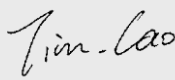
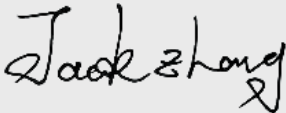


Test report No:
2290438R-RF-US-P06V03

FCC& ISED TEST REPORT

Product Name	BT & WLAN MODULE
Trademark	Alcatel-Lucent Enterprise
Model and /or type reference	BTWDB02
FCC ID	OL3BTWDB02
IC ID	1737D-BTWDB02
Applicant's name / address	ALE International 32, Avenue Kléber – 92700 Colombes – FRANCE
Test method requested, standard	FCC CFR Title 47 Part 15 Subpart C Section 15.247 ANSI C63.10: 2013 KDB 558074 D01v05r02 RSS-Gen Issue 5 /RSS-247 Issue 2
Verdict Summary	IN COMPLIANCE
Tested By (name / position & signature)	Tim Cao/ Project Engineer 
Approved by (name / position & signature)	Jack Zhang/ Manager 
Date of issue	2022-12-09
Report Version	V1.0
Report template No	Template_FCC Part 15C-RF-V1.0

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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.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA.

GENERAL CONDITIONS

Test Location	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Date(receive sample)	Sep. 23, 2022
Date (start test)	Sep. 24, 2022
Date (finish test)	Nov. 23, 2022

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	: Equipment Under Test
QP	: Quasi-Peak
CAV	: CISPR Average
AV	: Average
CDN	: Coupling Decoupling Network
SAC	: Semi-Anechoic Chamber
OATS	: Open Area Test Site
BW	: Bandwidth
AM	: Amplitude Modulation
PM	: Pulse Modulation
HCP	: Horizontal Coupling Plane
VCP	: Vertical Coupling Plane
U_N	: Nominal voltage
T_x	: Transmitter
R_x	: Receiver
N/A	: Not Applicable
N/M	: Not Measured

DOCUMENT HISTORY

Report No.	Version	Description	Issued Date
2290438R-RF-US-P06V03	V1.0	Initial issue of report.	2022-12-09

REMARKS AND COMMENTS

1. The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with Part 15 Subpart C Paragraph 15.247, RSS-Gen Issue 5, RSS-247 Issue 2.
3. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result.
4. The test results presented in this report relate only to the object tested.
5. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification (Suzhou) Co., Ltd.
6. This report will not be used for social proof function in China market.
7. DEKRA declines any responsibility with the following test data provided by customer that may affect the validity of result:
 - Chapter 1.1 General Description of the Item(s);
 - Chapter 1.2 Antenna Informaion;
 - Chapter 1.3 Test Data Rate;
 - Chapter 1.4 Channel List;
 - Chapter 1.5 Power Setting.

USED EQUIPMENT

AC Power Line Conducted Emission / TR1

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI	100573	2022.09.17	2023.09.16
Two-Line V-Network	R&S	ENV216	101044	2022.03.12	2023.03.11
Current Probe	R&S	EZ-17	100678	2021.12.31	2022.12.30
50ohm Termination	SHX	TF2	07081403	2022.09.04	2023.09.03
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	N/A	N/A
Temperature/Humidity Meter	RTS	RTS-8S	TR1-TH	2022.07.07	2023.07.06
Temperature/Humidity Meter	RTS	RTS-8S	TR1-TH	2022.07.07	2023.07.06
Coaxial Cable	Suhner	RG 223	TR1-C2	2022.03.21	2023.03.20
Dekra test software	Dekra	-	-	-	-

Emissions in non-restricted frequency bands/ Occupied Bandwidth/ Fundamental emission output power/ Power Spectral Density/Band Edge/ TR8

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EXA Spectrum Analyzer	Agilent	N9020A	MY49100159	2022.09.18	2023.09.17
MXA Signal Analyzer	Keysight	N9020A	MY56060147	2022.07.14	2023.07.13
4TX MIMO Power Sensor	Keysight	X8750A	MY59400102	2022.03.16	2023.03.15
Coaxial Cable	Woken	N/A	N/A	2022.01.18	2023.01.17
Temperature/Humidity Meter	RTS	RTS-8S	RF08	2022.07.07	2023.07.06
Temperature/Humidity Meter	RTS	RTS-8S	RF08	2022.07.07	2023.07.06
Tonscend test software	Tonscend				

Radiated Emission(30MHz-1GHz) / AC3

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI	100573	2022.09.17	2023.09.16
Loop Antenna	R&S	HFH2-Z2	833799/003	2022.04.15	2023.04.14
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2021.12.03	2022.12.02
Temperature/Humidity Meter	RTS	RTS-8S	AC3-TH	2022.07.09	2023.07.08
Temperature/Humidity Meter	RTS	RTS-8S	AC3-TH	2022.07.09	2023.07.08
Coaxial Cable	Huber+Suhner	RG 214	AC3-C	2022.03.30	2023.03.29
Dekra test software	Dekra	-	-	-	-

Radiated Emission(1GHz-40GHz) / AC5

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EXA Spectrum Analyzer	Keysight	N9010A	MY55370495	2022.08.12	2023.08.11
Pre-Amplifier	SKET	LNPA_0118G-45	SK2021090101	2021.12.13	2022.12.12
Preamplifier	CHENGYI	EMC184045SE	980263	2022.05.21	2023.05.20
DRG Horn	ETS-Lindgren	3117	00123988	2022.11.01	2023.10.31
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2022.05.19	2023.05.18
Temperature/Humidity Meter	RTS	RTS-8S	AC5-TH	2022.07.07	2023.07.06
Temperature/Humidity Meter	RTS	RTS-8S	AC5-TH	2022.07.07	2023.07.06
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2022.03.21	2023.03.20
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2022.03.21	2023.03.20
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2022.03.21	2023.03.20
Dekra test software	Dekra	-	-	-	-

UNCERTAINTY

Uncertainties have been calculated according to the DEKRA internal document. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Test item	Uncertainty
AC Power Line Conducted Emission	± 2.92 dB
Peak Power Output	± 1.13 dB
Radiated Emission(30MHz~1GHz)	Horizontal: 30MHz~200MHz: 4.60 dB 200MHz~1GHz: 4.10 dB Vertical: 30MHz~200MHz: 4.80 dB 200MHz~1GHz: 4.10 dB
Radiated Emission(1GHz~40GHz)	Horizontal: 1GHz~18GHz: 5.00 dB Vertical: 1GHz~18GHz: 4.80 dB Horizontal: 18GHz~40GHz: 4.70 dB Vertical: 18GHz~40GHz: 4.60 dB
RF antenna conducted test	± 1.13 dB
Radiated Emission Band Edge	± 5.00 dB
DTS Bandwidth	± 279 Hz
Occupied Bandwidth	± 279 Hz
Power Density	± 1.13 dB

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Product Name	BT & WLAN MODULE
Model No.	BTWDB02
FCC ID	OL3BTWDB02
IC	1737D-BTWDB02
HVIN	BTWDB02
Manufacturer	ALE International
Manufacturer Address	32, Avenue Kléber – 92700 Colombes – FRANCE

Wireless specification	WLAN
Operating frequency range(s)	2400~2483.5MHz
Type of modulation	802.11b: DSSS-DBPSK, DQPSK, CCK 802.11g: OFDM-BPSK, QPSK, 16QAM, 64QAM 802.11n: Up to 72.2Mbps
Number of channel	802.11b/g/n(20MHz) : 11
Device category	☐ Fixed point-to-point ☐ Emit multiple directional beams, simultaneously or sequentially ☒ Other cases

Rated power supply	Voltage and Frequency	
	☐	AC: 220 – 240 V, 50/60 Hz
	☒	DC: 3.3V
	☐	Adapter:
	☐	Battery:
Mounting position	☐	Table top equipment
	☐	Wall/Ceiling mounted equipment
	☐	Floor standing equipment
	☐	Head-mounted equipment
	☒	Other: Module

1.2 Antenna Information

Antenna model / type number.....:	N/A		
Antenna serial number	N/A		
Antenna Delivery	☒	1TX + 1RX	
	☐	2TX + 2RX	
	☐	Others:.....	
Antenna technology.....:	☒	SISO	
	☐	MIMO	☐ CDD
			☐ Beam-forming
Antenna Type.....:	☐	External	☐ Dipole
			☐ Sectorized
			☐ PCB
	☒	Internal	☐ FPC
			☒ PCB
			☐ Metal Monopole Antenna
			☐ Ceramic chip
			☐ Others.....
Antenna Gain.....:	3.16dBi		

1.3 Test Data Rate

IEEE 802.11b

Modulation	Data Rate(Mb/s)
DSSS	1
DSSS	2
CCK	5.5
CCK	11

IEEE 802.11g

Modulation	R	Data Rate(Mb/s)
BPSK	1/2	6
BPSK	3/4	9
QPSK	1/2	12
QPSK	3/4	18
16-QAM	1/2	24
16-QAM	3/4	36
64-QAM	2/3	48
64-QAM	3/4	54

IEEE 802.11n

Spatial streames	MCS Index	Modulation	R	Data Rate(Mb/s)	
				20MHz	
				800ns GI	400ns GI
1	0	BPSK	1/2	6.5	7.2
1	1	QPSK	1/2	13.0	14.4
1	2	QPSK	3/4	19.5	21.7
1	3	16-QAM	1/2	26.0	28.9
1	4	16-QAM	3/4	39.0	43.3
1	5	64-QAM	2/3	52.0	57.8
1	6	64-QAM	3/4	58.5	65.0
1	7	64-QAM	5/6	65.0	72.2

Note 1: Support of 400ns GI is optional on transmit and receive.

Symbol	Explanation
R	Code rate
GI	guard interval

1.4 Channel List

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

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412 MHz	2	2417 MHz	3	2422 MHz	4	2427 MHz
5	2432 MHz	6	2437 MHz	7	2442 MHz	8	2447 MHz
9	2452 MHz	10	2457 MHz	11	2462 MHz	-	-

1.5 Power Setting

Power Setting											
Channel	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	CH9	CH10	CH11
Frequency (MHz)	2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462
11b	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
11g	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
11n-20	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1

Note: The General Description of the Item, antenna information, Test Data Rate, Channel List and power setting in clause 1 are provided and confirmed by the client.

2 DESCRIPTION OF TEST SETUP

2.1 Operating mode(s) used for tests

During the tests the following operating mode(s) has(have) been used.

Test Mode	Mode 1: Transmit by 802.11b
	Mode 2: Transmit by 802.11g
	Mode 3: Transmit by 802.11n(20MHz)

Note : For client device, radiated tests was verified over X, Y, Z axis, and shown the worst case Z axis on this report.

