Testing Laboratory
3024

Test Report No:
2280486R-RFNAOTHV02-A

VARIANT TEST REPORT
FCC Rules&Requlations

Product Name	Dual-band Wireless-AC1200 USB Adapter
Brand Name	ASUS
Model No.	USB-AC53 Nano
FCC ID	MSQ-USBACRN00
Applicant´s Name / Address	ASUSTeK Computer Inc 1F, No. 15, Lide Rd. Beitou, Taipei, 112, Taiwan
Manufacturer's Name / Address	ASUSTeK Computer Inc 1F, No. 15, Lide Rd. Beitou, Taipei, 112, Taiwan
Test Method Requested, Standard	FCC CFR Title 47 Part 15 Subpart C Section 15.247 ANSI C63.10-2013
Verdict Summary	IN COMPLIANCE
Documented By	Hailey Peng Hailey Peng / Senior Engineer
Approved By	Rueyyan Lin Rueyyan Lin / Supervisor
Date of Receipt	Aug. 16, 2022
Date of Issue	Mar. 25, 2023
Report Version	V1.0

INDEX

Competences and Guarantees

DEKRA is a testing laboratory competent to carry out the tests described in this report.
In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

General Conditions

1. The test results relate only to the samples tested.
2. The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
3. This report must not be used to claim product endorsement by TAF or any agency of the government.
4. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.
5. 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.

Revision History

Version	Description	Issued Date
V1.0	Initial issue of report	Mar. 25, 2023

Permissive Change

Report No.	Version	Description	Issued Date
1690125R-RFUSP27V00	V1.0	Original application.	Dec. 07, 2016
1690125R-RFUSP27V00-A	V1.0	**Class I Permissive Change (C1PC)** Adding the second source of thermal pad (Manufacturer: LiPOLY). After evaluating, it was verified the radiation below 1 GHz test, does not affect the test result.	Jan. 16, 2017
2280486R-RFNAOTHV02-A	V1.0	**Class II Permissive Change (C2PC)** 1. Changing the address of applicant and manufacturer to “1F, No. 15, Lide Rd. Beitou, Taipei, 112, Taiwan” from “4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan”. 2. There is no hardware or electrical modification made to the applying modular transmitter itself. Adding 1 set (set 2 antenna) same type of monopole antenna with lower gain than the original certificate. After evaluating, it was verified for all test items, and they are based on worst case of original test report to perform test.	Mar. 25, 2023

1. General Information

1.1. EUT Description

Product Name	Dual-band Wireless-AC1200 USB Adapter	
Brand Name	ASUS	
Model No.	USB-AC53 Nano	
EUT Voltage	DC 5V (host equipment)	
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

The EUT has two has two sources of thermal pad for marketing:

Sources of thermal pad	Manufacturer
Main source	CHENG RUENN
Second source	LiPOLY

Antenna Information							
Set	Ant.	Brand Name	Model No.	Type	Antenna Gain (dBi)		
					2.4GHz	5GHz Band 1	5GHz Band 4
1	0	WIESON	GY197HT632-002	Monopole	1.81	0.08	1.70
	1	WIESON	GY197HT632-002	Monopole	0.36	-0.23	-4.63
Set	Ant.	Brand Name	Model No.	Type	Antenna Gain (dBi)		
					2.4GHz	5GHz Band 1	5GHz Band 4
2	0	FOXCONN	7B0911V00-G1J-G	Monopole	1.20	-0.80	1.20
	1	FOXCONN	7B0911V00-G1J-G	Monopole	-0.20	-0.60	-4.50

The EUT has two sets of antenna and there are two antennas for each set.

Because set 1 antenna and set 2 antenna are the same type antennas, only the higher gain antennas “set 1 antenna” was tested and recorded in the original report (DEKRA project number: 1690125R).

<WiFi 2.4GHz Function - 802.11b/g/n and WiFi 5GHz Function - 802.11a/n/ac>

For IEEE 802.11a/b/g: (1TX/1RX)

Only Ant. 0 can be used as transmitting/receiving functions.

For IEEE 802.11n/ac: (2TX, 2RX)

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

EUT Operational Condition	
Testing Voltage	DC 5V

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: The above EUT information is declared by the manufacturer.

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

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

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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.

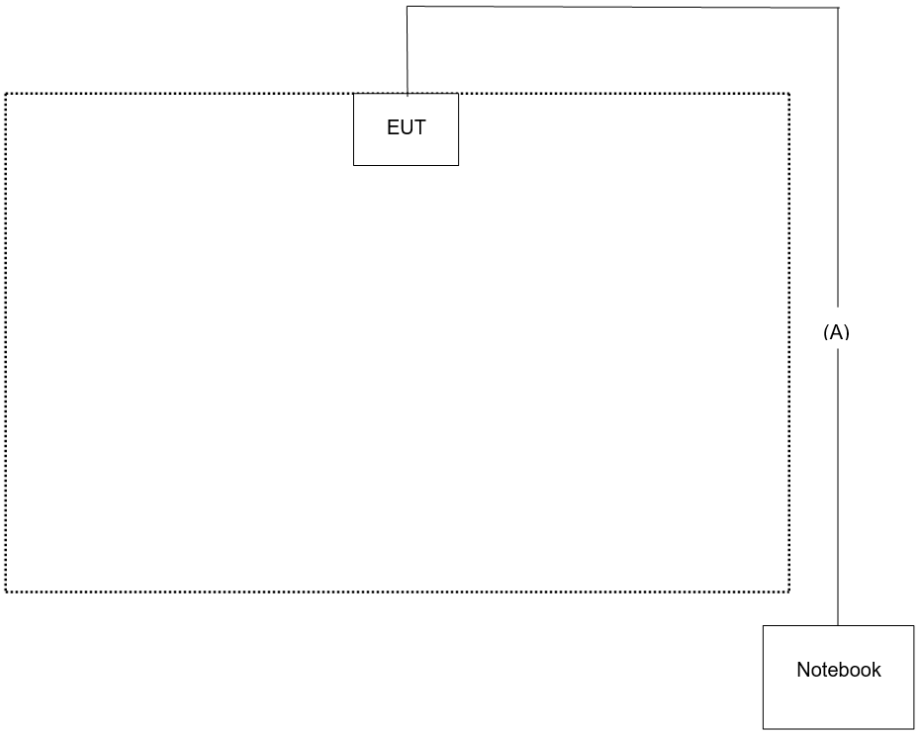
1.4. Tested System Details

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

	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	Notebook	DELL	Latitude E6320	8208580717	N/A

1.5. Configuration of Tested System

Connection Diagram



	Signal Cable Type	Signal cable Description
A	USB Cable	Shielded, 10m

1.6. EUT Operation of during Test

1	Execute control command by software “MP Tool v6.03”.
2	Configure the test mode, the test channel, and the data rate.
3	Press “Start TX” to start the continuous transmitting.
4	Verify that the EUT works properly.

