

FCC Test Report

Product Name : KNOT LR9 kit
Brand Name : MikroTik
Model No. : RB924iR-2nD-BT5&BG77&R11e-LR9,
RB924i-2nD-BT5&BG77
FCC ID : TV7924BT5LR9

Applicant : Mikrotikls SIA
Address : Brīvības gatve 214i,Rīga LV-1039 Latvia

Date of Receipt : Jul. 27, 2021
Issued Date : Dec. 20, 2021
Report No. : 2171120R-RFUSWL2V01-A
Report Version : V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF or any agency of the government.


Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

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Test Report Certification



Product Name : KNOT LR9 kit
Applicant : Mikrotiks SIA
Address : Brīvības gatve 214i,Rīga LV-1039 Latvia
Manufacturer : Mikrotiks SIA
Address : Brīvības gatve 214i,Rīga LV-1039 Latvia
Brand Name : MikroTik
Model No. : RB924iR-2nD-BT5&BG77&R11e-LR9, RB924i-2nD-BT5&BG77
FCC ID : TV7924BT5LR9
EUT Voltage : DC 5 ~ 24V
Testing Voltage : AC 120V/60Hz
Applicable Standard : FCC CFR Title 47 Part 15 Subpart C Section 15.247
ANSI C63.10: 2013
Laboratory Name : Hsin Chu Laboratory
Address : No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu
County 310, Taiwan, R.O.C.
TEL: +886-3-582-8001 / FAX: +886-3-582-8958
Test Result : Complied

Documented By : 

(Amelia Wu / Project Specialist)

Approved By : 

(Louis Hsu / Deputy Manager)

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Revision History

Version	Description	Issued Date
V1.0	Initial issue of report	Dec. 20, 2021

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1. General Information

1.1. EUT Description

Product Name	KNOT LR9 kit	
Brand Name	MikroTik	
Model No.	RB924iR-2nD-BT5&BG77&R11e-LR9, RB924i-2nD-BT5&BG77	
Frequency Range / Channel Number	IEEE 802.11b/g	2412 ~ 2462 MHz / 11 Channels
	IEEE 802.11n (20 MHz)	2412 ~ 2462 MHz / 11 Channels
	IEEE 802.11n (40 MHz)	2422 ~ 2452 MHz / 7 Channels
Type of Modulation	IEEE 802.11b	DSSS
	IEEE 802.11g/n	OFDM
Data Rate	IEEE 802.11b	1, 2, 5.5, 11 Mbps
	IEEE 802.11g	6, 9, 12, 18, 24, 36, 48, 54 Mbps
	IEEE 802.11n	Support a subset of the combination of GI, MCS 0 ~ MCS 15 and bandwidth defined in 802.11n

Accessories Information				
No.	Equipment Name	Brand Name	Model No.	Rating
1	Adapter	ULLPOWER	SAW30-240-1200U	INPUT: AC 100-240V, 50/60Hz, 0.8A OUTPUT: DC 24V, 1200mA
2	PoE injector / PoE injector connected to ETH 1 (PoE in)	MikroTik	RBGPOE	DC 18-57 V

The difference for each model is shown as below:

Model No.	LoRa Function
RB924iR-2nD-BT5&BG77&R11e-LR9	With
RB924i-2nD-BT5&BG77	Without

Antenna Information				
Ant.	Brand Name	Model No.	Type	Antenna Gain (dBi)
0	MikroTik	N/A	PIFA	1.5
1	MikroTik	N/A	PIFA	1.5

For IEEE 802.11b/g/n Mode: (2TX, 2RX)

Both Ant. 0 and Ant. 1 can be used as transmitting/receiving antennas, and they can transmit/receive signal simultaneously.

IEEE 802.11b/g & IEEE 802.11n (20 MHz)

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

IEEE 802.11n (40 MHz)

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
03	2422 MHz	04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz	-	-

Note:

1. Regards to the frequency band operation; the lowest, middle and highest frequency of channel were selected to perform the test, and then shown on this report.
2. The above EUT information is declared by the manufacturer.
3. This device contains WWAN LTE module FCC ID: XMR201912BG77.

1.2. Test Mode

DEKRA has verified the construction and function in typical operation. The preliminary tests were performed in different data rate, and to find the worst condition, which was shown in this test report. The following table is the final test mode.

Test Mode	Mode 1: Transmit (Adapter)
	Mode 2: Transmit (PoE)

Test Items	Test Mode	Modulation	Channel	Antenna	Result
AC Power Line Conducted Emission	Mode 1 Mode 2	11b	11	0+1	Pass
Maximum Conducted Output Power	Mode 1	11b	1/6/11	0+1	Pass
		11g	1/6/11	0+1	Pass
		11n (20 MHz)	1/6/11	0+1	Pass
		11n (40 MHz)	3/6/9	0+1	Pass
Radiated Emission Below 1 GHz	Mode 1 Mode 2	11b	11	0+1	Pass
Radiated Emission Above 1 GHz	Mode 1	11b	1/6/11	0+1	Pass
		11g	1/6/11	0+1	Pass
		11n (20 MHz)	1/6/11	0+1	Pass
		11n (40 MHz)	3/6/9	0+1	Pass
Antenna Port Conducted Emission	Mode 1	11b	1/6/11	0+1	Pass
		11g	1/6/11	0+1	Pass
		11n (20 MHz)	1/6/11	0+1	Pass
		11n (40 MHz)	3/6/9	0+1	Pass
Radiated Emission Band Edge	Mode 1	11b	1/6/11	0+1	Pass
		11g	1/6/11	0+1	Pass
		11n (20 MHz)	1/6/11	0+1	Pass
		11n (40 MHz)	3/6/9	0+1	Pass
Occupied Bandwidth & DTS Bandwidth	Mode 1	11b	1/6/11	0+1	Pass
		11g	1/6/11	0+1	Pass
		11n (20 MHz)	1/6/11	0+1	Pass
		11n (40 MHz)	3/6/9	0+1	Pass
Maximum Power Spectral Density	Mode 1	11b	1/6/11	0+1	Pass
		11g	1/6/11	0+1	Pass
		11n (20 MHz)	1/6/11	0+1	Pass
		11n (40 MHz)	3/6/9	0+1	Pass

Note:

1. Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. The worst case of data rate for 802.11b is 1 Mbps, for 802.11g is 6 Mbps, for 802.11n (20 MHz)/802.11n (40 MHz) are MCS 0, Nss1.
3. For radiated emission below 1 GHz and AC power line conducted emission have performed all modes of operation were investigated and the worst-case emissions are reported.
4. The EUT could be applied with WLAN 2.4 GHz function, Bluetooth function, LoRa function and WWAN LTE function; therefore Co-location Maximum Permissible Exposure (Please refer to DEKRA Report No.: 2171120R-RFUSMPEV02) and Radiated Emission Co-location (Please refer to Appendix A) tests are added for simultaneously transmit between WLAN 2.4 GHz function, Bluetooth function, LoRa function and WWAN LTE function. <Simultaneous Transmission Analysis Mode: 1. WLAN 2.4 GHz function + WWAN LTE function, 2. Bluetooth function + WWAN LTE function, 3. LoRa function + WWAN LTE function>

1.3. Comments and Remarks

The product specification and testing instructions for the EUT declared in the report are provided by the manufacturer who will take all responsibilities for the accuracy.

1.4. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system.

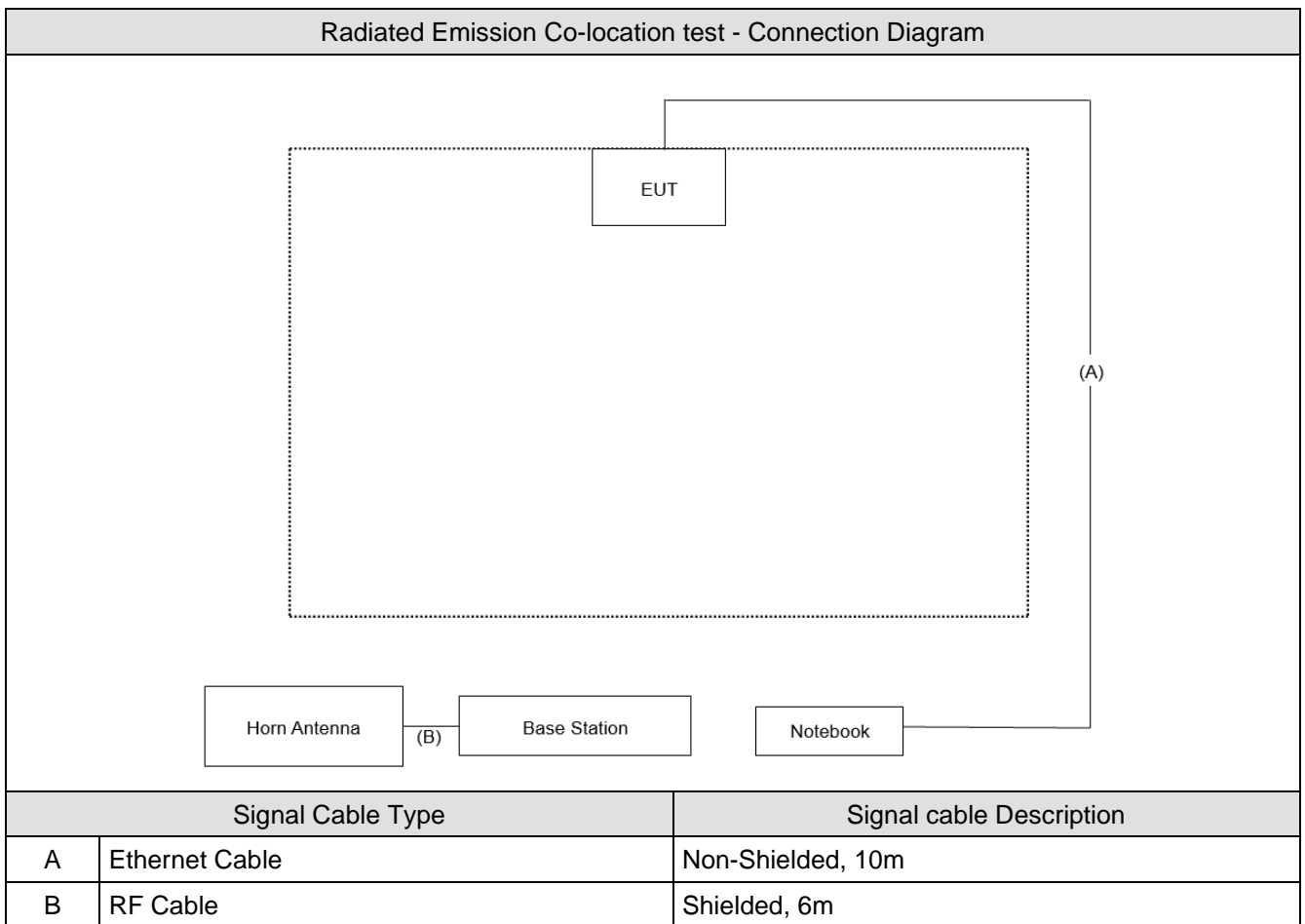
For Radiated Emission Co-location test:

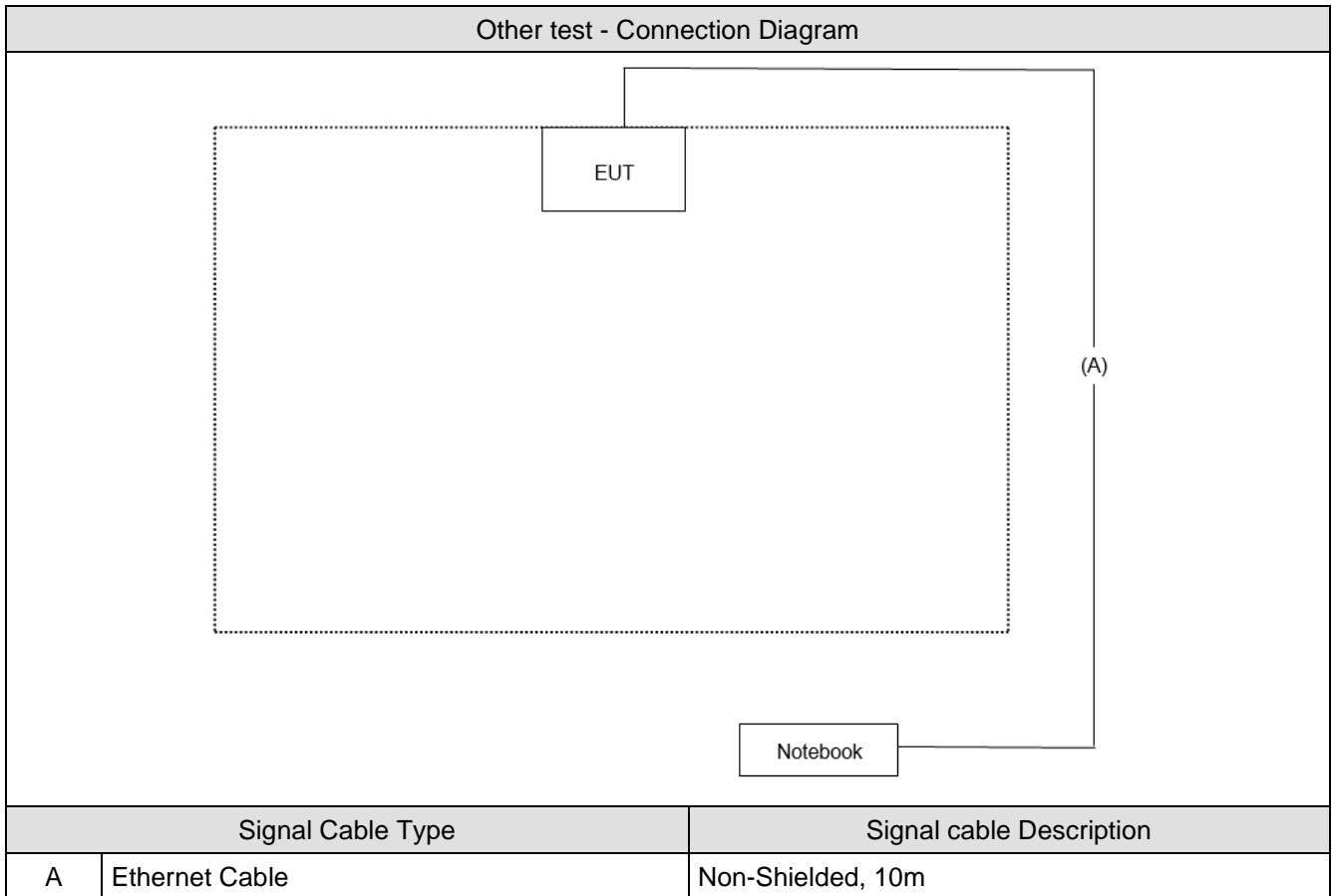
	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	Notebook	Lenovo	Lenovo Ideapad 510S	MP16Z7TB	SDoC
2	Base Station	R&S	CMW500	157118	-
3	Horn Antenna	Schwarzbeck	BBHA 9120D	1640	-

For other test:

	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	Notebook	Lenovo	Lenovo Ideapad 510S	MP16Z7TB	SDoC

1.5. Configuration of Tested System





1.6. EUT Operation of during Test

1	Set the EUT as shown.
2	Execute the Winbox v3.27 on the laptop.
3	Configure test mode, test channel and data rate.
4	Let the EUT start transmitting signal continuously.
5	Verify that the device is working properly.

1.7. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Actually	Tested by	Test Date	Test Site
Temperature (°C)	AC Power Line Conducted Emission	22.9	Ling Chen	2021/11/25	SR2-H
Humidity (%RH)		59			
Temperature (°C)	Maximum Conducted Output Power	19	Elwin Lin	2021/11/26	SR12-H
Humidity (%RH)		61			
Temperature (°C)	Radiated Emission	24.5 ~ 24.8	Ling Chen	2021/8/13 ~ 2021/8/27	CB2-H
Humidity (%RH)		60 ~ 68			
Temperature (°C)	Antenna Port Conducted Emission	20 ~ 25	Clemens Fang Elwin Lin	2021/9/10 ~ 2021/11/15	SR12-H
Humidity (%RH)		61 ~ 68			
Temperature (°C)	Radiated Emission Band Edge	25	Ling Chen	2021/8/11 ~ 2021/8/13	CB2-H
Humidity (%RH)		68			
Temperature (°C)	Occupied Bandwidth & DTS Bandwidth	24	Clemens Fang	2021/9/10	SR12-H
Humidity (%RH)		69			
Temperature (°C)	Maximum Power Spectral Density	20	Elwin Lin	2021/11/27	SR12-H
Humidity (%RH)		62			

Note: Test site information refers to Laboratory Information.

USA : **FCC Registration Number: TW3024**
Canada : **CAB identifier : TW3024**

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: <http://www.dekra.com.tw>

If you have any comments, please don't hesitate to contact us. Our test sites as below:

Test Laboratory	DEKRA Testing and Certification Co., Ltd.
Address	1. No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C. 2. No.372, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C.
Phone number	1. +886-3-582-8001 2. +886-3-582-8001
Fax number	1. +886-3-582-8958 2. +886-3-582-8958
E mail address	info.tw@dekra.com
Website	http://www.dekra.com.tw
Note: Test site number for address 1 includes SR2-H. Test site number for address 2 includes CB2-H, CB3-H, CB4-H, SR10-H and SR12-H.	

1.8. List of Test Equipment

SR2-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Artificial Mains Network	R&S	ENV4200	848411/010	2020/12/24	2021/12/23
Test Receiver	R&S	ESCS 30	836858/022	2021/02/22	2022/02/21
LISN	R&S	ENV216	100092	2021/06/08	2022/06/07
Coaxial Cable(9 m)	Harbour	RG-400	SR2-H	2021/08/15	2022/08/14
DEKRA Testing System	DEKRA	Version 2.0	SR2-H	N/A	N/A

SR12-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
High Speed Peak Power Meter Dual Input	Anritsu	ML2496A	1602004	2020/11/30	2021/11/29
Pulse Power Sensor	Anritsu	MA2411B	1531043	2020/11/30	2021/11/29
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2021/01/25	2022/01/24
Pulse Power Sensor	Anritsu	MA2411B	1531044	2020/11/30	2021/11/29
Power Meter	Keysight	8990B	MY51000248	2021/05/21	2022/05/20
Power Sensor	Keysight	N1923A	MY57240005	2021/05/21	2022/05/20
Spectrum Analyzer	Keysight	N9010B	MY57110159	2021/03/29	2022/03/28
Spectrum Analyzer	Agilent	N9010A	US47140172	2021/05/28	2022/05/27
Signal & Spectrum Analyzer	R&S	FSV40	101049	2021/03/31	2022/03/30

CB2-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2020/10/12	2021/10/11
Signal & Spectrum Analyzer	R&S	FSV40	101049	2021/03/31	2022/03/30
Signal Analyzer	R&S	FSVA40	101435	2021/06/04	2022/06/03
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2021/01/25	2022/01/24
Trilog Broadband Antenna	Schwarzbeck	VULB 9168	1209	2021/05/28	2022/05/27
Bilog Antenna	Teseq	CBL6112D	23191	2021/02/26	2022/02/25
Horn Antenna	Schwarzbeck	BBHA 9120D	639	2021/05/17	2022/05/16
Horn Antenna	Schwarzbeck	BBHA 9170	202	2020/12/16	2021/12/15
Pre-Amplifier	EMCI	EMC01820I	980365	2021/05/28	2022/05/27
Pre-Amplifier	EMEC	EM01G18GA	060741	2021/07/02	2022/07/01
Pre-Amplifier	DEKRA	AP-400C	201801231	2020/11/16	2021/11/15
EMI Test Receiver	R&S	ESR7	102260	2020/12/28	2021/12/27
Magnetic Loop Antenna	Teseq	HLA 6121	44287	2020/09/23	2021/09/22
Coaxial Cable(13m)	Huber+Suhner	SF104	CB2-H	2021/07/23	2022/07/22
Coaxial Cable(3m)	Suhnerr, Rosnol	SF102_Rosnol	CB2-H	2021/08/17	2022/08/18
DEKRA Testing System	DEKRA	Version 2.0	CB2-H	NA	NA

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

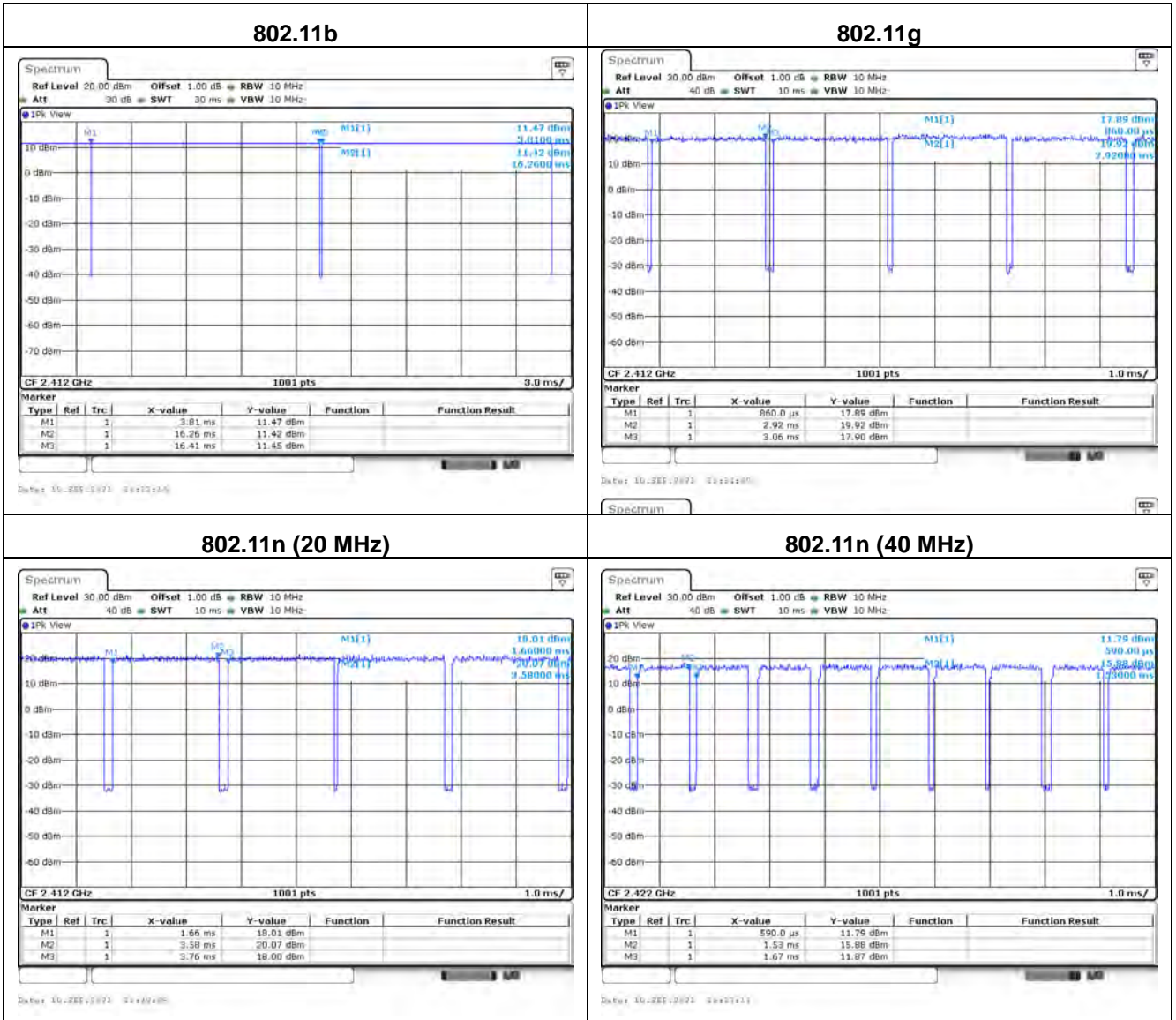
1.9. Measurement Uncertainty

Uncertainties have been calculated according to the DEKRA internal document with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

Test Item	Uncertainty
AC Power Line Conducted Emission	± 2.10 dB
Maximum Conducted Output Power	± 1.16 dB
Radiated Emission	± 3.25 dB below 1 GHz ± 3.32 dB above 1 GHz
Antenna Port Conducted Emission	± 1.60 dB
Radiated Emission Band Edge	± 3.32 dB above 1GHz
DTS Bandwidth	± 282.55 Hz
Occupied Bandwidth	± 282.55 Hz
Maximum Power Spectral Density	± 1.60 dB

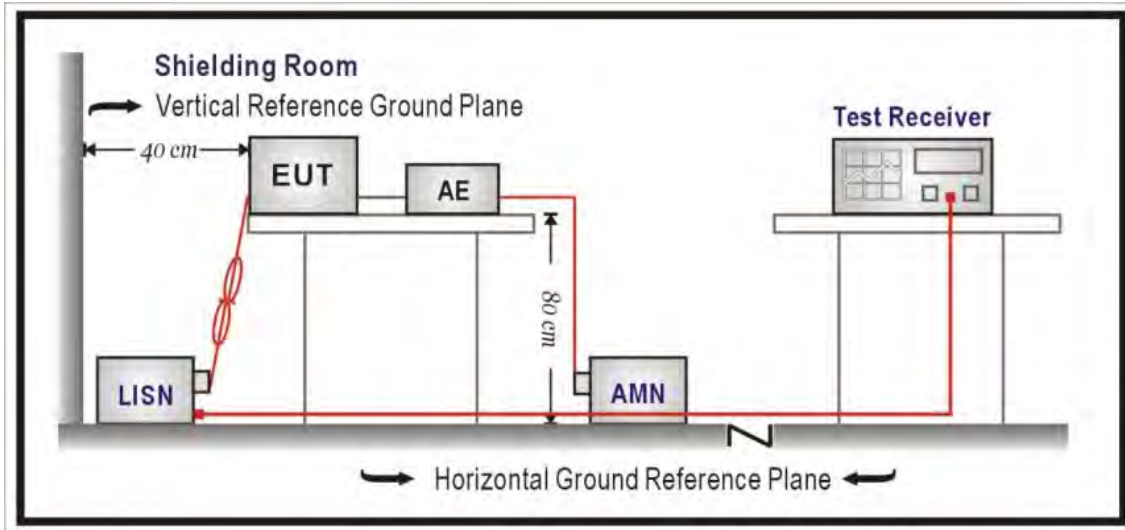
1.10. Duty Cycle

Modulation	On Times (ms)	On+Off Times (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11b	12.450	12.600	98.81	0.052	0.010
802.11g	2.060	2.200	93.64	0.286	0.485
802.11n (20 MHz)	1.920	2.100	91.43	0.389	0.521
802.11n (40 MHz)	0.940	1.080	87.04	0.603	1.064



2. AC Power Line Conducted Emission

2.1. Test Setup



2.2. Test Limit

Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

2.3. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50 uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm/50 uH coupling impedance with 50 ohm termination. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.