2.2 Accessories Information

Accessories Information	Brand/model name	Cable		
		Length used during test [m]	Attached during test	Shielded
USB Cable	N/A	10	☒	☒
USB Cable	N/A	0.5	☒	☒

2.3 Support / Auxiliary equipment / unit / Test software for the EUT

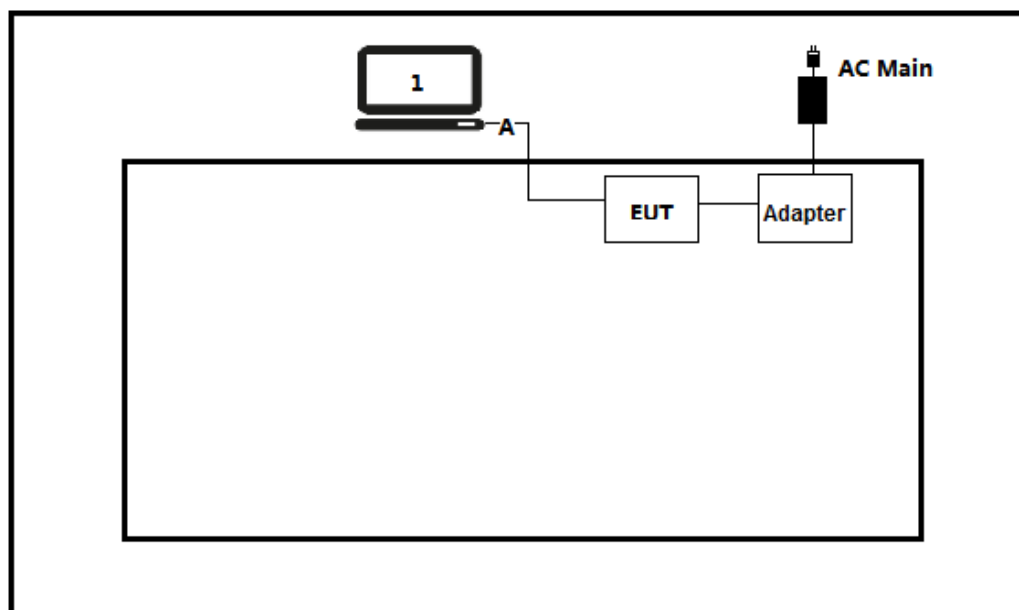
The EUT has been tested with the following auxiliary equipment / unit / software:

Auxiliary equipment	Type / Version	Manufacturer	Supplied by
Notebook	Think pad x220	Lenovo	Adapter
software	Type / Version	Manufacturer	Supplied by
PUTTY	N/A	N/A	N/A

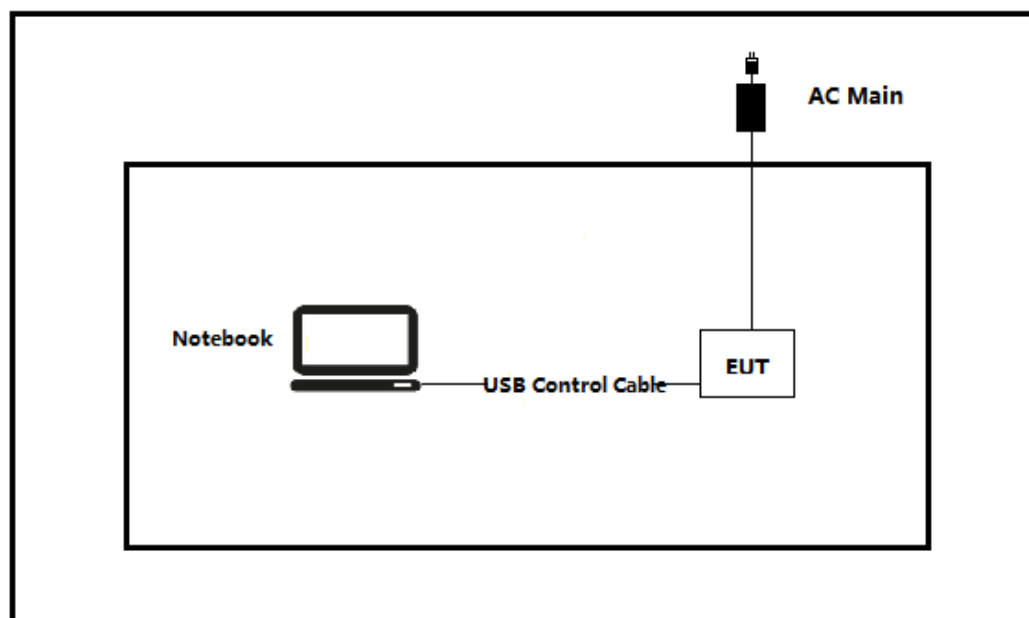
2.4 Test Configuration / Block diagram used for tests

The following test setup / configuration / block diagram has been used during the tests:

Test setup Diagram- AC Line Conducted Emission Test



Test setup Diagram- Radiated Emission



2.5 Testing process

1	Setup the EUT as shown in Section 2.4.
2	Run the software “PUTTY” and enter the corresponding instructions on the notebook computer.
3	Open the serial port and enter the corresponding commands to configure the test mode, test channel, test power and data rate.
4	Verify that the EUT works properly.

3 VERDICT SUMMARY SECTION

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

3.1 Standards

Standard	Year	Description
FCC CFR Title 47 Part 15 Subpart C Section 15.247	2020	Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz.
ANSI C63.10	2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
KDB 558074 D01V05r02	2019	Guidance for performing compliance measurements on Digital Transmission System (DTS) operating under section 15.247
RSS-Gen Issue 5 Amendment 2	2021	General Requirements for Compliance of Radio Apparatus
RSS-247 Issue 2	2017	Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

3.2 Overview of results

For FCC

Requirement – Test case	Basic standard(s)	Verdict	Remark
AC Power Line Conducted Emission	FCC 15.207	N/A	---
Emissions in restricted frequency bands	FCC 15.247(b)(3)	PASS	---
Duty cycle	ANSI C63.10:2013	PASS	---
Emissions in non-restricted frequency bands	FCC 15.247(d), FCC 15.209	PASS	---
Band Edge	FCC 15.247(d)	PASS	---
Fundamental emission output power	FCC 15.247(d), FCC 15.209	PASS	---
DTS Bandwidth	FCC 15.247(a)(2)	PASS	---
Power Spectral Density	FCC 15.247(e)	PASS	---
Antenna Requirement	FCC 15.203	PASS	---

For ISED

Requirement – Test case	Basic standard(s)	Verdict	Remark
AC Power Line Conducted Emission	RSS-Gen Issue 5 Section 8.8	N/A	---
Emissions in restricted frequency bands	RSS-Gen Issue 5 Section 8.9	PASS	---
Duty cycle	ANSI C63.10:2013	PASS	---
Emissions in non-restricted frequency bands	RSS-247 Issue 2 Section 5.5	PASS	---
Band Edge	RSS-Gen Issue 5 Section 8.10	PASS	---
Fundamental emission output power	RSS-247 Issue 2 Section 5.4(d)	PASS	---
DTS Bandwidth	RSS-Gen Issue 5 Section 6.7	PASS	---
Power Spectral Density	RSS-247 Issue 2 Section 5.2(b)	PASS	---
Antenna Requirement	RSS-Gen Issue 5 Section 6.8	PASS	---

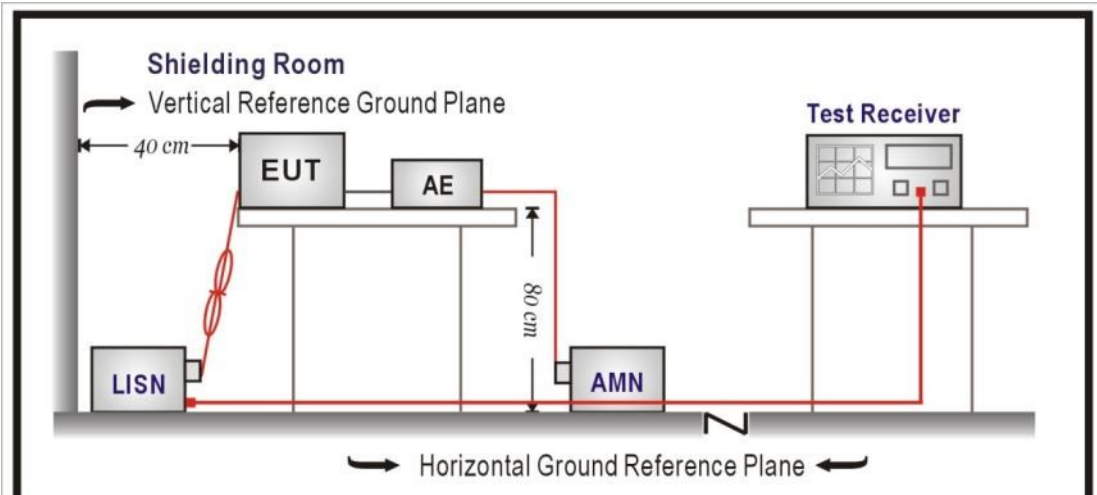
3.3 Test Facility

USA	:	FCC Designation Number: CN1199
CA	:	ISED CAB identifier: CN0040

4 TEST RESULTS

4.1 AC Power Line Conducted Emission	VERDICT: N/A
---	---------------------

4.1.1 Limit		
Standard	FCC Part 15 Subpart C Paragraph 15.207	
Frequency range [MHz]	Limit: QP [dB(μV) ¹⁾]	Limit: AV [dB(μV) ¹⁾]
0,15 - 0,50	66 - 56 ²⁾	56 - 46 ²⁾
0,50 - 5,0	56	46
5,0 - 30	60	50
¹⁾ At the transition frequency, the lower limit applies. ²⁾ The limit decreases linearly with the logarithm of the frequency.		

4.1.2 Test Setup


4.1.3 Test Procedure			
	References Rule	Chapter	Item
☒	ANSI C63.10-2013	6.2	Standard test method for ac power-line conducted emissions from unlicensed wireless devices

4.1.4 Test Data

Note: EUT Powered by DC.

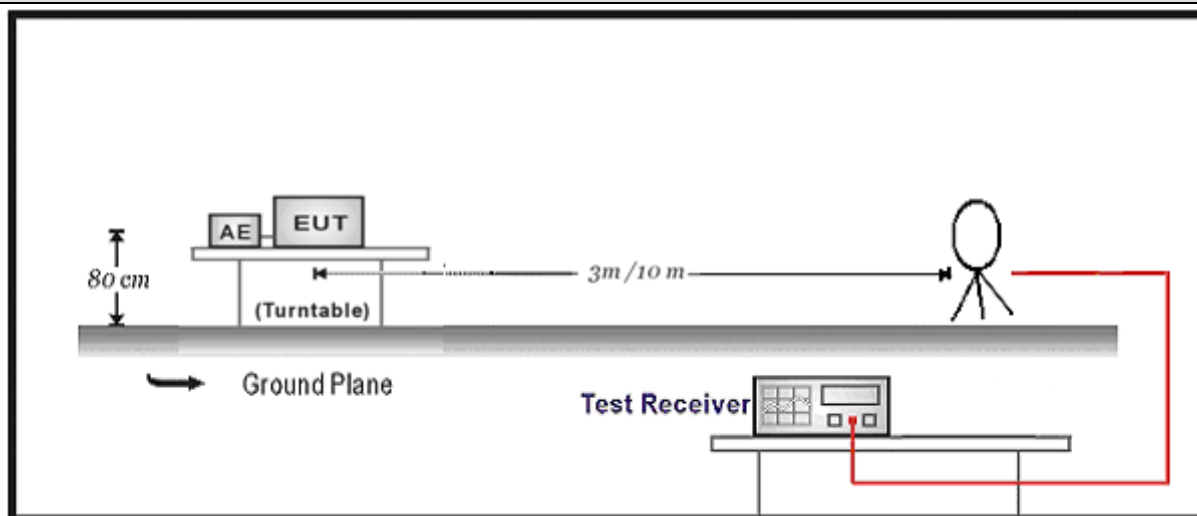
4.2 Emissions in restricted frequency bands**VERDICT: PASS****4.2.1 Limit**

Standard		FCC Part 15 Subpart C Paragraph 15.205; 15.209	
Restricted Bands of operation for FCC			
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
0.495 – 0.505	16.69475 –16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2690 – 2900	22.01 – 23.12
8.81425 – 8.81475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975–12.52025	240 – 285	3345.8 – 3358	36.43 – 36.5
12.57675–12.57725	322 – 335.4	3600 – 4400	Above 38.6
13.36 – 13.41	--	--	--
Restricted Band Emissions Limit			
Frequency (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Measurement distance (m)
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300 ^(Note 1)
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30 ^(Note 1)
1.705 - 30	30	29.5	30 ^(Note 1)
30 - 88	100	40	3 ^(Note 2)
88 - 216	150	43.5	3 ^(Note 2)
216 - 960	200	46	3 ^(Note 2)
Above 960	500	54	3 ^(Note 2)
Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).			
Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated			