1.7. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Actually	Tested by	Test Date	Test Site
Temperature (°C)	Maximum Conducted Output Power	19.1	Scott Chang	2023/03/23	HC-SR12
Humidity (%RH)		55			
Temperature (°C)	Radiated Emission	23	Cyri Chen	2023/03/23	HC-CB02
Humidity (%RH)		61			
Temperature (°C)	Antenna Port Conducted Emission	21.3	Scott Chang	2023/03/24	HC-SR12
Humidity (%RH)		58			
Temperature (°C)	Radiated Emission Band Edge	23	Cyri Chen	2023/03/23	HC-CB02
Humidity (%RH)		61			
Temperature (°C)	Occupied Bandwidth & DTS Bandwidth	21.3	Scott Chang	2023/03/24	HC-SR12
Humidity (%RH)		58			
Temperature (°C)	Maximum Power Spectral Density	21.3	Scott Chang	2023/03/24	HC-SR12
Humidity (%RH)		58			

Note: Test site information refers to Laboratory Information.

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 HC-SR02. Test site number for address 2 includes HC-CB02, HC-CB03, HC-CB04, HC-SR10 and HC-SR12.	

1.8. List of Test Equipment

HC-SR12

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
High Speed Peak Power Meter Dual Input	Anritsu	ML2496A	1602004	2022/11/02	2023/11/01
Pulse Power Sensor	Anritsu	MA2411B	1531043	2022/11/02	2023/11/01
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2022/12/13	2023/12/12
Pulse Power Sensor	Anritsu	MA2411B	1531044	2022/11/02	2023/11/01
Signal and Spectrum Analyzer	R&S	FSVA40	101435	2022/05/30	2023/05/29

HC-CB02

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2022/09/29	2023/09/28
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2022/12/13	2023/12/12
Trilog Broadband Antenna	Schwarzbeck	VULB 9168	1272	2022/05/19	2023/05/18
Double Ridged Horn Antenna	RF SPIN	DRH18-E	211211A18EN	2022/11/15	2023/11/14
Horn Antenna	Schwarzbeck	BBHA 9170	203	2023/02/13	2024/02/12
Pre-Amplifier	EMCI	EMC01820I	980365	2022/04/15	2023/04/14
Pre-Amplifier	EMEC	EM01G18GA	060741	2022/05/06	2023/05/05
Pre-Amplifier	DEKRA	AP-400C	201801231	2022/09/27	2023/09/26
EMI Test Receiver	R&S	ESR7	102260	2022/12/01	2023/11/30
Magnetic Loop Antenna	Teseq	HLA 6121	44287	2022/10/21	2023/10/20
Coaxial Cable(13m)	Suhner	SF104	HC-CB02	2022/08/15	2023/08/14
Coaxial Cable(3m)	Suhner,Rosnol	SF102_UP0264	HC-CB02_1	2022/08/14	2023/08/13
Radiated Software	AUDIX	e3 V9	HC-CB02_1	N/A	N/A

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).

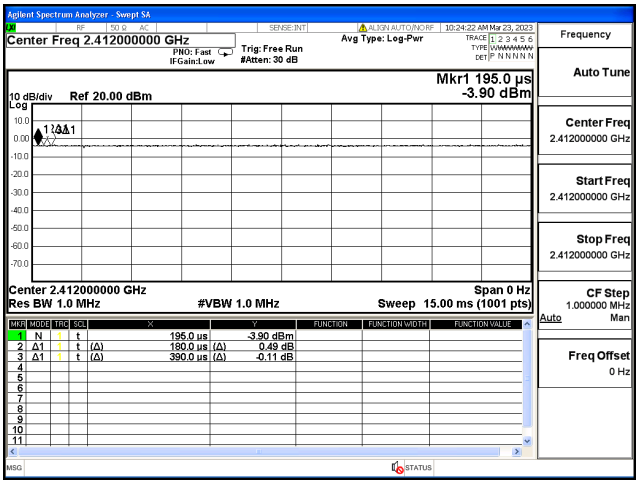
Test Item	Uncertainty
Maximum Conducted Output Power	± 1.16 dB
Radiated Emission	± 3.52 dB below 1 GHz ± 3.56 dB above 1 GHz
Antenna Port Conducted Emission	± 2.47 dB
Radiated Emission Band Edge	± 3.56 dB
DTS Bandwidth	± 282.55 Hz
Occupied Bandwidth	± 282.55 Hz
Maximum Power Spectral Density	± 2.47 dB

1.10. Duty Cycle

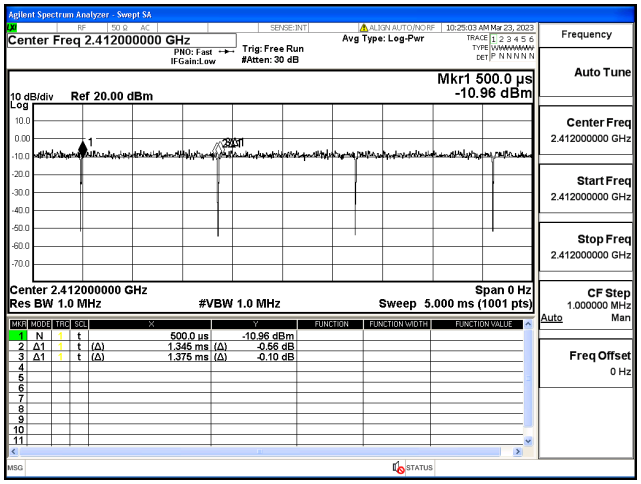
For 802.11b: Duty cycle of test signal is ≥ 98 %, duty factor is not required.