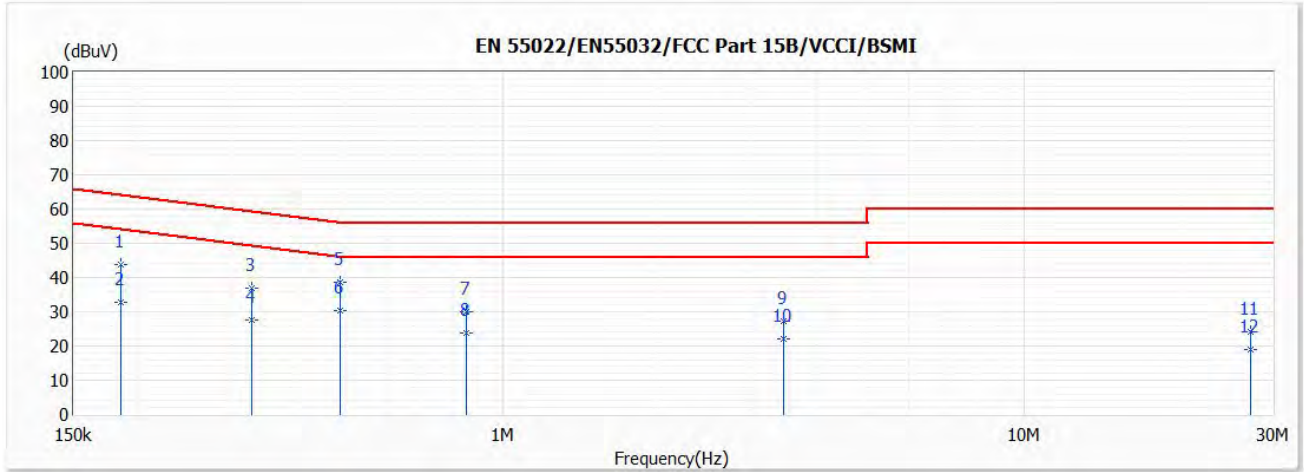
AC Power Line Conducted Emissions were investigated over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz.

2.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247.

2.5. Test Result of AC Power Line Conducted Emission

Test Mode	Mode 1: Transmit (Adapter)	Phase	Line
Test Condition	802.11b / Ant. 0 + Ant. 1 / 2462 MHz	Test Voltage	AC120V/60Hz

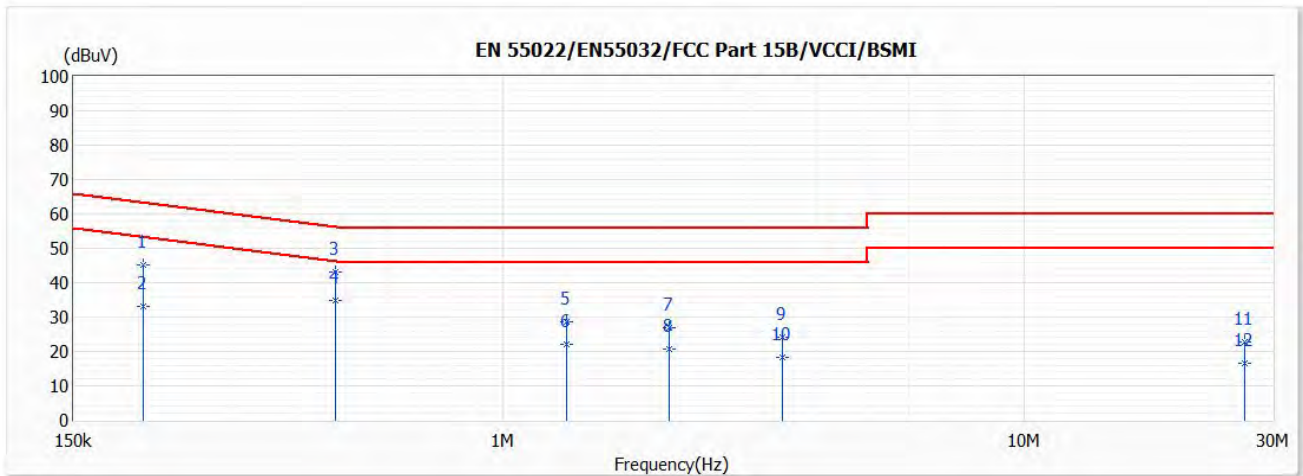


No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.185	43.83	64.27	-20.44	34.20	9.63	QP
2	0.185	32.78	54.27	-21.49	23.15	9.63	AV
3	0.330	36.78	59.46	-22.68	27.13	9.65	QP
4	0.330	27.56	49.46	-21.90	17.91	9.65	AV
5	0.486	38.78	56.23	-17.45	29.11	9.67	QP
*6	0.486	30.37	46.23	-15.86	20.70	9.67	AV
7	0.852	30.17	56.00	-25.83	20.46	9.71	QP
8	0.852	23.82	46.00	-22.18	14.11	9.71	AV
9	3.449	27.41	56.00	-28.59	17.56	9.85	QP
10	3.449	22.22	46.00	-23.78	12.37	9.85	AV
11	27.158	24.08	60.00	-35.92	13.59	10.49	QP
12	27.158	19.09	50.00	-30.91	8.60	10.49	AV

Note:

1. " * ", means this data is the worst emission level.
2. Emission Level = Reading Level + Correct Factor (Correct Factor = LISN Insertion Loss + Cable Loss).
3. Margin = Emission Level - Limit.

Test Mode	Mode 1: Transmit (Adapter)	Phase	Neutral
Test Condition	802.11b / Ant. 0 + Ant. 1 / 2462 MHz	Test Voltage	AC120V/60Hz

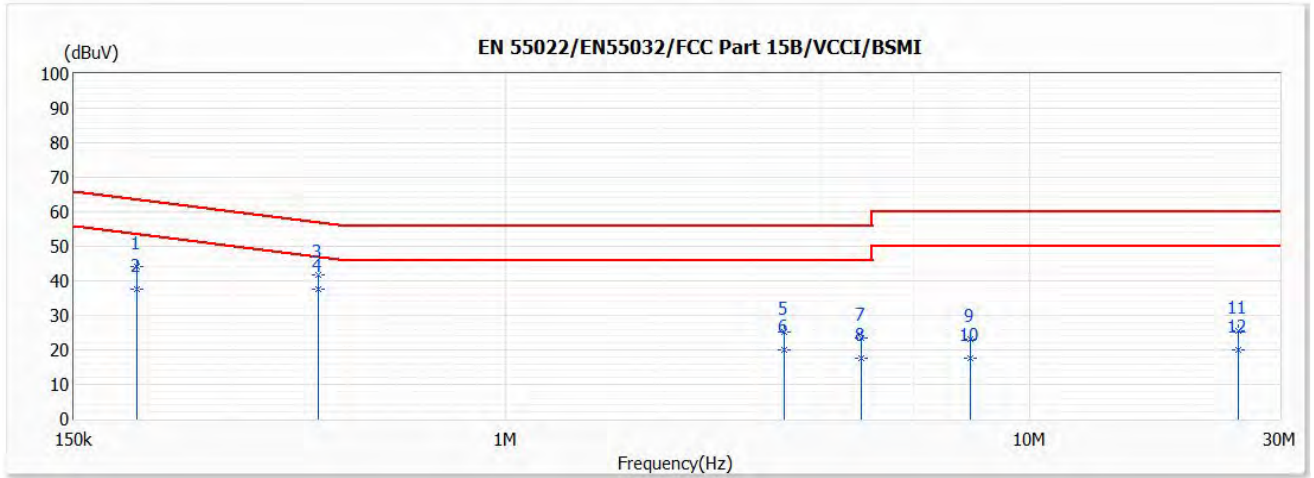


No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.204	45.06	63.46	-18.40	35.42	9.64	QP
2	0.204	32.95	53.46	-20.51	23.31	9.64	AV
3	0.478	43.06	56.37	-13.31	33.38	9.68	QP
*4	0.478	34.75	46.37	-11.62	25.07	9.68	AV
5	1.326	28.79	56.00	-27.21	19.04	9.75	QP
6	1.326	22.19	46.00	-23.81	12.44	9.75	AV
7	2.085	27.00	56.00	-29.00	17.21	9.79	QP
8	2.085	20.80	46.00	-25.20	11.01	9.79	AV
9	3.440	24.29	56.00	-31.71	14.43	9.86	QP
10	3.440	18.24	46.00	-27.76	8.38	9.86	AV
11	26.430	22.68	60.00	-37.32	11.95	10.73	QP
12	26.430	16.55	50.00	-33.45	5.82	10.73	AV

Note:

- " * ", means this data is the worst emission level.
- Emission Level = Reading Level + Correct Factor (Correct Factor = LISN Insertion Loss + Cable Loss).
- Margin = Emission Level - Limit.

Test Mode	Mode 2: Transmit (PoE)	Phase	Line
Test Condition	802.11b / Ant. 0 + Ant. 1 / 2462 MHz	Test Voltage	AC120V/60Hz

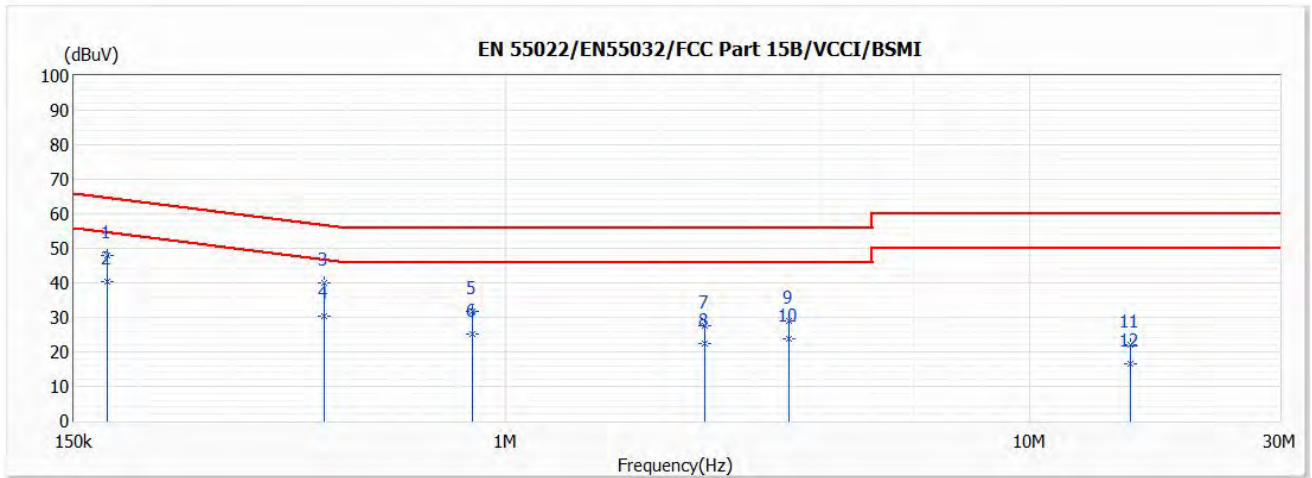


No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.197	44.12	63.72	-19.60	34.48	9.64	QP
2	0.197	37.73	53.72	-15.99	28.09	9.64	AV
3	0.438	41.86	57.10	-15.24	32.20	9.66	QP
*4	0.438	37.69	47.10	-9.41	28.03	9.66	AV
5	3.407	25.32	56.00	-30.68	15.47	9.85	QP
6	3.407	19.87	46.00	-26.13	10.02	9.85	AV
7	4.780	23.28	56.00	-32.72	13.36	9.92	QP
8	4.780	17.59	46.00	-28.41	7.67	9.92	AV
9	7.708	23.20	60.00	-36.80	13.18	10.02	QP
10	7.708	17.47	50.00	-32.53	7.45	10.02	AV
11	24.960	25.64	60.00	-34.36	15.18	10.46	QP
12	24.960	20.15	50.00	-29.85	9.69	10.46	AV

Note:

1. " * ", means this data is the worst emission level.
2. Emission Level = Reading Level + Correct Factor (Correct Factor = LISN Insertion Loss + Cable Loss).
3. Margin = Emission Level - Limit.

Test Mode	Mode 2: Transmit (PoE)	Phase	Neutral
Test Condition	802.11b / Ant. 0 + Ant. 1 / 2462 MHz	Test Voltage	AC120V/60Hz



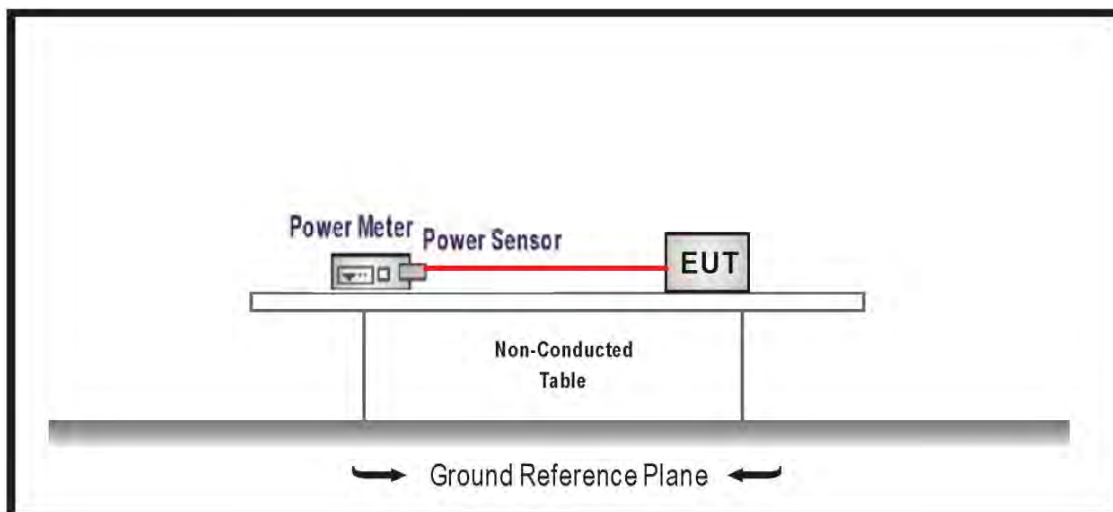
No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.174	48.03	64.77	-16.74	38.39	9.64	QP
*2	0.174	40.32	54.77	-14.45	30.68	9.64	AV
3	0.451	39.97	56.86	-16.89	30.30	9.67	QP
4	0.451	30.39	46.86	-16.47	20.72	9.67	AV
5	0.864	31.76	56.00	-24.24	22.04	9.72	QP
6	0.864	25.15	46.00	-20.85	15.43	9.72	AV
7	2.397	27.50	56.00	-28.50	17.69	9.81	QP
8	2.397	22.38	46.00	-23.62	12.57	9.81	AV
9	3.475	28.81	56.00	-27.19	18.95	9.86	QP
10	3.475	23.85	46.00	-22.15	13.99	9.86	AV
11	15.596	22.15	60.00	-37.85	11.76	10.39	QP
12	15.596	16.44	50.00	-33.56	6.05	10.39	AV

Note:

- " * ", means this data is the worst emission level.
- Emission Level = Reading Level + Correct Factor (Correct Factor = LISN Insertion Loss + Cable Loss).
- Margin = Emission Level - Limit.

3. Maximum Conducted Output Power

3.1. Test Setup



3.2. Test Limit

The maximum conducted output power shall be less 30 dBm (1 Watt).

3.3. Test Procedures

The EUT was setup according to ANSI C63.10: 2013; tested according to DTS test procedure of KDB 558074 D01 v05r02 for compliance to FCC 47CFR 15.247 requirements.

3.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247.

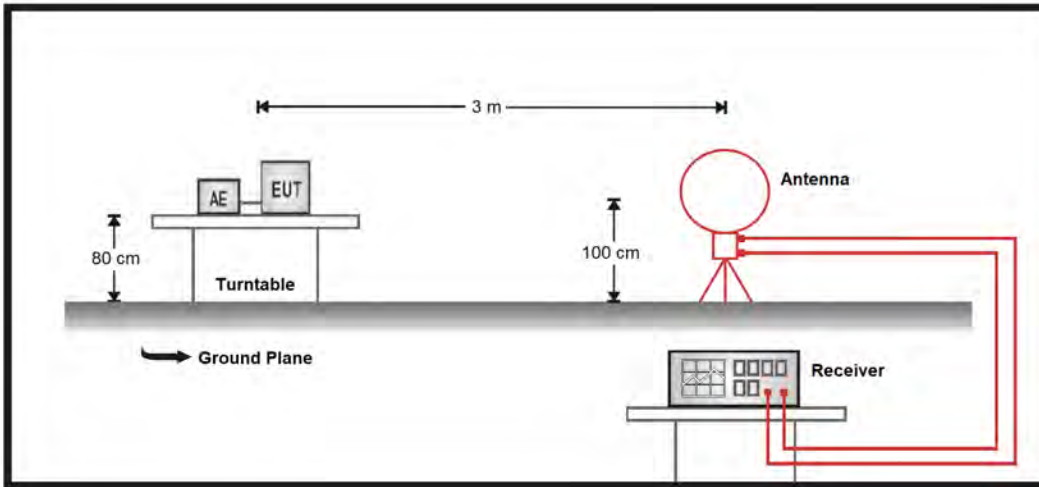
3.5. Test Result of Maximum Conducted Output Power

Modulation	Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)			Limit (dBm)	Result
			Ant. 0	Ant. 1	Total		
802.11b	1	2412	10.620	8.270	12.612	≤ 30.00	Pass
	6	2437	10.810	8.240	12.723	≤ 30.00	Pass
	11	2462	10.670	8.020	12.554	≤ 30.00	Pass
802.11g	1	2412	16.640	14.780	18.819	≤ 30.00	Pass
	6	2437	16.730	14.260	18.679	≤ 30.00	Pass
	11	2462	17.580	15.470	19.662	≤ 30.00	Pass
802.11n (20 MHz)	1	2412	17.020	14.530	18.961	≤ 30.00	Pass
	6	2437	16.510	14.090	18.477	≤ 30.00	Pass
	11	2462	16.450	14.350	18.536	≤ 30.00	Pass
802.11n (40 MHz)	3	2422	10.600	8.360	12.633	≤ 30.00	Pass
	6	2437	11.420	8.800	13.315	≤ 30.00	Pass
	9	2452	11.440	8.900	13.363	≤ 30.00	Pass

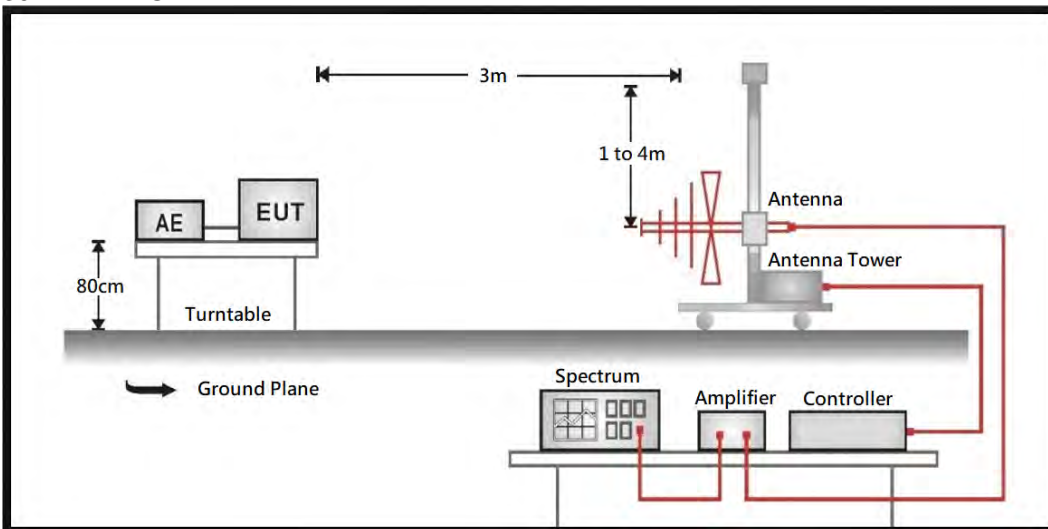
4. Radiated Emission

4.1. Test Setup

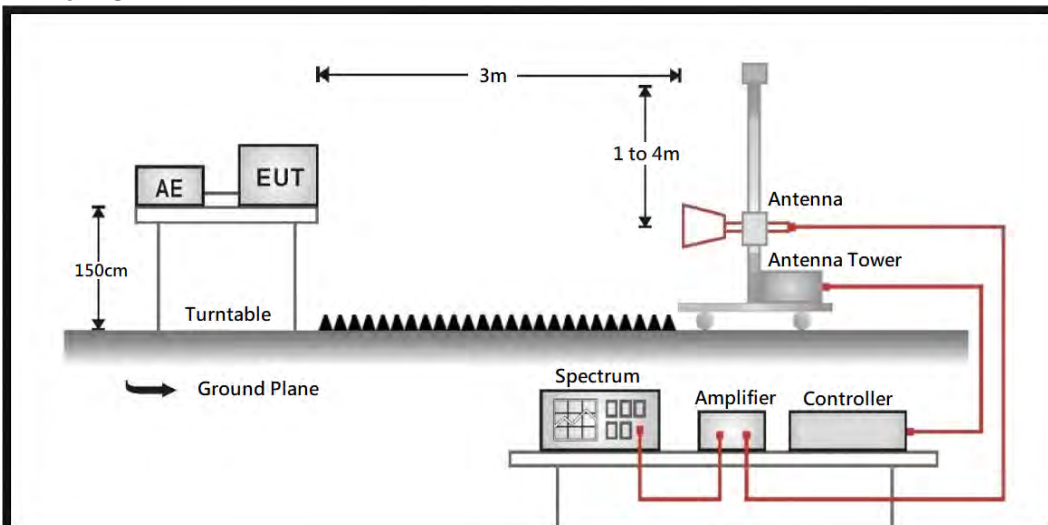
9 kHz ~ 30 MHz



30 MHz ~ 1 GHz



Above 1 GHz



4.2. Test Limit

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 30dB below the level of the fundamental or to the general radiated emission limit in paragraph 15.209, whichever is the lesser attenuation.