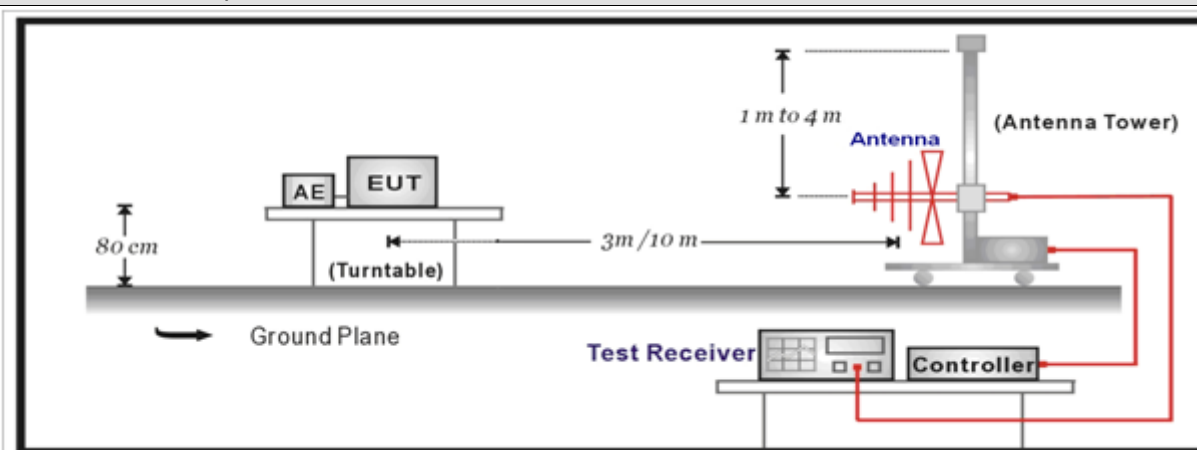
that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

4.2.2 Test Setup

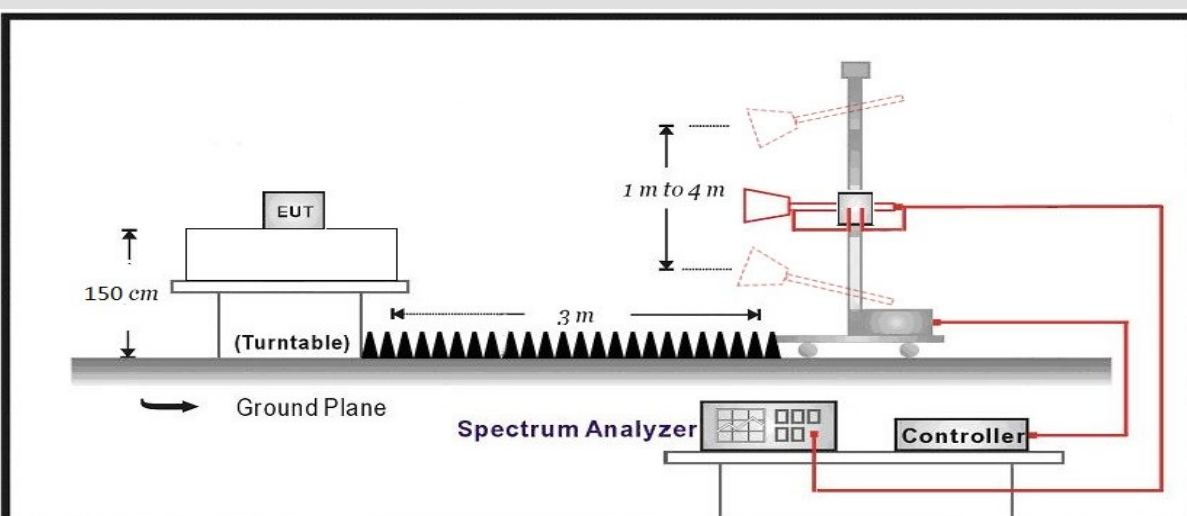
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



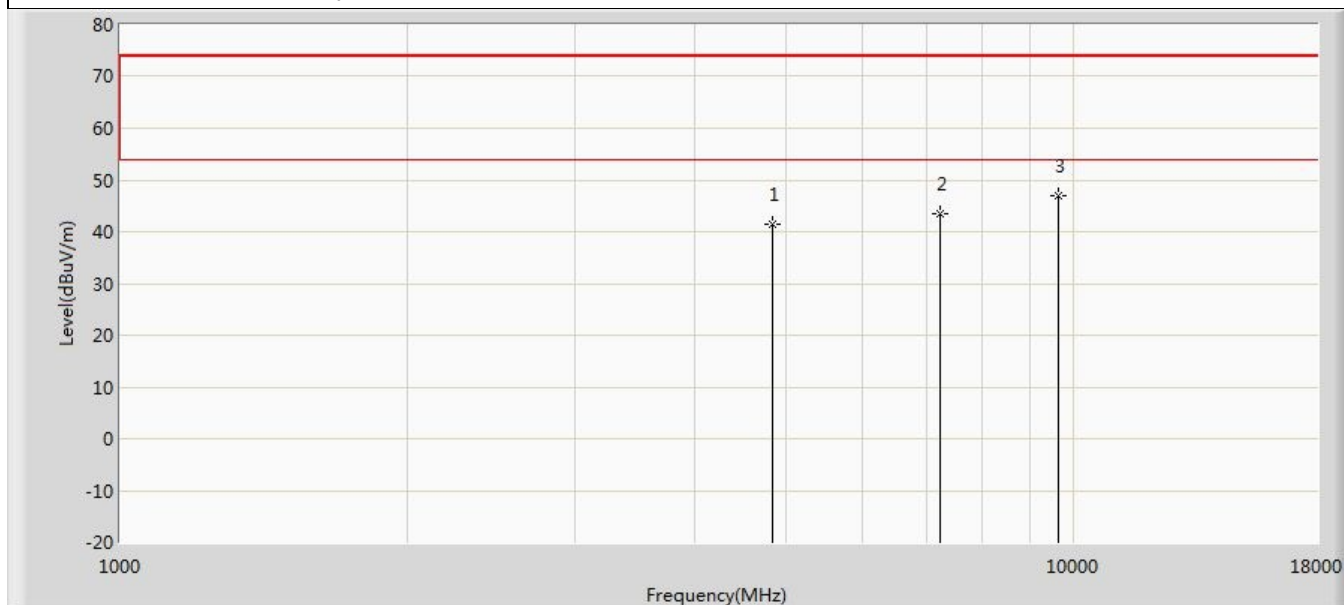
Above 1GHz Test Setup:



4.2.3 Test Procedure				
	References Rule		Chapter	Description
☒	ANSI C63.10		11.12	Emissions in restricted frequency bands
	☒	ANSI C63.10	11.12.1	Radiated emission measurements
	☒	ANSI C63.10	6.3	Radiated spurious emission test
	☒	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
	☒	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
	☒	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz
	☐	ANSI C63.10	11.12.2	Antenna-port conducted measurements
	☐	ANSI C63.10	11.12.2.3	Quasi-peak measurement procedure
	☐	ANSI C63.10	11.12.2.4	Peak power measurement procedure
	☐	ANSI C63.10	11.12.2.5	Average power measurement procedures
	☐	ANSI C63.10	11.12.2.5.1	Trace averaging with continuous EUT transmission at full power
	☐	ANSI C63.10	11.12.2.5.2	Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction
	☐	ANSI C63.10	11.12.2.5.3	Reduced VBW averaging across ON and OFF times of the EUT transmissions with max hold

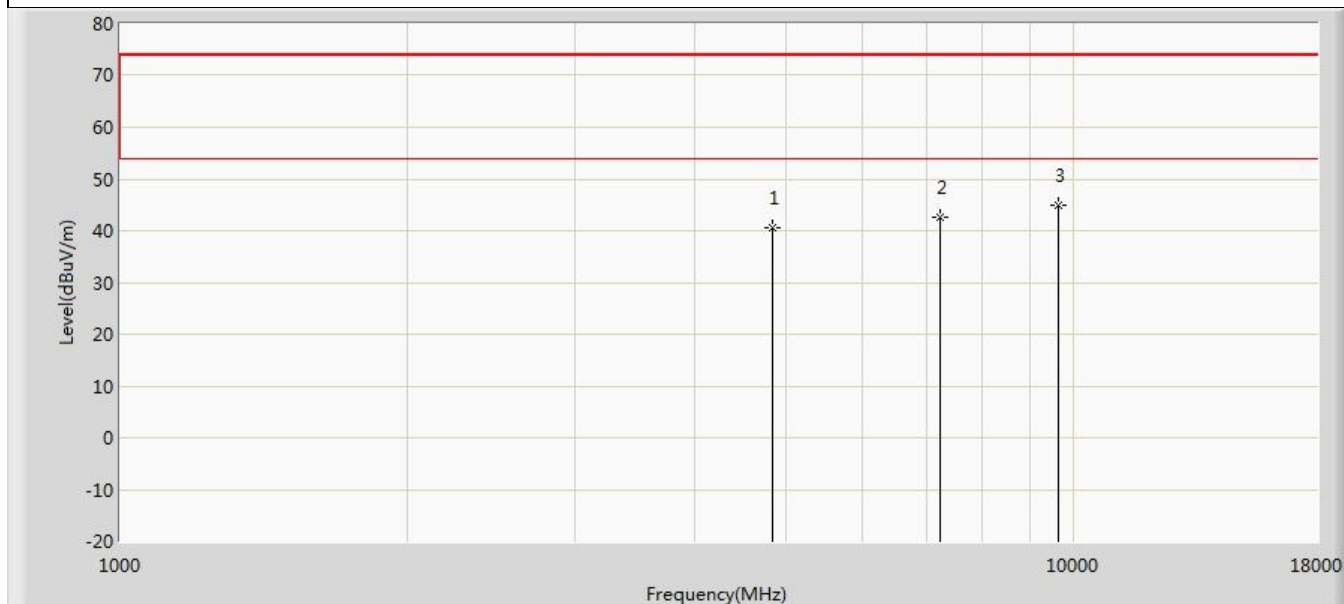
4.2.4 Test Data

Profile: 2290438R	Page No.: 19
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2412MHz by 11b	



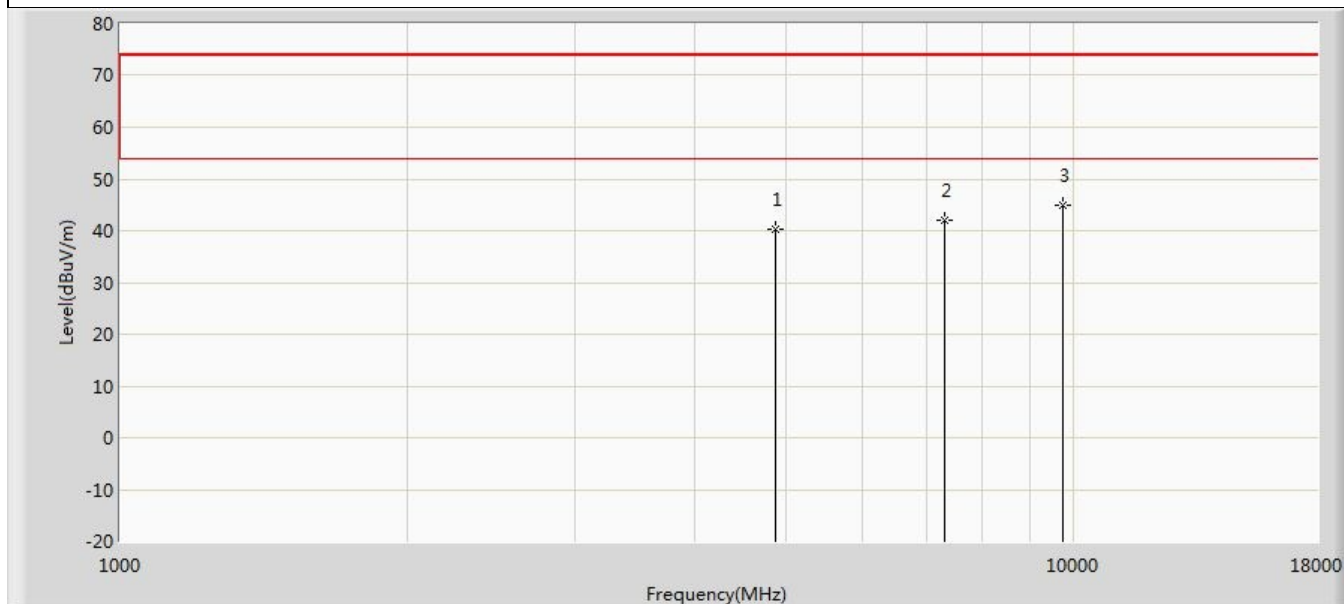
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	41.382	56.274	-32.618	74.000	-14.892	PK
2		7236.000	43.377	54.221	-30.623	74.000	-10.844	PK
3	*	9648.000	47.019	54.880	-26.981	74.000	-7.860	PK