Modulation	On Times (ms)	On+Off Times (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11g	1.345	1.375	97.82	0.096	0.743
802.11n (20 MHz)	1.255	1.290	97.29	0.119	0.797
802.11n (40 MHz)	0.620	0.639	97.03	0.131	1.613

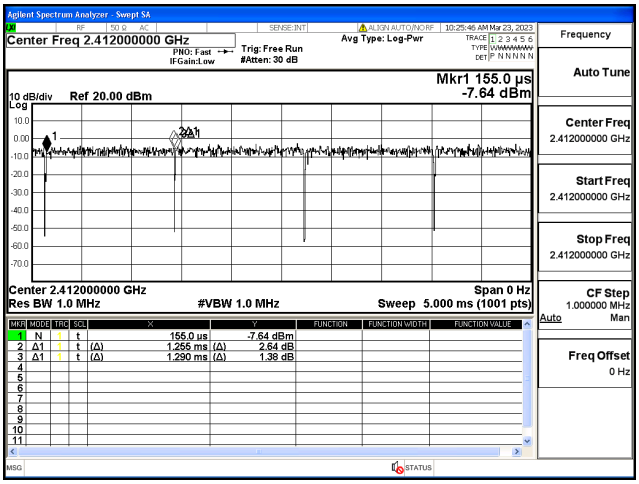
802.11b



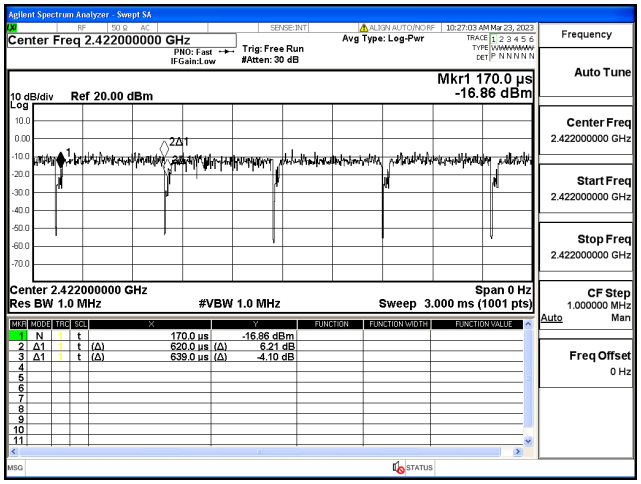
802.11g



802.11n (20 MHz)

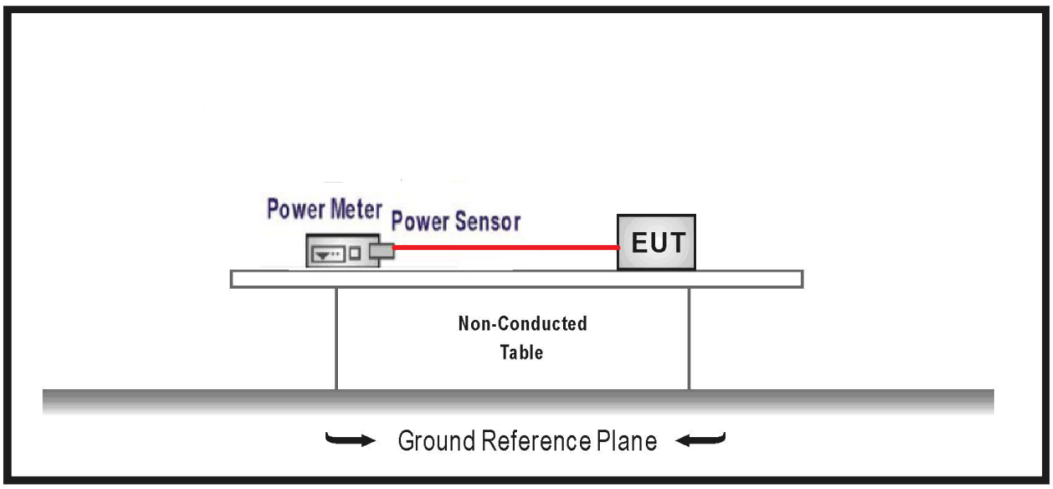


802.11n (40 MHz)



2. Maximum Conducted Output Power

2.1. Test Setup



2.2. Test Limit

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

2.3. 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.

2.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247.

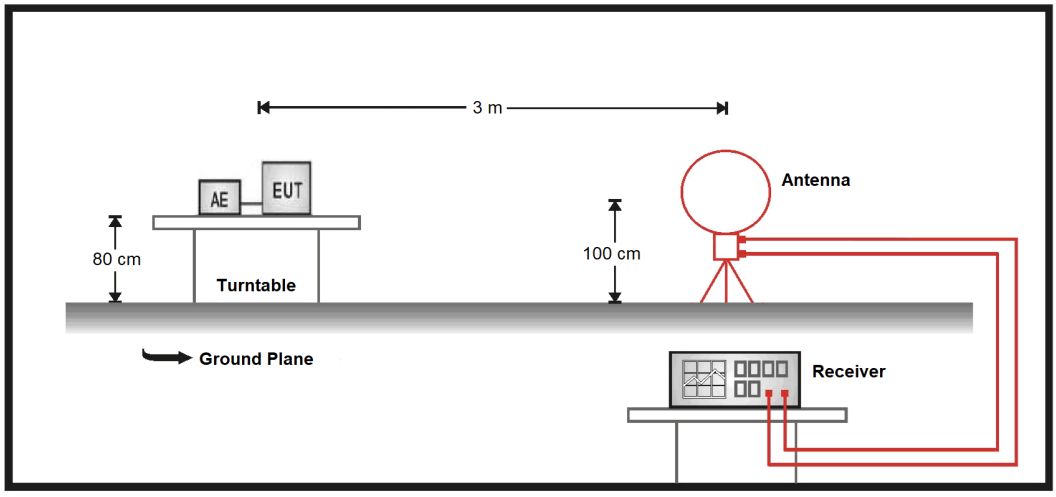
2.5. Test Result of Maximum Conducted Output Power

Modulation	Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)			Limit (dBm)	Result
			Ant. 0				
802.11b	1	2412	11.58			≦30.00	Pass
	6	2437	11.86			≦30.00	Pass
	11	2462	11.61			≦30.00	Pass
802.11g	1	2412	12.37			≦30.00	Pass
	6	2437	12.66			≦30.00	Pass
	11	2462	12.51			≦30.00	Pass
Modulation	Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)			Limit (dBm)	Result
			Ant. 0	Ant. 1	Total		
802.11n (20 MHz)	1	2412	12.43	12.64	15.55	≦30.00	Pass
	6	2437	12.48	12.60	15.55	≦30.00	Pass
	11	2462	12.68	12.71	15.71	≦30.00	Pass
802.11n (40 MHz)	3	2422	11.25	10.55	13.92	≦30.00	Pass
	6	2437	12.55	12.76	15.67	≦30.00	Pass
	9	2452	10.24	10.44	13.35	≦30.00	Pass