Frequency (MHz)	Field strength (uV/m)	Field strength (dBuV/m)	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	20 log (2400/F(kHz))	300
0.490 – 1.705	24000/F(kHz)	20 log (24000/F(kHz))	30
1.705 - 30	30	29.5	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

Remarks:

1. Field strength (dBuV/m) = 20 log Field strength (uV/m)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

4.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB 558074 D01V05r02 for compliance to FCC 47CFR 15.247 requirements.

The EUT and its simulators are placed on a turn table which is 0.8 or 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

On any frequency or frequencies from 9 kHz(include The the lowest oscillator frequency generated within the device up to the 10th harmonic) to 1000 MHz, the limit shown are based on measuring equipment employing a quasi-peak detector function and on any frequency or frequencies above 1000 MHz the radiated limit shown are based upon the use of measurement instrumentation employing an average detector function. When average radiated emission measurement are included emission measurement below 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

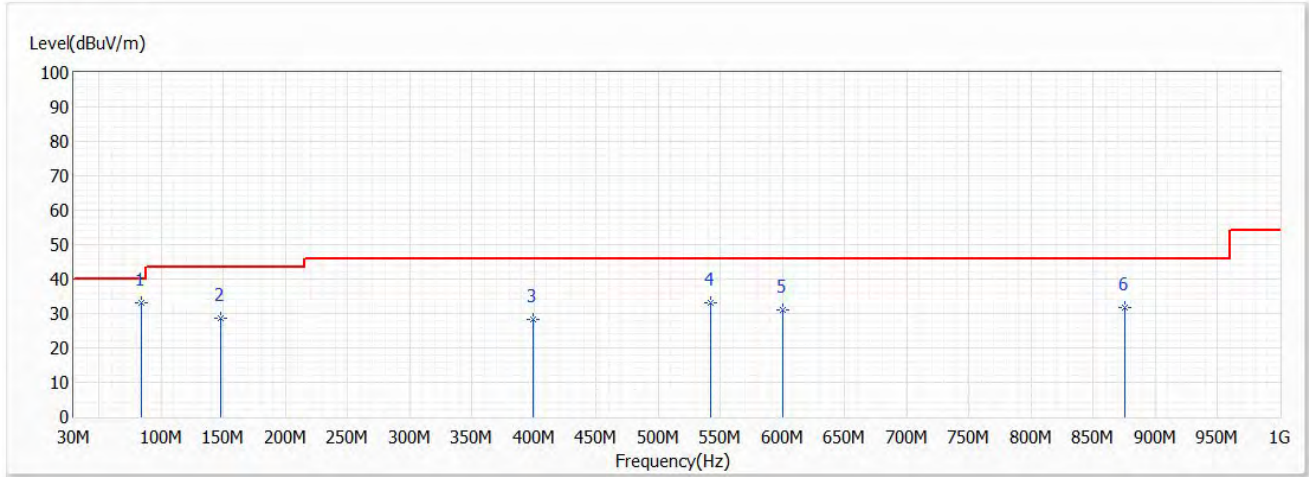
The bandwidth below 1 GHz setting on the field strength meter is 120 kHz and above 1 GHz is 1 MHz.

4.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247.

4.5. Test Result of Radiated Emissions (30 MHz ~ 1 GHz)

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Horizontal
Test Condition	802.11b / Ant. 0 + Ant. 1 / 2462 MHz	Test Voltage	AC120V/60Hz

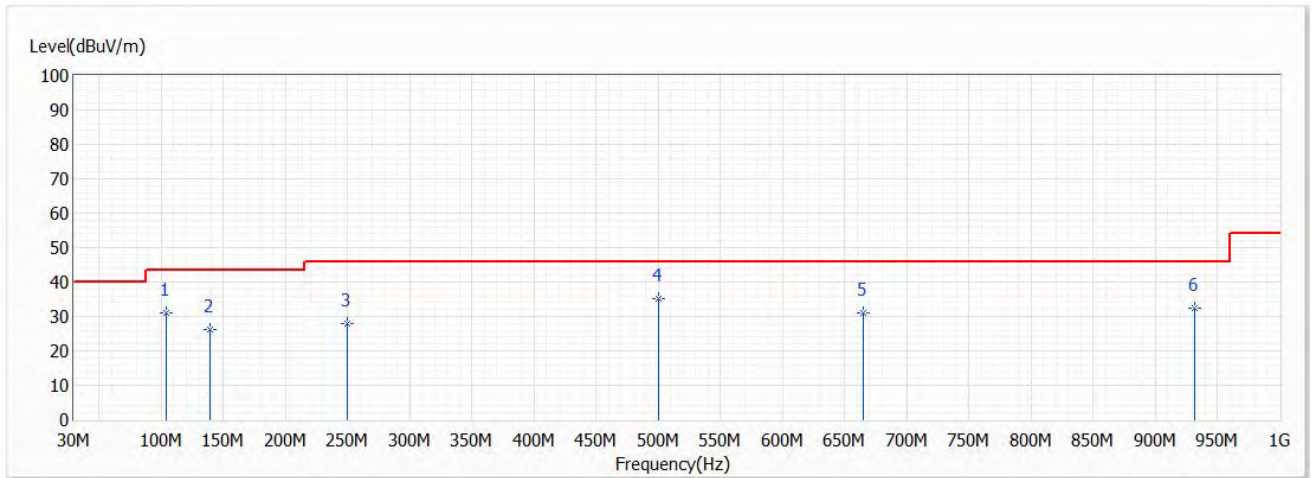


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	84.684	33.07	40.00	-6.93	41.12	-8.05	QP
2	147.855	28.77	43.50	-14.73	33.94	-5.17	QP
3	399.085	28.25	46.00	-17.75	27.37	0.88	QP
4	541.796	32.95	46.00	-13.05	28.70	4.25	QP
5	599.996	31.03	46.00	-14.97	26.56	4.47	QP
6	875.113	31.81	46.00	-14.19	24.50	7.31	QP

Note:

1. All Reading Levels is Quasi-Peak value.
2. “ * ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Correct Factor
4. The emission under 30MHz were not included is because their levels are lower than 20dB from limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Vertical
Test Condition	802.11b / Ant. 0 + Ant. 1 / 2462 MHz	Test Voltage	AC120V/60Hz

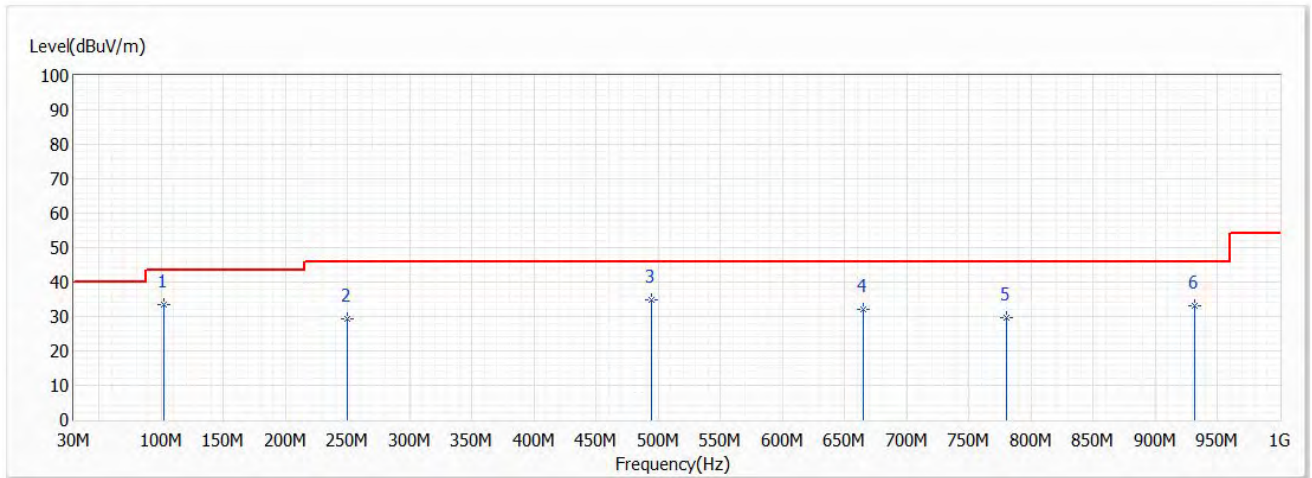


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	104.690	30.95	43.50	-12.55	35.16	-4.21	QP
2	139.368	26.35	43.50	-17.15	30.86	-4.51	QP
3	249.948	28.06	46.00	-17.94	31.21	-3.15	QP
* 4	500.450	35.34	46.00	-10.66	32.46	2.88	QP
5	665.108	31.03	46.00	-14.97	25.97	5.06	QP
6	931.009	32.58	46.00	-13.42	24.74	7.84	QP

Note:

1. All Reading Levels is Quasi-Peak value.
2. “ * ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Correct Factor
4. The emission under 30MHz were not included is because their levels are lower than 20dB from limit.

Test Mode	Mode 2: Transmit (PoE)	Polarity	Horizontal
Test Condition	802.11b / Ant. 0 + Ant. 1 / 2462 MHz	Test Voltage	AC120V/60Hz

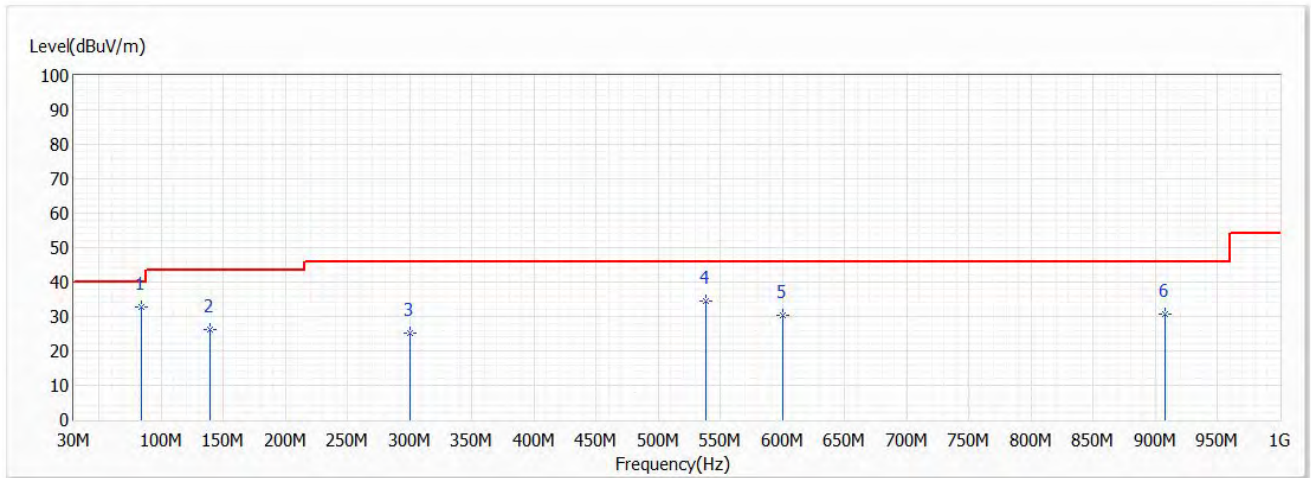


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	102.508	33.58	43.50	-9.92	38.07	-4.49	QP
2	249.948	29.35	46.00	-16.65	32.50	-3.15	QP
3	494.509	34.79	46.00	-11.21	31.94	2.85	QP
4	664.986	31.92	46.00	-14.08	26.86	5.06	QP
5	779.931	29.53	46.00	-16.47	23.05	6.48	QP
6	931.130	33.21	46.00	-12.79	25.37	7.84	QP

Note:

1. All Reading Levels is Quasi-Peak value.
2. “ * ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Correct Factor
4. The emission under 30MHz were not included is because their levels are lower than 20dB from limit.

Test Mode	Mode 2: Transmit (PoE)	Polarity	Vertical
Test Condition	802.11b / Ant. 0 + Ant. 1 / 2462 MHz	Test Voltage	AC120V/60Hz



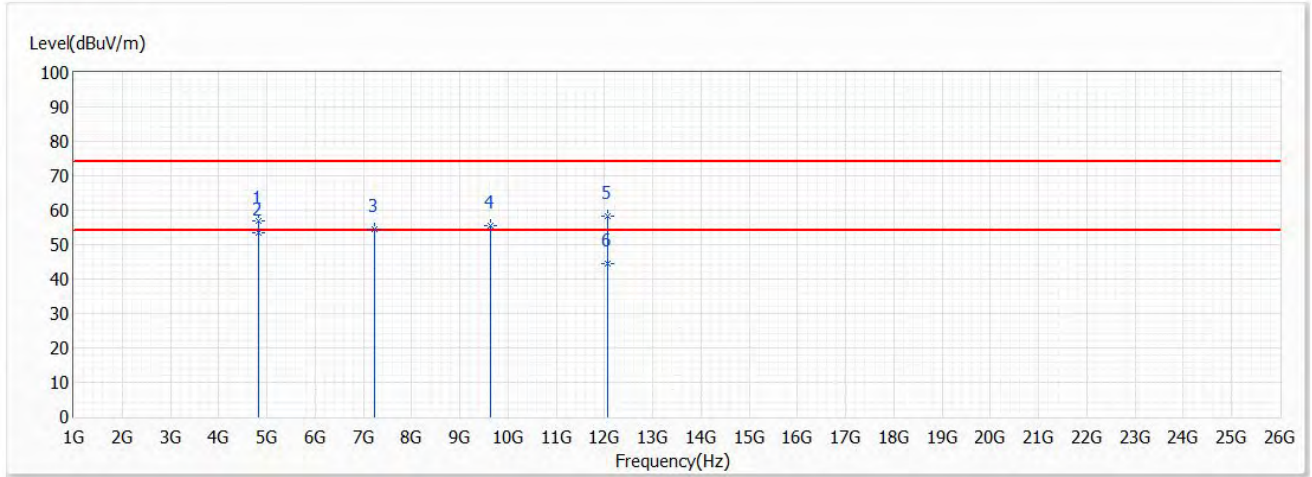
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	84.199	32.74	40.00	-7.26	40.89	-8.15	QP
2	139.368	26.35	43.50	-17.15	30.86	-4.51	QP
3	300.024	25.20	46.00	-20.80	27.42	-2.22	QP
4	538.765	34.35	46.00	-11.65	30.32	4.03	QP
5	600.118	30.29	46.00	-15.71	25.82	4.47	QP
6	907.244	30.83	46.00	-15.17	23.16	7.67	QP

Note:

1. All Reading Levels is Quasi-Peak value.
2. “ * ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Correct Factor
4. The emission under 30MHz were not included is because their levels are lower than 20dB from limit.

4.6. Test Result of Radiated Emissions (1 GHz ~ 10th Harmonic)

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Horizontal
Test Condition	802.11b / Ant. 0 + Ant. 1 / 2412 MHz	Test Voltage	AC120V/60Hz

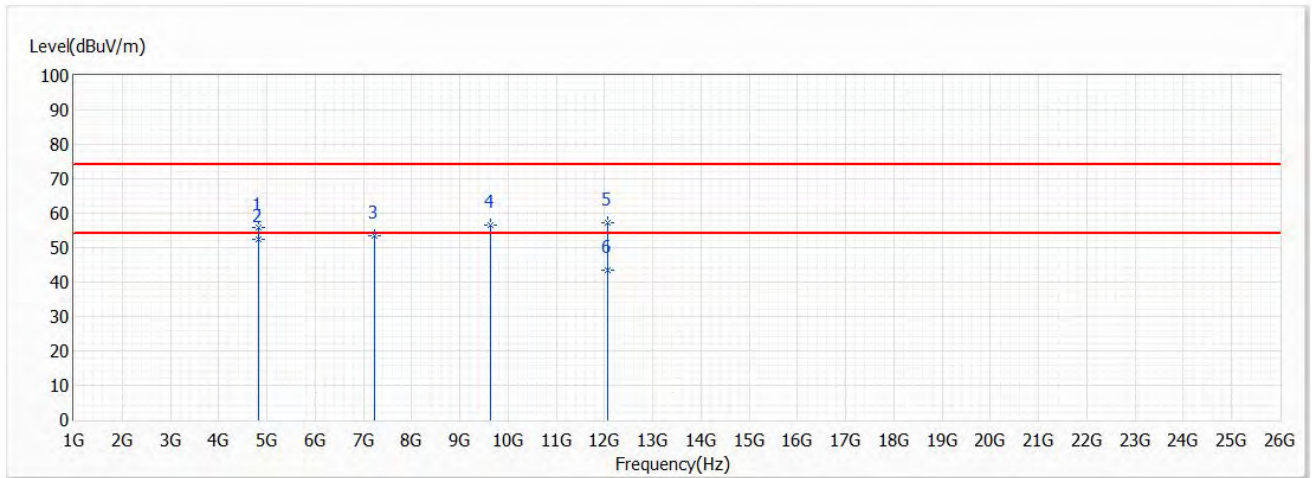


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4824.000	56.83	74.00	-17.17	70.28	-13.45	PK
* 2	4824.000	53.36	54.00	-0.64	66.81	-13.45	AV
3	7236.000	54.59	74.00	-19.41	60.45	-5.86	PK
4	9648.000	55.43	74.00	-18.57	57.79	-2.36	PK
5	12060.000	58.31	74.00	-15.69	57.31	1.00	PK
6	12060.000	44.35	54.00	-9.65	43.35	1.00	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Vertical
Test Condition	802.11b / Ant. 0 + Ant. 1 / 2412 MHz	Test Voltage	AC120V/60Hz

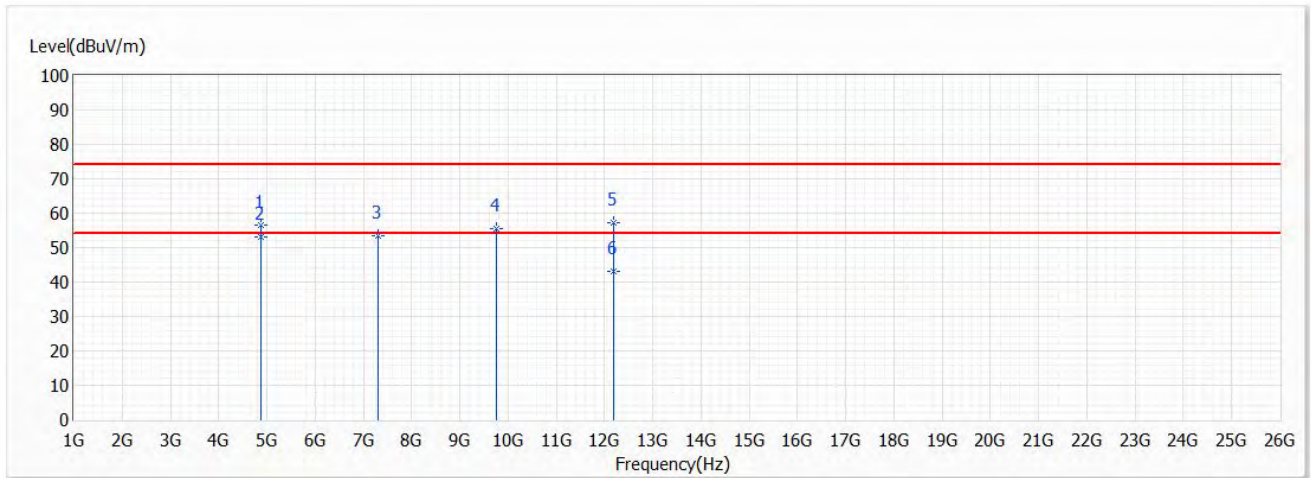


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4824.000	55.85	74.00	-18.15	69.30	-13.45	PK
* 2	4824.000	52.48	54.00	-1.52	65.93	-13.45	AV
3	7236.000	53.29	74.00	-20.71	59.15	-5.86	PK
4	9648.000	56.43	74.00	-17.57	58.79	-2.36	PK
5	12060.000	57.09	74.00	-16.91	56.09	1.00	PK
6	12060.000	43.45	54.00	-10.55	42.45	1.00	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Horizontal
Test Condition	802.11b / Ant. 0 + Ant. 1 / 2437 MHz	Test Voltage	AC120V/60Hz

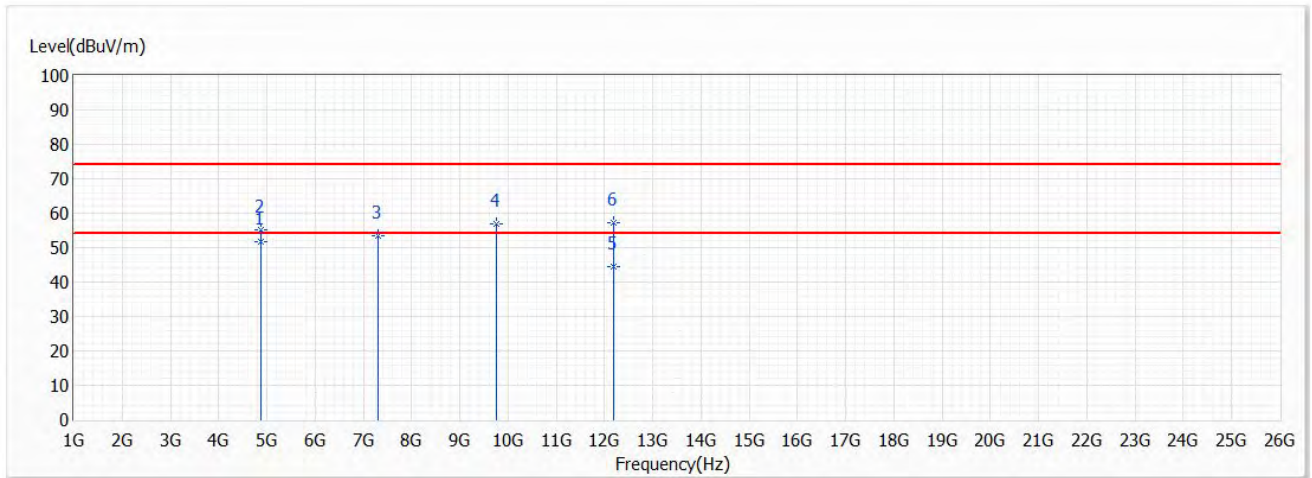


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4874.000	56.45	74.00	-17.55	69.70	-13.25	PK
* 2	4874.000	53.27	54.00	-0.73	66.52	-13.25	AV
3	7311.000	53.61	74.00	-20.39	59.24	-5.63	PK
4	9748.000	55.42	74.00	-18.58	57.53	-2.11	PK
5	12185.000	57.36	74.00	-16.64	56.31	1.05	PK
6	12185.000	43.21	54.00	-10.79	42.16	1.05	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Vertical
Test Condition	802.11b / Ant. 0 + Ant. 1 / 2437 MHz	Test Voltage	AC120V/60Hz