Profile: 2290438R	Page No.: 20
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2412MHz by 11b	



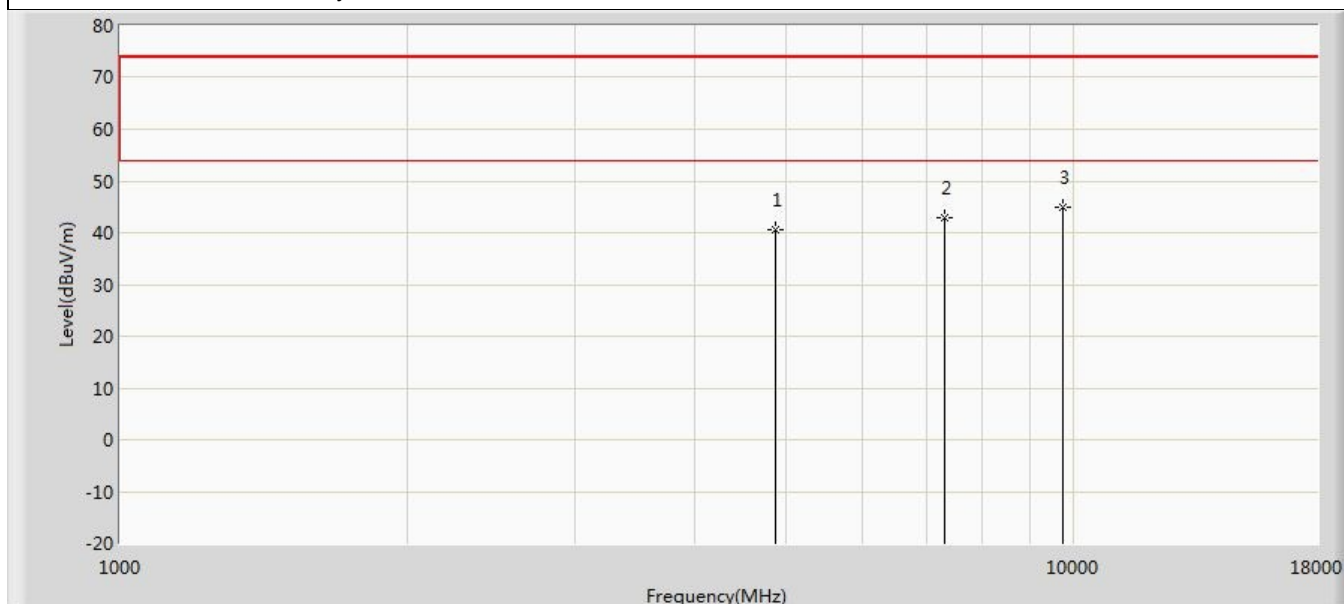
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	40.450	55.342	-33.550	74.000	-14.892	PK
2		7236.000	42.505	53.349	-31.495	74.000	-10.844	PK
3	*	9648.000	45.038	52.899	-28.962	74.000	-7.860	PK

Profile: 2290438R	Page No.: 21
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2437MHz by 11b	



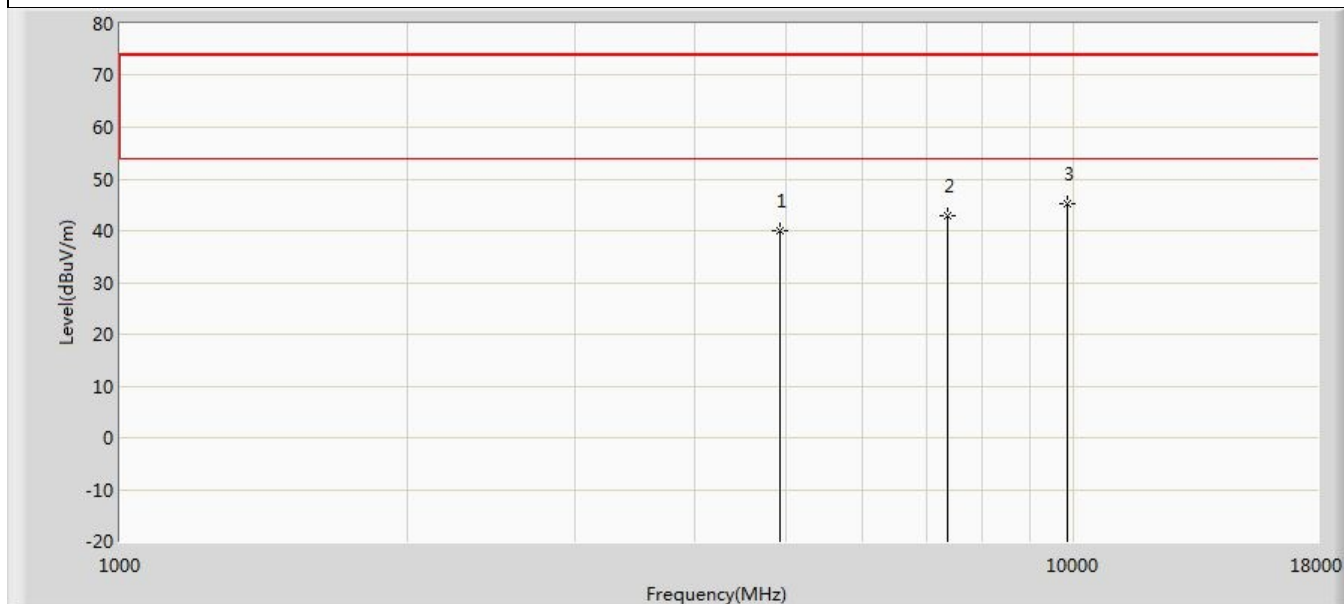
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	40.171	54.781	-33.829	74.000	-14.610	PK
2		7311.000	41.927	52.772	-32.073	74.000	-10.844	PK
3	*	9748.000	44.972	52.763	-29.028	74.000	-7.791	PK

Profile: 2290438R	Page No.: 22
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2437MHz by 11b	



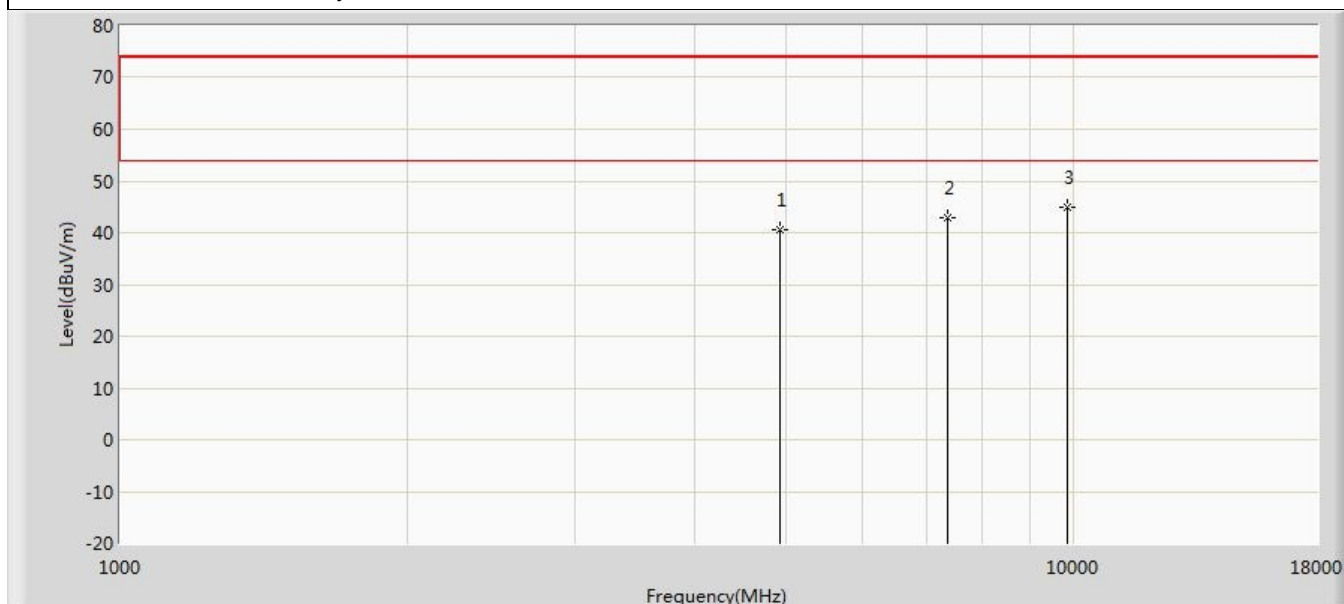
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	40.670	55.280	-33.330	74.000	-14.610	PK
2		7311.000	42.989	53.834	-31.011	74.000	-10.844	PK
3	*	9748.000	44.802	52.593	-29.198	74.000	-7.791	PK

Profile: 2290438R	Page No.: 23
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2462MHz by 11b	



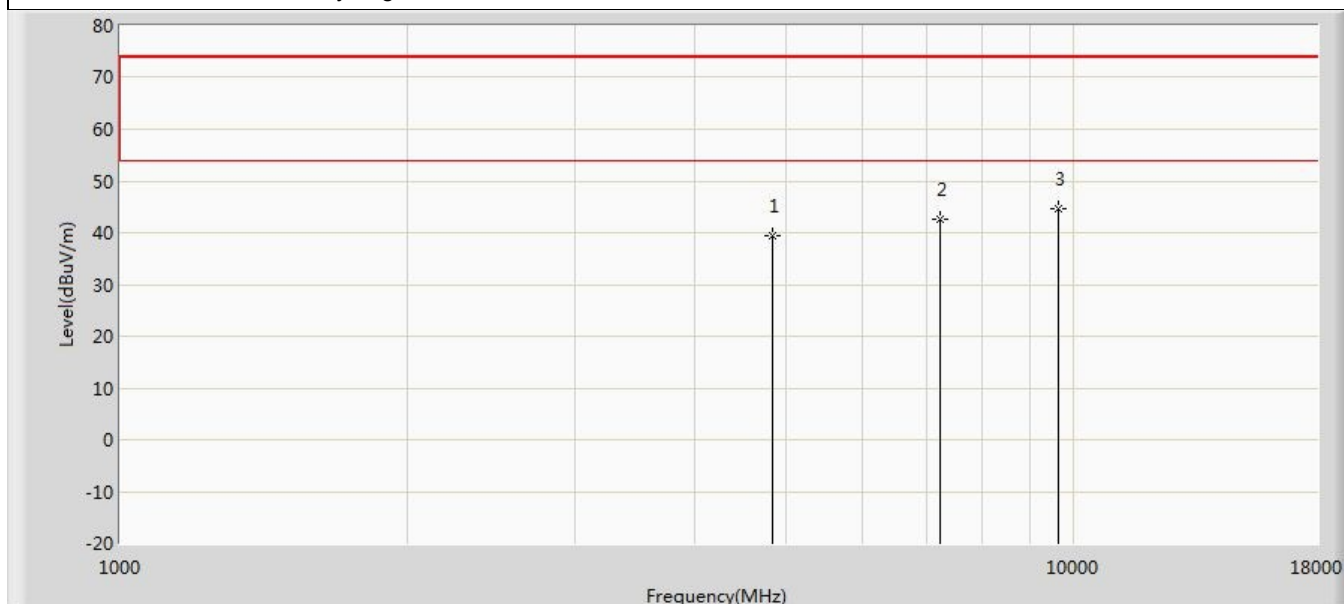
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	39.975	54.715	-34.025	74.000	-14.741	PK
2		7386.000	42.976	53.841	-31.024	74.000	-10.866	PK
3	*	9848.000	45.099	52.724	-28.901	74.000	-7.625	PK

