DEKRA Testing and Certification (Suzhou) Co., Ltd.
No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006, Jiangsu, China
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098

Test report No:
2040637R-RF-US-P06V01

FCC TEST REPORT & ISED TEST REPORT

Product Name	Tunable White Direct Connect Smart Bulb
Trademark	GE
Model and /or type reference	CLEDR309SD1
FCC ID	PUU-BR30-DMTW
IC ID	10798A-DMTWBR30
Applicant´s name / address	GE Lighting 1975 Noble Road, Cleveland, Ohio, United States
Test method requested, standard	FCC CFR Title 47 Part 15 Subpart C Section 15.247 ANSI C63.10: 2013 KDB558074 D01v05r02 RSS-Gen Issue 5 / RSS-247 Issue 2
Verdict Summary	IN COMPLIANCE
Documented By	Kitty Li/Project Assistant
Reviewed by (name / position & signature)	Frank He/ Technical Supervisor
Approved by (name / position & signature)	Jack Zhang/ Supervisor
Date of issue	2020-07-02
Report template No	2040637R-RF-US-P06V01

INDEX

page

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

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
2040637R-RF-US-P06V01	V1.0	Initial issue of report.	2020-06-10
2040637R-RF-US-P06V01	V1.1	Update the standard name of Chapter 4.1.4.	2020-06-23
2040637R-RF-US-P06V01	V1.2	Update some descriptions.	2020-07-02

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, unless the specification, standard or customer have special requirements.
4. The test results presented in this report relate only to the object tested.
5. The test results relate only to the samples tested.
6. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification (Suzhou) Co., Ltd.
7. This report will not be used for social proof function in China market.

USED EQUIPMENT

AC Power Line Conducted Emission / TR1(Chamber details)

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI	100906	2020.04.20	2021.04.19
Two-Line V-Network	R&S	ENV216	101190	2019.05.25	2020.05.24
Two-Line V-Network	R&S	ENV216	101044	2019.05.25	2020.05.24
Current Probe	R&S	EZ-17	100678	2020.03.12	2021.04.11
50ohm Termination	SHX	TF2	07081402	2019.09.02	2020.09.01
50ohm Termination	SHX	TF2	07081403	2019.09.02	2020.09.01
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	N/A	N/A
Temperature/Humidity Meter	RTS	RTS-8S	TR1-TH	2019.08.21	2020.08.20
Coaxial Cable	Suhner	RG 223	TR1-C1	2019.08.25	2020.08.24
Coaxial Cable	Suhner	RG 223	TR1-C2	2019.08.25	2020.08.24
Dekra test software					

RF conducted test / TR8(Chamber details)

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2019.09.28	2020.09.27
EXA Spectrum Analyzer	Keysight	N9010A	MY55370495	2020.04.17	2021.04.16
MXA Signal Anlyzer	Keysight	N9020A	MY56060147	2019.08.30	2020.08.29
Wideband Peak Power Meter	Anritsu	ML2495A	0905006	2019.07.14	2020.07.13
Power Sensor	Anritsu	MA2411B	0846014	2019.08.12	2020.08.11
Dekra test software					

Radiated Emission(30MHz-1GHz) / AC3(Chamber details)

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI	100573	2020.03.03	2021.03.02
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2019.05.25	2020.05.24
Temperature/Humidity Meter	RTS	RTS-8S	AC2-TH	2019.09.02	2020.09.01
Coaxial Cable	Huber+Suhner	RG 214	AC2-C	2020.04.13	2021.04.12
Dekra test software					

Radiated Emission / AC5(1GHz-40GHz)(Chamber details)

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2020.05.08	2021.05.07
Preamplifier	Miteq	NSP1800-25	1364185	2020.05.06	2021.05.05
Preamplifier	QuieTek	AP-040G	CHM-0906001	2020.05.06	2021.05.05
DRG Horn	ETS-Lindgren	3117	00123988	2020.01.22	2021.01.21
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2019.09.02	2020.09.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2020.04.13	2021.04.12
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2020.04.13	2021.04.12
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2020.04.13	2021.04.12
Dekra test software					

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	9kHz~150kHz: 2.80dB 150kHz~30MHz: 2.40dB
Peak Power Output	± 1.27 dB
Radiated Emission(30MHz~1GHz)	Horizontal: 30MHz~200MHz: 3.50 dB 300MHz~1GHz: 3.60 dB Vertical: 30MHz~200MHz: 3.60 dB 300MHz~1GHz: 3.50 dB
Radiated Emission(1GHz~26.5GHz)	Horizontal: 1GHz~18GHz: 5.00 dB Vertical: 1GHz~18GHz: 4.80 dB
RF antenna conducted test	± 1.27dB
Radiated Emission Band Edge	± 3.9 dB
DTS Bandwidth	±150Hz
Occupied Bandwidth	±1kHz
Power Density	±1.27dB

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Model / Type number.....:	CLEDR309SD1
Trademark.....:	GE
Manufacturer.....:	GE Lighting
Manufacturer Address .....:	1975 Noble Road, Cleveland, Ohio, United States

Wireless specifiction .....:	WIFI	
Operating frequency range(s).....:	2400~2483.5MHz	
Type of modulation .....:	DSSS: BPSK,QPSK,CCK OFDM: BPSK, QPSK, 16QAM, 64QAM	
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
	☒	AC: 100 – 240 V, 50/60 Hz
	☐	DC: 12 V, 24 V, 12 / 24 V
	☐	Rated voltage: 100-120Vac 60Hz Rated input: 1100W(Max. Load)
Mounting position.....:	☐	Table top equipment
	☐	Wall/Ceiling mounted equipment
	☒	Floor standing equipment
	☐	Hand-held equipment
	☐	Other:

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	☐	Basic
			☐	CDD
			☐	Sectorized
			☐	Beam-forming
Antenna Type .....:	☐	External	☐	Dipole
			☐	Sectorized
	☒	Internal	☐	PIFA
			☐	PCB
			☒	Metal Monopole Antenna
Antenna Gain.....:	1.1dBi			

1.3 Test date

Test Location	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Date(receive sample)	Apr. 25, 2020
Date (start test)	Apr. 28, 2020
Date (finish test)	May.20, 2020

1.4 Data Rate

IEEE 802.11b

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

Table 1 –TX Antenna number = 1

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

Table 1 – MCS parameters for TX Antenna number = 1

IEEE 802.11n

Spatial streames	MCS Index	Modulation	R	Data Rate(Mb/s)			
				800ns GI		400ns GI	
				20MHz	40MHz	20MHz	40MHz
1	0	BPSK	1/2	6.5	13.5	7.2	15.0
1	1	QPSK	1/2	13.0	27.0	14.4	30.0
1	2	QPSK	3/4	19.5	40.5	21.7	45.0
1	3	16-QAM	1/2	26.0	54.0	28.9	60.0
1	4	16-QAM	3/4	39.0	81.0	43.3	90.0
1	5	64-QAM	2/3	52.0	108.0	57.8	120.0
1	6	64-QAM	3/4	58.5	121.5	65.0	135.0
1	7	64-QAM	5/6	65.0	135.0	72.2	150.0
Note 1: Support of 400ns GI is optional on transmit and receive.							

Table 1 – MCS parameters for TX Antenna number = 1

1.5 Channel List

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

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
001	2412 MHz	002	2417 MHz	003	2422 MHz	004	2427 MHz
005	2432 MHz	006	2437 MHz	007	2442 MHz	008	2447 MHz
009	2452 MHz	010	2457 MHz	011	2462 MHz	-	-

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)
	Mode 4: Transmit by 802.11n(40MHz)

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

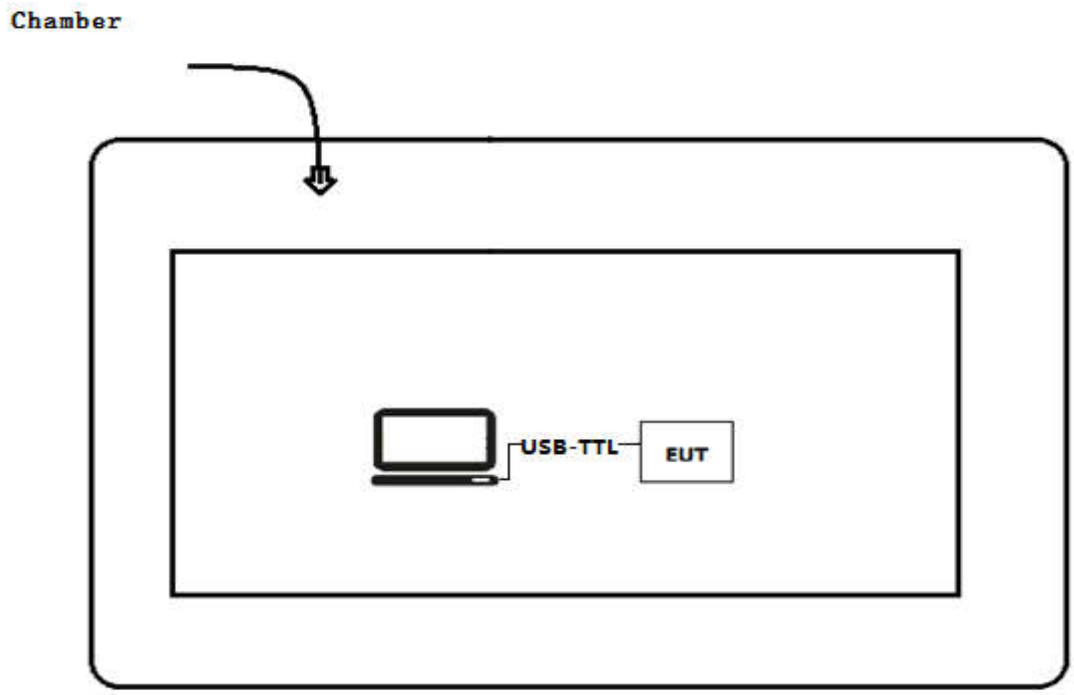
The EUT has been tested with the following auxiliary equipment / unit / software:

Auxiliary equipment	Type / Version	Manufacturer	Supplied by
Notebook	Think pad x220	Lenovo	Adapter
unit / software	Type / Version	Manufacturer	Supplied by
software	Type / Version	Manufacturer	Supplied by
Supplemental information:			

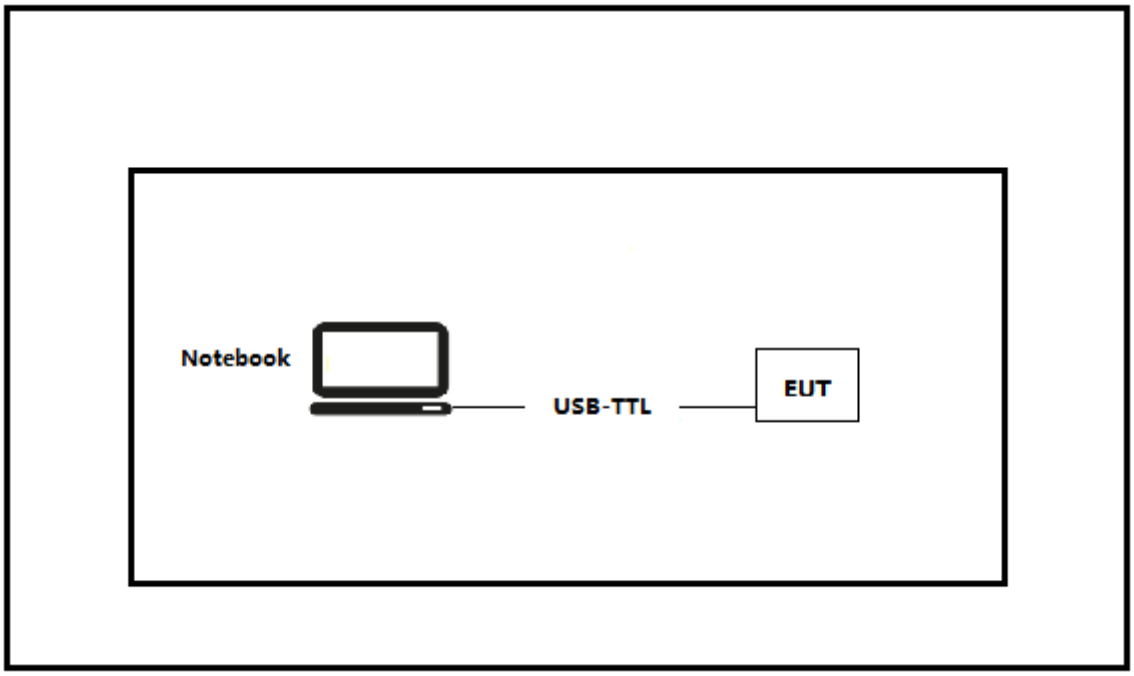
2.3 Test Configuration / Block diagram used for tests

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

Test setup Diagram- AC Line Conducted Emission Test



Test setup Diagram- Conducted test



2.4 Testing process

1	Setup the EUT as shown in Section 2.4.
2	Input the commands.
3	Configure the test mode, the test channel, and the data rate.
4	Start the continuous Transmitter.
5	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	2019	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 1	2019	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

Requirement – Test case	Basic standard(s)	Verdict	Remark
AC Power Line Conducted Emission	FCC 15.207	PASS	---
Emissions in restricted frequency bands	FCC 15.247(b)(3)	PASS	---
Duty cycle	ANSI C63.10:2013	N/A	
Emissions in non-restricted frequency bands	FCC 15.247(d), FCC 15.209	PASS	---
Radiated Emission 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	---
Supplementary information:			

3.3 Test Facility

USA	**:**	**FCC Designation Number: CN1199**
Canada	**:**	**CAB identifier Number: CN0040**

4 TEST RESULTS

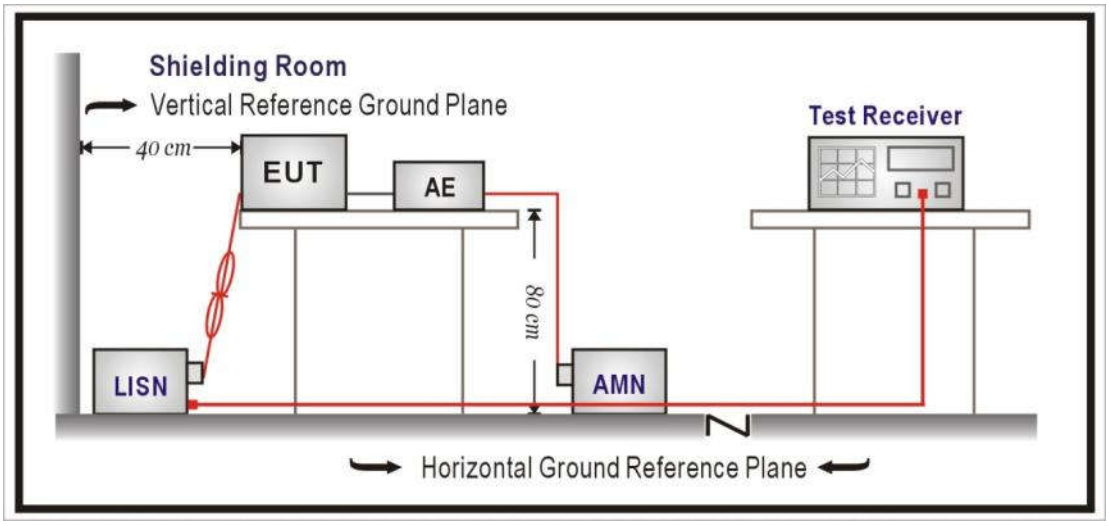
4.1 AC Power Line Conducted Emission	VERDICT: PASS

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.
NOTE 1: The exclusion band for transmitters shall be considered for transmitters operating at frequencies below 30 MHz.
NOTE 2: Where the AC output port is directly connected (or via a circuit breaker) to the AC power input port of the EUT the AC power output port need not to be tested.

4.1.2 Test Setup

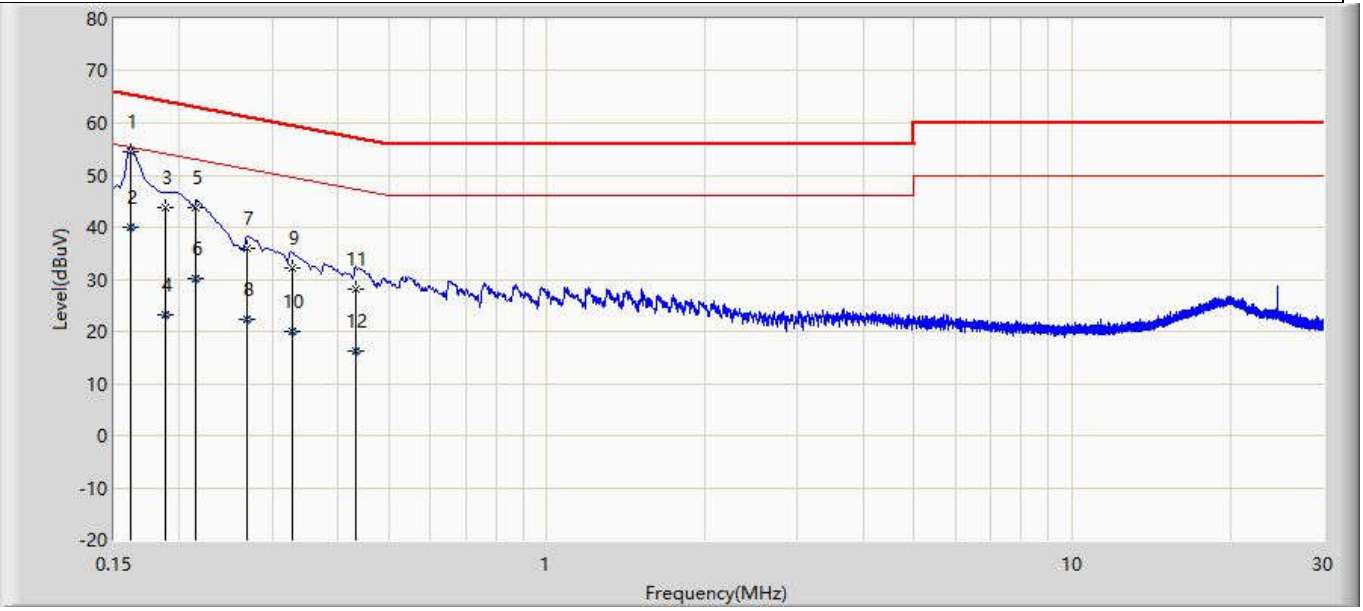


4.1.3 Test Procedure

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

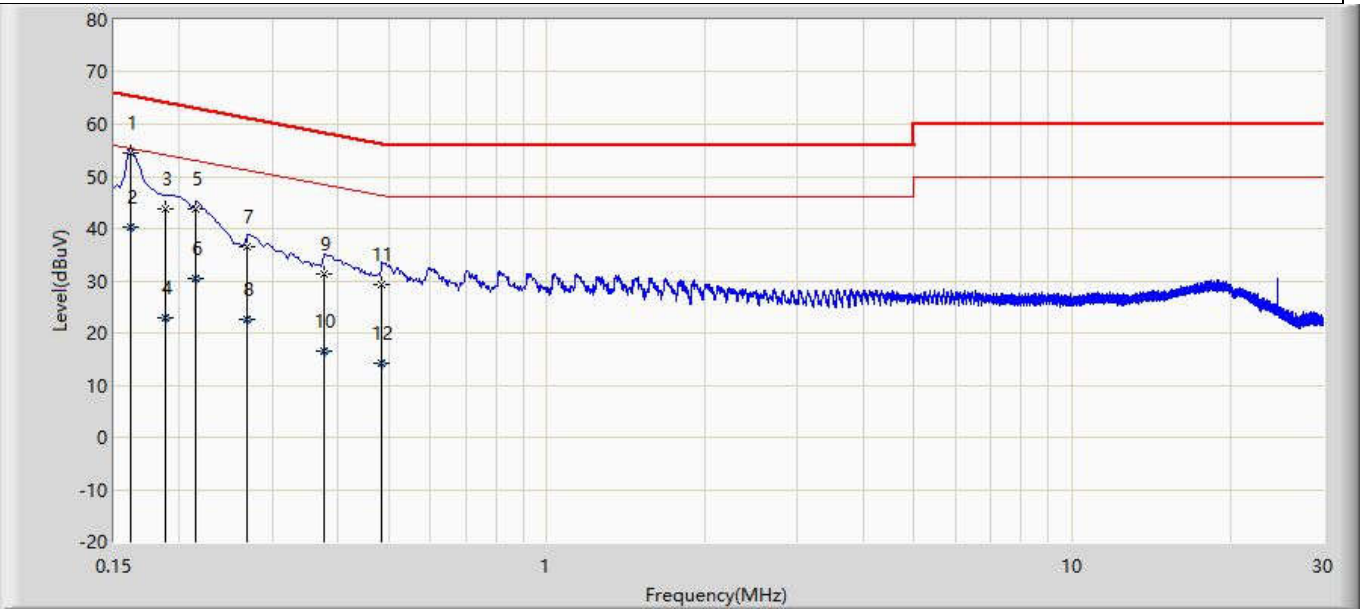
4.1.4 Test Data

Profile: 2040637R	Page No.: 1
Engineer: Tian	
Site: TR1	Time: 2020/04/24
Limit: FCC_Part15.207_CE_AC Power	Margin: 0
Probe: ENV216_101190(0.009-30MHz)	Polarity: Neutral
EUT: Tunable White Direct Connect Smart Bulb	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Probe (dB)	Cable (dB)	Amp (dB)	Type
1	*	0.161	54.361	44.740	-11.038	65.399	9.592	0.029	0.000	QP
2		0.161	39.976	30.355	-15.423	55.399	9.592	0.029	0.000	AV
3		0.188	43.905	34.279	-20.208	64.113	9.598	0.028	0.000	QP
4		0.188	23.068	13.442	-31.046	54.113	9.598	0.028	0.000	AV
5		0.215	43.707	34.079	-19.293	63.000	9.599	0.029	0.000	QP
6		0.215	30.195	20.567	-22.806	53.000	9.599	0.029	0.000	AV
7		0.269	35.840	26.210	-25.301	61.141	9.597	0.033	0.000	QP
8		0.269	22.360	12.730	-28.781	51.141	9.597	0.033	0.000	AV
9		0.328	32.082	22.452	-27.426	59.508	9.595	0.035	0.000	QP
10		0.328	19.903	10.273	-29.605	49.508	9.595	0.035	0.000	AV
11		0.433	28.125	18.493	-29.060	57.185	9.592	0.040	0.000	QP
12		0.433	16.366	6.735	-30.819	47.185	9.592	0.040	0.000	AV

Profile: 2040637R	Page No.: 2
Engineer: Tian	
Site: TR1	Time: 2020/04/24
Limit: FCC_Part15.207_CE_AC Power	Margin: 0
Probe: ENV216_101190(0.009-30MHz)	Polarity: Line
EUT: Tunable White Direct Connect Smart Bulb	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Probe (dB)	Cable (dB)	Amp (dB)	Type
1	*	0.161	54.507	44.870	-10.893	65.399	9.608	0.029	0.000	QP
2		0.161	40.198	30.562	-15.201	55.399	9.608	0.029	0.000	AV
3		0.188	43.815	34.184	-20.299	64.113	9.602	0.028	0.000	QP
4		0.188	22.969	13.338	-31.145	54.113	9.602	0.028	0.000	AV
5		0.215	43.763	34.134	-19.237	63.000	9.600	0.029	0.000	QP
6		0.215	30.332	20.702	-22.668	53.000	9.600	0.029	0.000	AV
7		0.269	36.590	26.957	-24.551	61.141	9.600	0.033	0.000	QP
8		0.269	22.534	12.901	-28.607	51.141	9.600	0.033	0.000	AV
9		0.377	31.449	21.812	-26.890	58.340	9.600	0.037	0.000	QP
10		0.377	16.481	6.843	-31.859	48.340	9.600	0.037	0.000	AV
11		0.485	29.186	19.544	-27.063	56.249	9.600	0.042	0.000	QP
12		0.485	14.087	4.445	-32.162	46.249	9.600	0.042	0.000	AV

Remark	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).

4.2 Emissions in restricted frequency bands	VERDICT: PASS

4.2.1 Limit

Standard	FCC Part 15 Subpart C Paragraph 15.205

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	
13.36 – 13.41			

Restricted Bands of operation for IC

0.090 - 0.110	13.36 - 13.41	960 - 1427	9.0 - 9.2
0.495 - 0.505	16.42 - 16.423	1435 - 1626.5	9.3 - 9.5
2.1735 - 2.1905	16.69475 - 16.69525	1645.5 - 1646.5	10.6 - 12.7
3.020 - 3.026	16.80425 - 16.80475	1660 - 1710	13.25 - 13.4
4.125 - 4.128	25.5 - 25.67	1718.8 - 1722.2	14.47 - 14.5
4.17725 - 4.17775	37.5 - 38.25	2200 - 2300	15.35 - 16.2
4.20725 - 4.20775	73 - 74.6	2310 - 2390	17.7 - 21.4
5.677 - 5.683	74.8 - 75.2	2483.5 - 2500	22.01 - 23.12
6.215 - 6.218	108 - 138	2655 - 2900	23.6 - 24.0
6.26775 - 6.26825	149.9 - 150.05	3260 - 3267	31.2 - 31.8
6.31175 - 6.31225	156.52475 - 156.52525	3332 - 3339	36.43 - 36.5
8.291 - 8.294	156.7 - 156.9	3345.8 - 3358	Above 38.6
8.362 - 8.366	162.0125 - 167.17	3500 - 4400	
8.37625 - 8.38675	167.72 - 173.2	4500 - 5150	
8.41425 - 8.41475	240 - 285	5350 - 5460	
12.29 - 12.293	322 - 335.4	7250 - 7750	
12.51975 - 12.52025	399.9 - 410	8025 - 8500	
12.57675 - 12.57725	608 - 614	--	

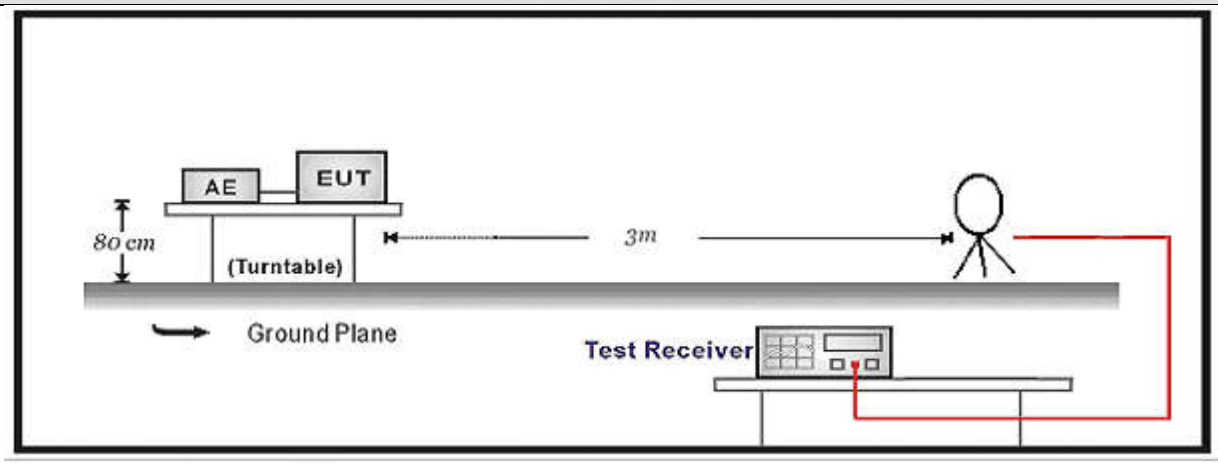
Restricted Band Emissions Limit			
Frequency (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Measurement distance (m)
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300(Note 1)
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30(Note 1)
1.705 - 30	30	29.5	30(Note 1)
30 - 88	100	40	3(Note 2)
88 - 216	150	43.5	3(Note 2)
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).

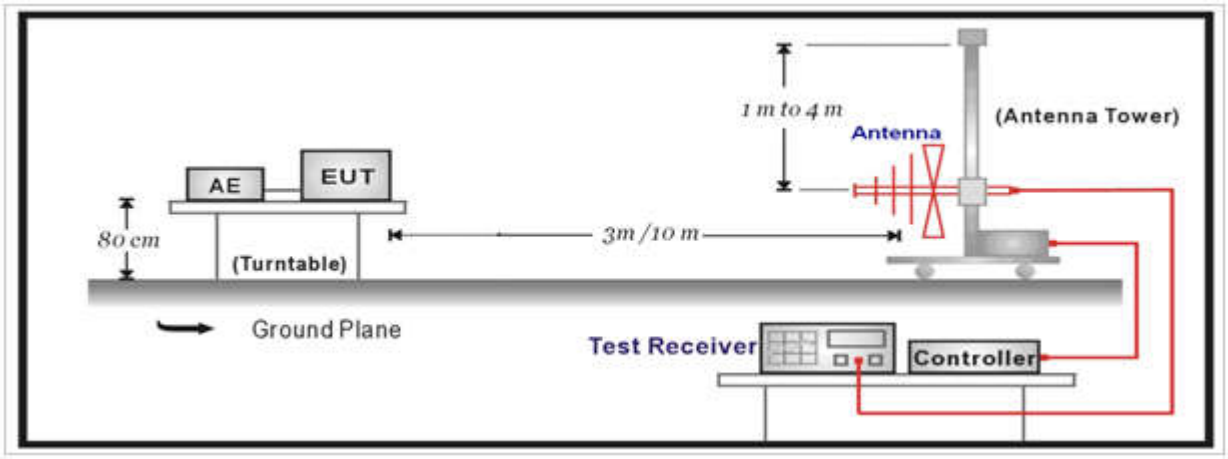
Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated 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

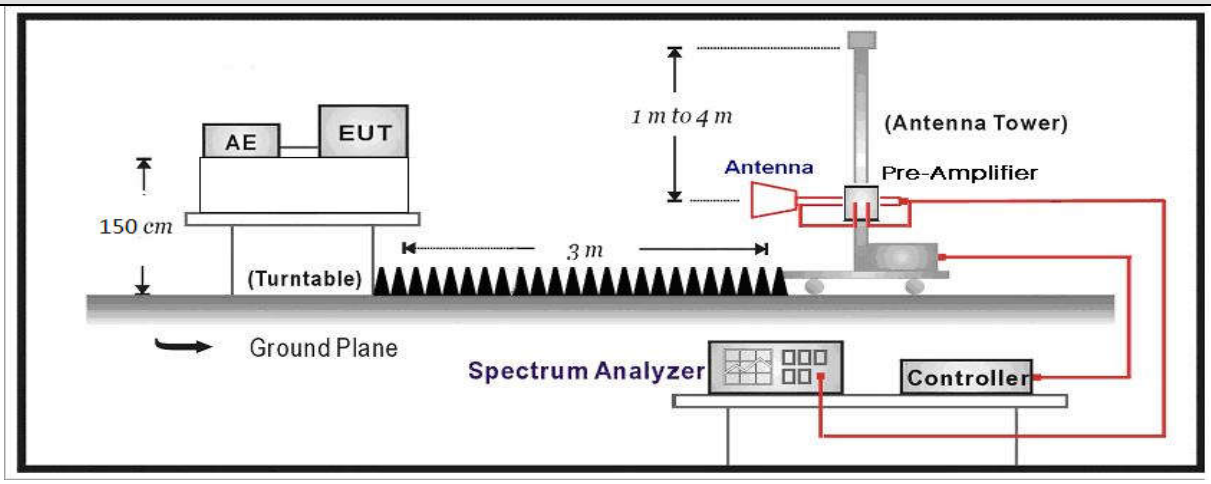
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



Above 1GHz Test Setup:

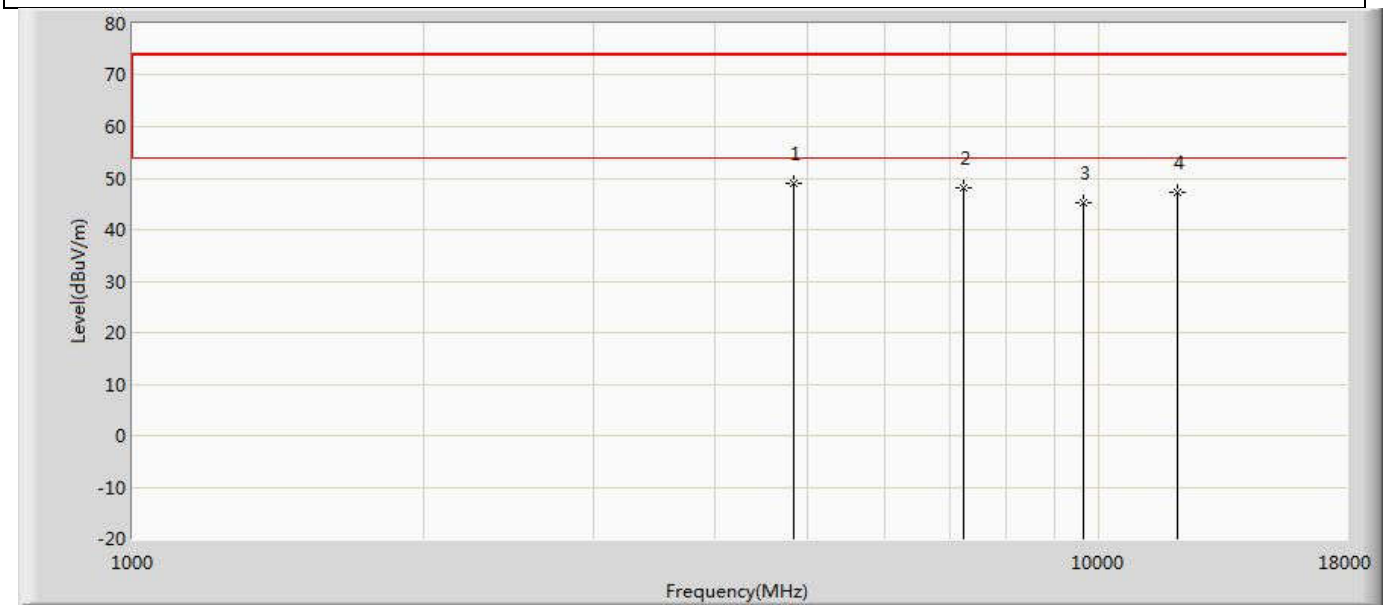


4.2.3 Test Procedure

	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	11.12.2.7	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

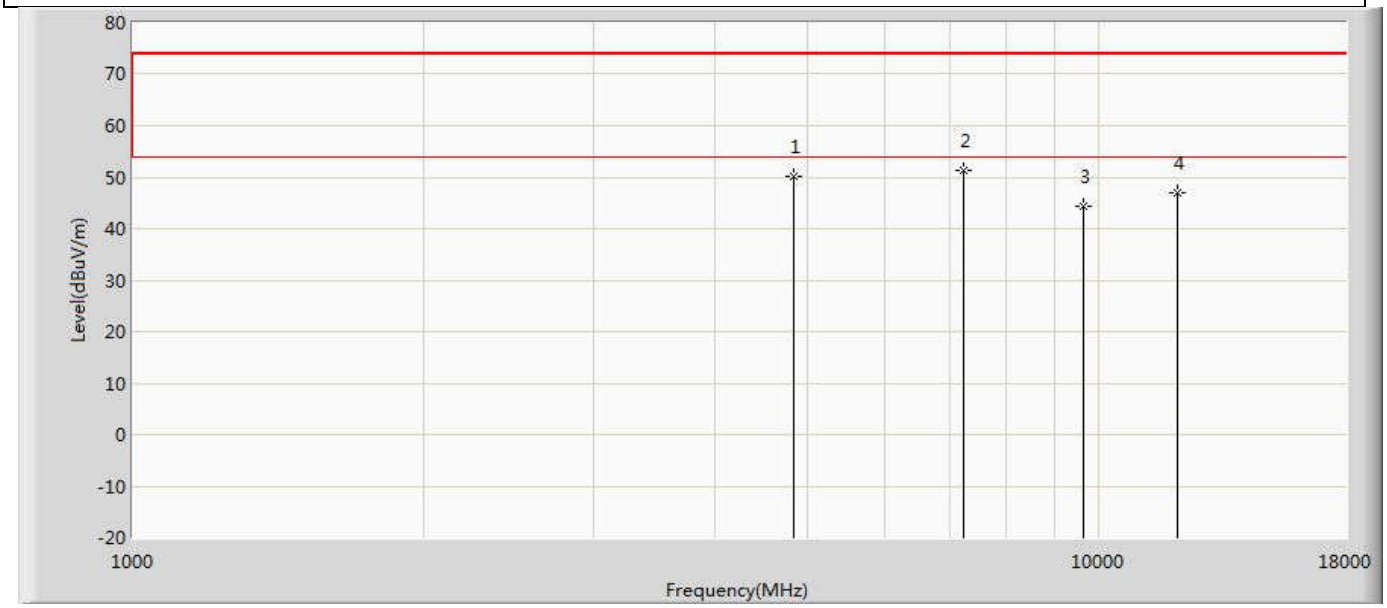
4.2.4 Test Data

Profile: 2040637R	Page No.: 57
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:49
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2412MHz by 802.11b	



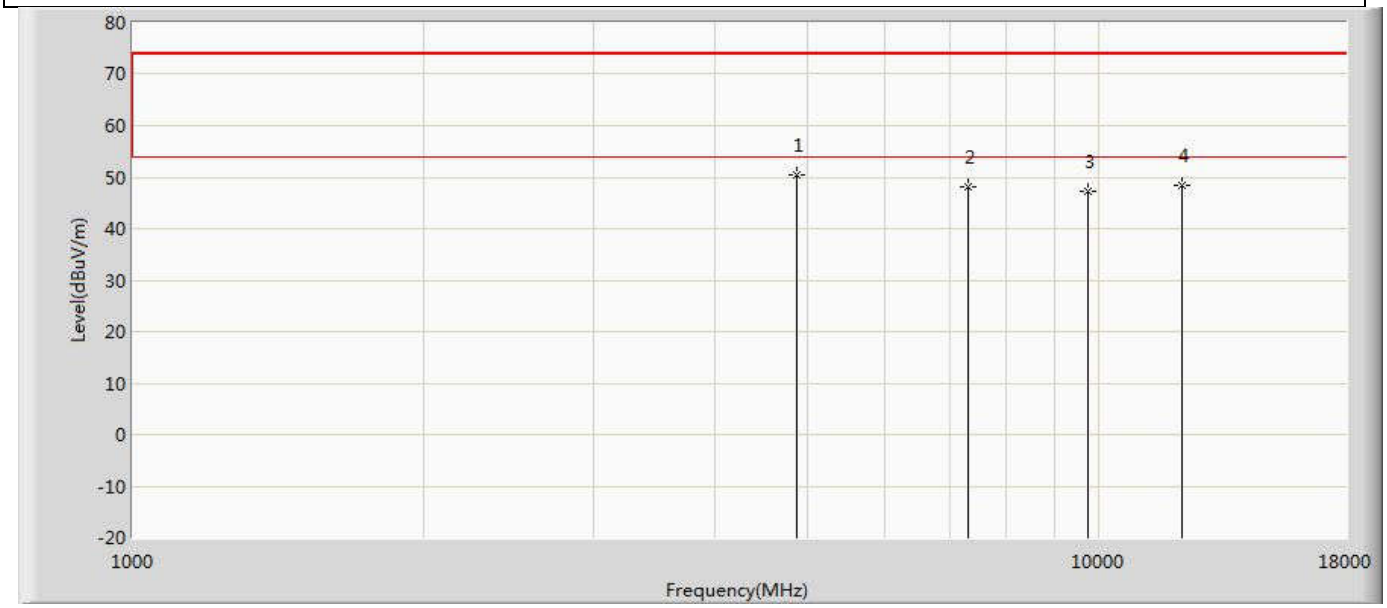
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	4824.000	48.884	45.384	-25.116	74.000	3.500	PK
2		7236.000	48.140	41.292	-25.860	74.000	6.847	PK
3		9648.000	45.094	36.562	-28.906	74.000	8.531	PK
4		12060.000	47.388	34.114	-26.612	74.000	13.274	PK

Profile: 2040637R	Page No.: 58
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:49
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2412MHz by 802.11b	