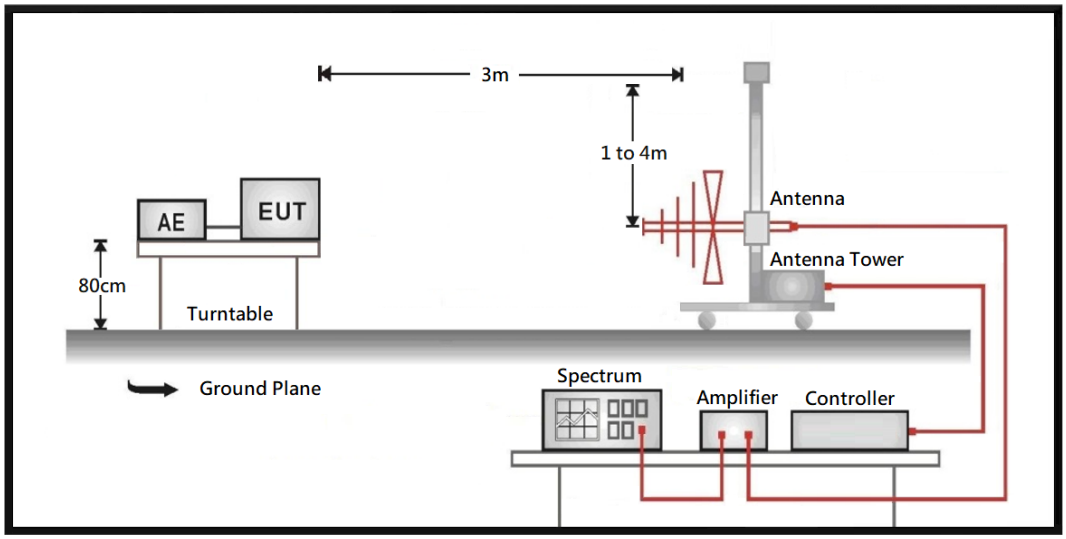
3. Radiated Emission

3.1. Test Setup

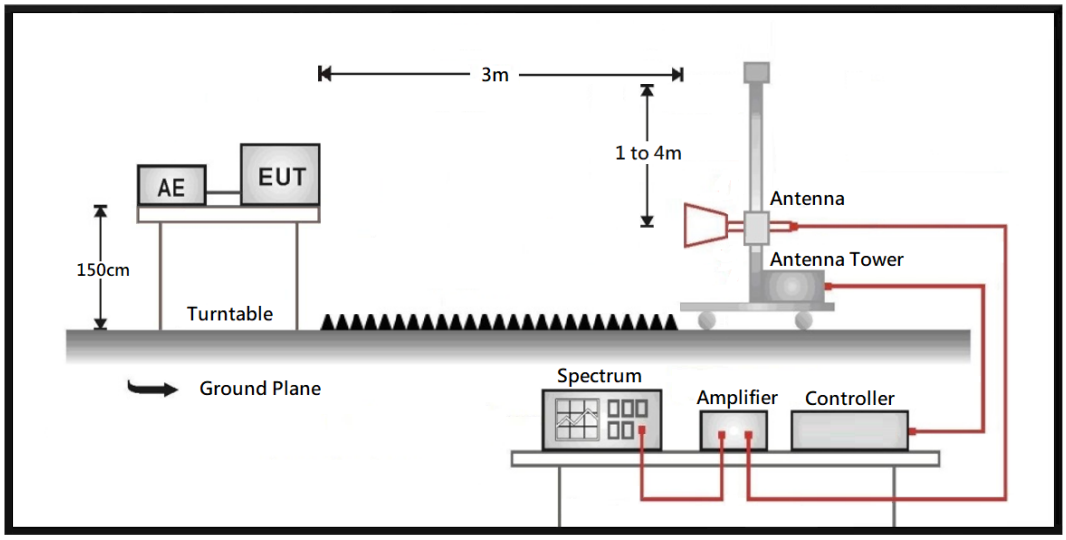
9 kHz ~ 30 MHz



30 MHz ~ 1 GHz



Above 1 GHz



3.2. 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

3.3. Test Procedure

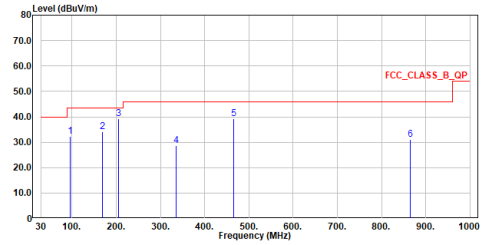
The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB 558074 D01V05r02 for compliance to FCC 47CFR 15.247 requirements.
The EUT and its simulators are placed on a turn table which is 0.8 or 1.5 meter above ground. The turn table can rotate 360 degrees to determine 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 form 9 kHz(inculde 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.

3.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247.

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

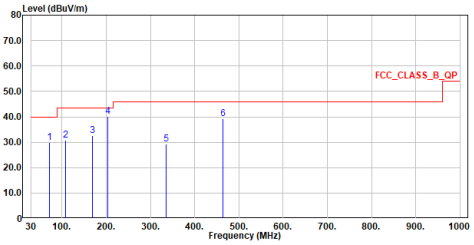
Site :HC-CB02
Condition :3m Horizontal
Mode :LF_b_TX_2437MHz
Test by :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	96.106	32.19	43.50	-11.31	40.15	-7.96	QP
2	168.080	33.96	43.50	-9.54	36.72	-2.76	QP
3	204.552	39.14	43.50	-4.36	45.11	-5.97	QP
4	335.841	28.77	46.00	-17.23	29.48	-0.71	QP
5	466.355	39.40	46.00	-6.60	36.59	2.81	QP
6	864.491	31.17	46.00	-14.83	21.31	9.86	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.
5. The other emission levels were very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :LF_b_TX_2437MHz
Test by :Cyril

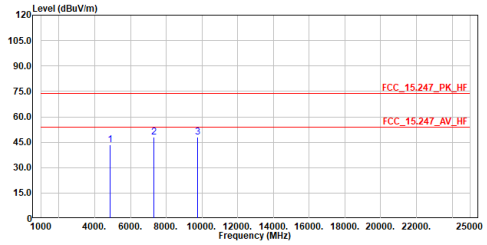


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	72.098	29.80	40.00	-10.20	34.34	-4.54	QP
2	107.988	30.69	43.50	-12.81	36.76	-6.07	QP
3	168.080	32.74	43.50	-10.76	35.50	-2.76	QP
4	204.067	40.02	43.50	-3.48	45.99	-5.97	QP
5	336.084	29.17	46.00	-16.83	29.88	-0.71	QP
6	464.027	39.31	46.00	-6.69	36.54	2.77	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.
5. The other emission levels were very low against the limit.