Profile: 2290438R	Page No.: 24
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2462MHz by 11b	



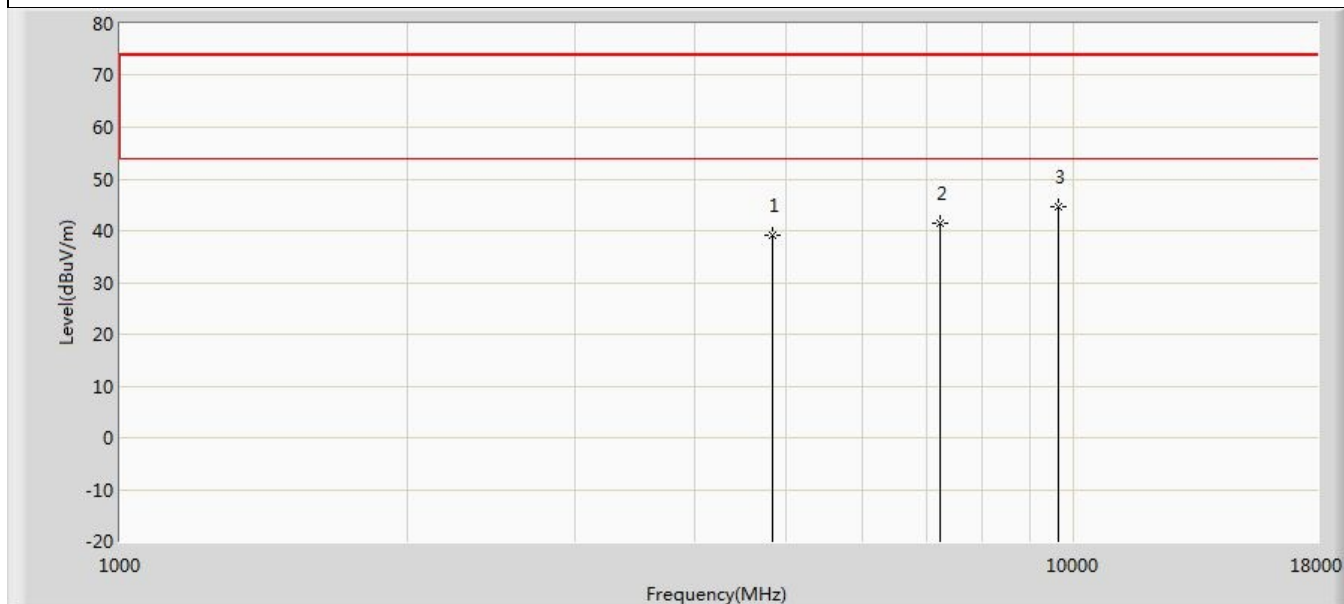
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	40.497	55.237	-33.503	74.000	-14.741	PK
2		7386.000	42.769	53.634	-31.231	74.000	-10.866	PK
3	*	9848.000	45.068	52.693	-28.932	74.000	-7.625	PK

Profile: 2290438R	Page No.: 25
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2412MHz by 11g	



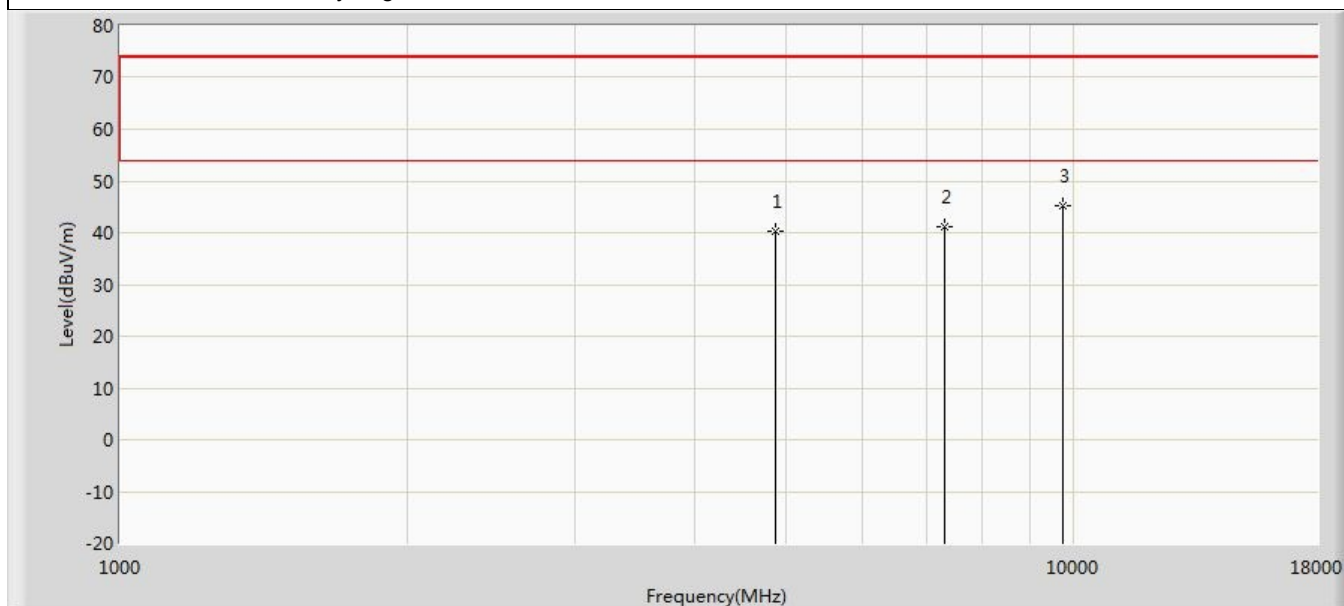
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	39.401	54.293	-34.599	74.000	-14.892	PK
2		7236.000	42.593	53.437	-31.407	74.000	-10.844	PK
3	*	9648.000	44.776	52.637	-29.224	74.000	-7.860	PK

Profile: 2290438R	Page No.: 26
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2412MHz by 11g	



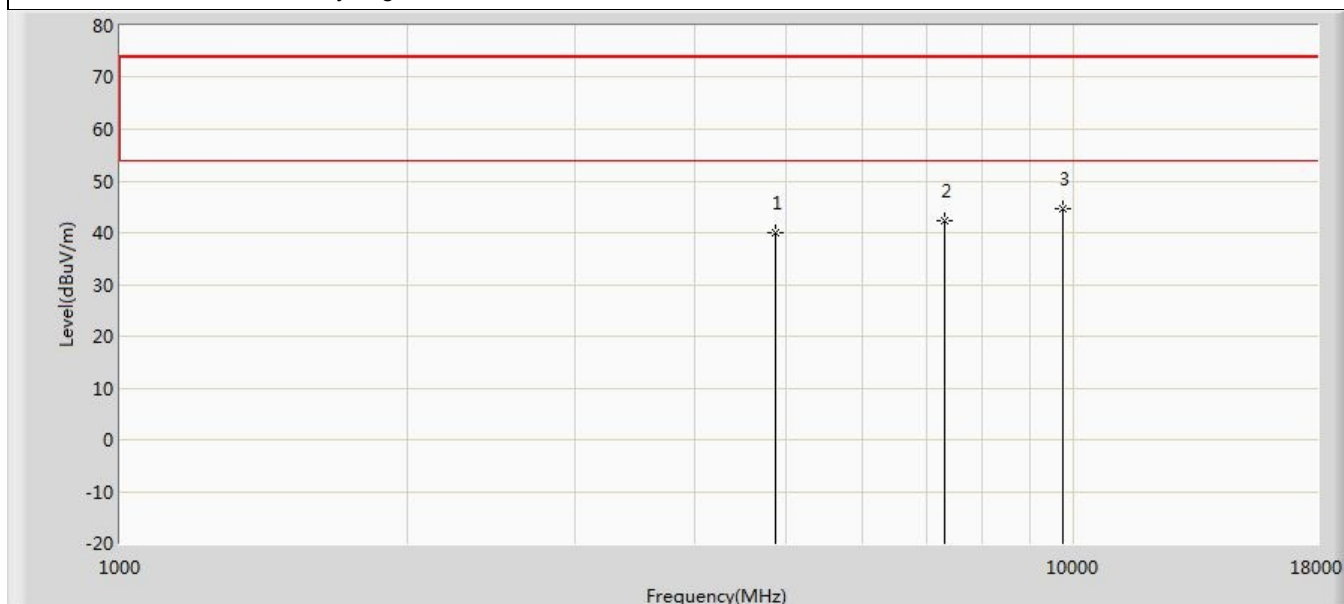
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	39.096	53.988	-34.904	74.000	-14.892	PK
2		7236.000	41.408	52.252	-32.592	74.000	-10.844	PK
3	*	9648.000	44.600	52.461	-29.400	74.000	-7.860	PK

Profile: 2290438R	Page No.: 27
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2437MHz by 11g	



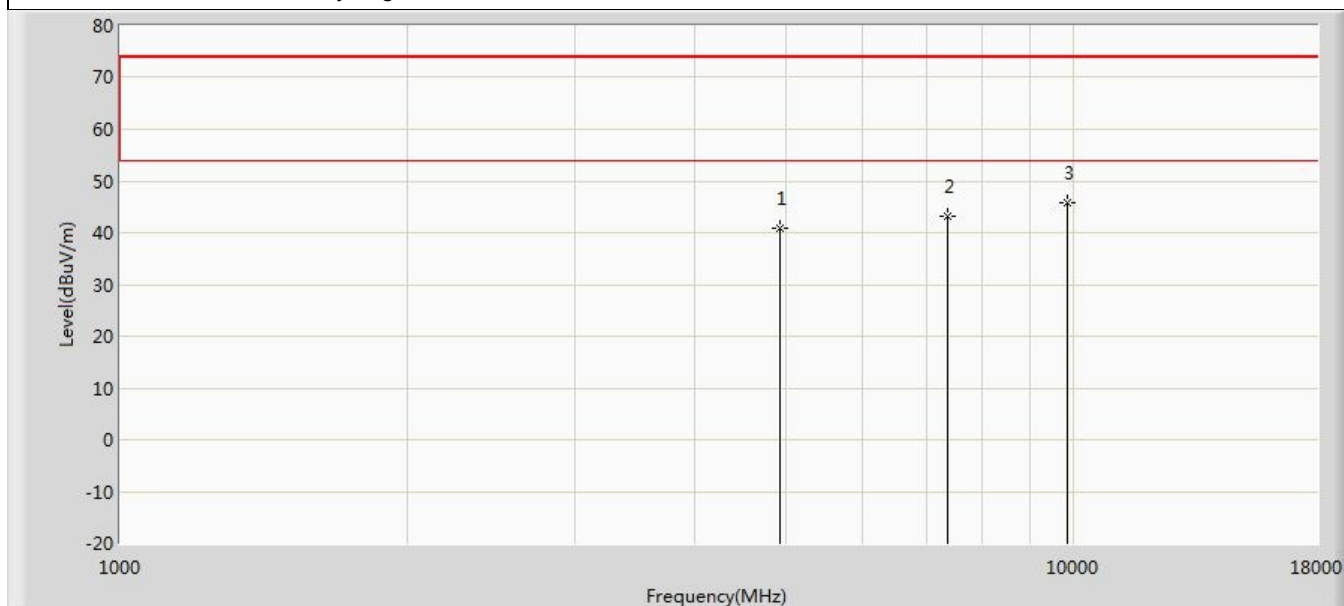
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	40.332	54.942	-33.668	74.000	-14.610	PK
2		7311.000	41.112	51.957	-32.888	74.000	-10.844	PK
3	*	9748.000	45.118	52.909	-28.882	74.000	-7.791	PK

Profile: 2290438R	Page No.: 28
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2437MHz by 11g	