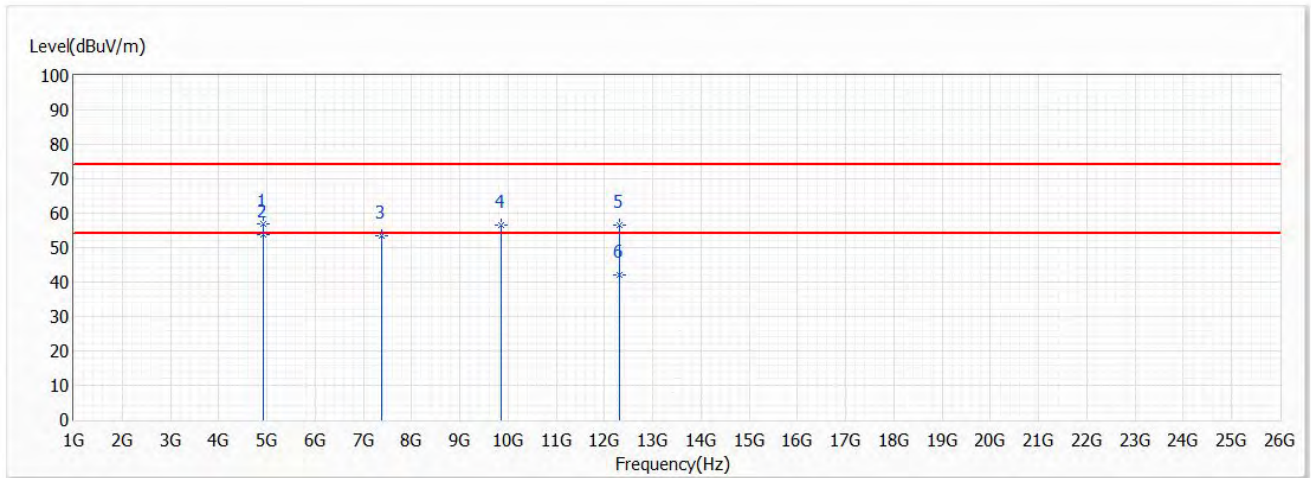


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	4874.000	51.75	54.00	-2.25	65.00	-13.25	AV
2	4874.000	55.34	74.00	-18.66	68.59	-13.25	PK
3	7311.000	53.44	74.00	-20.56	59.07	-5.63	PK
4	9748.000	56.92	74.00	-17.08	59.03	-2.11	PK
5	12185.000	44.37	54.00	-9.63	43.32	1.05	AV
6	12185.000	57.33	74.00	-16.67	56.28	1.05	PK

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Horizontal
Test Condition	802.11b / Ant. 0 + Ant. 1 / 2462 MHz	Test Voltage	AC120V/60Hz

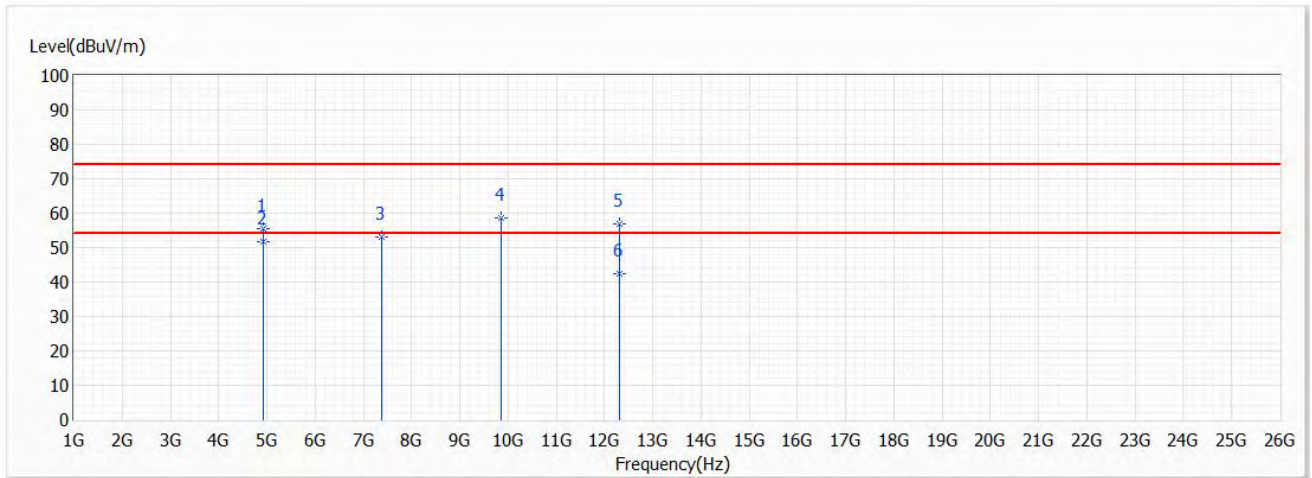


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4924.000	56.88	74.00	-17.12	69.93	-13.05	PK
* 2	4924.000	53.91	54.00	-0.09	66.96	-13.05	AV
3	7386.000	53.38	74.00	-20.62	58.78	-5.40	PK
4	9848.000	56.66	74.00	-17.34	58.52	-1.86	PK
5	12310.000	56.41	74.00	-17.59	55.30	1.11	PK
6	12310.000	42.24	54.00	-11.76	41.13	1.11	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Vertical
Test Condition	802.11b / Ant. 0 + Ant. 1 / 2462 MHz	Test Voltage	AC120V/60Hz

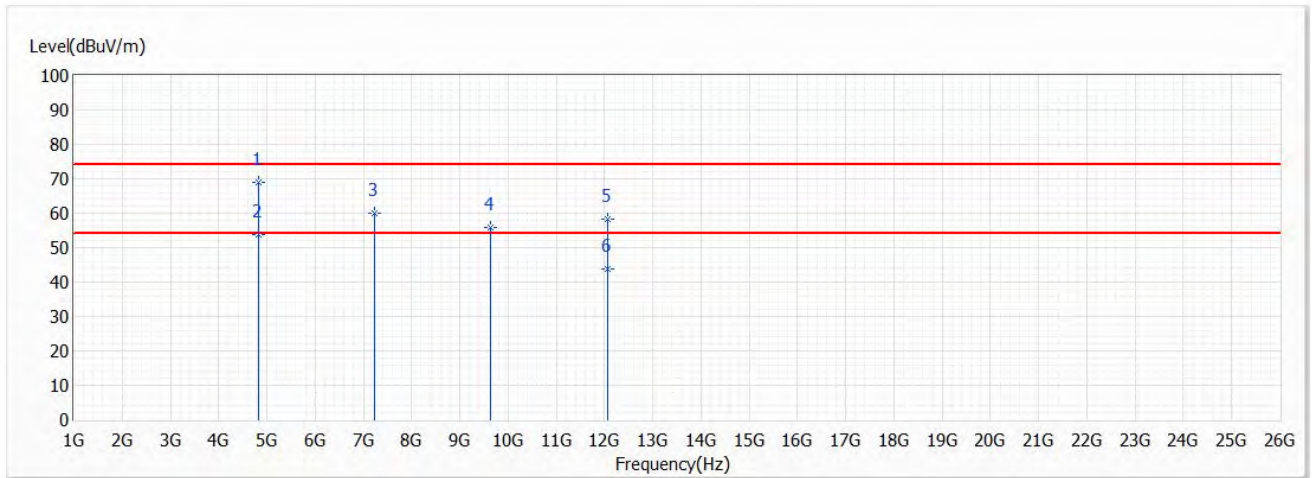


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4924.000	55.37	74.00	-18.63	68.42	-13.05	PK
* 2	4924.000	51.73	54.00	-2.27	64.78	-13.05	AV
3	7386.000	53.27	74.00	-20.73	58.67	-5.40	PK
4	9848.000	58.46	74.00	-15.54	60.32	-1.86	PK
5	12310.000	56.77	74.00	-17.23	55.66	1.11	PK
6	12310.000	42.56	54.00	-11.44	41.45	1.11	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Horizontal
Test Condition	802.11g / Ant. 0 + Ant. 1 / 2412 MHz	Test Voltage	AC120V/60Hz

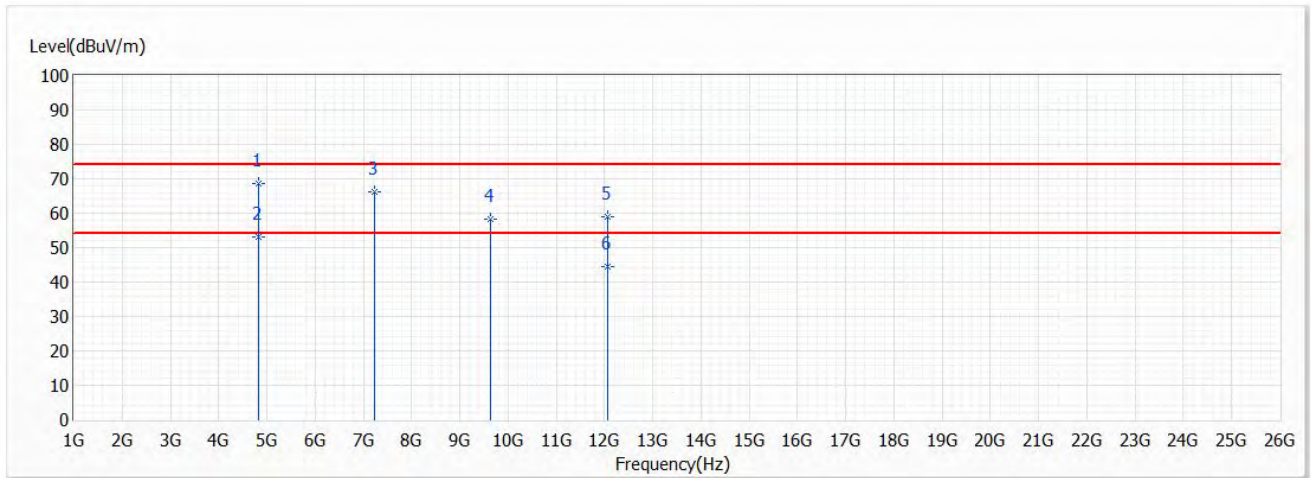


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4824.000	68.94	74.00	-5.06	82.39	-13.45	PK
* 2	4824.000	53.87	54.00	-0.13	67.32	-13.45	AV
3	7236.000	59.93	74.00	-14.07	65.79	-5.86	PK
4	9648.000	55.83	74.00	-18.17	58.19	-2.36	PK
5	12060.000	58.33	74.00	-15.67	57.33	1.00	PK
6	12060.000	43.73	54.00	-10.27	42.73	1.00	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Vertical
Test Condition	802.11g / Ant. 0 + Ant. 1 / 2412 MHz	Test Voltage	AC120V/60Hz

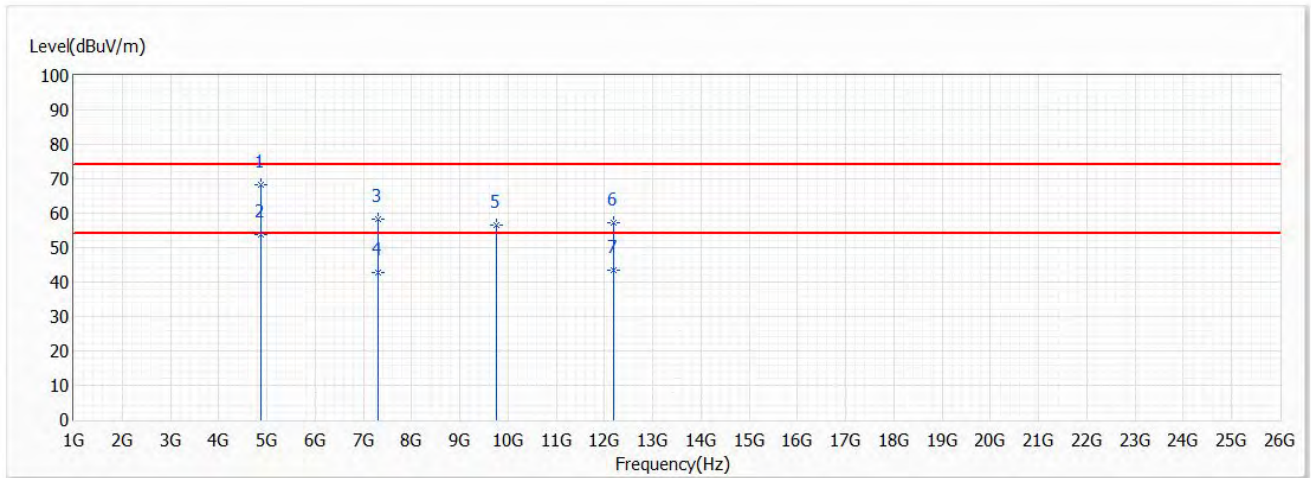


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4824.000	68.58	74.00	-5.42	82.03	-13.45	PK
* 2	4824.000	53.11	54.00	-0.89	66.56	-13.45	AV
3	7236.000	66.14	74.00	-7.86	72.00	-5.86	PK
4	9648.000	58.13	74.00	-15.87	60.49	-2.36	PK
5	12060.000	58.91	74.00	-15.09	57.91	1.00	PK
6	12060.000	44.38	54.00	-9.62	43.38	1.00	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Horizontal
Test Condition	802.11g / Ant. 0 + Ant. 1 / 2437 MHz	Test Voltage	AC120V/60Hz

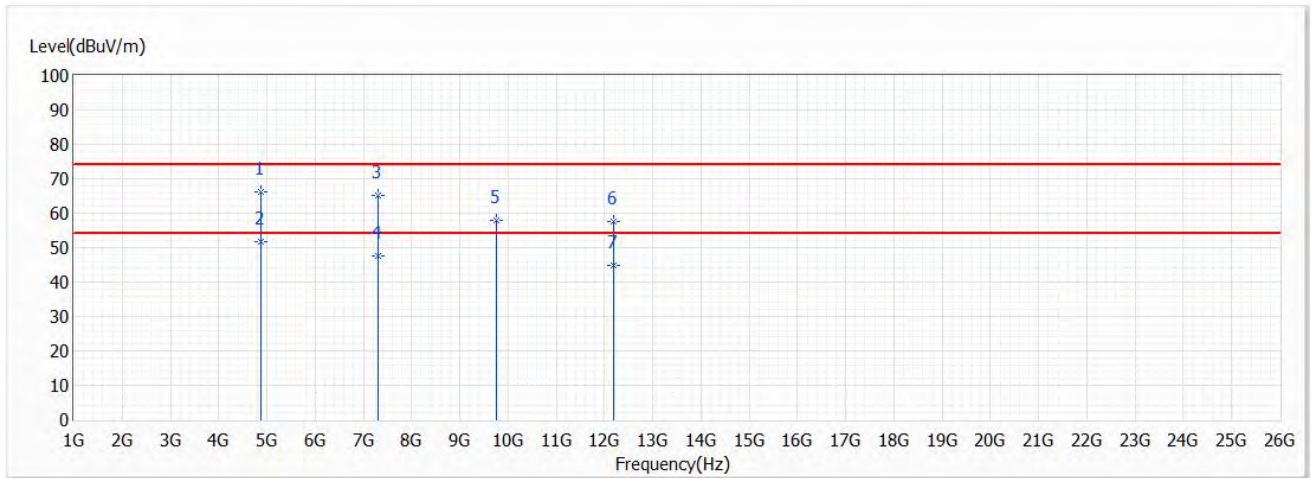


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4874.000	68.39	74.00	-5.61	81.64	-13.25	PK
* 2	4874.000	53.72	54.00	-0.28	66.97	-13.25	AV
3	7311.000	58.31	74.00	-15.69	63.94	-5.63	PK
4	7311.000	42.67	54.00	-11.33	48.30	-5.63	AV
5	9748.000	56.57	74.00	-17.43	58.68	-2.11	PK
6	12185.000	57.38	74.00	-16.62	56.33	1.05	PK
7	12185.000	43.28	54.00	-10.72	42.23	1.05	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Vertical
Test Condition	802.11g / Ant. 0 + Ant. 1 / 2437 MHz	Test Voltage	AC120V/60Hz

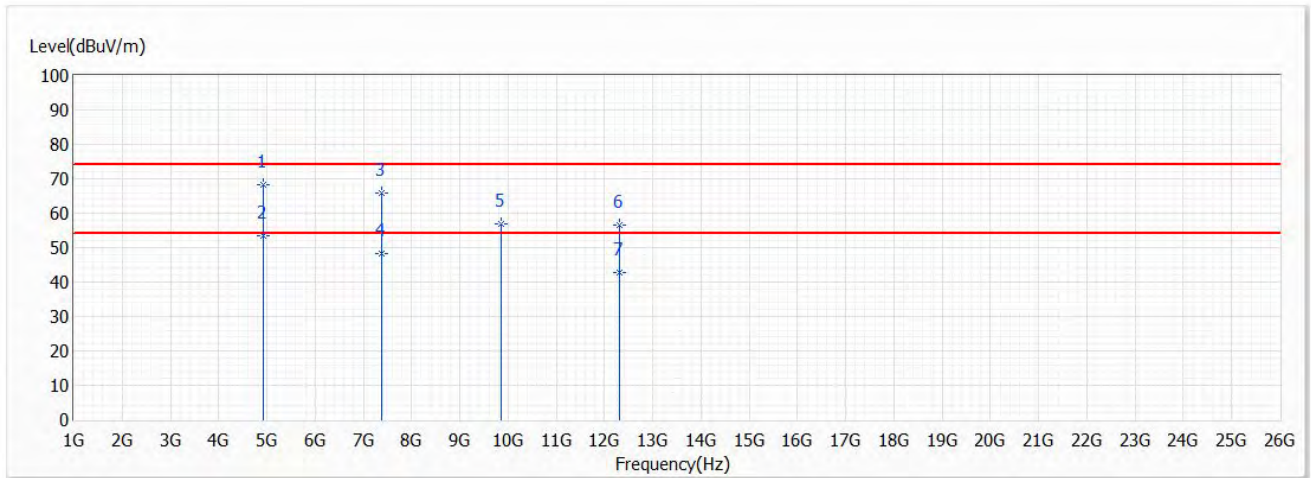


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4874.000	66.31	74.00	-7.69	79.56	-13.25	PK
* 2	4874.000	51.69	54.00	-2.31	64.94	-13.25	AV
3	7311.000	65.13	74.00	-8.87	70.76	-5.63	PK
4	7311.000	47.75	54.00	-6.25	53.38	-5.63	AV
5	9748.000	58.06	74.00	-15.94	60.17	-2.11	PK
6	12185.000	57.65	74.00	-16.35	56.60	1.05	PK
7	12185.000	44.89	54.00	-9.11	43.84	1.05	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Horizontal
Test Condition	802.11g / Ant. 0 + Ant. 1 / 2462 MHz	Test Voltage	AC120V/60Hz

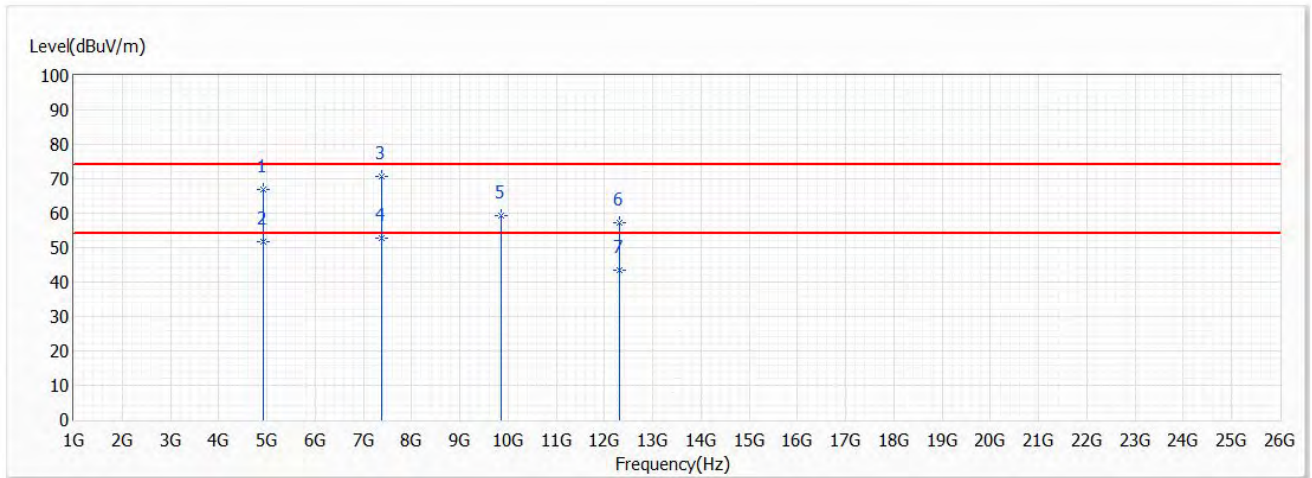


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4924.000	68.39	74.00	-5.61	81.44	-13.05	PK
* 2	4924.000	53.43	54.00	-0.57	66.48	-13.05	AV
3	7386.000	65.93	74.00	-8.07	71.33	-5.40	PK
4	7386.000	48.26	54.00	-5.74	53.66	-5.40	AV
5	9848.000	56.85	74.00	-17.15	58.71	-1.86	PK
6	12310.000	56.46	74.00	-17.54	55.35	1.11	PK
7	12310.000	42.69	54.00	-11.31	41.58	1.11	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Vertical
Test Condition	802.11g / Ant. 0 + Ant. 1 / 2462 MHz	Test Voltage	AC120V/60Hz

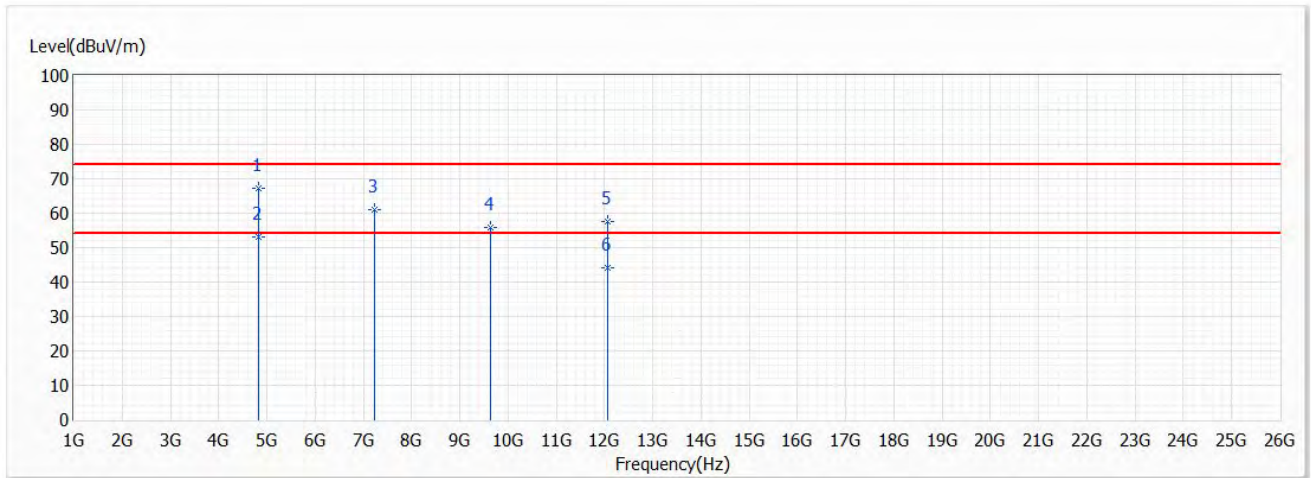


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4924.000	66.76	74.00	-7.24	79.81	-13.05	PK
2	4924.000	51.78	54.00	-2.22	64.83	-13.05	AV
3	7386.000	70.76	74.00	-3.24	76.16	-5.40	PK
* 4	7386.000	52.69	54.00	-1.31	58.09	-5.40	AV
5	9848.000	59.18	74.00	-14.82	61.04	-1.86	PK
6	12310.000	57.41	74.00	-16.59	56.30	1.11	PK
7	12310.000	43.47	54.00	-10.53	42.36	1.11	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Horizontal
Test Condition	802.11n (20 MHz) / Ant. 0 + Ant. 1 / 2412 MHz	Test Voltage	AC120V/60Hz

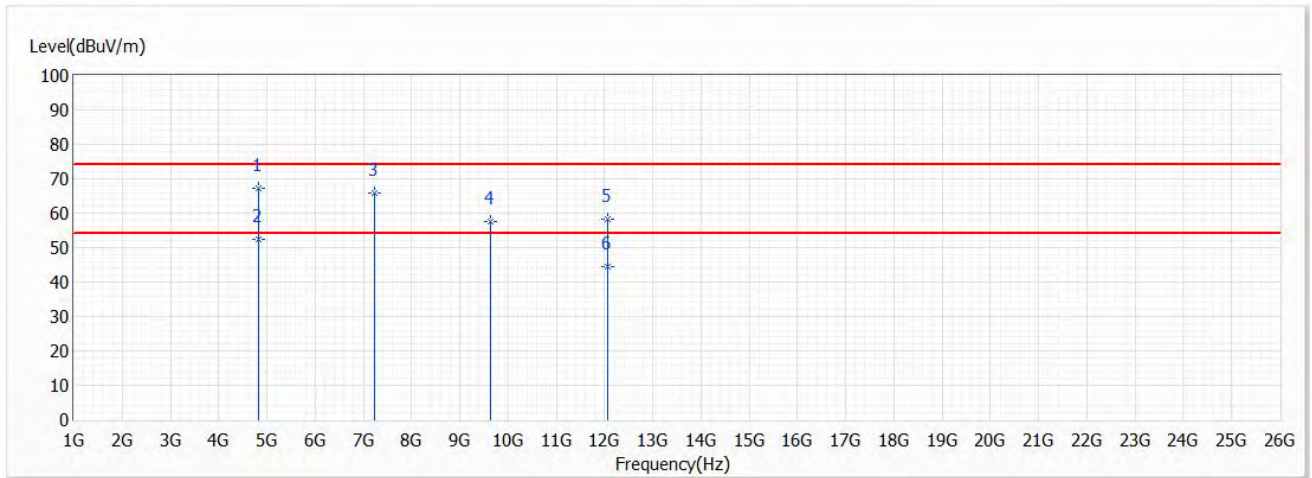


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4824.000	67.29	74.00	-6.71	80.74	-13.45	PK
* 2	4824.000	53.26	54.00	-0.74	66.71	-13.45	AV
3	7236.000	60.94	74.00	-13.06	66.80	-5.86	PK
4	9648.000	55.89	74.00	-18.11	58.25	-2.36	PK
5	12060.000	57.56	74.00	-16.44	56.56	1.00	PK
6	12060.000	44.23	54.00	-9.77	43.23	1.00	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Vertical
Test Condition	802.11n (20 MHz) / Ant. 0 + Ant. 1 / 2412 MHz	Test Voltage	AC120V/60Hz

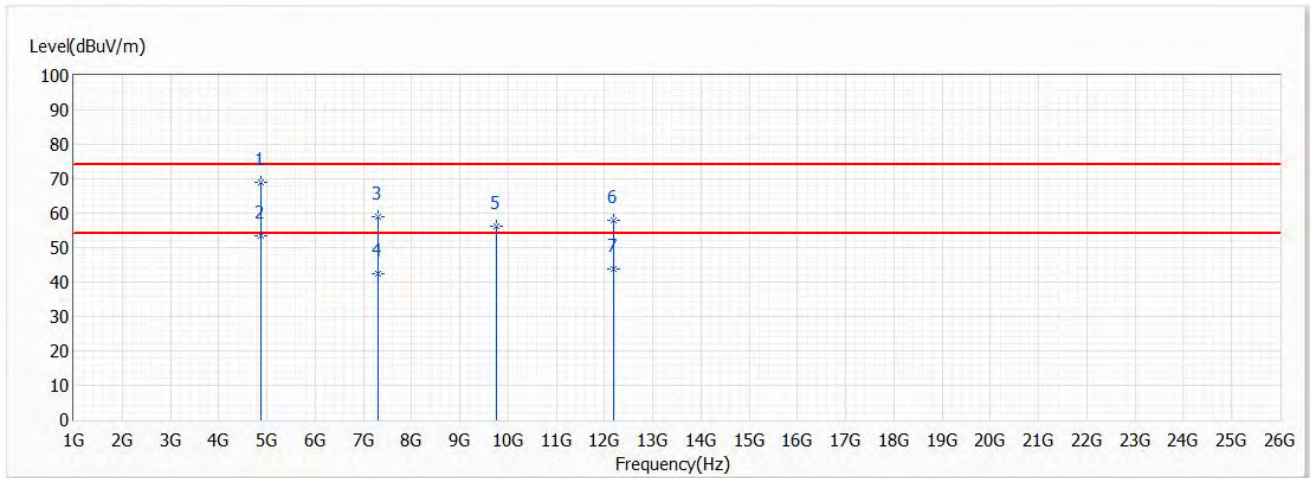


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4824.000	67.07	74.00	-6.93	80.52	-13.45	PK
* 2	4824.000	52.49	54.00	-1.51	65.94	-13.45	AV
3	7236.000	65.88	74.00	-8.12	71.74	-5.86	PK
4	9648.000	57.66	74.00	-16.34	60.02	-2.36	PK
5	12060.000	58.15	74.00	-15.85	57.15	1.00	PK
6	12060.000	44.37	54.00	-9.63	43.37	1.00	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Horizontal
Test Condition	802.11n (20 MHz) / Ant. 0 + Ant. 1 / 2437 MHz	Test Voltage	AC120V/60Hz

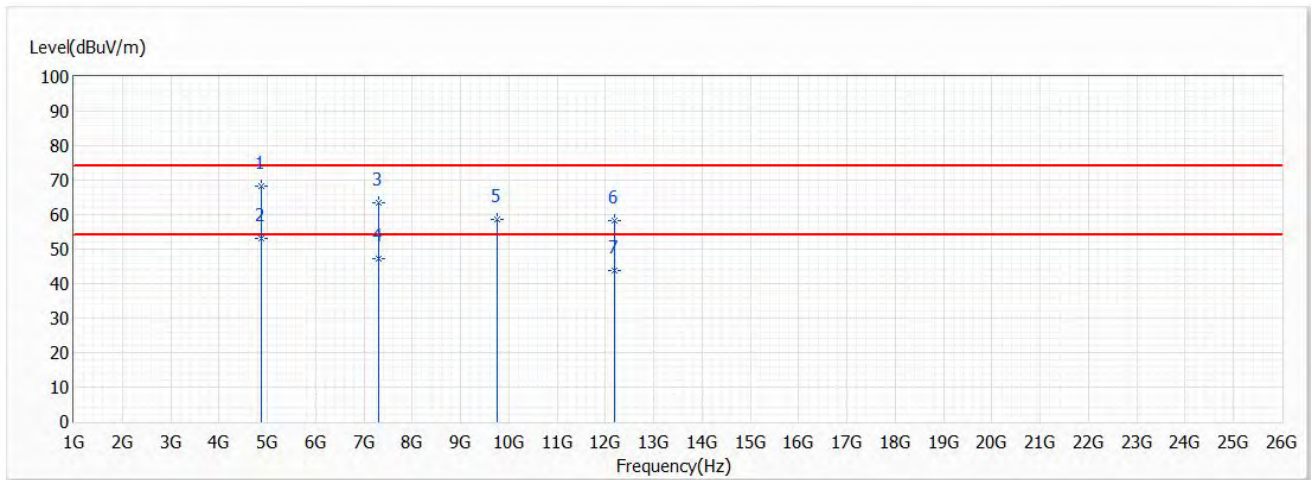


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4874.000	68.96	74.00	-5.04	82.21	-13.25	PK
* 2	4874.000	53.58	54.00	-0.42	66.83	-13.25	AV
3	7311.000	59.13	74.00	-14.87	64.76	-5.63	PK
4	7311.000	42.44	54.00	-11.56	48.07	-5.63	AV
5	9748.000	56.04	74.00	-17.96	58.15	-2.11	PK
6	12185.000	57.81	74.00	-16.19	56.76	1.05	PK
7	12185.000	43.96	54.00	-10.04	42.91	1.05	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Vertical
Test Condition	802.11n (20 MHz) / Ant. 0 + Ant. 1 / 2437 MHz	Test Voltage	AC120V/60Hz

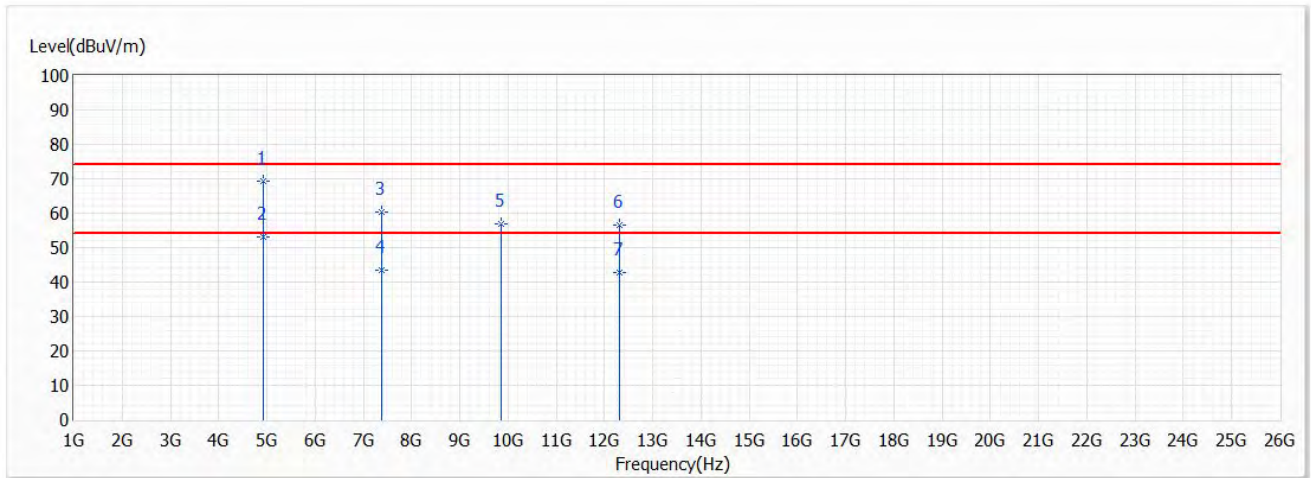


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4874.000	68.11	74.00	-5.89	81.36	-13.25	PK
* 2	4874.000	53.18	54.00	-0.82	66.43	-13.25	AV
3	7311.000	63.58	74.00	-10.42	69.21	-5.63	PK
4	7311.000	47.33	54.00	-6.67	52.96	-5.63	AV
5	9748.000	58.63	74.00	-15.37	60.74	-2.11	PK
6	12185.000	58.42	74.00	-15.58	57.37	1.05	PK
7	12185.000	43.92	54.00	-10.08	42.87	1.05	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Horizontal
Test Condition	802.11n (20 MHz) / Ant. 0 + Ant. 1 / 2462 MHz	Test Voltage	AC120V/60Hz

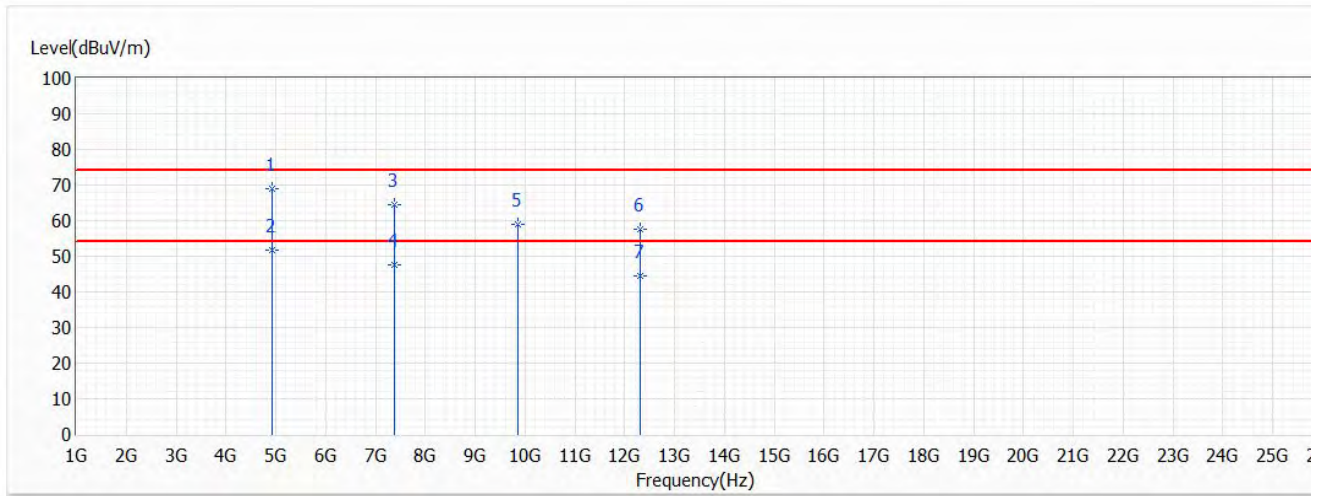


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4924.000	69.28	74.00	-4.72	82.33	-13.05	PK
* 2	4924.000	53.18	54.00	-0.82	66.23	-13.05	AV
3	7386.000	60.22	74.00	-13.78	65.62	-5.40	PK
4	7386.000	43.39	54.00	-10.61	48.79	-5.40	AV
5	9848.000	56.77	74.00	-17.23	58.63	-1.86	PK
6	12310.000	56.48	74.00	-17.52	55.37	1.11	PK
7	12310.000	42.85	54.00	-11.15	41.74	1.11	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Vertical
Test Condition	802.11n (20 MHz) / Ant. 0 + Ant. 1 / 2462 MHz	Test Voltage	AC120V/60Hz

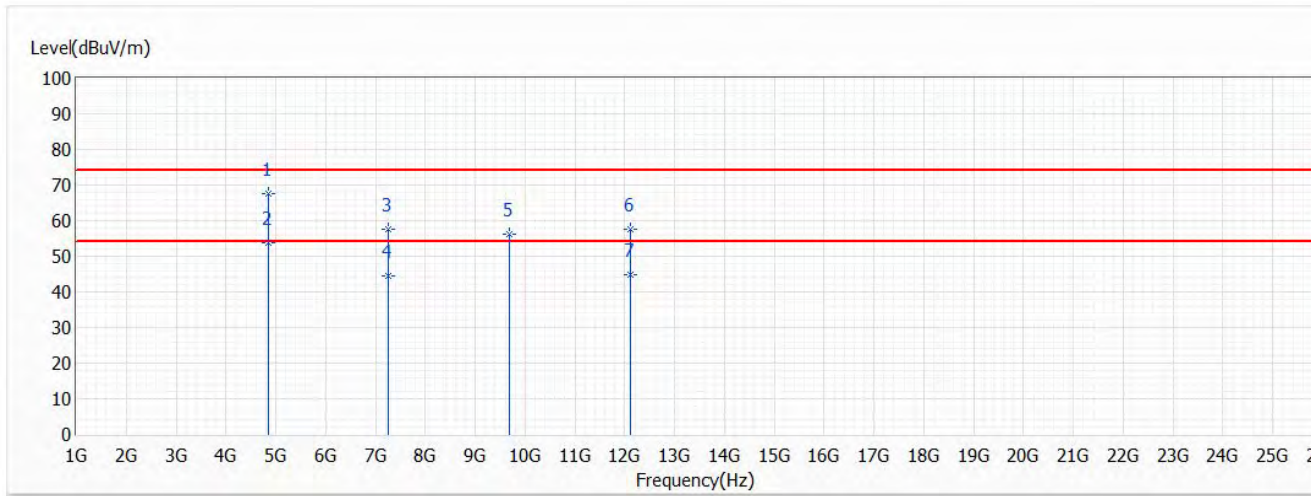


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4924.000	68.85	74.00	-5.15	81.90	-13.05	PK
* 2	4924.000	51.79	54.00	-2.21	64.84	-13.05	AV
3	7386.000	64.52	74.00	-9.48	69.92	-5.40	PK
4	7386.000	47.75	54.00	-6.25	53.15	-5.40	AV
5	9848.000	59.07	74.00	-14.93	60.93	-1.86	PK
6	12310.000	57.64	74.00	-16.36	56.53	1.11	PK
7	12310.000	44.56	54.00	-9.44	43.45	1.11	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Horizontal
Test Condition	802.11n (40 MHz) / Ant. 0 + Ant. 1 / 2422 MHz	Test Voltage	AC120V/60Hz

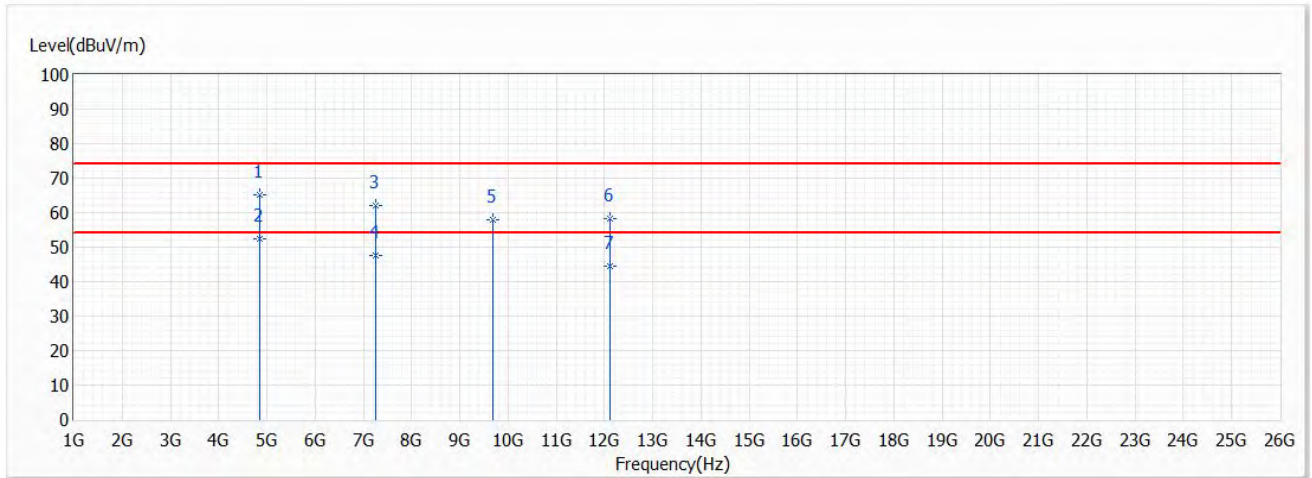


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4844.000	67.47	74.00	-6.53	80.85	-13.38	PK
* 2	4844.000	53.88	54.00	-0.12	67.26	-13.38	AV
3	7266.000	57.67	74.00	-16.33	63.43	-5.76	PK
4	7266.000	44.61	54.00	-9.39	50.37	-5.76	AV
5	9688.000	56.33	74.00	-17.67	58.59	-2.26	PK
6	12110.000	57.69	74.00	-16.31	56.67	1.02	PK
7	12110.000	44.75	54.00	-9.25	43.73	1.02	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Vertical
Test Condition	802.11n (40 MHz) / Ant. 0 + Ant. 1 / 2422 MHz	Test Voltage	AC120V/60Hz

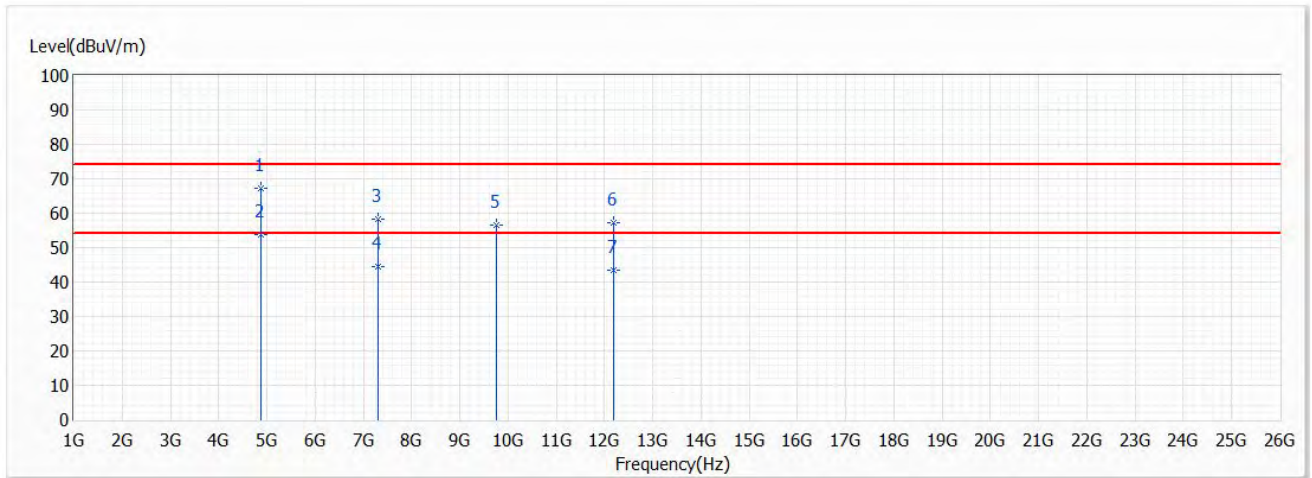


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4844.000	65.21	74.00	-8.79	78.59	-13.38	PK
* 2	4844.000	52.47	54.00	-1.53	65.85	-13.38	AV
3	7266.000	62.11	74.00	-11.89	67.87	-5.76	PK
4	7266.000	47.62	54.00	-6.38	53.38	-5.76	AV
5	9688.000	57.87	74.00	-16.13	60.13	-2.26	PK
6	12110.000	58.24	74.00	-15.76	57.22	1.02	PK
7	12110.000	44.54	54.00	-9.46	43.52	1.02	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Horizontal
Test Condition	802.11n (40 MHz) / Ant. 0 + Ant. 1 / 2437 MHz	Test Voltage	AC120V/60Hz

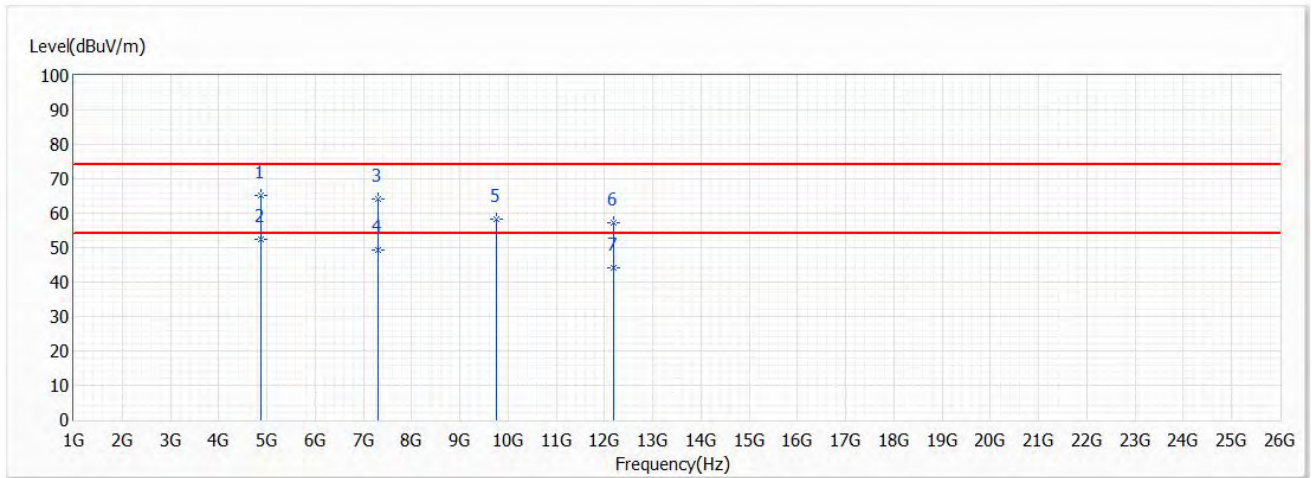


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4874.000	67.33	74.00	-6.67	80.58	-13.25	PK
* 2	4874.000	53.76	54.00	-0.24	67.01	-13.25	AV
3	7311.000	58.32	74.00	-15.68	63.95	-5.63	PK
4	7311.000	44.61	54.00	-9.39	50.24	-5.63	AV
5	9748.000	56.45	74.00	-17.55	58.56	-2.11	PK
6	12185.000	57.41	74.00	-16.59	56.36	1.05	PK
7	12185.000	43.49	54.00	-10.51	42.44	1.05	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Vertical
Test Condition	802.11n (40 MHz) / Ant. 0 + Ant. 1 / 2437 MHz	Test Voltage	AC120V/60Hz