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

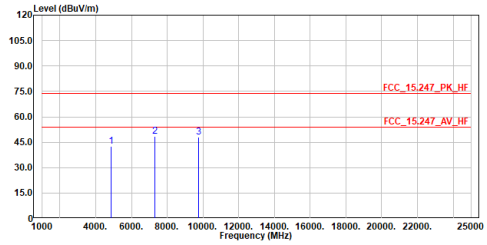
Site :HC-CB02
Condition :3m Horizontal
Mode :b_TX_2437MHz
Test by :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4874.000	43.29	74.00	-30.71	55.72	-12.43	Peak
2	7311.000	47.85	74.00	-26.15	53.60	-5.75	Peak
3	9748.000	48.15	74.00	-25.85	51.15	-3.00	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :b_TX_2437MHz
Test by :Cyril

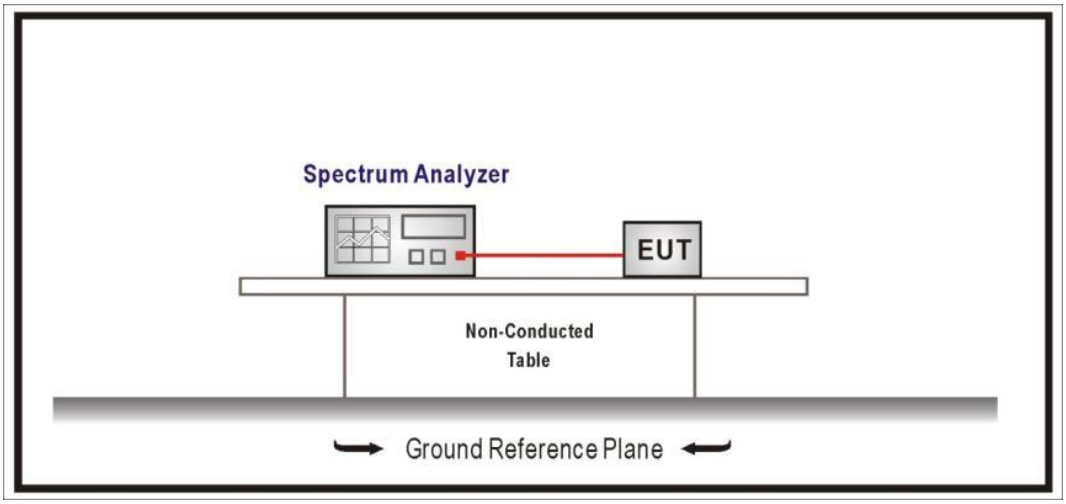


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4874.000	42.41	74.00	-31.59	54.84	-12.43	Peak
2	7311.000	48.65	74.00	-25.35	54.40	-5.75	Peak
3	9748.000	48.18	74.00	-25.82	51.18	-3.00	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

4. Antenna Port Conducted Emission

4.1. Test Setup



4.2. 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)).

4.3. Test Procedure

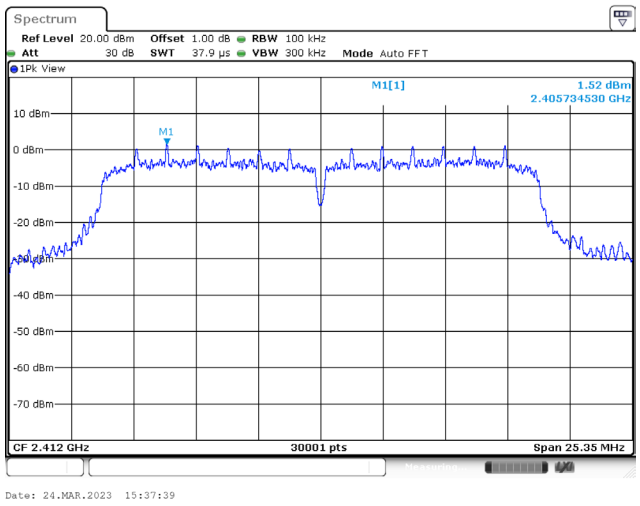
The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB 558074 D01 V05r02 for compliance to FCC 47CFR 15.247 requirements.
Set RBW = 100 kHz, Set VBW> RBW, scan up through 10th harmonic.

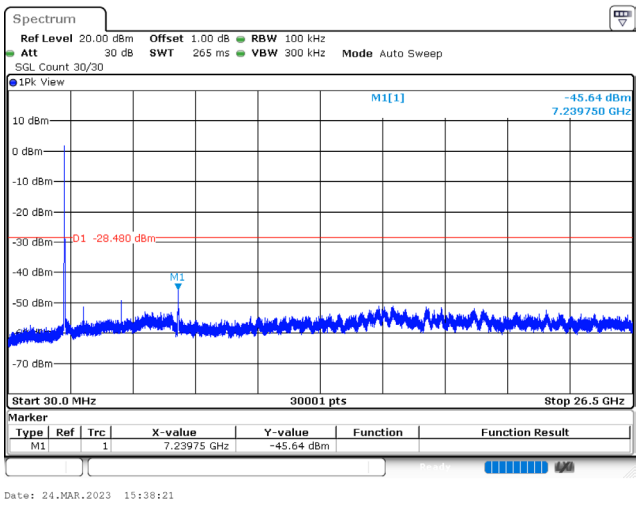
4.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247.

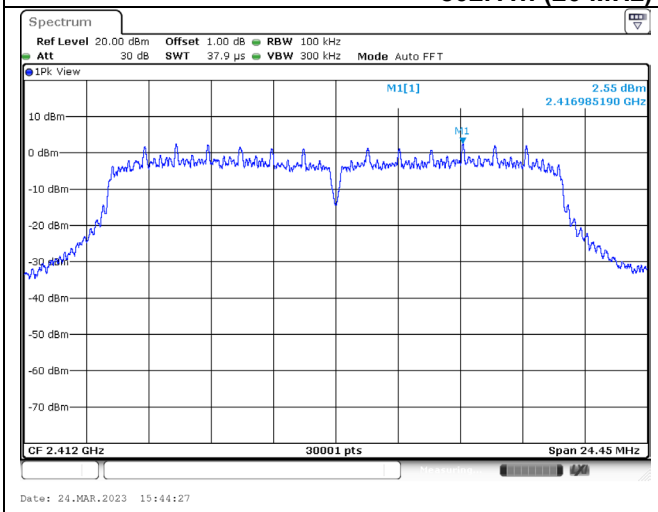
4.5. Test Result of Antenna Port Conducted Emission