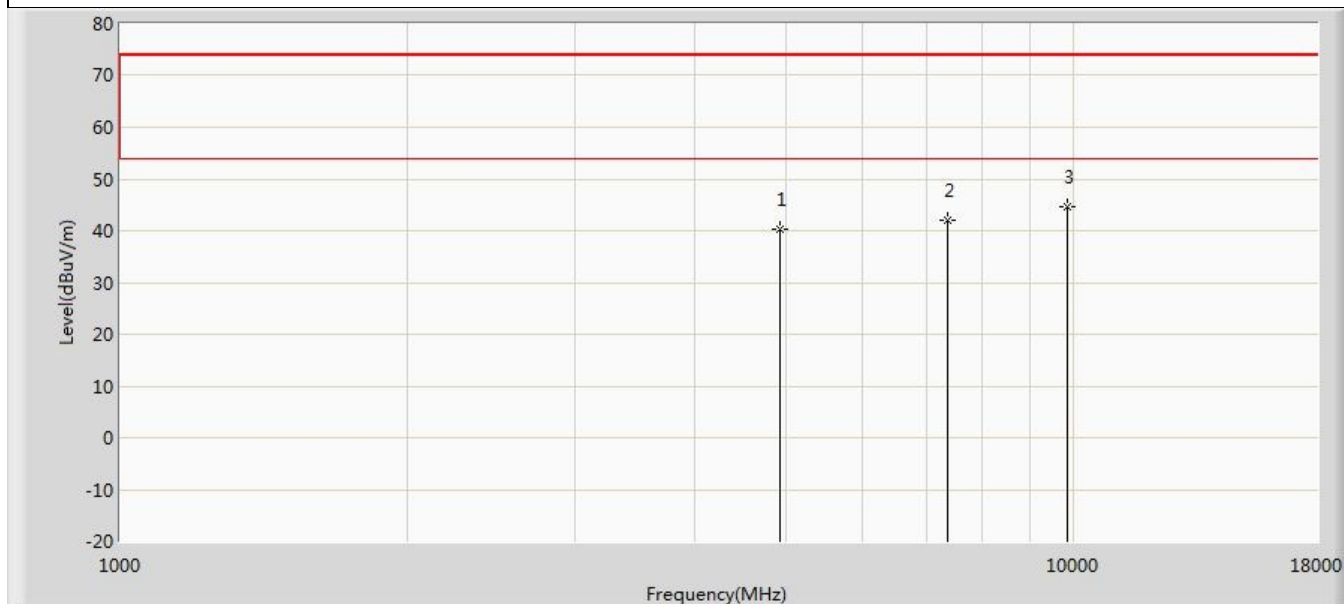
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	40.031	54.641	-33.969	74.000	-14.610	PK
2		7311.000	42.286	53.131	-31.714	74.000	-10.844	PK
3	*	9748.000	44.620	52.411	-29.380	74.000	-7.791	PK

Profile: 2290438R	Page No.: 29
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2462MHz by 11g	



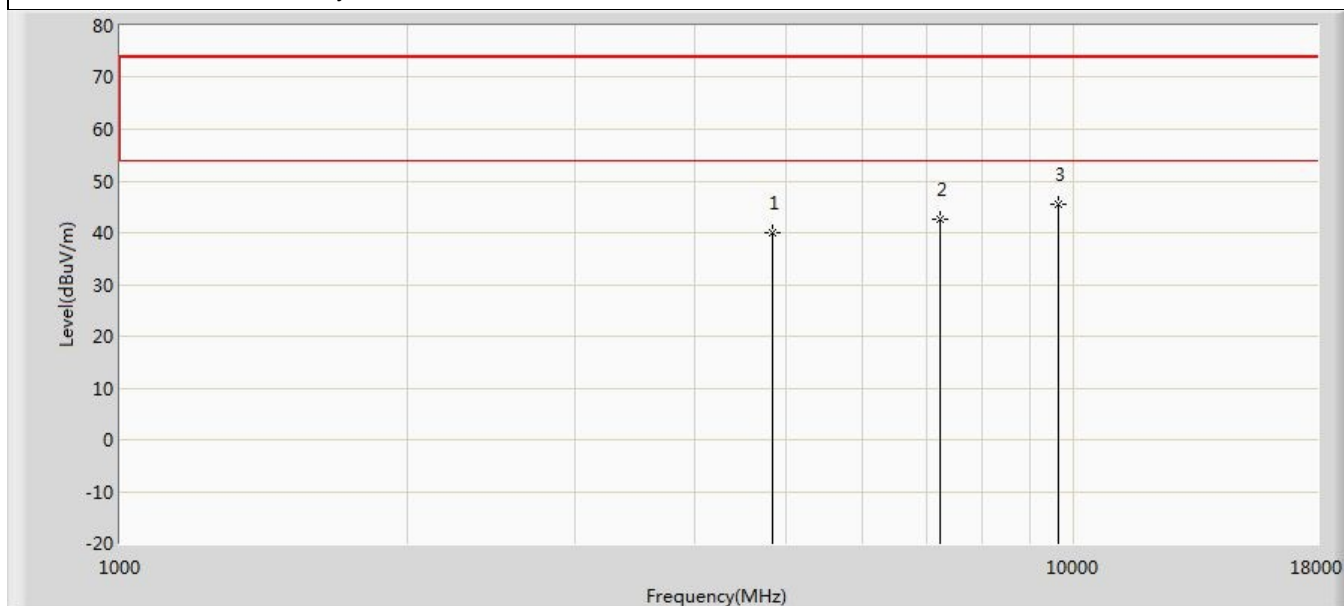
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	40.908	55.648	-33.092	74.000	-14.741	PK
2		7386.000	43.137	54.002	-30.863	74.000	-10.866	PK
3	*	9848.000	45.676	53.301	-28.324	74.000	-7.625	PK

Profile: 2290438R	Page No.: 30
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2462MHz by 11g	



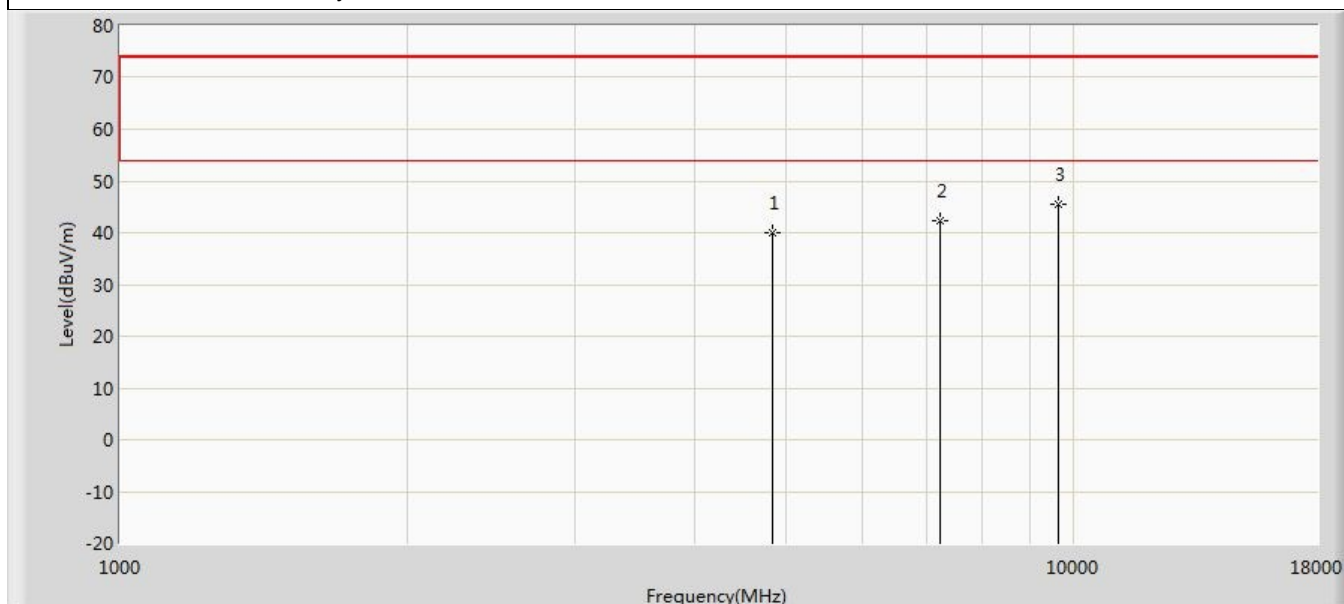
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	40.160	54.900	-33.840	74.000	-14.741	PK
2		7386.000	41.994	52.859	-32.006	74.000	-10.866	PK
3	*	9848.000	44.740	52.365	-29.260	74.000	-7.625	PK

Profile: 2290438R	Page No.: 31
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2412MHz by 11n20	



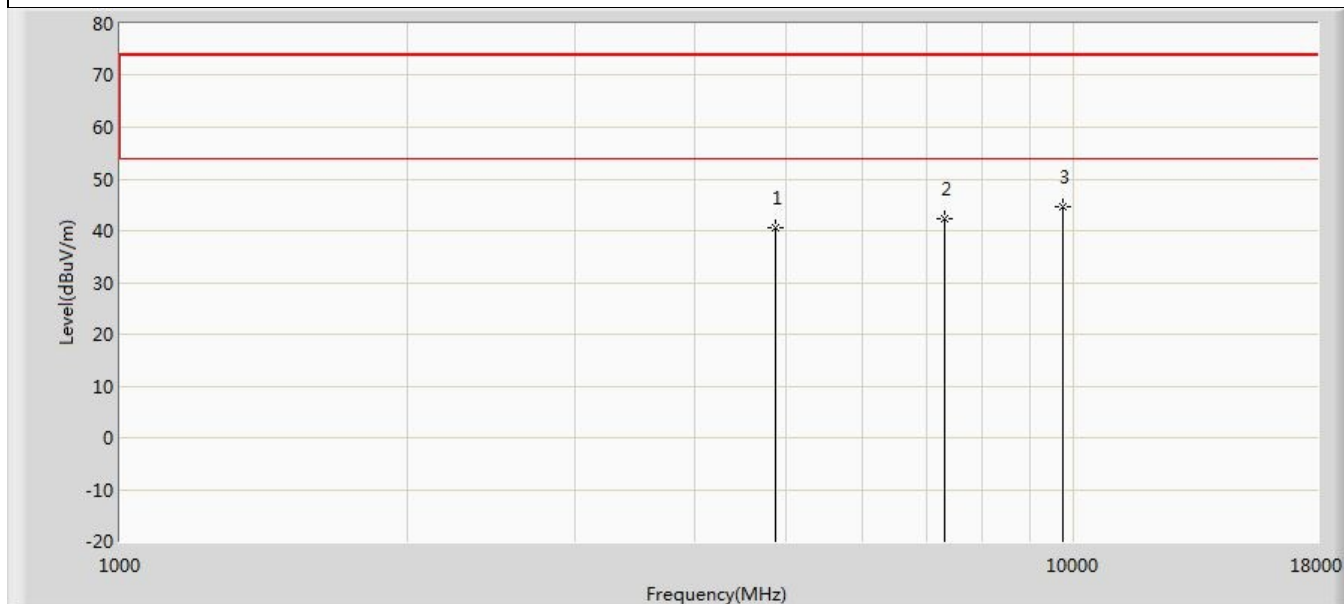
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	40.118	55.010	-33.882	74.000	-14.892	PK
2		7236.000	42.693	53.537	-31.307	74.000	-10.844	PK
3	*	9648.000	45.413	53.274	-28.587	74.000	-7.860	PK

Profile: 2290438R	Page No.: 32
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2412MHz by 11n20	



