.

Data Rated

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

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

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	/	/

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

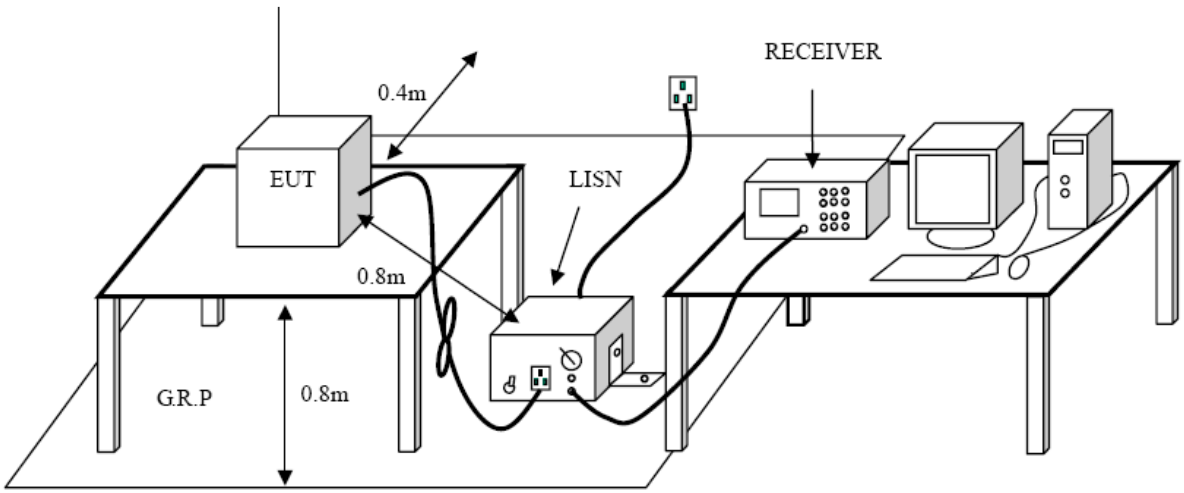
Limit

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



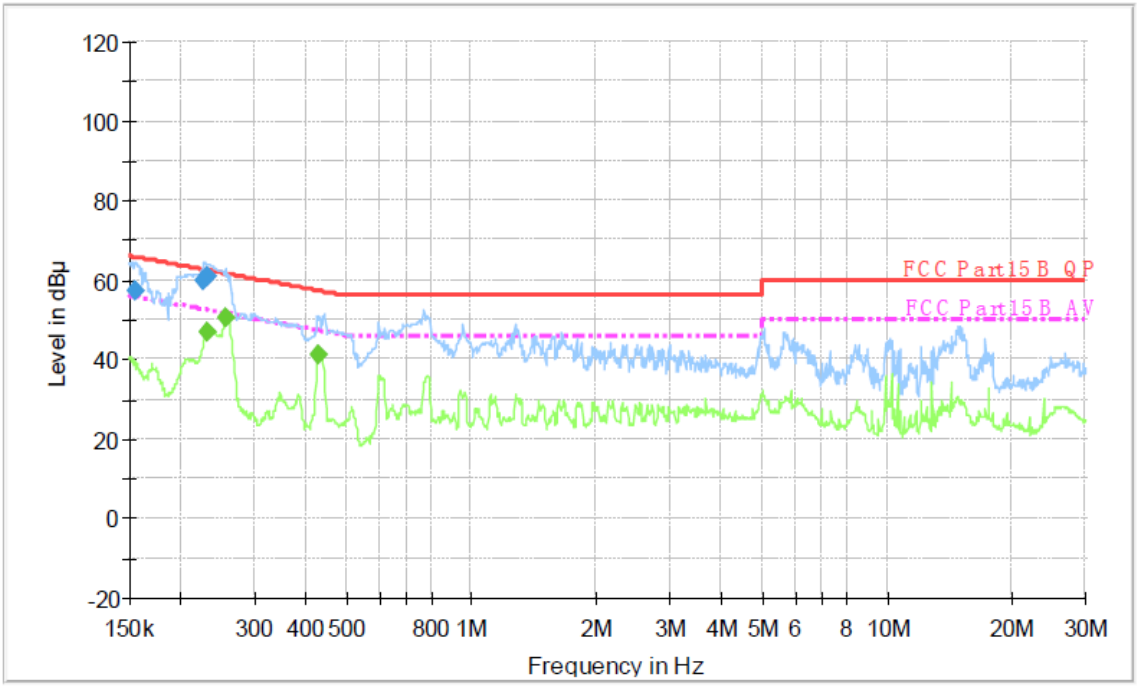
Test Procedure

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



Final Measurement Detector 1

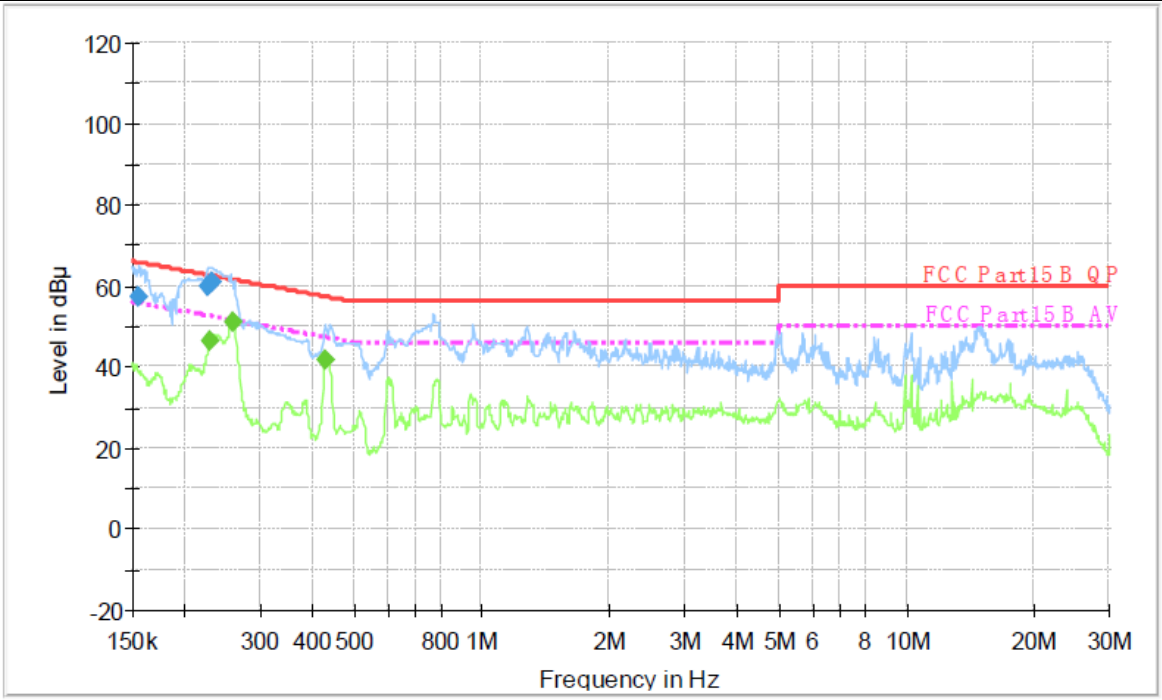
Frequency (MHz)	QuasiPeak (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.154870	57.0	1000.00	9.000	On	L1	9.7	8.7	65.7	
0.227190	59.9	1000.00	9.000	On	L1	9.7	2.7	62.6	
0.231770	60.7	1000.00	9.000	On	L1	9.7	1.8	62.4	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.230850	47.0	1000.00	9.000	On	L1	9.7	5.4	52.4	
0.257120	50.4	1000.00	9.000	On	L1	9.7	1.1	51.5	
0.430320	41.1	1000.00	9.000	On	L1	9.7	6.1	47.2	

Emission Level= Read Level+ Correct Factor

Test Voltage:	AC 120V/60 Hz
Terminal:	Neutral



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.155490	57.3	1000.00	9.000	On	N	10.0	8.4	65.7	
0.227190	60.1	1000.00	9.000	On	N	10.0	2.5	62.6	
0.231770	60.8	1000.00	9.000	On	N	10.0	1.6	62.4	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.229930	46.4	1000.00	9.000	On	N	10.0	6.1	52.5	
0.258150	50.9	1000.00	9.000	On	N	10.0	0.6	51.5	
0.430320	41.6	1000.00	9.000	On	N	10.0	5.6	47.2	

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

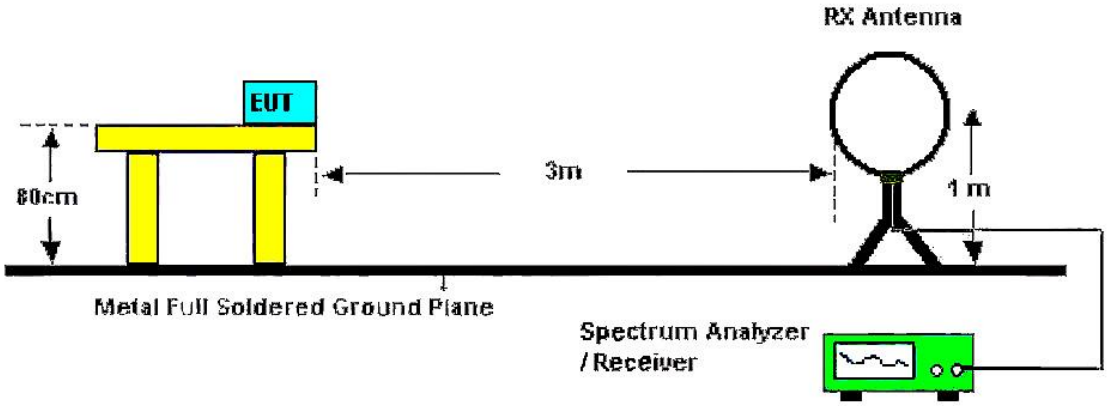
Frequency (MHz)	dB(uV/m) (at 3 meters)	
	Peak	Average
Above 1000	74	54

Note:

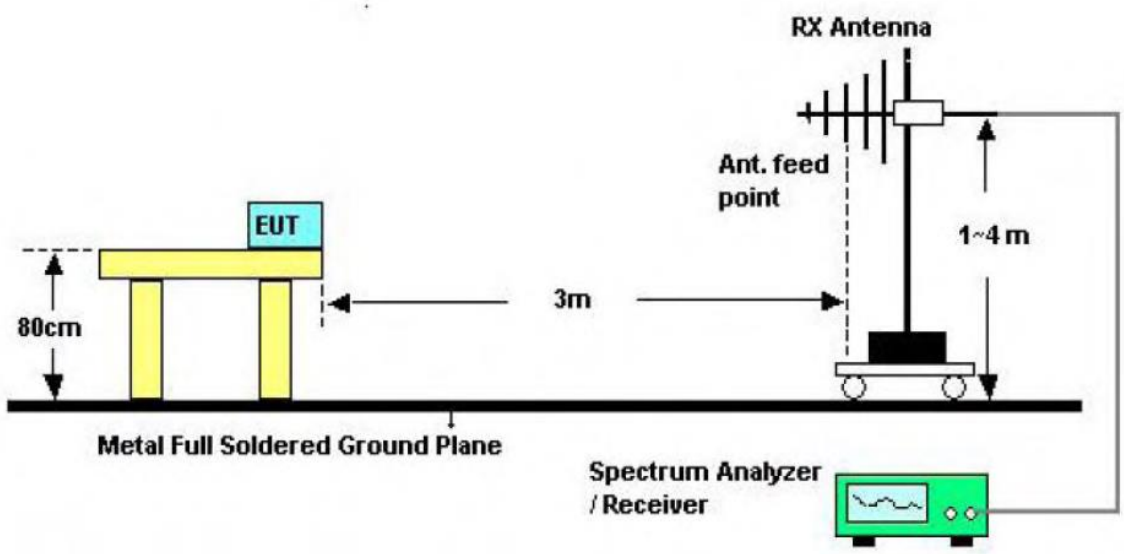
(1) The tighter limit applies at the band edges.

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

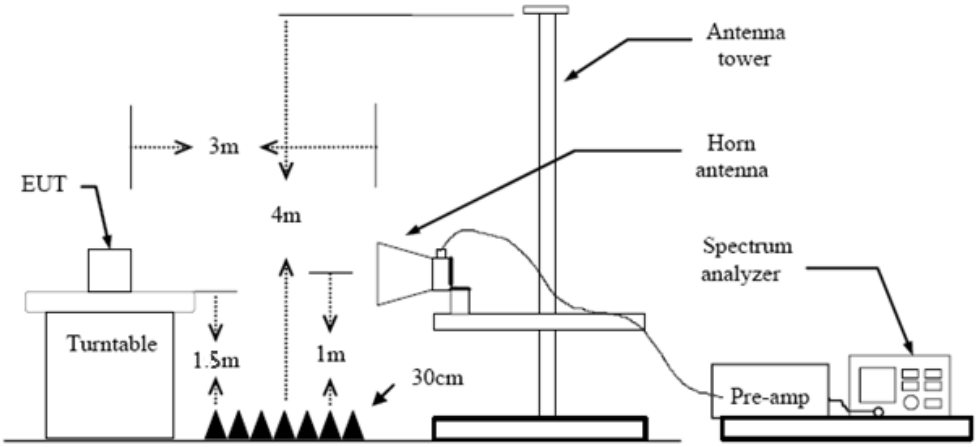
Test Configuration



Below 30MHz Test Setup



Below 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 3.8 Duty Cycle.

Test Mode

Please refer to the clause 2.4.

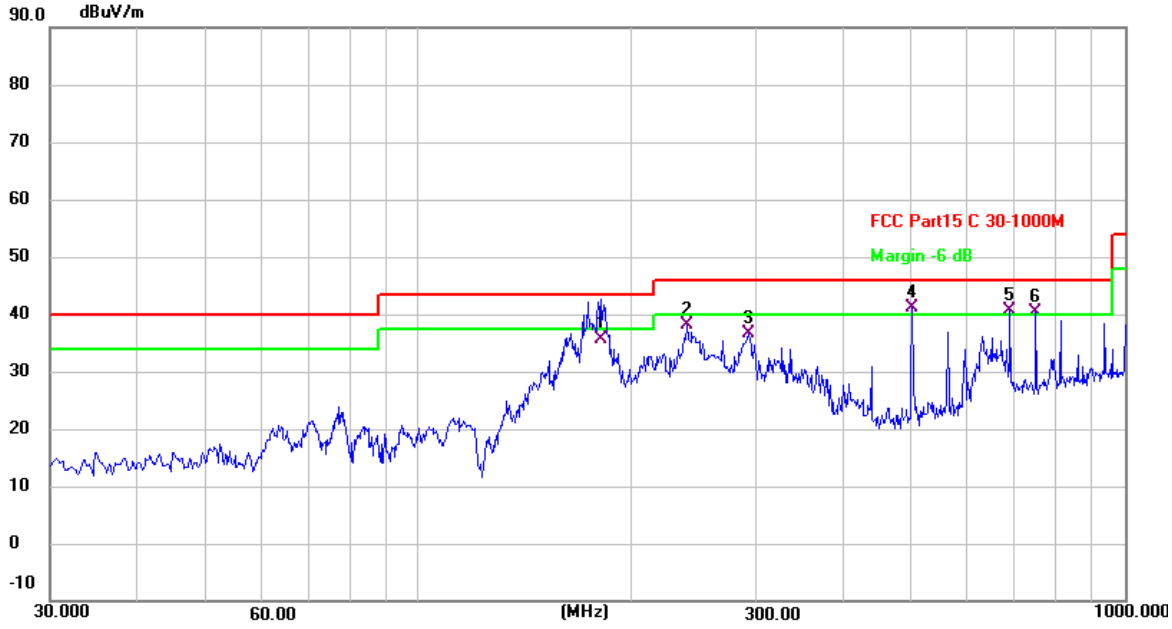
Test Result

9 KHz~30 MHz

From 9 KHz to 30 MHz: 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

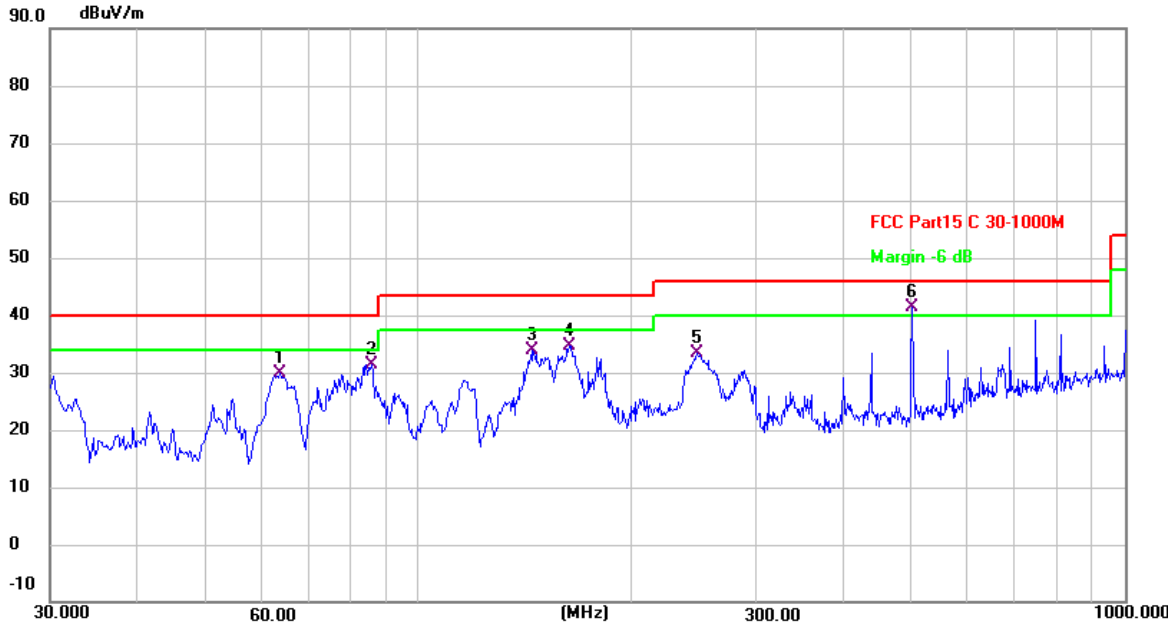
Ant. Pol.	Horizontal
Test Mode:	Ant 1 802.11b Mode 2412MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	181.6433	53.44	-17.88	35.56	43.50	-7.94	QP
2	240.1667	53.16	-14.93	38.23	46.00	-7.77	QP
3	293.5167	50.30	-13.68	36.62	46.00	-9.38	QP
4 *	500.1267	50.39	-9.19	41.20	46.00	-4.80	QP
5 !	687.6599	46.31	-5.68	40.63	46.00	-5.37	QP
6 !	750.0633	45.18	-4.82	40.36	46.00	-5.64	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:	Ant 1 802.11b 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	63.6267	46.81	-16.84	29.97	40.00	-10.03	QP
2	85.6133	50.53	-19.05	31.48	40.00	-8.52	QP
3	144.7833	53.61	-19.80	33.81	43.50	-9.69	QP
4	163.2133	53.75	-19.02	34.73	43.50	-8.77	QP
5	247.9267	48.01	-14.70	33.31	46.00	-12.69	QP
6 *	500.1267	50.52	-9.19	41.33	46.00	-4.67	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.:	Ant 1
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 *	4823.985	27.23	2.20	29.43	54.00	-24.57	AVG
2	4824.005	40.38	2.20	42.58	74.00	-31.42	peak

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

Ant No.:	Ant 1
Ant. 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 *	4823.969	33.40	2.20	35.60	54.00	-18.40	AVG
2	4823.970	43.24	2.20	45.44	74.00	-28.56	peak

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

Ant No.:	Ant 1
Ant. 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	4873.797	40.17	2.30	42.47	74.00	-31.53	peak
2 *	4873.847	26.50	2.30	28.80	54.00	-25.20	AVG

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

Ant No.:	Ant 1
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	4873.934	42.64	2.30	44.94	74.00	-29.06	peak
2 *	4873.983	34.47	2.30	36.77	54.00	-17.23	AVG

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

Ant No.:	Ant 1
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 *	4923.991	30.63	2.41	33.04	54.00	-20.96	AVG
2	4924.225	41.47	2.41	43.88	74.00	-30.12	peak

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

Ant No.:	Ant 1
Ant. 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 *	4923.998	39.32	2.41	41.73	54.00	-12.27	AVG
2	4924.101	44.63	2.41	47.04	74.00	-26.96	peak

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

Ant No.:	Ant 1
Ant. 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 *	4823.995	24.53	2.20	26.73	54.00	-27.27	AVG
2	4824.286	39.49	2.20	41.69	74.00	-32.31	peak

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

Ant No.:	Ant 1
Ant. 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 *	4824.140	25.69	2.20	27.89	54.00	-26.11	AVG
2	4824.158	41.25	2.20	43.45	74.00	-30.55	peak

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

Ant No.:	Ant 1
Ant. 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 *	4874.149	23.93	2.30	26.23	54.00	-27.77	AVG
2	4874.461	39.60	2.30	41.90	74.00	-32.10	peak

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

Ant No.:	Ant 1
Ant. 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 *	4873.736	25.61	2.30	27.91	54.00	-26.09	AVG
2	4873.750	39.86	2.30	42.16	74.00	-31.84	peak

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

Ant No.:	Ant 1
Ant. 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 *	4923.489	24.04	2.41	26.45	54.00	-27.55	AVG
2	4924.075	39.14	2.41	41.55	74.00	-32.45	peak

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

Ant No.:	Ant 1
Ant. 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 *	4923.608	26.78	2.41	29.19	54.00	-24.81	AVG
2	4923.943	41.00	2.41	43.41	74.00	-30.59	peak

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

Ant No.:	Ant 1 + Ant 2
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	4823.723	40.28	2.20	42.48	74.00	-31.52	peak
2 *	4824.307	25.43	2.20	27.63	54.00	-26.37	AVG

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

Ant No.:	Ant 1 + Ant 2
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 *	4823.899	27.74	2.20	29.94	54.00	-24.06	AVG
2	4823.944	42.09	2.20	44.29	74.00	-29.71	peak

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

Ant No.:	Ant 1 + Ant 2
Ant. Pol.	Horizontal
Test Mode:	TX 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 *	4873.292	24.52	2.30	26.82	54.00	-27.18	AVG
2	4874.526	39.22	2.30	41.52	74.00	-32.48	peak

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

Ant No.:	Ant 1 + Ant 2
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 *	4874.175	26.00	2.30	28.30	54.00	-25.70	AVG
2	4874.491	40.42	2.30	42.72	74.00	-31.28	peak

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

Ant No.:	Ant 1 + Ant 2
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 *	4923.707	24.57	2.41	26.98	54.00	-27.02	AVG
2	4924.084	39.72	2.41	42.13	74.00	-31.87	peak

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

Ant No.:	Ant 1 + Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 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	4923.959	42.63	2.41	45.04	74.00	-28.96	peak
2 *	4924.388	28.37	2.41	30.78	54.00	-23.22	AVG

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

Ant No.:	Ant 1 + Ant 2
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 *	4843.844	24.53	2.24	26.77	54.00	-27.23	AVG
2	4844.333	39.76	2.24	42.00	74.00	-32.00	peak

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

Ant No.:	Ant 1 + Ant 2
Ant. Pol.	Vertical
Test Mode:	TX 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	4843.631	41.04	2.24	43.28	74.00	-30.72	peak
2 *	4843.771	25.41	2.24	27.65	54.00	-26.35	AVG

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

Ant No.:	Ant 1 + Ant 2
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	4873.553	40.61	2.30	42.91	74.00	-31.09	peak
2 *	4873.983	24.77	2.30	27.07	54.00	-26.93	AVG

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

Ant No.:	Ant 1 + Ant 2
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	4873.901	39.74	2.30	42.04	74.00	-31.96	peak
2 *	4874.324	24.41	2.30	26.71	54.00	-27.29	AVG

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

Ant No.:	Ant 1 + Ant 2
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	4904.445	39.87	2.36	42.23	74.00	-31.77	peak
2 *	4904.576	24.74	2.36	27.10	54.00	-26.90	AVG

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

Ant No.:	Ant 1 + Ant 2
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	4903.769	41.44	2.36	43.80	74.00	-30.20	peak
2 *	4903.892	25.30	2.36	27.66	54.00	-26.34	AVG

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

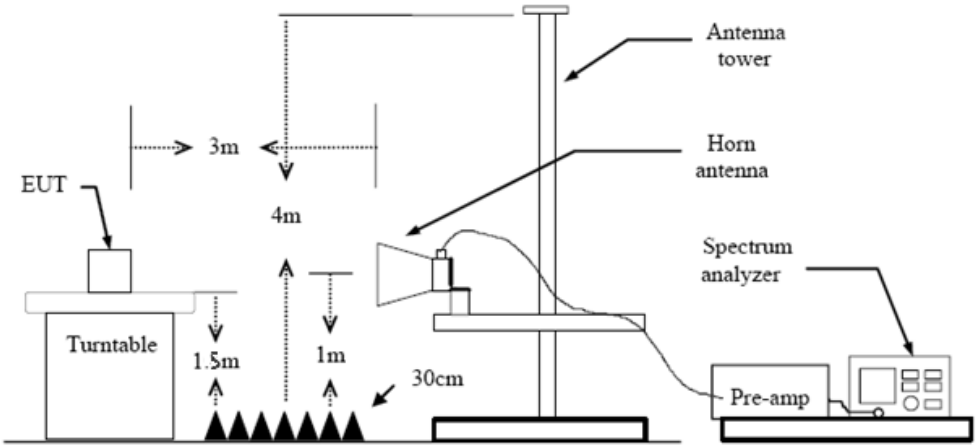
3.3. Band Edge Emissions (Radiated)

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

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 3.7 Duty Cycle.

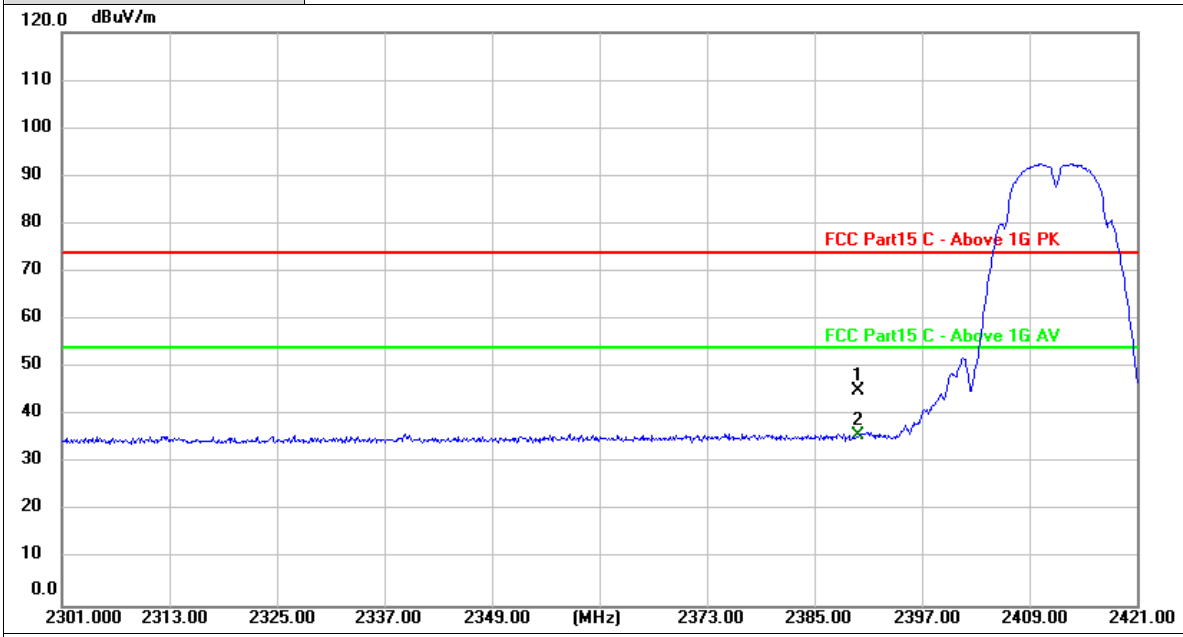
Test Mode

Please refer to the clause 2.4.

Test Results

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

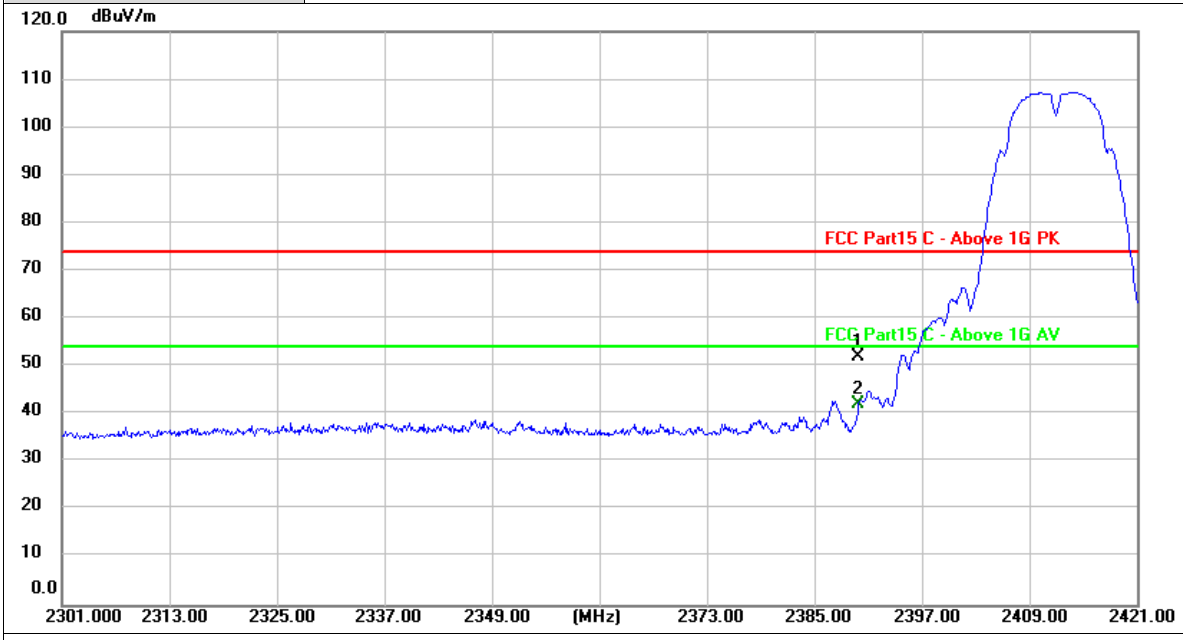
Ant No.:	Ant 1
Ant. Pol.	Horizontal
Test Mode:	B Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	14.19	30.84	45.03	74.00	-28.97	peak
2 *	2390.000	5.03	30.84	35.87	54.00	-18.13	AVG

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

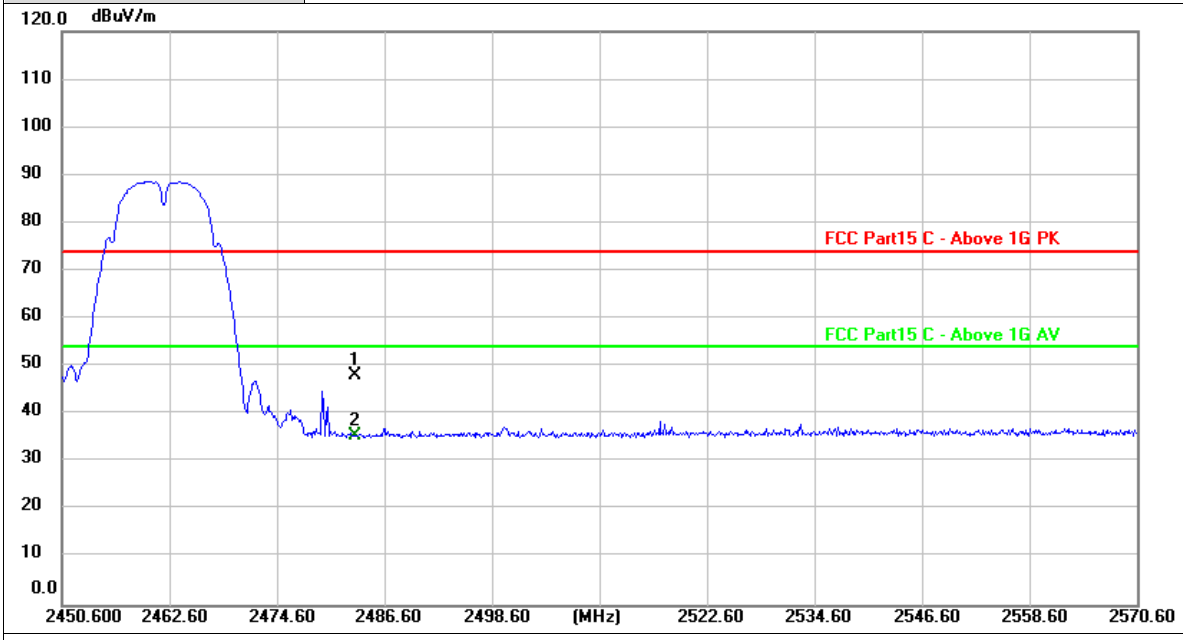
Ant No.:	Ant 1
Ant. Pol.	Vertical
Test Mode:	B Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	21.26	30.84	52.10	74.00	-21.90	peak
2 *	2390.000	11.22	30.84	42.06	54.00	-11.94	AVG

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

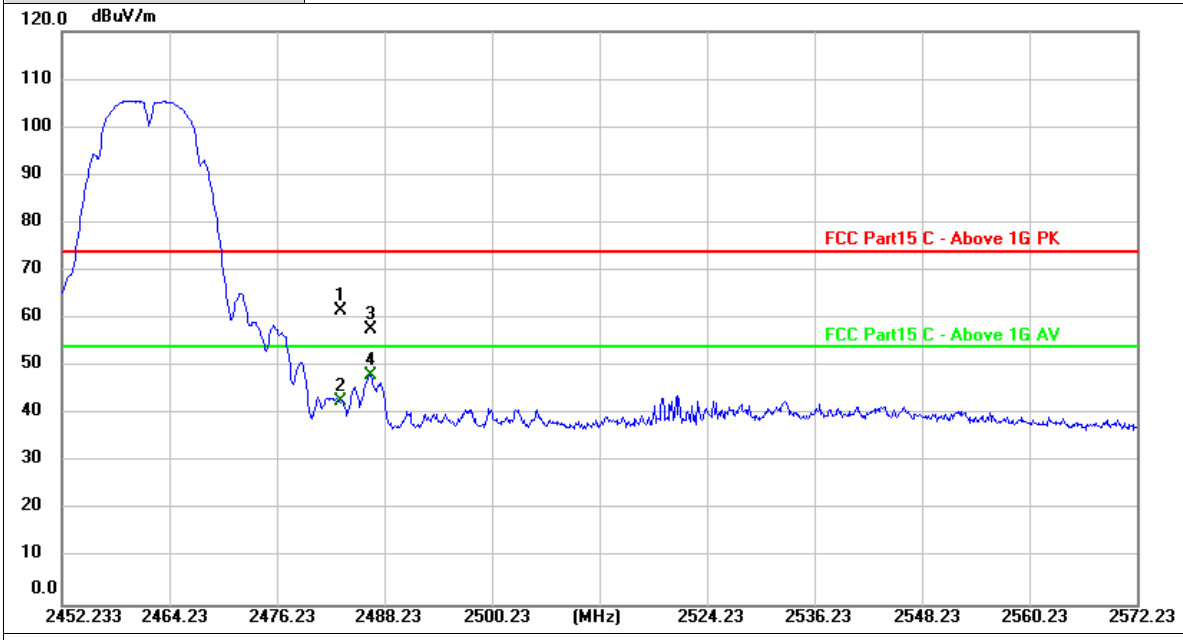
Ant No.:	Ant 1
Ant. Pol.	Horizontal
Test Mode:	B Mode 2462 MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	16.80	31.24	48.04	74.00	-25.96	peak
2 *	2483.500	4.31	31.24	35.55	54.00	-18.45	AVG

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

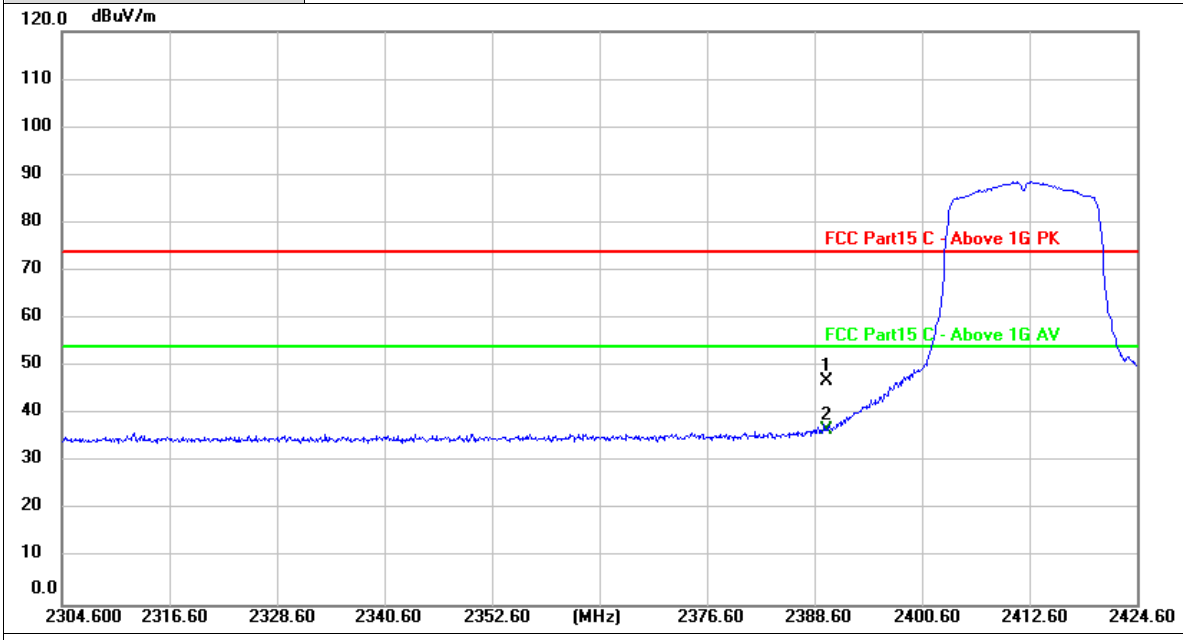
Ant No.:	Ant 1
Ant. Pol.	Vertical
Test Mode:	B Mode 2462 MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	30.41	31.24	61.65	74.00	-12.35	peak
2	2483.500	11.61	31.24	42.85	54.00	-11.15	AVG
3	2486.673	26.41	31.25	57.66	74.00	-16.34	peak
4 *	2486.673	17.04	31.25	48.29	54.00	-5.71	AVG

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

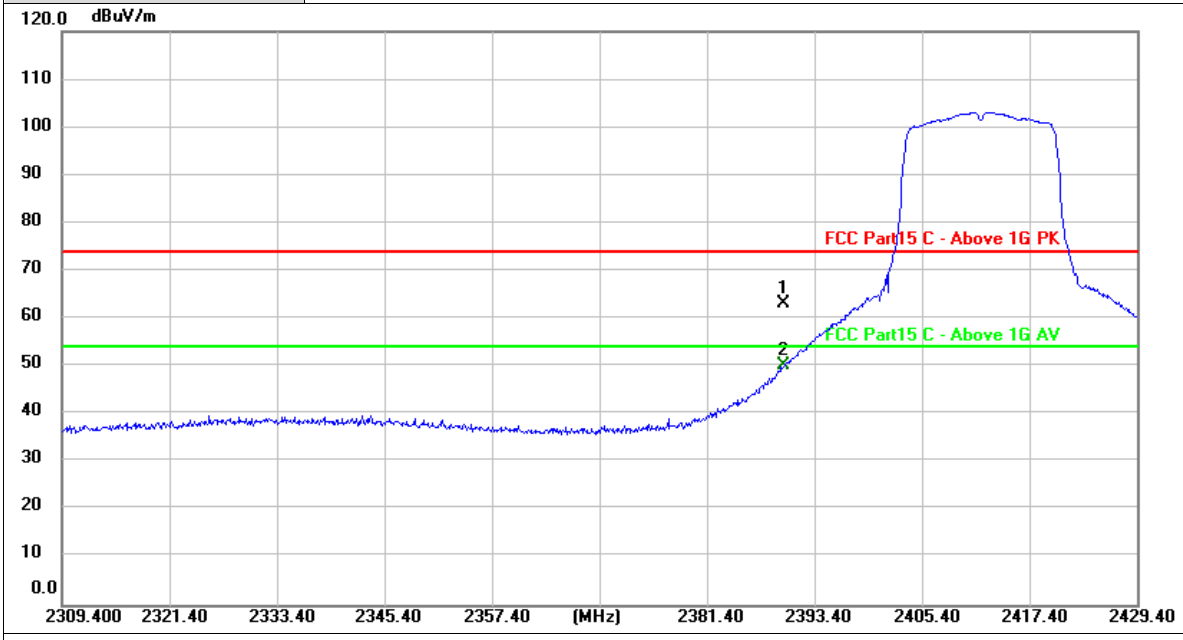
Ant No.:	Ant 1
Ant. Pol.	Horizontal
Test Mode:	G Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	16.17	30.84	47.01	74.00	-26.99	peak
2 *	2390.000	6.00	30.84	36.84	54.00	-17.16	AVG

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

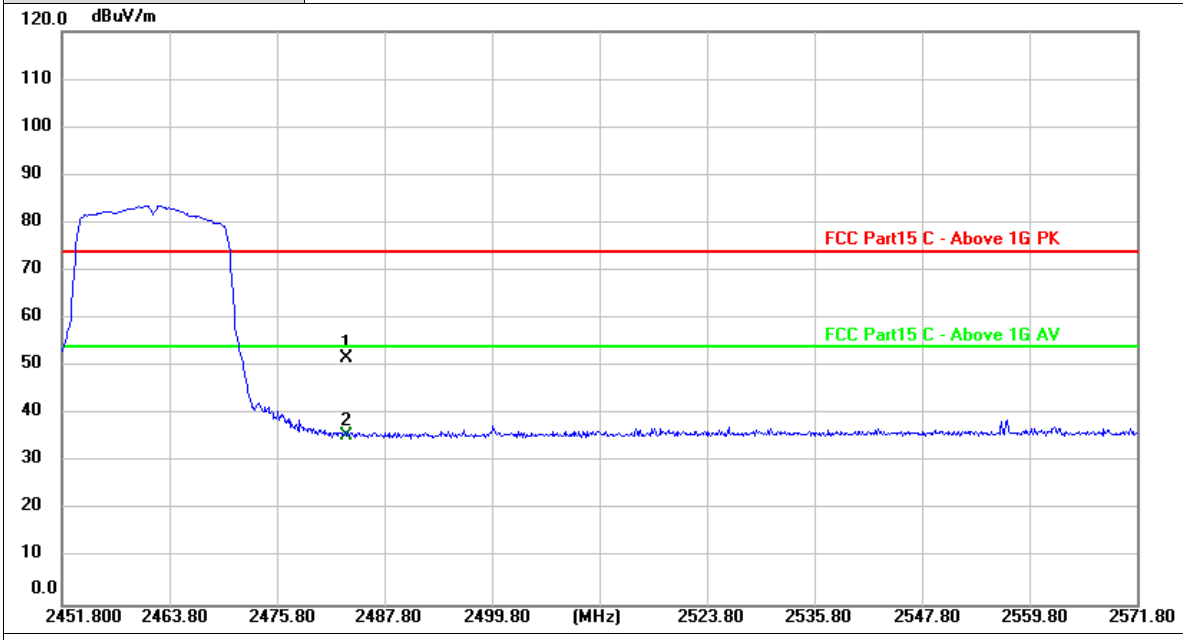
Ant No.:	Ant 1
Ant. Pol.	Vertical
Test Mode:	G Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	32.28	30.84	63.12	74.00	-10.88	peak
2 *	2390.000	19.47	30.84	50.31	54.00	-3.69	AVG

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

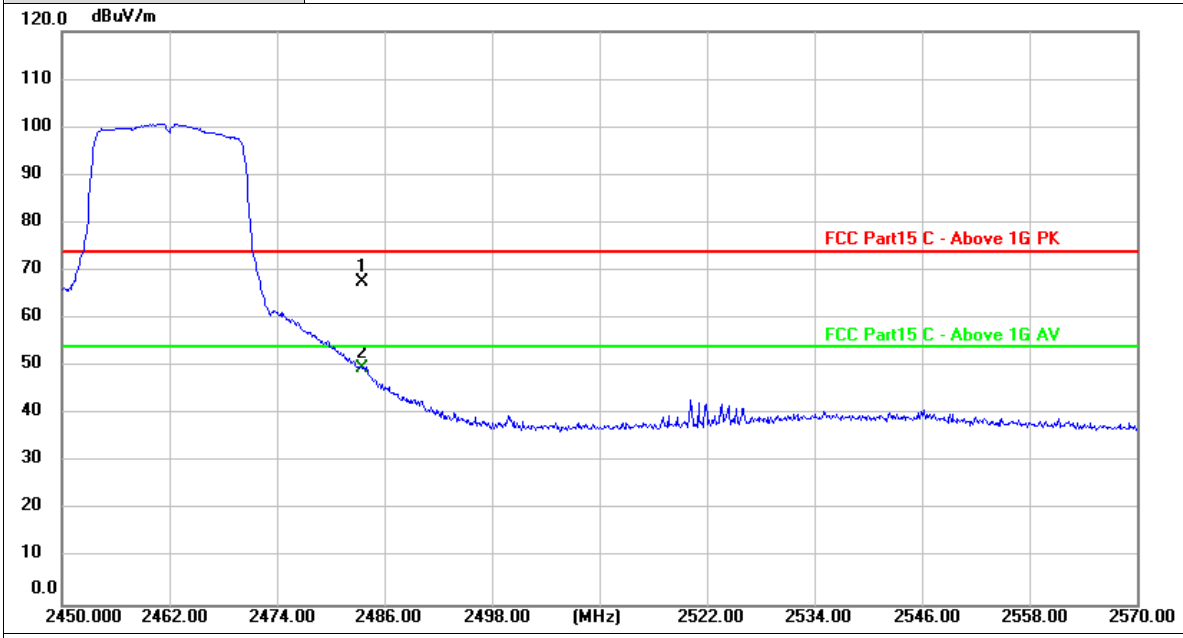
Ant No.:	Ant 1
Ant. Pol.	Horizontal
Test Mode:	G Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	20.46	31.24	51.70	74.00	-22.30	peak
2 *	2483.500	4.40	31.24	35.64	54.00	-18.36	AVG

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

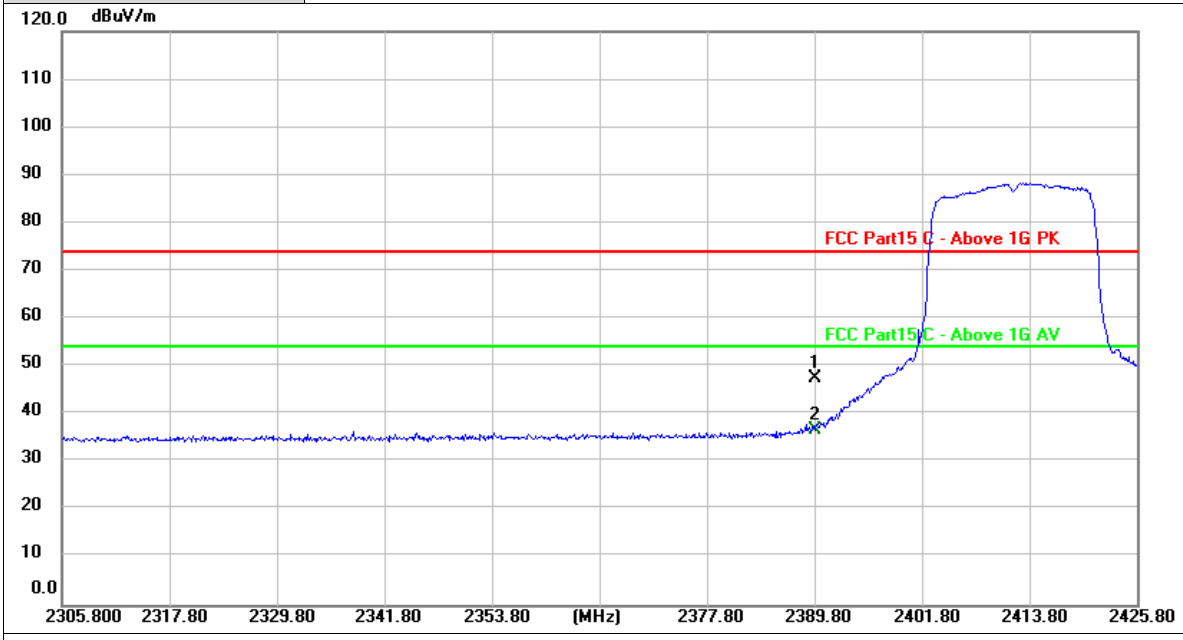
Ant No.:	Ant 1
Ant. Pol.	Vertical
Test Mode:	G Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	36.55	31.24	67.79	74.00	-6.21	peak
2 *	2483.500	18.40	31.24	49.64	54.00	-4.36	AVG

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

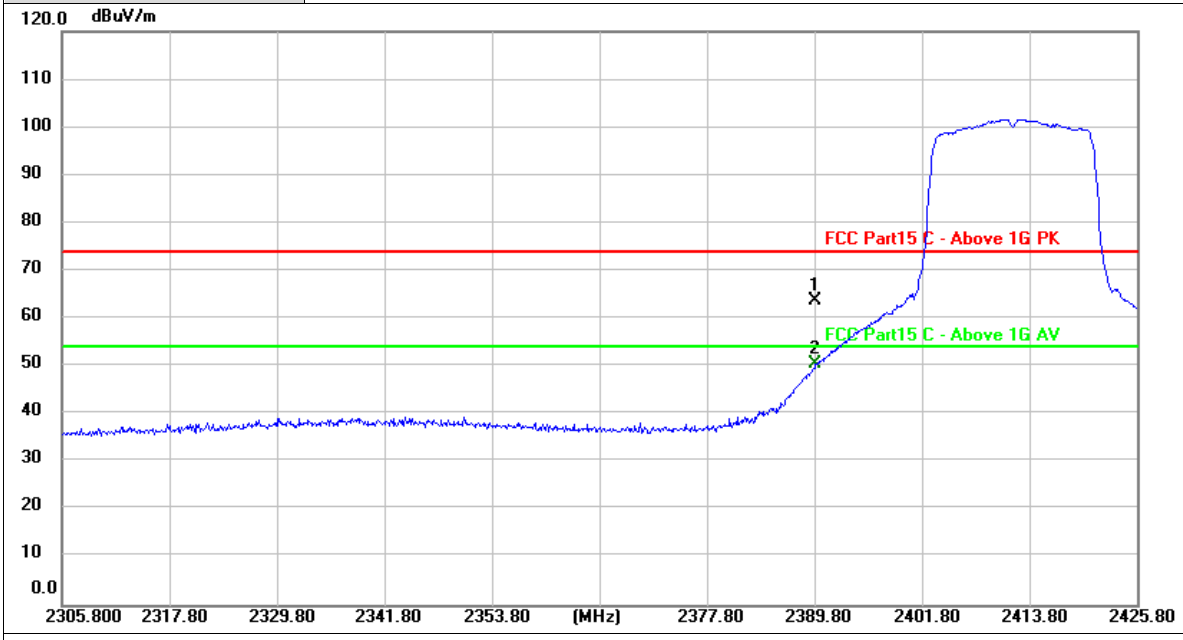
Ant No.:	Ant 1 + Ant 2
Ant. Pol.	Horizontal
Test Mode:	N(HT20) Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	16.80	30.84	47.64	74.00	-26.36	peak
2 *	2390.000	5.92	30.84	36.76	54.00	-17.24	AVG

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

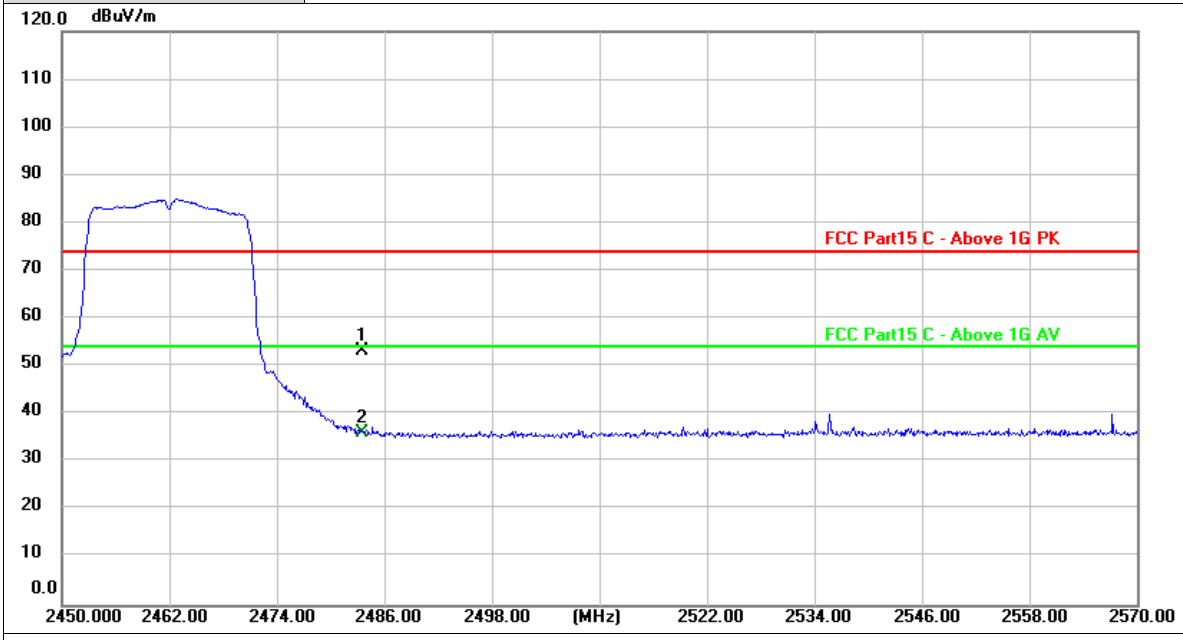
Ant No.:	Ant 1 + Ant 2
Ant. Pol.	Vertical
Test Mode:	N(HT20) Mode 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	33.06	30.84	63.90	74.00	-10.10	peak
2 *	2390.000	19.72	30.84	50.56	54.00	-3.44	AVG

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

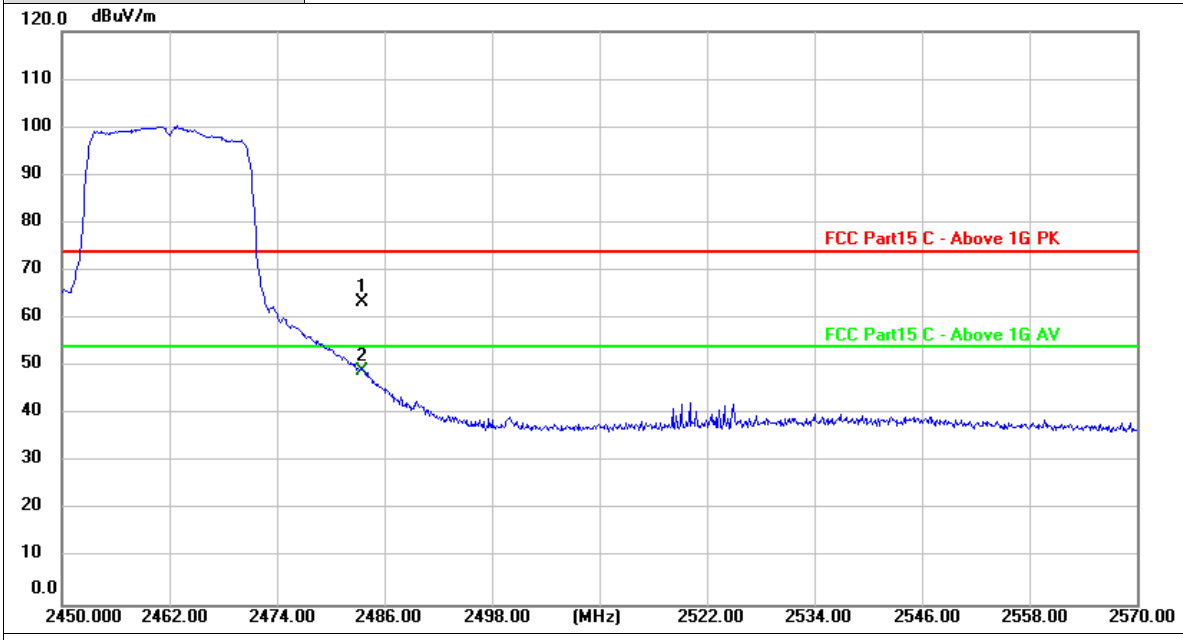
Ant No.:	Ant 1 + Ant 2
Ant. Pol.	Horizontal
Test Mode:	N(HT20) Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	22.10	31.24	53.34	74.00	-20.66	peak
2 *	2483.500	4.85	31.24	36.09	54.00	-17.91	AVG

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

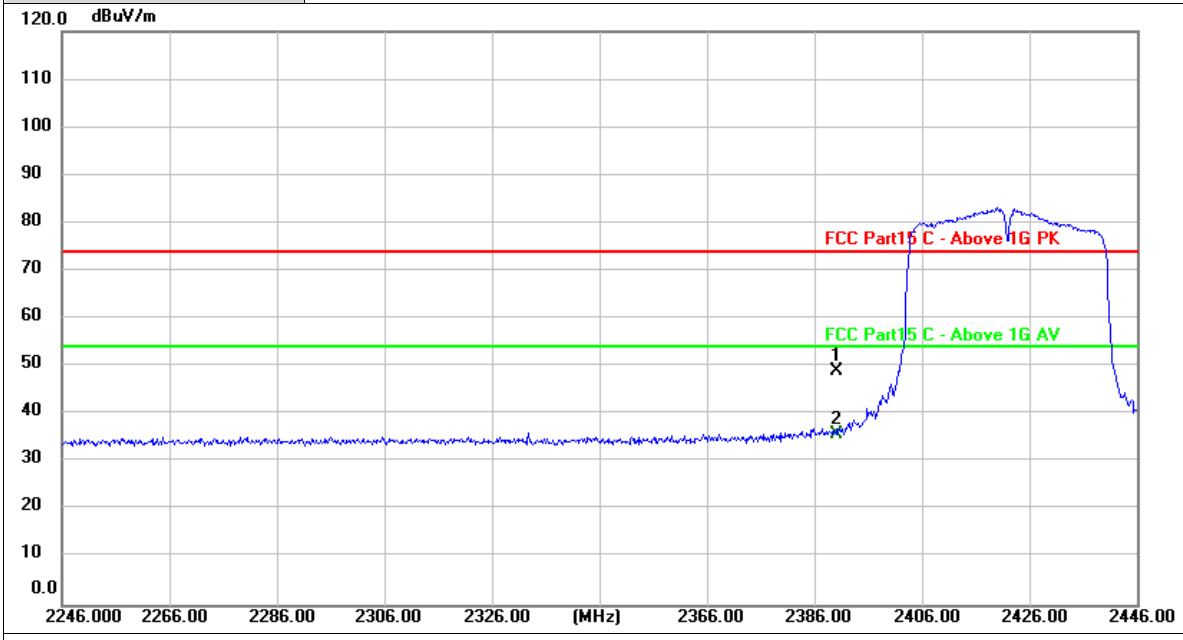
Ant No.:	Ant 1 + Ant 2
Ant. Pol.	Vertical
Test Mode:	N(HT20) Mode 2462MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	32.25	31.24	63.49	74.00	-10.51	peak
2 *	2483.500	17.79	31.24	49.03	54.00	-4.97	AVG

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

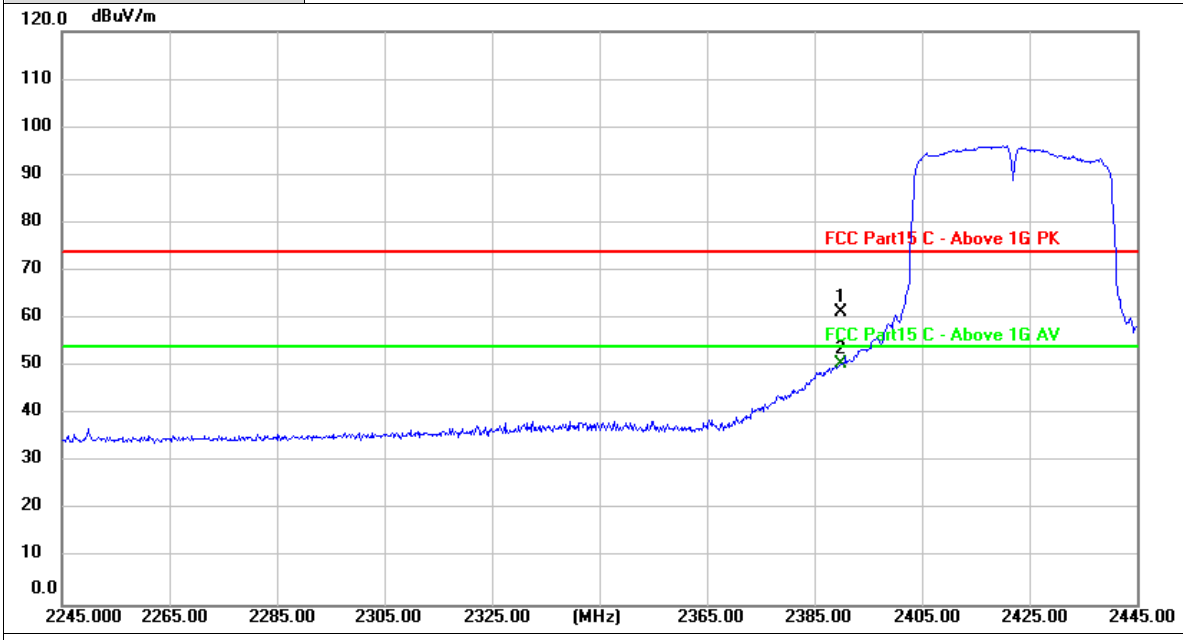
Ant No.:	Ant 1 + Ant 2
Ant. Pol.	Horizontal
Test Mode:	N(HT40) Mode 2422MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	18.15	30.84	48.99	74.00	-25.01	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

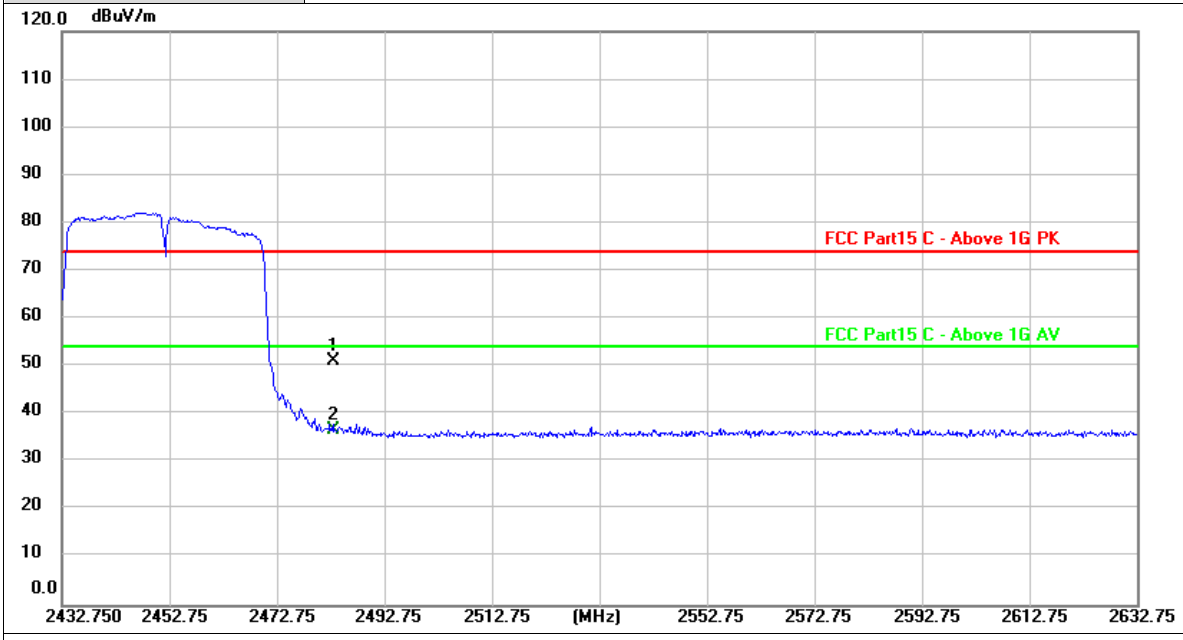
Ant No.:	Ant 1 + Ant 2
Ant. Pol.	Vertical
Test Mode:	N(HT40) Mode 2422MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	30.40	30.84	61.24	74.00	-12.76	peak
2 *	2390.000	19.69	30.84	50.53	54.00	-3.47	AVG

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

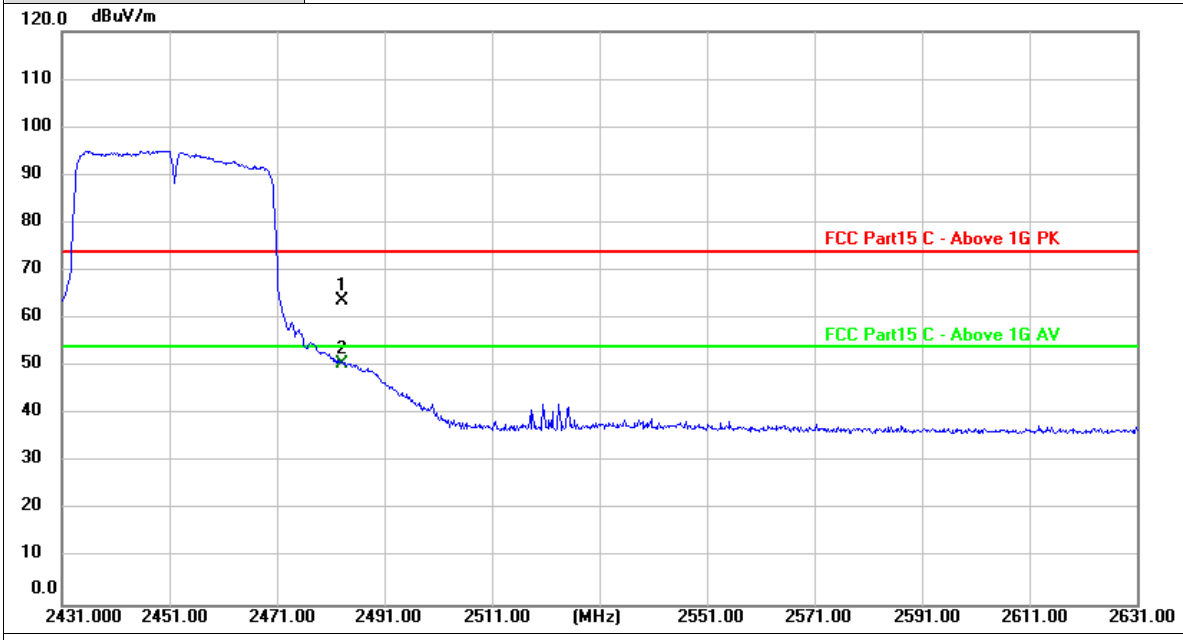
Ant No.:	Ant 1 + Ant 2
Ant. Pol.	Horizontal
Test Mode:	N(HT40) Mode 2452MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	20.03	31.24	51.27	74.00	-22.73	peak
2 *	2483.500	5.47	31.24	36.71	54.00	-17.29	AVG

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

Ant No.:	Ant 1 + Ant 2
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	32.55	31.24	63.79	74.00	-10.21	peak
2 *	2483.500	19.29	31.24	50.53	54.00	-3.47	AVG

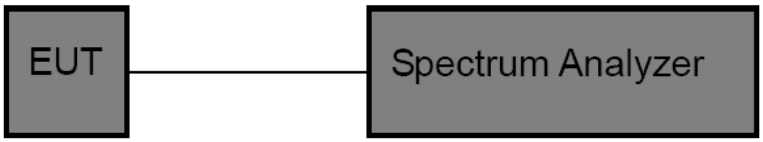
Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

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

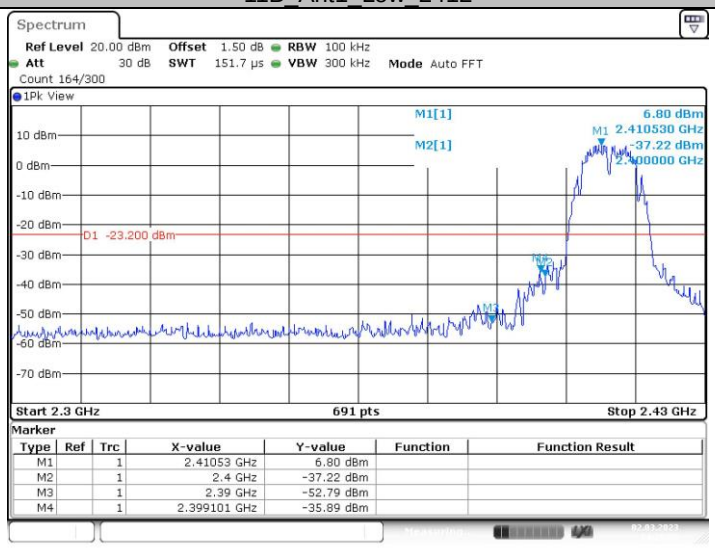
Please refer to the clause 2.4.

Test Results

(1) Band edge Conducted Test

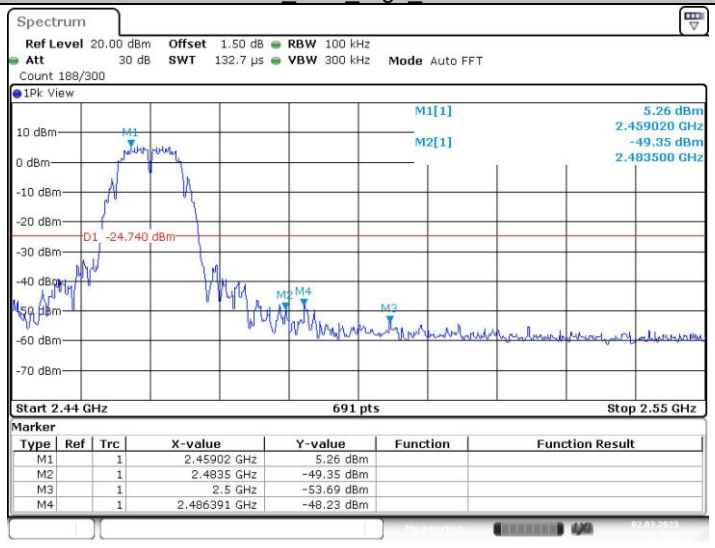
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	6.80	-35.89	≤-23.2	PASS
	Ant2	Low	2412	6.07	-34	≤-23.93	PASS
	Ant1	High	2462	5.26	-48.23	≤-24.74	PASS
	Ant2	High	2462	7.49	-51.02	≤-22.51	PASS
11G	Ant1	Low	2412	5.12	-28.81	≤-24.88	PASS
	Ant2	Low	2412	3.99	-27.17	≤-26.01	PASS
	Ant1	High	2462	4.82	-43.24	≤-25.18	PASS
	Ant2	High	2462	0.70	-44.63	≤-29.3	PASS
11N20MIMO	Ant1	Low	2412	1.57	-33.65	≤-28.43	PASS
	Ant2	Low	2412	1.66	-33.3	≤-28.34	PASS
	Ant1	High	2462	1.44	-49.27	≤-28.56	PASS
	Ant2	High	2462	1.70	-45.1	≤-28.3	PASS
11N40MIMO	Ant1	Low	2422	-2.84	-35.61	≤-32.84	PASS
	Ant2	Low	2422	-3.85	-34.41	≤-33.85	PASS
	Ant1	High	2452	-1.86	-46.18	≤-31.86	PASS
	Ant2	High	2452	-2.04	-40.36	≤-32.04	PASS

11B_Ant1_Low_2412

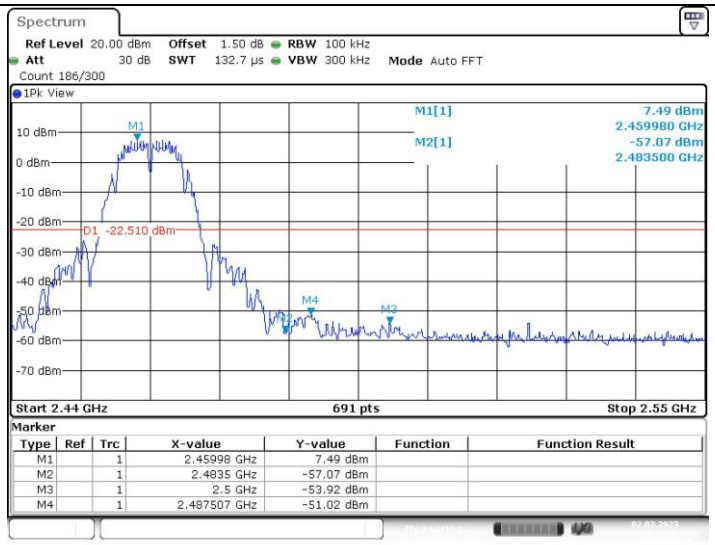


11B_Ant2_Low_2412

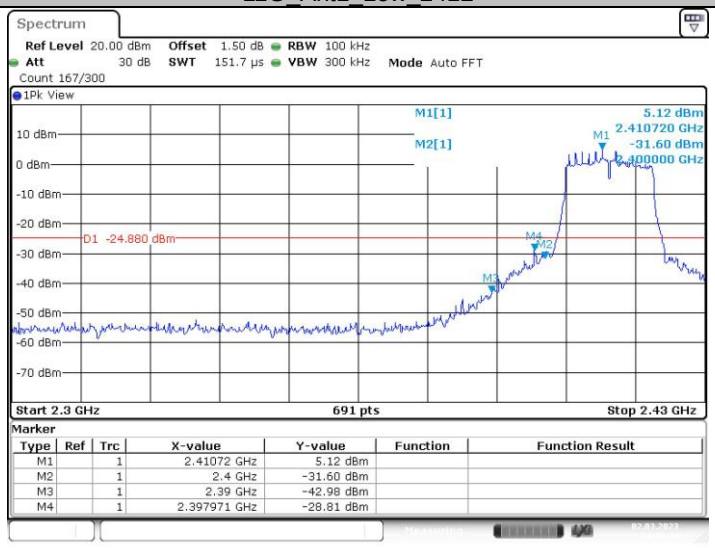
11B_Ant1_High_2462



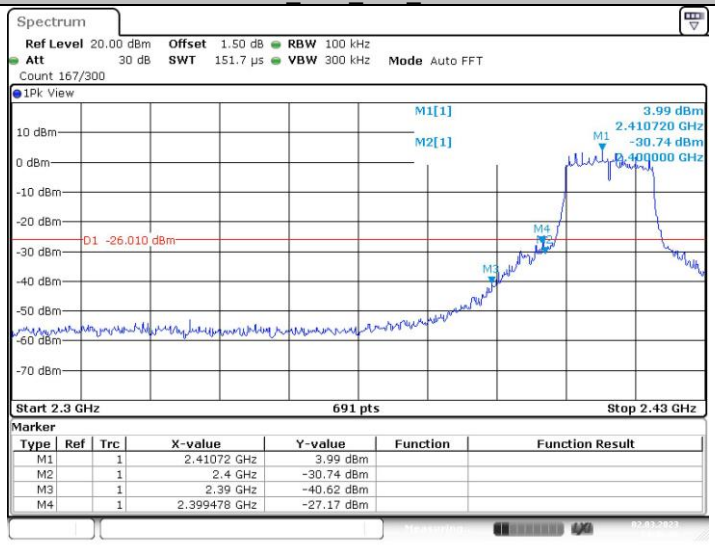
11B_Ant2_High_2462



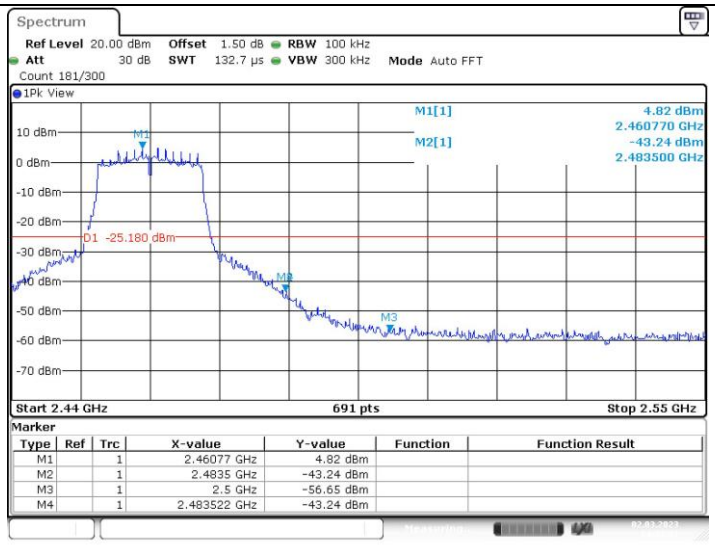
11G_Ant1_Low_2412



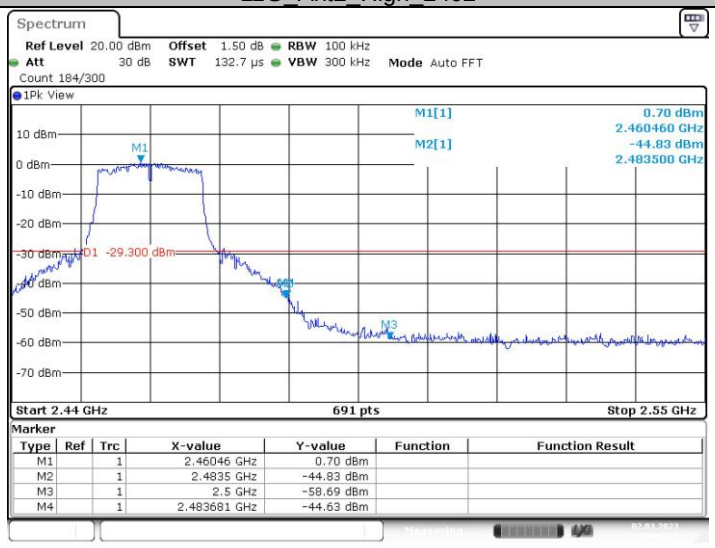
11G_Ant2_Low_2412



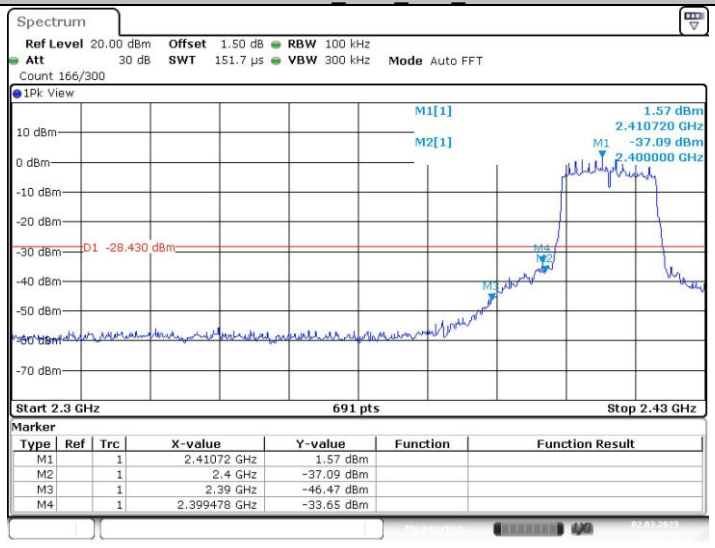
11G_Ant1_High_2462



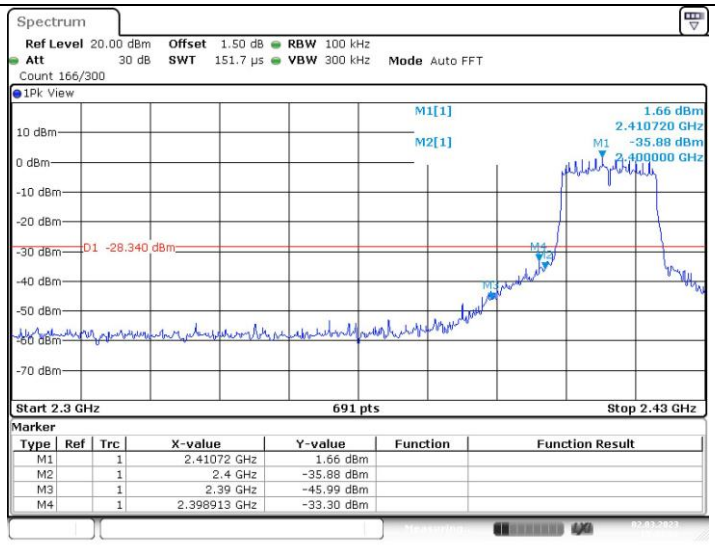
11G_Ant2_High_2462



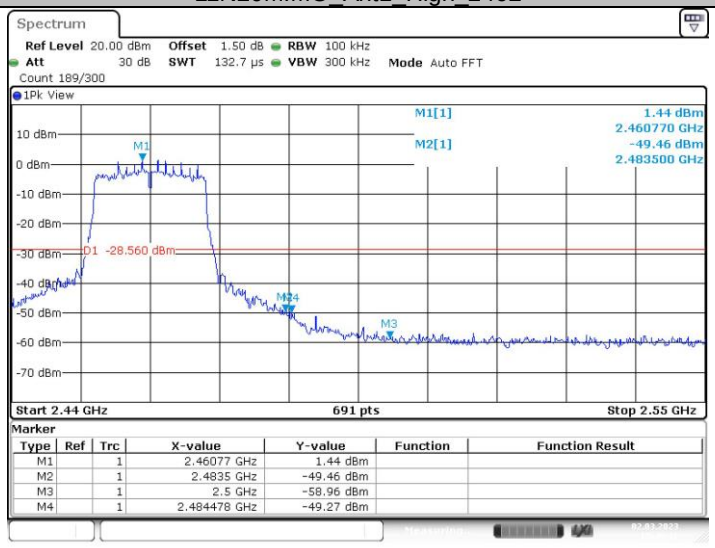
11N20MIMO_Ant1_Low_2412



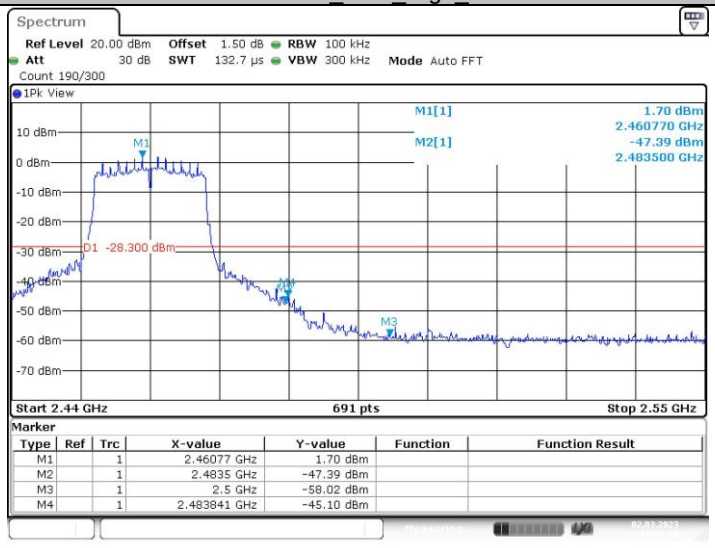
11N20MIMO_Ant2_Low_2412



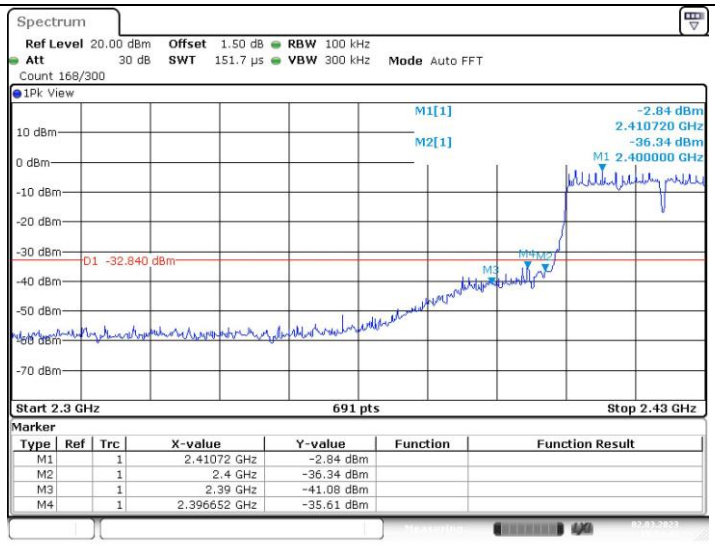
11N20MIMO_Ant1_High_2462



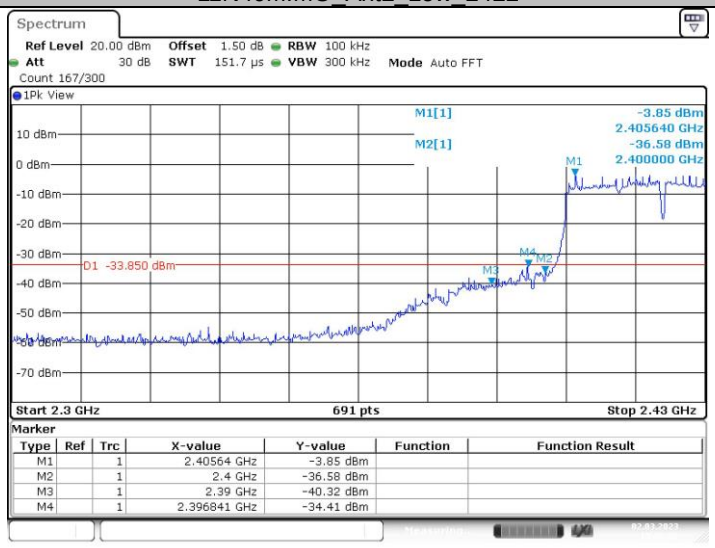
11N20MIMO_Ant2_High_2462



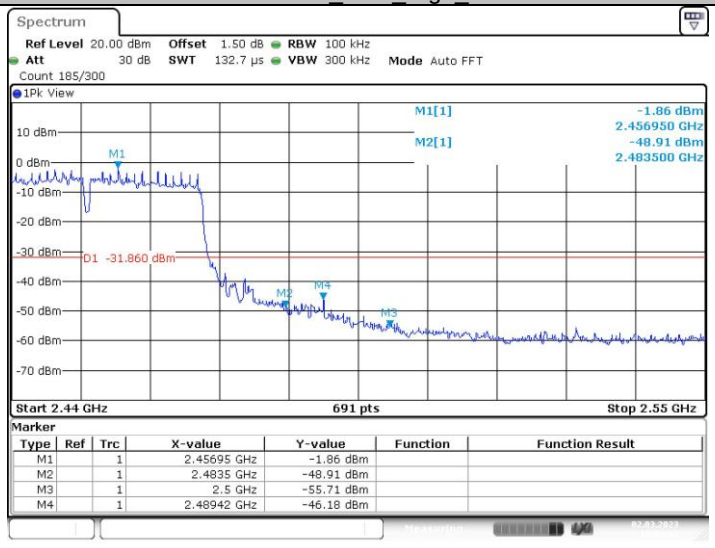
11N40MIMO_Ant1_Low_2422



11N40MIMO_Ant2_Low_2422



11N40MIMO_Ant1_High_2452



11N40MIMO_Ant2_High_2452

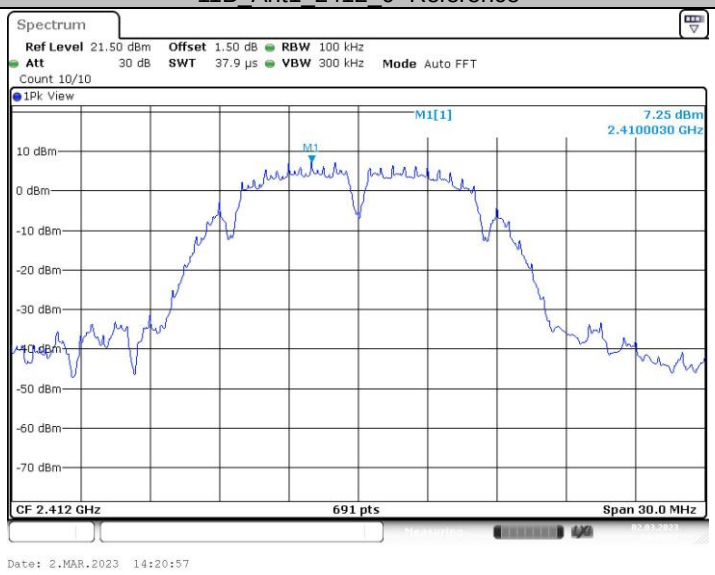

Spectrum
Ref Level 20.00 dBm Offset 1.50 dB RBW 100 kHz
Att 30 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
Count 184/300
1Pk View
M1[1] -2.04 dBm
2.446920 GHz
M2[1] -42.64 dBm
2.483500 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
D1 -32.040 dBm
Start 2.44 GHz
691 pts
Stop 2.55 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.44692 GHz -2.04 dBm
M2 1 2.4835 GHz -42.64 dBm
M3 1 2.5 GHz -52.34 dBm
M4 1 2.488304 GHz -40.36 dBm
Date: 2.MAR.2023 16:06:24

(2) Conducted Spurious Emissions Test

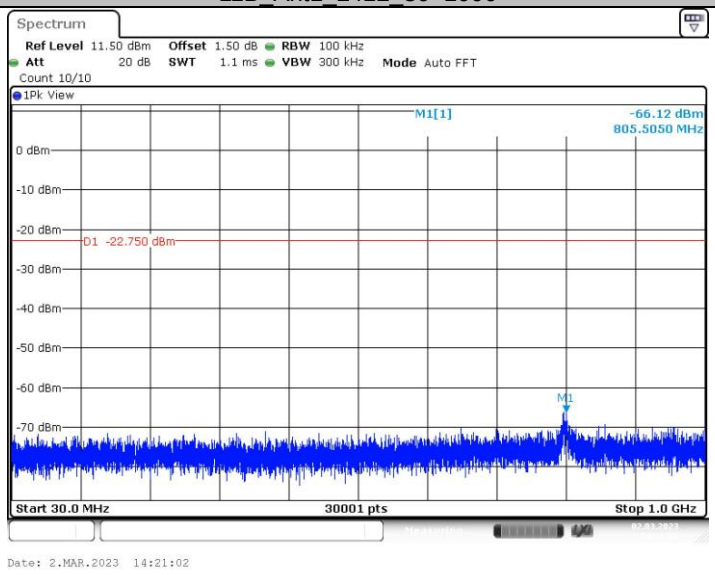
TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	7.25	7.25	---	PASS
			30~1000	7.25	-66.12	≤-22.75	PASS
			1000~26500	7.25	-40.01	≤-22.75	PASS
	Ant2	2412	Reference	7.32	7.32	---	PASS
			30~1000	7.32	-61.41	≤-22.68	PASS
			1000~26500	7.32	-41.46	≤-22.68	PASS
	Ant1	2437	Reference	7.14	7.14	---	PASS
			30~1000	7.14	-64.32	≤-22.86	PASS
			1000~26500	7.14	-40.01	≤-22.86	PASS
	Ant2	2437	Reference	7.43	7.43	---	PASS
			30~1000	7.43	-60.48	≤-22.57	PASS
			1000~26500	7.43	-41.08	≤-22.57	PASS
	Ant1	2462	Reference	6.82	6.82	---	PASS
			30~1000	6.82	-63.51	≤-23.18	PASS
			1000~26500	6.82	-40.99	≤-23.18	PASS
	Ant2	2462	Reference	7.23	7.23	---	PASS
			30~1000	7.23	-62.24	≤-22.77	PASS
			1000~26500	7.23	-41.32	≤-22.77	PASS
11G	Ant1	2412	Reference	3.28	3.28	---	PASS
			30~1000	3.28	-68.28	≤-26.72	PASS
			1000~26500	3.28	-40.94	≤-26.72	PASS
	Ant2	2412	Reference	4.16	4.16	---	PASS
			30~1000	4.16	-66.41	≤-25.84	PASS
			1000~26500	4.16	-41.4	≤-25.84	PASS
	Ant1	2437	Reference	3.37	3.37	---	PASS
			30~1000	3.37	-67.7	≤-26.63	PASS
			1000~26500	3.37	-40.86	≤-26.63	PASS
	Ant2	2437	Reference	3.94	3.94	---	PASS
			30~1000	3.94	-66.91	≤-26.06	PASS
			1000~26500	3.94	-41.33	≤-26.06	PASS
	Ant1	2462	Reference	3.10	3.10	---	PASS
			30~1000	3.10	-66.91	≤-26.9	PASS
			1000~26500	3.10	-40.28	≤-26.9	PASS
	Ant2	2462	Reference	3.56	3.56	---	PASS
			30~1000	3.56	-65.83	≤-26.44	PASS
			1000~26500	3.56	-41.41	≤-26.44	PASS
11N20MIMO	Ant1	2412	Reference	1.52	1.52	---	PASS
			30~1000	1.52	-69.43	≤-28.48	PASS
			1000~26500	1.52	-41.73	≤-28.48	PASS
	Ant2	2412	Reference	1.77	1.77	---	PASS
			30~1000	1.77	-68.9	≤-28.23	PASS
			1000~26500	1.77	-41.16	≤-28.23	PASS
	Ant1	2437	Reference	1.70	1.70	---	PASS
			30~1000	1.70	-68.52	≤-28.3	PASS
			1000~26500	1.70	-40.93	≤-28.3	PASS
	Ant2	2437	Reference	1.89	1.89	---	PASS
			30~1000	1.89	-69.17	≤-28.11	PASS
			1000~26500	1.89	-40.48	≤-28.11	PASS
	Ant1	2462	Reference	1.38	1.38	---	PASS
			30~1000	1.38	-67.9	≤-28.62	PASS
			1000~26500	1.38	-40.9	≤-28.62	PASS
	Ant2	2462	Reference	1.66	1.66	---	PASS
			30~1000	1.66	-69.3	≤-28.34	PASS
			1000~26500	1.66	-41.1	≤-28.34	PASS
11N40MIMO	Ant1	2422	Reference	-1.83	-1.83	---	PASS
			30~1000	-1.83	-69.51	≤-31.83	PASS
			1000~26500	-1.83	-40.87	≤-31.83	PASS
	Ant2	2422	Reference	-2.09	-2.09	---	PASS
			30~1000	-2.09	-68.64	≤-32.09	PASS
			1000~26500	-2.09	-41.15	≤-32.09	PASS
	Ant1	2437	Reference	-1.58	-1.58	---	PASS
			30~1000	-1.58	-69.2	≤-31.58	PASS
			1000~26500	-1.58	-41.25	≤-31.58	PASS

	Ant2	2437	Reference	-2.45	-2.45	---	PASS
			30~1000	-2.45	-69.17	≤-32.45	PASS
			1000~26500	-2.45	-40.96	≤-32.45	PASS
	Ant1	2452	Reference	-1.68	-1.68	---	PASS
			30~1000	-1.68	-68.92	≤-31.68	PASS
			1000~26500	-1.68	-41.37	≤-31.68	PASS
	Ant2	2452	Reference	-1.98	-1.98	---	PASS
			30~1000	-1.98	-67.44	≤-31.98	PASS
			1000~26500	-1.98	-41.79	≤-31.98	PASS

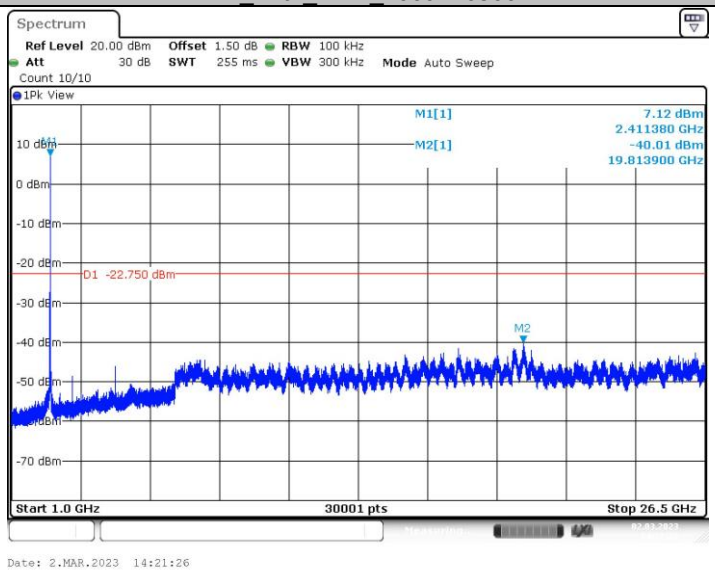
11B_Ant1_2412_0~Reference



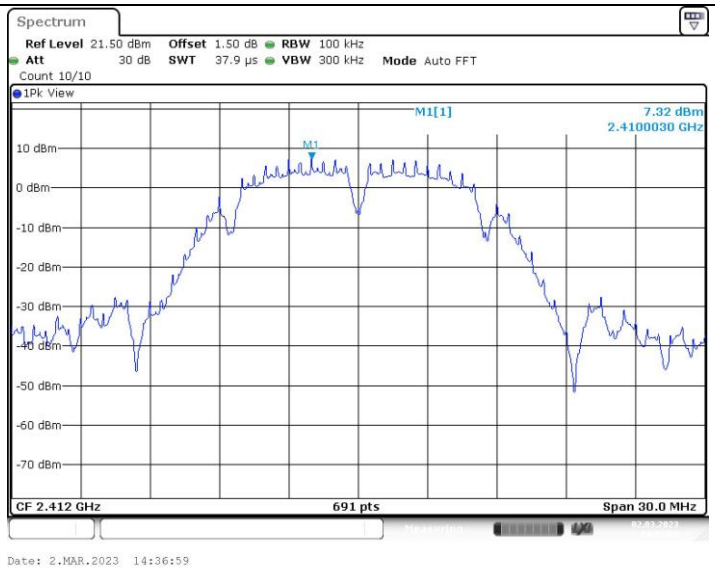
11B_Ant1_2412_30~1000



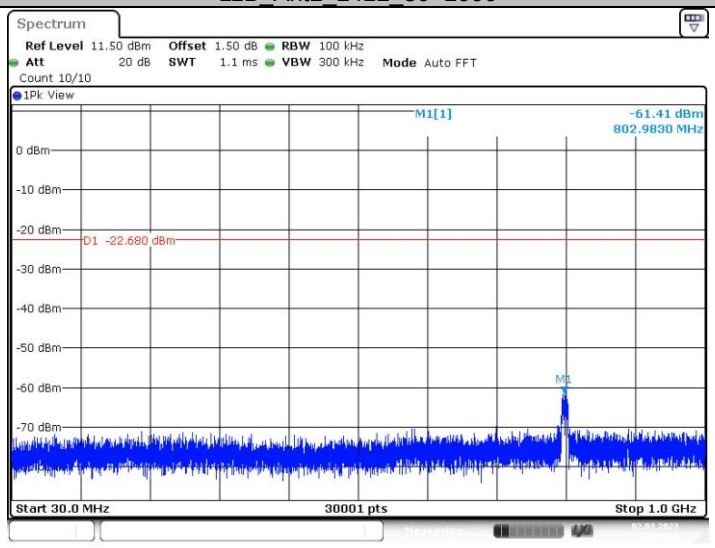
11B_Ant1_2412_1000~26500



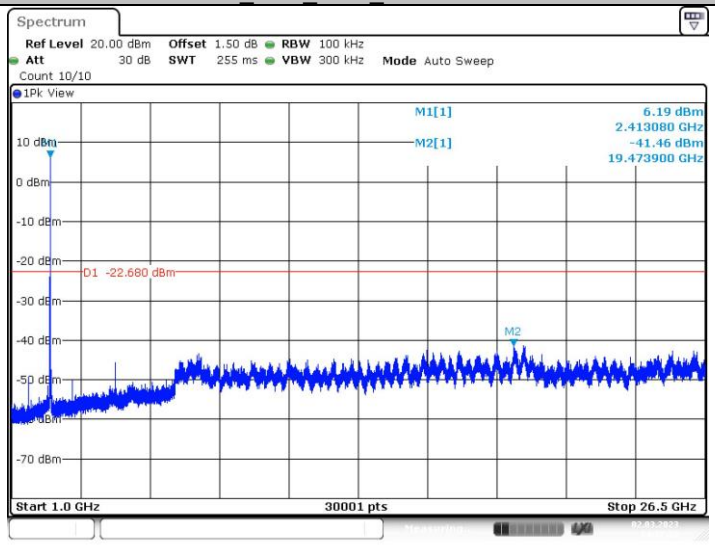
11B_Ant2_2412_0~Reference



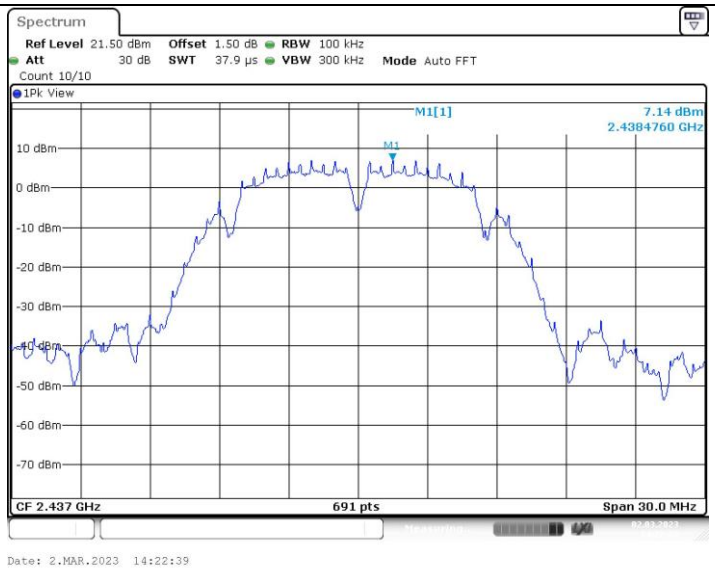
11B_Ant2_2412_30~1000



11B_Ant2_2412_1000~26500



11B_Ant1_2437_0~Reference



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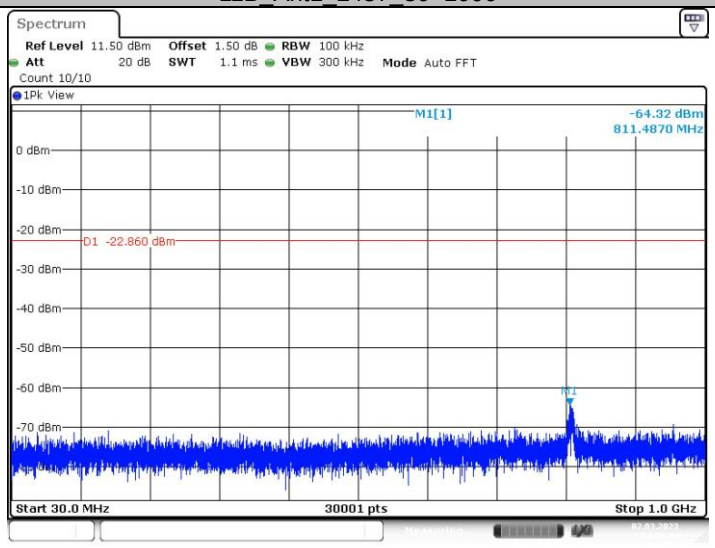

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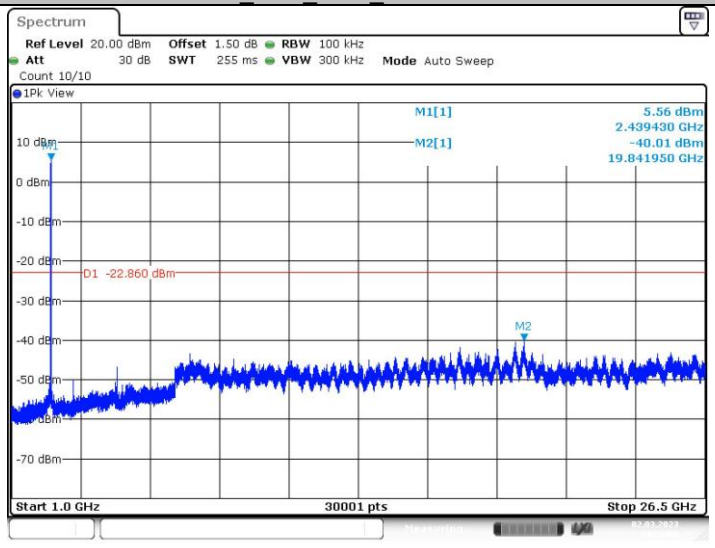

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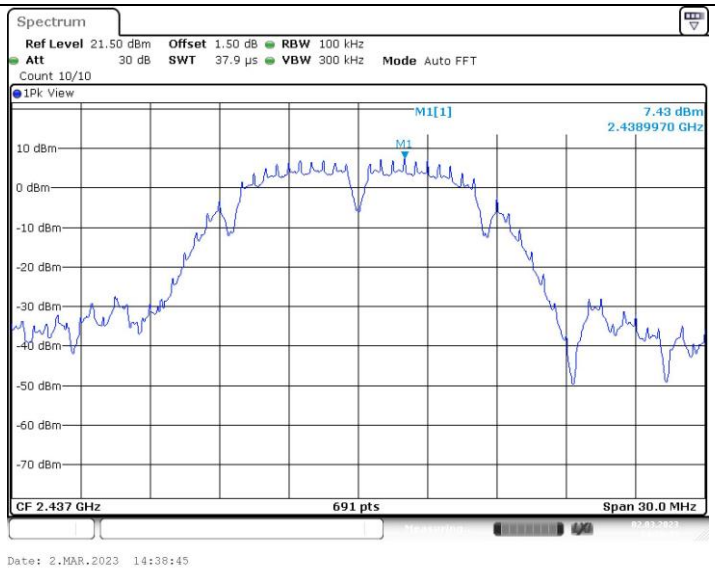

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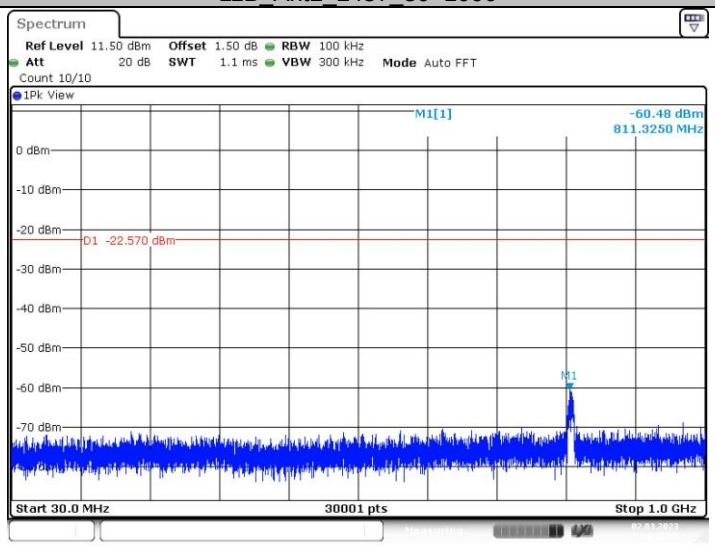

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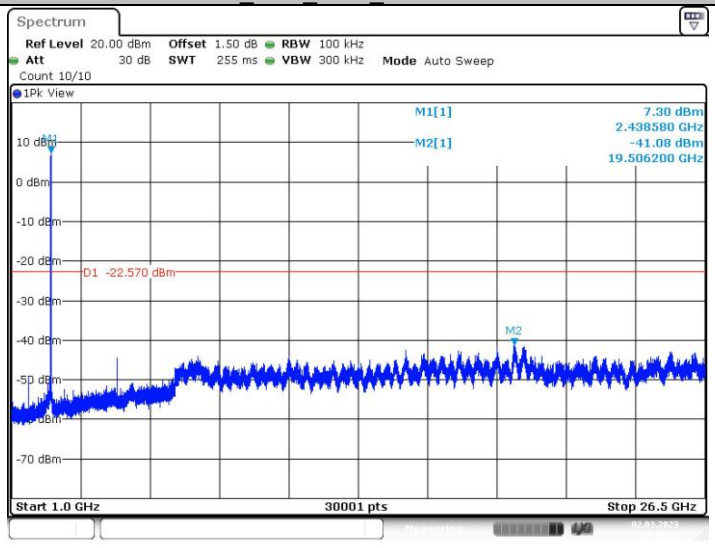

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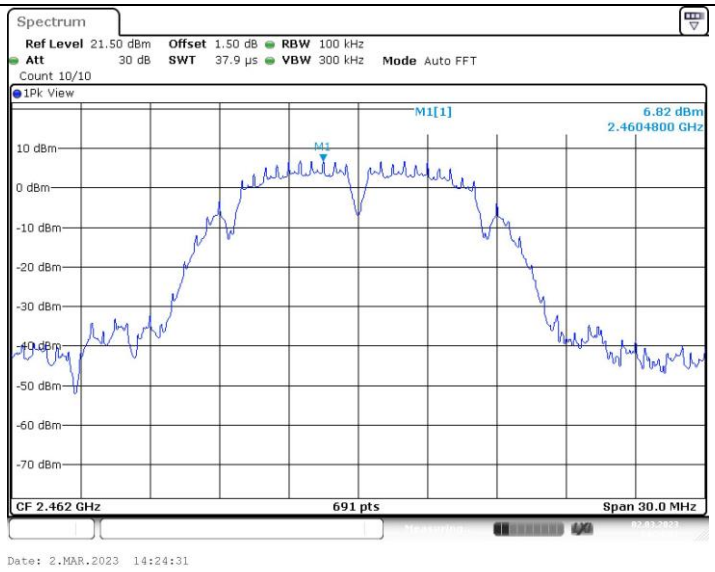

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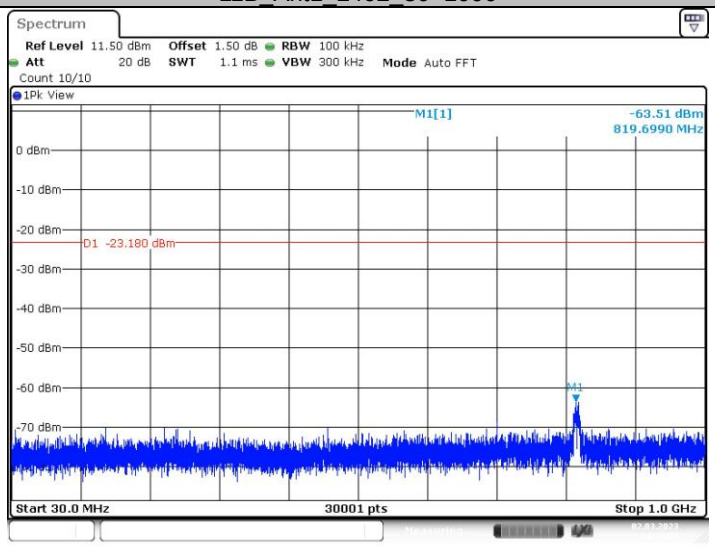

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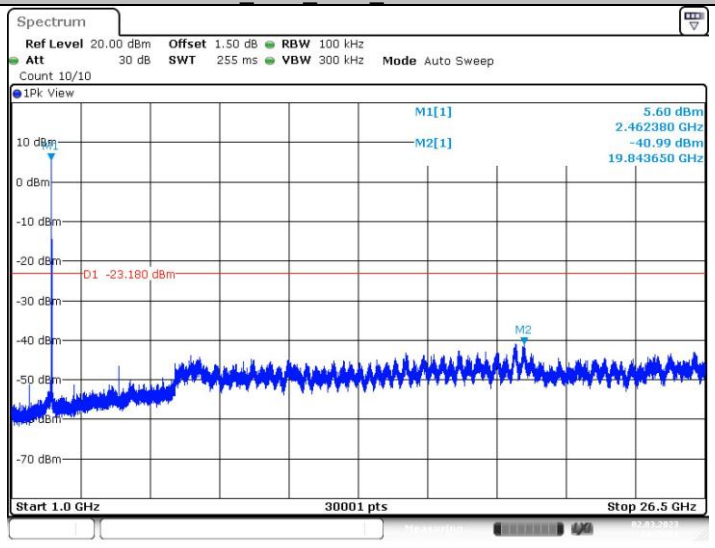

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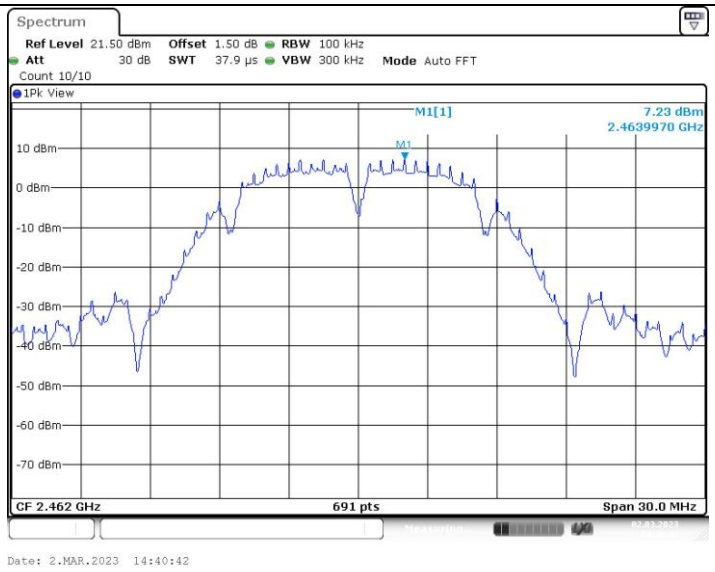

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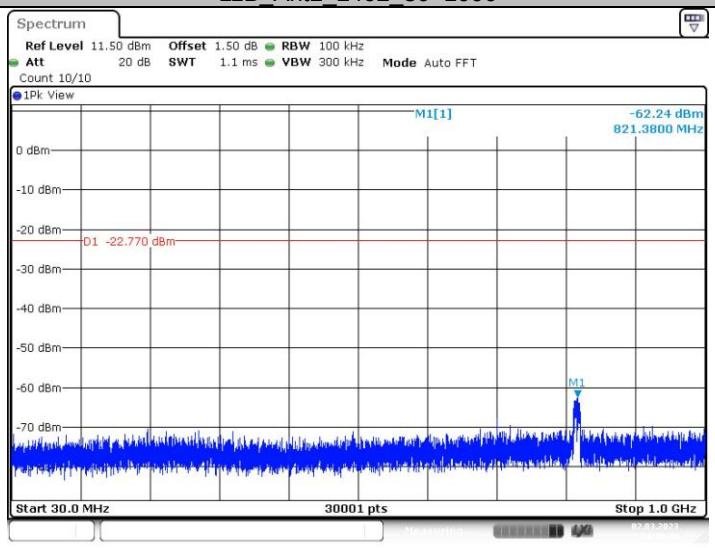

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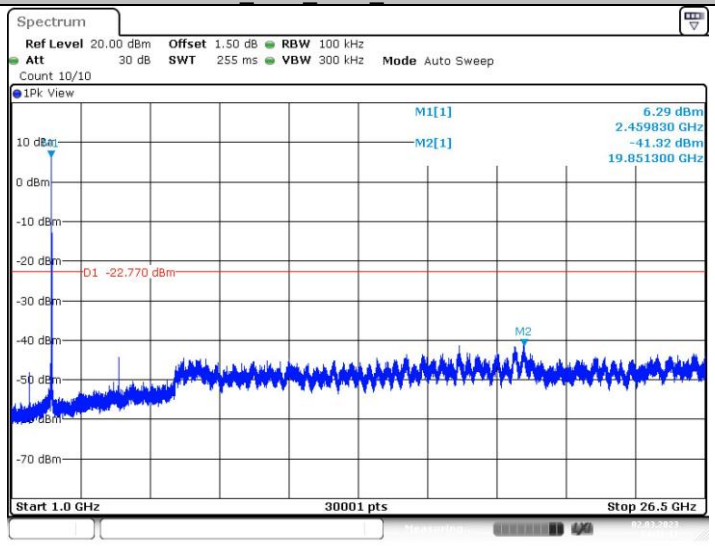

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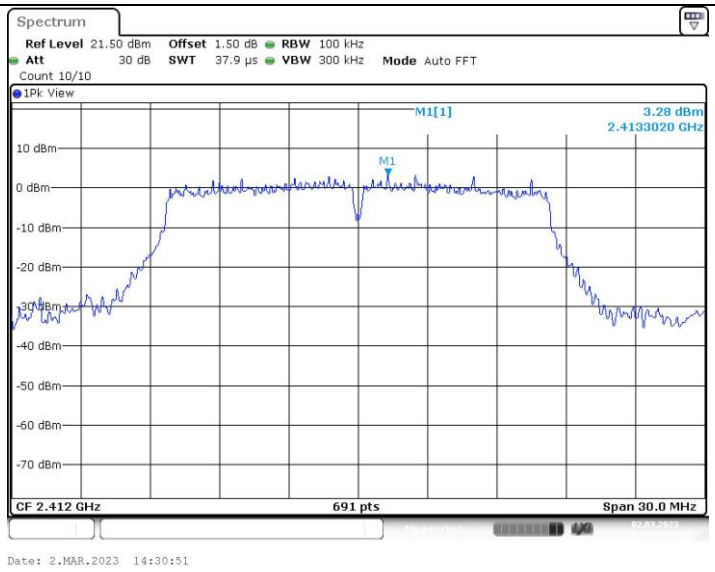

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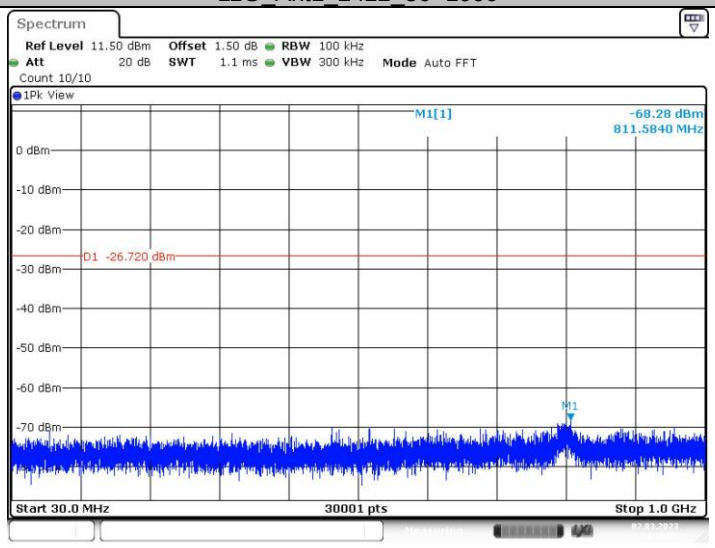

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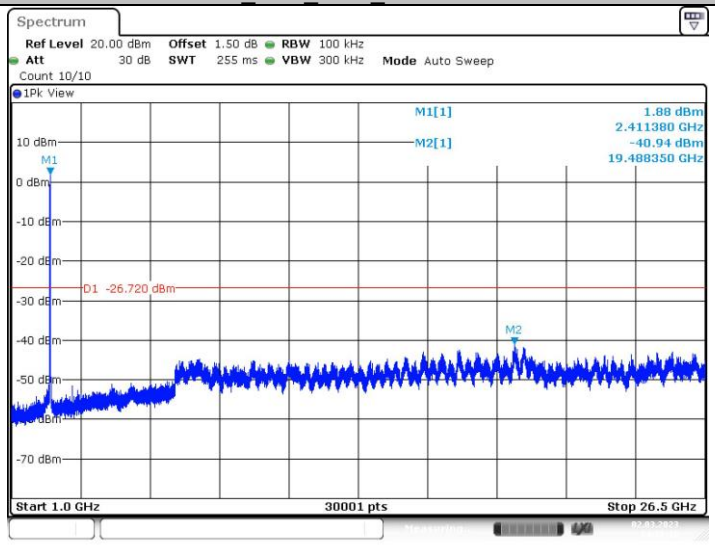

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