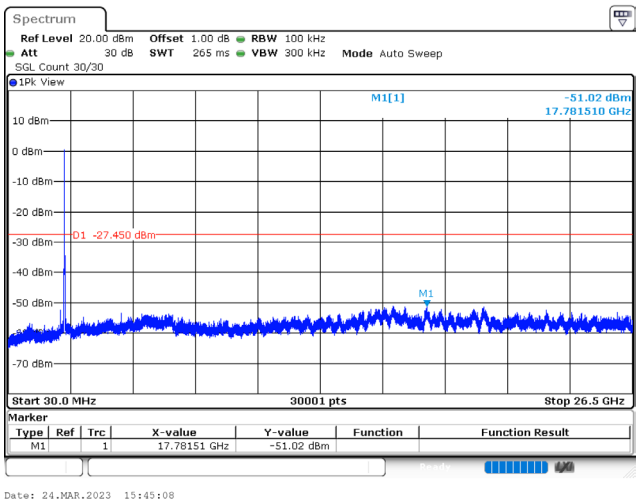
802.11n (20 MHz) / Ant. 0 / 2412 MHz



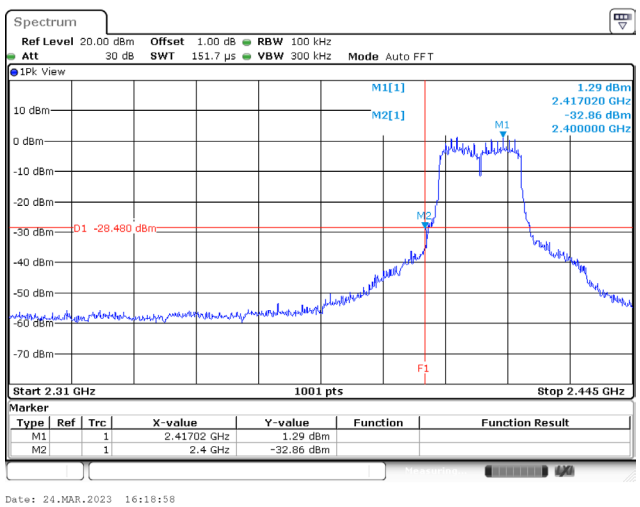


802.11n (20 MHz) / Ant. 1 / 2412 MHz

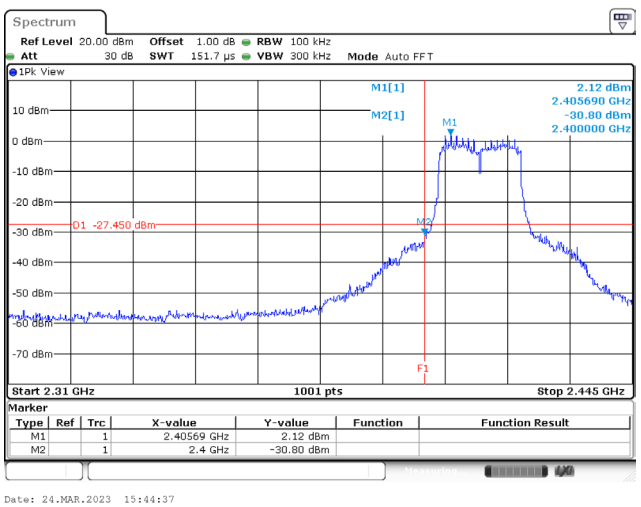




802.11n (20 MHz) / Ant. 0 / 2412 MHz (Band Edge)

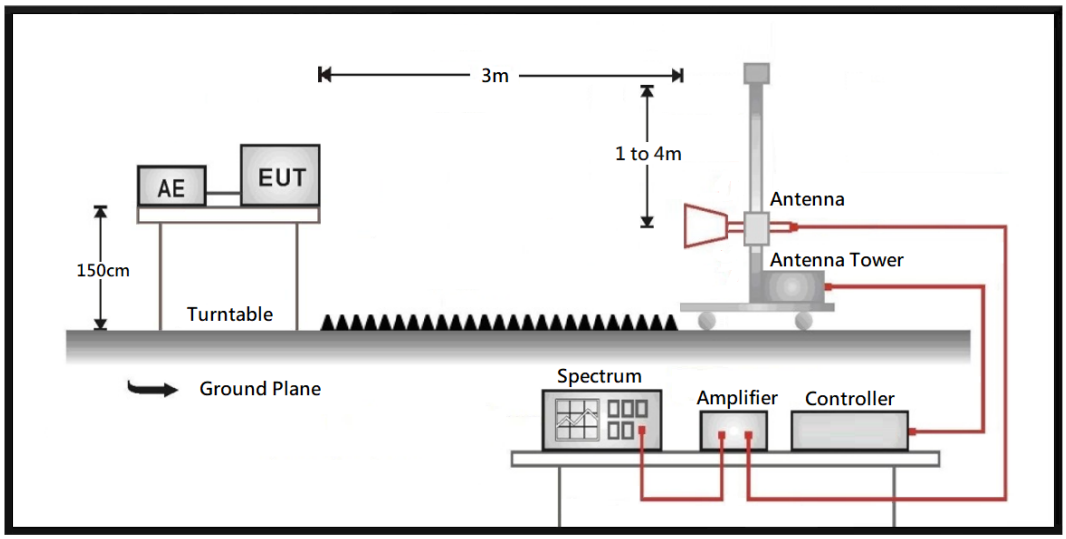


802.11n (20 MHz) / Ant. 1 / 2462 MHz (Band Edge)



5. Radiated Emission Band Edge

5.1. Test Setup



5.2. Test Limit

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 30 dB 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)
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

5.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to the FCC KDB 558074 D01 v05r02 for compliance to FCC 47CFR 15.247 requirements.

The EUT and its simulators are placed on a turn table which is 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.

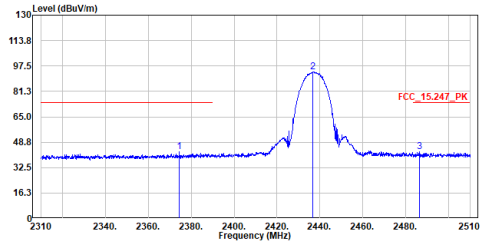
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

5.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247.

5.5. Test Result of Radiated Emission Band Edge

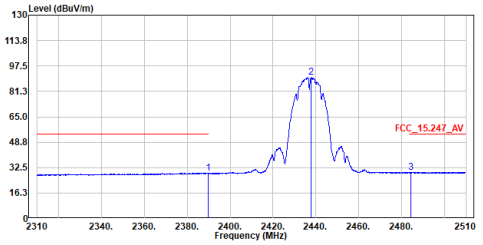
Site :HC-CB02
Condition :3m Horizontal
Mode :b_TX_2437MHz
Test by :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2374.500	42.82	74.00	-31.18	29.96	12.86	Peak
2	2436.800	93.77	------	------	80.58	13.19	Peak
3	2486.500	42.69	74.00	-31.31	29.25	13.44	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

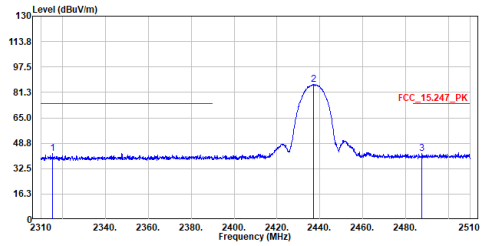
Site :HC-CB02
Condition :3m Horizontal
Mode :b_TX_2437MHz
Test by :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2389.700	29.06	54.00	-24.94	16.12	12.94	Average
2	2437.800	90.15	------	------	76.95	13.20	Average
3	2484.300	29.59	54.00	-24.41	16.16	13.43	Average

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

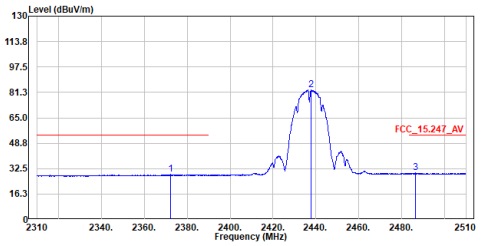
Site :HC-CB02
Condition :3m Vertical
Mode :b_TX_2437MHz
Test by :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2315.300	42.31	74.00	-31.69	29.75	12.56	Peak
2	2436.900	86.31	------	------	73.12	13.19	Peak
3	2487.500	42.09	74.00	-31.91	28.64	13.45	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :b_TX_2437MHz
Test by :Cyril

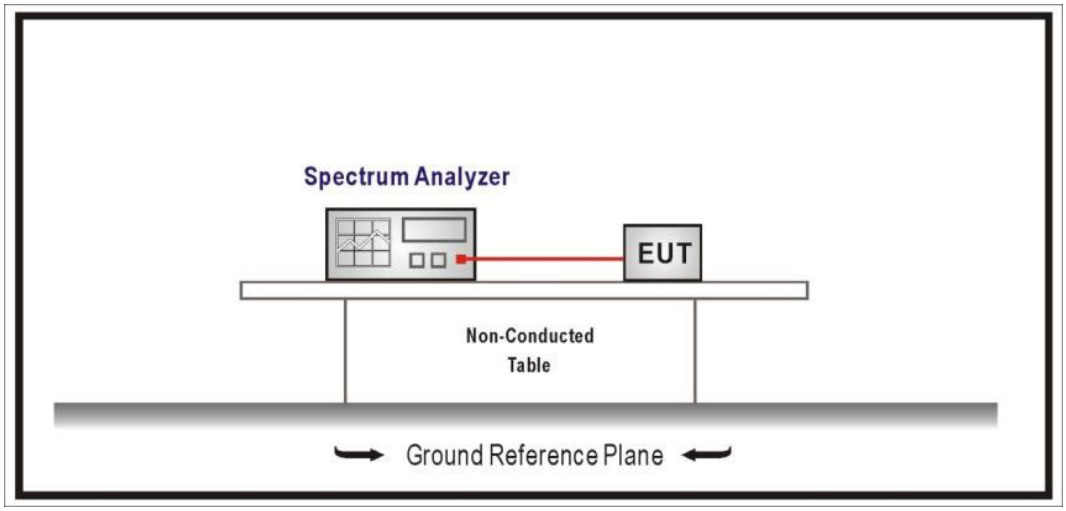


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2372.300	28.77	54.00	-25.23	15.92	12.85	Average
2	2437.800	82.86	------	------	69.66	13.20	Average
3	2486.400	29.69	54.00	-24.31	16.25	13.44	Average

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

6. Occupied Bandwidth & DTS Bandwidth

6.1. Test Setup



6.2. Test Limit

The 6 dB bandwidth: ≧ 0.50 MHz.

Occupied Bandwidth: NA

6.3. 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.

6.4. Test Specification

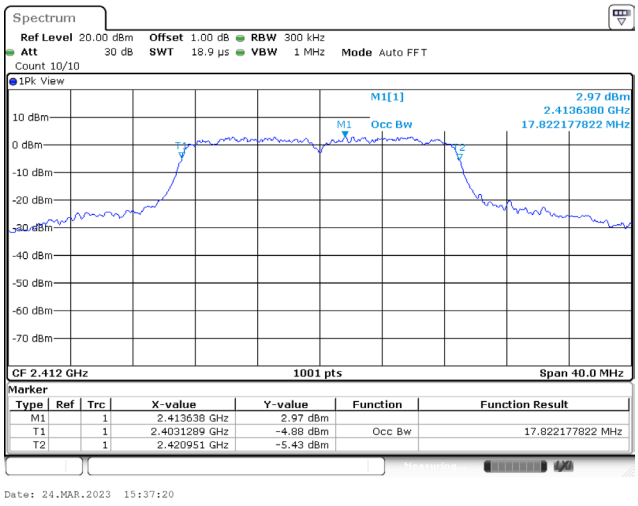
According to FCC Part 15 Subpart C Paragraph 15.247.

6.5. Test Result of Occupied Bandwidth

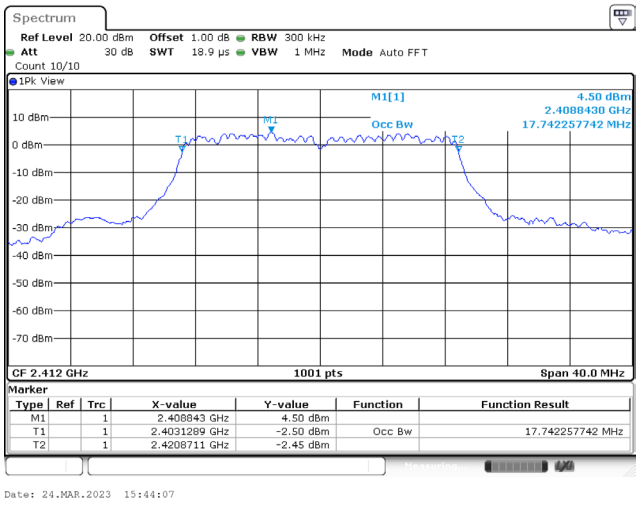
Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		Limit (MHz)
			Ant. 0	Ant. 1	
802.11n (20 MHz)	1	2412	17.822	17.742	-

Spectrum plot

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



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

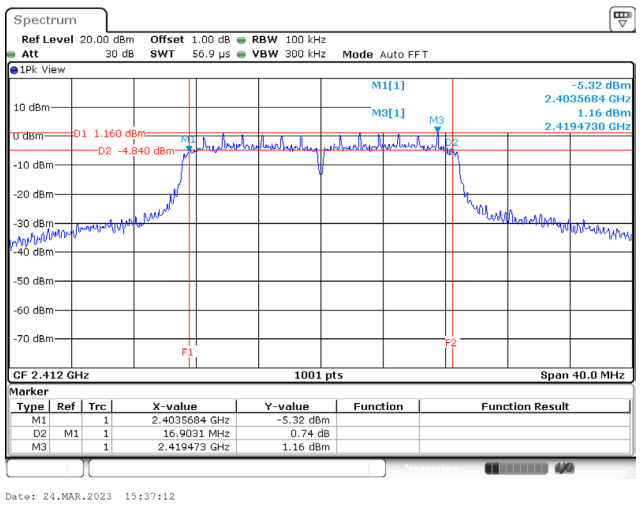


6.6. Test Result of DTS Bandwidth

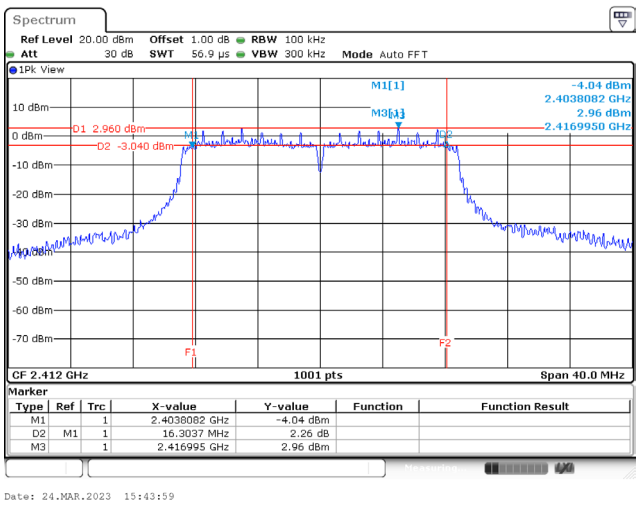
Modulation	Channel	Frequency (MHz)	DTS Bandwidth (MHz)		Limit (MHz)	Result
			Ant. 0	Ant. 1		
802.11n (20 MHz)	1	2412	16.903	16.303	≧0.50	Pass

Spectrum plot

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

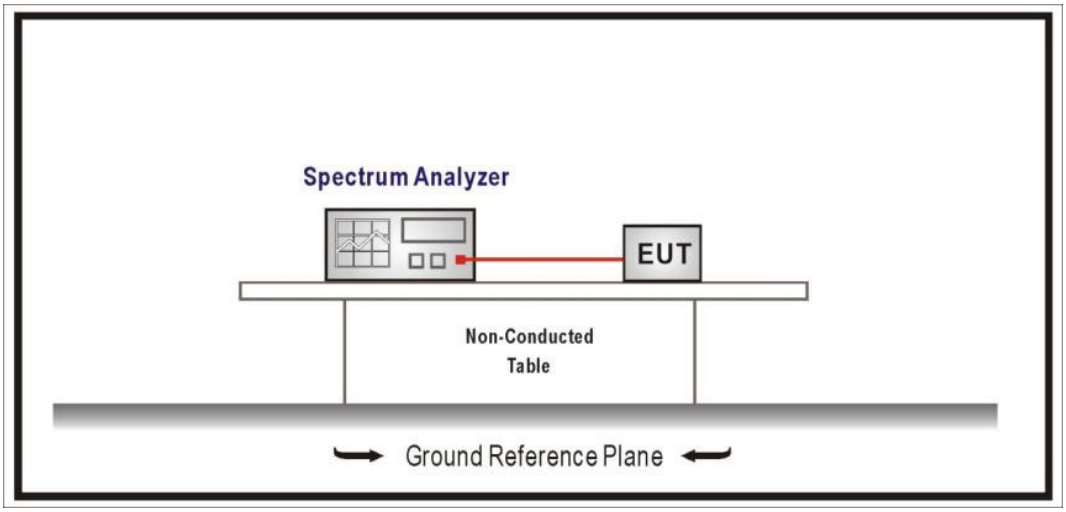


802.11n (20 MHz) / Ant. 1 / 2412 MHz



7. Maximum Power Spectral Density

7.1. Test Setup



7.2. Test Limit

The peak power spectral density conducted from the intentional radiated to the antenna shall not be greater than +8 dBm in any 3 kHz band during any time interval of continuous transmission.

7.3. 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.

7.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247.

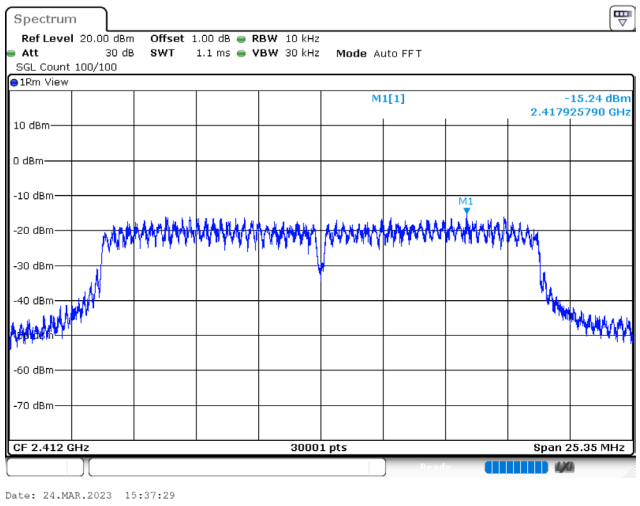
7.5. Test Result of Maximum Power Spectral Density

Modulation	Channel	Frequency (MHz)	Power Spectral Density (dBm / 3kHz)			Limit (dBm / 3kHz)	Result
			Ant. 0	Ant. 1	Total		
802.11n (20 MHz)	1	2412	-15.240	-14.770	-11.903	≦8.00	Pass

Note: Total power spectral density = power spectral density + duty factor, and the duty factor refer to section 1.10.

Spectrum plot

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



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