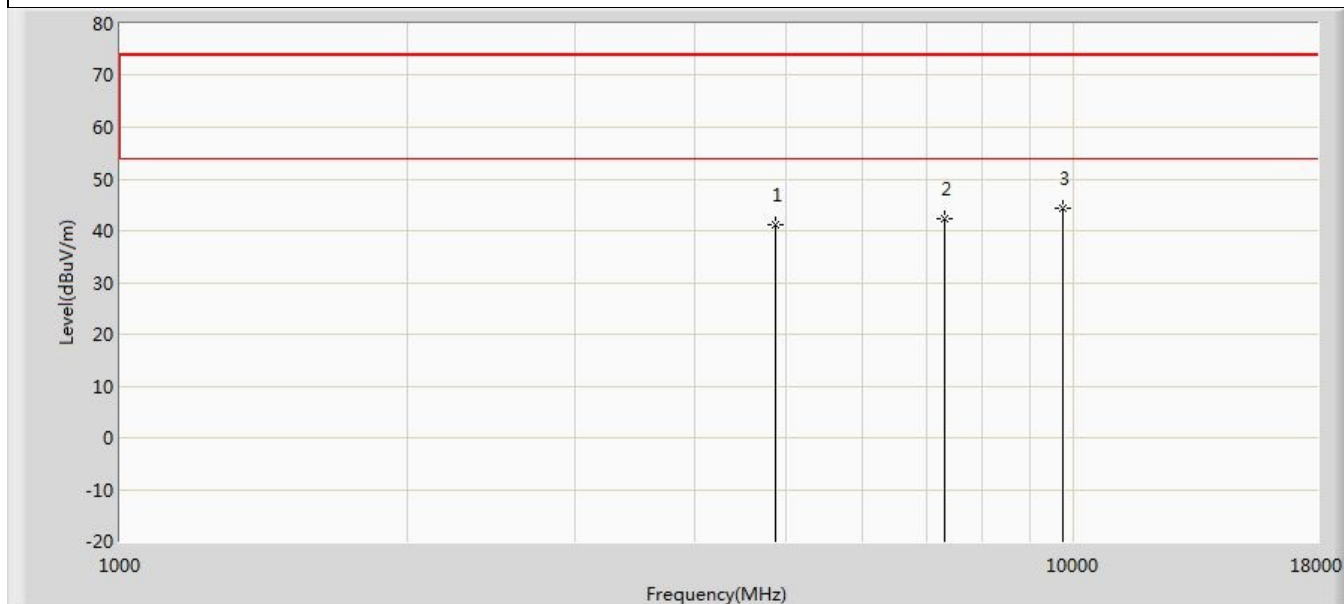
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	40.027	54.919	-33.973	74.000	-14.892	PK
2		7236.000	42.449	53.293	-31.551	74.000	-10.844	PK
3	*	9648.000	45.562	53.423	-28.438	74.000	-7.860	PK

Profile: 2290438R	Page No.: 33
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2437MHz by 11n20	



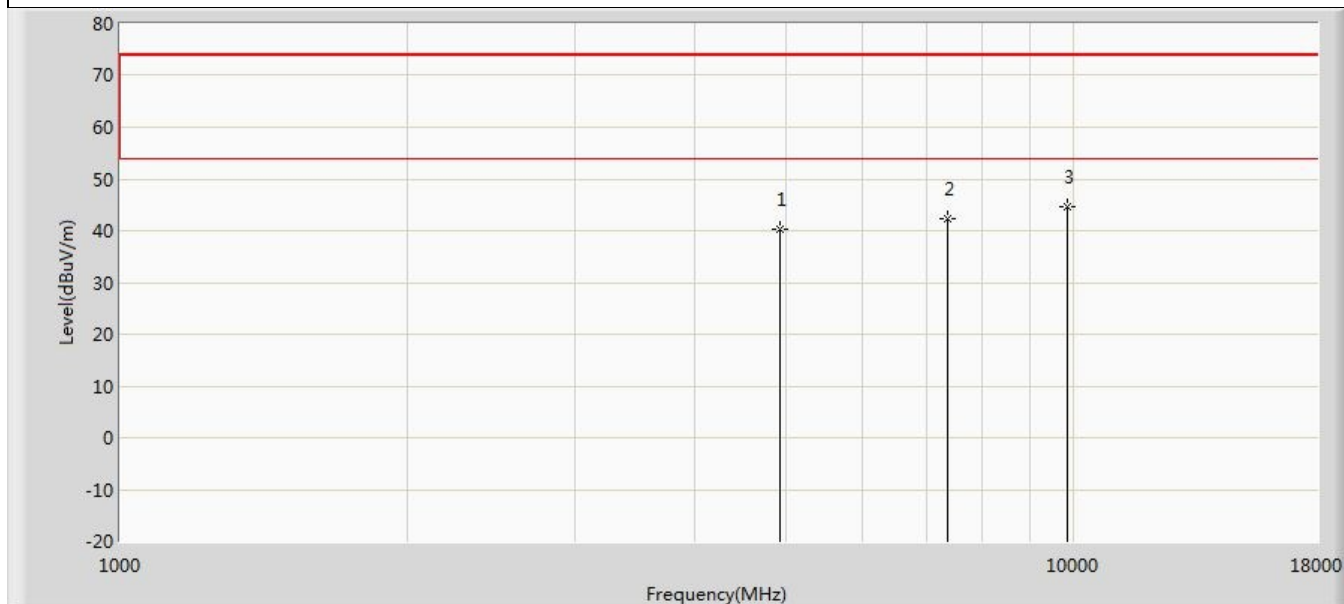
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	40.538	55.148	-33.462	74.000	-14.610	PK
2		7311.000	42.224	53.069	-31.776	74.000	-10.844	PK
3	*	9748.000	44.724	52.515	-29.276	74.000	-7.791	PK

Profile: 2290438R	Page No.: 34
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2437MHz by 11n20	



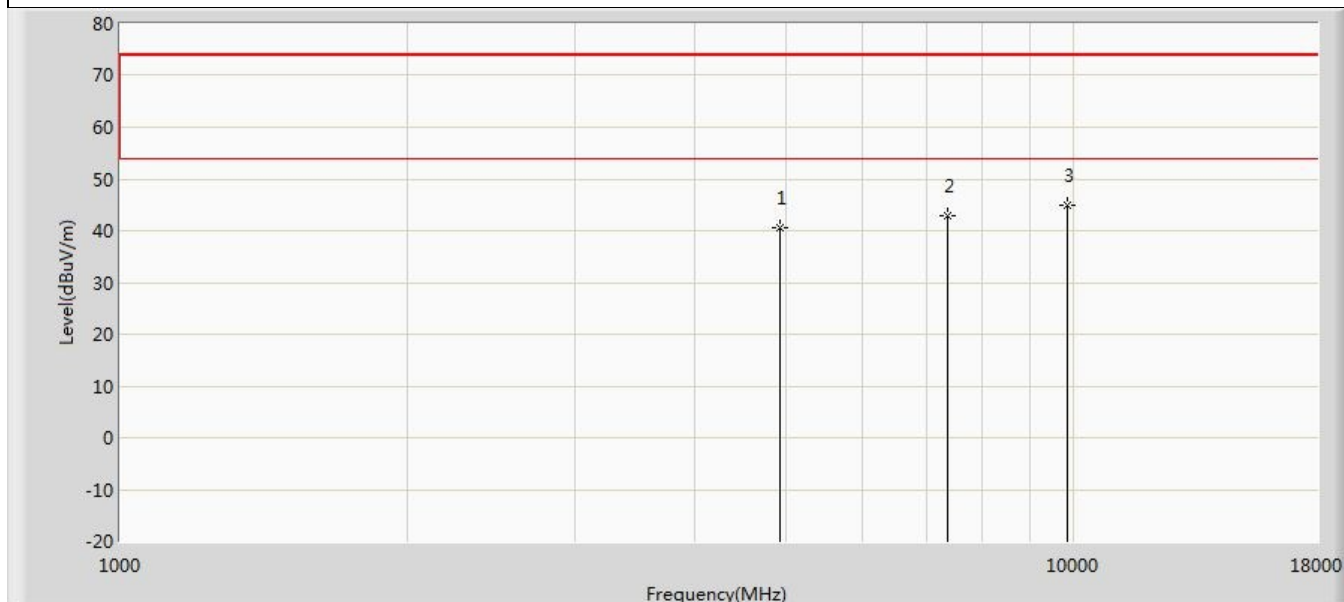
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	41.079	55.689	-32.921	74.000	-14.610	PK
2		7311.000	42.436	53.281	-31.564	74.000	-10.844	PK
3	*	9748.000	44.452	52.243	-29.548	74.000	-7.791	PK

Profile: 2290438R	Page No.: 35
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2462MHz by 11n20	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	40.303	55.043	-33.697	74.000	-14.741	PK
2		7386.000	42.271	53.136	-31.729	74.000	-10.866	PK
3	*	9848.000	44.627	52.252	-29.373	74.000	-7.625	PK

Profile: 2290438R	Page No.: 36
Engineer: Yu Liu	
Site: AC5	Time: 2022/11/08 - 03:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Transmit at 2462MHz by 11n20	



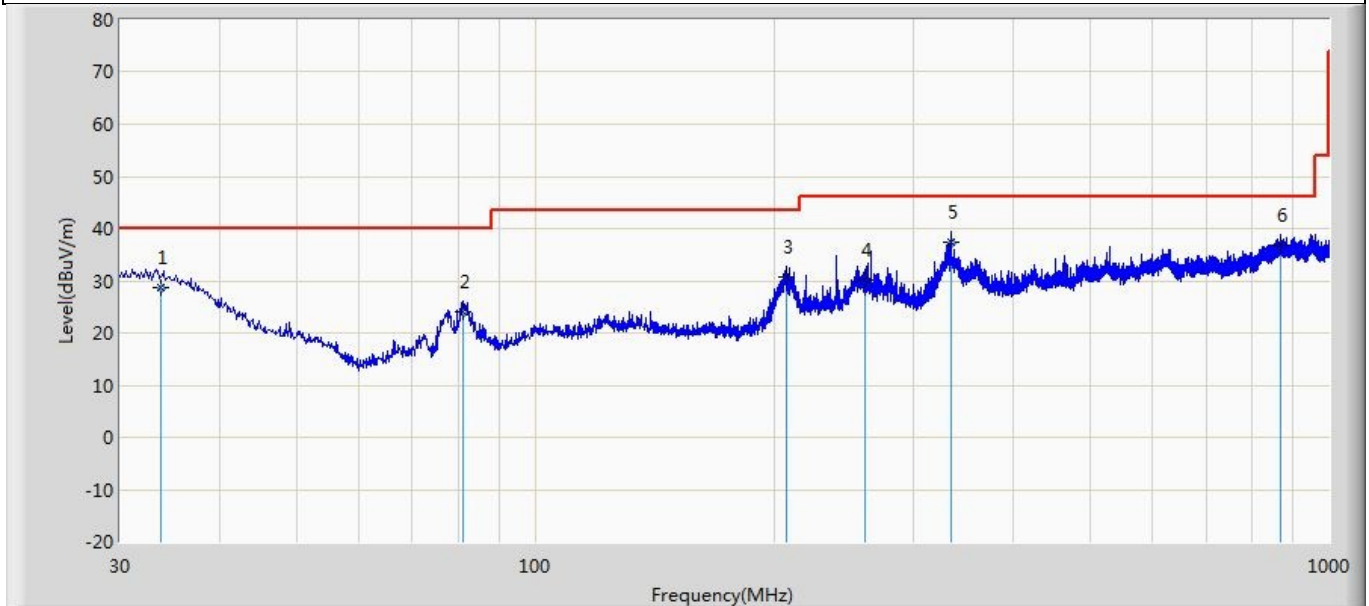
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	40.567	55.307	-33.433	74.000	-14.741	PK
2		7386.000	42.757	53.622	-31.243	74.000	-10.866	PK
3	*	9848.000	44.864	52.489	-29.136	74.000	-7.625	PK

Note:

1. Measured Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, worst case are at least 20dB below the limits, therefore no data appear in the report.
3. This limit applies for both peak and average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.
4. The points in graph are the highest data in test frequency range.