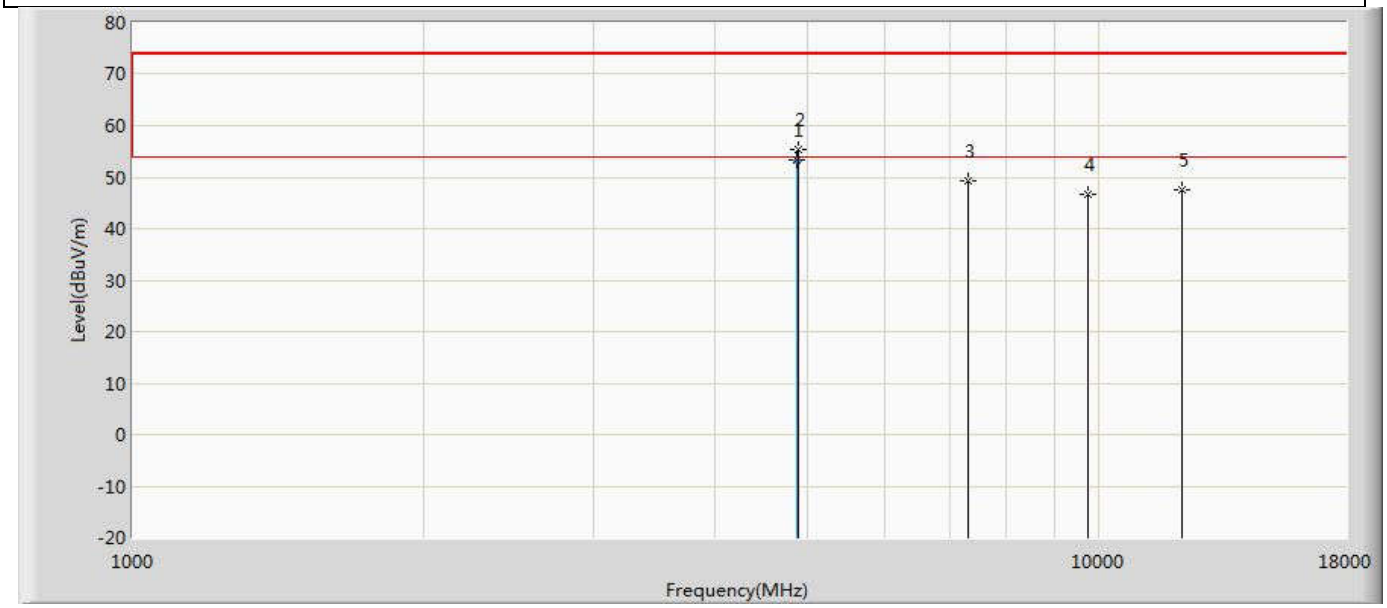
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4825.000	50.078	46.589	-23.922	74.000	3.489	PK
2	*	7236.000	51.379	44.531	-22.621	74.000	6.847	PK
3		9648.000	44.244	35.712	-29.756	74.000	8.531	PK
4		12060.000	46.972	33.698	-27.028	74.000	13.274	PK

Profile: 2040637R	Page No.: 59
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:49
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2437MHz by 802.11b	



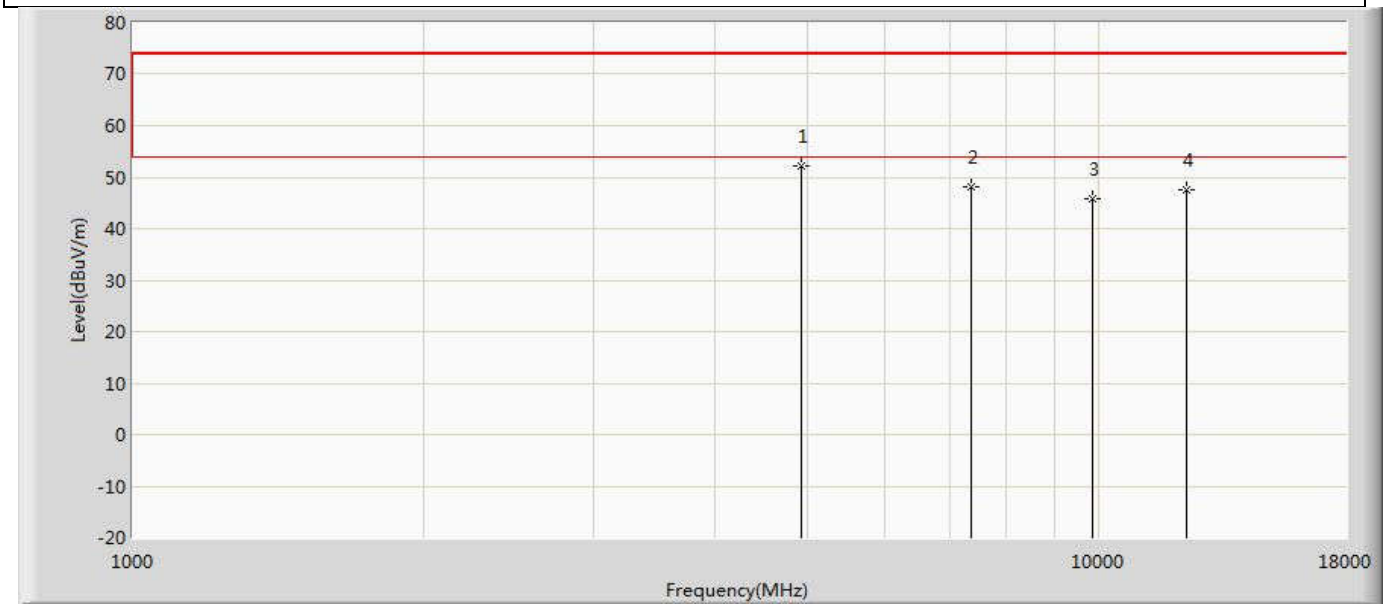
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	4874.000	50.393	46.706	-23.607	74.000	3.687	PK
2		7311.000	48.143	41.513	-25.857	74.000	6.630	PK
3		9748.000	47.189	38.569	-26.811	74.000	8.620	PK
4		12185.000	48.295	35.395	-25.705	74.000	12.900	PK

Profile: 2040637R	Page No.: 60
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:49
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2437MHz by 802.11b	



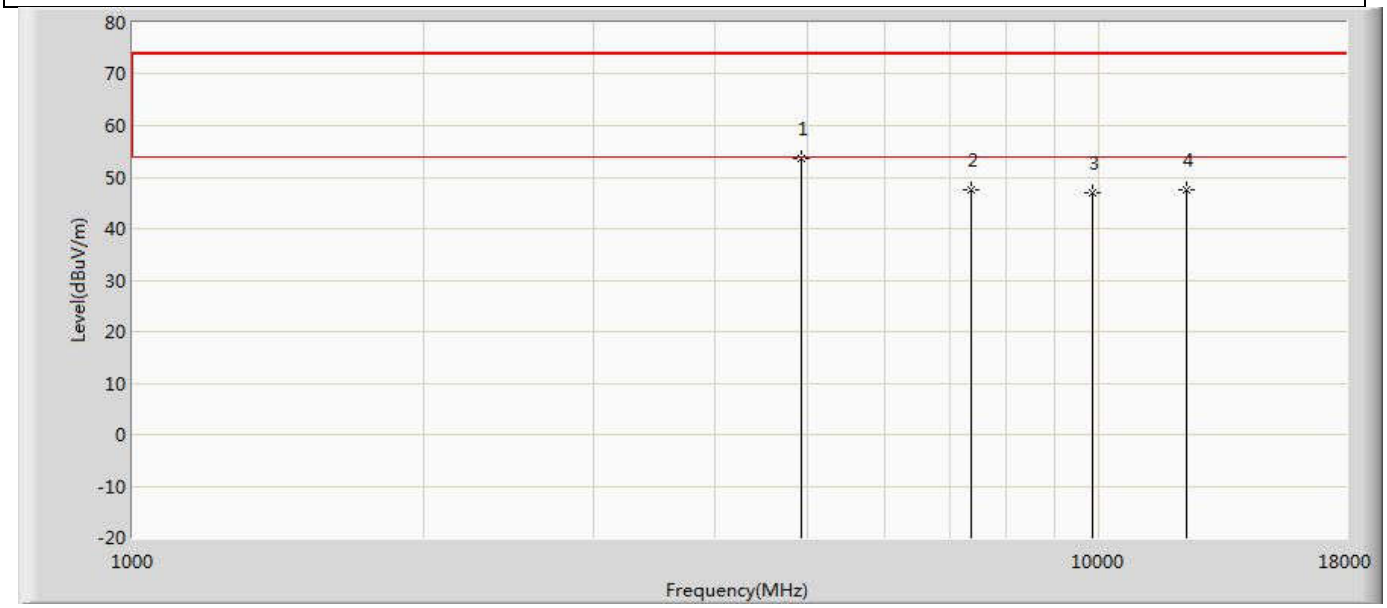
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	4874.000	53.431	49.744	-0.569	54.000	3.687	AV
2		4876.000	55.231	51.546	-18.769	74.000	3.685	PK
3		7311.000	49.213	42.583	-24.787	74.000	6.630	PK
4		9748.000	46.693	38.073	-27.307	74.000	8.620	PK
5		12185.000	47.586	34.686	-26.414	74.000	12.900	PK

Profile: 2040637R	Page No.: 61
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:49
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2462MHz by 802.11b	



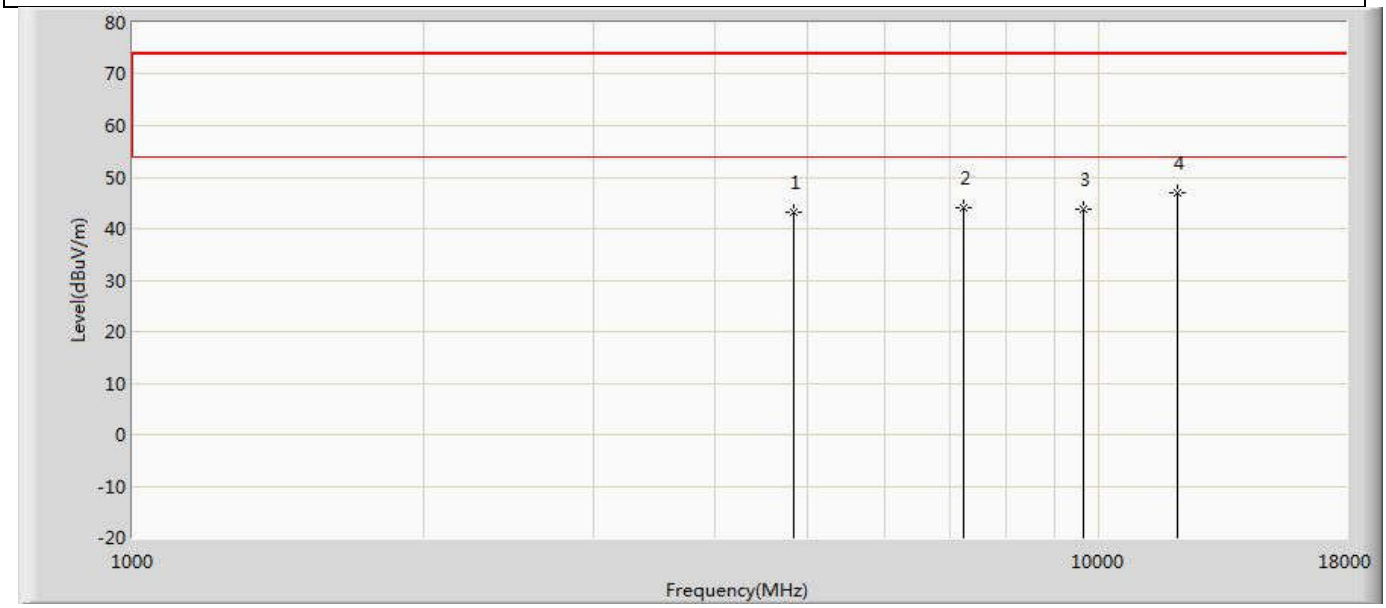
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	4927.000	52.313	48.769	-21.687	74.000	3.545	PK
2		7386.000	48.220	41.436	-25.780	74.000	6.783	PK
3		9848.000	45.933	37.476	-28.067	74.000	8.458	PK
4		12310.000	47.573	34.385	-26.427	74.000	13.188	PK

Profile: 2040637R	Page No.: 62
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:49
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2462MHz by 802.11b	



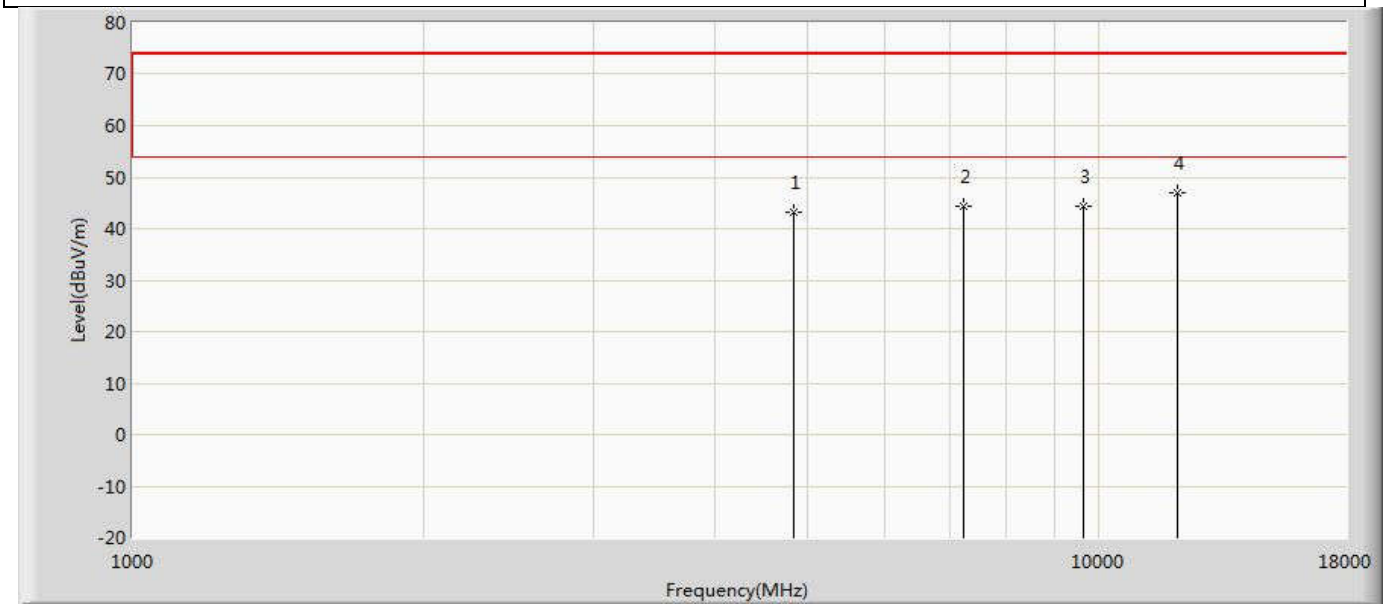
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	4927.000	53.672	50.128	-20.328	74.000	3.545	PK
2		7386.000	47.568	40.784	-26.432	74.000	6.783	PK
3		9848.000	46.816	38.359	-27.184	74.000	8.458	PK
4		12310.000	47.636	34.448	-26.364	74.000	13.188	PK

Profile: 2040637R	Page No.: 63
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:49
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2412MHz by 802.11g	



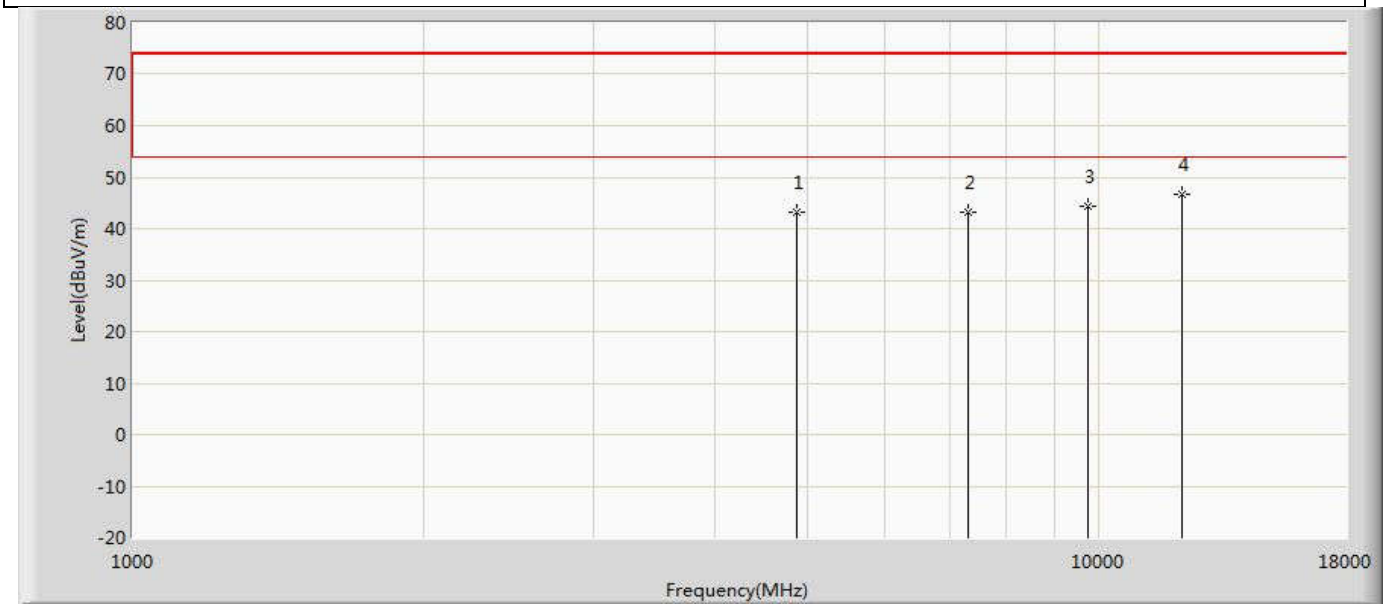
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	43.106	39.606	-30.894	74.000	3.500	PK
2		7236.000	44.126	37.278	-29.874	74.000	6.847	PK
3		9648.000	43.895	35.363	-30.105	74.000	8.531	PK
4	*	12060.000	47.015	33.741	-26.985	74.000	13.274	PK

Profile: 2040637R	Page No.: 64
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2412MHz by 802.11g	



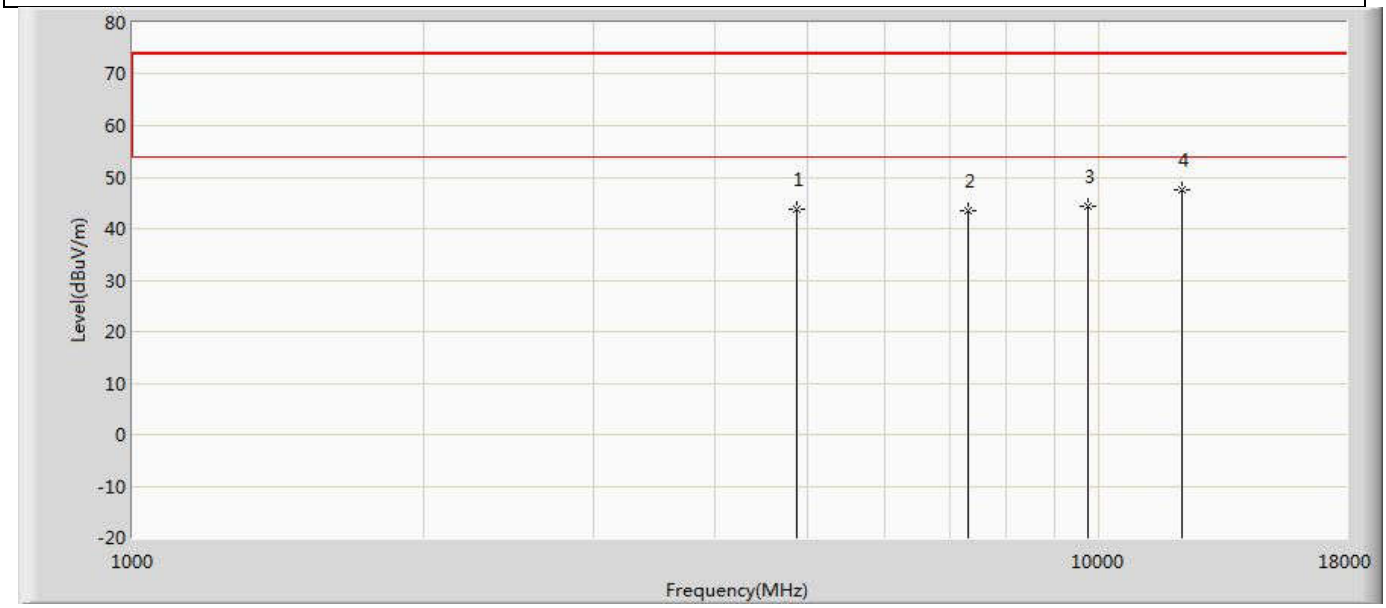
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	43.106	39.606	-30.894	74.000	3.500	PK
2		7236.000	44.289	37.441	-29.711	74.000	6.847	PK
3		9648.000	44.331	35.799	-29.669	74.000	8.531	PK
4	*	12060.000	46.929	33.655	-27.071	74.000	13.274	PK

Profile: 2040637R	Page No.: 65
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2437MHz by 802.11g	



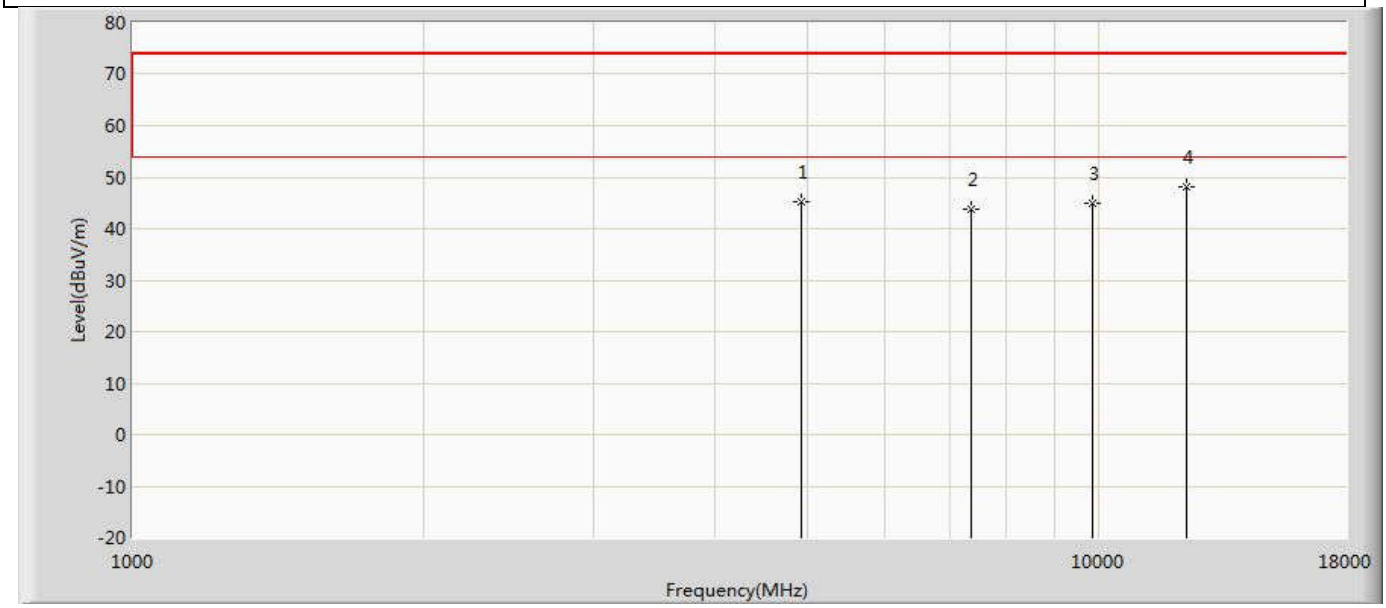
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	43.095	39.408	-30.905	74.000	3.687	PK
2		7311.000	43.172	36.542	-30.828	74.000	6.630	PK
3		9748.000	44.407	35.787	-29.593	74.000	8.620	PK
4	*	12185.000	46.625	33.725	-27.375	74.000	12.900	PK

Profile: 2040637R	Page No.: 66
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2437MHz by 802.11g	



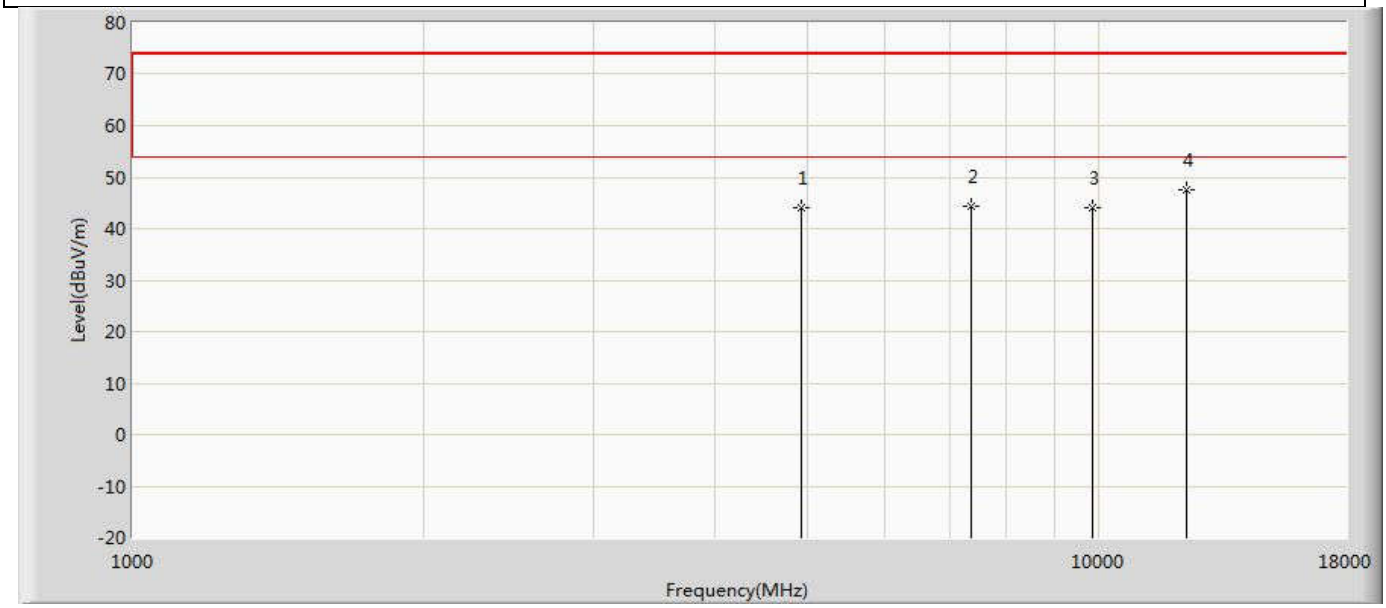
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	43.838	40.151	-30.162	74.000	3.687	PK
2		7311.000	43.367	36.737	-30.633	74.000	6.630	PK
3		9748.000	44.376	35.756	-29.624	74.000	8.620	PK
4	*	12185.000	47.418	34.518	-26.582	74.000	12.900	PK

Profile: 2040637R	Page No.: 67
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2462MHz by 802.11g	



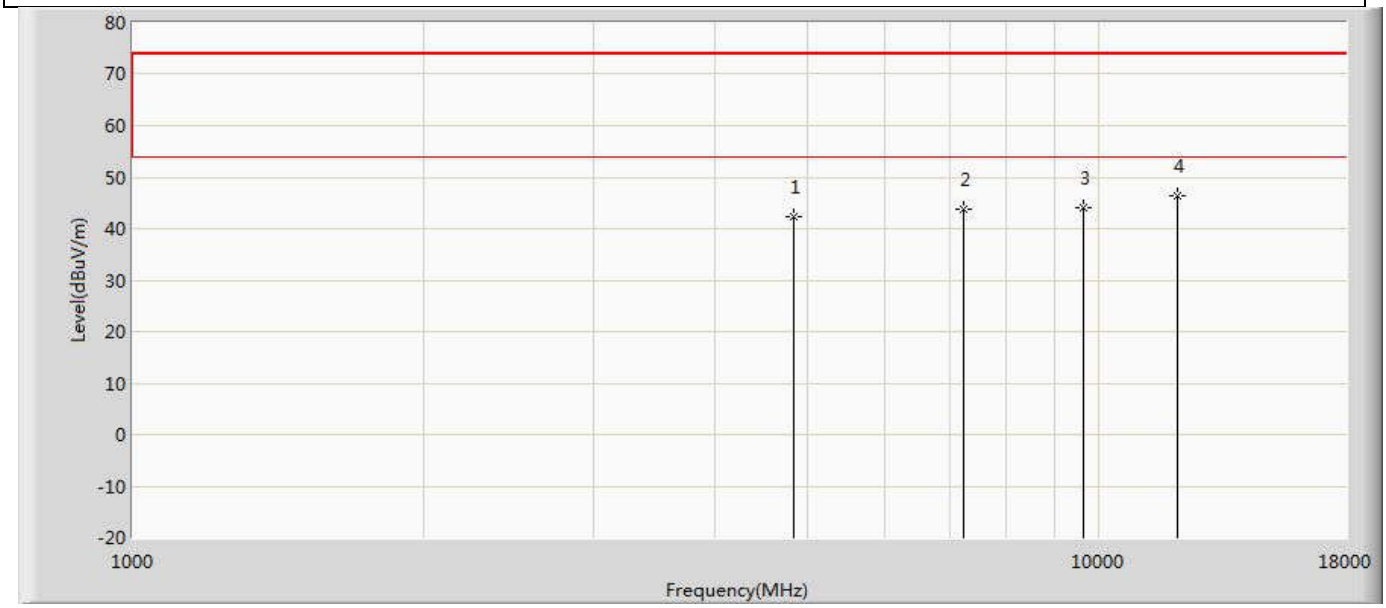
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	45.123	41.559	-28.877	74.000	3.563	PK
2		7386.000	43.803	37.019	-30.197	74.000	6.783	PK
3		9848.000	44.955	36.498	-29.045	74.000	8.458	PK
4	*	12310.000	48.114	34.926	-25.886	74.000	13.188	PK

Profile: 2040637R	Page No.: 68
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2462MHz by 802.11g	



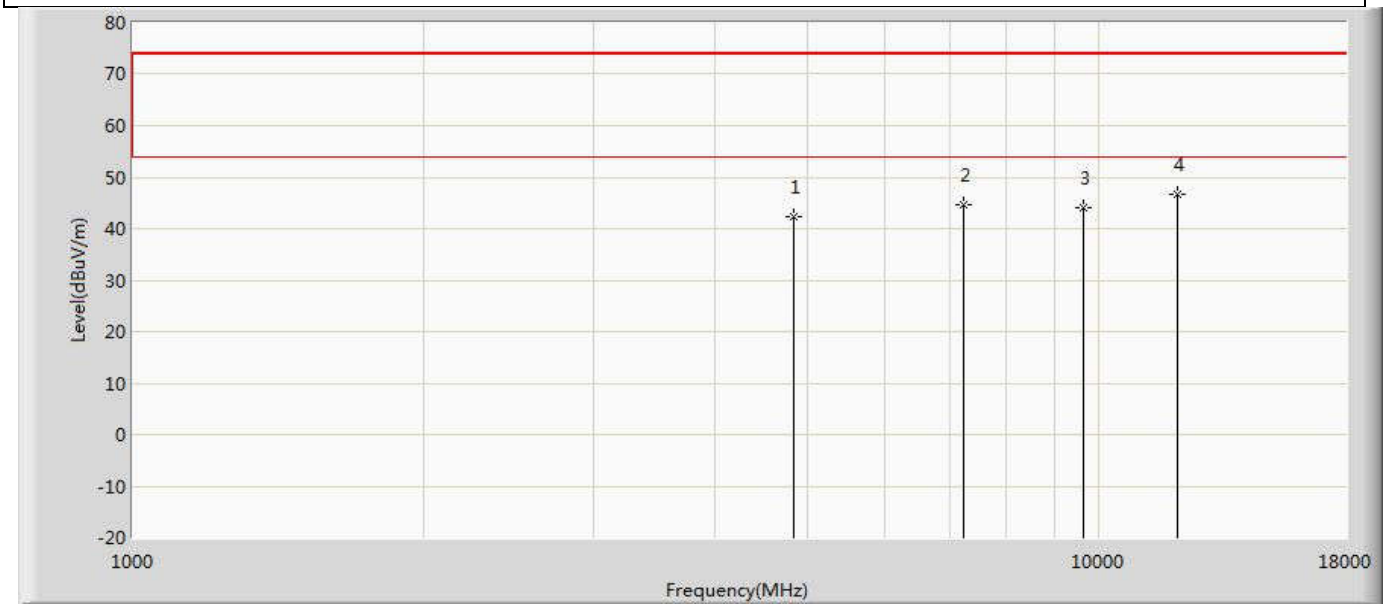
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	43.962	40.398	-30.038	74.000	3.563	PK
2		7386.000	44.244	37.460	-29.756	74.000	6.783	PK
3		9848.000	44.139	35.682	-29.861	74.000	8.458	PK
4	*	12310.000	47.447	34.259	-26.553	74.000	13.188	PK

Profile: 2040637R	Page No.: 69
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2412MHz by 802.11n(20MHz)	



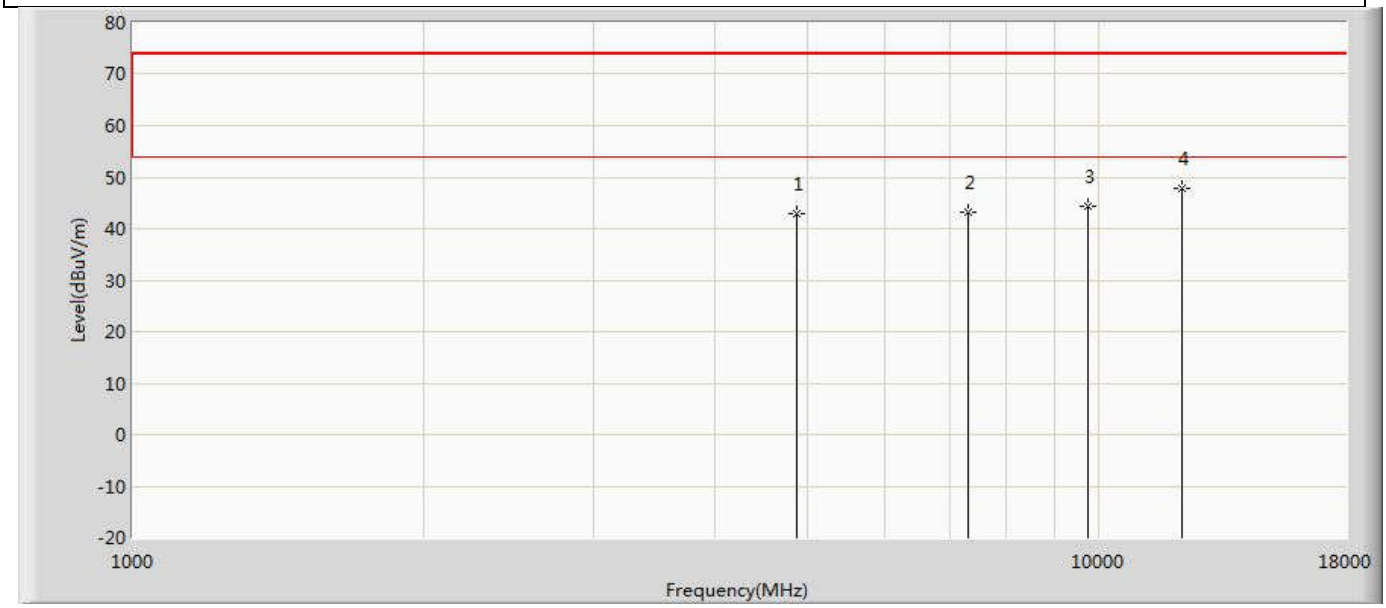
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	42.315	38.815	-31.685	74.000	3.500	PK
2		7236.000	43.701	36.853	-30.299	74.000	6.847	PK
3		9648.000	44.109	35.577	-29.891	74.000	8.531	PK
4	*	12060.000	46.484	33.210	-27.516	74.000	13.274	PK

Profile: 2040637R	Page No.: 70
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2412MHz by 802.11n(20MHz)	



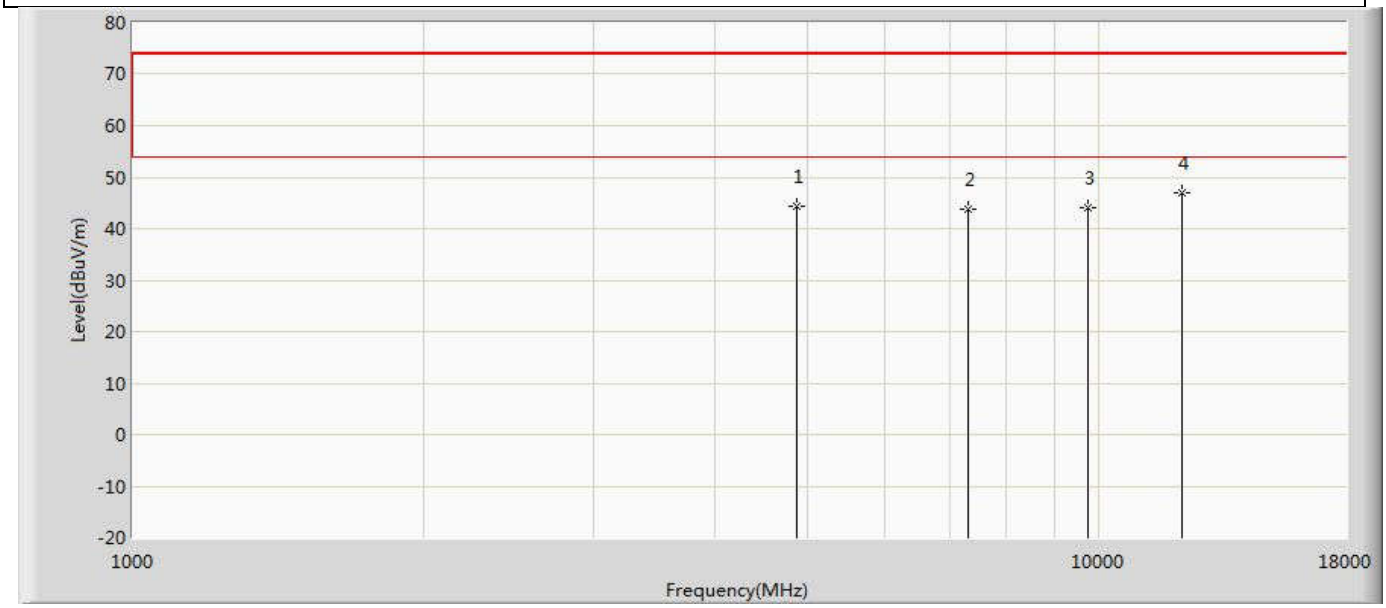
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	42.202	38.702	-31.798	74.000	3.500	PK
2		7236.000	44.729	37.881	-29.271	74.000	6.847	PK
3		9648.000	44.067	35.535	-29.933	74.000	8.531	PK
4	*	12060.000	46.774	33.500	-27.226	74.000	13.274	PK

Profile: 2040637R	Page No.: 71
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2437MHz by 802.11n(20MHz)	



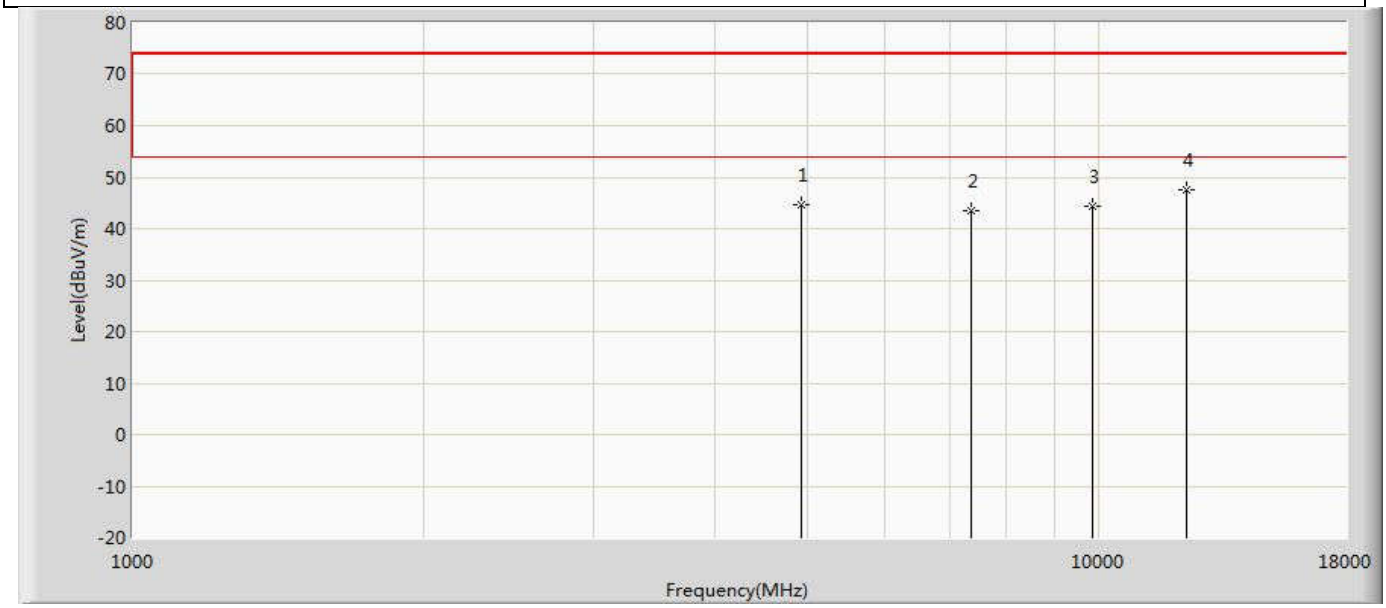
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	42.960	39.273	-31.040	74.000	3.687	PK
2		7311.000	43.162	36.532	-30.838	74.000	6.630	PK
3		9748.000	44.291	35.671	-29.709	74.000	8.620	PK
4	*	12185.000	47.895	34.995	-26.105	74.000	12.900	PK

Profile: 2040637R	Page No.: 72
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2437MHz by 802.11n(20MHz)	



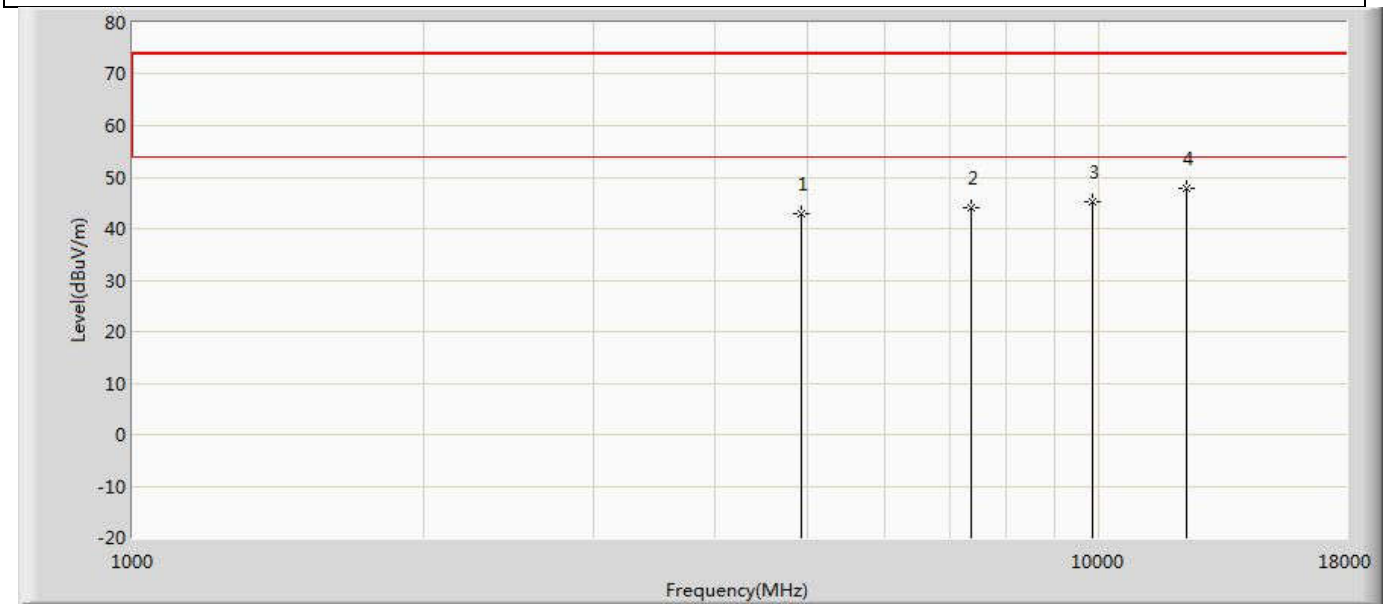
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	44.318	40.631	-29.682	74.000	3.687	PK
2		7311.000	43.651	37.021	-30.349	74.000	6.630	PK
3		9748.000	43.983	35.363	-30.017	74.000	8.620	PK
4	*	12185.000	46.899	33.999	-27.101	74.000	12.900	PK

Profile: 2040637R	Page No.: 73
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2462MHz by 802.11n(20MHz)	



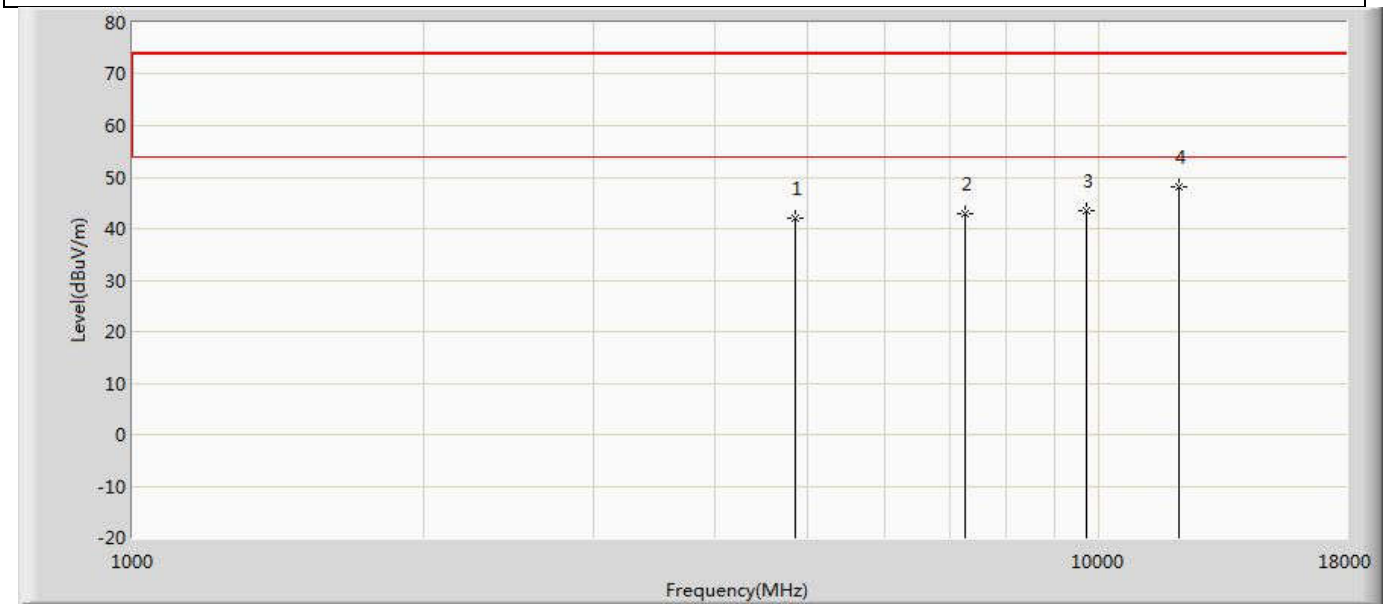
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	44.640	41.076	-29.360	74.000	3.563	PK
2		7386.000	43.521	36.737	-30.479	74.000	6.783	PK
3		9848.000	44.394	35.937	-29.606	74.000	8.458	PK
4	*	12310.000	47.470	34.282	-26.530	74.000	13.188	PK

Profile: 2040637R	Page No.: 74
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2462MHz by 802.11n(20MHz)	



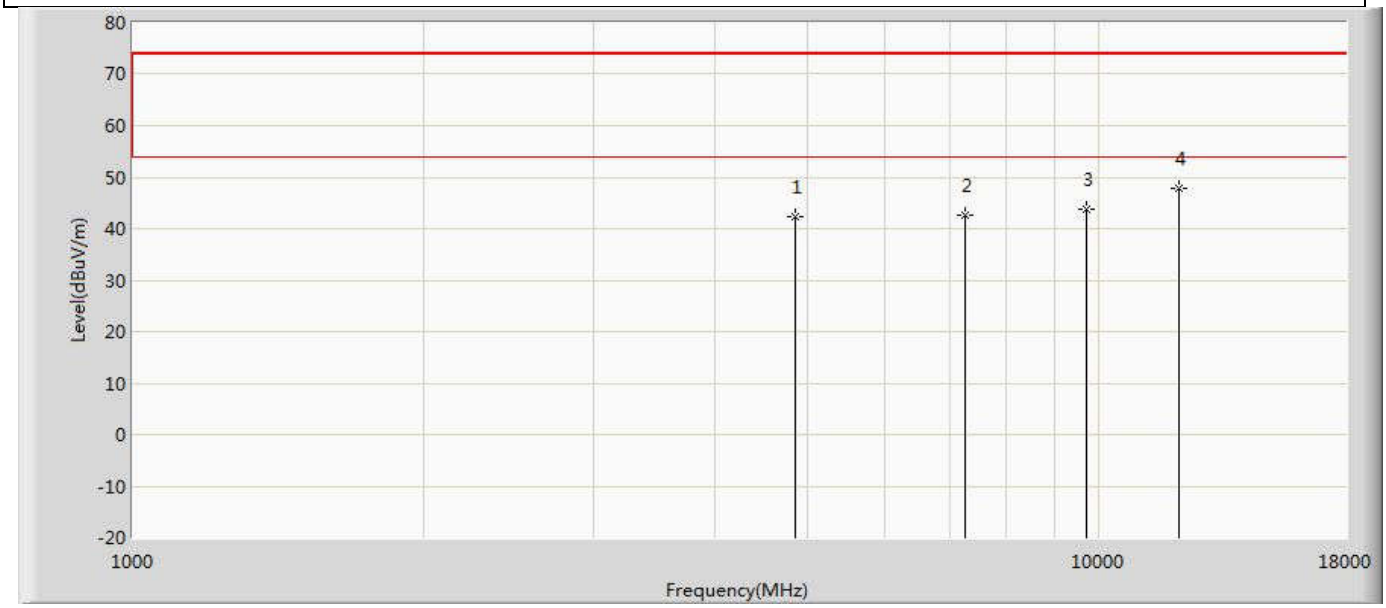
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	43.012	39.448	-30.988	74.000	3.563	PK
2		7386.000	44.136	37.352	-29.864	74.000	6.783	PK
3		9848.000	45.277	36.820	-28.723	74.000	8.458	PK
4	*	12310.000	47.959	34.771	-26.041	74.000	13.188	PK

Profile: 2040637R	Page No.: 75
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2422MHz by 802.11n(40MHz)	



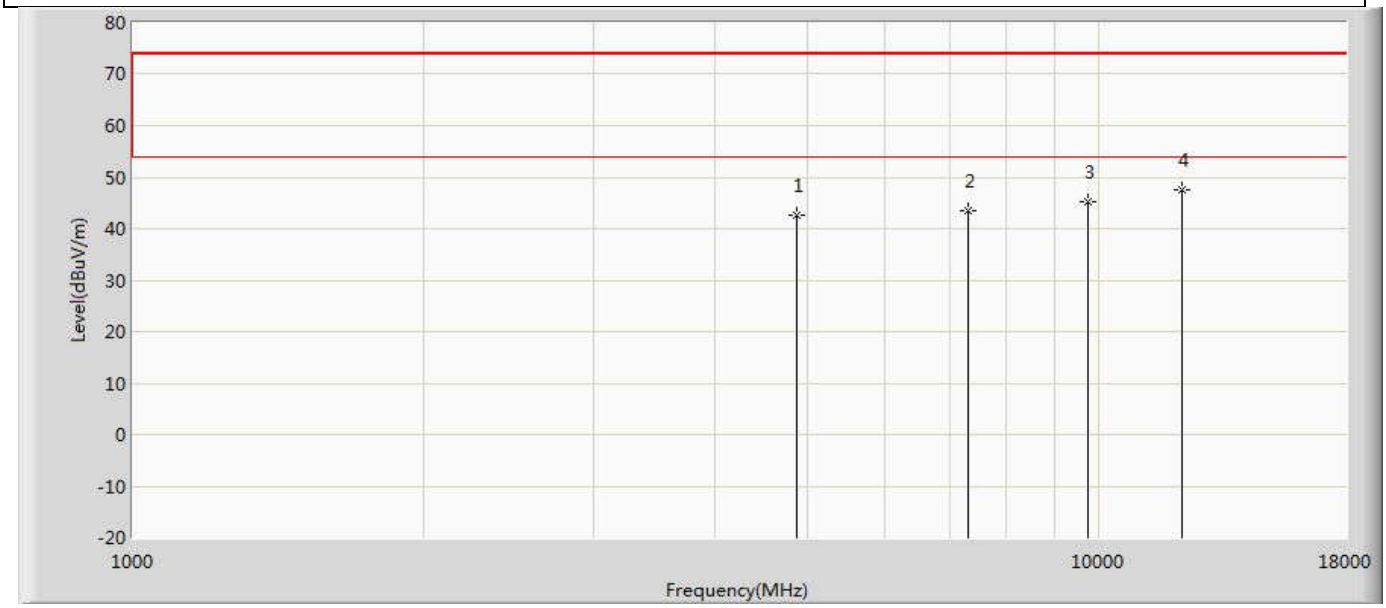
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4844.000	41.920	38.244	-32.080	74.000	3.676	PK
2		7266.000	42.911	36.269	-31.089	74.000	6.642	PK
3		9688.000	43.457	35.024	-30.543	74.000	8.434	PK
4	*	12110.000	48.222	34.930	-25.778	74.000	13.292	PK

Profile: 2040637R	Page No.: 76
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2422MHz by 802.11n(40MHz)	



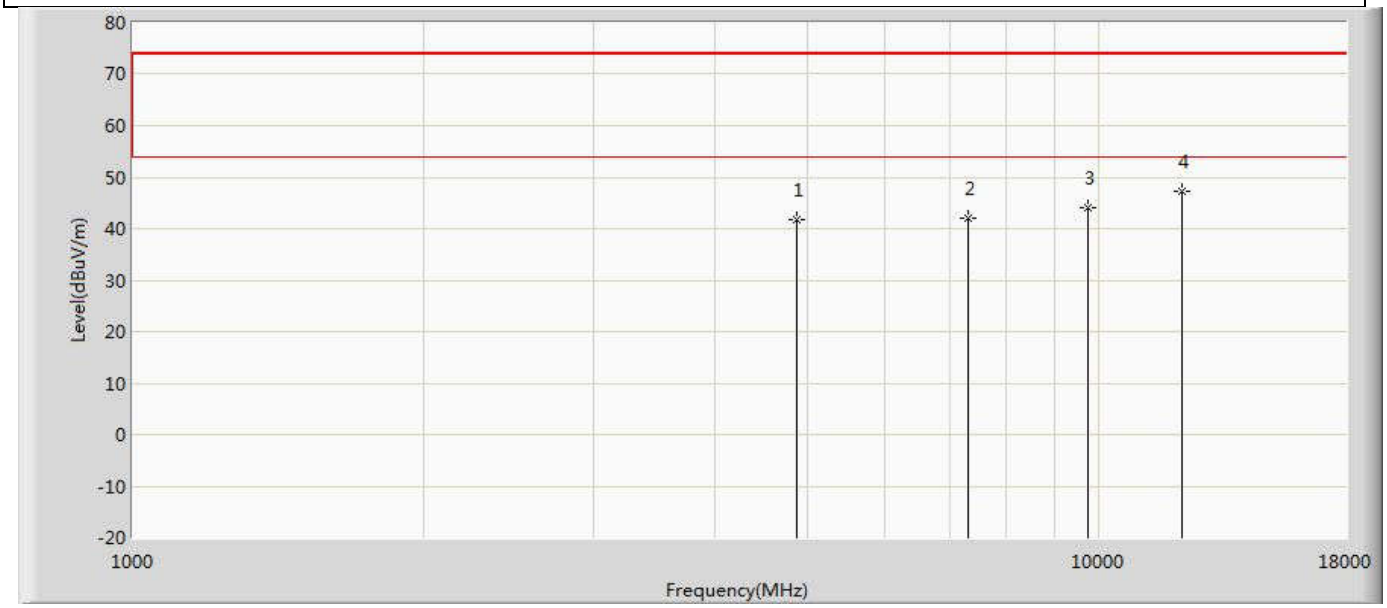
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4844.000	42.177	38.501	-31.823	74.000	3.676	PK
2		7266.000	42.560	35.918	-31.440	74.000	6.642	PK
3		9688.000	43.808	35.375	-30.192	74.000	8.434	PK
4	*	12110.000	47.874	34.582	-26.126	74.000	13.292	PK

Profile: 2040637R	Page No.: 77
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2437MHz by 802.11n(40MHz)	



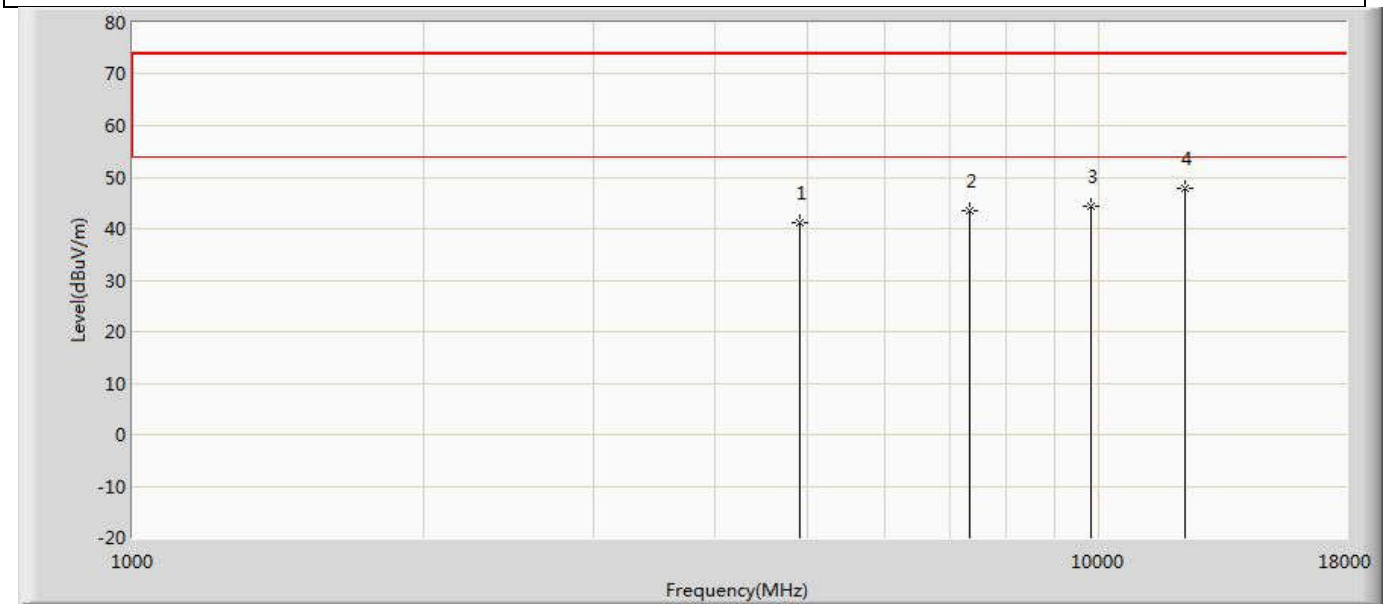
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	42.585	38.898	-31.415	74.000	3.687	PK
2		7311.000	43.558	36.928	-30.442	74.000	6.630	PK
3		9748.000	45.110	36.490	-28.890	74.000	8.620	PK
4	*	12185.000	47.629	34.729	-26.371	74.000	12.900	PK

Profile: 2040637R	Page No.: 78
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:51
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2437MHz by 802.11n(40MHz)	



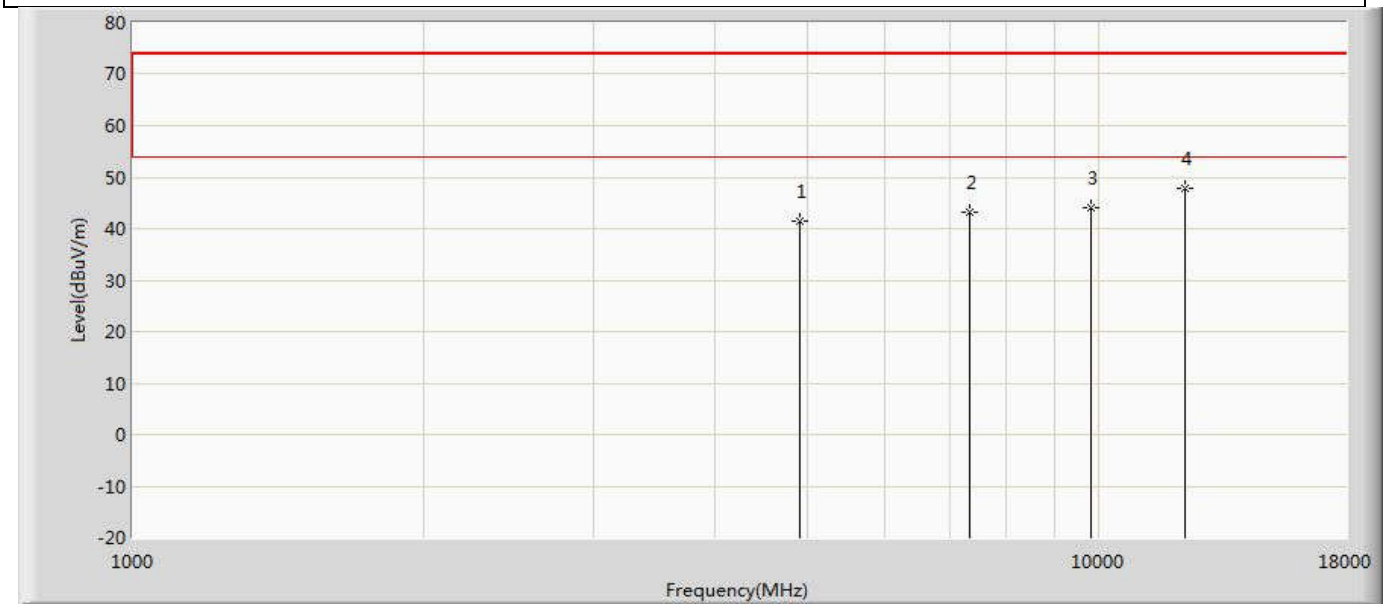
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	41.793	38.106	-32.207	74.000	3.687	PK
2		7311.000	42.150	35.520	-31.850	74.000	6.630	PK
3		9748.000	44.055	35.435	-29.945	74.000	8.620	PK
4	*	12185.000	47.178	34.278	-26.822	74.000	12.900	PK

Profile: 2040637R	Page No.: 79
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:51
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2452MHz by 802.11n(40MHz)	



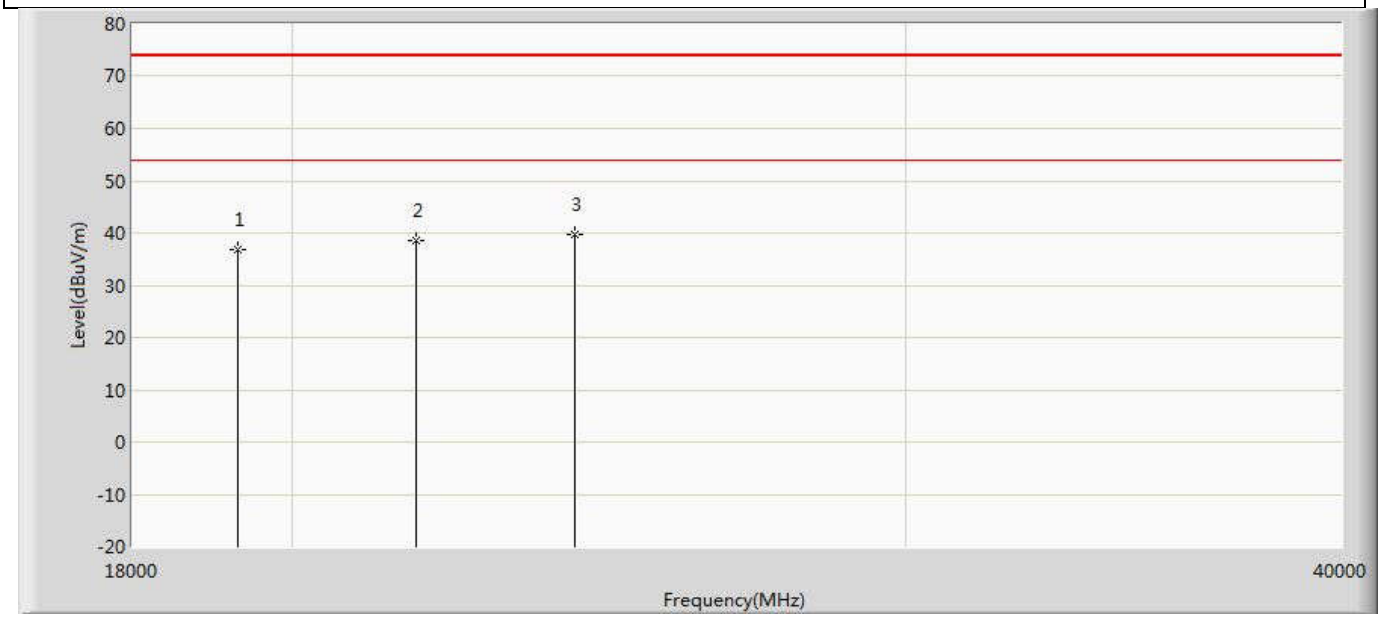
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4904.000	41.248	37.649	-32.752	74.000	3.598	PK
2		7356.000	43.402	36.438	-30.598	74.000	6.964	PK
3		9808.000	44.395	35.538	-29.605	74.000	8.857	PK
4	*	12260.000	47.901	34.538	-26.099	74.000	13.363	PK

Profile: 2040637R	Page No.: 80
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 05:51
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2452MHz by 802.11n(40MHz)	



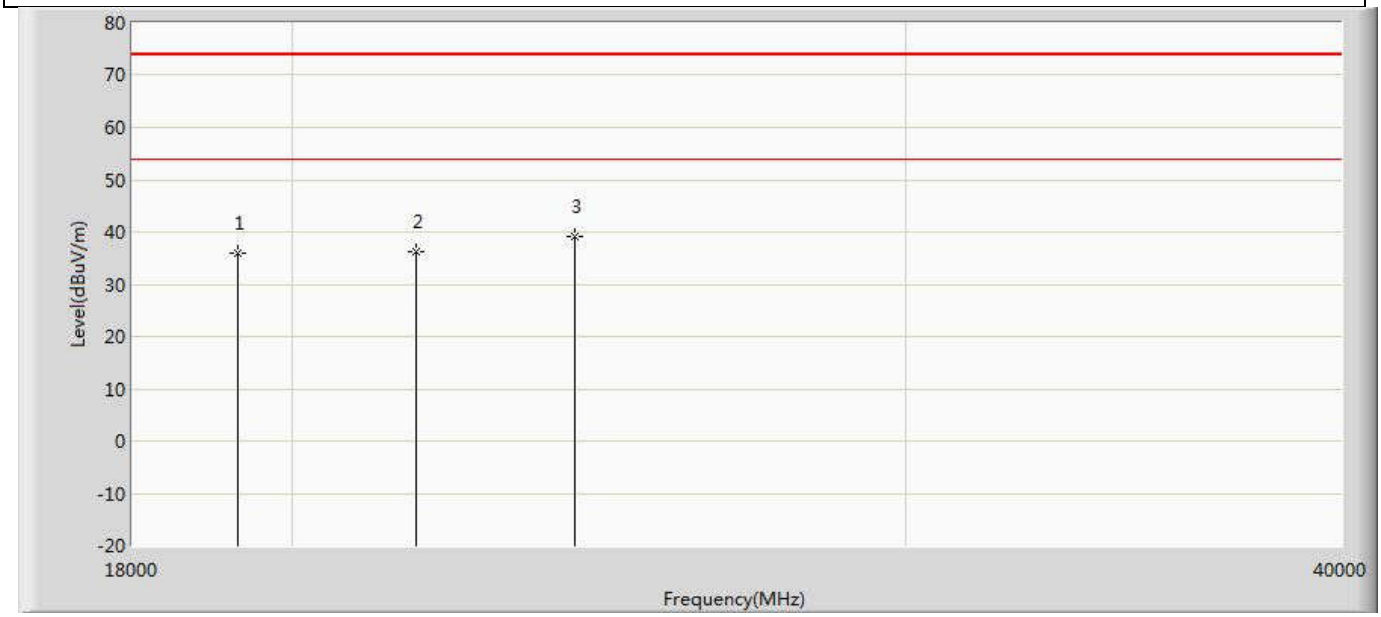
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4904.000	41.484	37.885	-32.516	74.000	3.598	PK
2		7356.000	43.175	36.211	-30.825	74.000	6.964	PK
3		9808.000	44.021	35.164	-29.979	74.000	8.857	PK
4	*	12260.000	47.785	34.422	-26.215	74.000	13.363	PK

Profile: 2040637R	Page No.: 105
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:22
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2412MHz by 802.11b	



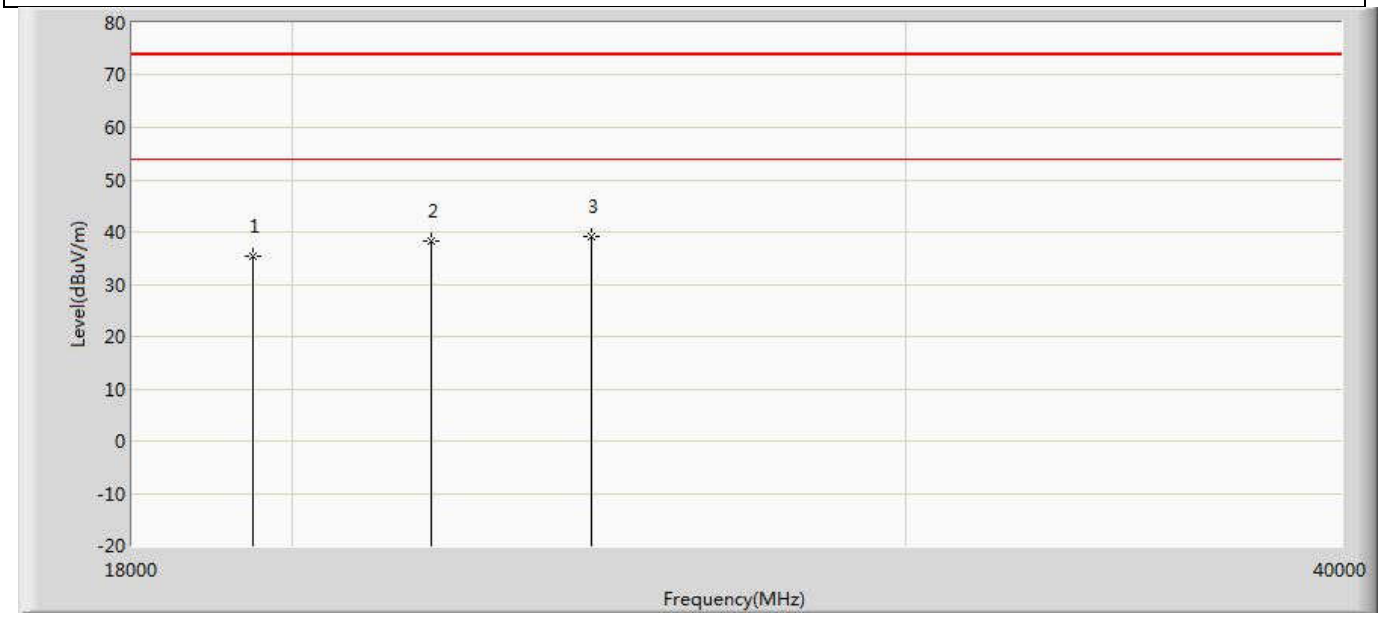
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19296.000	36.833	33.367	-37.167	74.000	3.466	PK
2		21708.000	38.525	33.726	-35.475	74.000	4.799	PK
3	*	24120.000	39.656	34.210	-34.344	74.000	5.446	PK

Profile: 2040637R	Page No.: 106
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:22
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2412MHz by 802.11b	



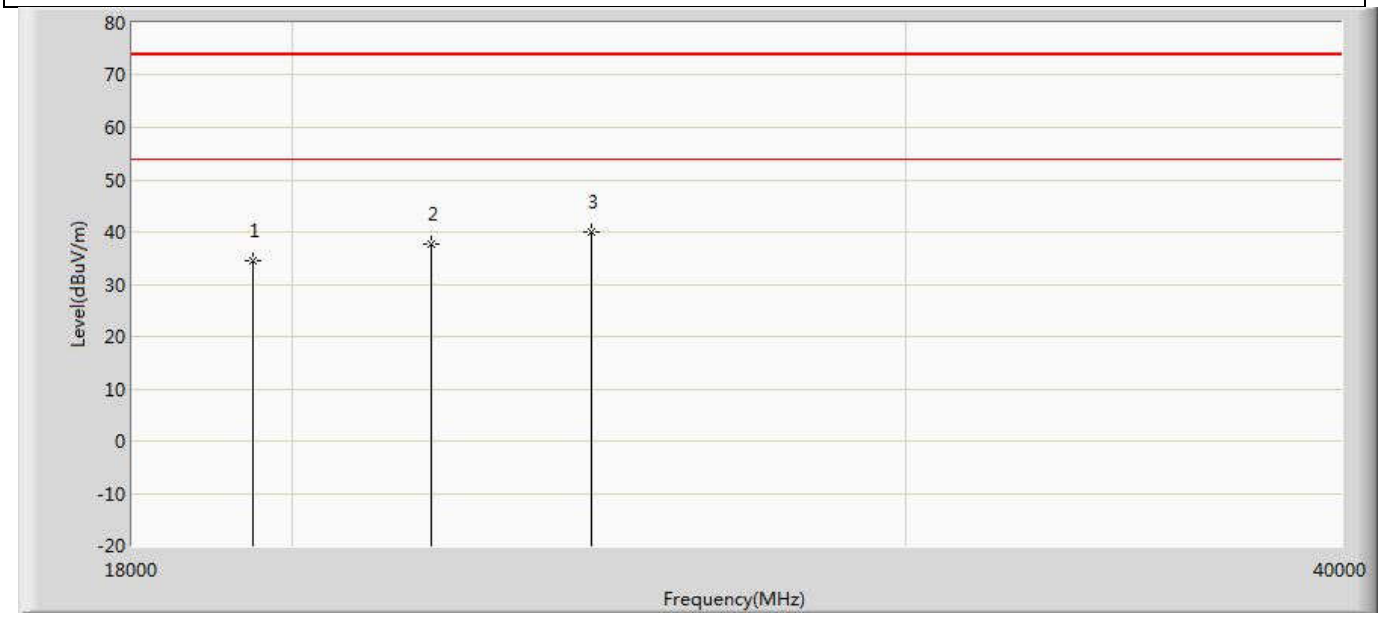
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19296.000	35.915	32.449	-38.085	74.000	3.466	PK
2		21708.000	36.244	31.445	-37.756	74.000	4.799	PK
3	*	24120.000	39.005	33.559	-34.995	74.000	5.446	PK

Profile: 2040637R	Page No.: 107
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2437MHz by 802.11b	



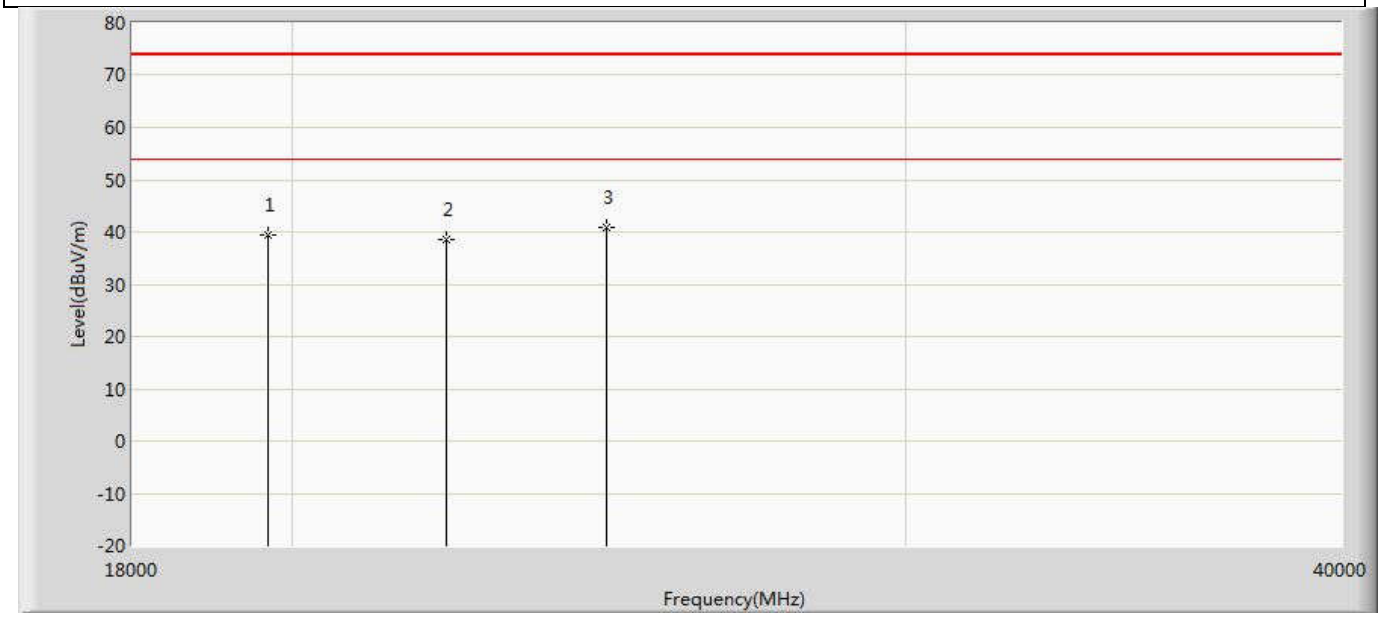
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19496.000	35.503	31.937	-38.497	74.000	3.566	PK
2		21933.000	38.127	33.144	-35.873	74.000	4.983	PK
3	*	24370.000	39.176	33.505	-34.824	74.000	5.671	PK

Profile: 2040637R	Page No.: 108
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_375(18-40GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2437MHz by 802.11b	



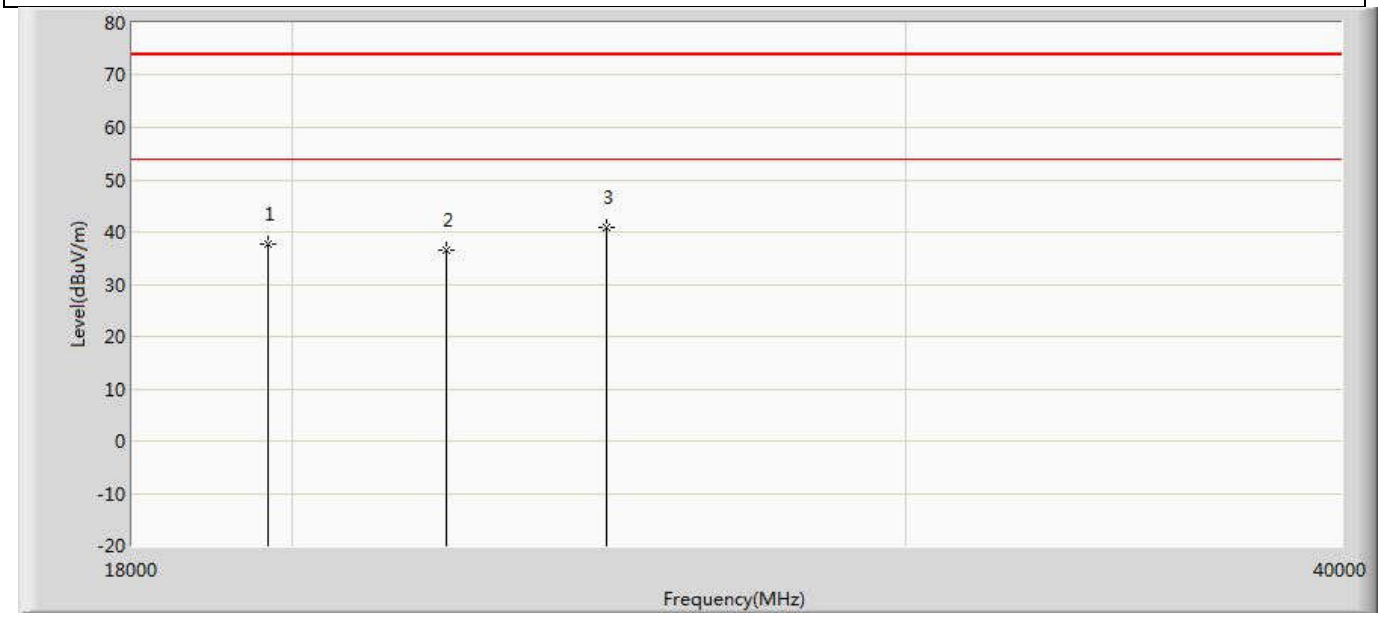
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19496.000	34.488	30.922	-39.512	74.000	3.566	PK
2		21933.000	37.723	32.740	-36.277	74.000	4.983	PK
3	*	24370.000	40.089	34.418	-33.911	74.000	5.671	PK

Profile: 2040637R	Page No.: 109
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2462MHz by 802.11b	



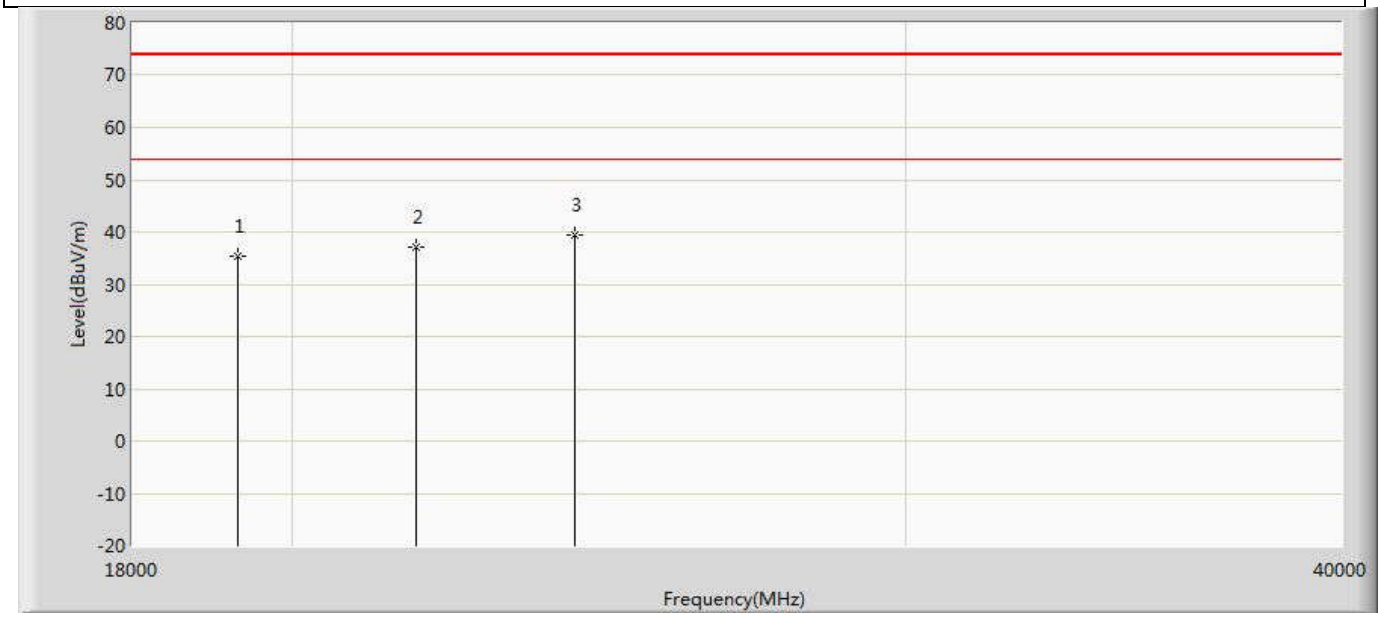
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19696.000	39.563	35.830	-34.437	74.000	3.733	PK
2		22158.000	38.469	33.485	-35.531	74.000	4.984	PK
3	*	24620.000	40.819	35.105	-33.181	74.000	5.713	PK

Profile: 2040637R	Page No.: 110
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2462MHz by 802.11b	



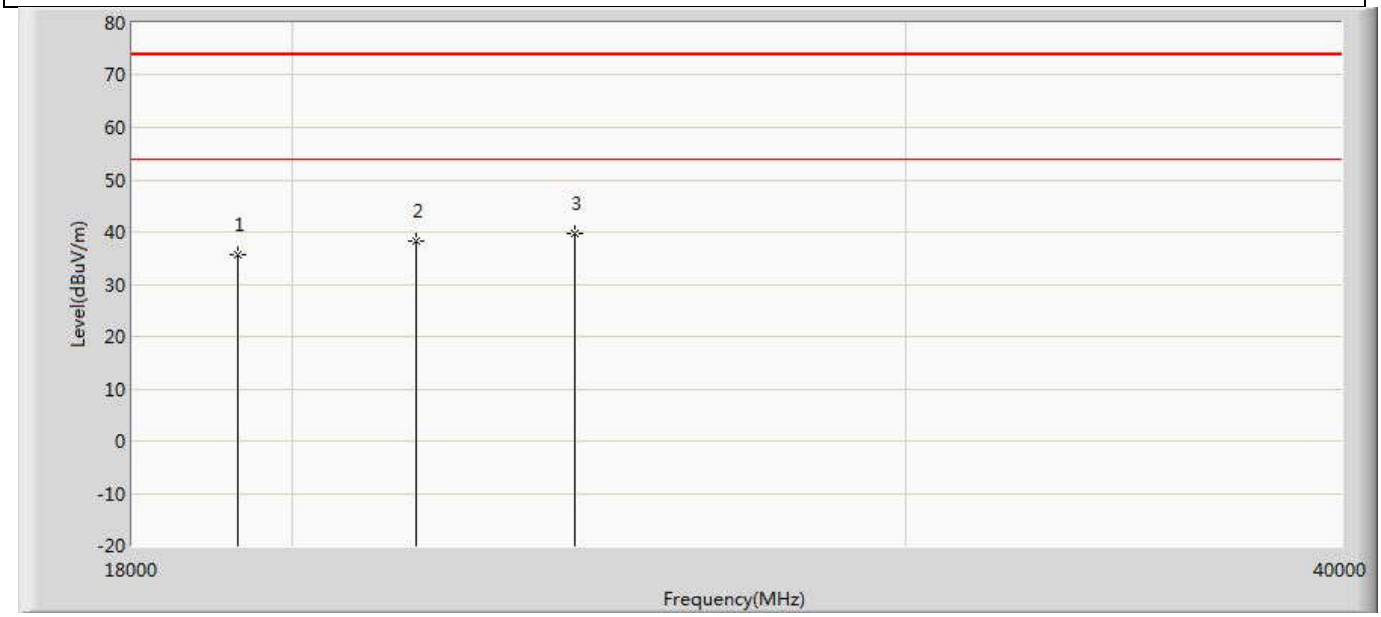
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19696.000	37.664	33.931	-36.336	74.000	3.733	PK
2		22158.000	36.575	31.591	-37.425	74.000	4.984	PK
3	*	24620.000	40.846	35.132	-33.154	74.000	5.713	PK

Profile: 2040637R	Page No.: 111
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2412MHz by 802.11g	



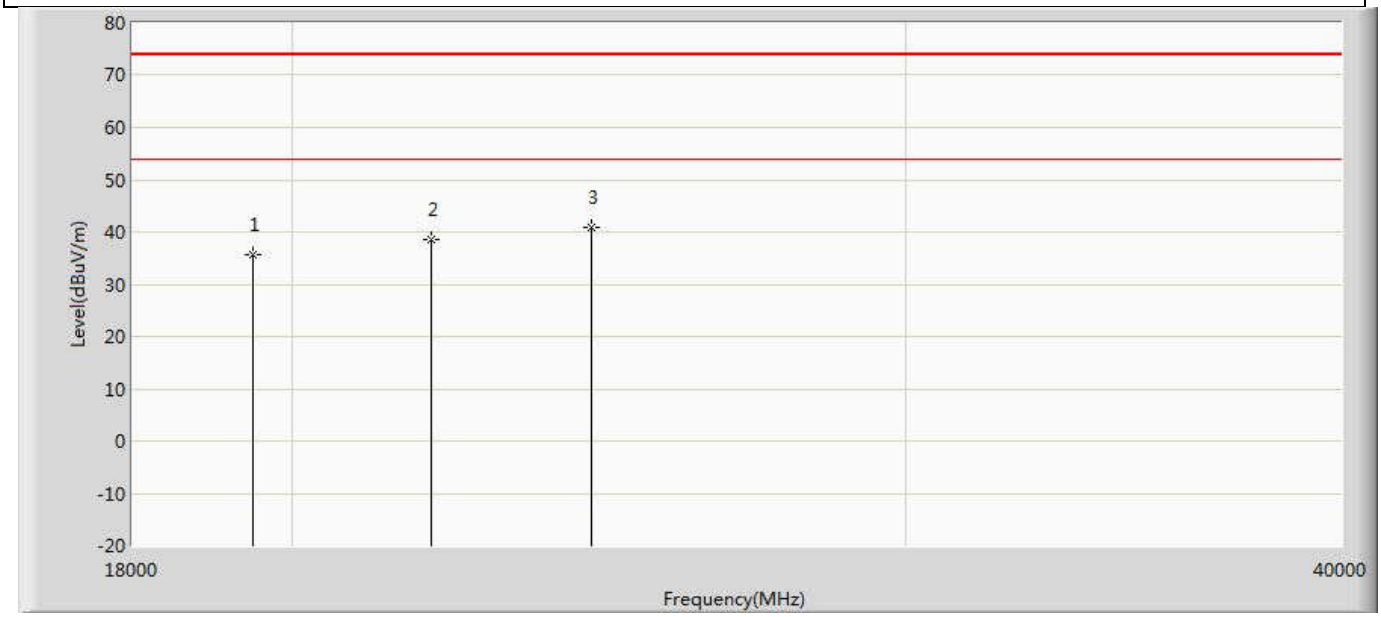
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19296.000	35.379	31.913	-38.621	74.000	3.466	PK
2		21708.000	37.056	32.257	-36.944	74.000	4.799	PK
3	*	24120.000	39.288	33.842	-34.712	74.000	5.446	PK

Profile: 2040637R	Page No.: 112
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2412MHz by 802.11g	



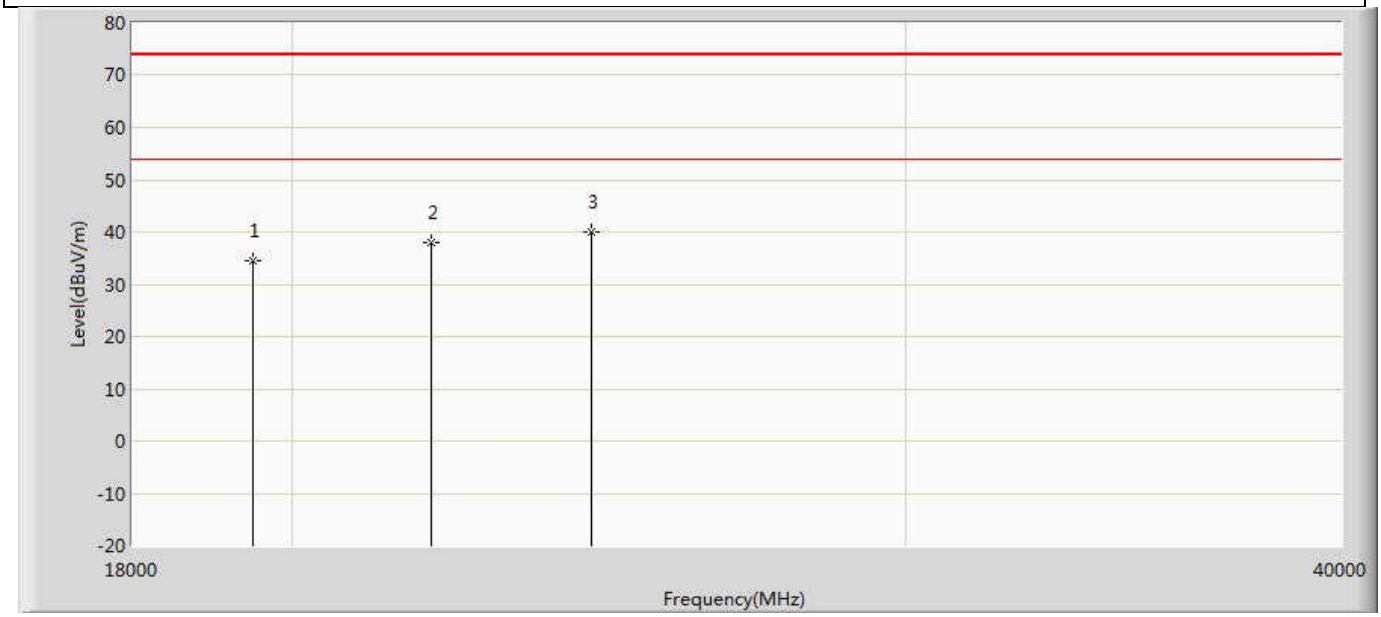
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19296.000	35.762	32.296	-38.238	74.000	3.466	PK
2		21708.000	38.301	33.502	-35.699	74.000	4.799	PK
3	*	24120.000	39.603	34.157	-34.397	74.000	5.446	PK

Profile: 2040637R	Page No.: 113
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2437MHz by 802.11g	



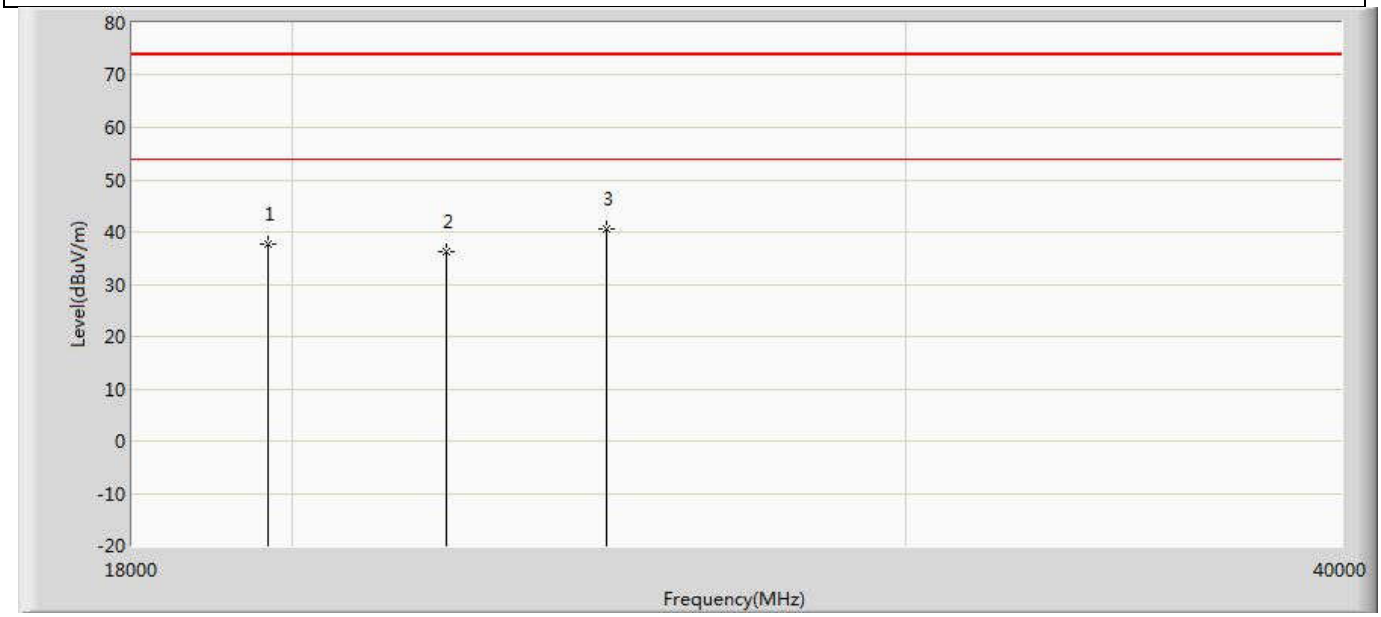
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19496.000	35.611	32.045	-38.389	74.000	3.566	PK
2		21933.000	38.528	33.545	-35.472	74.000	4.983	PK
3	*	24370.000	40.853	35.182	-33.147	74.000	5.671	PK

Profile: 2040637R	Page No.: 114
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2437MHz by 802.11g	



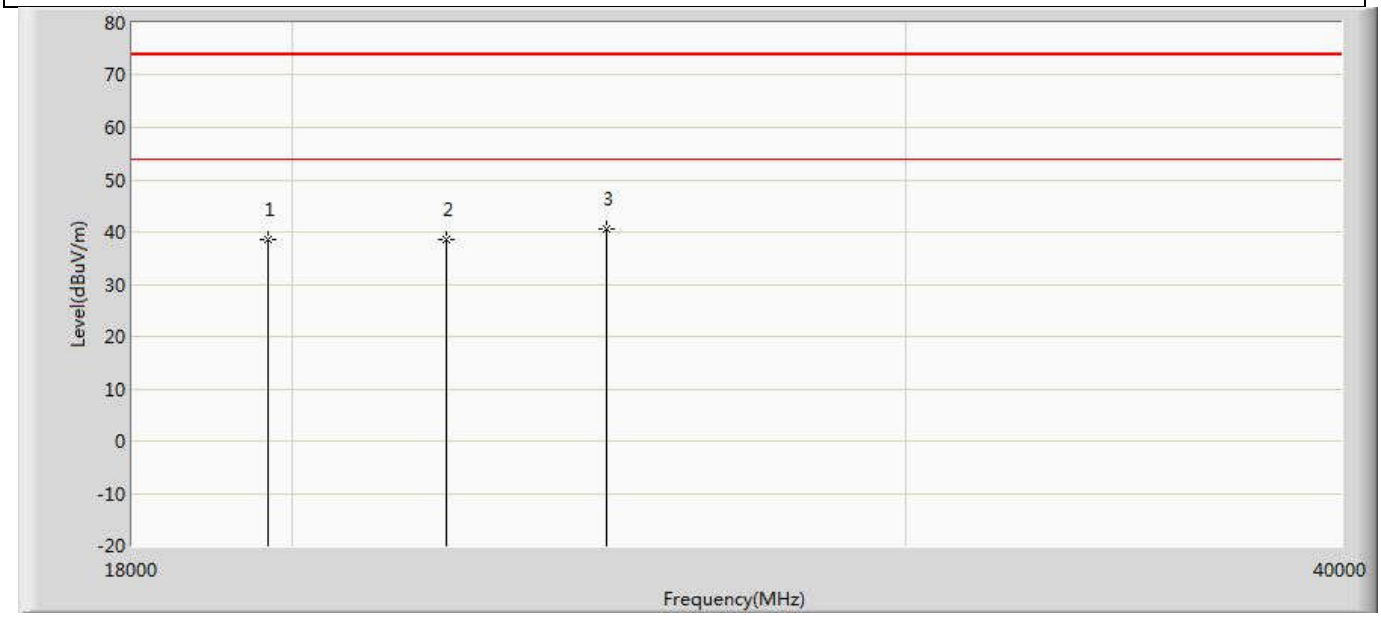
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19496.000	34.450	30.884	-39.550	74.000	3.566	PK
2		21933.000	37.991	33.008	-36.009	74.000	4.983	PK
3	*	24370.000	40.032	34.361	-33.968	74.000	5.671	PK

Profile: 2040637R	Page No.: 115
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2462MHz by 802.11g	



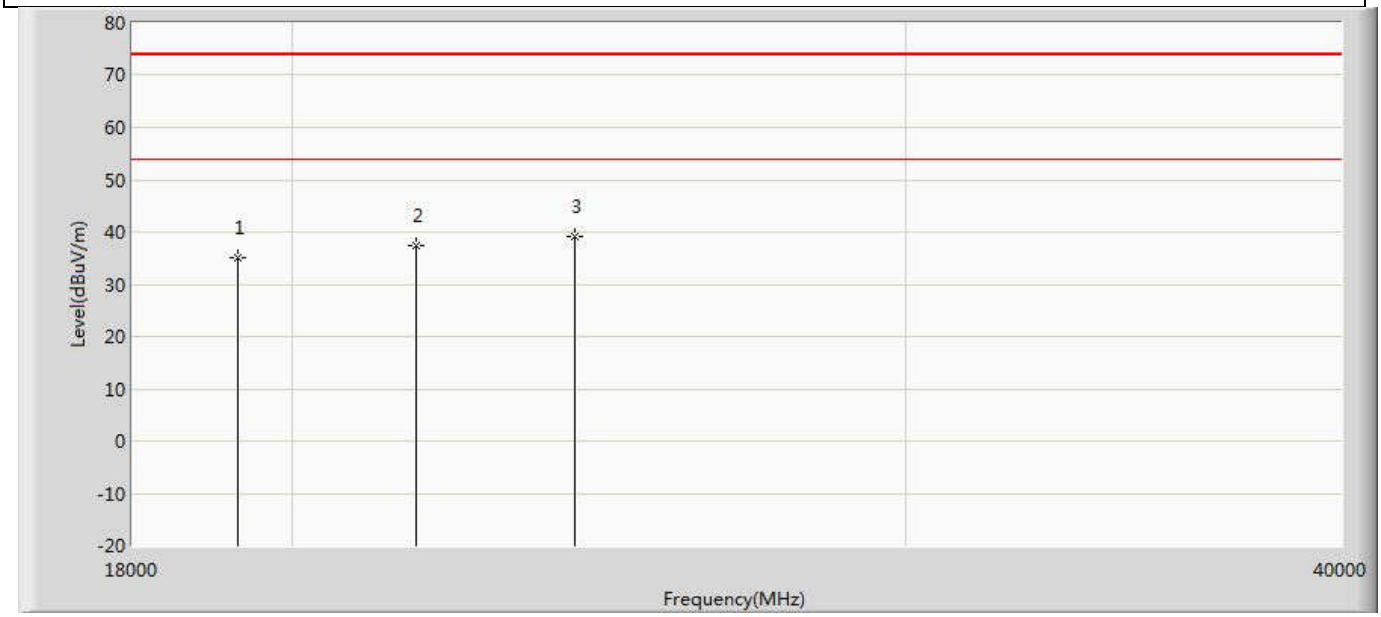
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19696.000	37.667	33.934	-36.333	74.000	3.733	PK
2		22158.000	36.342	31.358	-37.658	74.000	4.984	PK
3	*	24620.000	40.449	34.735	-33.551	74.000	5.713	PK

Profile: 2040637R	Page No.: 116
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2462MHz by 802.11g	



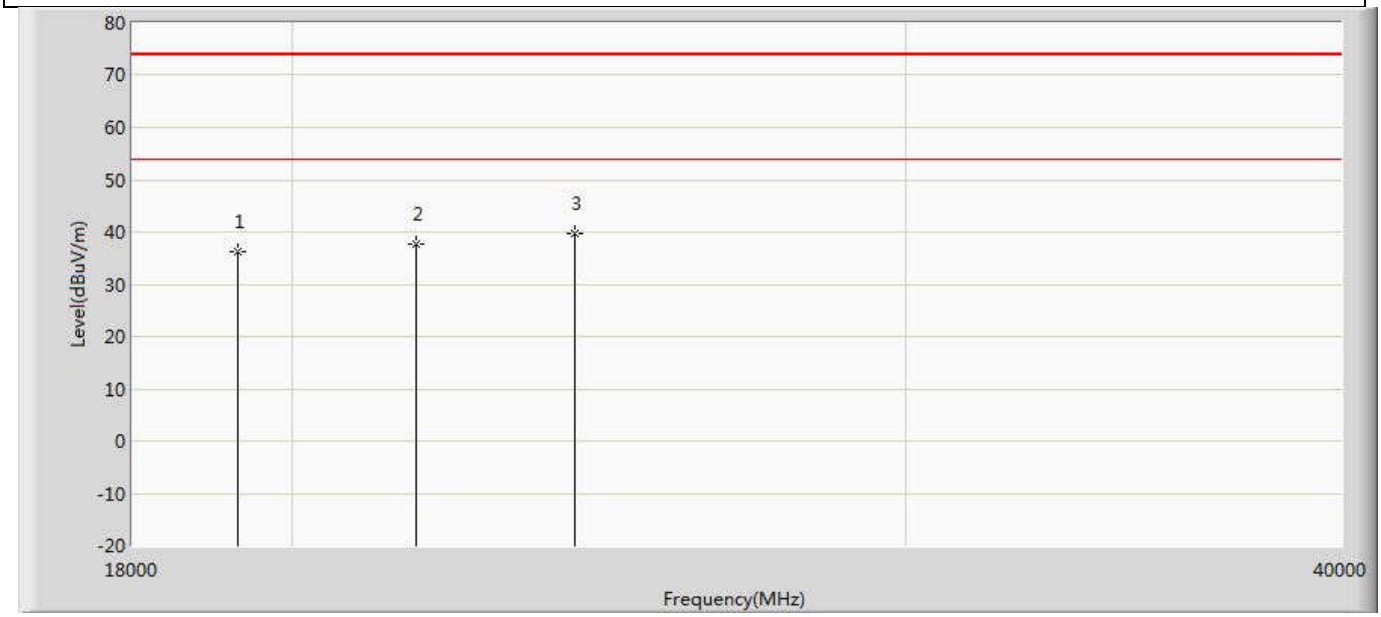
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19696.000	38.423	34.690	-35.577	74.000	3.733	PK
2		22158.000	38.448	33.464	-35.552	74.000	4.984	PK
3	*	24620.000	40.444	34.730	-33.556	74.000	5.713	PK

Profile: 2040637R	Page No.: 117
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2412MHz by 802.11n(20MHz)	



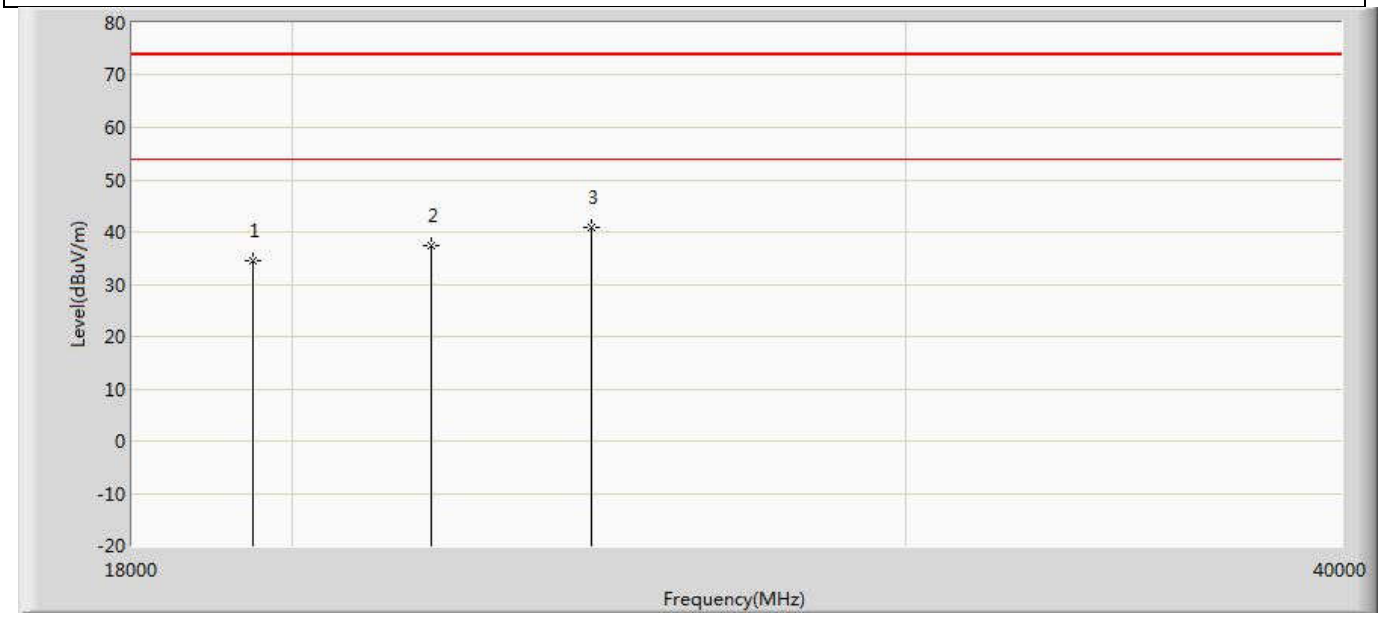
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19296.000	35.062	31.596	-38.938	74.000	3.466	PK
2		21708.000	37.426	32.627	-36.574	74.000	4.799	PK
3	*	24120.000	39.218	33.772	-34.782	74.000	5.446	PK

Profile: 2040637R	Page No.: 118
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2412MHz by 802.11n(20MHz)	



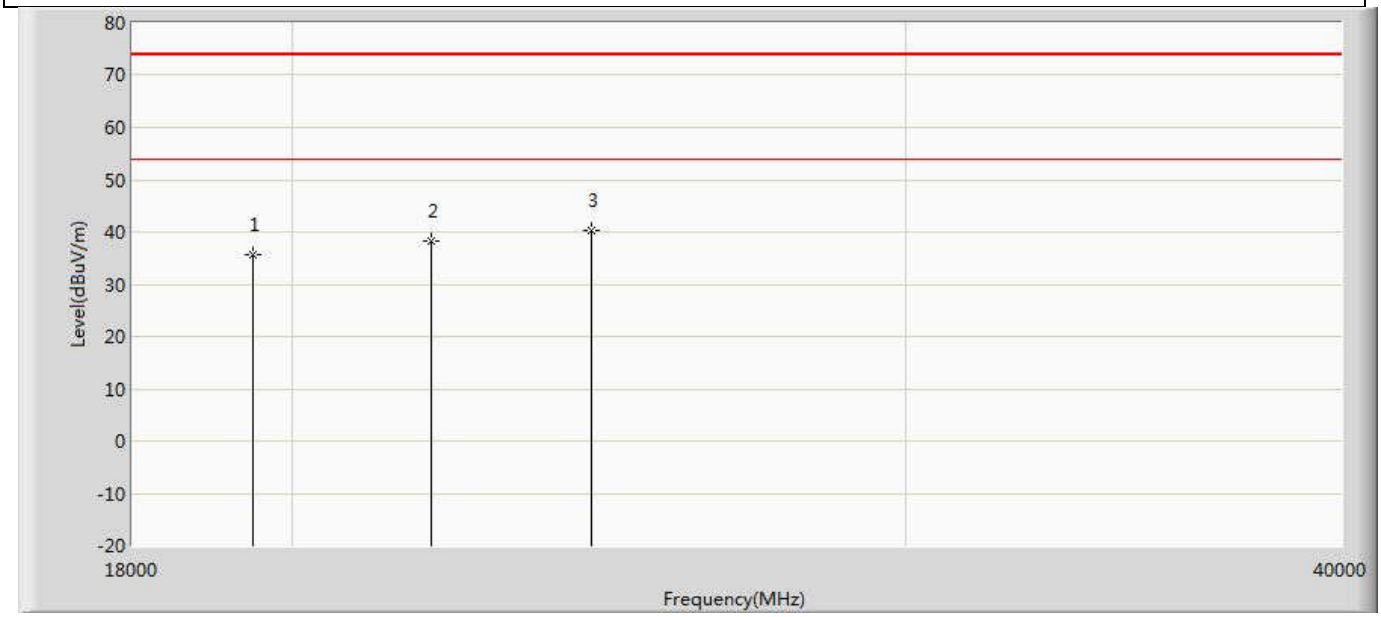
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19296.000	36.344	32.878	-37.656	74.000	3.466	PK
2		21708.000	37.713	32.914	-36.287	74.000	4.799	PK
3	*	24120.000	39.789	34.343	-34.211	74.000	5.446	PK

Profile: 2040637R	Page No.: 119
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2437MHz by 802.11n(20MHz)	



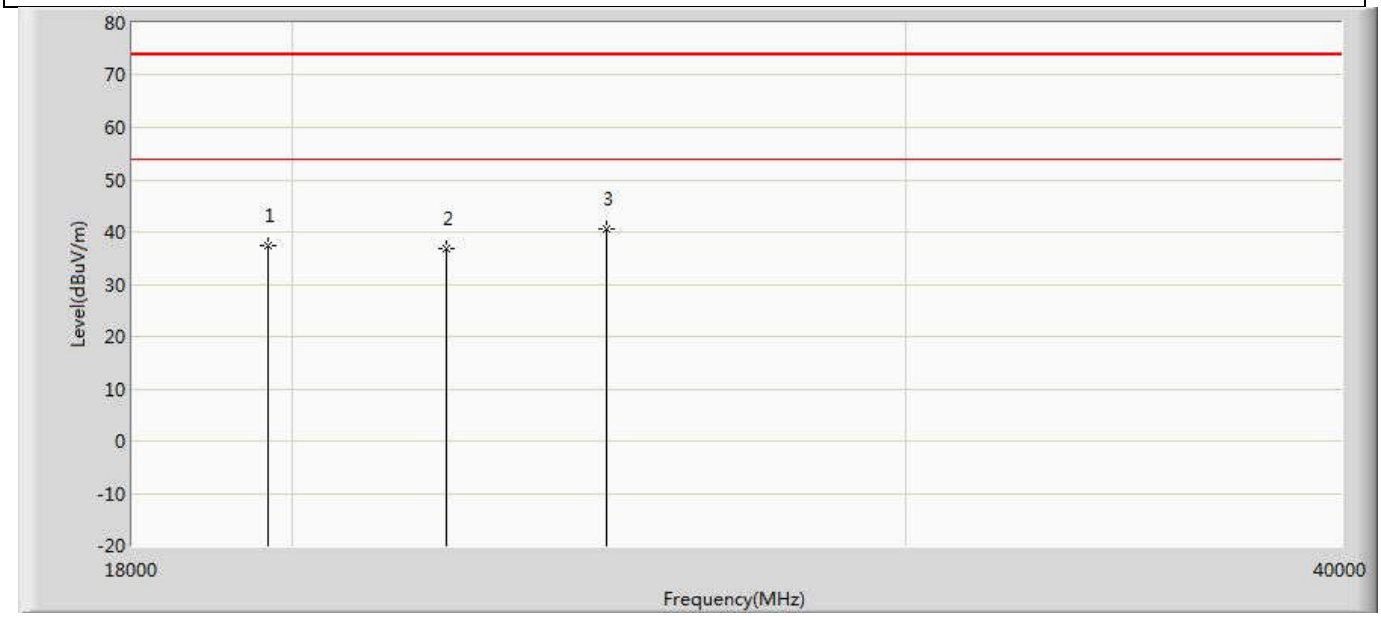
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19496.000	34.504	30.938	-39.496	74.000	3.566	PK
2		21933.000	37.503	32.520	-36.497	74.000	4.983	PK
3	*	24370.000	40.841	35.170	-33.159	74.000	5.671	PK

Profile: 2040637R	Page No.: 120
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2437MHz by 802.11n(20MHz)	



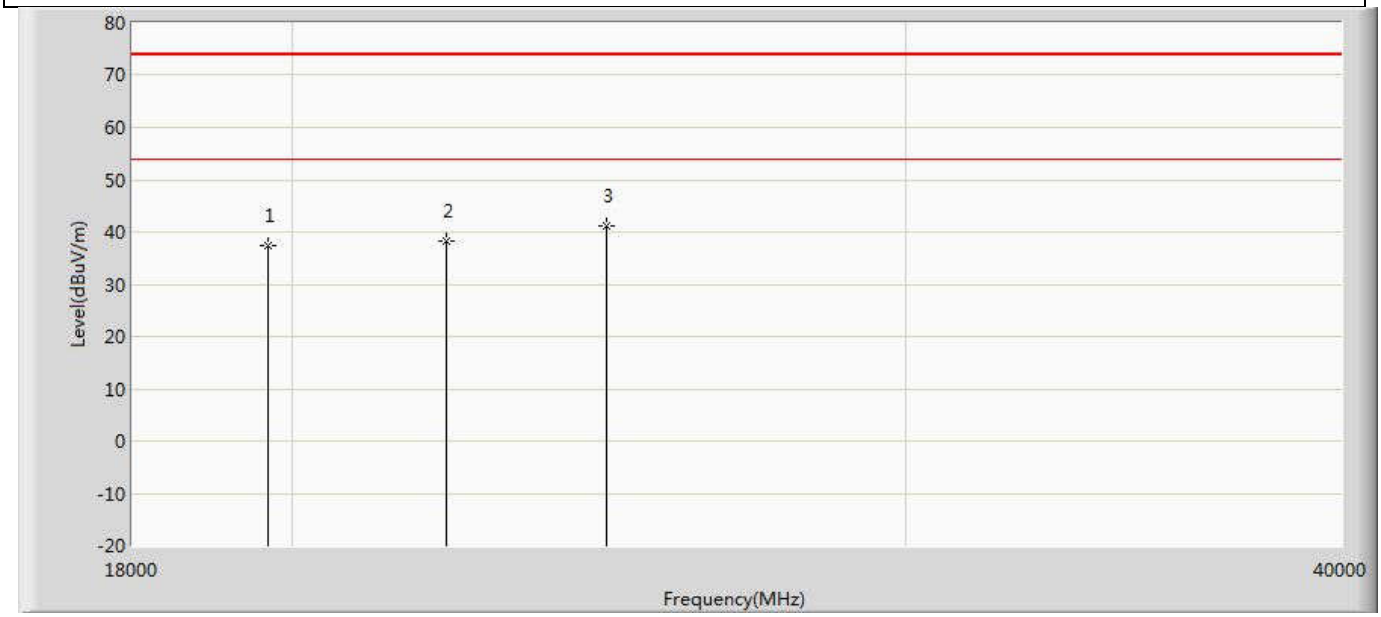
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19496.000	35.577	32.011	-38.423	74.000	3.566	PK
2		21933.000	38.212	33.229	-35.788	74.000	4.983	PK
3	*	24370.000	40.246	34.575	-33.754	74.000	5.671	PK

Profile: 2040637R	Page No.: 121
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2462MHz by 802.11n(20MHz)	



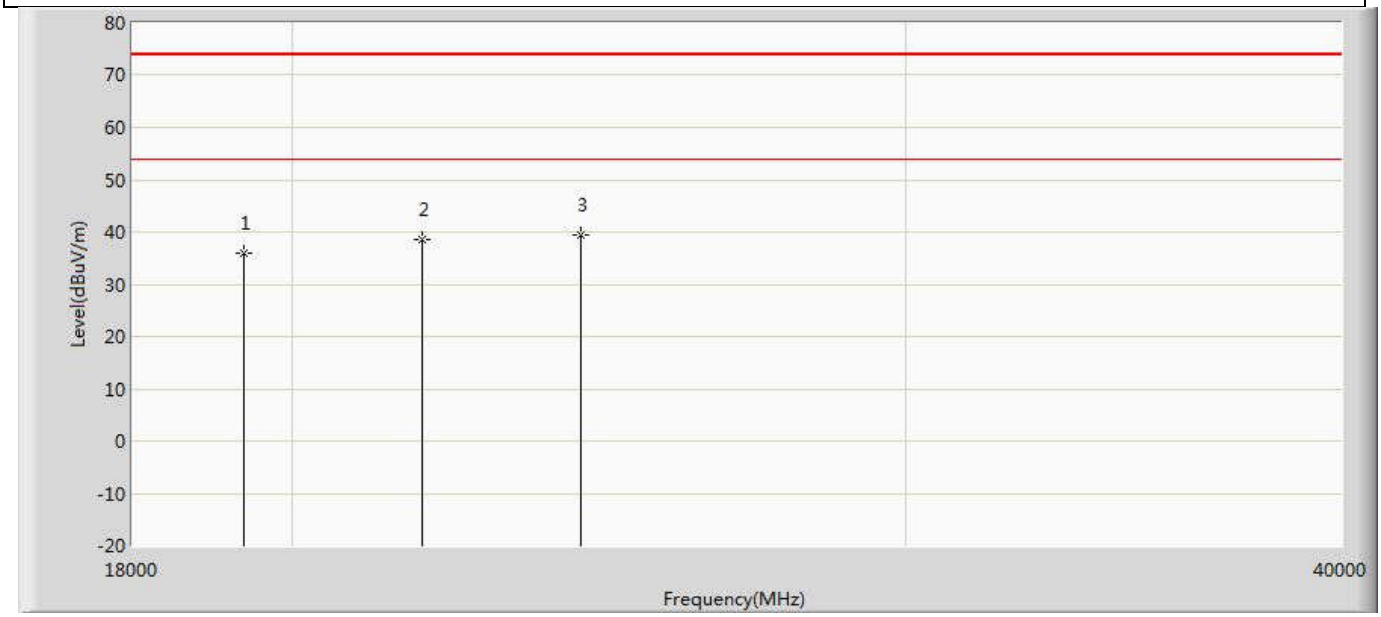
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19696.000	37.389	33.656	-36.611	74.000	3.733	PK
2		22158.000	36.935	31.951	-37.065	74.000	4.984	PK
3	*	24620.000	40.576	34.862	-33.424	74.000	5.713	PK

Profile: 2040637R	Page No.: 122
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2462MHz by 802.11n(20MHz)	



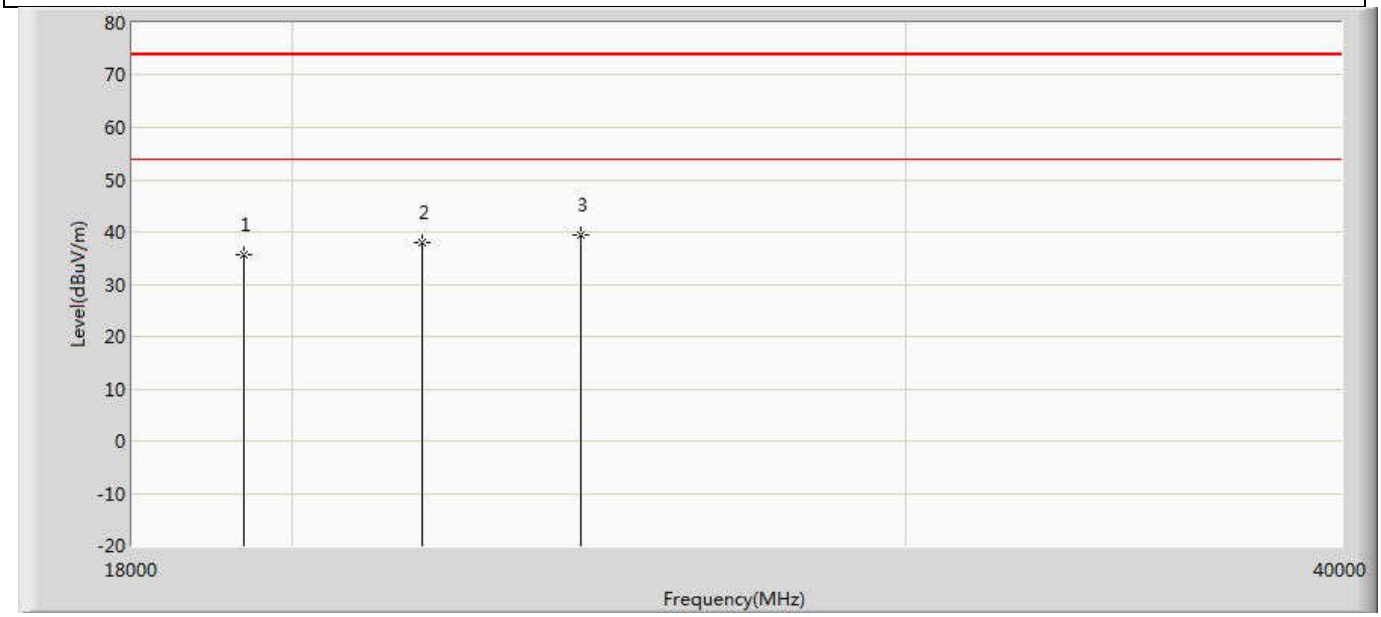
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19696.000	37.323	33.590	-36.677	74.000	3.733	PK
2		22158.000	38.387	33.403	-35.613	74.000	4.984	PK
3	*	24620.000	41.087	35.373	-32.913	74.000	5.713	PK

Profile: 2040637R	Page No.: 123
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2422MHz by 802.11n(40MHz)	



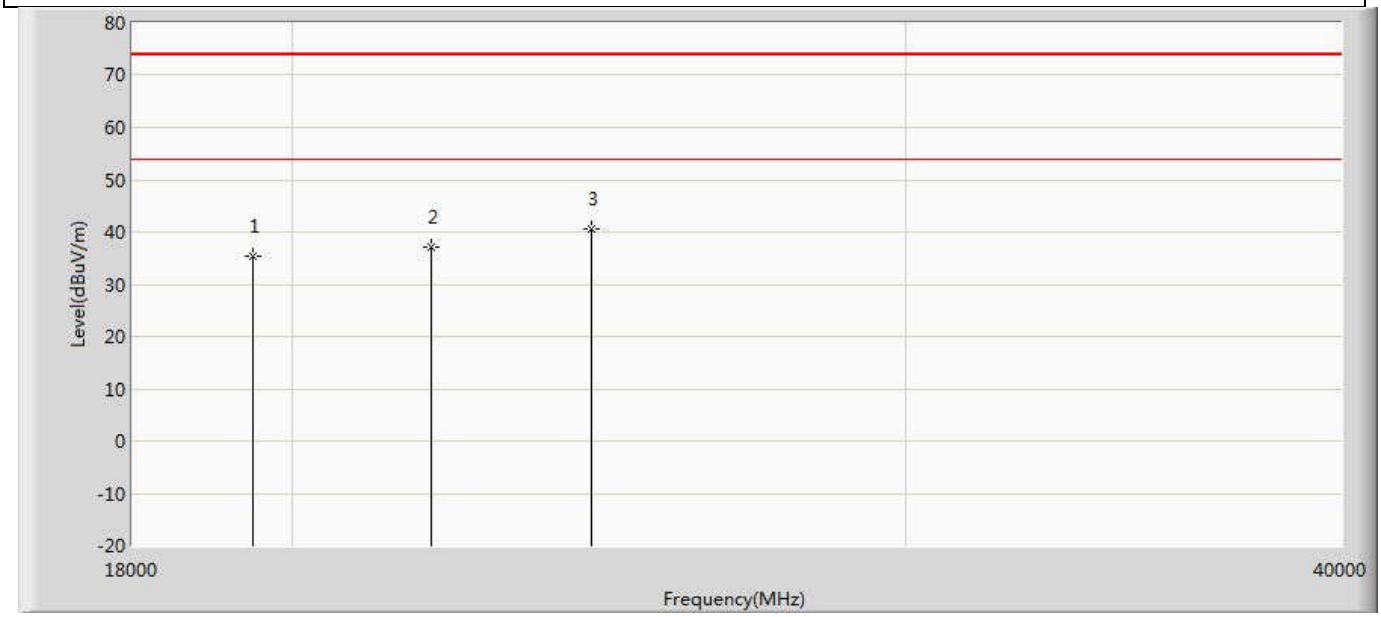
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19376.000	35.867	32.361	-38.133	74.000	3.506	PK
2		21798.000	38.535	33.662	-35.465	74.000	4.872	PK
3	*	24220.000	39.502	33.966	-34.498	74.000	5.536	PK

Profile: 2040637R	Page No.: 124
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2422MHz by 802.11n(40MHz)	



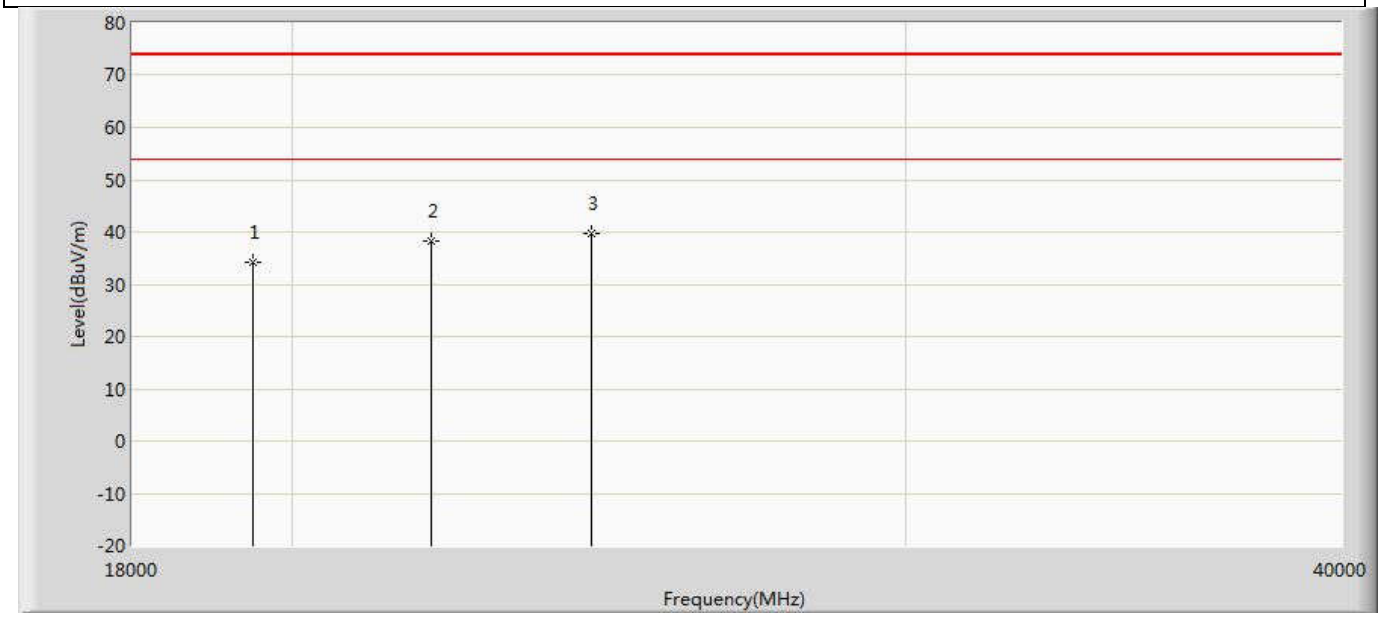
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19376.000	35.681	32.175	-38.319	74.000	3.506	PK
2		21798.000	37.841	32.968	-36.159	74.000	4.872	PK
3	*	24220.000	39.350	33.814	-34.650	74.000	5.536	PK

Profile: 2040637R	Page No.: 125
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2437MHz by 802.11n(40MHz)	



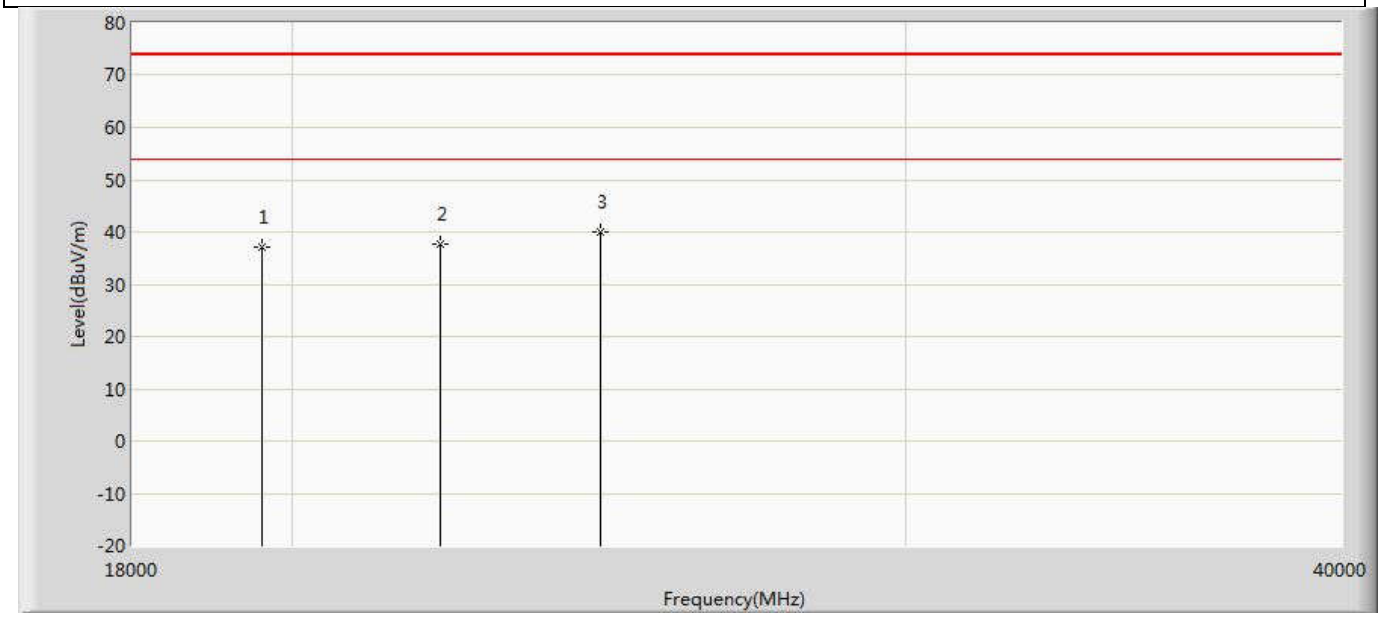
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19496.000	35.277	31.711	-38.723	74.000	3.566	PK
2		21933.000	37.153	32.170	-36.847	74.000	4.983	PK
3	*	24370.000	40.435	34.764	-33.565	74.000	5.671	PK

Profile: 2040637R	Page No.: 126
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2437MHz by 802.11n(40MHz)	



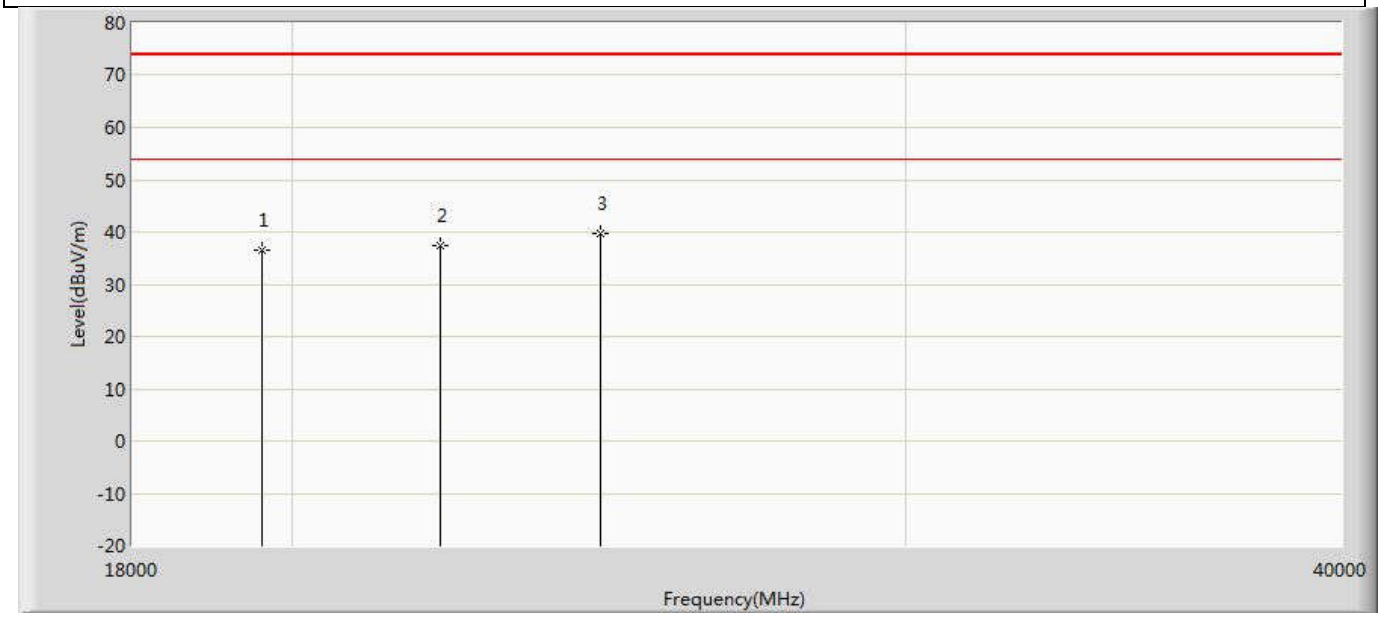
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19496.000	34.186	30.620	-39.814	74.000	3.566	PK
2		21933.000	38.337	33.354	-35.663	74.000	4.983	PK
3	*	24370.000	39.747	34.076	-34.253	74.000	5.671	PK

Profile: 2040637R	Page No.: 127
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2452MHz by 802.11n(40MHz)	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19616.000	37.002	33.336	-36.998	74.000	3.666	PK
2		22068.000	37.570	32.555	-36.430	74.000	5.015	PK
3	*	24520.000	40.004	34.228	-33.996	74.000	5.776	PK

Profile: 2040637R	Page No.: 128
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 13:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2452MHz by 802.11n(40MHz)	

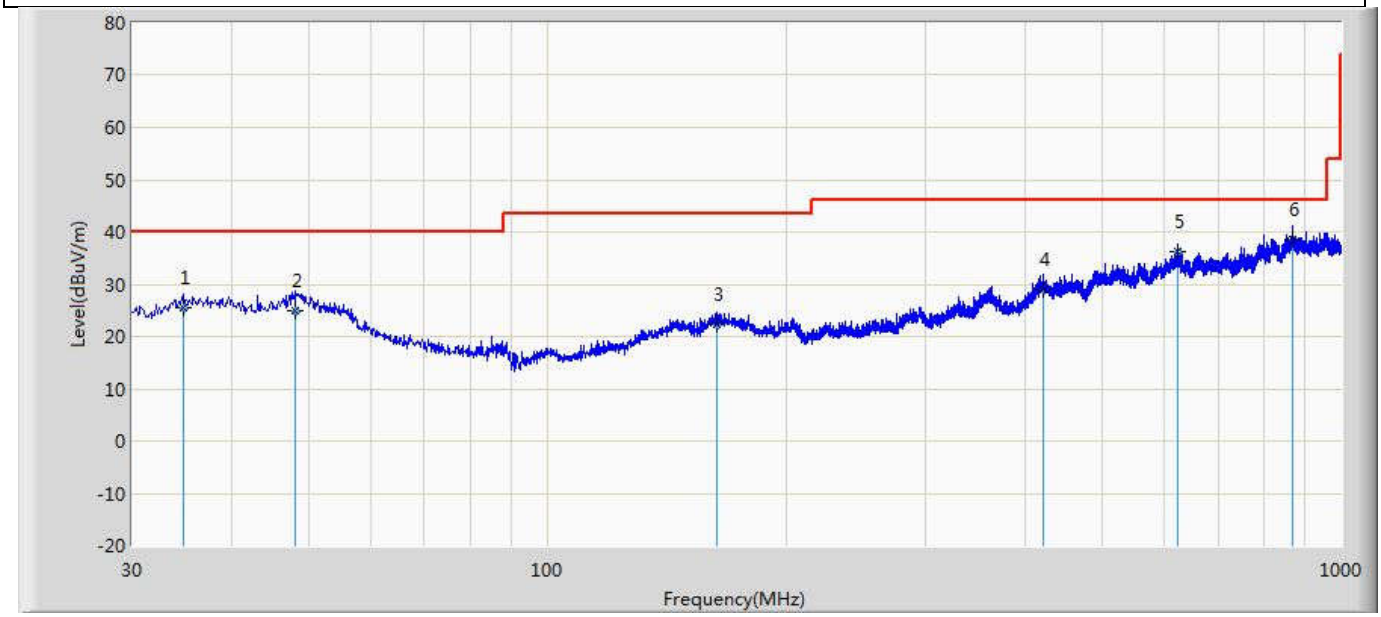


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		19616.000	36.649	32.983	-37.351	74.000	3.666	PK
2		22068.000	37.474	32.459	-36.526	74.000	5.015	PK
3	*	24520.000	39.639	33.863	-34.361	74.000	5.776	PK

Remark	1. " * ", means this data is the worst emission level. 2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp). 3. The test frequency range, 9kHz~30MHz worst case are at least 6dB below the limits, therefore no data appear in the report. 4. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed. 5. The complete raw data please refer to Appendix RSE, Shown in the report is the worst data.

The worst case of Radiated Emission below 1GHz:

Profile: 2040637R	Page No.: 5
Engineer: Lucas	
Site: AC2	Time: 2020/04/30
Limit: FCC_Part15.209_RE(3m)_ClassB	Margin: 0
Probe: SuZ-2141	Polarity: Horizontal
EUT: Tunable White Direct Connect Smart Bulb	Power: AC 120V/60Hz
Note: Mode 1	

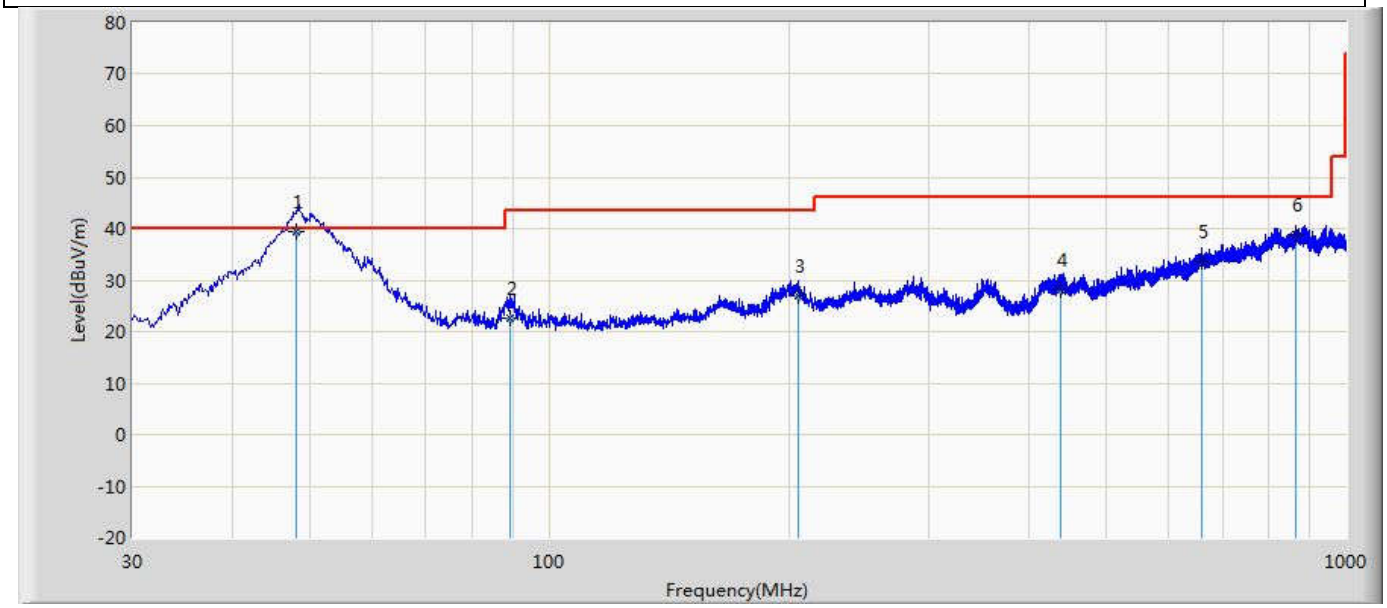


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1		34.799	25.553	2.500	-14.447	40.000	16.715	6.338	0.000	100	258	QP
2		48.226	24.847	3.100	-15.153	40.000	15.267	6.481	0.000	100	184	QP
3		163.555	22.313	2.500	-21.187	43.500	12.751	7.062	0.000	100	88	QP
4		421.323	29.052	2.100	-16.948	46.000	19.011	7.940	0.000	100	87	QP
5		623.555	36.202	5.100	-9.798	46.000	22.602	8.500	0.000	100	201	QP
6	*	869.656	38.544	3.100	-7.456	46.000	26.341	9.102	0.000	100	111	QP

Note:

1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Profile: 2040637R	Page No.: 6
Engineer: Lucas	
Site: AC2	Time: 2020/04/30
Limit: FCC_Part15.209_RE(3m)_ClassB	Margin: 0
Probe: SuZ-2141	Polarity: Vertical
EUT: Tunable White Direct Connect Smart Bulb	Power: AC 120V/60Hz
Note: Mode 1	



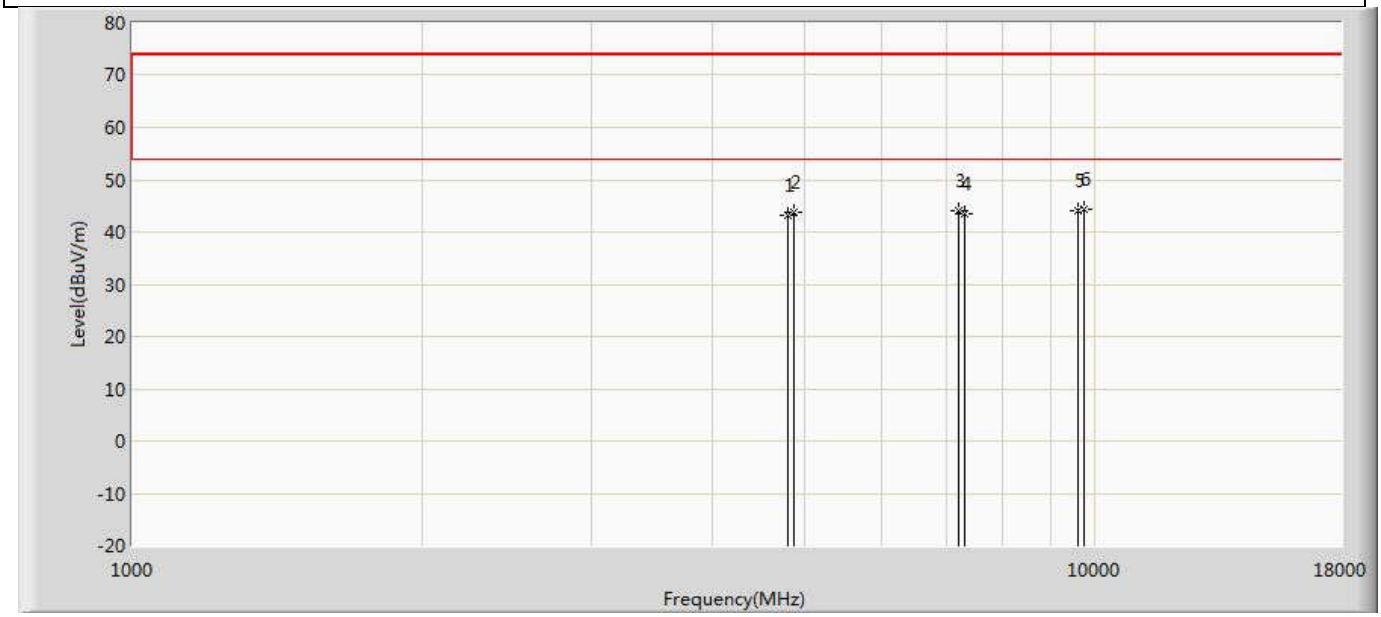
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1	*	48.231	39.403	14.900	-0.597	40.000	18.023	6.481	0.000	100	185	QP
2		89.325	22.482	8.600	-21.018	43.500	7.164	6.718	0.000	100	23	QP
3		205.327	26.985	2.510	-16.515	43.500	17.254	7.221	0.000	100	152	QP
4		438.326	28.157	2.100	-17.843	46.000	18.067	7.991	0.000	100	201	QP
5		660.595	33.657	3.100	-12.343	46.000	21.960	8.596	0.000	100	98	QP
6		866.798	38.901	3.800	-7.099	46.000	26.005	9.095	0.000	100	93	QP

Note:

1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

The worst case of Simultaneous transmission:

Profile: 2040637R	Page No.: 129
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 15:05
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Tunable White Direct Connect Smart Bulb	Power: AC 120V/60Hz
Note: Mode 1:Transmit at BLE 2402MHz and 802.11n20 2437MHz	

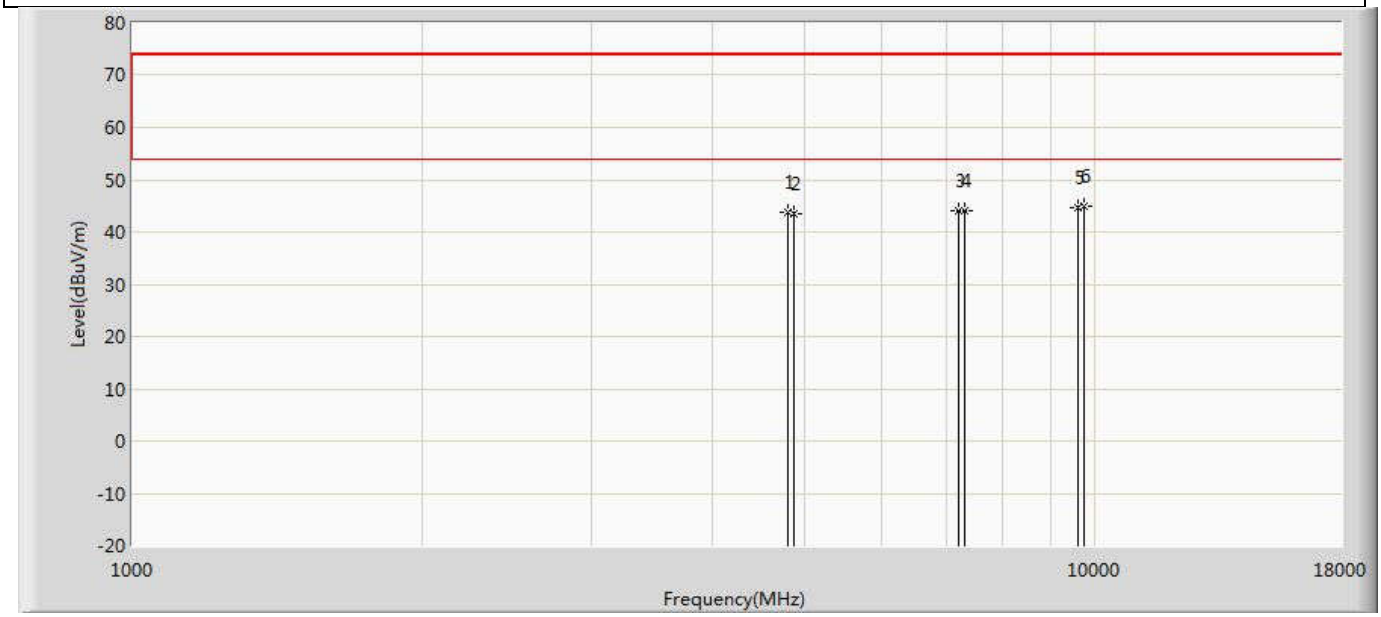


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	43.248	39.587	-30.752	74.000	3.662	PK
2		4874.000	43.642	39.955	-30.358	74.000	3.687	PK
3		7206.000	44.057	37.394	-29.943	74.000	6.663	PK
4		7311.000	43.542	36.912	-30.458	74.000	6.630	PK
5		9608.000	44.128	35.992	-29.872	74.000	8.137	PK
6	*	9748.000	44.231	35.611	-29.769	74.000	8.620	PK

Note:

1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Profile: 2040637R	Page No.: 130
Engineer: YULIU	
Site: AC5	Time: 2020/05/20 - 15:13
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Tunable White Direct Connect Smart Bulb	Power: AC 120V/60Hz
Note: Mode 1:Transmit at BLE 2402MHz and 802.11n20 2437MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	43.685	40.024	-30.315	74.000	3.662	PK
2		4874.000	43.348	39.661	-30.652	74.000	3.687	PK
3		7206.000	43.998	37.335	-30.002	74.000	6.663	PK
4		7311.000	44.015	37.385	-29.985	74.000	6.630	PK
5		9608.000	44.681	36.545	-29.319	74.000	8.137	PK
6	*	9748.000	44.824	36.204	-29.176	74.000	8.620	PK

Note:
1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

4.3 Emissions in non-restricted frequency band	VERDICT: PASS

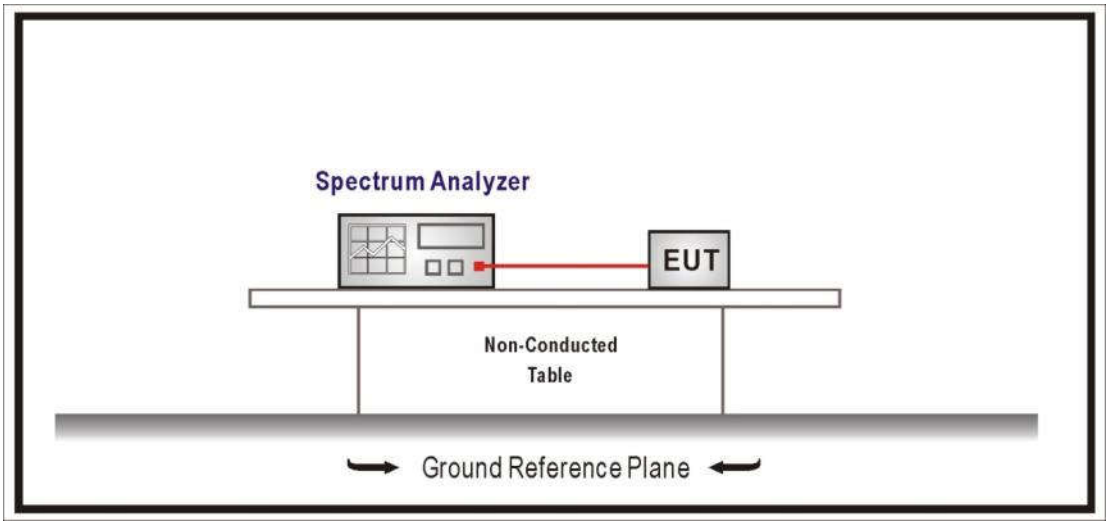
4.3.1 Limit

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

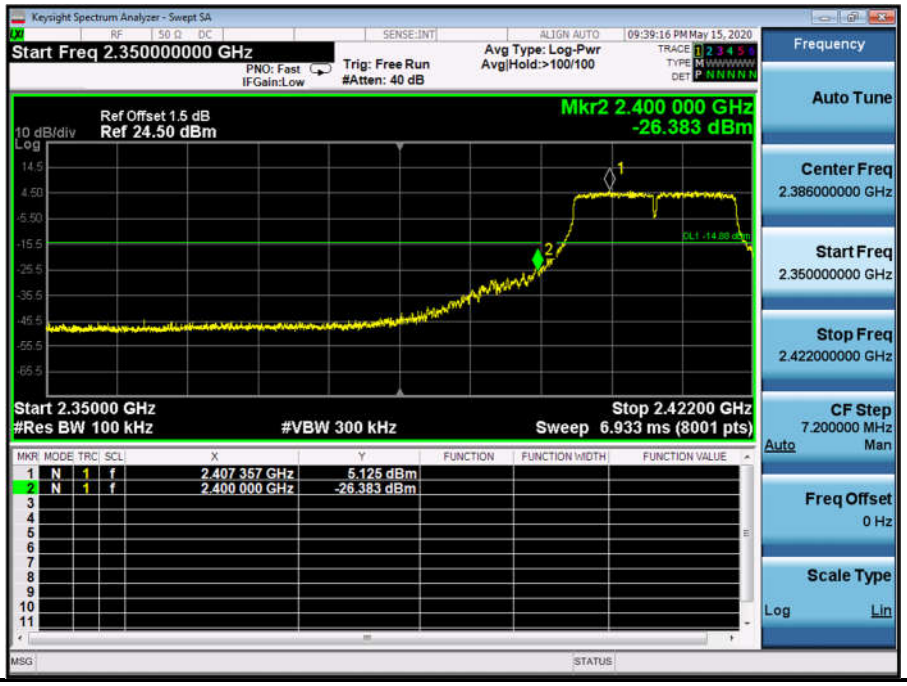
References Rule			Chapter	Description
☒	ANSI C63.10		11.11	Emissions in non-restricted frequency bands
	☒	ANSI C63.10	11.11.1	General
	☒	ANSI C63.10	11.11.2	Reference level measurement
	☒	ANSI C63.10	11.11.3	Emission level measurement

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	12.475	2400	-24.252	36.727	⩾20	Pass
	11	2462	14.776	2500	-45.863	60.639	⩾20	Pass
2	1	2412	5.125	2400	-26.383	31.508	⩾20	Pass
	11	2462	5.025	2500	-45.695	50.720	⩾20	Pass
3	1	2412	3.913	2400	-29.011	32.924	⩾20	Pass
	11	2462	4.856	2500	-47.063	51.919	⩾20	Pass
4	3	2422	0.530	2400	-42.094	42.624	⩾20	Pass
	9	2452	0.876	2500	-45.479	46.355	⩾20	Pass

Note: The worst case of emissions in non-restricted frequency bands as below:

Mode 2 CH01(2412MHz)

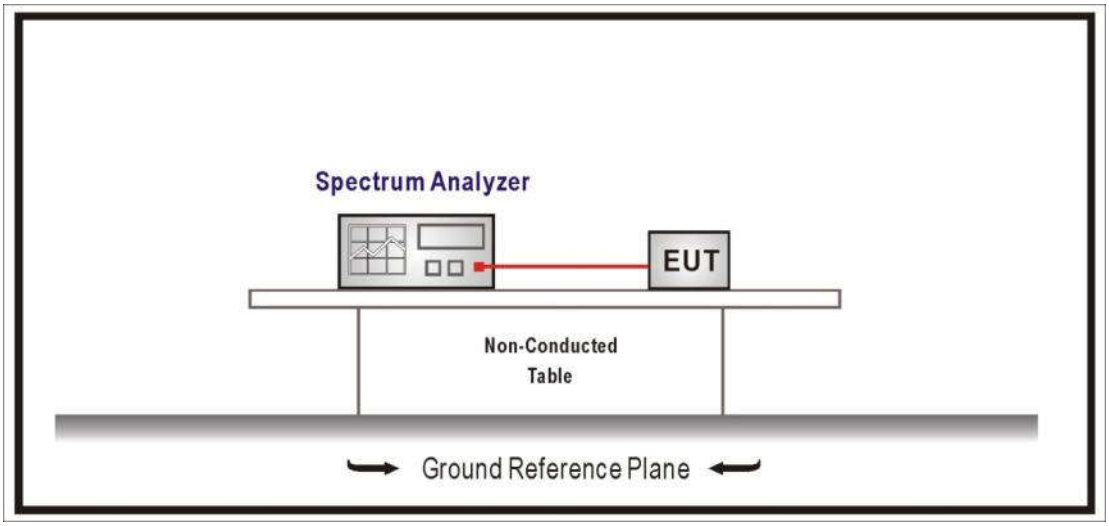


4.4 Duty cycle	VERDICT: PASS

4.4.1 Limit

N/A

4.4.2 Test Setup



4.4.3 Test Procedure

References Rule		Chapter	Description
☒	ANSI C63.10	11.6	Duty cycle (D), transmission duration (T), and maximum power control level

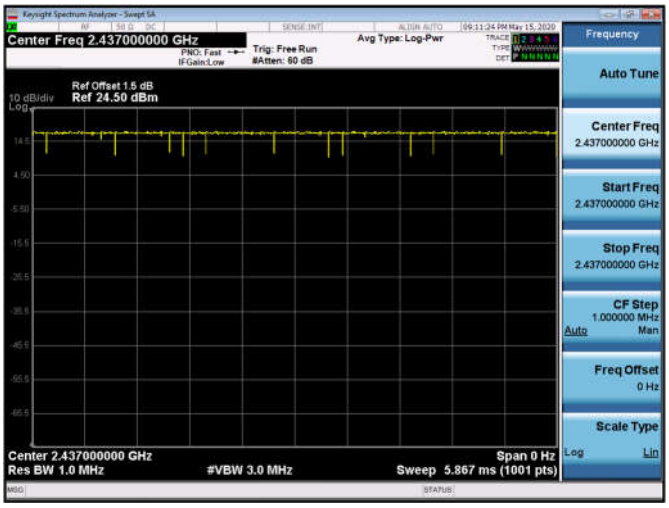
4.4.4 Test Data

Test Mode	Tx On (ms)	Tx Off (ms)	VBW	Tx On + Tx Off (ms)	Duty Cycle
1	N/A	N/A	10Hz	N/A	100%
2	N/A	N/A	10Hz	N/A	100%
3	N/A	N/A	10Hz	N/A	100%
4	N/A	N/A	10Hz	N/A	100%

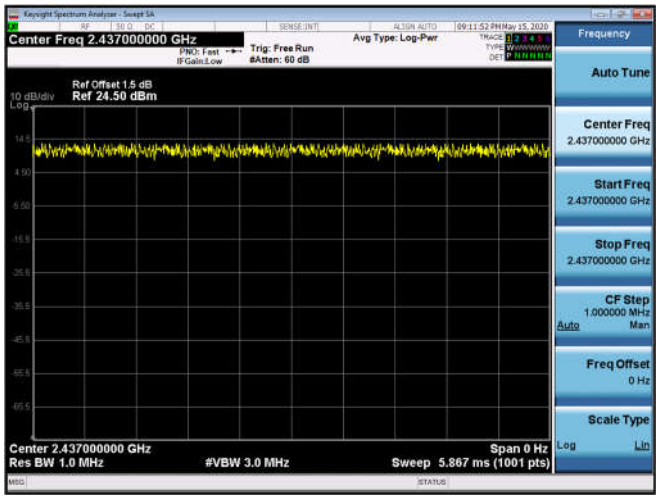
Note 1: T means the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Note 2: According to KDB 558074, when test for Radiated Emission Band Edge and Radiated Emission, for average detector set: VBW ≥ 1/T will be used.

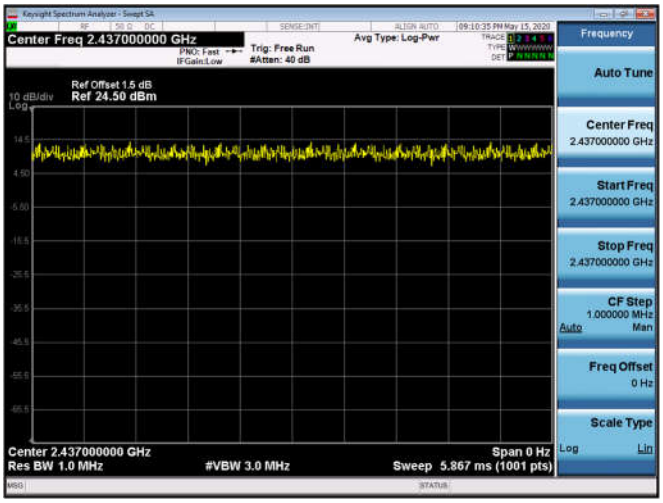
802.11b



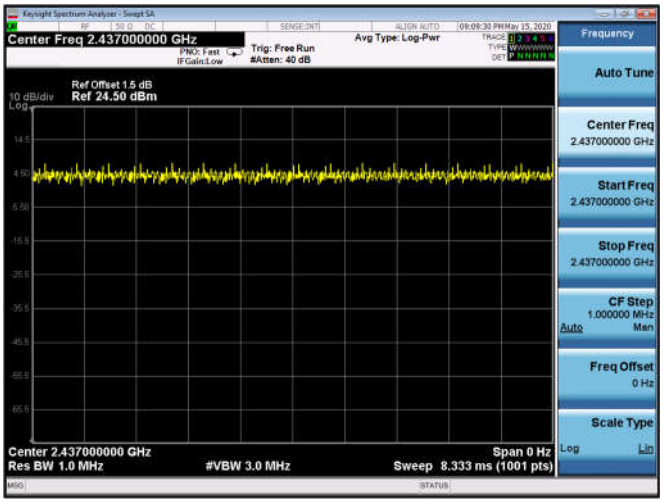
802.11g



802.11n(20MHz)



802.11n(40MHz)



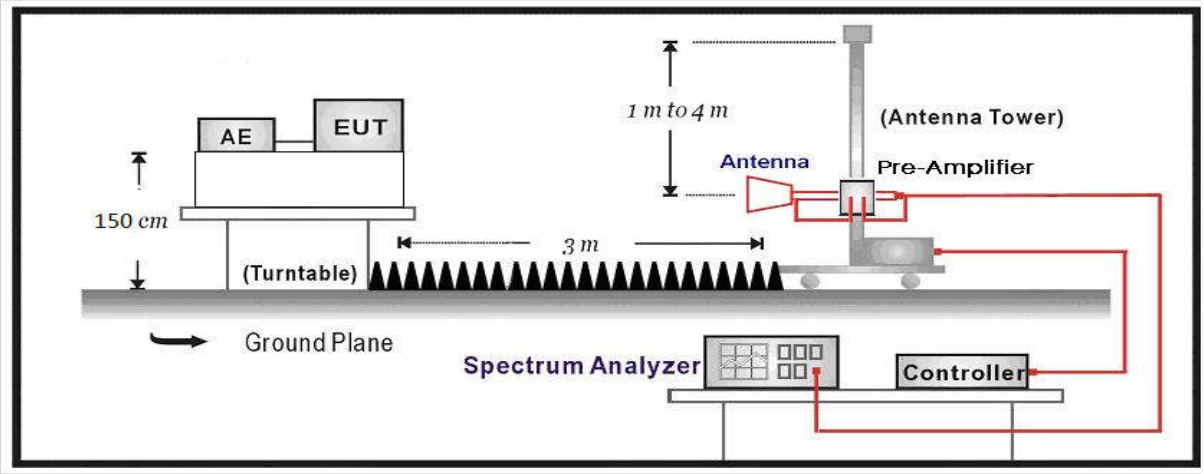
4.5 Radiated Emission Band Edge	VERDICT: PASS

4.5.1 Limit

Standard	FCC Part 15 Subpart C Paragraph 15.247(d) , 15.209			
Frequency bands (MHz)	Detector	Limit (dBμV/m)	RBW (MHz)	Distance (m)
2310-2390 2483.5-2500	PK	74	1	3
	AV	54	1	3
Note: The field strength of emissions appearing within these frequency bands shall not exceed the limits.				

4.5.2 Test Setup

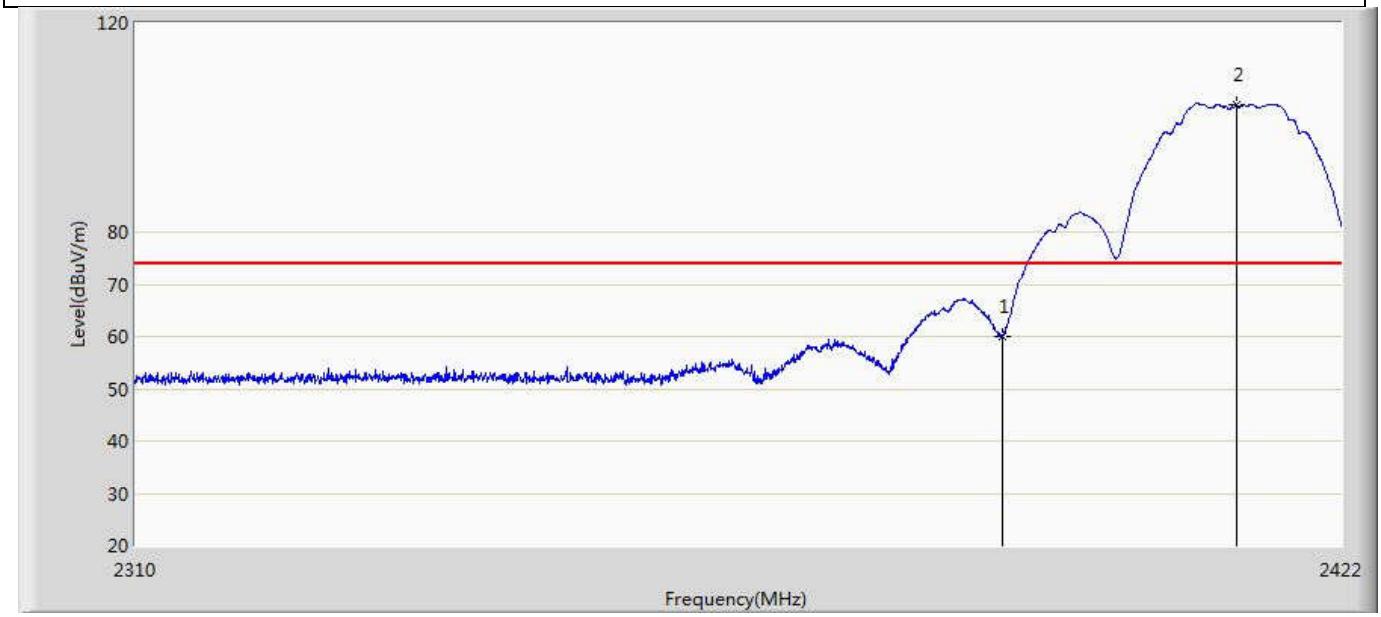
Above 1GHz Test Setup:



4.5.3 Test Procedure									
	References Rule							Chapter	Description
☒	ANSI C63.10							6.10	Band-edge testing
	☒	ANSI C63.10						6.10.5	Restricted-band band-edge measurements
	☐	ANSI C63.10						6.10.6	Marker-delta method
☒	ANSI C63.10							11.12	Emissions in restricted frequency bands
	☒	ANSI C63.10						11.12.1	Radiated emission measurements
	☒	ANSI C63.10						11.12.2.7	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

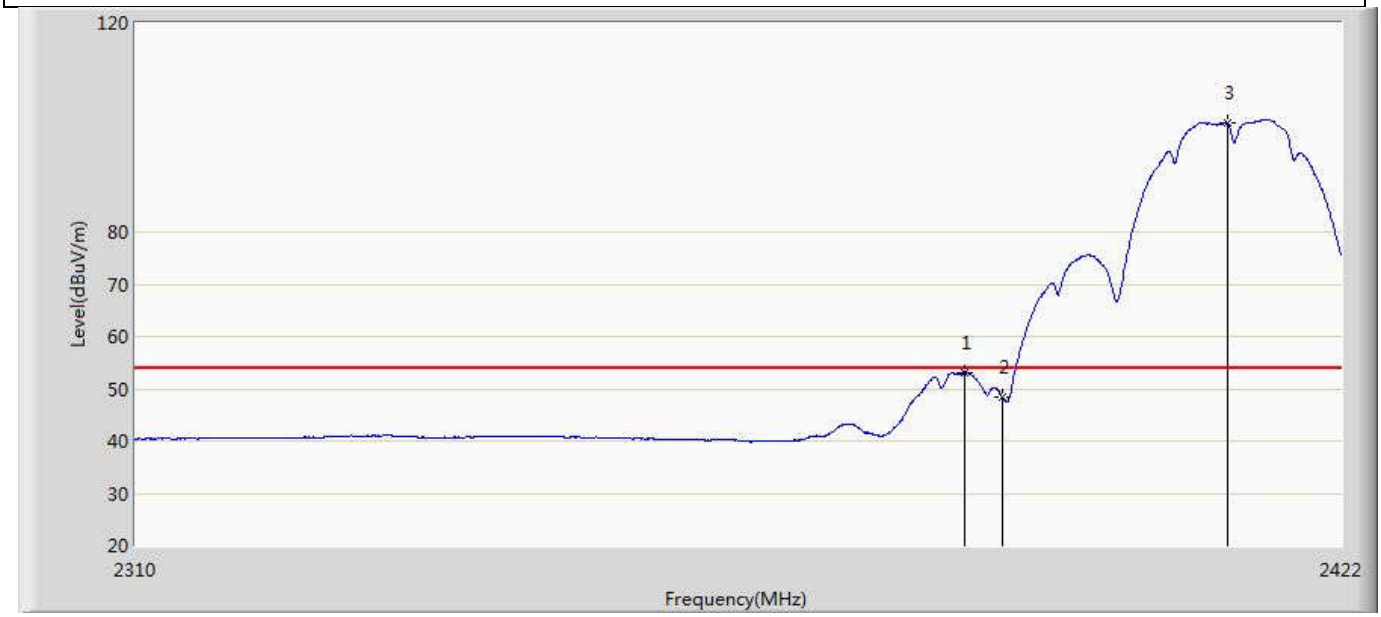
4.5.4 Test Data

Profile: 2040637R	Page No.: 1
Engineer: YULIU	
Site: AC5	Time: 2020/03/12 - 00:39
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2412MHz by 802.11b	



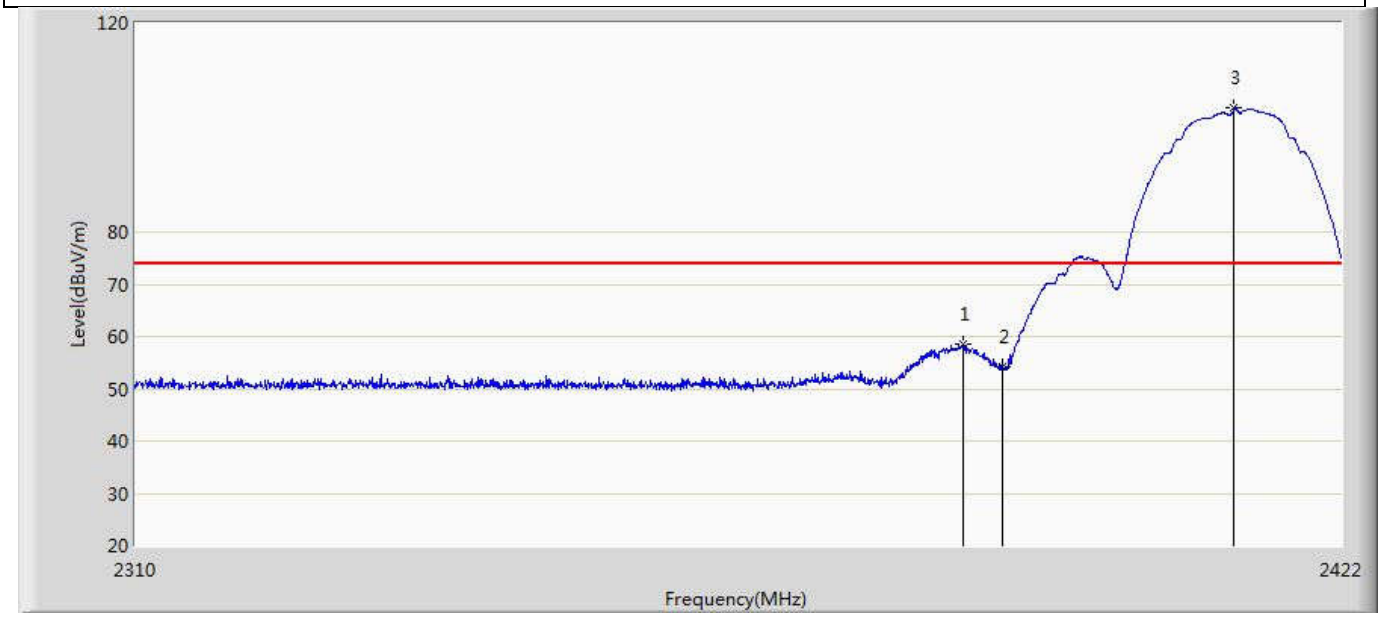
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	59.961	24.646	-14.039	74.000	35.315	PK
2	*	2412.088	104.416	69.108	N/A	N/A	35.308	PK

Profile: 2040637R	Page No.: 2
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 02:40
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2412MHz by 802.11b	



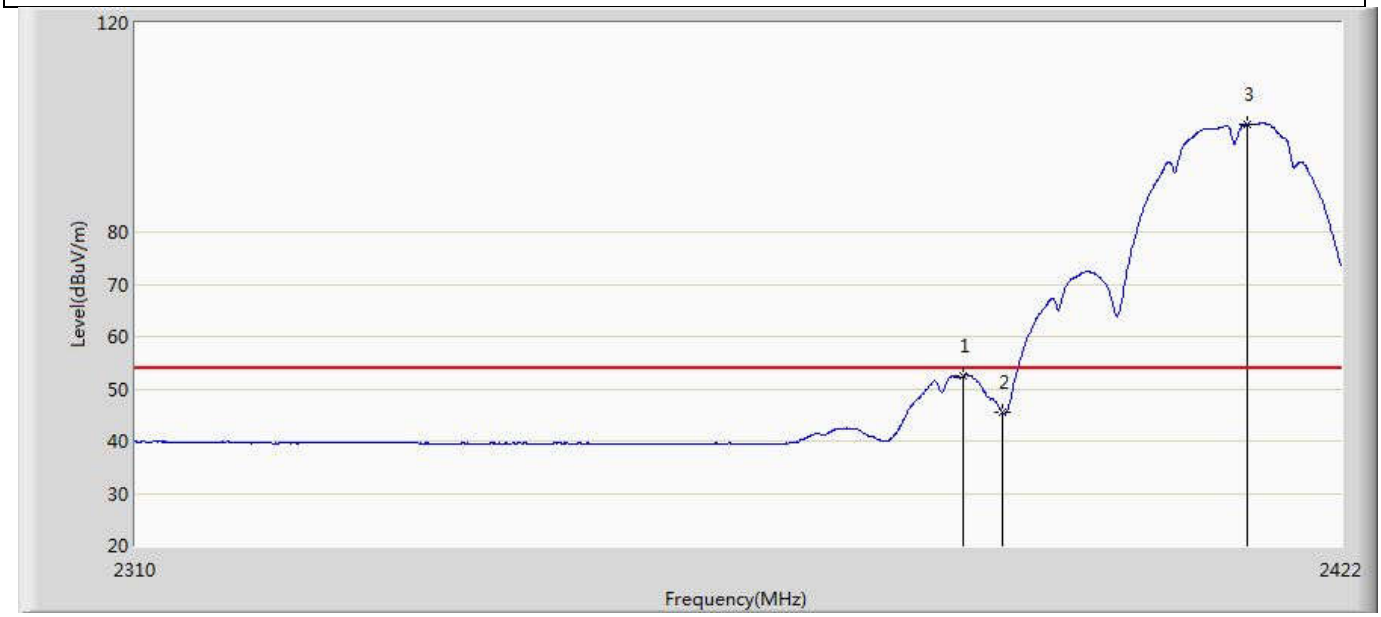
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2386.440	53.131	17.818	-0.869	54.000	35.313	AV
2		2390.000	48.440	13.125	-5.560	54.000	35.315	AV
3	*	2411.192	100.789	65.481	N/A	N/A	35.308	AV

Profile: 2040637R	Page No.: 3
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 02:46
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2412MHz by 802.11b	



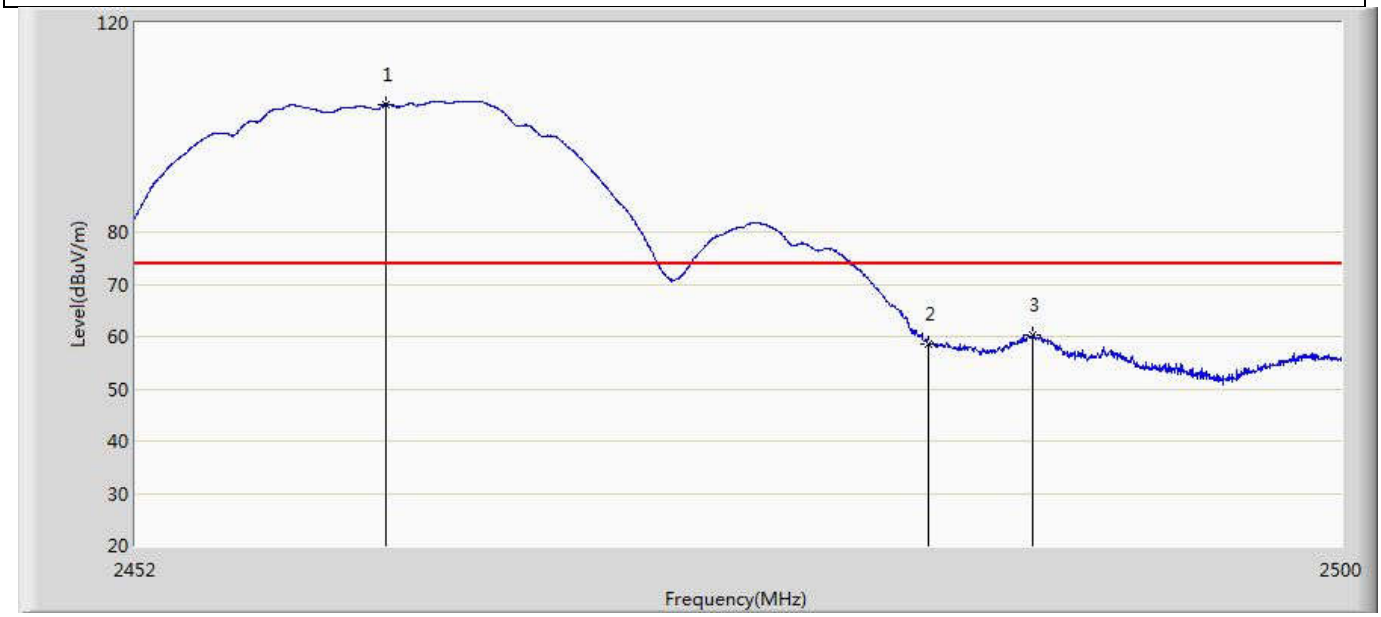
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2386.384	58.541	23.228	-15.459	74.000	35.313	PK
2		2390.000	54.238	18.923	-19.762	74.000	35.315	PK
3	*	2411.864	103.727	68.419	N/A	N/A	35.308	PK

Profile: 2040637R	Page No.: 4
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 02:48
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2412MHz by 802.11b	



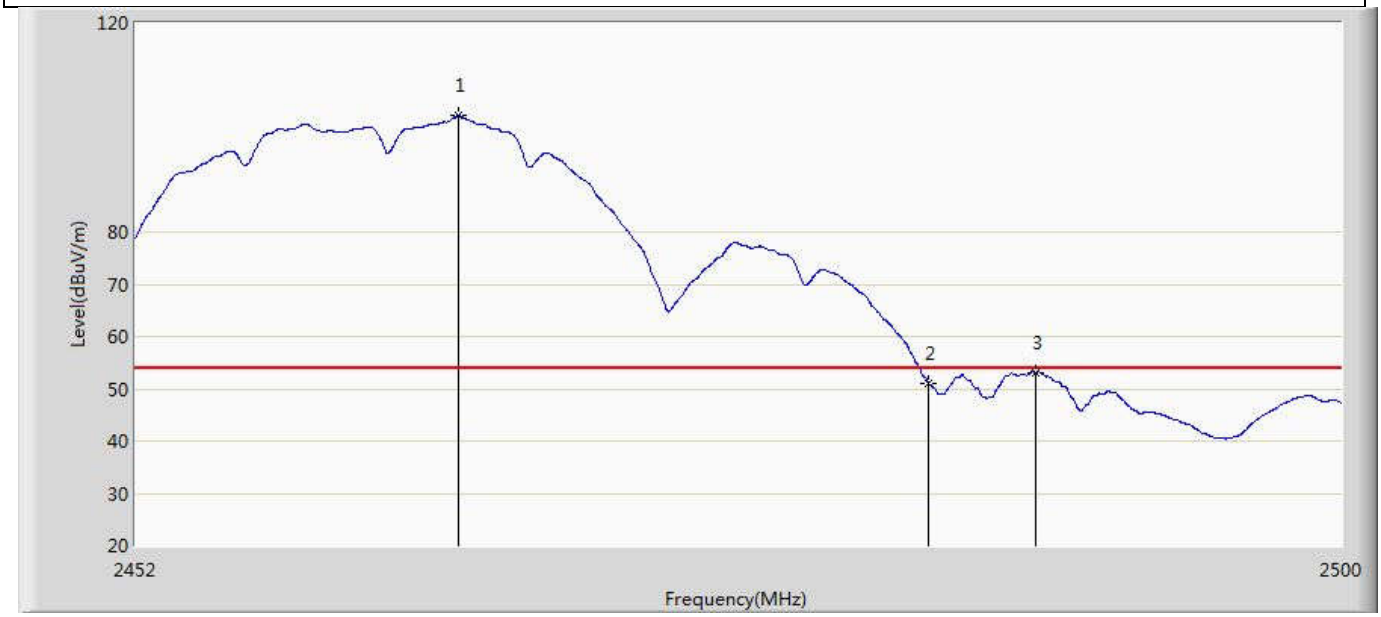
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2386.328	52.512	17.199	-1.488	54.000	35.313	AV
2		2390.000	45.365	10.050	-8.635	54.000	35.315	AV
3	*	2413.040	100.597	65.289	N/A	N/A	35.308	AV

Profile: 2040637R	Page No.: 5
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 02:51
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2462MHz by 802.11b	



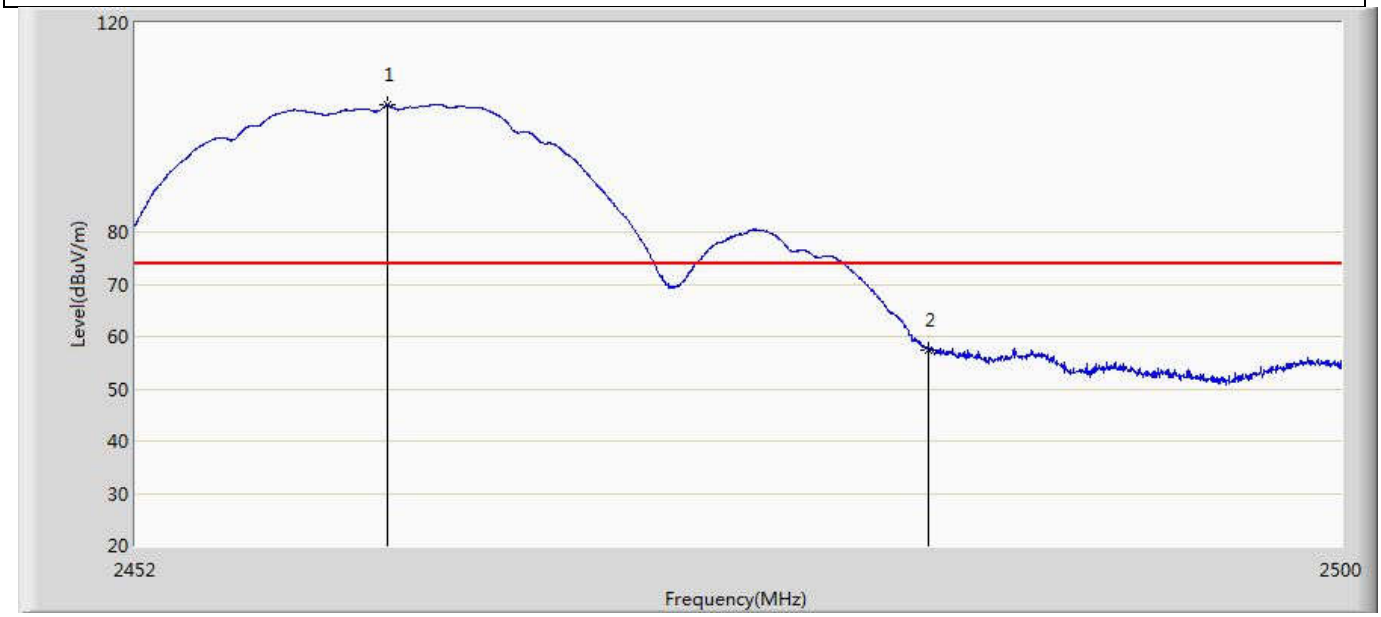
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2461.888	104.476	69.167	N/A	N/A	35.309	PK
2		2483.500	58.453	23.155	-15.547	74.000	35.297	PK
3		2487.664	60.280	24.984	-13.720	74.000	35.296	PK

Profile: 2040637R	Page No.: 6
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 02:55
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2462MHz by 802.11b	



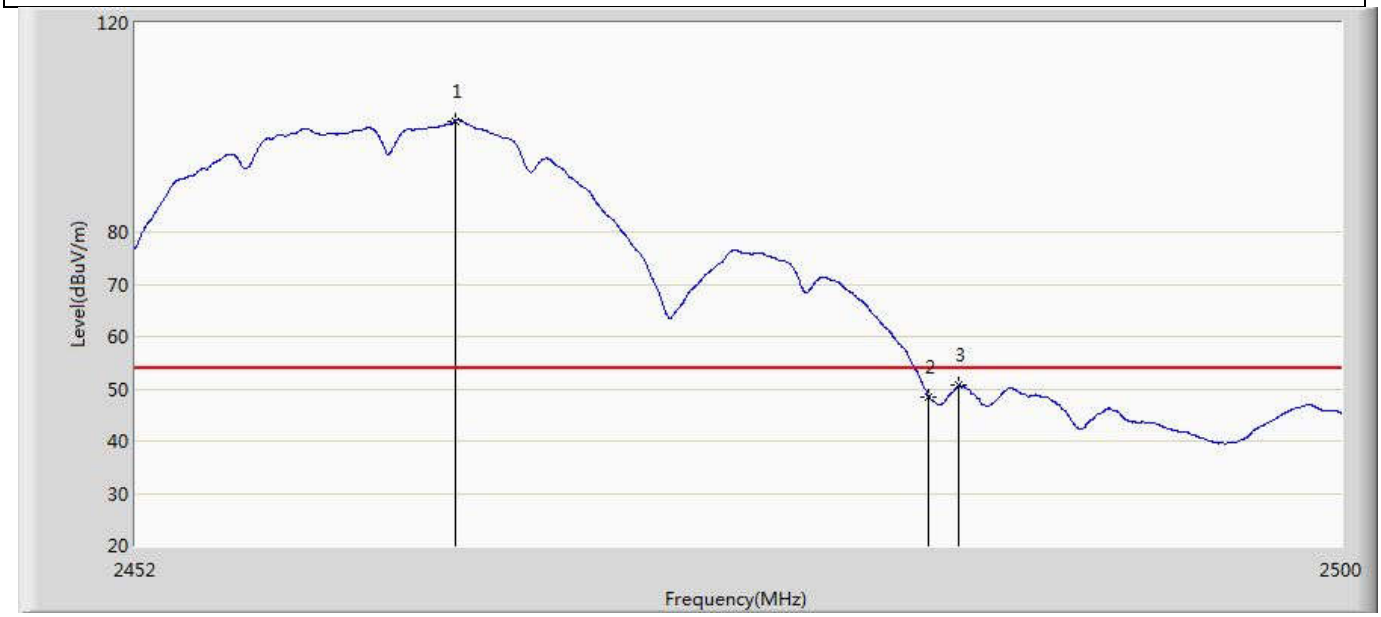
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2464.792	102.188	66.881	N/A	N/A	35.307	AV
2		2483.500	50.929	15.631	-3.071	54.000	35.297	AV
3		2487.784	53.158	17.862	-0.842	54.000	35.296	AV

Profile: 2040637R	Page No.: 7
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 02:57
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2462MHz by 802.11b	



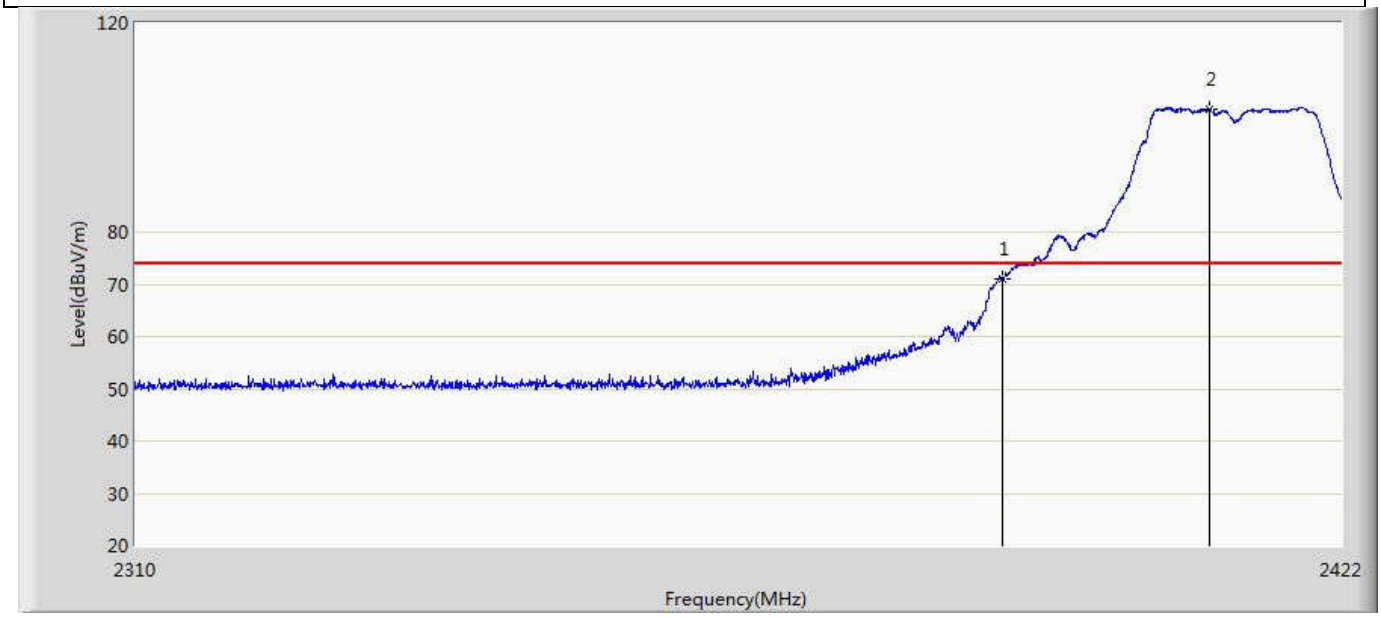
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2461.984	104.329	69.020	N/A	N/A	35.309	PK
2		2483.500	57.500	22.202	-16.500	74.000	35.297	PK

Profile: 2040637R	Page No.: 8
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 02:59
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2462MHz by 802.11b	



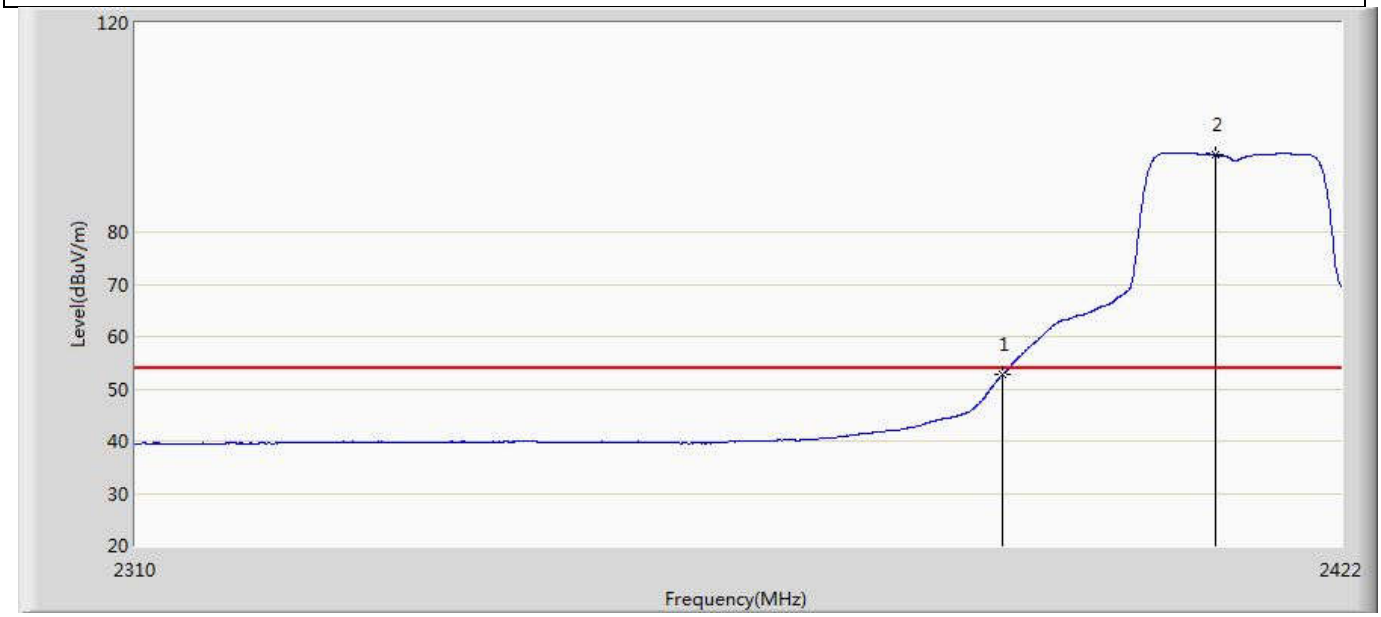
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2464.648	101.264	65.957	N/A	N/A	35.307	AV
2		2483.500	48.409	13.111	-5.591	54.000	35.297	AV
3		2484.688	50.634	15.337	-3.366	54.000	35.297	AV

Profile: 2040637R	Page No.: 9
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 03:01
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2412MHz by 802.11g	



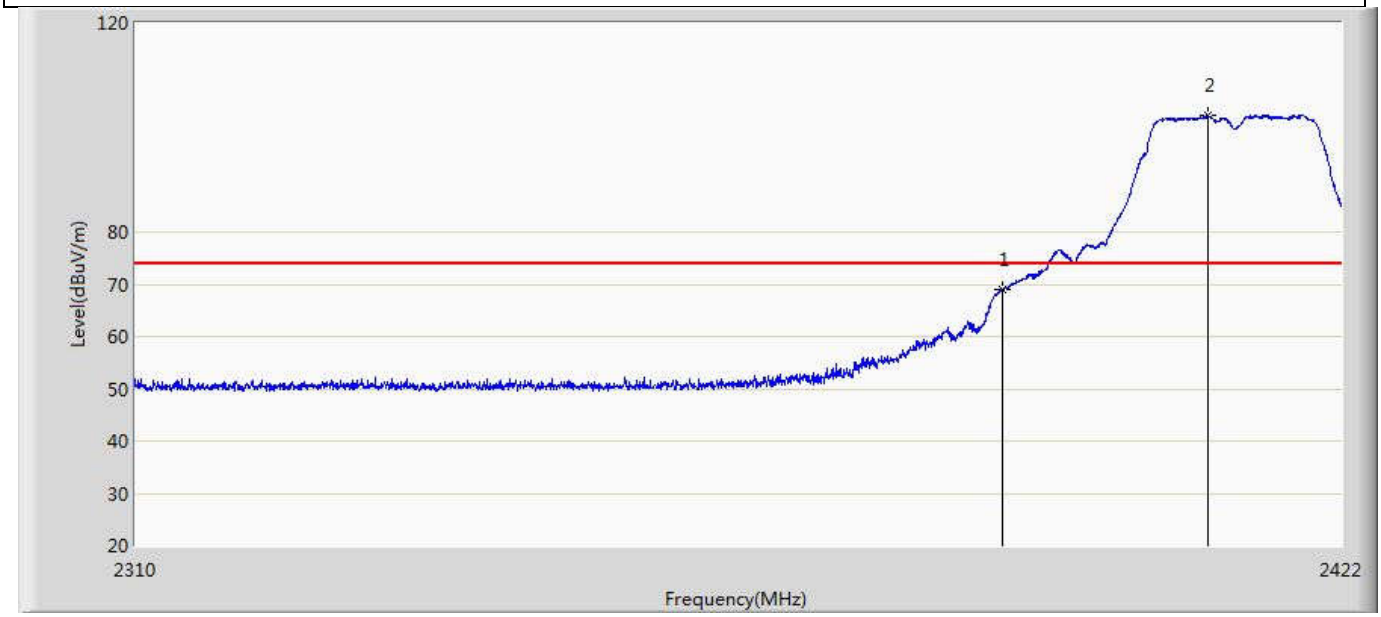
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	71.073	35.758	-2.927	74.000	35.315	PK
2	*	2409.568	103.508	68.199	N/A	N/A	35.309	PK

Profile: 2040637R	Page No.: 10
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 03:06
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2412MHz by 802.11g	



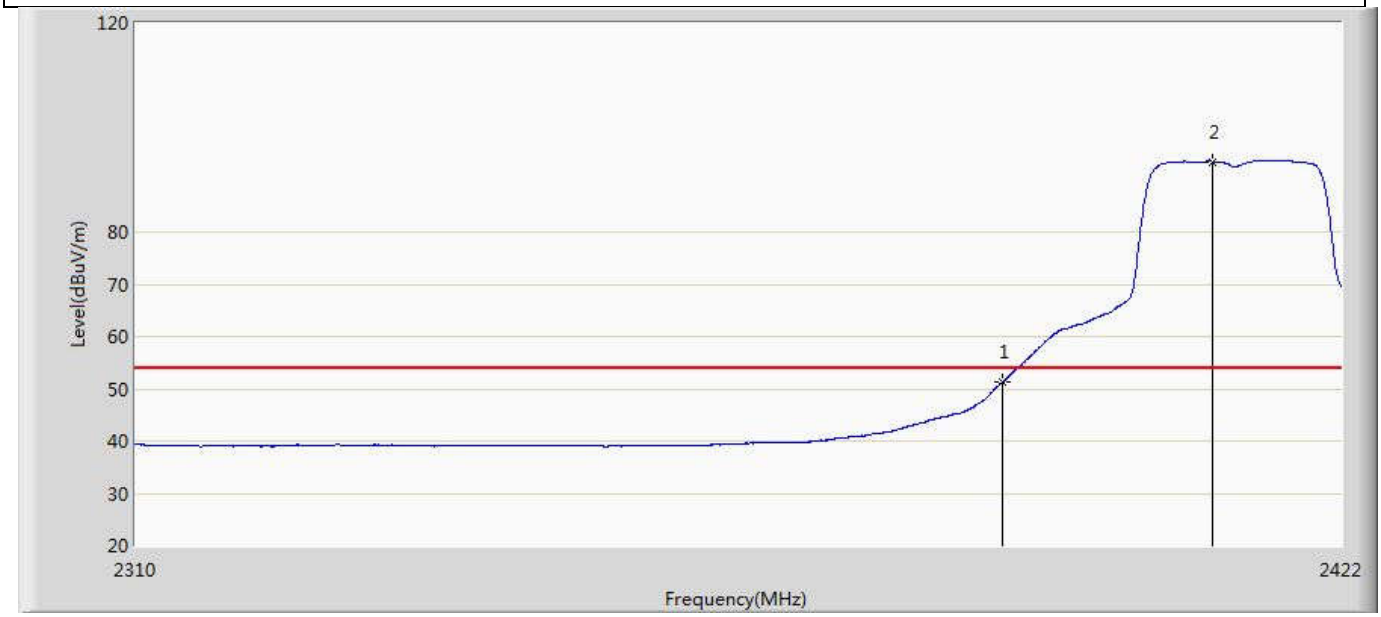
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	52.643	17.328	-1.357	54.000	35.315	AV
2	*	2410.128	94.695	59.386	N/A	N/A	35.308	AV

Profile: 2040637R	Page No.: 11
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 03:14
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2412MHz by 802.11g	



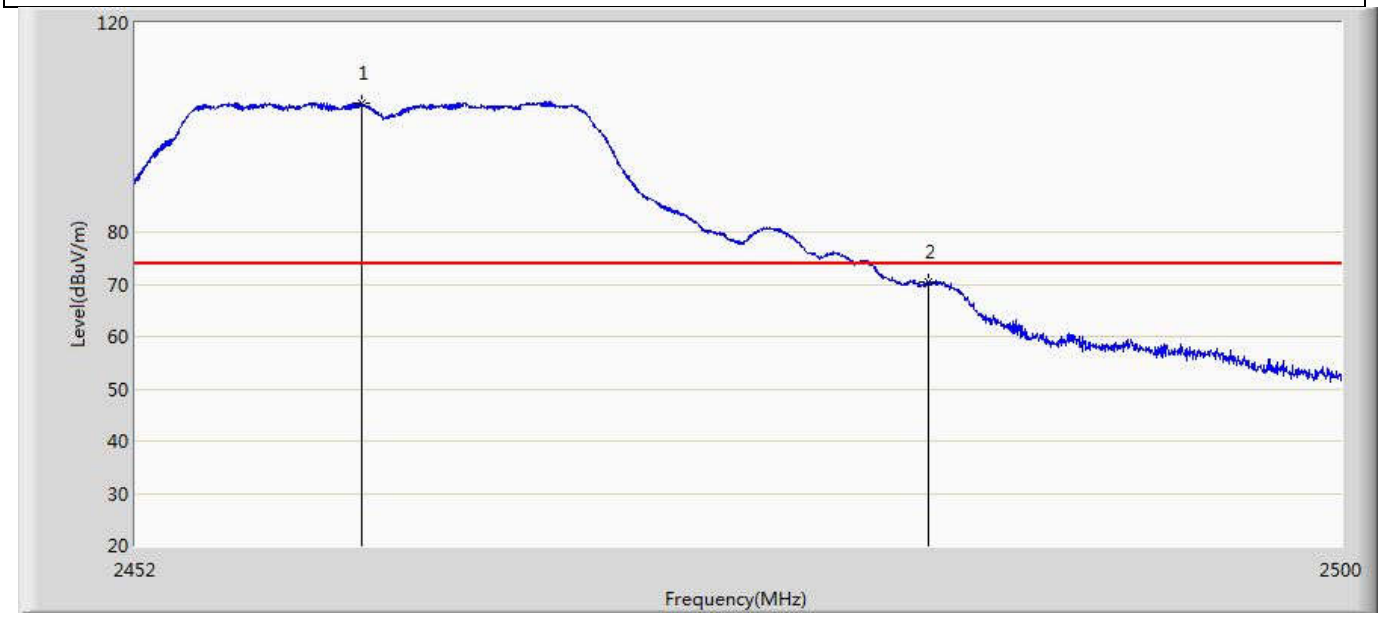
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	68.989	33.674	-5.011	74.000	35.315	PK
2	*	2409.400	102.191	66.882	N/A	N/A	35.309	PK

Profile: 2040637R	Page No.: 12
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 03:16
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2412MHz by 802.11g	



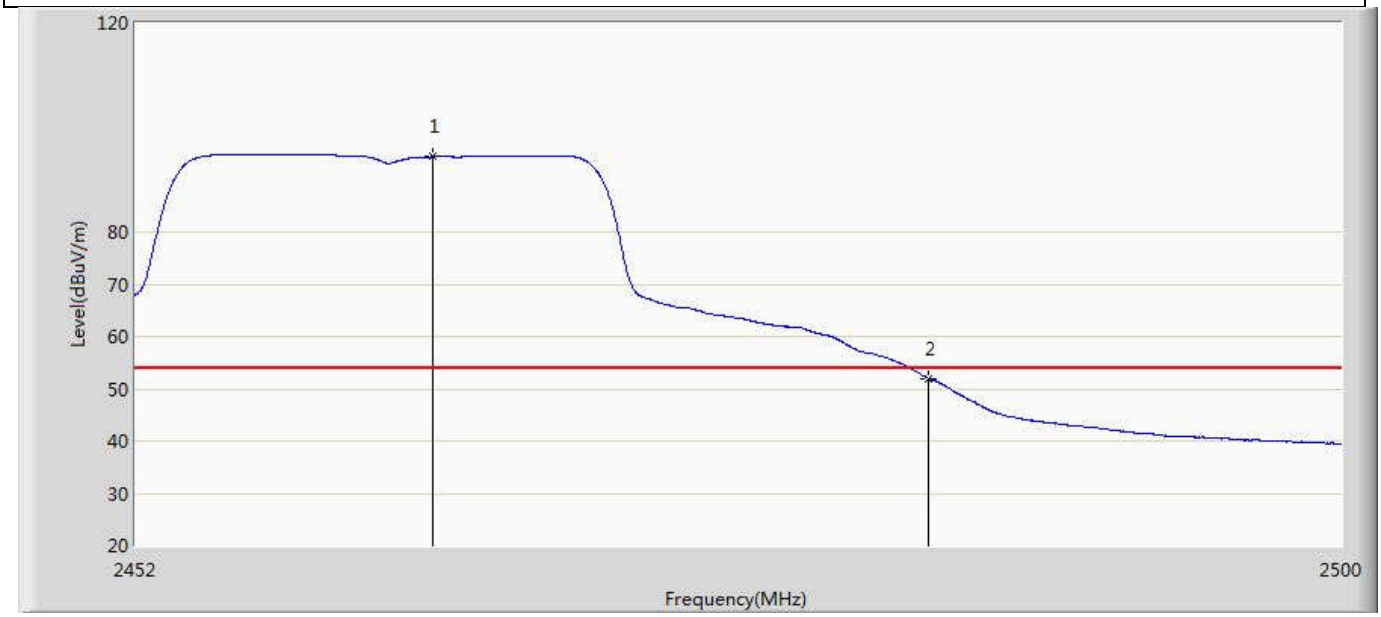
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	51.220	15.905	-2.780	54.000	35.315	AV
2	*	2409.792	93.466	58.157	N/A	N/A	35.308	AV

Profile: 2040637R	Page No.: 13
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 03:18
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2462MHz by 802.11g	



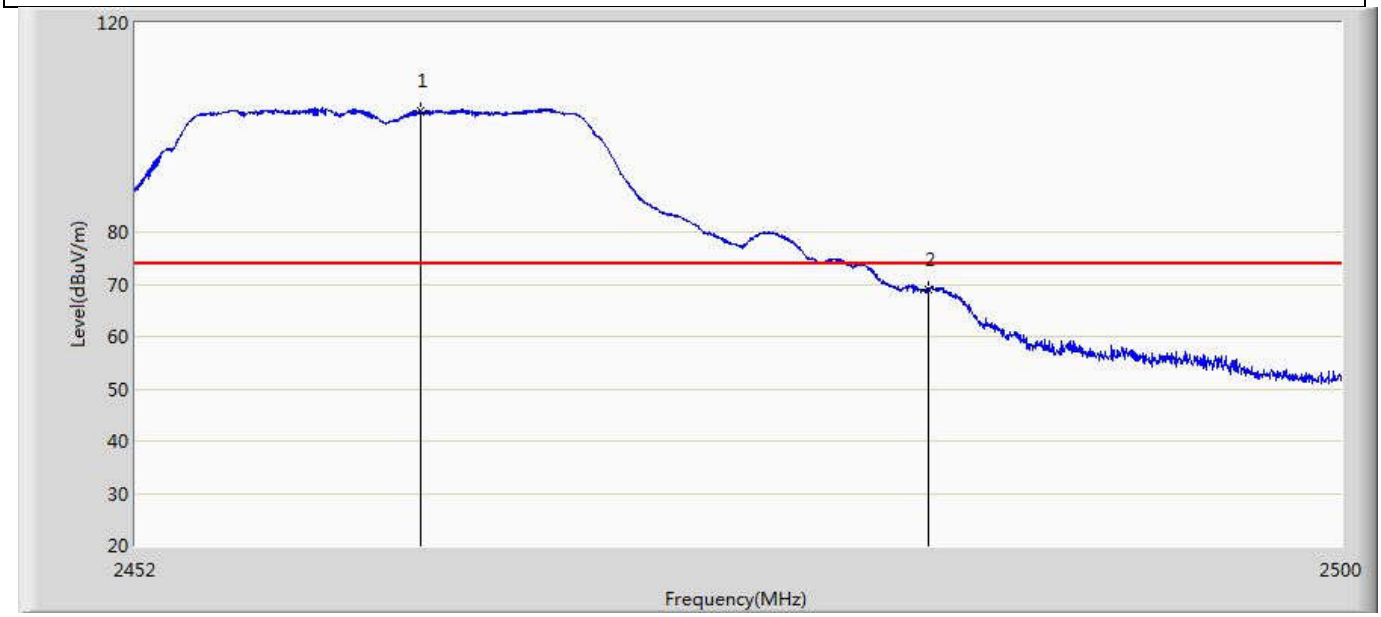
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2460.952	104.653	69.344	N/A	N/A	35.309	PK
2		2483.500	70.436	35.138	-3.564	74.000	35.297	PK

Profile: 2040637R	Page No.: 14
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 03:21
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2462MHz by 802.11g	



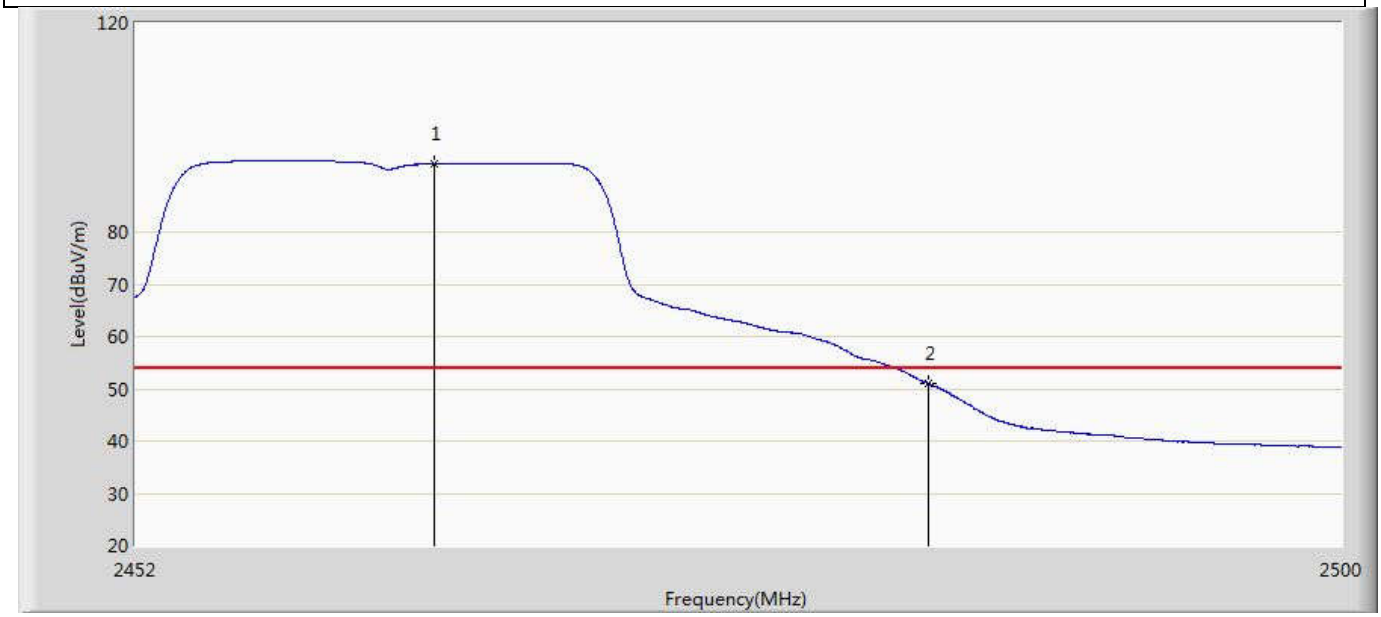
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2463.760	94.394	59.086	N/A	N/A	35.307	AV
2		2483.500	51.936	16.638	-2.064	54.000	35.297	AV

Profile: 2040637R	Page No.: 15
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 03:35
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2462MHz by 802.11g	



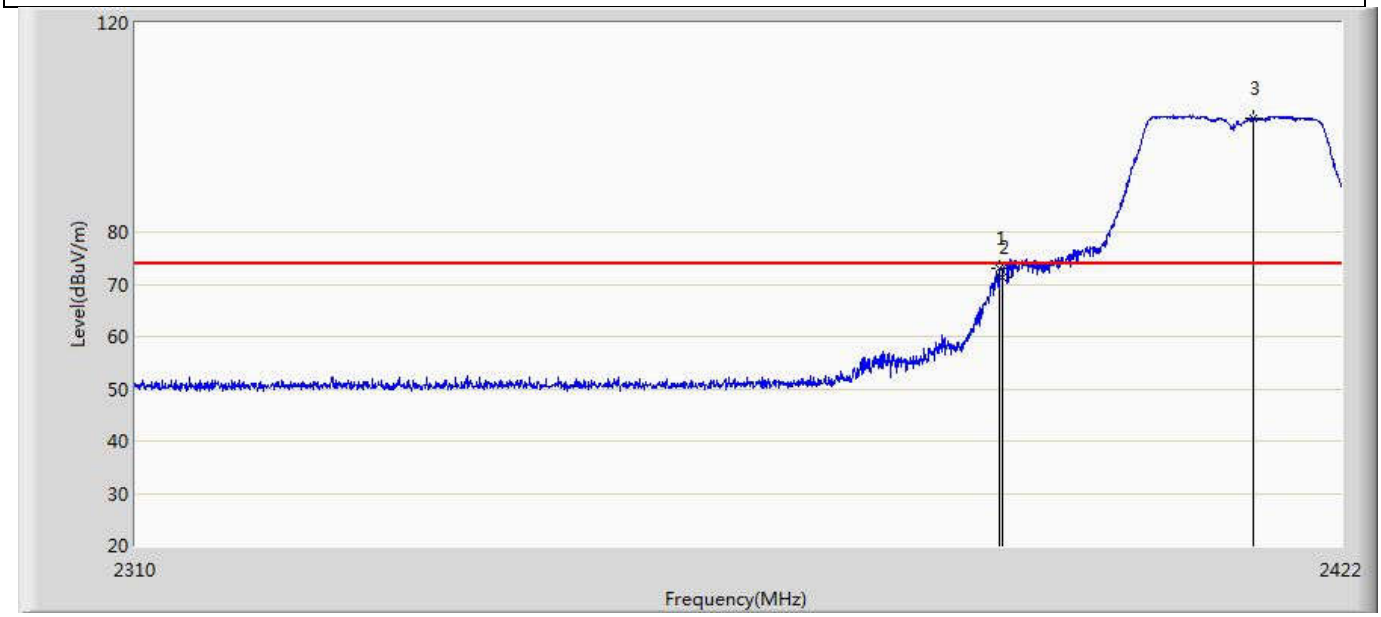
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2463.304	103.120	67.812	N/A	N/A	35.307	PK
2		2483.500	68.878	33.580	-5.122	74.000	35.297	PK

Profile: 2040637R	Page No.: 16
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 03:37
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2462MHz by 802.11g	



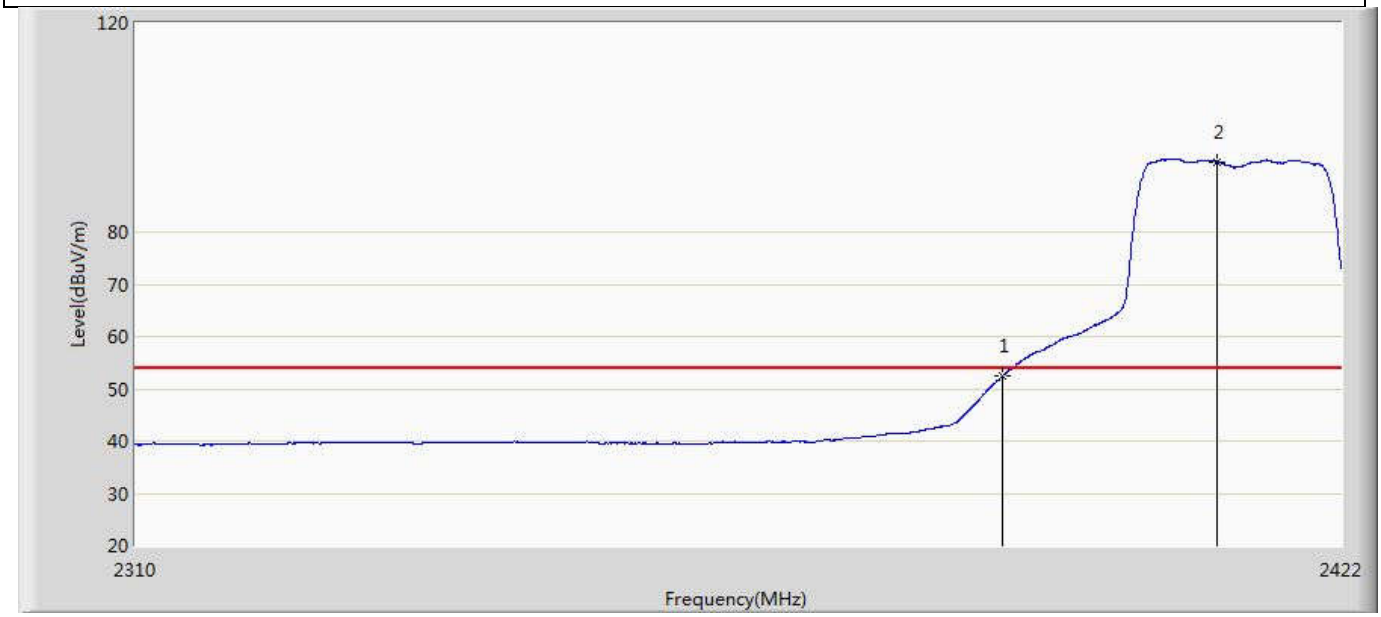
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2463.832	93.144	57.836	N/A	N/A	35.307	AV
2		2483.500	50.886	15.588	-3.114	54.000	35.297	AV

Profile: 2040637R	Page No.: 17
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 03:39
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2412MHz by 802.11n(20MHz)	



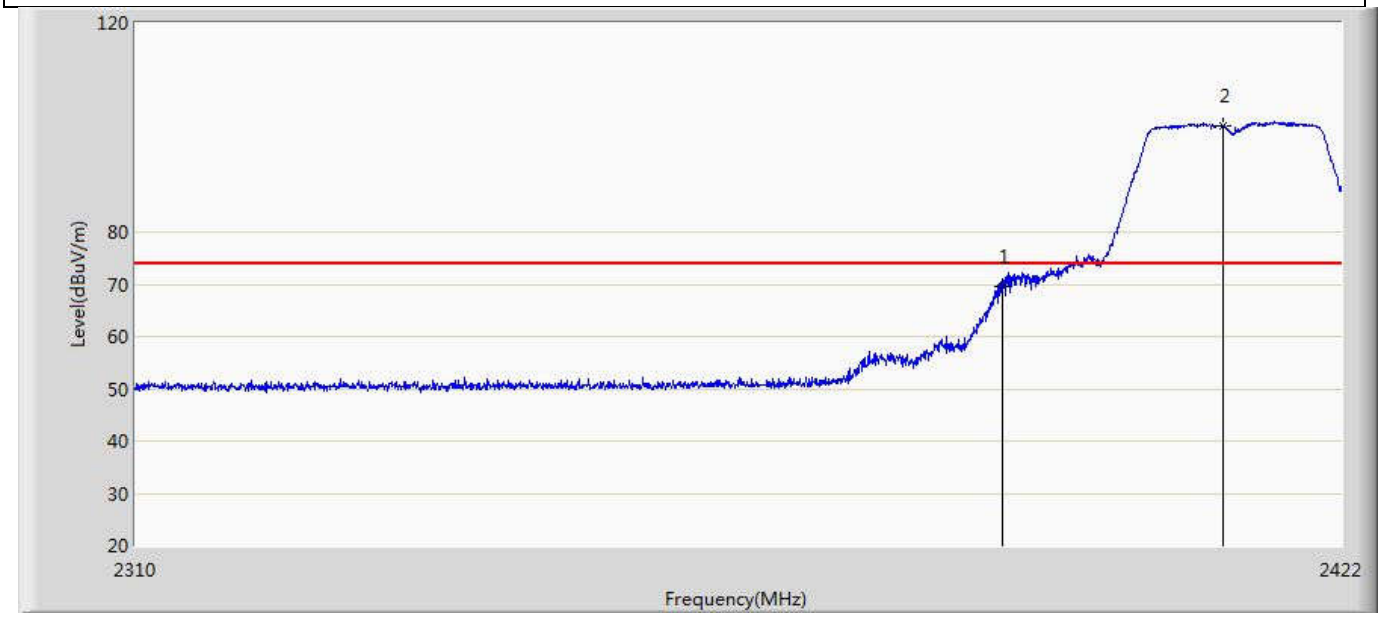
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2389.800	73.007	37.692	-0.993	74.000	35.315	PK
2		2390.000	71.286	35.971	-2.714	74.000	35.315	PK
3	*	2413.656	101.864	66.556	N/A	N/A	35.308	PK

Profile: 2040637R	Page No.: 18
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 03:42
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2412MHz by 802.11n(20MHz)	



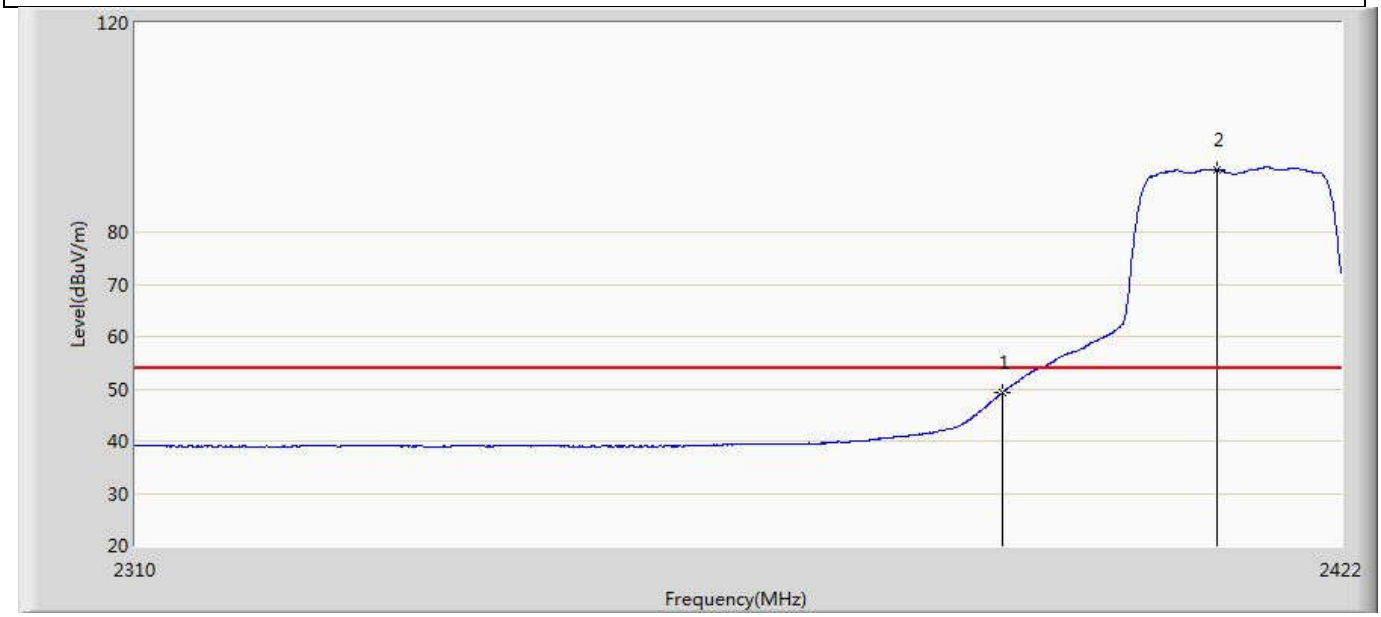
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	52.439	17.124	-1.561	54.000	35.315	AV
2	*	2410.296	93.461	58.152	N/A	N/A	35.308	AV

Profile: 2040637R	Page No.: 19
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 03:57
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2412MHz by 802.11n(20MHz)	



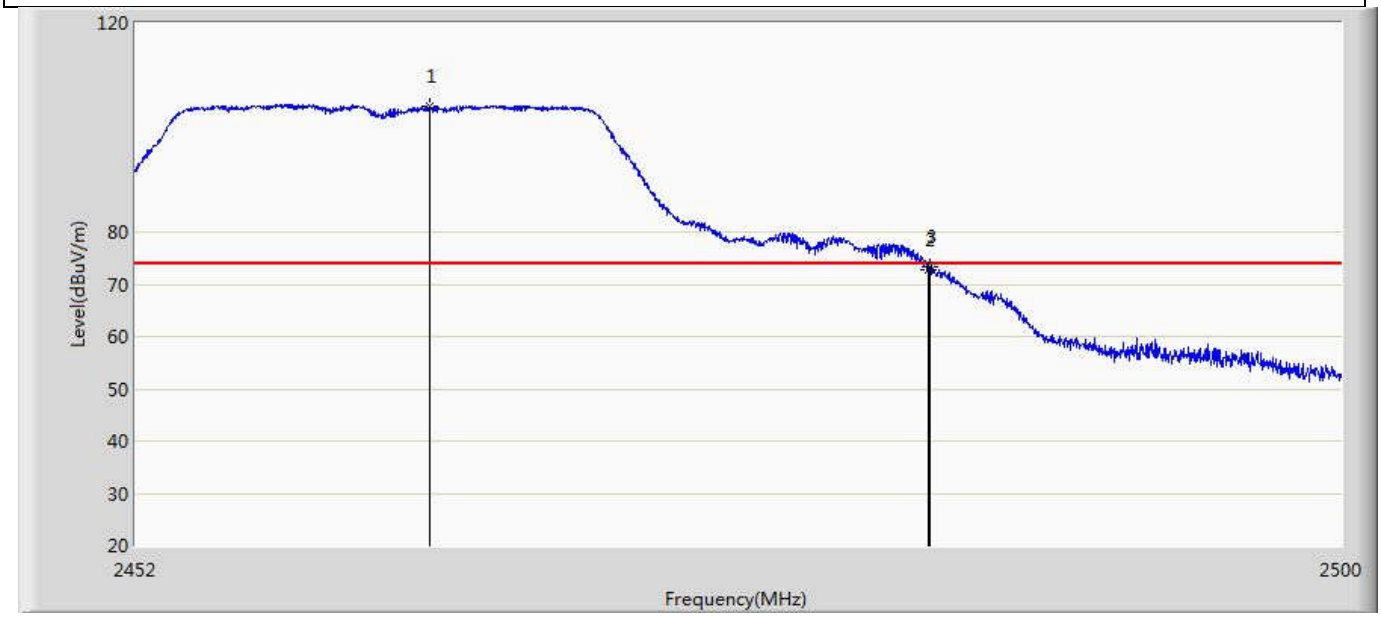
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	69.425	34.110	-4.575	74.000	35.315	PK
2	*	2410.856	100.309	65.001	N/A	N/A	35.308	PK

Profile: 2040637R	Page No.: 20
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 03:59
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2412MHz by 802.11n(20MHz)	



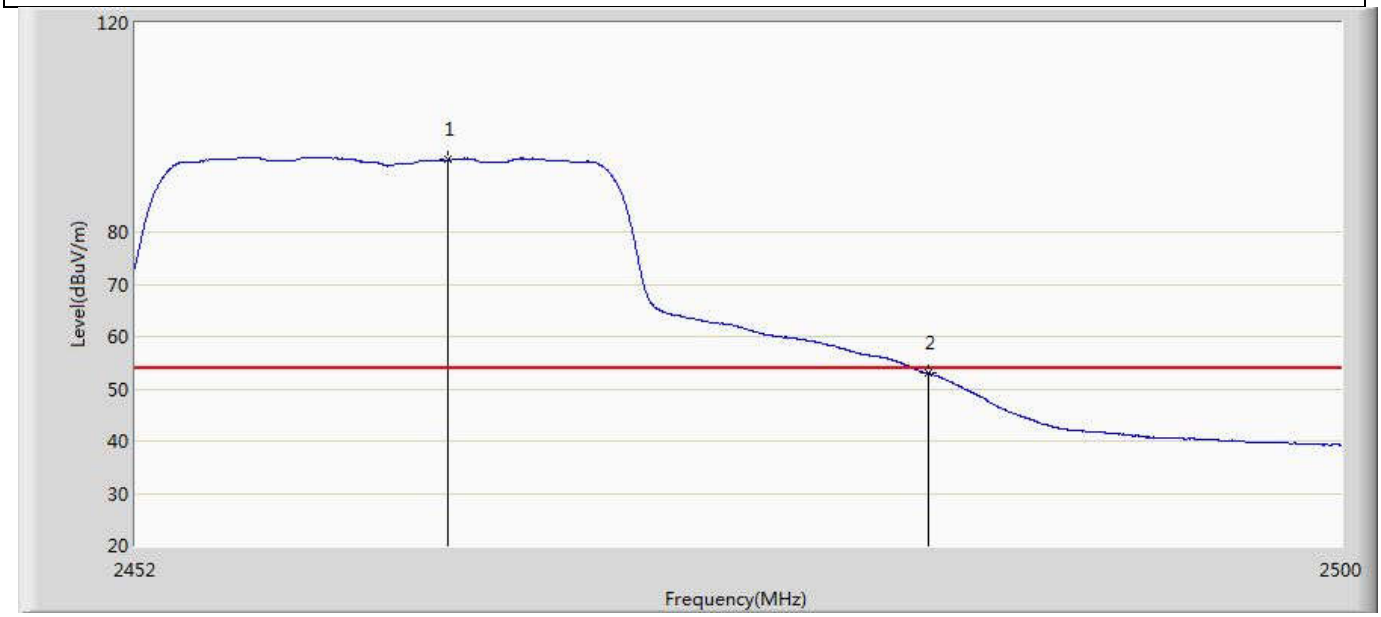
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	49.222	13.907	-4.778	54.000	35.315	AV
2	*	2410.296	91.897	56.588	N/A	N/A	35.308	AV

Profile: 2040637R	Page No.: 21
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 04:01
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2462MHz by 802.11n(20MHz)	



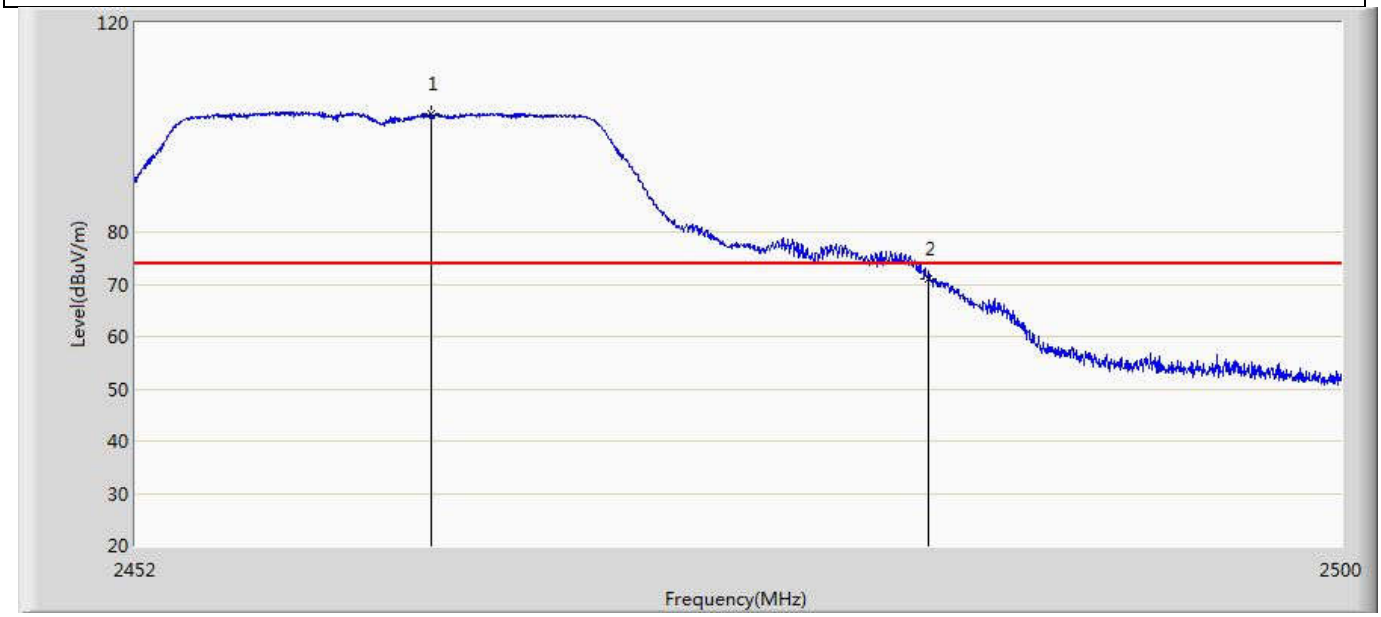
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2463.640	104.065	68.757	N/A	N/A	35.307	PK
2		2483.500	72.789	37.491	-1.211	74.000	35.297	PK
3		2483.560	73.369	38.071	-0.631	74.000	35.297	PK

Profile: 2040637R	Page No.: 22
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 04:06
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2462MHz by 802.11n(20MHz)	



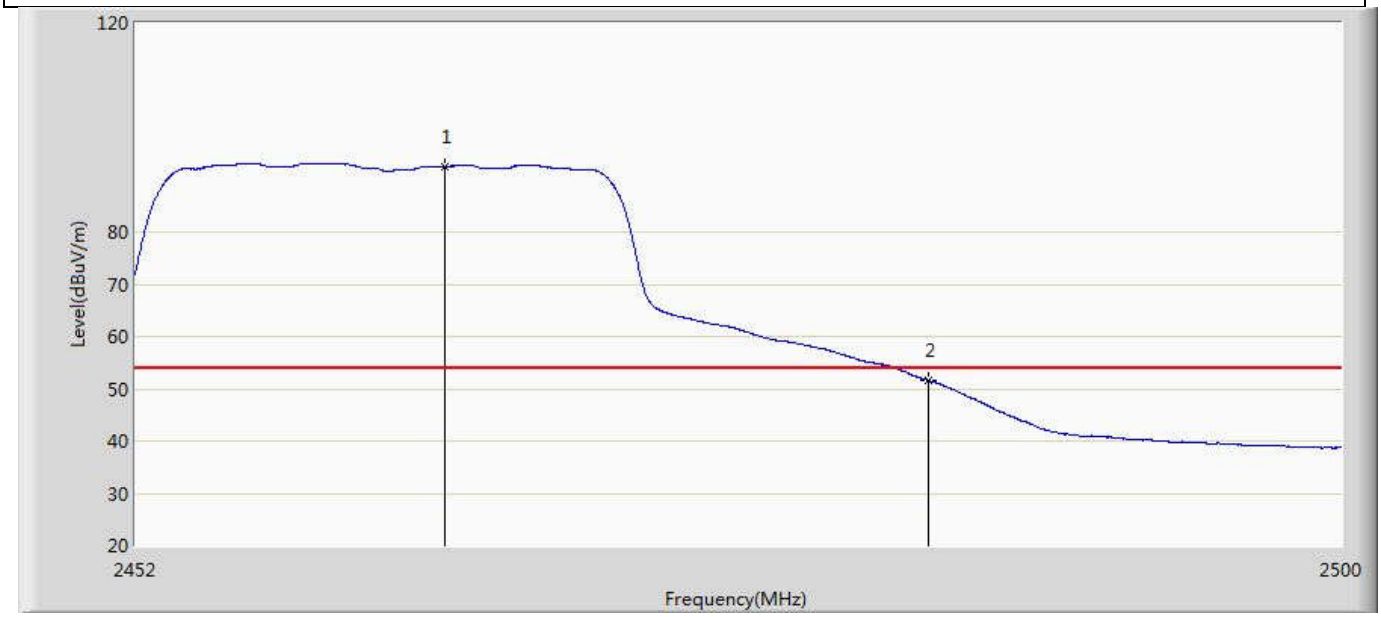
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2464.384	93.770	58.463	N/A	N/A	35.307	AV
2		2483.500	52.914	17.616	-1.086	54.000	35.297	AV

Profile: 2040637R	Page No.: 23
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 04:07
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2462MHz by 802.11n(20MHz)	



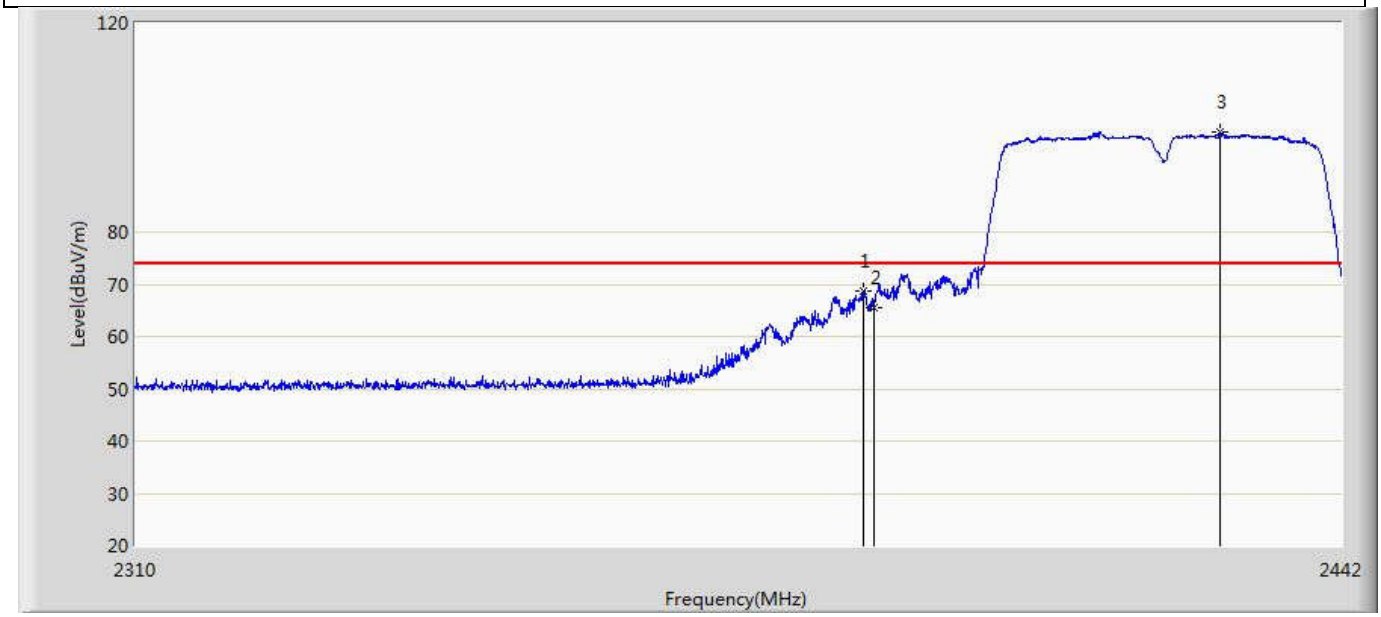
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2463.712	102.556	67.248	N/A	N/A	35.307	PK
2		2483.500	71.024	35.726	-2.976	74.000	35.297	PK

Profile: 2040637R	Page No.: 24
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 04:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2462MHz by 802.11n(20MHz)	



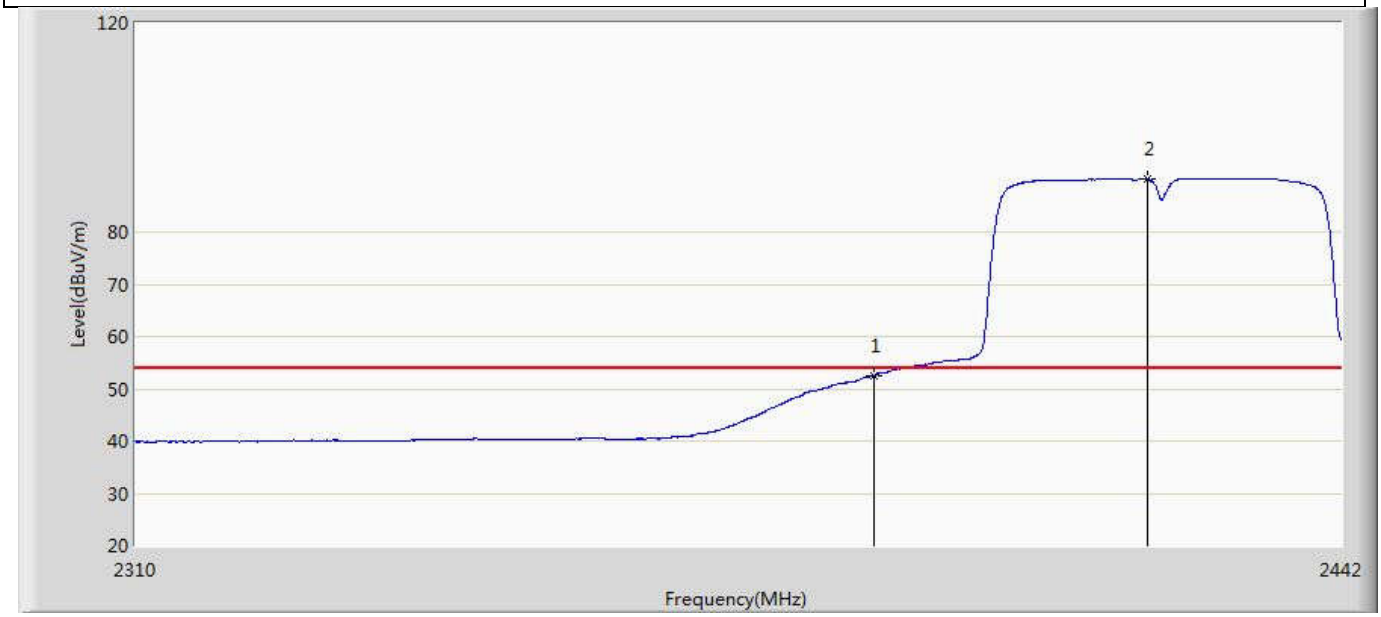
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2464.264	92.526	57.219	N/A	N/A	35.307	AV
2		2483.500	51.544	16.246	-2.456	54.000	35.297	AV

Profile: 2040637R	Page No.: 25
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 04:11
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2422MHz by 802.11n(40MHz)	



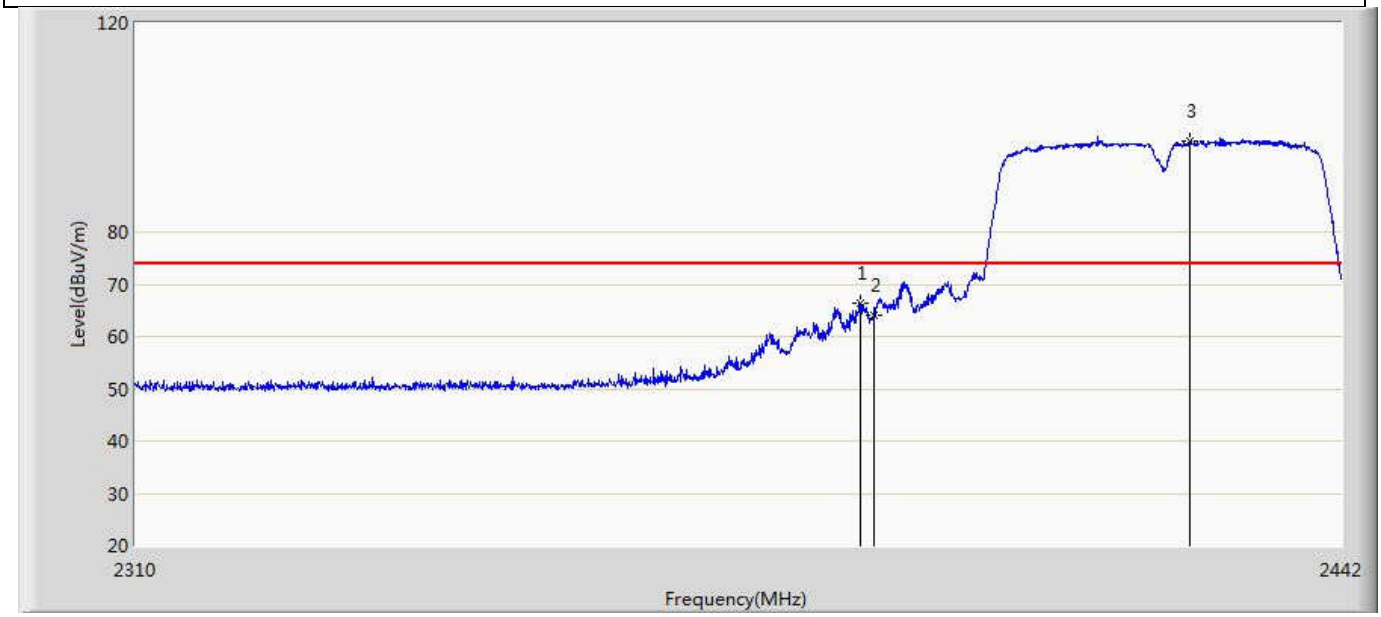
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2388.870	68.649	33.335	-5.351	74.000	35.314	PK
2		2390.000	65.494	30.179	-8.506	74.000	35.315	PK
3	*	2428.470	99.058	63.754	N/A	N/A	35.304	PK

Profile: 2040637R	Page No.: 26
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 04:14
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2422MHz by 802.11n(40MHz)	



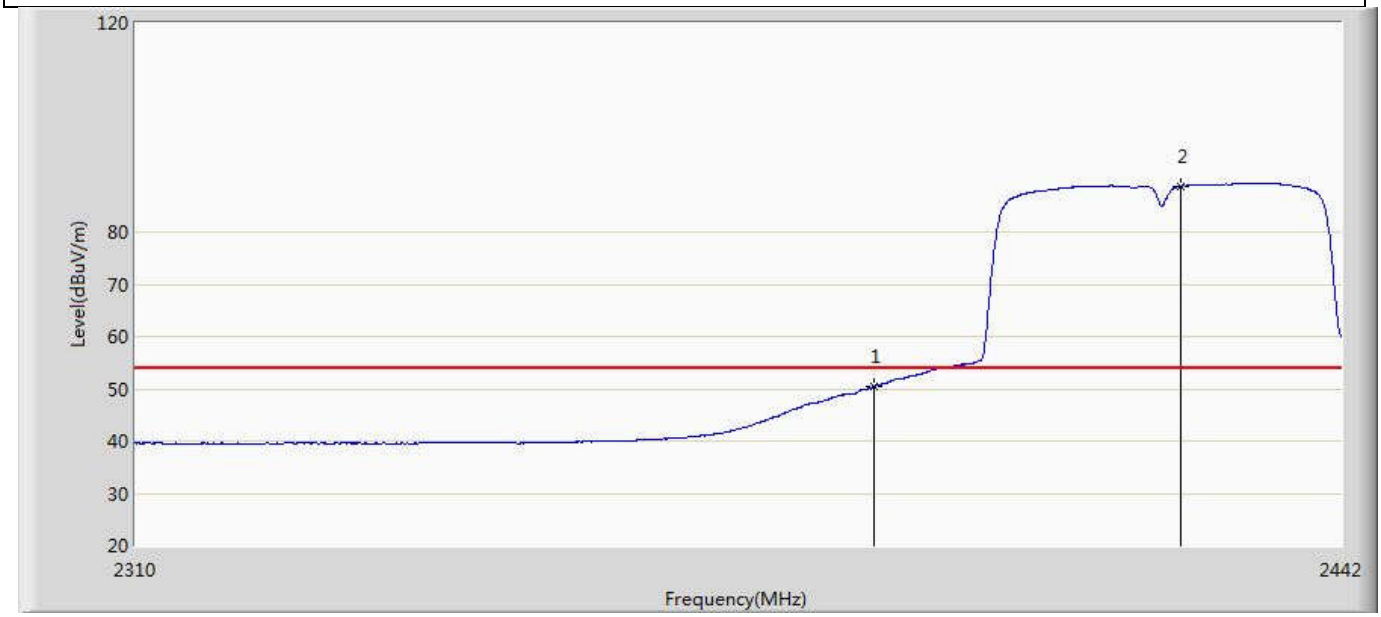
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	52.567	17.252	-1.433	54.000	35.315	AV
2	*	2420.352	90.034	54.728	N/A	N/A	35.306	AV

Profile: 2040637R	Page No.: 27
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 04:20
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2422MHz by 802.11n(40MHz)	



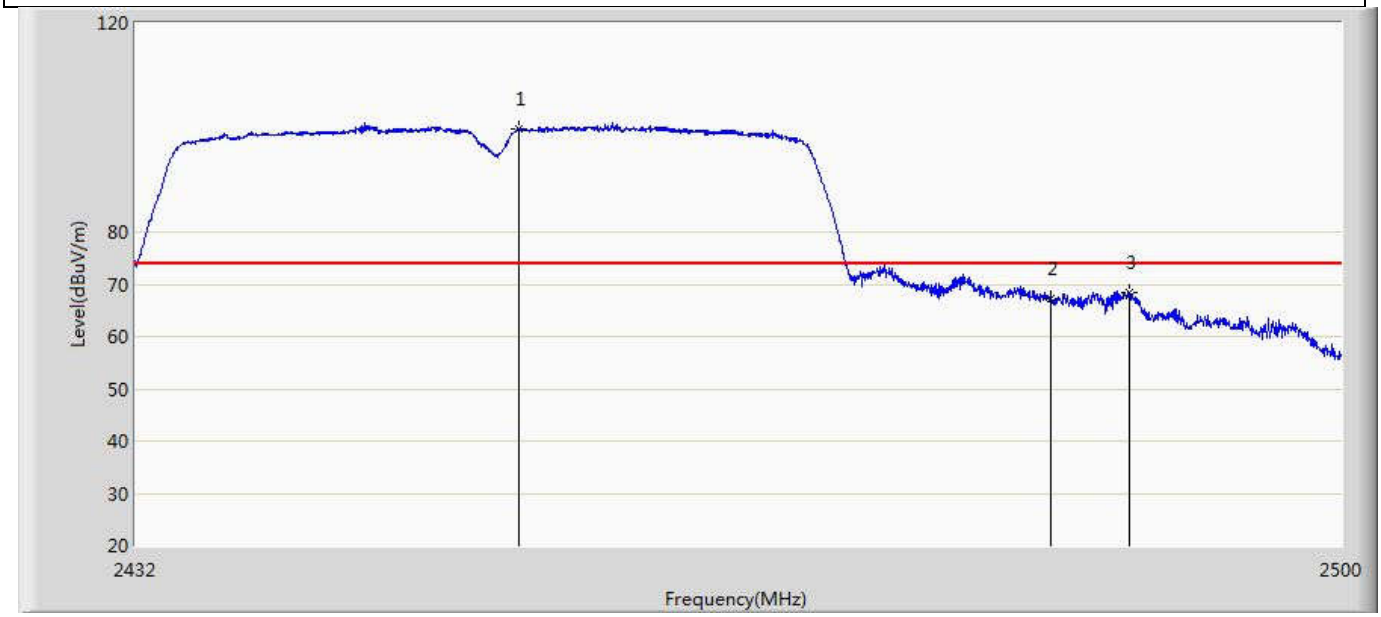
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2388.540	66.436	31.122	-7.564	74.000	35.314	PK
2		2390.000	63.922	28.607	-10.078	74.000	35.315	PK
3	*	2425.104	97.260	61.956	N/A	N/A	35.304	PK

Profile: 2040637R	Page No.: 28
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 04:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2422MHz by 802.11n(40MHz)	



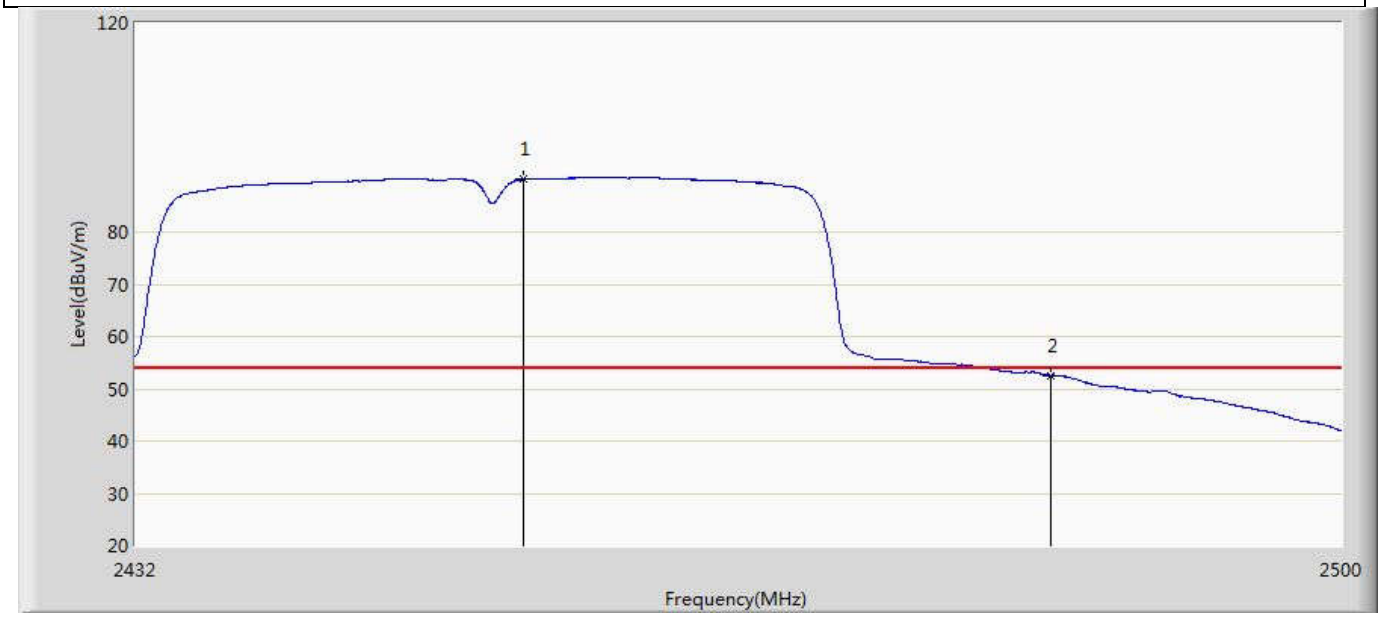
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	50.314	14.999	-3.686	54.000	35.315	AV
2	*	2424.048	88.830	53.525	N/A	N/A	35.305	AV

Profile: 2040637R	Page No.: 29
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 04:25
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2452MHz by 802.11n(40MHz)	



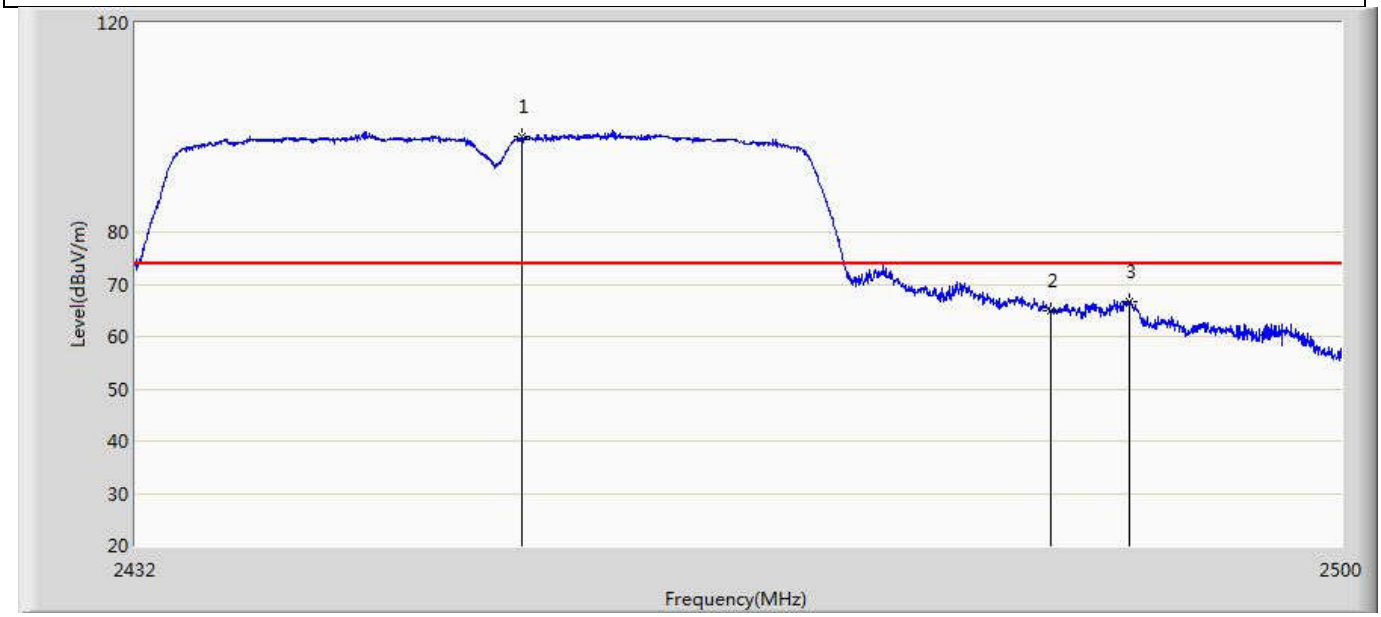
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2453.454	99.683	64.371	N/A	N/A	35.312	PK
2		2483.500	67.205	31.907	-6.795	74.000	35.297	PK
3		2487.930	68.341	33.045	-5.659	74.000	35.296	PK

Profile: 2040637R	Page No.: 30
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 04:28
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2452MHz by 802.11n(40MHz)	



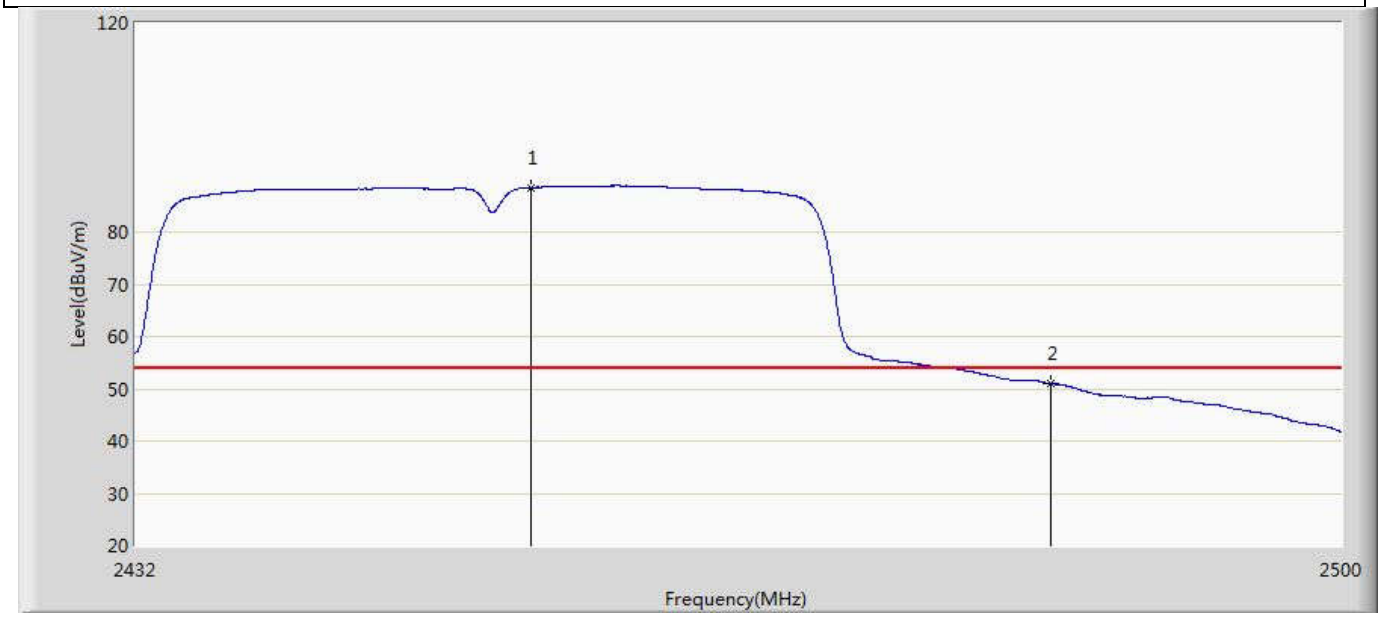
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2453.692	90.033	54.722	N/A	N/A	35.311	AV
2		2483.500	52.590	17.292	-1.410	54.000	35.297	AV

Profile: 2040637R	Page No.: 31
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 04:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2452MHz by 802.11n(40MHz)	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2453.624	98.140	62.829	N/A	N/A	35.311	PK
2		2483.500	64.901	29.603	-9.099	74.000	35.297	PK
3		2487.964	66.789	31.493	-7.211	74.000	35.296	PK

Profile: 2040637R	Page No.: 32
Engineer: YULIU	
Site: AC5	Time: 2020/04/29 - 04:37
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: TUNABLE WHITE DIRECT CONNECT SMART BULB	Power: AC 120V/60Hz
Note: Mode 4:Transmit at 2452MHz by 802.11n(40MHz)	



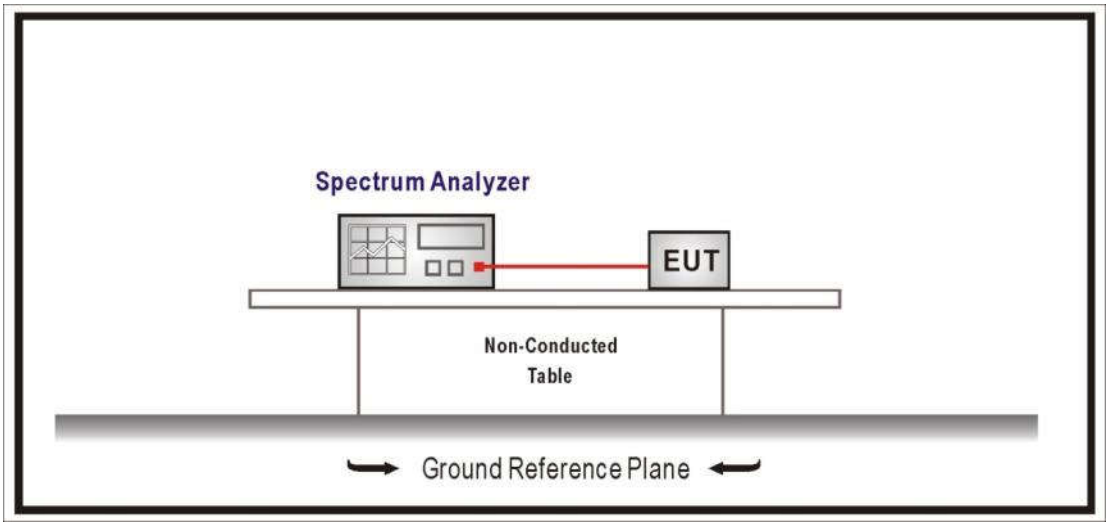
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2454.100	88.483	53.172	N/A	N/A	35.311	AV
2		2483.500	50.964	15.666	-3.036	54.000	35.297	AV

Remark	1. " * ", means this data is the worst emission level. 2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp). 3. The complete raw data please refer to Appendix RSE, Shown in the report is the worst data.

4.6 DTS Bandwidth	VERDICT: PASS

4.6.1 Limit	
Standard	FCC Part 15 Subpart C Paragraph 15.247 (a)(2)
Systems using digital modulation techniques operate in the2400-2483.5 MHz .The minimum 6 dB bandwidth shall be at least 500 kHz	

4.6.2 Test Setup



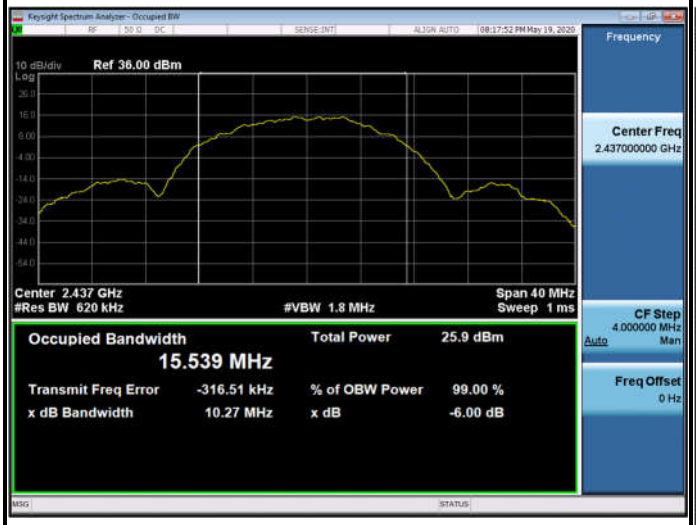
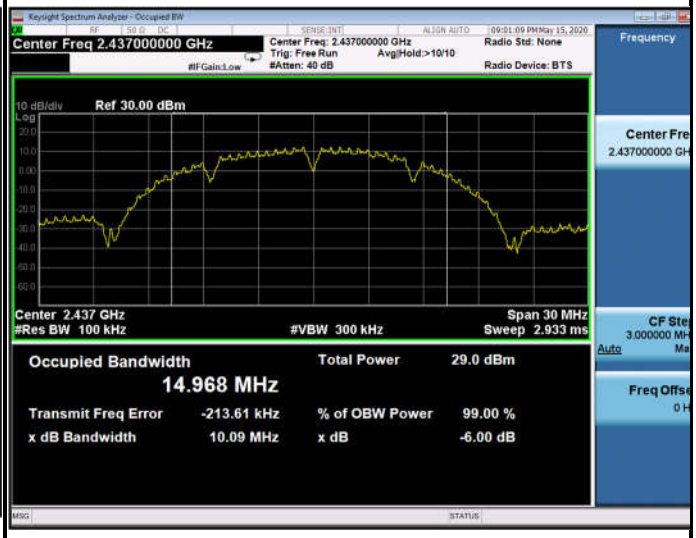
4.6.3 Test Procedure

	Reference Rule		Chapter	Description
☒	ANSI C63.10		11.8	DTS bandwidth
	☐	ANSI C63.10	11.8.1	Option 1
	☒	ANSI C63.10	11.8.2	Option 2

4.6.4 Test Data

Mode	CH.	Test Freq. (MHz)	99% Occupied Bandwidth (MHz)	6dB Occupied Bandwidth (MHz)	Limit (kHz)	Result
1	1	2412	15.030	10.10	≥500	Pass
	6	2437	15.539	10.09	≥500	Pass
	11	2462	15.545	10.10	≥500	Pass
2	1	2412	17.696	16.55	≥500	Pass
	6	2437	17.843	16.56	≥500	Pass
	11	2462	17.702	16.58	≥500	Pass
3	1	2412	18.481	17.72	≥500	Pass
	6	2437	18.574	17.76	≥500	Pass
	11	2462	18.544	17.69	≥500	Pass
4	3	2422	35.829	36.37	≥500	Pass
	6	2437	35.855	36.38	≥500	Pass
	9	2452	35.872	36.38	≥500	Pass

Note : The worst case of Occupied Bandwidth as below in next page:

99% Occupied Bandwidth	6dB Occupied Bandwidth
Mode 1 CH01 (2437MHz)	**Mode 1 CH01 (2437MHz)**
	

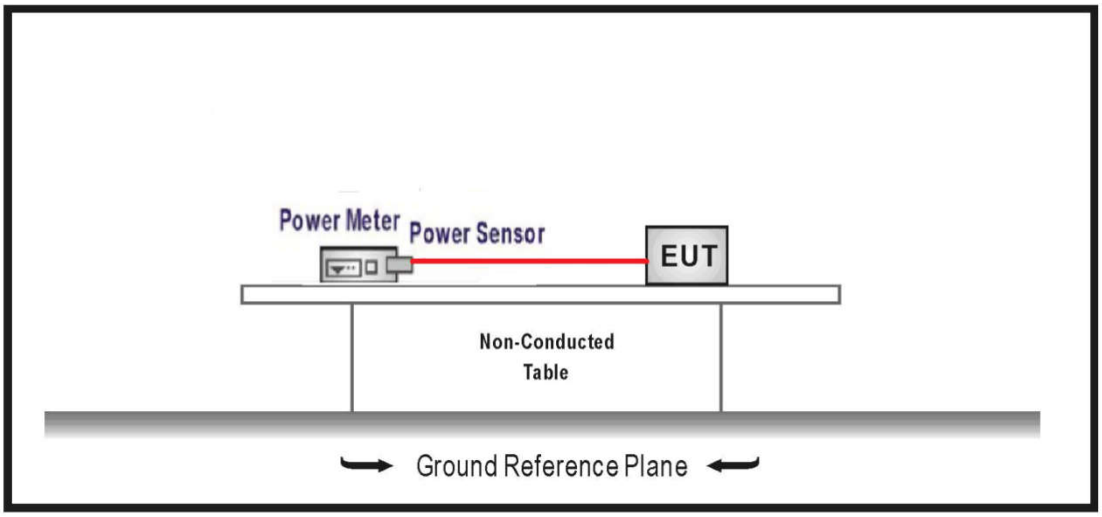
4.7 Fundamental emission output power	VERDICT: PASS

4.7.1 Limit

Standard			FCC Part 15 Subpart C Paragraph 15.247 (b)(3)
☒	GTX ＜6dBi		Pout≤30dBm
☐	GTX ＞6dBi		
	☐	Non-Fix point-point	Pout≤30-(GTX -6)
	☐	Fix point-point	Pout≤30-[(GTX-6)]/3
	☐	Point-to-multipoint	Pout≤30-(GTX-6)
	☐	Overlap Beams	Pout≤30-[(GTX-6)]/3
	☐	Aggregate power transmitted simultaneously on all beams	Pout≤30-[(GTX-6)]/3
	☐	single directional beam	Pout≤30-[(GTX-6)]/3+8dB

Note 1 : GTX directional gain of transmitting antennas.
Note 2 : Pout is maximum peak conducted output power .

4.7.2 Test Setup



4.7.3 Test Procedure							
	References Rule					Chapter	Description
☒	ANSI C63.10					11.9	Fundamental emission output power
	☒	ANSI C63.10				11.9.1	Maximum peak conducted output power
		☐	ANSI C63.10			11.9.1.1	RBW ⩾ DTS bandwidth
		☐	ANSI C63.10			11.9.1.2	Integrated band power method
		☐	ANSI C63.10			11.9.1.3	PKPM1 Peak power meter method
	☐	ANSI C63.10				11.9.2	Maximum conducted (average) output power
		☐	ANSI C63.10			11.9.2.2	Measurement using a spectrum analyzer (SA)
			☐	ANSI C63.10		11.9.2.2.2	Method AVGSA-1(Duty cycle⩾98%)
			☐	ANSI C63.10		11.9.2.2.3	Method AVGSA-1A(Duty cycle⩾98%)
			☐	ANSI C63.10		11.9.2.2.4	Method AVGSA-2(Duty cycle⩽98%)
			☐	ANSI C63.10		11.9.2.2.5	Method AVGSA-2A(Duty cycle⩽98%)
			☐	ANSI C63.10		11.9.2.2.4	Method AVGSA-3
			☐	ANSI C63.10		11.9.2.2.5	Method AVGSA-3A
		☒	ANSI C63.10			11.9.2.3	Measurement using a power meter (PM)
			☒	ANSI C63.10		11.9.2.3.1	Method AVGPM
			☐	ANSI C63.10		11.9.2.3.2	Method AVGPM-G

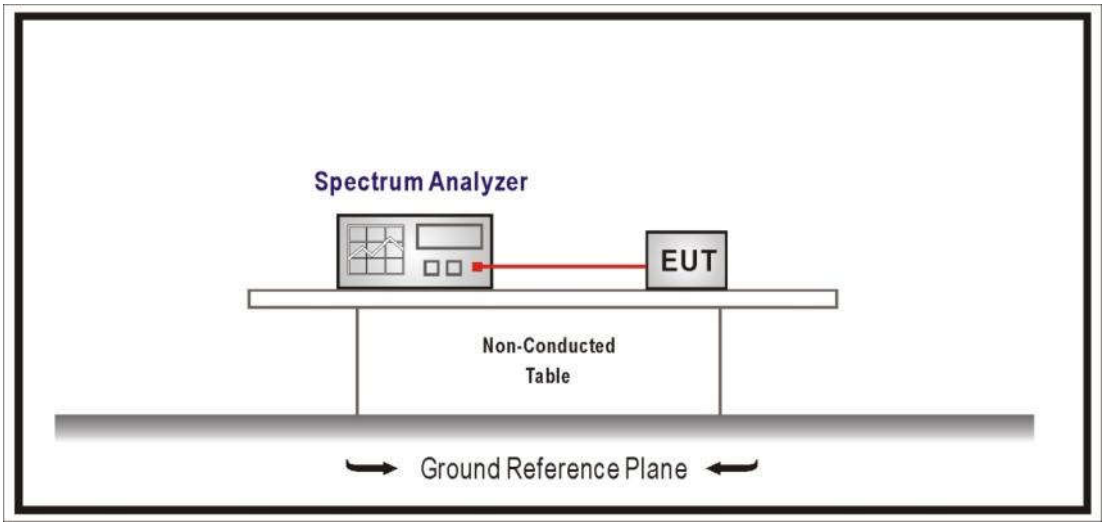
4.7.4 Test Data

Mode	Channel	Test Frequency (MHz)	Power Output (dBm)	Limit (dBm)	Result
1	1	2412	24.13	30.00	Pass
	6	2437	26.13	30.00	Pass
	11	2462	25.93	30.00	Pass
2	1	2412	22.43	30.00	Pass
	6	2437	23.12	30.00	Pass
	11	2462	22.93	30.00	Pass
3	1	2412	21.14	30.00	Pass
	6	2437	22.45	30.00	Pass
	11	2462	21.23	30.00	Pass
4	3	2422	20.75	30.00	Pass
	6	2437	20.82	30.00	Pass
	9	2452	20.84	30.00	Pass

4.8 Power Density	VERDICT: PASS

4.8.1 Limit:	
Standard	FCC Part 15 Subpart C Paragraph 15.247 (b)(3)
Power Spectral Density≤8dBm/3kHz	

4.8.2 Test Setup



4.8.3 Test Procedure

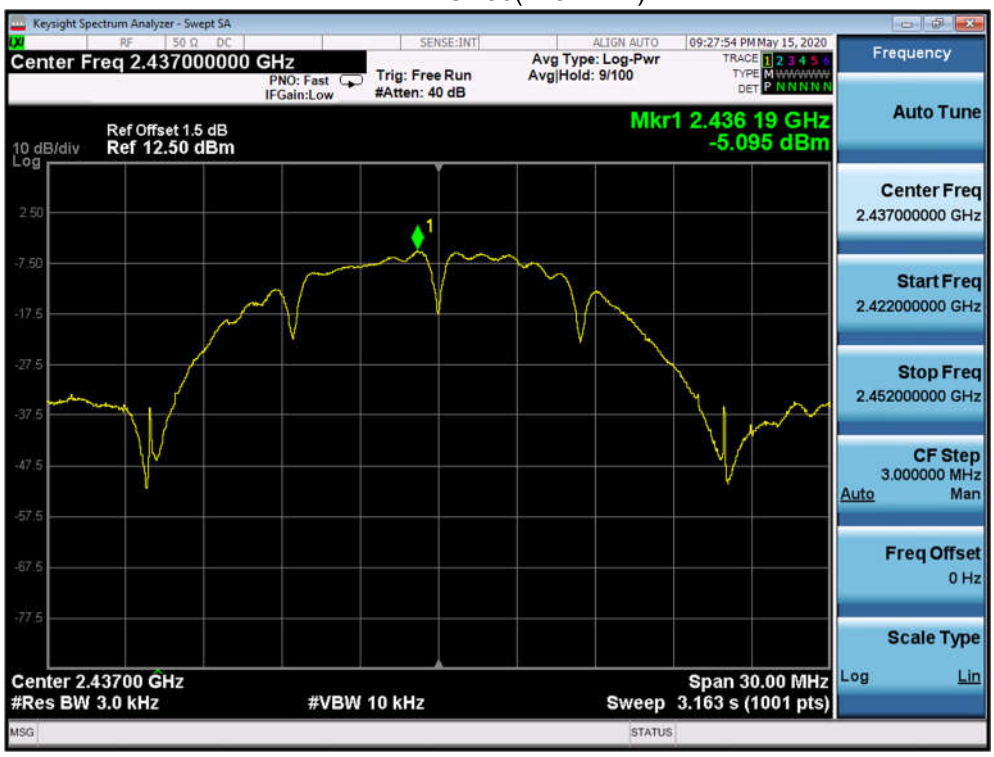
	References Rule		Chapter	Description
☒	ANSI C63.10		11.10	Maximum power spectral density level in the fundamental emission
	☒	ANSI C63.10	11.10.2	Method PKPSD (peak PSD)
	☐	ANSI C63.10	11.10.3	Method AVGPSD-1(Duty cycle≥98%)
	☐	ANSI C63.10	11.10.4	Method AVGPSD-1A(Duty cycle≥98%)
	☐	ANSI C63.10	11.10.5	Method AVGPSD-2(Duty cycle＜98%)
	☐	ANSI C63.10	11.10.6	Method AVGPSD-2A(Duty cycle＜98%)
	☐	ANSI C63.10	11.10.7	Method AVGPSD-3
	☐	ANSI C63.10	11.10.8	Method AVGPSD-3A

4.8.4 Test Data

Mode	Channel	Test Frequency (MHz)	Measurement PSD (dBm/3kHz)	Antenna Gain (dBi)	Limit (dBm/3kHz)	Result
1	1	2412	-7.199	1.1	≤8	Pass
	6	2437	-5.095	1.1	≤8	Pass
	11	2462	-5.253	1.1	≤8	Pass
2	1	2412	-9.994	1.1	≤8	Pass
	6	2437	-8.866	1.1	≤8	Pass
	11	2462	-9.227	1.1	≤8	Pass
3	1	2412	-10.113	1.1	≤8	Pass
	6	2437	-10.504	1.1	≤8	Pass
	11	2462	-9.215	1.1	≤8	Pass
4	3	2422	-13.284	1.1	≤8	Pass
	6	2437	-10.452	1.1	≤8	Pass
	9	2452	-13.622	1.1	≤8	Pass

Remark: The worst data as below:

Mode 1 CH06(2437MHz)



4.9 Antenna Requirement	VERDICT: PASS

4.9.1 Limit:	
Standard	FCC Part 15 Subpart C Paragraph 15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221.

Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

4.9.2 Antenna Connector Construction:	
☐	The use of a permanently attached antenna
☐	The antenna use of a unique coupling to the intentional radiator
☐	The use of a nonstandard antenna jack or electrical connector

Please refer to the attached document "Internal Photograph" to show the antenna connector.

4.10 Test setup photo and EUT Photo	VERDICT: PASS

Remark: The test setup photo and EUT Photo please see appendix.

The End