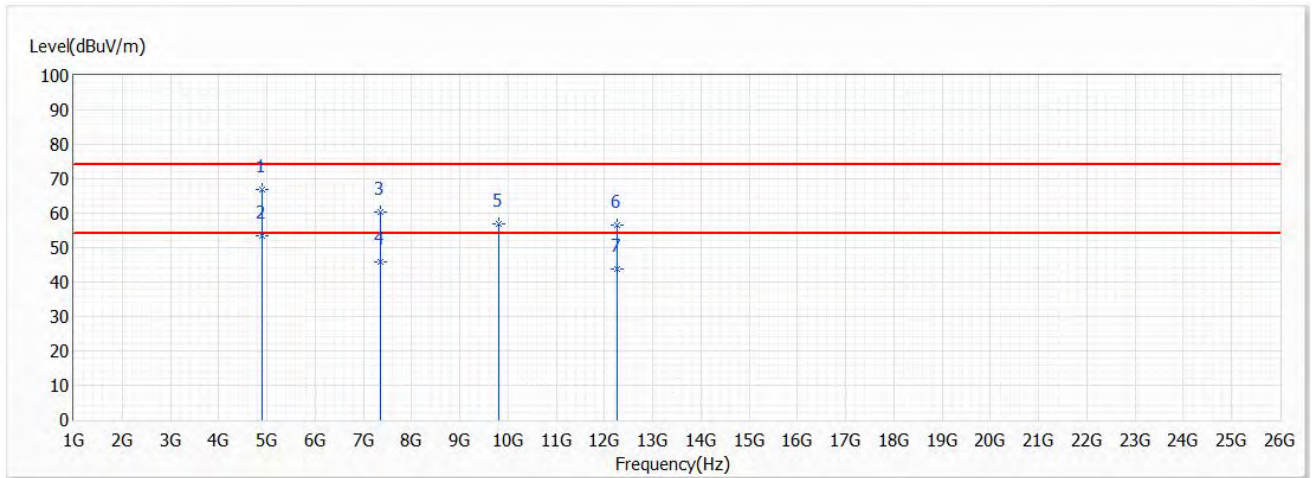


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4874.000	65.16	74.00	-8.84	78.41	-13.25	PK
* 2	4874.000	52.33	54.00	-1.67	65.58	-13.25	AV
3	7311.000	64.24	74.00	-9.76	69.87	-5.63	PK
4	7311.000	49.21	54.00	-4.79	54.84	-5.63	AV
5	9748.000	58.36	74.00	-15.64	60.47	-2.11	PK
6	12185.000	57.18	74.00	-16.82	56.13	1.05	PK
7	12185.000	44.23	54.00	-9.77	43.18	1.05	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Horizontal
Test Condition	802.11n (40 MHz) / Ant. 0 + Ant. 1 / 2452 MHz	Test Voltage	AC120V/60Hz

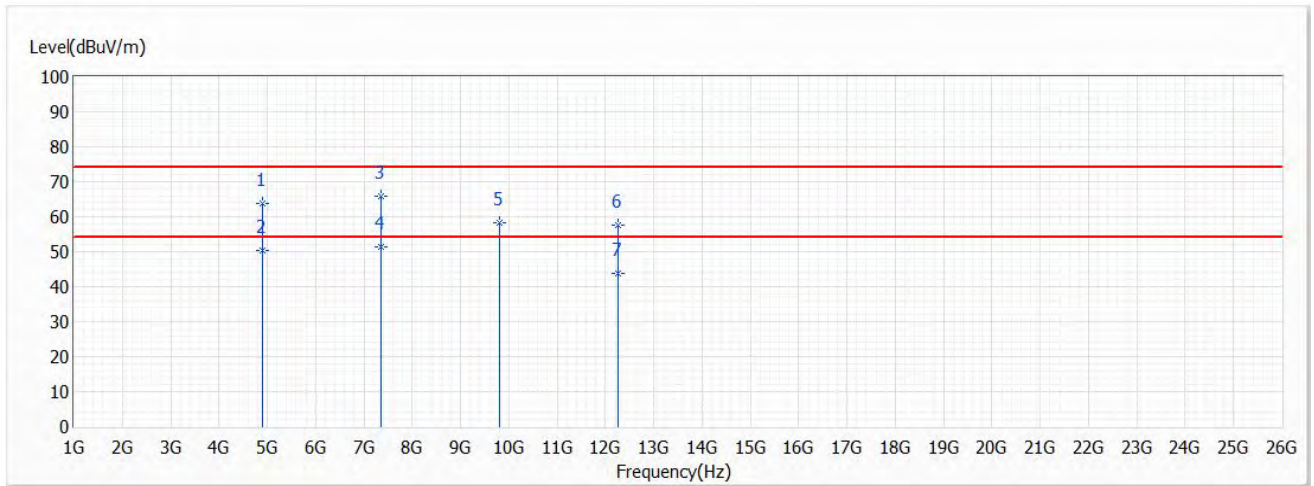


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4904.000	66.85	74.00	-7.15	79.98	-13.13	PK
* 2	4904.000	53.32	54.00	-0.68	66.45	-13.13	AV
3	7356.000	60.33	74.00	-13.67	65.83	-5.50	PK
4	7356.000	45.74	54.00	-8.26	51.24	-5.50	AV
5	9808.000	56.85	74.00	-17.15	58.81	-1.96	PK
6	12260.000	56.57	74.00	-17.43	55.49	1.08	PK
7	12260.000	43.65	54.00	-10.35	42.57	1.08	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

Test Mode	Mode 1: Transmit (Adapter)	Polarity	Vertical
Test Condition	802.11n (40 MHz) / Ant. 0 + Ant. 1 / 2452 MHz	Test Voltage	AC120V/60Hz



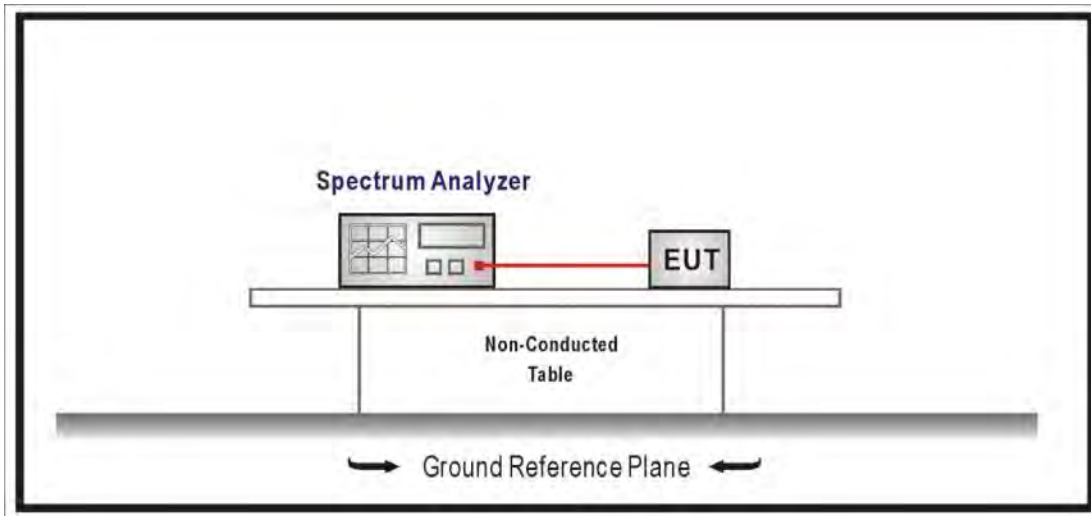
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4904.000	63.69	74.00	-10.31	76.82	-13.13	PK
2	4904.000	50.49	54.00	-3.51	63.62	-13.13	AV
3	7356.000	65.98	74.00	-8.02	71.48	-5.50	PK
* 4	7356.000	51.52	54.00	-2.48	57.02	-5.50	AV
5	9808.000	58.33	74.00	-15.67	60.29	-1.96	PK
6	12260.000	57.62	74.00	-16.38	56.54	1.08	PK
7	12260.000	43.81	54.00	-10.19	42.73	1.08	AV

Note:

- 1.All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst value.
- 3.Emission Level = Reading Level + Correct Factor.
- 4.The average measurement was not performed when the peak measured data under the limit of average detection.
- 5.The emission above 13GHz were not included is because their levels are lower than 20dB form limit.

5. Antenna Port Conducted Emission

5.1. Test Setup



5.2. Test Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limit. If the transmitter complies with the conducted power limit based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limit specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limit specified in §15.209(a) (see §15.205(c)).

5.3. Test Procedure

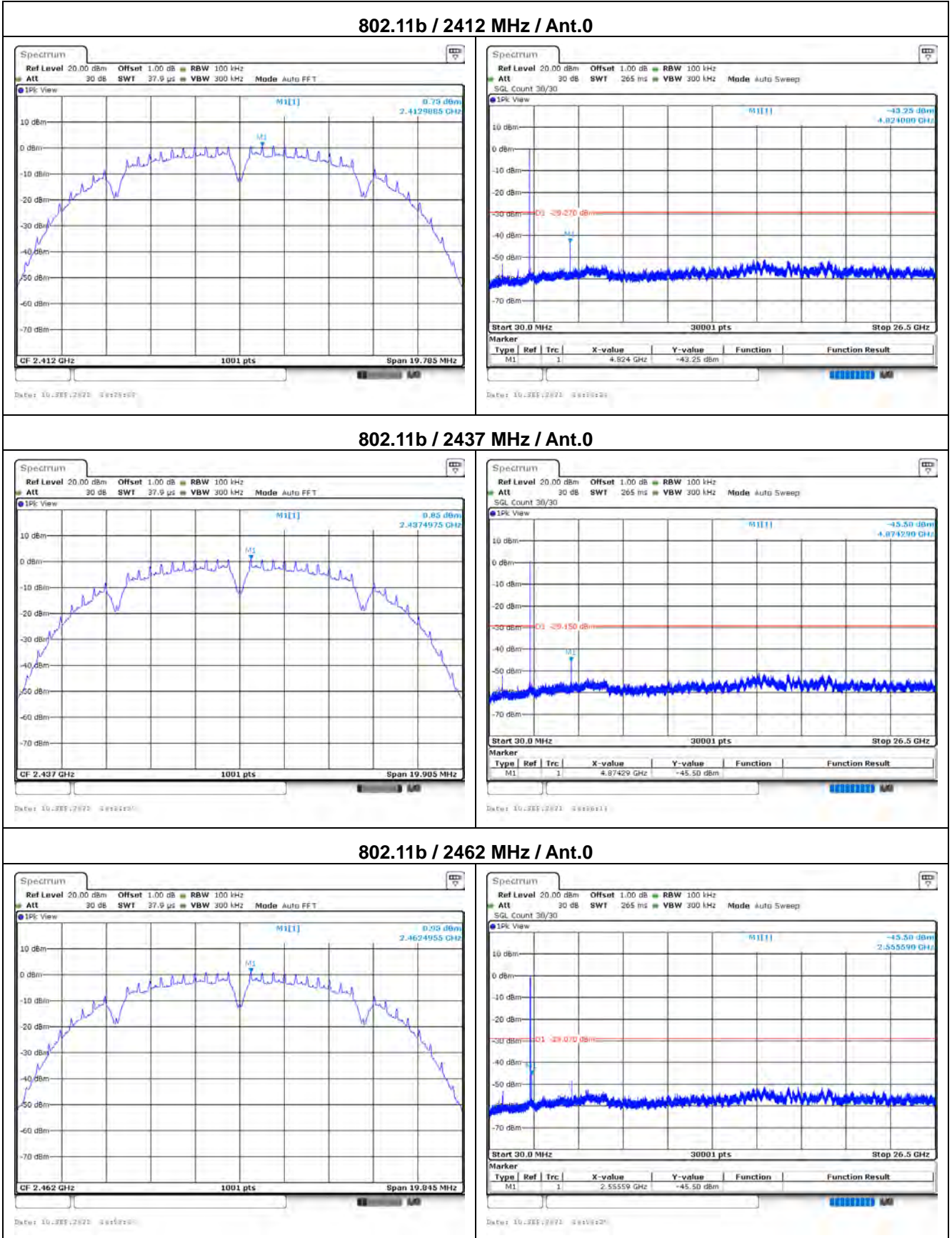
The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB 558074 D01 V05r02 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Set VBW > RBW, scan up through 10th harmonic.

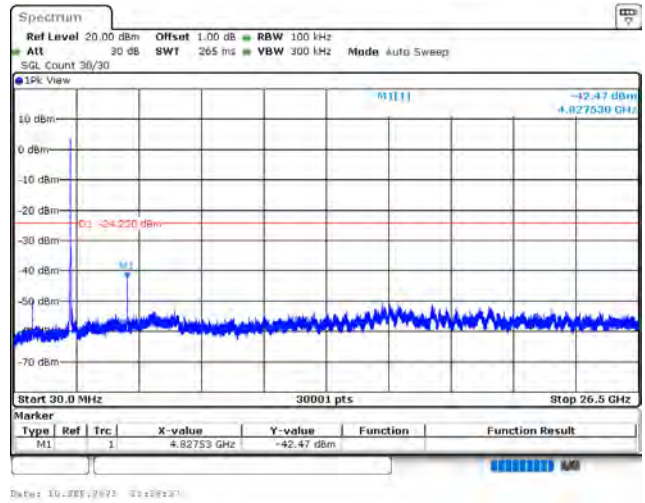
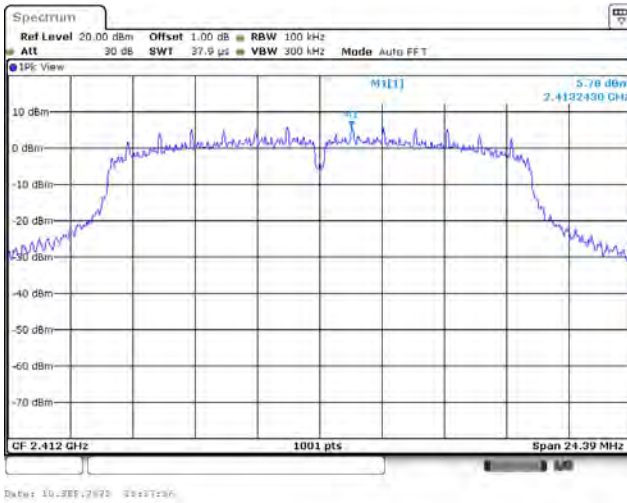
5.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247.

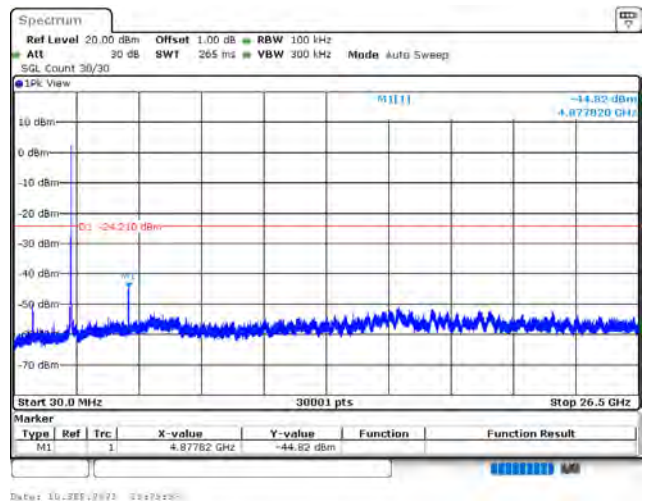
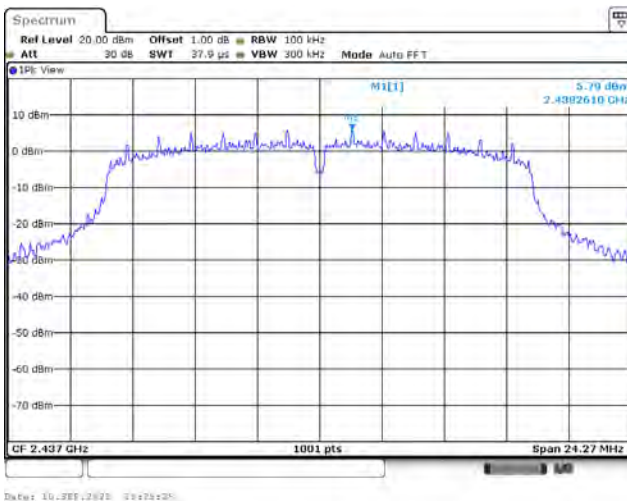
5.5. Test Result of Antenna Port Conducted Emission



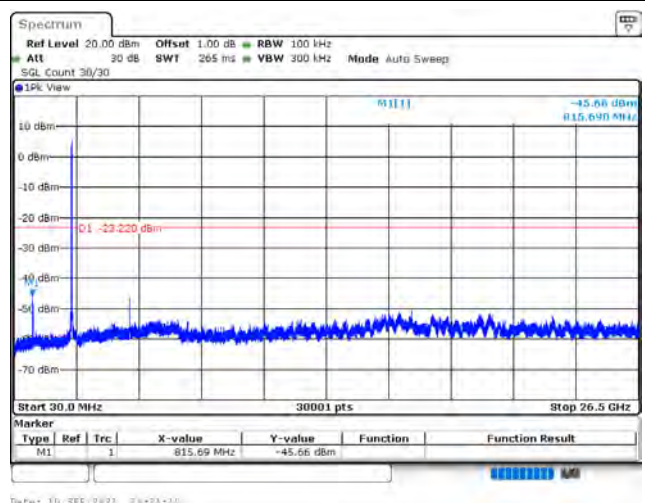
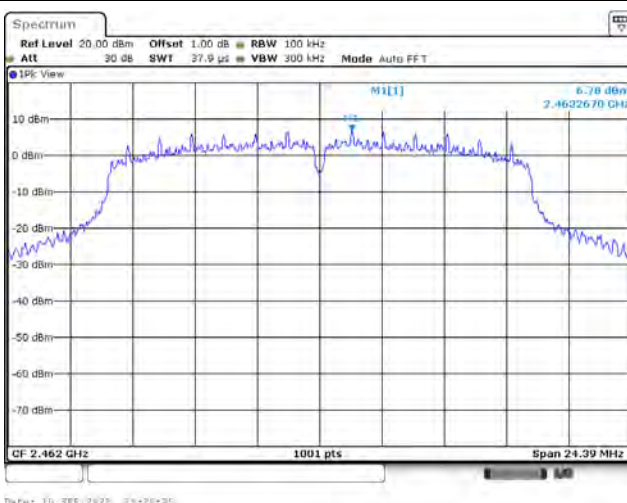
802.11g / 2412 MHz / Ant.0



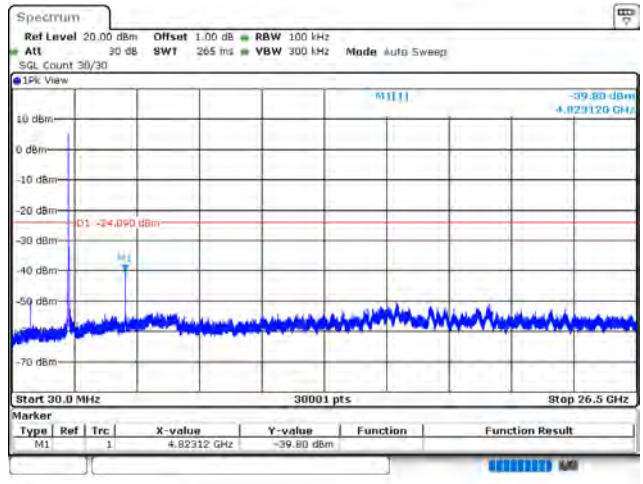
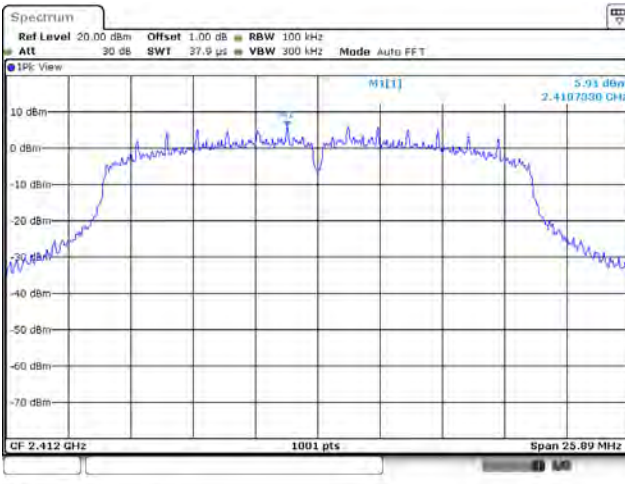
802.11g / 2437 MHz / Ant.0



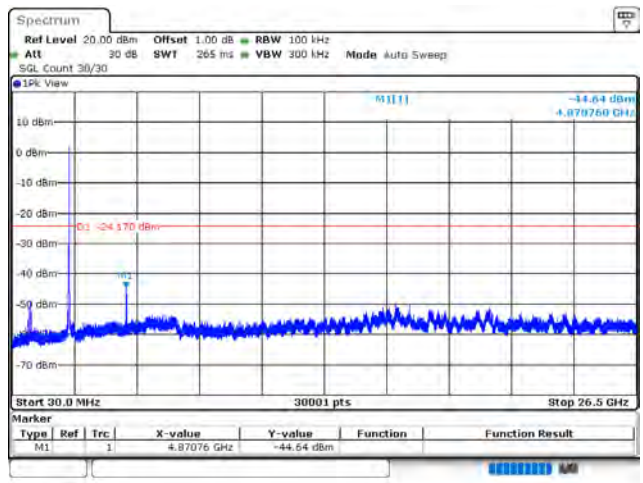
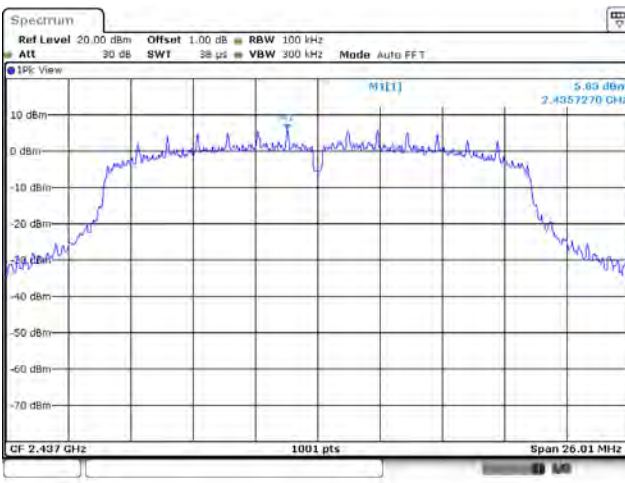
802.11g / 2462 MHz / Ant.0



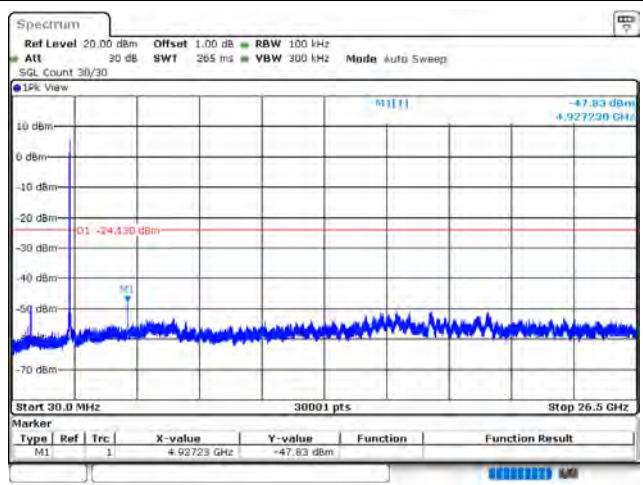
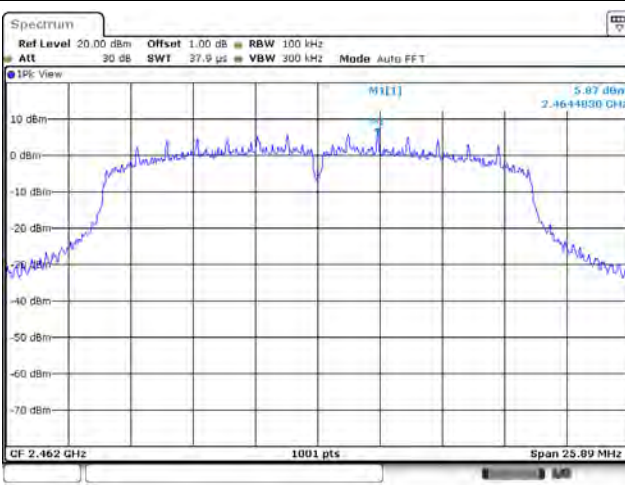
802.11n (20 MHz) / 2412 MHz / Ant.0



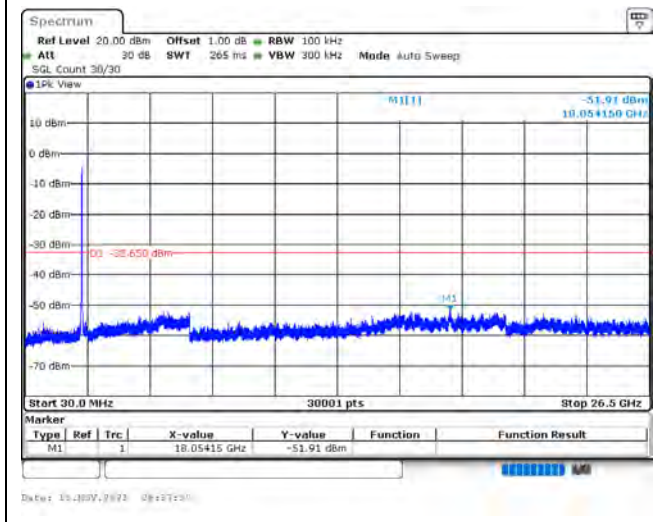
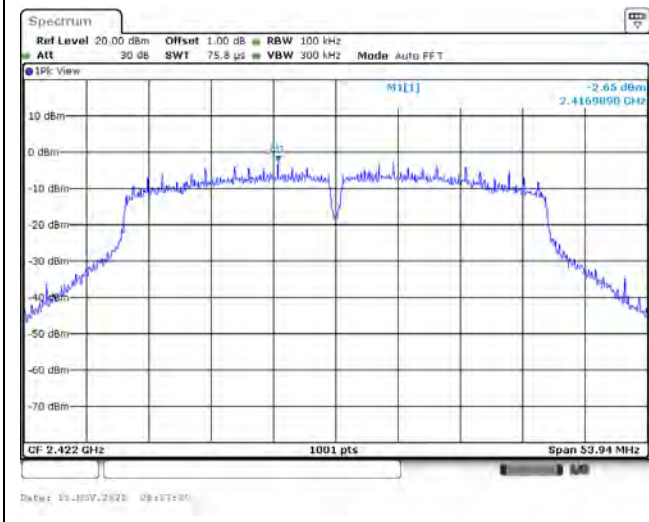
802.11n (20 MHz) / 2437 MHz / Ant.0



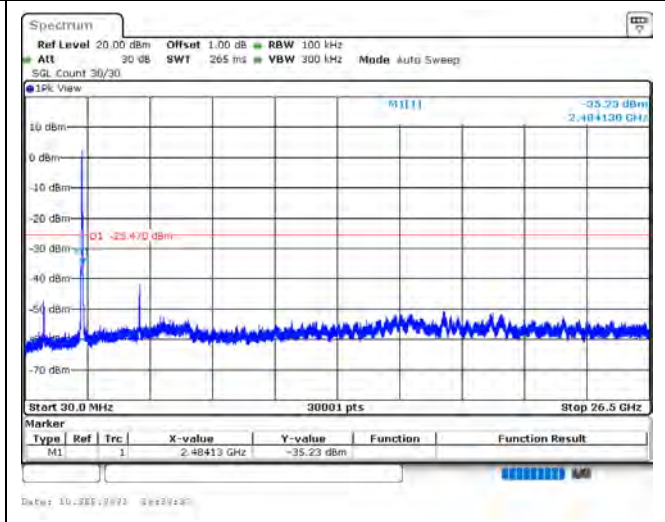
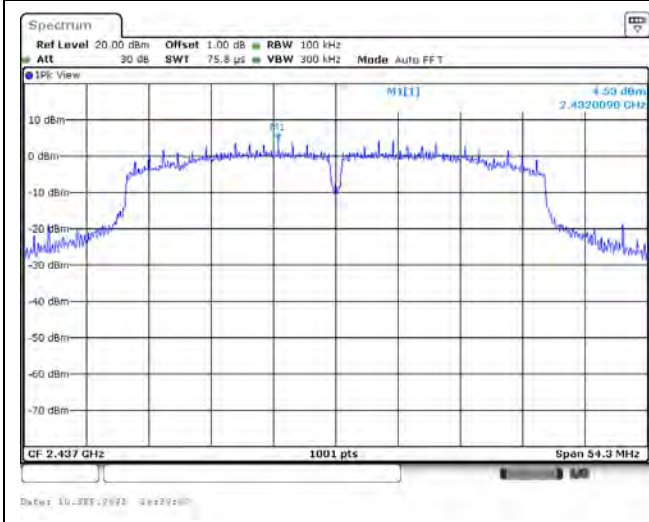
802.11n (20 MHz) / 2462 MHz / Ant.0



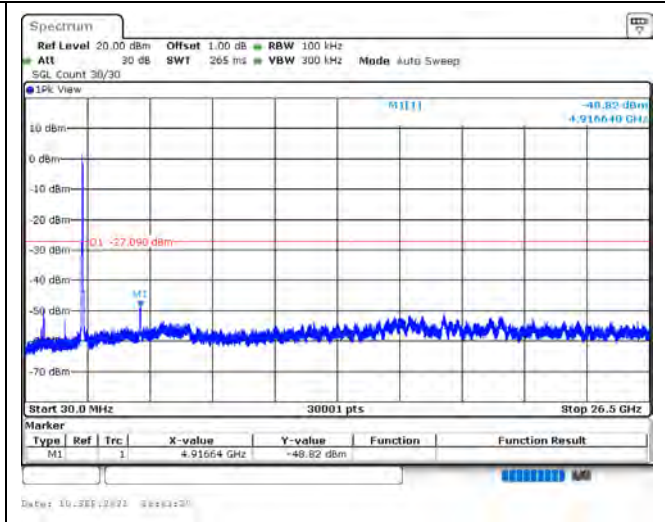
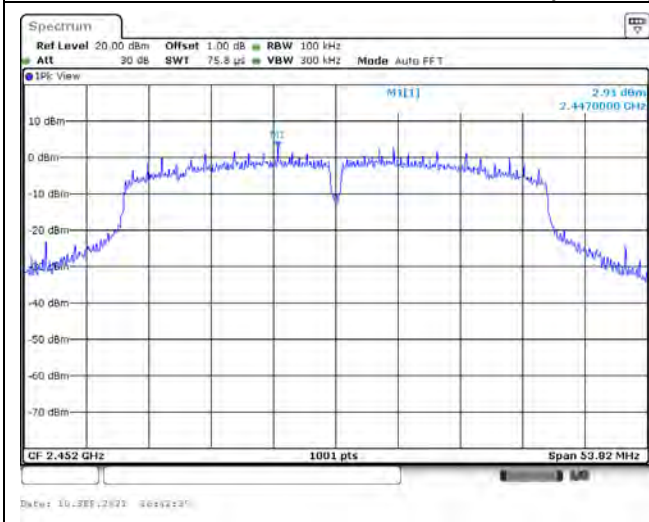
802.11n (40 MHz) / 2422 MHz / Ant.0



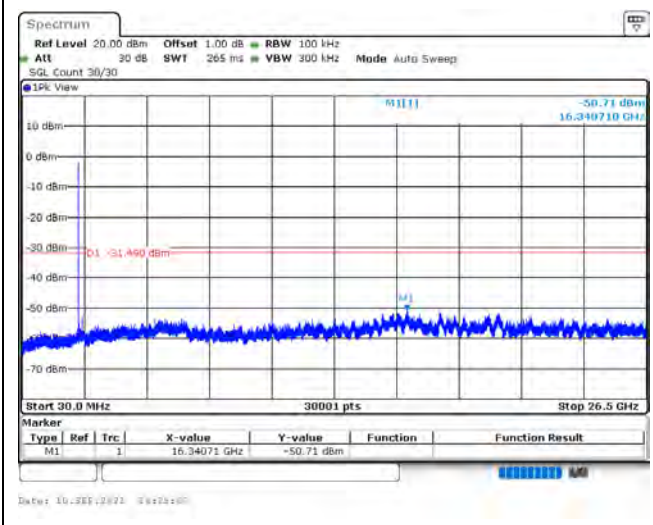
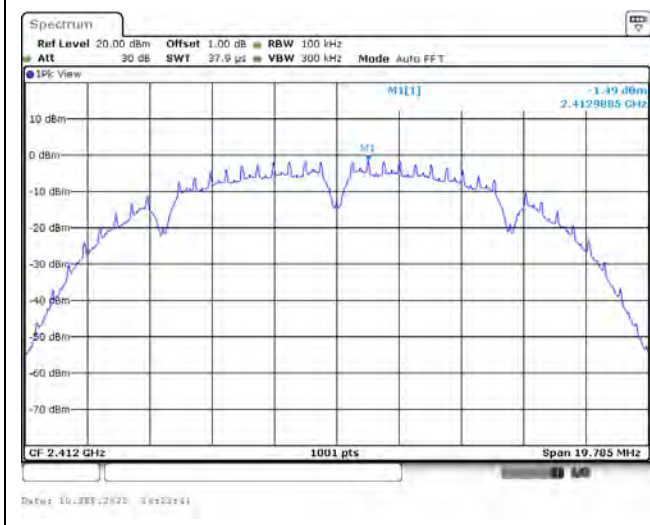
802.11n (40 MHz) / 2437 MHz / Ant.0



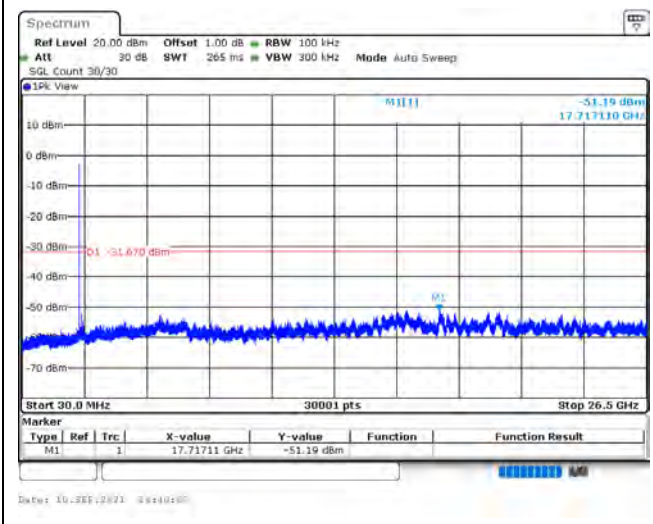
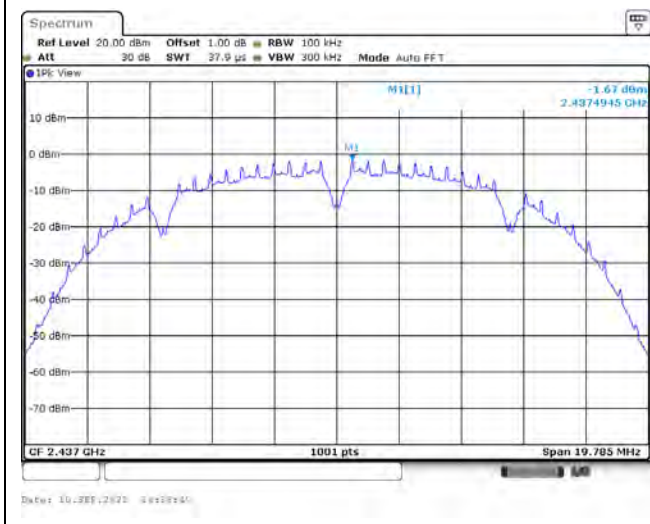
802.11n (40 MHz) / 2452 MHz / Ant.0



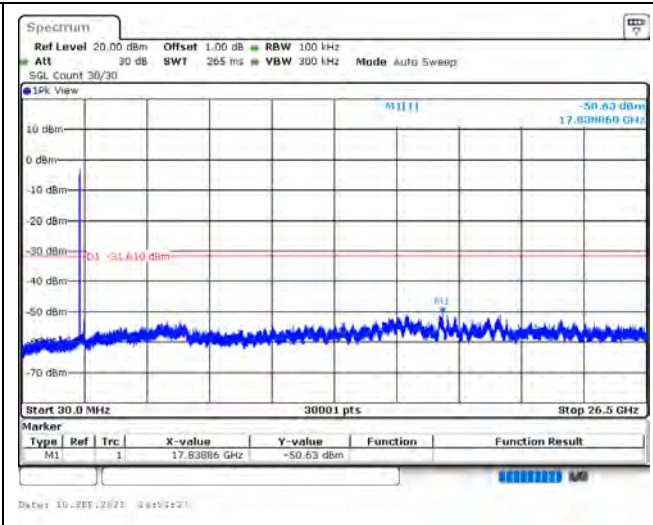
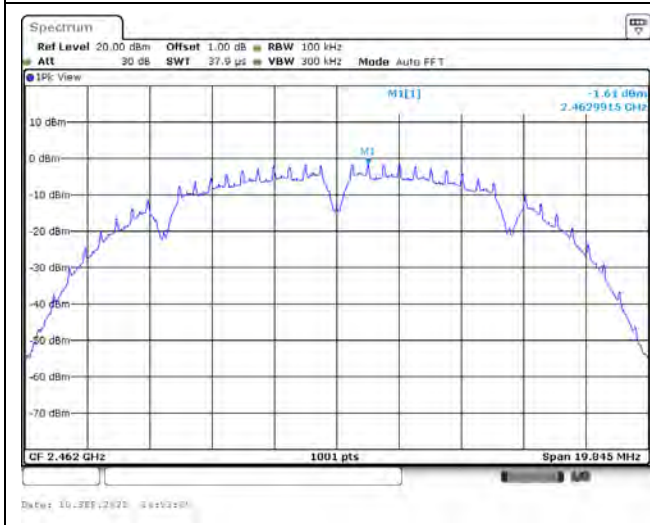
802.11b / 2412 MHz / Ant.1



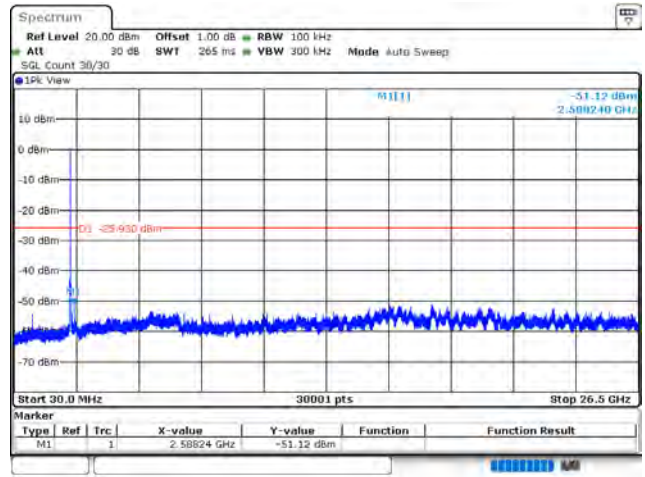
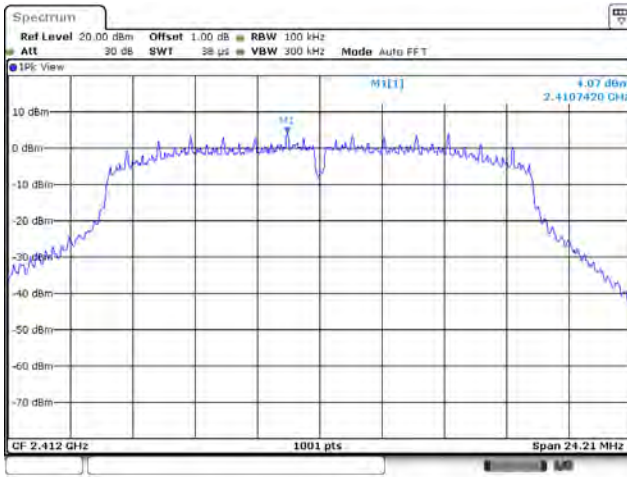
802.11b / 2437 MHz / Ant.1



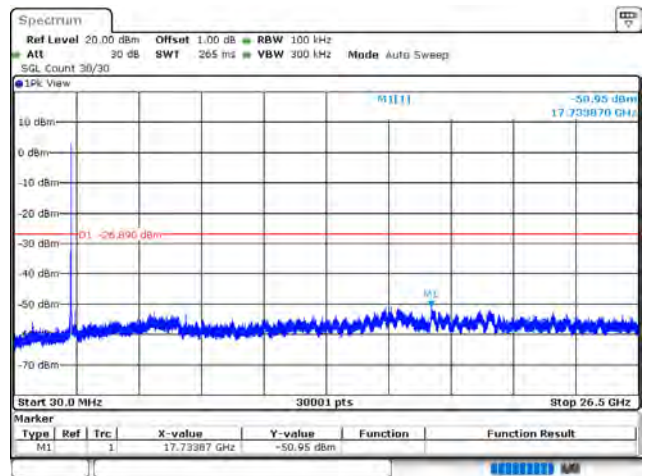
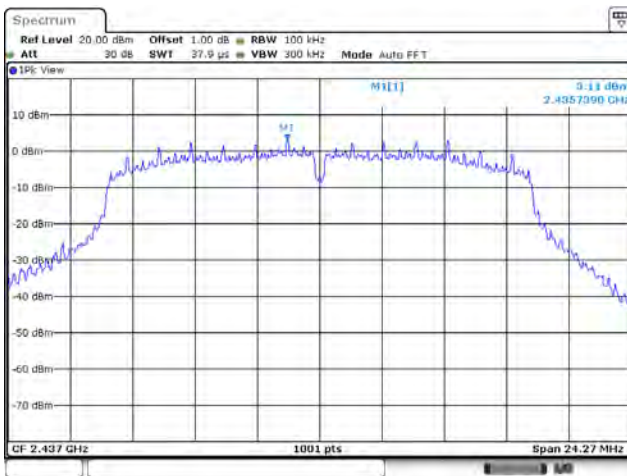
802.11b / 2462 MHz / Ant.1



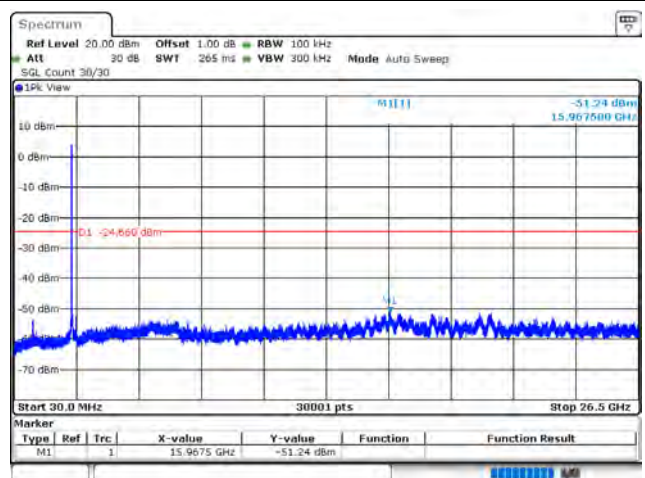
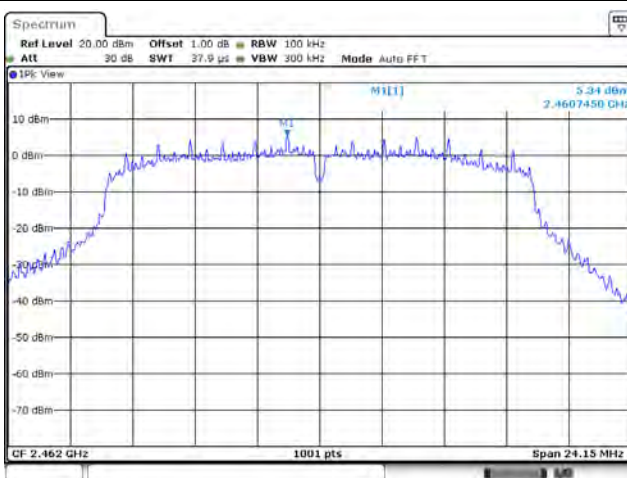
802.11g / 2412 MHz / Ant.1



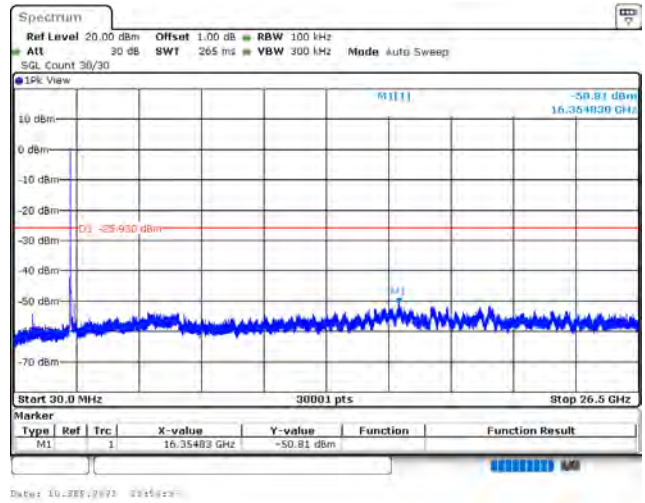
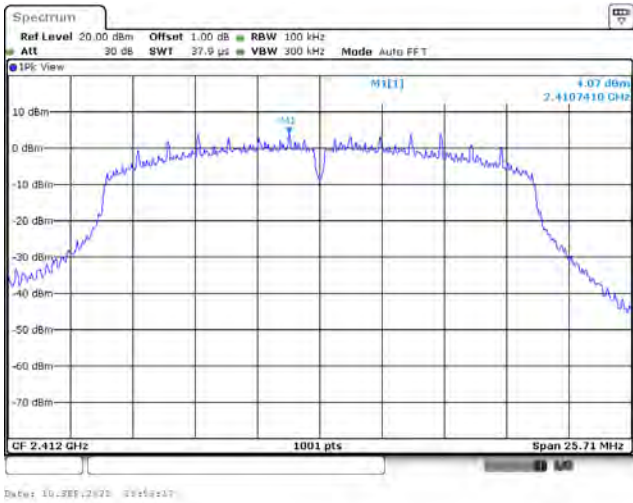
802.11g / 2437 MHz / Ant.1



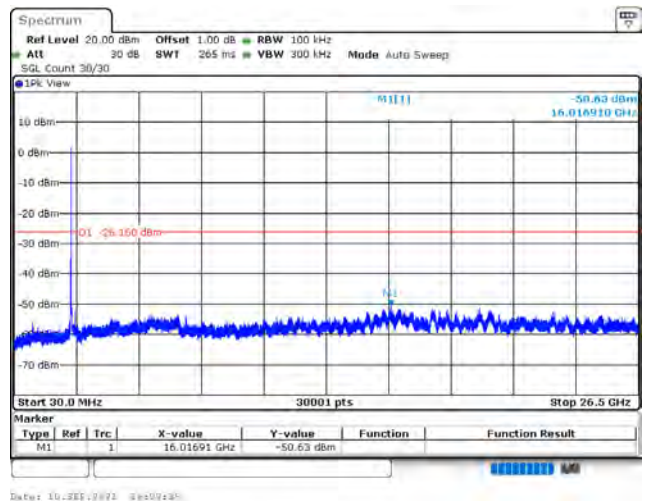
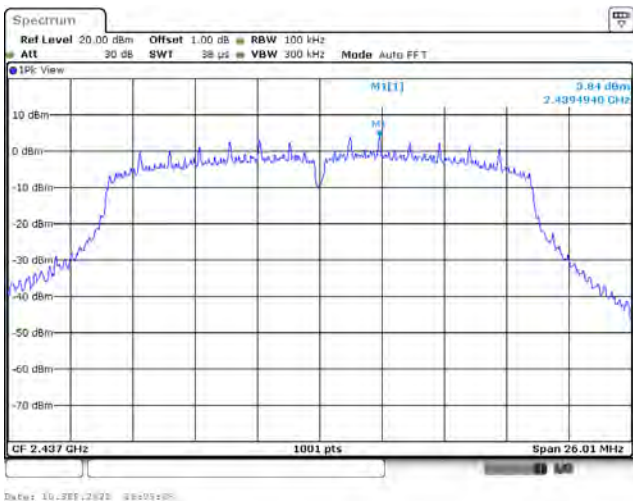
802.11g / 2462 MHz / Ant.1



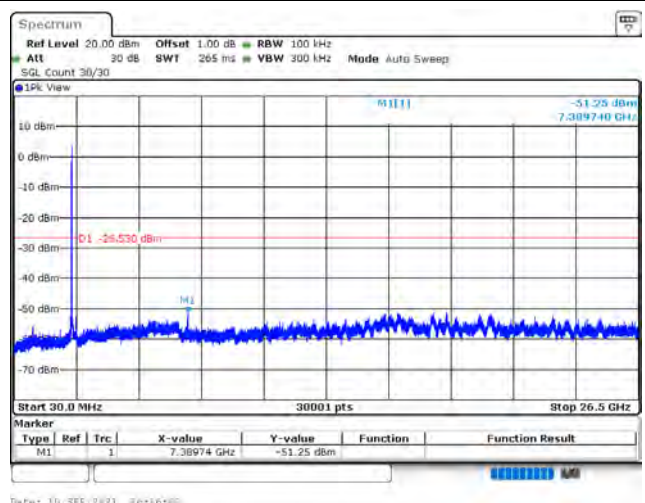
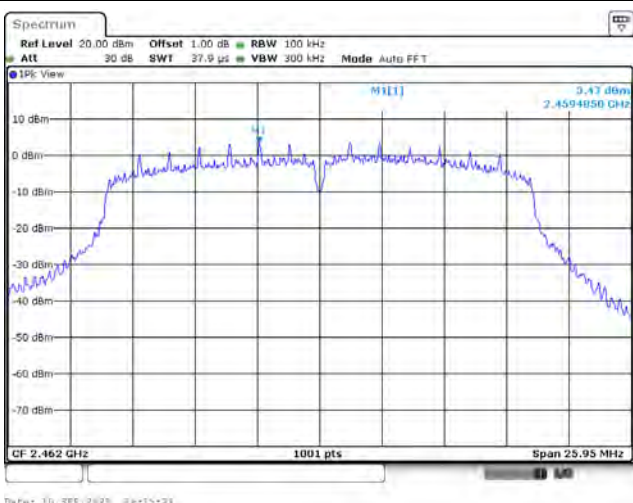
802.11n (20 MHz) / 2412 MHz / Ant.1



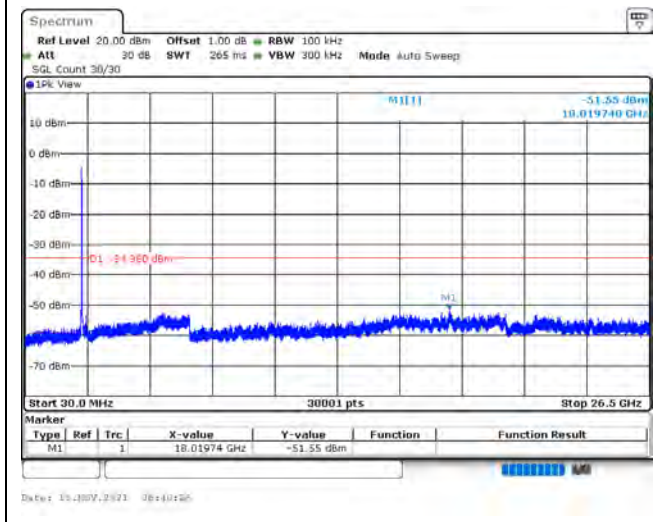
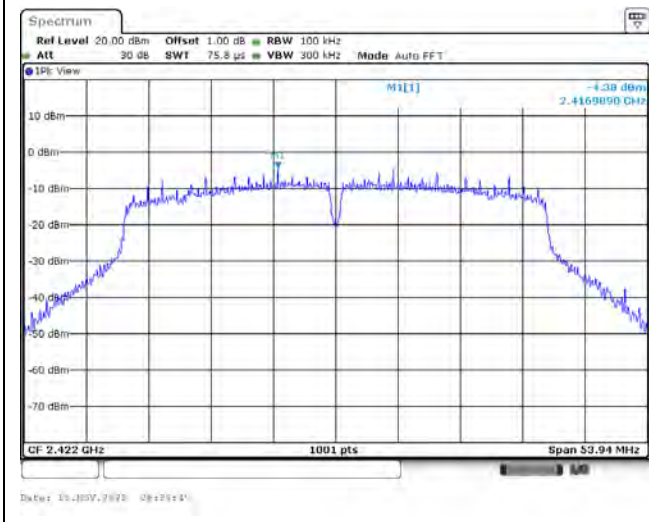
802.11n (20 MHz) / 2437 MHz / Ant.1



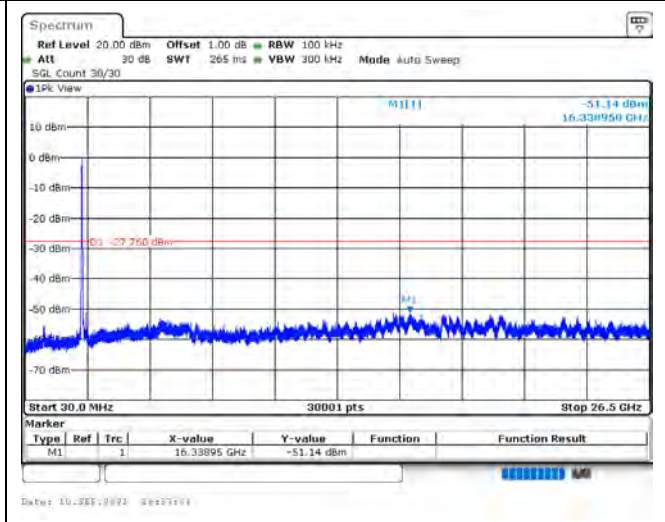
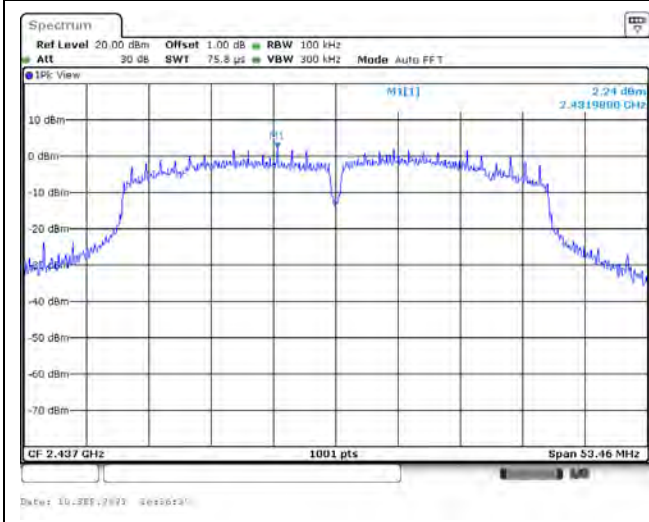
802.11n (20 MHz) / 2462 MHz / Ant.1



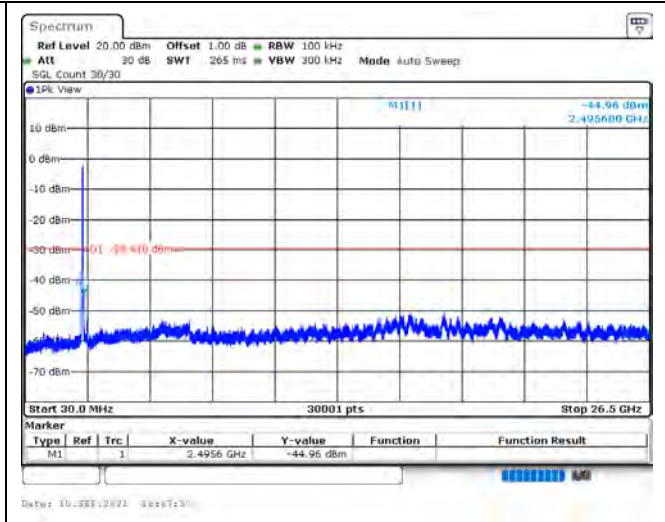
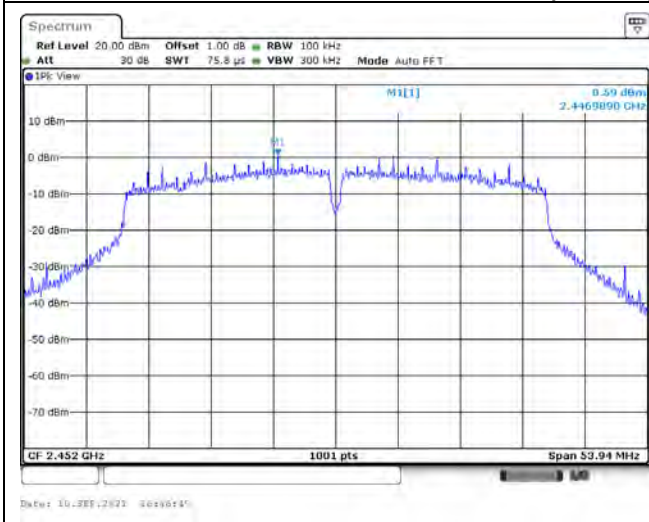
802.11n (40 MHz) / 2422 MHz / Ant.1



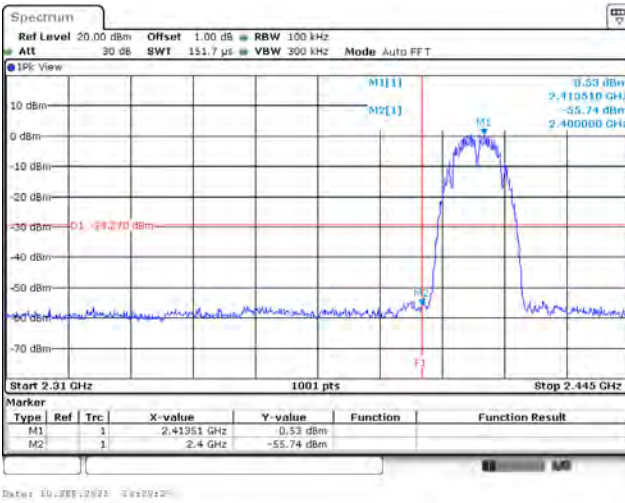
802.11n (40 MHz) / 2437 MHz / Ant.1



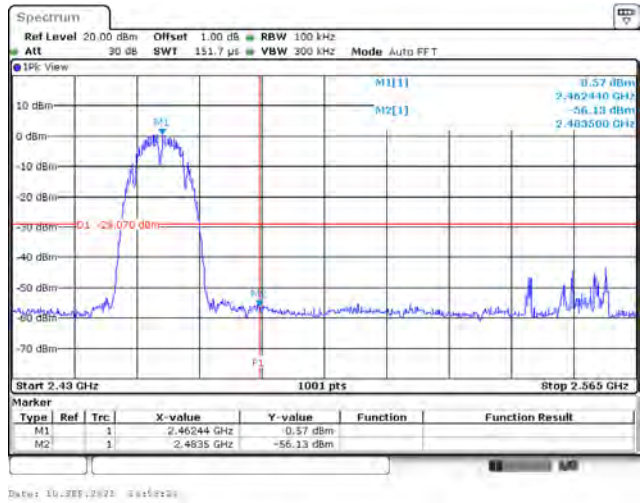
802.11n (40 MHz) / 2452 MHz / Ant.1



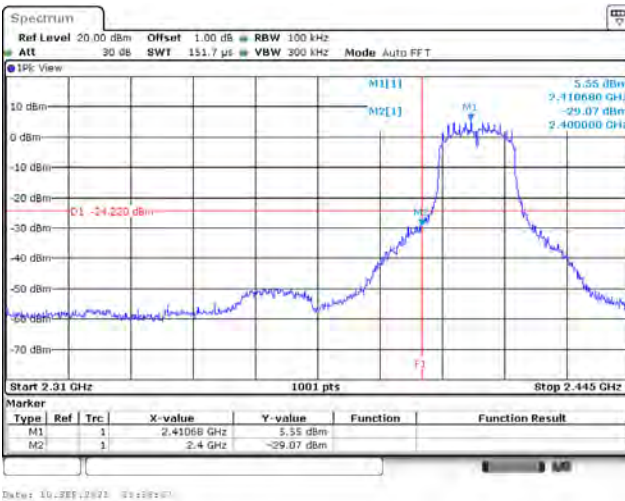
802.11b / Ant.0 / 2412 MHz (Band Edge)



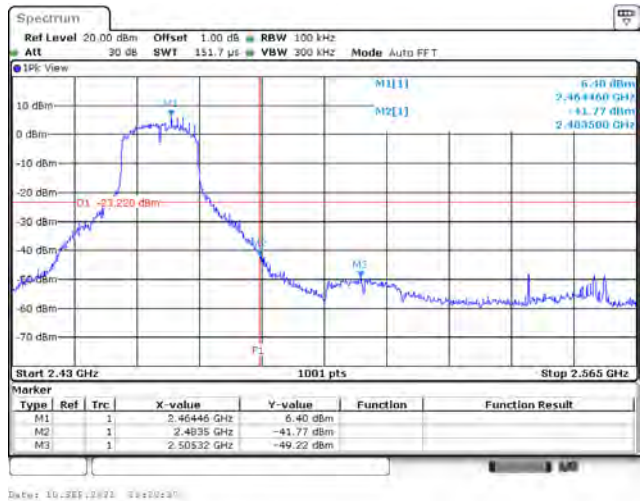
802.11b / Ant.0 / 2462 MHz (Band Edge)



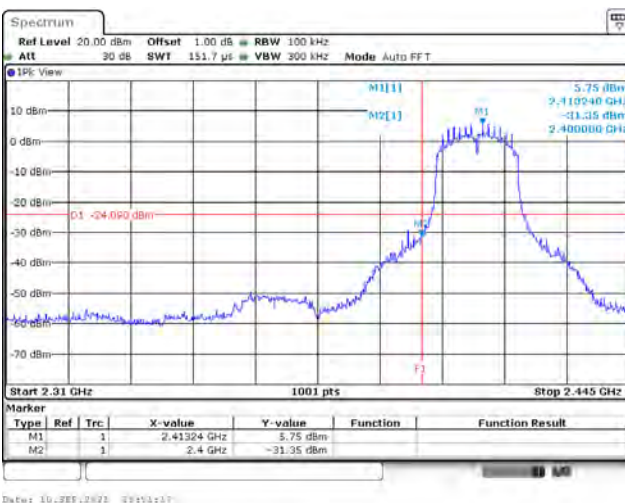
802.11g / Ant.0 / 2412 MHz (Band Edge)



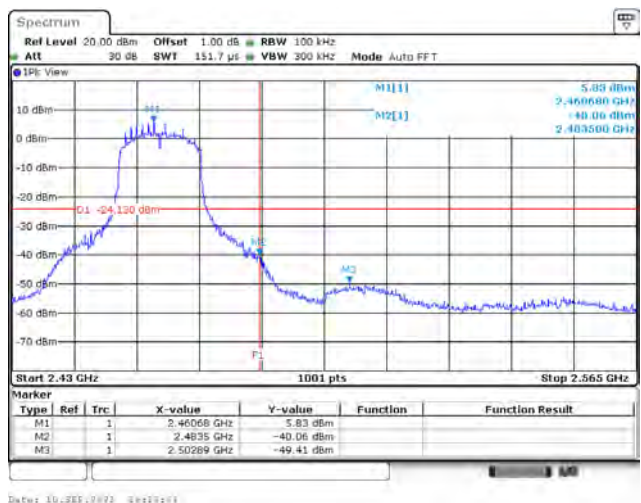
802.11g / Ant.0 / 2462 MHz (Band Edge)

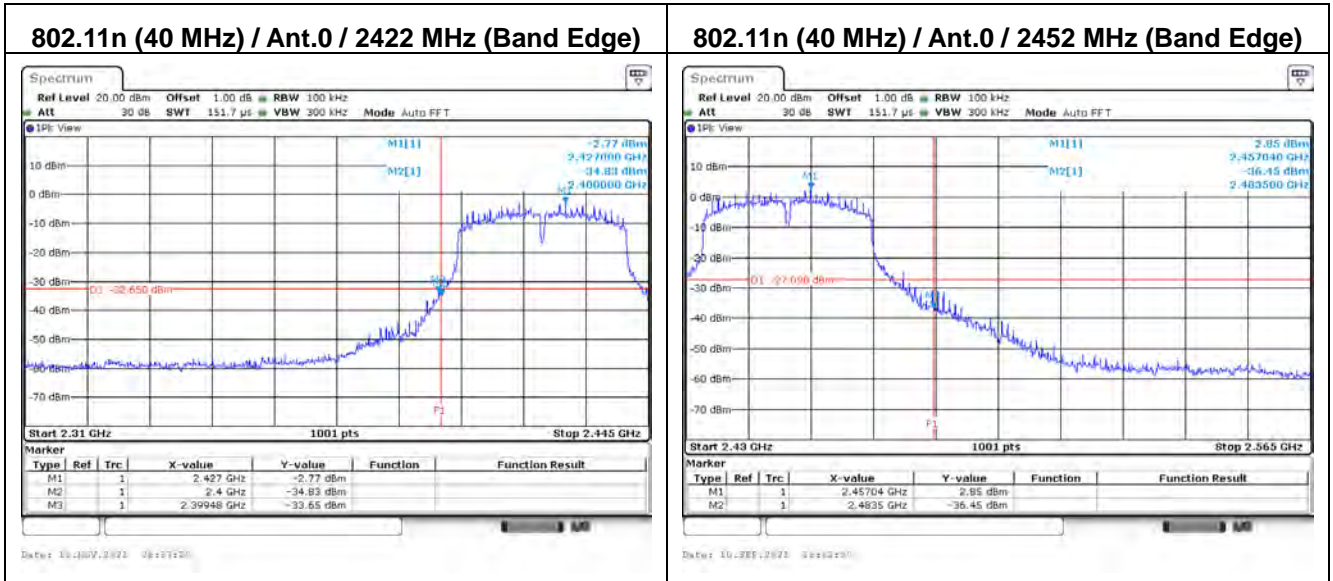


802.11n (20 MHz) / Ant.0 / 2412 MHz (Band Edge)

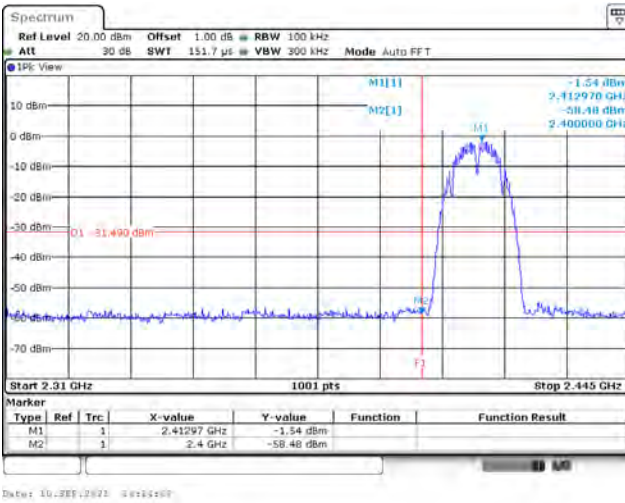


802.11n (20 MHz) / Ant.0 / 2462 MHz (Band Edge)

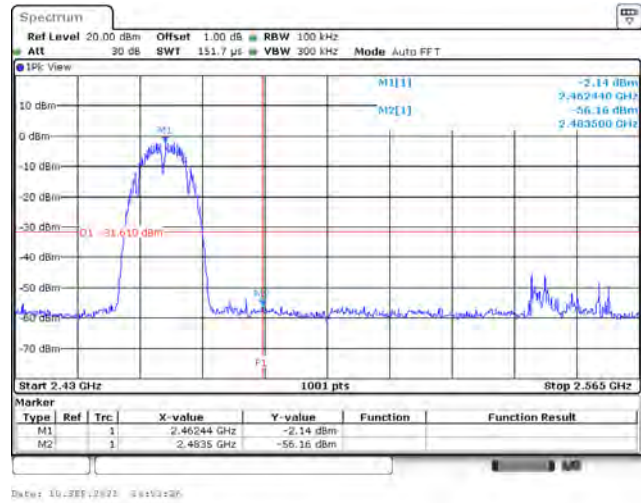




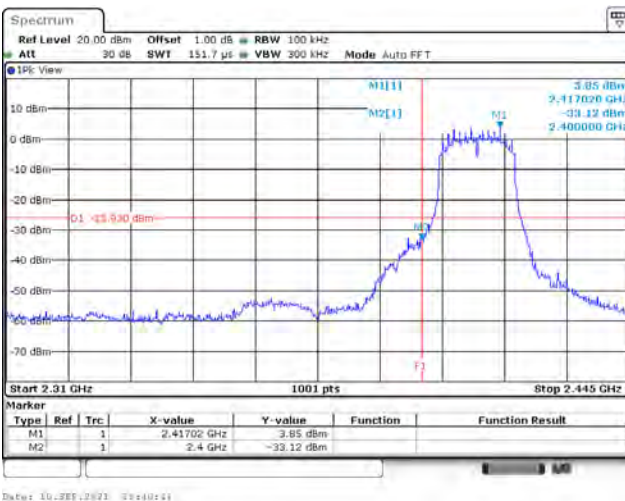
802.11b / Ant.1 / 2412 MHz (Band Edge)



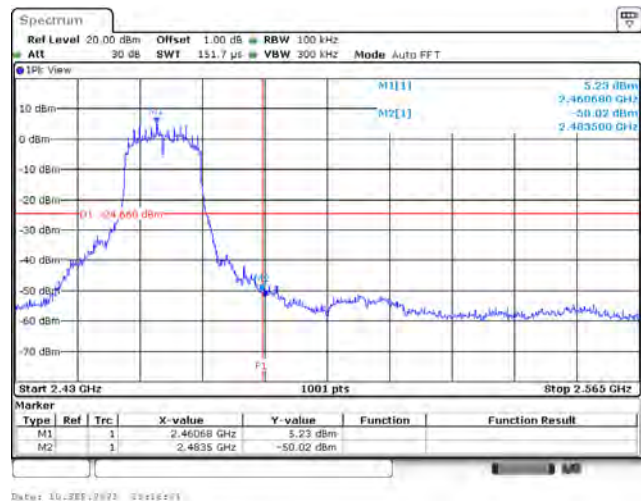
802.11b / Ant.1/ 2462 MHz (Band Edge)



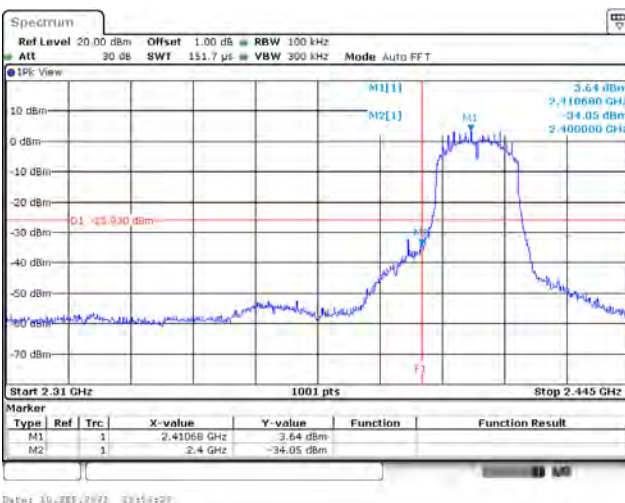
802.11g / Ant.1 / 2412 MHz (Band Edge)



802.11g / Ant.1 / 2462 MHz (Band Edge)



802.11n (20 MHz) / Ant.1 / 2412 MHz (Band Edge)



802.11n (20 MHz) / Ant.1 / 2462 MHz (Band Edge)