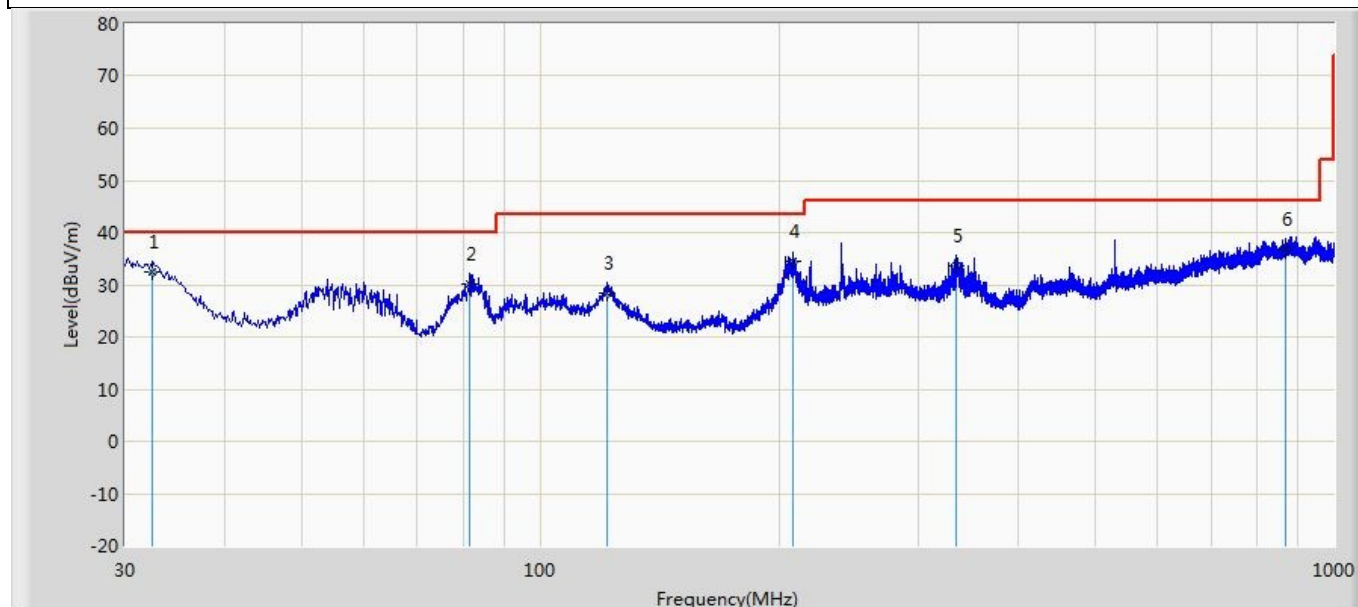
The worst case of Radiated Emission below 1GHz:

Profile: 2290438R	Page No.: 22
Engineer: Yu Liu	
Site: AC3	Time: 2022/11/14 - 20:41
Limit: FCC_Part15.109_RE(3m)_ClassB	Margin: 0
Probe: AC3_3M(30-1000M)	Polarity: Horizontal
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Mode 1: Transmit at 2437MHz by 11b	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		33.759	28.750	1.683	-11.250	40.000	27.067	QP
2		81.168	24.119	10.474	-15.881	40.000	13.644	QP
3		207.510	30.713	13.466	-12.787	43.500	17.247	QP
4		260.011	30.142	11.192	-15.858	46.000	18.950	QP
5	*	334.216	37.509	14.610	-8.491	46.000	22.898	QP
6		870.384	36.769	3.835	-9.231	46.000	32.934	QP

Profile: 2290438R	Page No.: 23
Engineer: Yu Liu	
Site: AC3	Time: 2022/11/14 - 20:46
Limit: FCC_Part15.109_RE(3m)_ClassB	Margin: 0
Probe: AC3_3M(30-1000M)	Polarity: Vertical
EUT: BT & WLAN MODULE	Power: DC 3.3V
Note: Mode 1: Transmit at 2437MHz by 11b	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	32.425	32.380	9.141	-7.620	40.000	23.239	QP
2		81.652	30.058	14.622	-9.942	40.000	15.436	QP
3		121.665	28.303	7.670	-15.197	43.500	20.633	QP
4		208.116	34.368	11.018	-9.132	43.500	23.350	QP
5		334.337	33.686	10.528	-12.314	46.000	23.158	QP
6		868.807	36.877	3.894	-9.123	46.000	32.983	QP

Note:

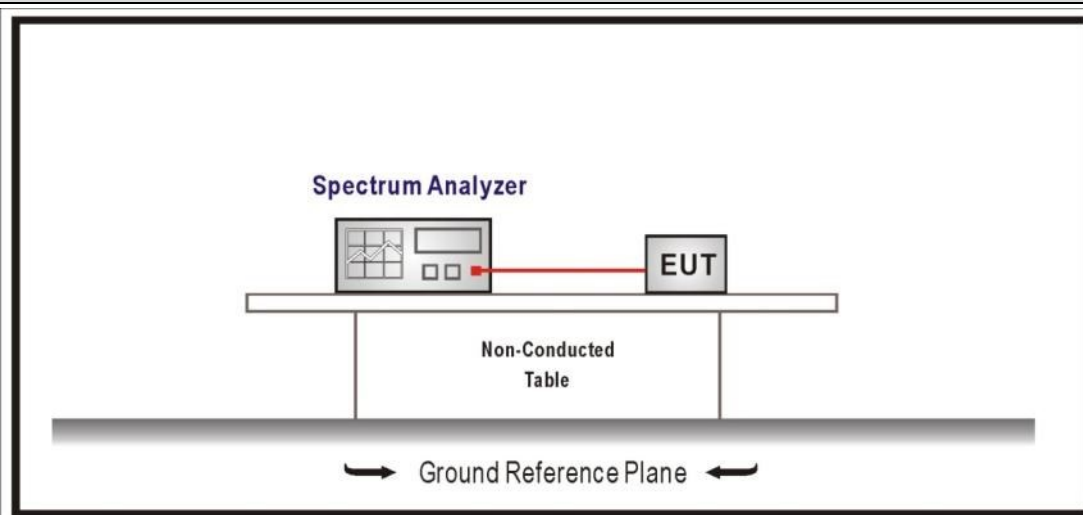
1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Factor(Probe+Cable-Amp)

4.3 Emissions in non-restricted frequency band**VERDICT: PASS****4.3.1 Limit**

Standard	FCC Part 15 Subpart C Paragraph 15.247(d)
RF Output power (Detection methods)	Limit(dB)
RF Output power(Average detector)	30dBc(Note1)
RF Output power(PK detector)	20dBc(Note2)

Note 1: If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 30 dBc).

Note 2: If the maximum peak conducted output power procedure was used, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).

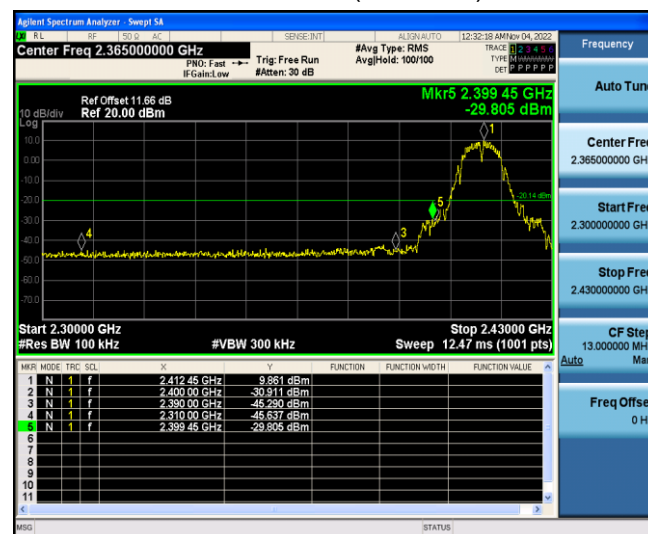
4.3.2 Test Setup**4.3.3 Test Procedure**

References Rule	Chapter	Description
☒ ANSI C63.10	11.11	Emissions in non-restricted frequency bands
☒ ANSI C63.10	11.11.1	General
☒ ANSI C63.10	11.11.2	Reference level measurement
☒ ANSI C63.10	11.11.3	Emission level measurement

4.3.4 Test Data

Mode	Channel	Test Frequency (MHz)	Maximum In-Band PSD[a] (dBm/100kHz)	Frequency (MHz)	Out-Band PSD[b] (dBm/100kHz)	[a]-[b] (dB)	Limit (dB)	Result
1	1	2412	9.86	2398.47	-29.81	39.67	≥20	Pass
	11	2462	10.04	2500	-42.36	52.4	≥20	Pass
2	1	2412	6.81	2400	-30.18	36.99	≥20	Pass
	11	2462	7.20	2500	-35.31	42.51	≥20	Pass
3	1	2412	7.21	2400	-30.93	38.14	≥20	Pass
	11	2462	7.49	2500	-30.08	37.57	≥20	Pass

Mode 1 CH01(2412MHz)



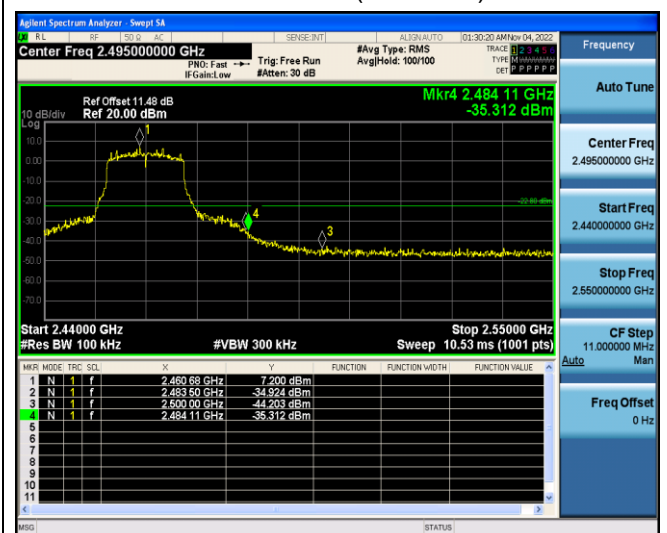
Mode 1 CH11(2462MHz)



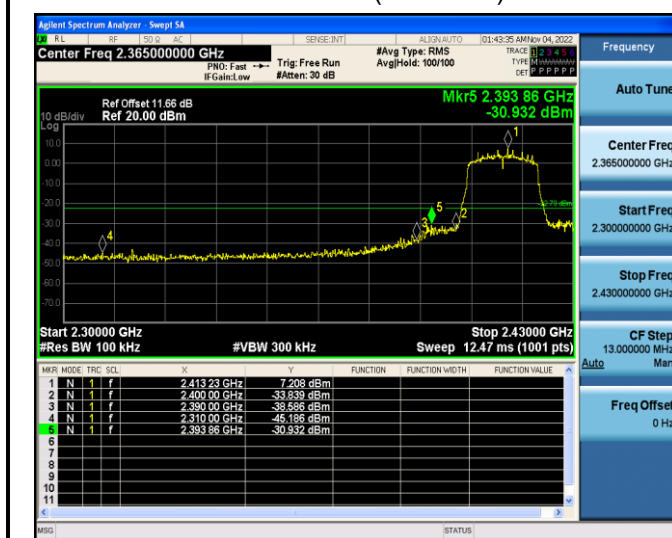
Mode 2 CH01(2412MHz)



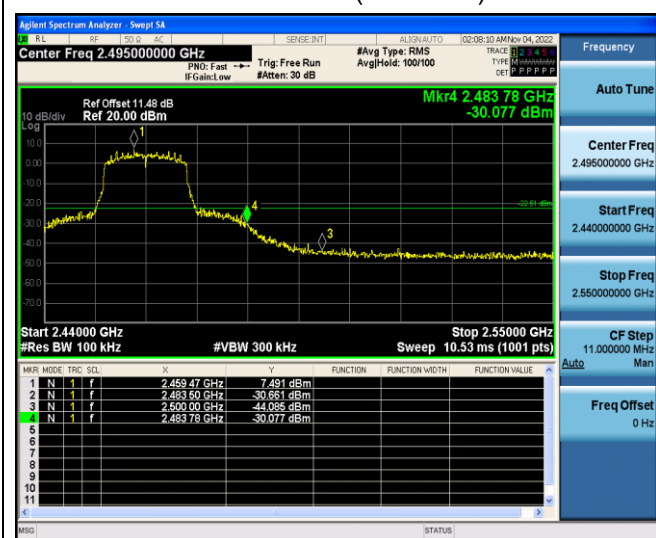
Mode 2 CH11(2462MHz)



Mode 3 CH01(2412MHz)



Mode 3 CH11(2462MHz)



The data of entire corresponding spectrum:

