



Test report No:
2320237R-RF-US-P06V02

FCC & ISED TEST REPORT

Product Name	LED lamp
Trademark	PHILIPS
Model and /or type reference	9290035755
FCC ID	2AGBW9290035755X
IC	20812-35755X
Applicant's name / address	Signify (China) Investment Co., Ltd. Building No.9, Lane 888, Tianlin Road, Minhang district, 200233, Shanghai, China.
Test method requested, standard	CFR 47, FCC Part 15 Subpart C ANSI C63.10: 2013 RSS-Gen / RSS-247
Verdict Summary	IN COMPLIANCE
Documented by (name / position & signature)	Tim Cao/Project Manager 
Approved by (name / position & signature)	Jack Zhang/ Manager 
Date of issue	2023-07-05
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COMPETENCES AND GUARANTEES

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

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

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

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

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GENERAL CONDITIONS

Test Location	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Date(receive sample)	Feb. 09, 2023
Date (start test)	Feb. 13, 2023
Date (finish test)	Feb. 24, 2023

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
2320237R-RF-US-P06V02	V1.0	Initial issue of report.	2023-06-29
2320237R-RF-US-P06V02	V2.0	Whole of report: Update voltage information. (The test report No.: 2320237R-RF-US-P06V02 V2.0 is to replace the test report No.: 2320237R-RF-US-P06V02 V1.0, and test report 2320237R-RF-US-P06V02 V1.0 is obsoleted.)	2023-07-05

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, ANSI C63.10: 2013, RSS-Gen Issue 5 and RSS-247 Issue 2.
3. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result.
4. The test results presented in this report relate only to the object tested.
5. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification (Suzhou) Co., Ltd.
6. This report will not be used for social proof function in China market.
7. DEKRA declines any responsibility with the following test data provided by customer that may affect the validity of result:
 - Chapter 1.1 General Description of the Item(s);
 - Chapter 1.2 Antenna Informaion;
 - Chapter 1.3 Channel List.

USED EQUIPMENT

AC Power Line Conducted Emission / TR1

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI	100906	2022.09.04	2023.09.03
Two-Line V-Network	R&S	ENV216	101189	2022.07.01	2023.06.30
Two-Line V-Network	R&S	ENV216	101044	2022.03.12	2023.03.11
Artificial Mains Network	SCHWARZBECK	NNLK 8129	8129-294	2022.11.27	2023.11.26
Impedance Stabilization Network	Teseq GmbH	ISN T800	57318	2022.03.21	2023.03.20
Impedance Stabilization Network	Teseq GmbH	ISN T8-Cat6	29680	2022.03.16	2023.03.15
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	N/A	N/A
Coaxial Cable	Suhner	RG 223	TR1-C1	2022.03.30	2023.03.29
Temperature/Humidity Meter	RTS	RTS-8S	TR1-TH	2022.07.07	2023.07.06

Conducted Test / TR8

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Wireless Connectivity Tester	R&S	CMW 270	102593	2022.05.21	2023.05.20
Coaxial Cable	N/A	N/A	2187	2022.06.09	2023.06.08
High and low temperature and fast temperature change test box	ASTUOD	ASTD-FBT-225K	N/A	2022.07.13	2023.07.12
Temperature/Humidity Meter	RTS	RTS-8S	RF08	2022.07.07	2023.07.06
Test system					
4TX MIMO Power Sensor	Keysight	X8750A	MY59400102	2022.03.16	2023.03.15
MAX Signal Analyzer	Keysight	N9020B	MY59050482	2022.09.17	2023.09.16
Switch Box	Keysight	X8749A	N/A	N/A	N/A
High and low temperature and fast temperature change test box	ASTUOD	ASTD-FBT-225K	N/A	2022.07.13	2023.07.12
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY61252529	2022.07.14	2023.07.13
Frequency extender for EXG or MXG	Keysight	N5182BX07	MY59362500	2022.07.14	2023.07.13
EXG-B MW Analog Signal Generator	Keysight	N5173B	MY61252566	2022.09.28	2023.09.27

Radiated Emission(9kHz-1GHz) / AC3

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI	100573	2022.07.10	2023.07.09
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2022.08.28	2023.08.27
Coaxial Cable	Huber+Suhner	RG 214	AC2-C	2022.03.30	2023.03.29
Loop Antenna	R&S	HFH2-Z2	833799/003	2022.04.15	2023.04.14
Temperature/Humidity Meter	RTS	RTS-8S	AC2-TH	2022.07.07	2023.07.06

Radiated Emission (1GHz-40GHz) / AC5

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
MXA Signal Analyzer	Keysight	N9020B	MY60112218	2022.12.08	2023.12.07
Preamplifier	SKET	LNPA_0118G-45	SK2021041201	2022.04.15	2023.04.14
Pre-Amplifier	Schwarzbeck	BBV 9721	9721-024	2022.12.08	2023.12.07
DRG Horn	ETS-Lindgren	3117	00123988	2022.08.29	2023.08.28
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9170	01249	2022.09.22	2023.09.21
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2022.03.30	2023.03.29
Coaxial Cable	ROSENBERGER	LA1-C011-2000/3000	AC5-40G	2022.03.21	2023.03.20
Notch Filter	Micro-mve	MFN-2400.2485.S1	AN0003N	2022.07.18	2023.07.17

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~30MHz: 2.92dB
Peak Power Output	± 1.13 dB
Radiated Emission(30MHz~1GHz)	30MHz~300MHz: 4.81 dB 300MHz~1GHz: 4.15 dB
Radiated Emission(1GHz~26.5GHz)	1GHz~18GHz: 4.98 dB 18GHz~26.5GHz: 4.72 dB
RF antenna conducted test	± 1.27 dB
Radiated Emission Band Edge	1GHz~18GHz: 4.98 dB
DTS Bandwidth	± 279 Hz
Occupied Bandwidth	± 279 Hz
Power Density	± 0.95 dB

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Product Name	LED lamp
Model No.	9290035755
Trademark	PHILIPS
FCC ID	2AGBW9290035755X
IC	20812-35755X
Manufacturer	Signify (China) Investment Co., Ltd.
Manufacturer address	Building No.9, Lane 888, Tianlin Road, Minhang district, 200233, Shanghai, China

Wireless specification.....	Zigbee
Operating frequency range(s)	2405~2480MHz
Type of Modulation.....	O-QPSK
Data Rate	250kbps
Number of channel.....	16

Rated power supply	Voltage and Frequency	
	<input checked="" type="checkbox"/>	AC: 12Vac
	<input type="checkbox"/>	AC: 100 - 240 Vac, 50/60 Hz
	<input type="checkbox"/>	DC: 24 Vdc
	<input type="checkbox"/>	Battery: 3Vdc
	<input type="checkbox"/>	Adapter:Input: Output:
Brand of adapter	N/A	
Adapter model.....	N/A	
Mounting position	<input type="checkbox"/>	Table top equipment
	<input checked="" type="checkbox"/>	Wall/Ceiling mounted equipment
	<input type="checkbox"/>	Floor standing equipment
	<input type="checkbox"/>	Hand-held/Portable equipment
	<input type="checkbox"/>	Other:

1.2 Antenna Information

Antenna model / type number	N/A		
Antenna serial number	N/A		
Antenna Delivery	<input checked="" type="checkbox"/>	1TX + 1RX	
	<input type="checkbox"/>	2TX + 2RX	
	<input type="checkbox"/>	Others:.....	
Antenna technology	<input checked="" type="checkbox"/>	SISO	
	<input type="checkbox"/>	MIMO	<input type="checkbox"/> CDD
			<input type="checkbox"/> Beam-forming
Antenna Type	<input type="checkbox"/>	External	<input type="checkbox"/> Dipole
			<input type="checkbox"/> Sectorized
	<input checked="" type="checkbox"/>	Internal	<input type="checkbox"/> Ceramic Chip
			<input type="checkbox"/> PIFA
			<input checked="" type="checkbox"/> PCB
			<input type="checkbox"/> Others.....
Antenna Gain	1 dBi		

1.3 Channel List

Working Frequency of Each Channel: For Zigbee							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
11	2405 MHz	12	2410 MHz	13	2415 MHz	14	2420 MHz
15	2425 MHz	16	2430 MHz	17	2435 MHz	18	2440 MHz
19	2445 MHz	20	2450 MHz	21	2455 MHz	22	2460 MHz
23	2465 MHz	24	2470 MHz	25	2475 MHz	26	2480 MHz

Note: The general description of the Item(s), antenna information and channel list in clause 1 are provided and confirmed by the client.

2 DESCRIPTION OF TEST SETUP

2.1 Operating mode(s) used for tests

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

Test Mode For Zigbee	Mode1: Transmit by Zigbee
----------------------	---------------------------

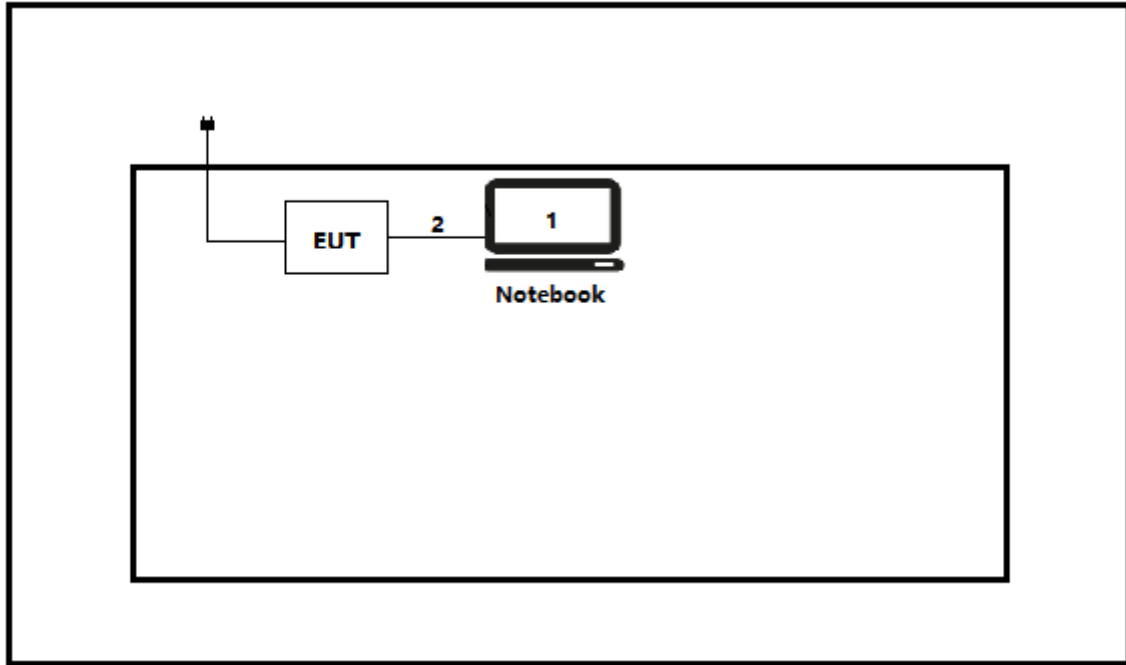
2.2 Auxiliary equipment / Test software for the EUT

Auxiliary equipment	Type / Version	Manufacturer	Supplied by
(1) Notebook	Think pad x220	Lenovo	Adapter
(2) USB Control Cable	N/A	N/A	N/A
(3) USB Control Cable	N/A	N/A	N/A
software	Type / Version	Manufacturer	Supplied by
Approbation Tool	V1.5.6.0	N/A	N/A

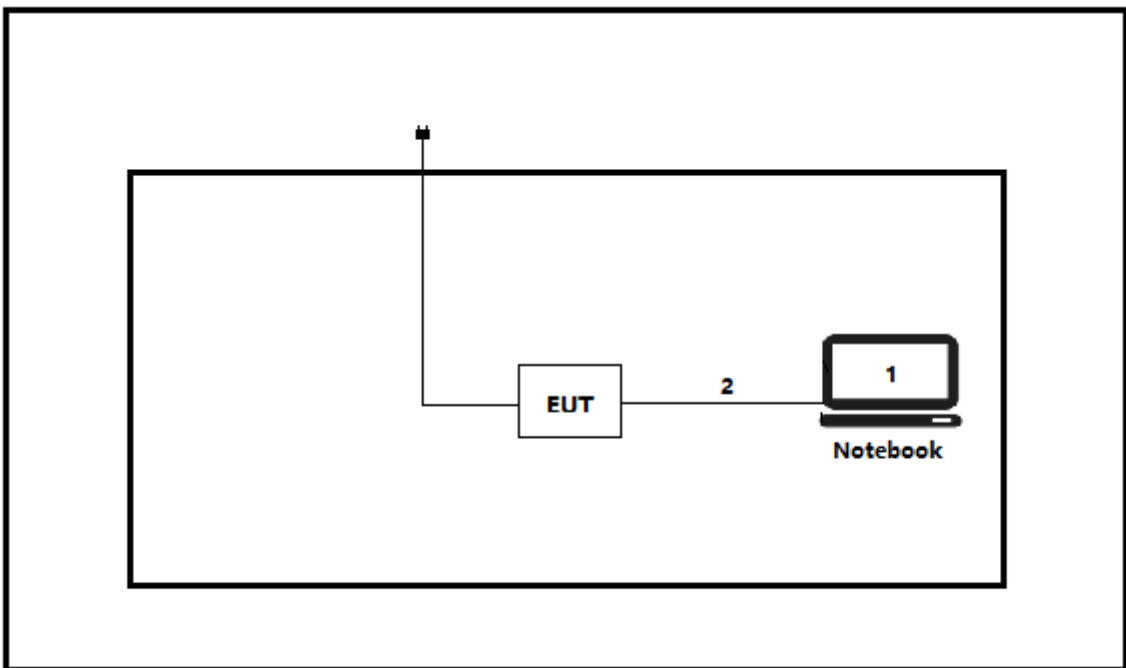
Accessories Information	Cable		
	Length used during test [m]	Attached during test	Shielded
(2)USB Control Cable	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(3)USB Control Cable	8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

2.3 Test Configuration / Block diagram used for tests

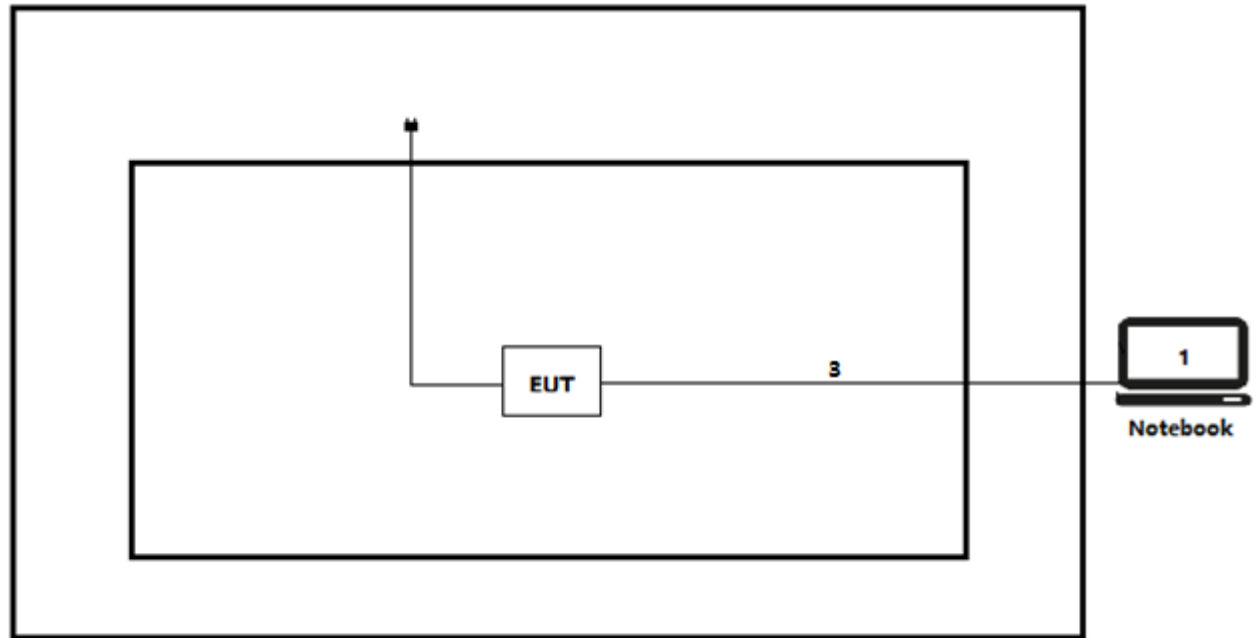
Test setup Diagram- AC Line Conducted Emission Test



Test setup Diagram- Conducted test



Test setup Diagram- Ratiated test



2.4 Testing process

1	Setup the EUT shown in Section 2.3.
2	Execute the [Approbation Tool] on the notebook.
3	Configure the test mode, the test channel, and the data rate.
4	Verify that the EUT works properly.

3 VERDICT SUMMARY SECTION

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

3.1 Standards

Standard	Year	Description
CFR 47, FCC Part 15 Subpart C	2023	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
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 Deviation(s) from the Standard(s) / Test Specification(s)

The following deviation(s) was / were made from the published requirements of the listed standards: N/A.

(Please define the deviations from the standard(s) if applicable)

3.3 Overview of results

Requirement – Test Item of FCC	Standard(s)	Verdict	Remark
DTS Bandwidth	FCC 15.247(a)(2)	PASS	Test data please refer to Appendix A
Maximum conducted output power	15.247 (b)(3)	PASS	Test data please refer to Appendix C
Maximum power spectral density	FCC 15.247(e)	PASS	Test data please refer to Appendix D
Band edge measurements	FCC 15.247(d) FCC 15.205 FCC 15.209	PASS	Test data please refer to Appendix E
Conducted Spurious Emission	FCC 15.247(d), FCC 15.209	PASS	Test data please refer to Appendix F
Duty cycle	ANSI C63.10:2013	PASS	Test data please refer to Appendix G
Emissions in Restricted Bands	FCC 15.205 FCC 15.209	PASS	Test data please refer to Appendix H
AC Power Line Conducted Emission	FCC 15.207	PASS	Test data please refer to Appendix I
Antenna Requirement	FCC 15.203	PASS	---

Requirement – Test case of ISED	Standard(s)	Verdict	Remark
DTS Bandwidth	RSS-Gen Issue 5 Paragraph 6.7 RSS-247 Issue 2 Paragraph 5.2	PASS	Test data please refer to Appendix A
Occupied Channel Bandwidth	RSS-Gen Issue 5 Paragraph 6.7 RSS-247 Issue 2 Paragraph 5.2	PASS	Test data please refer to Appendix B
Maximum conducted output power	RSS-247 Issue 2 Paragraph 5.4(d)	PASS	Test data please refer to Appendix C
Maximum power spectral density	RSS-247 Issue 2 Paragraph 5.2(b)	PASS	Test data please refer to Appendix D
Band edge measurements	RSS-Gen Issue 5 Paragraph 8.10	PASS	Test data please refer to Appendix E
Conducted Spurious Emission	RSS-247 Issue 2 Paragraph 5.5	PASS	Test data please refer to Appendix F
Duty cycle	ANSI C63.10:2013	PASS	Test data please refer to Appendix G
Emissions in Restricted Bands	RSS-Gen Issue 5 Paragraph 8.9	PASS	Test data please refer to Appendix H
AC Power Line Conducted Emission	RSS-Gen Issue 5 Paragraph 8.8	PASS	Test data please refer to Appendix I
Antenna Requirement	RSS-Gen Issue 5 Paragraph 6.8	PASS	---

3.4 Power setting in test

Mode	Channel	Frequency (MHz)	Power setting
Zigbee	11	2405	10
	18	2440	10
	25	2480	10

3.5 Test Matrix

Test item	Model / Type		
	1(#1)	2(#2)	3()
DTS Bandwidth	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Occupied Channel Bandwidth	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maximum conducted output power	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maximum power spectral density	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Band edge measurements	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Conducted Spurious Emission	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Duty cycle	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emissions in Restricted Bands	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AC Power Line Conducted Emission	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Antenna Requirement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Note: The only difference between sample #1 and sample 2 is whether to keep the original antenna, sample #1 is a conduction test product that removes the original antenna and is equipped with SMA wires, and sample #2 is a complete product that retains the original antenna.

3.6 Test Facility

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

4 TEST ITEMS OF LIMIT/SETUP/PROCEDURE

4.1 DTS Bandwidth

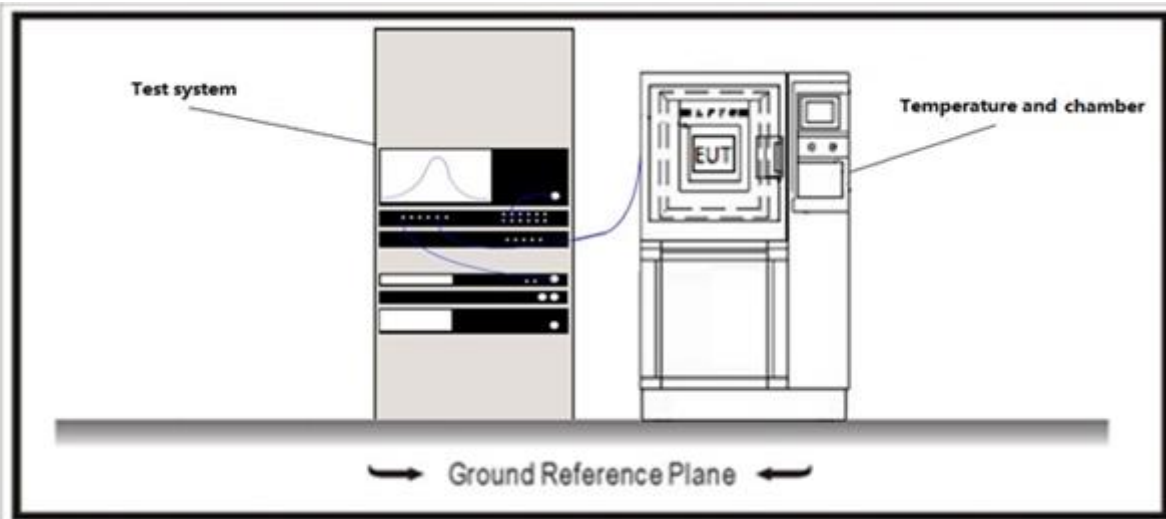
VERDICT: PASS

4.1.1 Limit

Standard FCC Part 15 Subpart C Paragraph 15.247 (a)(2); RSS-247 Issue 2 Paragraph 5.2.

Systems using digital modulation techniques operate in the 2400-2483.5 MHz. The minimum 6 dB bandwidth shall be at least 500 kHz

4.1.2 Test Setup



4.1.3 Test Procedure

	Reference Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.8	DTS bandwidth
<input type="checkbox"/>	ANSI C63.10	11.8.1	Option 1
<input checked="" type="checkbox"/>	ANSI C63.10	11.8.2	Option 2

4.2 Occupied Channel Bandwidth

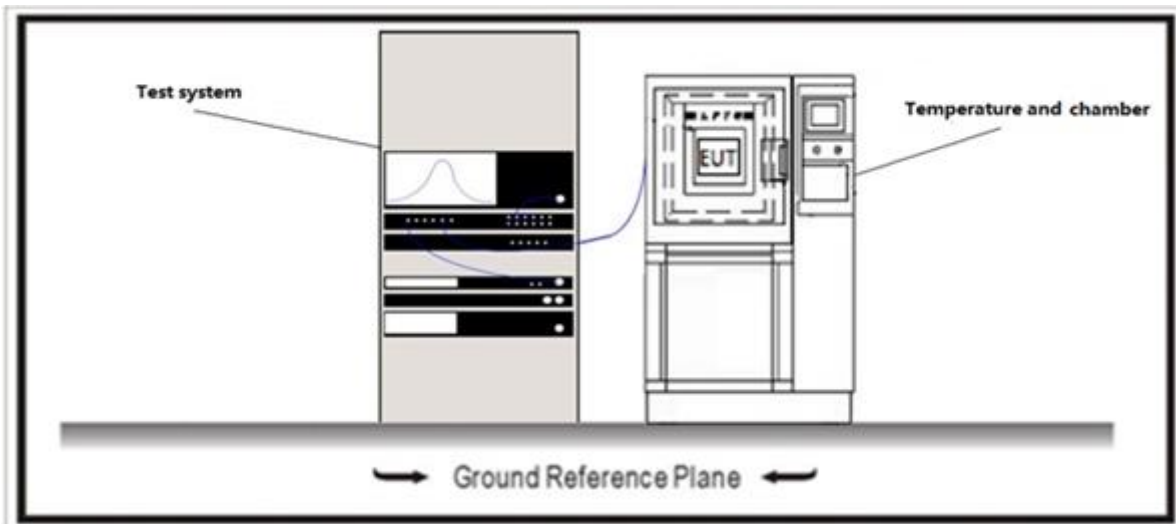
VERDICT: PASS

4.2.1 Limit

Standard RSS-Gen Issue 5 Paragraph 6.7

The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs

4.2.2 Test Setup



4.2.3 Test Procedure

	Reference Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	6.9	Occupied bandwidth tests
<input type="checkbox"/>	ANSI C63.10	6.9.2	Relative measurement procedure
<input checked="" type="checkbox"/>	ANSI C63.10	6.9.3	Power bandwidth (99%) measurement procedure

4.3 Maximum Conducted Output Power	VERDICT: PASS
---	----------------------

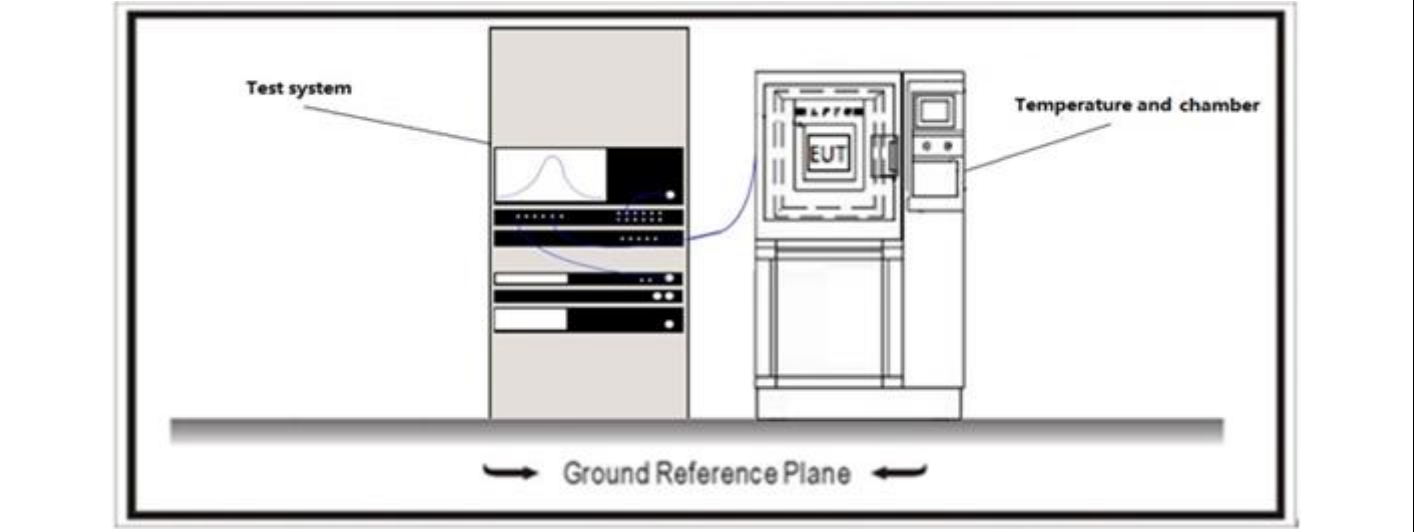
4.3.1 Limit

Standard	FCC Part 15 Subpart C Paragraph 15.247 (b)(3); RSS-247 Issue 2 Paragraph 5.4(d).	
<input checked="" type="checkbox"/>	GTX < 6dBi	Pout≤30dBm
<input type="checkbox"/>	GTX > 6dBi	
<input type="checkbox"/>	Non-Fix point-point	Pout≤30-(GTX -6)
<input type="checkbox"/>	Fix point-point	Pout≤30-[(GTX-6)]/3
<input type="checkbox"/>	Point-to-multipoint	Pout≤30-(GTX-6)
<input type="checkbox"/>	Overlap Beams	Pout≤30-[(GTX-6)]/3
<input type="checkbox"/>	Aggregate power transmitted simultaneously on all beams	Pout≤30-[(GTX-6)]/3
<input type="checkbox"/>	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 .

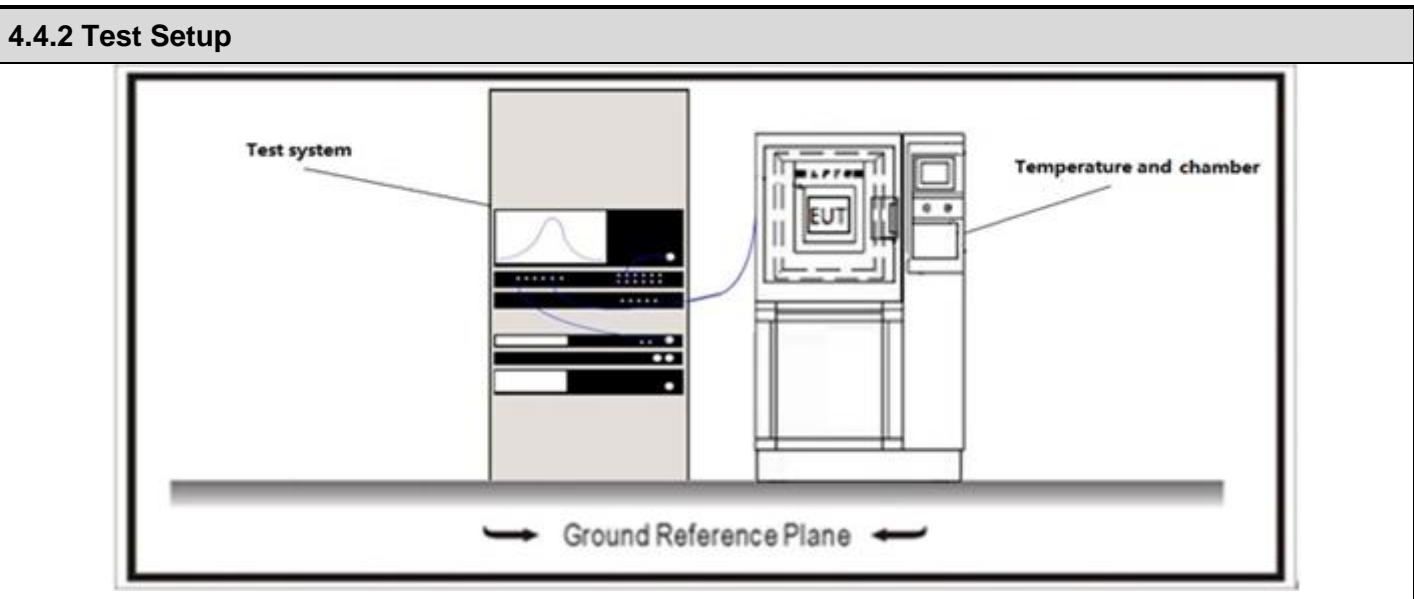
4.3.2 Test Setup



4.3.3 Test Procedure					
	References Rule		Chapter	Description	
<input checked="" type="checkbox"/>	ANSI C63.10		11.9	Fundamental emission output power	
	<input checked="" type="checkbox"/>	ANSI C63.10		11.9.1	Maximum peak conducted output power
	<input type="checkbox"/>	ANSI C63.10	11.9.1.1	RBW \geq DTS bandwidth	
	<input type="checkbox"/>	ANSI C63.10	11.9.1.2	Integrated band power method	
	<input checked="" type="checkbox"/>	ANSI C63.10	11.9.1.3	PKPM1 Peak power meter method	
	<input type="checkbox"/>	ANSI C63.10		11.9.2	Maximum conducted (average) output power
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2	Measurement using a spectrum analyzer (SA)	
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.2	Method AVGSA-1(Duty cycle \geq 98%)	
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.3	Method AVGSA-1A(Duty cycle \geq 98%)	
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.4	Method AVGSA-2(Duty cycle \leq 98%)	
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.5	Method AVGSA-2A(Duty cycle \leq 98%)	
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.4	Method AVGSA-3	
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.5	Method AVGSA-3A	
	<input type="checkbox"/>	ANSI C63.10		11.9.2.3	Measurement using a power meter (PM)
	<input type="checkbox"/>	ANSI C63.10	11.9.2.3.1	Method AVGPM	
<input type="checkbox"/>	ANSI C63.10	11.9.2.3.2	Method AVGPM-G		

4.4 Maximum Power Spectral Density	VERDICT: PASS
---	----------------------

4.4.1 Limit	
Standard	FCC Part 15 Subpart C Paragraph 15.247 (b)(3); RSS-247 Issue 2 Paragraph 5.2(b).
Power Spectral Density ≤ 8dBm/3kHz	

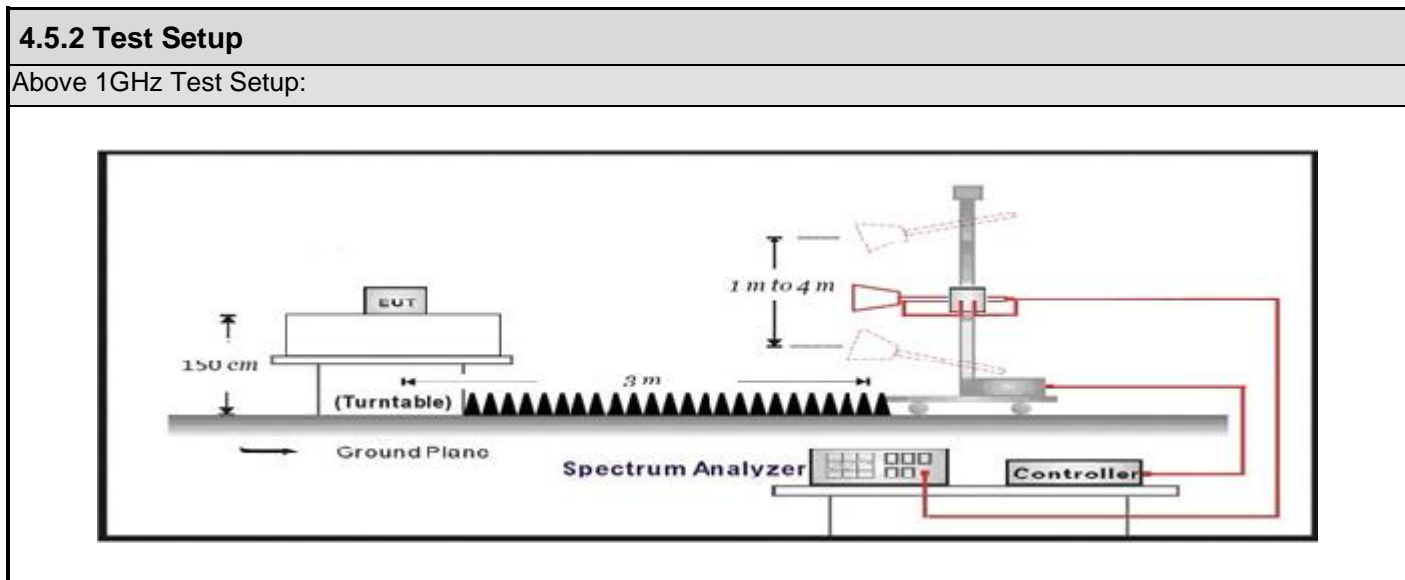


4.4.3 Test Procedure

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

4.5 Band Edge Measurements	VERDICT: PASS
-----------------------------------	----------------------

4.5.1 Limit				
Standard		FCC Part 15 Subpart C Paragraph 15.247(d) , 15.209; RSS-Gen Issue 5 Paragraph 8.10.		
Frequency bands (MHz)	Detector	Limit (dBµV/m)	RBW (MHz)	Distance (m)
2310-2390	PK	74	1	3
2483.5-2500	AV	54	1	3
Note: The field strength of emissions appearing within these frequency bands shall not exceed the limits.				



4.5.3 Test Procedure			
	References Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	6.10	Band-edge testing
<input type="checkbox"/>	<input checked="" type="checkbox"/> ANSI C63.10	6.10.5	Restricted-band band-edge measurements
<input type="checkbox"/>	<input type="checkbox"/> ANSI C63.10	6.10.6	Marker-delta method
<input checked="" type="checkbox"/>	ANSI C63.10	11.12	Emissions in restricted frequency bands
<input type="checkbox"/>	<input checked="" type="checkbox"/> ANSI C63.10	11.12.1	Radiated emission measurements
<input type="checkbox"/>	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.7	Radiated spurious emission test
<input type="checkbox"/>	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
<input type="checkbox"/>	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
<input checked="" type="checkbox"/>	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz

4.6 Conducted Spurious Emission	VERDICT: PASS
--	----------------------

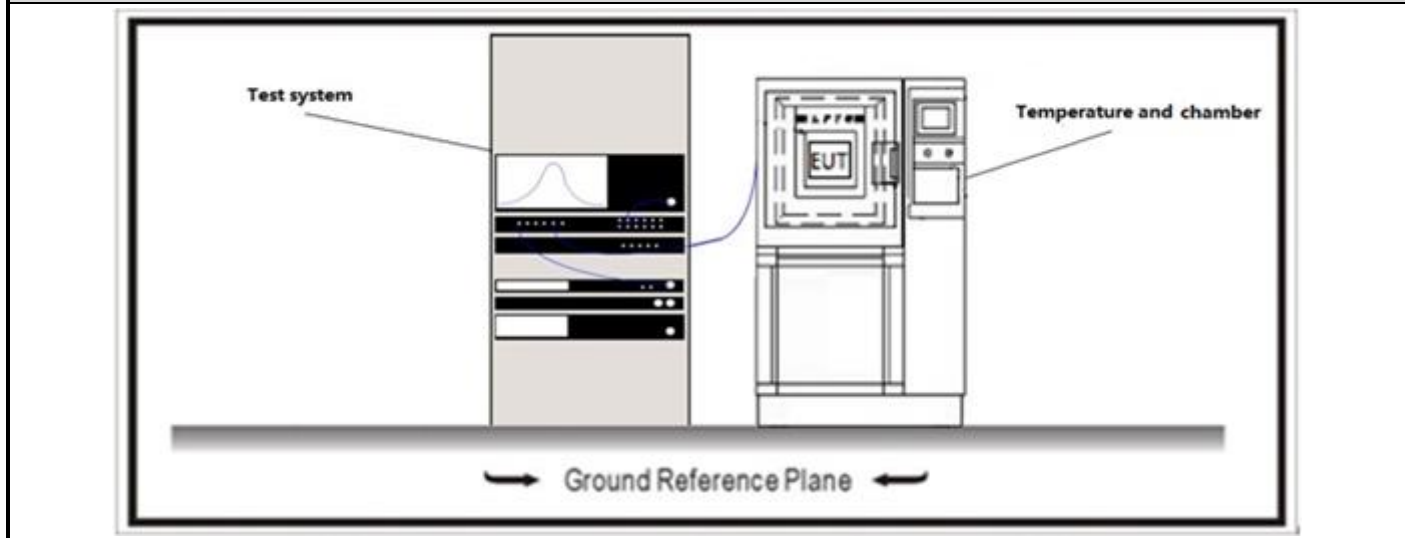
4.6.1 Limit

Standard	FCC Part 15 Subpart C Paragraph 15.247(d); RSS-247 Issue 2 Paragraph 5.5.	
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).

4.6.2 Test Setup

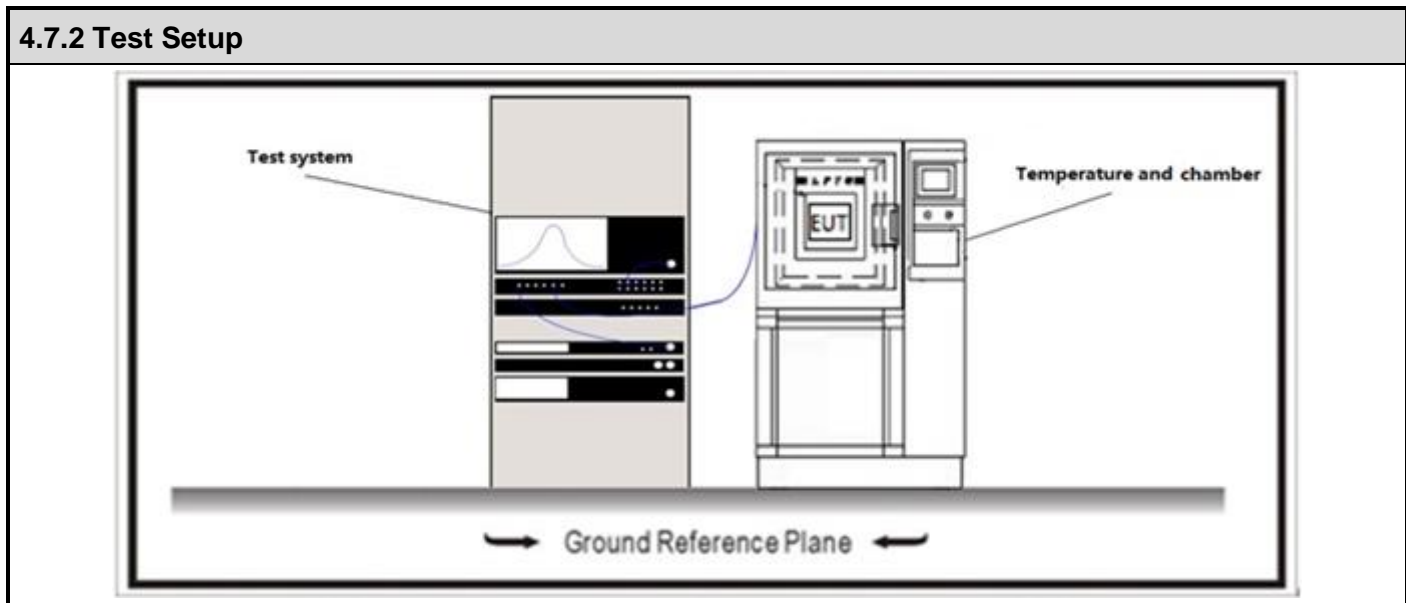


4.6.3 Test Procedure

References	Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.11	Emissions in non-restricted frequency bands
	<input checked="" type="checkbox"/> ANSI C63.10	11.11.1	General
	<input checked="" type="checkbox"/> ANSI C63.10	11.11.2	Reference level measurement
	<input checked="" type="checkbox"/> ANSI C63.10	11.11.3	Emission level measurement

4.7 Duty cycle	VERDICT: PASS
-----------------------	----------------------

4.7.1 Limit
N/A



4.7.3 Test Procedure			
References	Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.6	Duty cycle (D), transmission duration (T), and maximum power control level

4.8 Emissions in Restricted Bands**VERDICT: PASS****4.8.1 Limit****Standard**

FCC Part 15 Subpart C Paragraph 15.205

Restricted Bands of operation

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			

Standard

RSS-Gen Issue 5 Paragraph 8.10

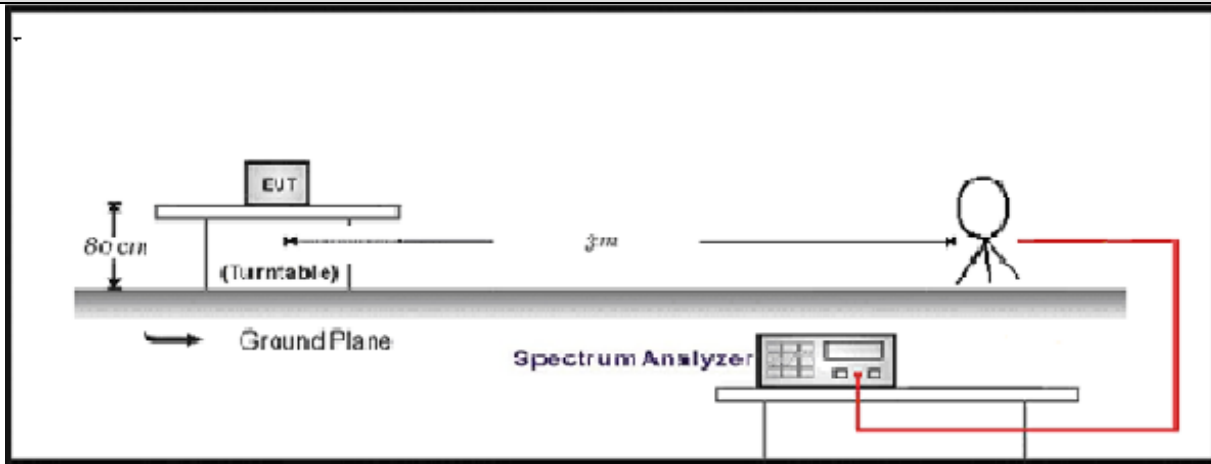
Restricted Bands of operation for IC

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	--	

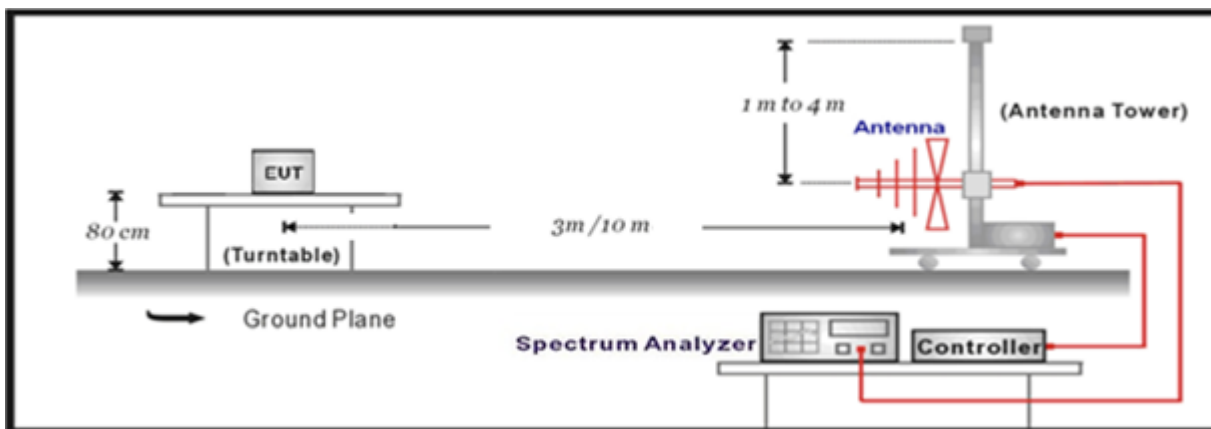
Restricted Band Emissions Limit			
FCC Part 15 Subpart C Paragraph 15.209			
Frequency (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300 _(Note 1)
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30 _(Note 1)
1.705 - 30	30	29.5	30 _(Note 1)
30 - 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)
RSS-Gen Issue 5 Paragraph 8.9.			
Frequency (MHz)	Field strength	Field strength (dBµV/m)	Measurement distance (m)
0.009 - 0.49	6.37/F(kHz) µA/m	48.5 – 13.8	300 _(Note 1)
0.49 - 1.705	63.7/F(kHz) µA/m	33.8 - 23	30 _(Note 1)
1.705 - 30	30 µV/m	29.5	30 _(Note 1)
30 - 88	100 µV/m	40	3 _(Note 2)
88 - 216	150 µV/m	43.5	3 _(Note 2)
216 - 960	200 µV/m	46	3 _(Note 2)
Above 960	500 µV/m	54	3 _(Note 2)
<p>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).</p> <p>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).</p>			

4.8.2 Test Setup

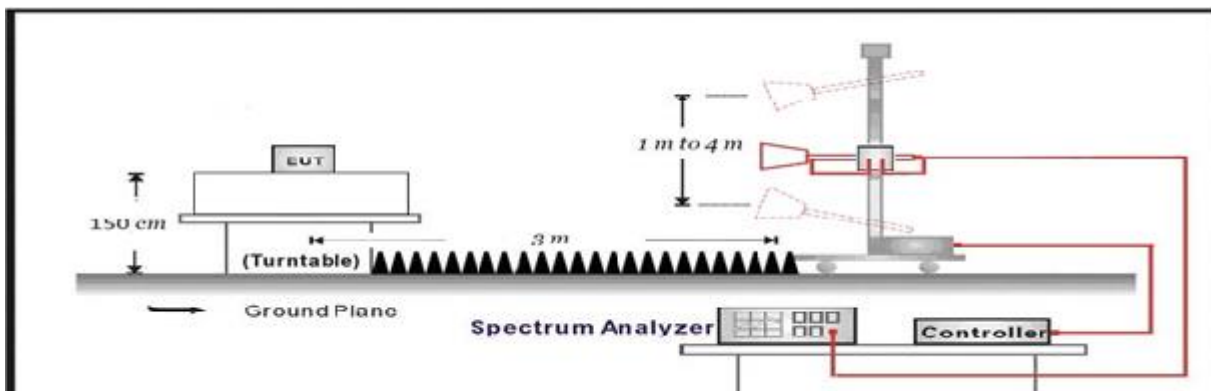
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



Above 1GHz Test Setup:



4.8.3 Test Procedure			
	References Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.12	Emissions in restricted frequency bands
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.1	Radiated emission measurements
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.7	Radiated spurious emission test
	<input checked="" type="checkbox"/> ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
	<input checked="" type="checkbox"/> ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
	<input checked="" type="checkbox"/> ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz

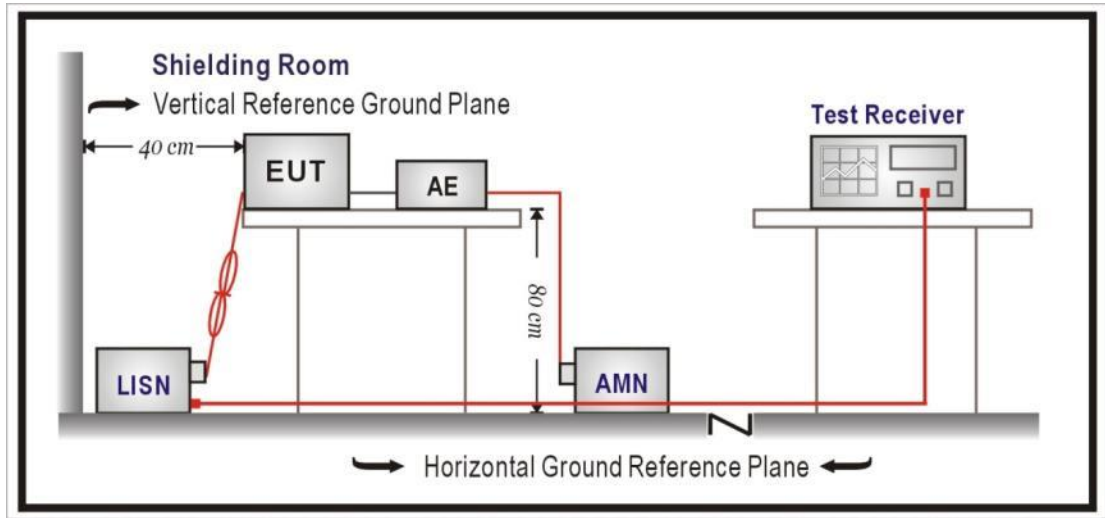
4.9 AC Power Line Conducted Emission	VERDICT: PASS
---	----------------------

4.9.1 Limit

Standard	FCC Part 15 Subpart C Paragraph 15.207; RSS-Gen Issue 5 Paragraph 8.8.	
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.

4.9.2 Test Setup



4.9.3 Test Procedure

	References Rule	Chapter	Item
<input checked="" type="checkbox"/>	ANSI C63.10-2013	6.2	Standard test method for ac power-line conducted emissions from unlicensed wireless devices

4.10 Antenna Requirement	VERDICT: PASS
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4.10.1 Limit:

Standard	FCC Part 15 Subpart C Paragraph 15.203; RSS-Gen Issue 5 Paragraph 6.8.
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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.

4.10.2 Antenna Connector Construction:

<input checked="" type="checkbox"/>	The use of a permanently attached antenna
<input type="checkbox"/>	The antenna use of a unique coupling to the intentional radiator
<input type="checkbox"/>	The use of a nonstandard antenna jack or electrical connector

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

5 TEST SETUP PHOTO AND EUT PHOTO

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

Appendix A: DTS Bandwidth

Test Result

Test Mode	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
Mode 1	2405	1.690	2404.170	2405.860	0.5	PASS
	2440	1.700	2439.130	2440.830	0.5	PASS
	2480	1.660	2479.170	2480.830	0.5	PASS

Test Graphs



Mode 1_2480



Appendix B: Occupied Channel Bandwidth

Test Result

Test Mode	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
Mode 1	2405	2.2861	2403.8404	2406.1265	2400~2483.5	Pass
	2440	2.2727	2438.8408	2441.1135	2400~2483.5	Pass
	2480	2.2947	2478.8262	2481.1209	2400~2483.5	Pass

Test Graphs



Mode 1_2480



Appendix C: Maximum conducted output power

Test Result Peak

Test Mode	Frequency[MHz]	Conducted Result[dBm]	Limit[dBm]	EIRP Result[dBm]	Limit[dBm]	Verdict
Mode 1	2405	10.63	≤30	11.63	≤36	PASS
	2440	10.65	≤30	11.65	≤36	PASS
	2480	10.07	≤30	11.07	≤36	PASS

Appendix D: Maximum power spectral density

Test Result

Test Mode	Frequency[MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
Mode 1	2405	-5.05	≤8.00	PASS
	2440	-5.01	≤8.00	PASS
	2480	-5.11	≤8.00	PASS

Test Graphs

Mode 1_2405



Mode 1_2440



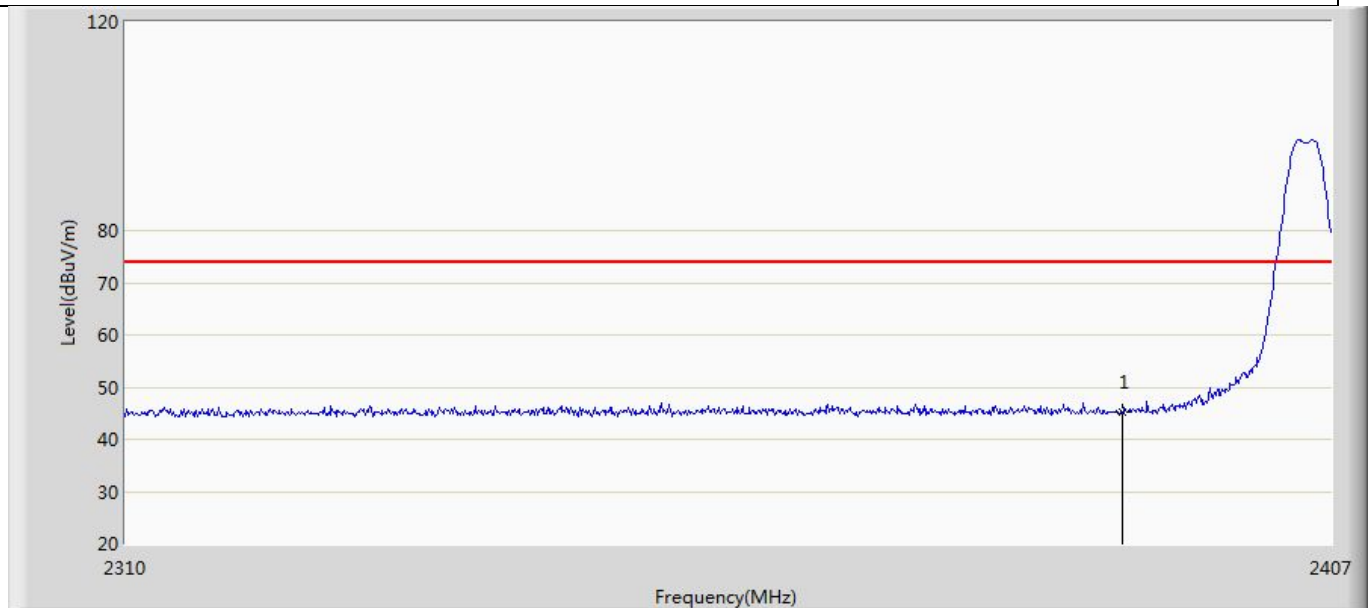
Mode 1_2480



Appendix E: Band edge measurements

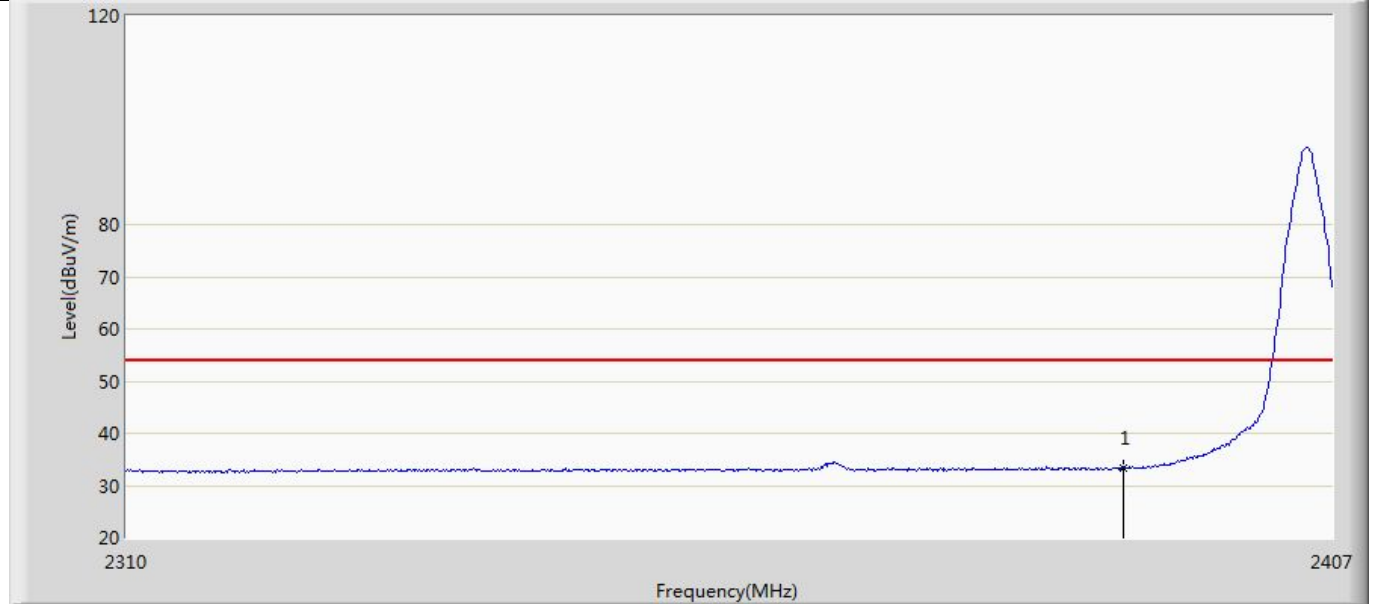
Test Result

Profile: 2320237R	Page No.: 33
Engineer: Yuliu	
Site: AC5	Time: 2023/02/21 - 21:40
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: LED LAMP	Power: 12Vac
Note: Mode 1 : Transmit at 2405MHz by Zigbee	



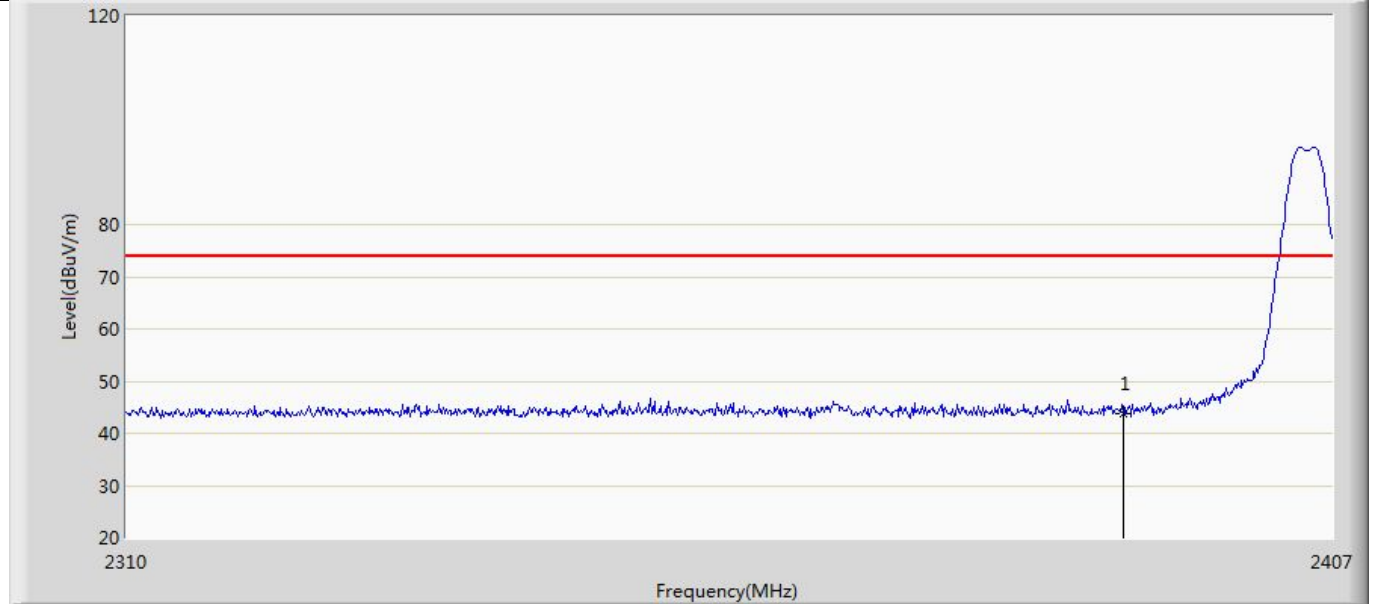
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	45.223	11.139	-28.777	74.000	34.084	PK

Profile: 2320237R	Page No.: 34
Engineer: Yuliu	
Site: AC5	Time: 2023/02/21 - 21:42
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: LED LAMP	Power: 12Vac
Note: Mode 1 : Transmit at 2405MHz by Zigbee	



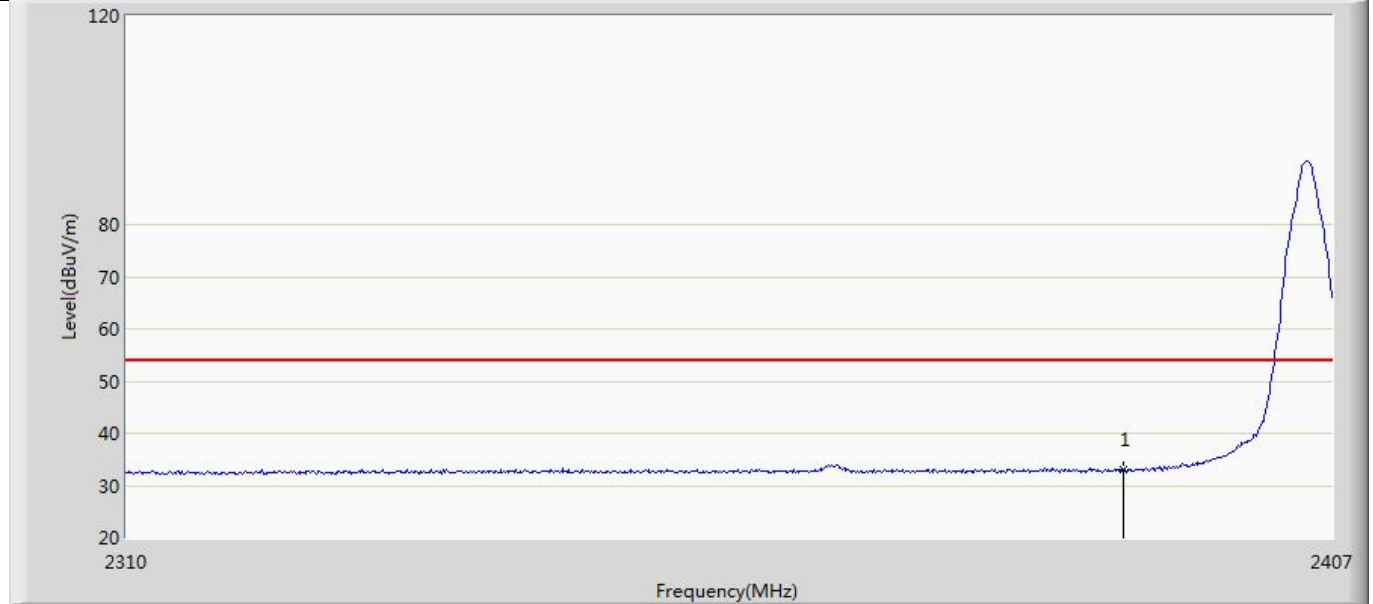
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	33.341	-0.743	-20.659	54.000	34.084	AV

Profile: 2320237R	Page No.: 35
Engineer: Yuliu	
Site: AC5	Time: 2023/02/21 - 21:43
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: LED LAMP	Power: 12Vac
Note: Mode 1 : Transmit at 2405MHz by Zigbee	



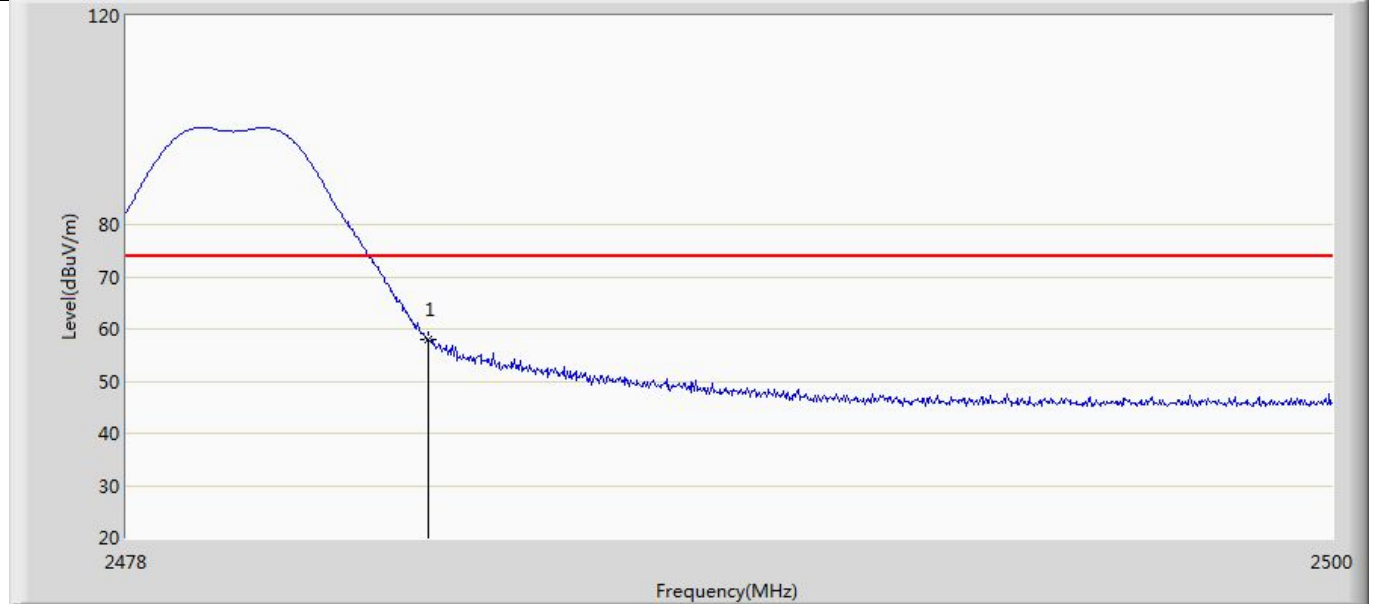
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	43.848	9.764	-30.152	74.000	34.084	PK

Profile: 2320237R	Page No.: 36
Engineer: Yuliu	
Site: AC5	Time: 2023/02/21 - 21:43
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: LED LAMP	Power: 12Vac
Note: Mode 1 : Transmit at 2405MHz by Zigbee	



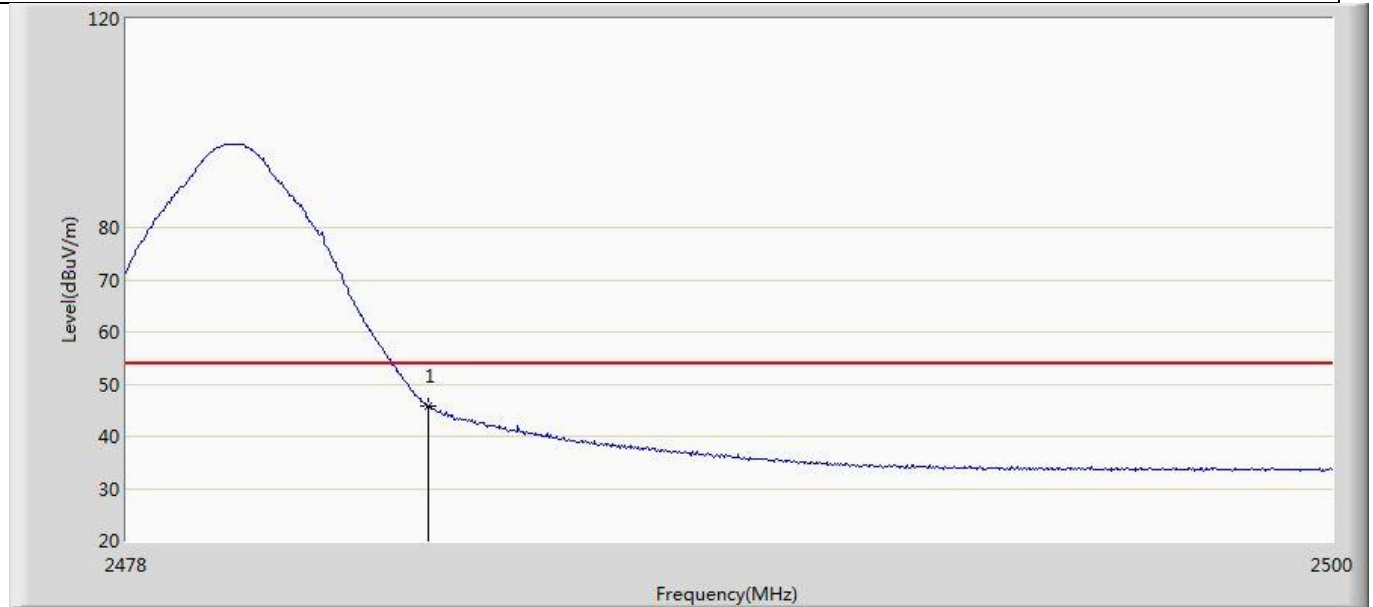
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	33.130	-0.954	-20.870	54.000	34.084	AV

Profile: 2320237R	Page No.: 37
Engineer: Yuliu	
Site: AC5	Time: 2023/02/21 - 21:43
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: LED LAMP	Power: 12Vac
Note: Mode 1 : Transmit at 2480MHz by Zigbee	



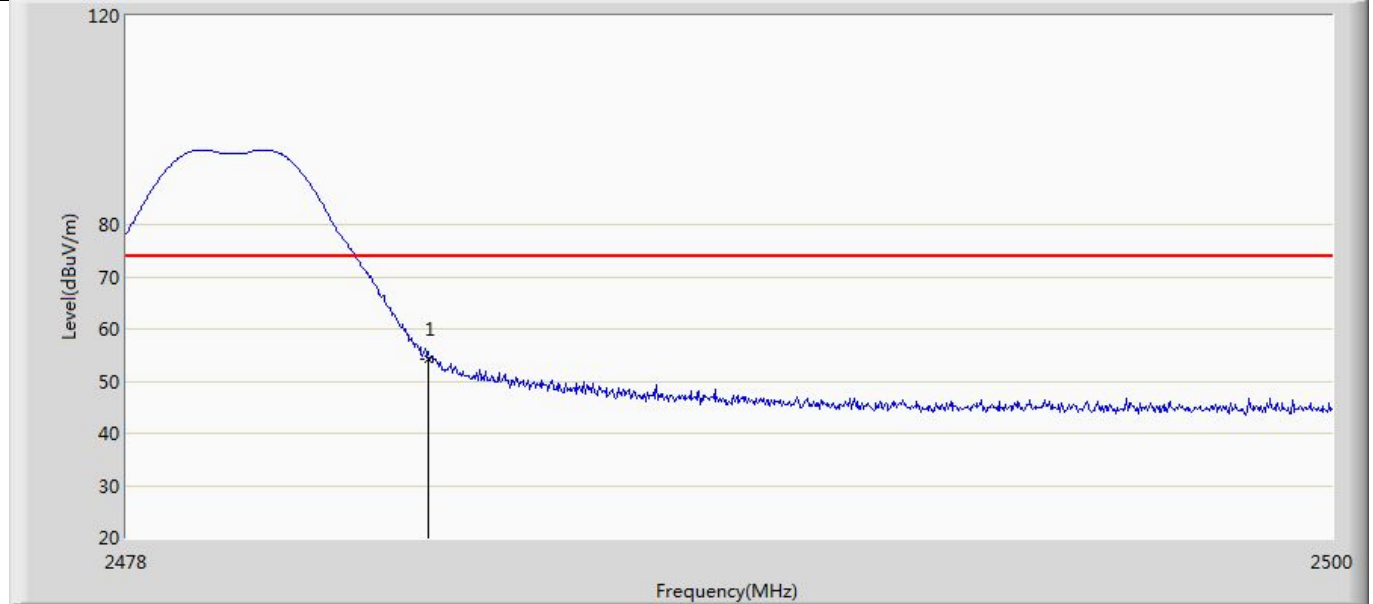
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	57.955	23.464	-16.045	74.000	34.491	PK

Profile: 2320237R	Page No.: 38
Engineer: Yuliu	
Site: AC5	Time: 2023/02/21 - 21:45
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: LED LAMP	Power: 12Vac
Note: Mode 1 : Transmit at 2480MHz by Zigbee	



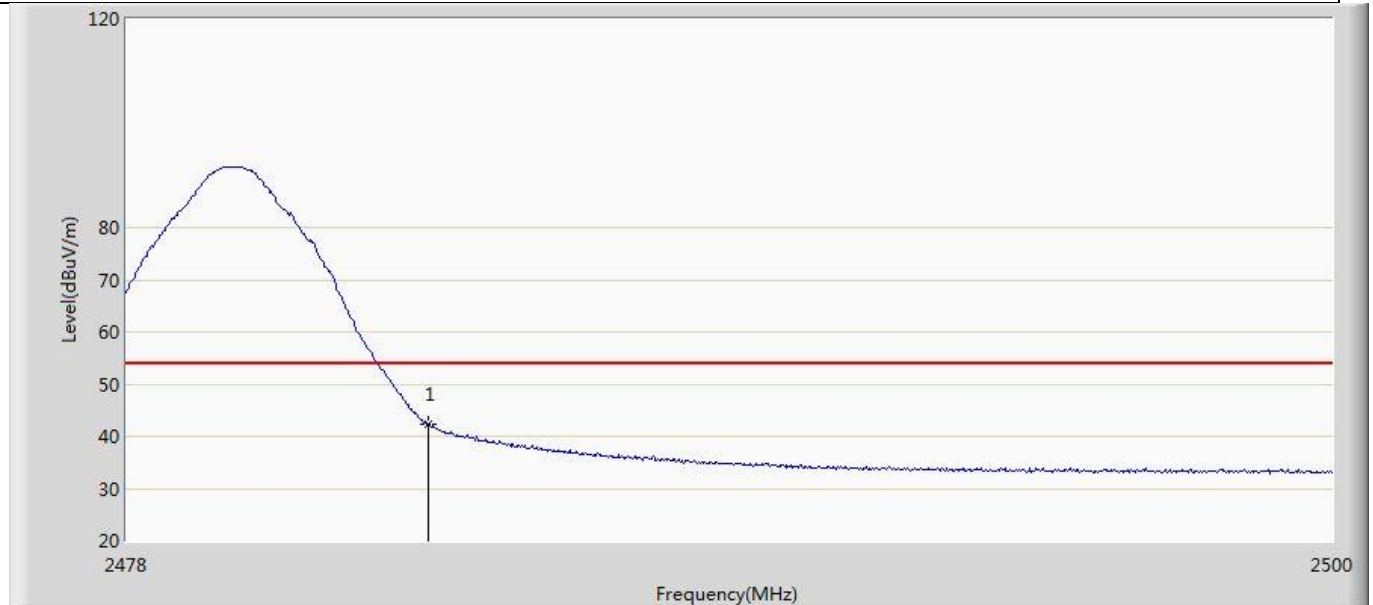
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	45.667	11.176	-8.333	54.000	34.491	AV

Profile: 2320237R	Page No.: 39
Engineer: Yuliu	
Site: AC5	Time: 2023/02/21 - 21:46
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: LED LAMP	Power: 12Vac
Note: Mode 1 : Transmit at 2480MHz by Zigbee	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	54.260	19.769	-19.740	74.000	34.491	PK

Profile: 2320237R	Page No.: 40
Engineer: Yuliu	
Site: AC5	Time: 2023/02/21 - 21:46
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: LED LAMP	Power: 12Vac
Note: Mode 1 : Transmit at 2480MHz by Zigbee	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	42.177	7.686	-11.823	54.000	34.491	AV

Note:

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

Appendix F: Conducted Spurious Emission

Test Result

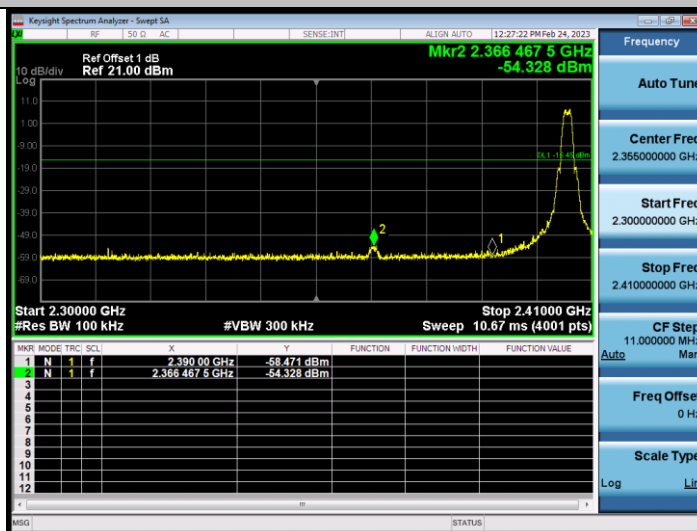
Test Mode	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
Mode1	2405	Reference	4.55	4.55	---	PASS
		2300~2410	4.55	-54.32	≤-15.45	PASS
		30~1000	4.55	-53.98	≤-15.45	PASS
		1000~26500	4.55	-37.63	≤-15.45	PASS
	2440	Reference	5.17	5.17	---	PASS
		30~1000	5.17	-53.29	≤-14.83	PASS
		1000~26500	5.17	-37.39	≤-14.83	PASS
	2480	Reference	4.43	4.43	---	PASS
		2470~2550	4.43	-53.43	≤-15.57	PASS
		30~1000	4.43	-53.62	≤-15.57	PASS
		1000~26500	4.43	-37.55	≤-15.57	PASS

Test Graphs

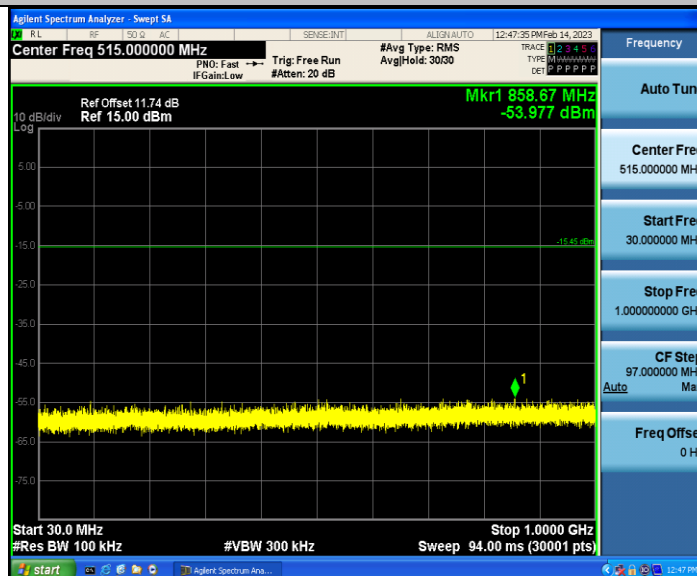
Mode1_2405_0~Reference



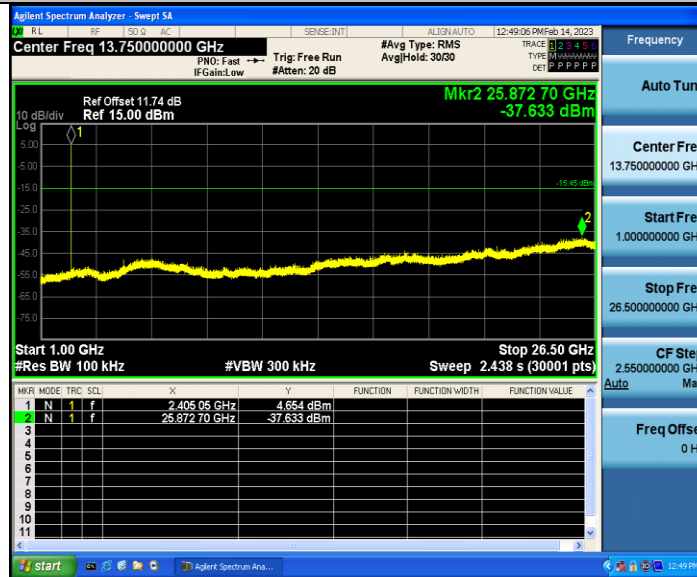
Mode1_2405_2300~2410



Mode1_2405_30~1000



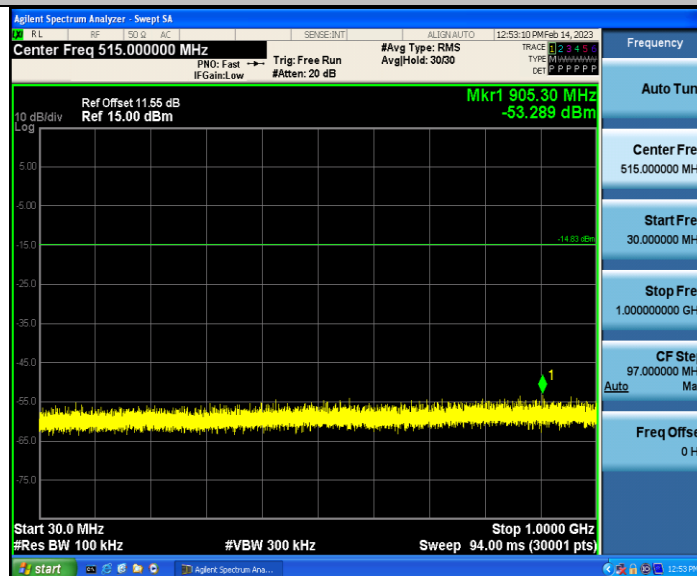
Mode1_2405_1000~26500



Mode1_2440_0~Reference



Mode1_2440_30~1000



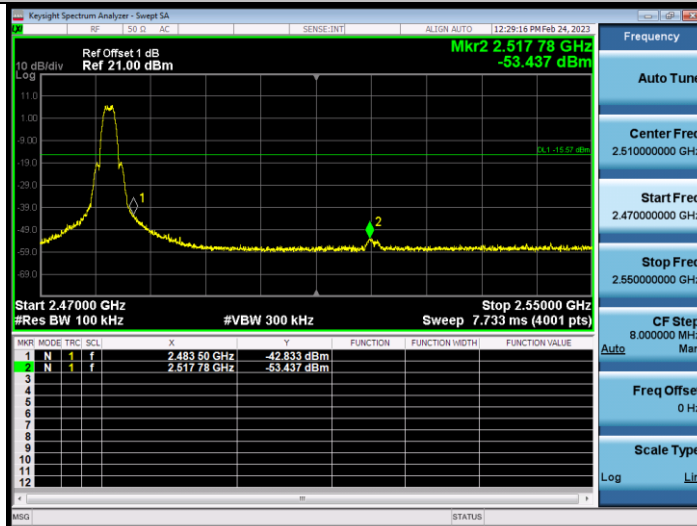
Mode1_2440_1000~26500



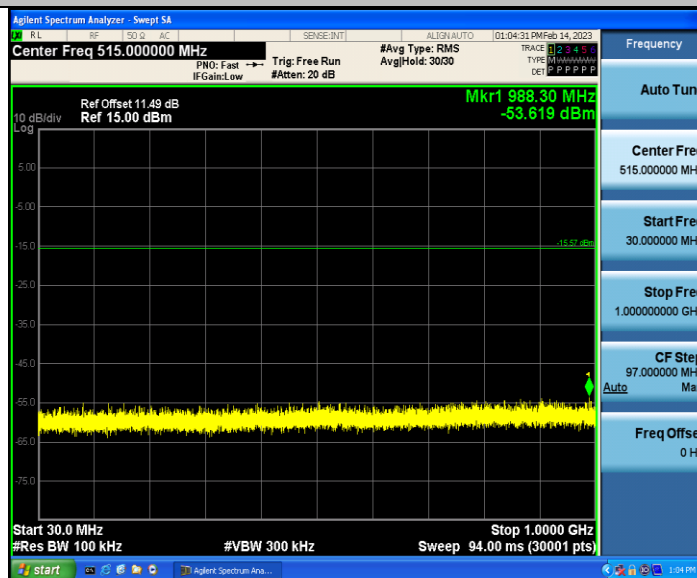
Mode1_2480_0~Reference



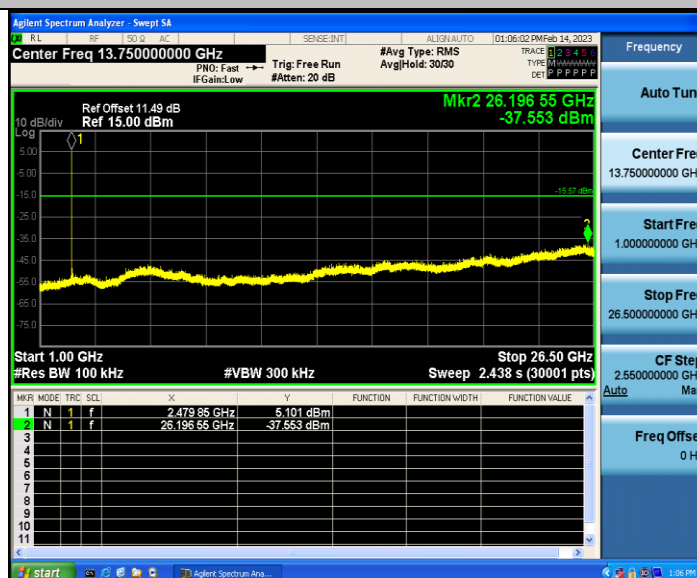
Mode1_2480_2470~2550



Mode1_2480_30~1000



Mode1_2480_1000~26500



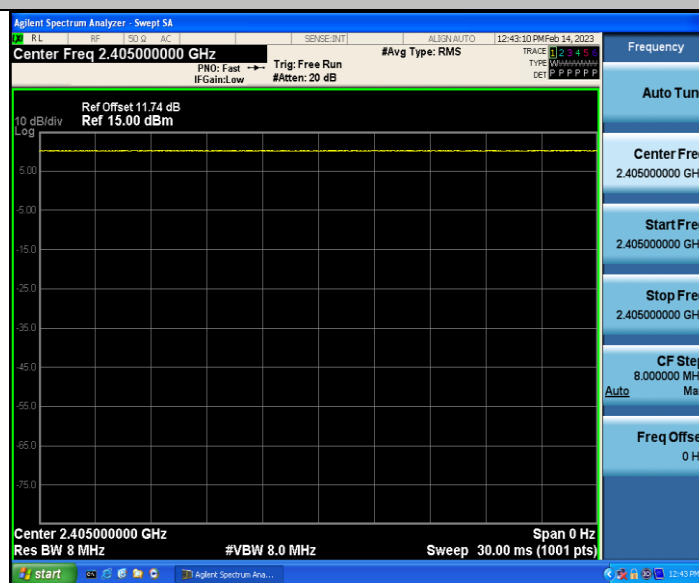
Appendix G: Duty Cycle

Test Result

Test Mode	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
Mode 1	2405	N/A	N/A	100
	2440	N/A	N/A	100
	2480	N/A	N/A	100

Test Graphs

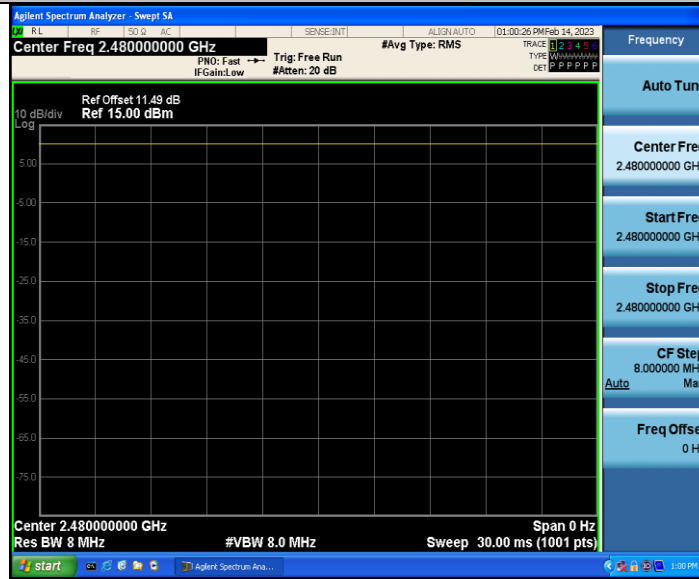
Mode 1_2405



Mode 1_2440



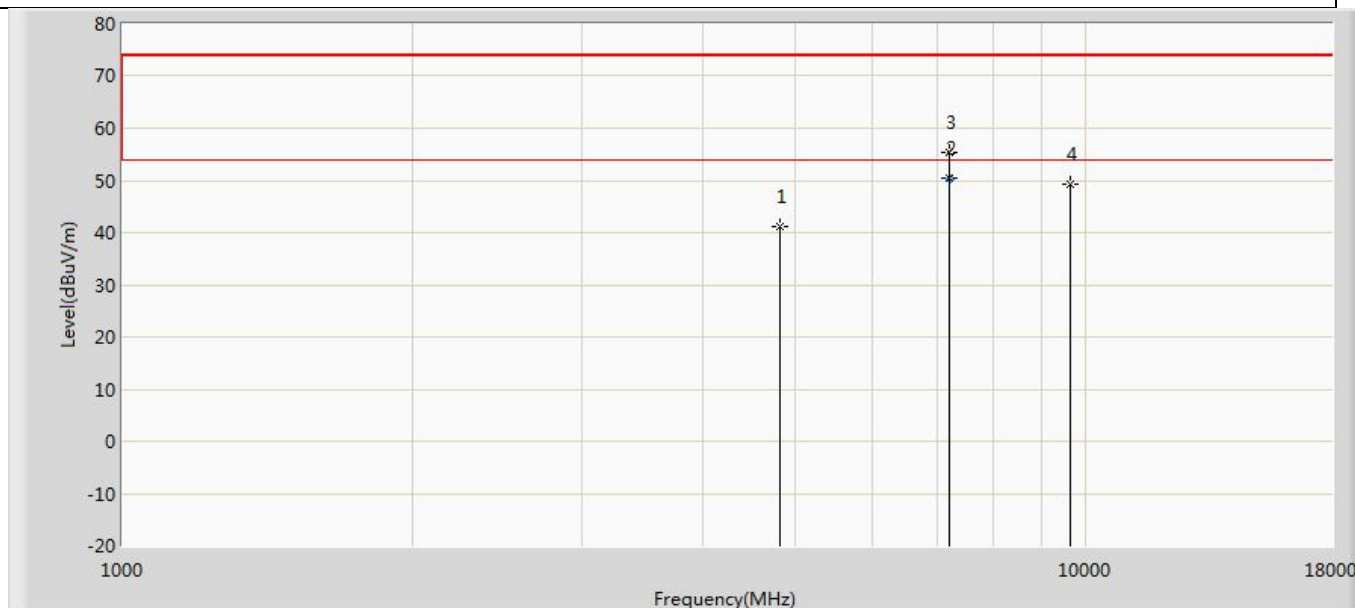
Mode 1_2480



Appendix H: Emissions in Restricted Bands

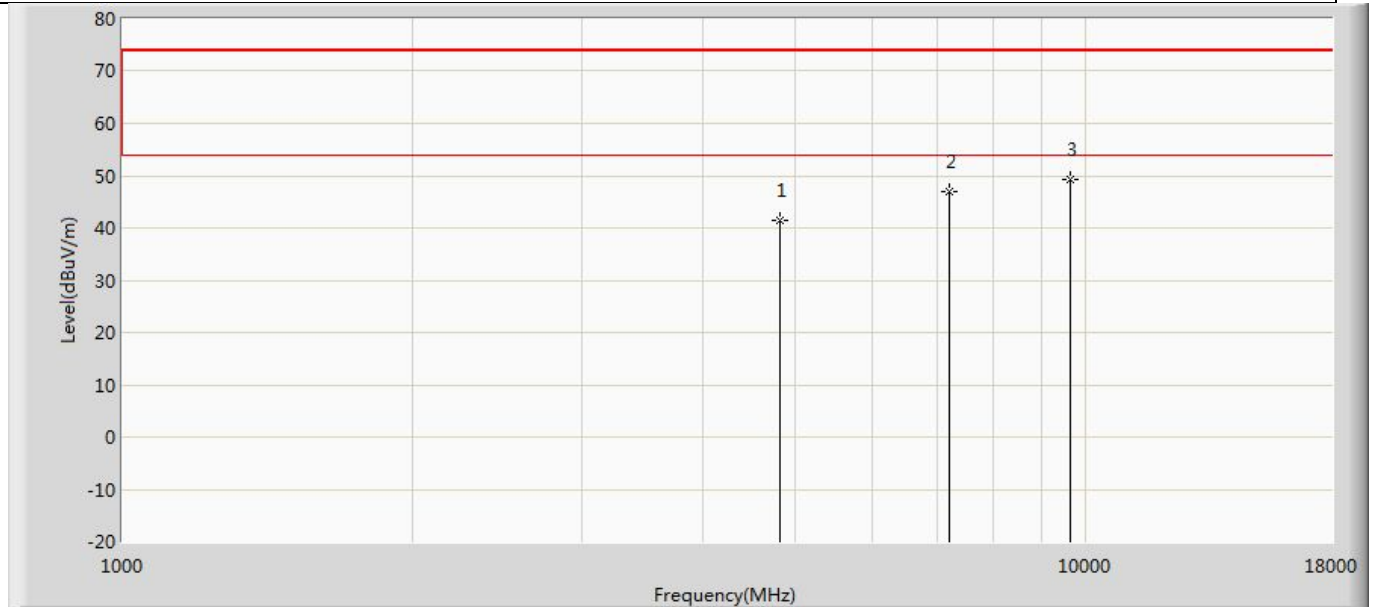
Test Result

Profile: 2320237R	Page No.: 55
Engineer: Yu Liu	
Site: AC5	Time: 2023/02/21 - 22:18
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: LED Lamp	Power: 12Vac
Note: Mode 1 : Transmit at 2405MHz by Zigbee	



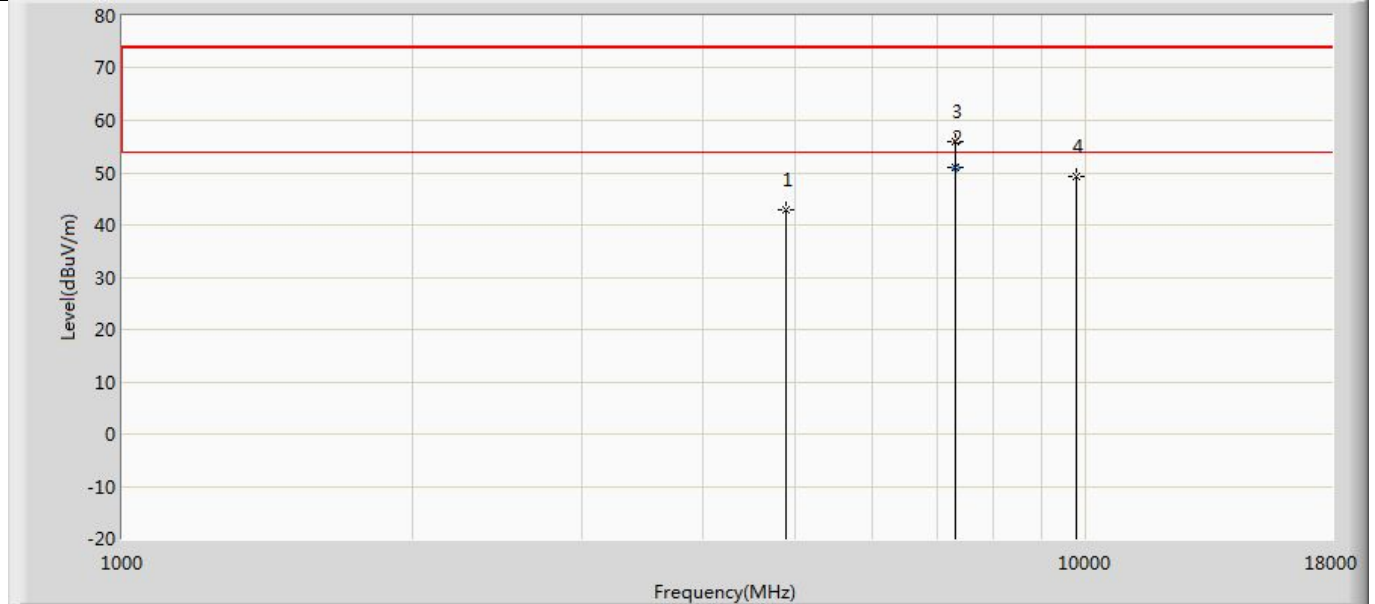
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4810.000	41.079	55.726	-32.921	74.000	-14.647	PK
2	*	7216.530	50.410	60.190	-3.590	54.000	-9.780	AV
3		7222.000	55.423	65.237	-18.577	74.000	-9.814	PK
4		9620.000	49.277	55.089	-24.723	74.000	-5.811	PK

Profile: 2320237R	Page No.: 56
Engineer: Yu Liu	
Site: AC5	Time: 2023/02/21 - 22:18
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: LED Lamp	Power: 12Vac
Note: Mode 1 : Transmit at 2405MHz by Zigbee	



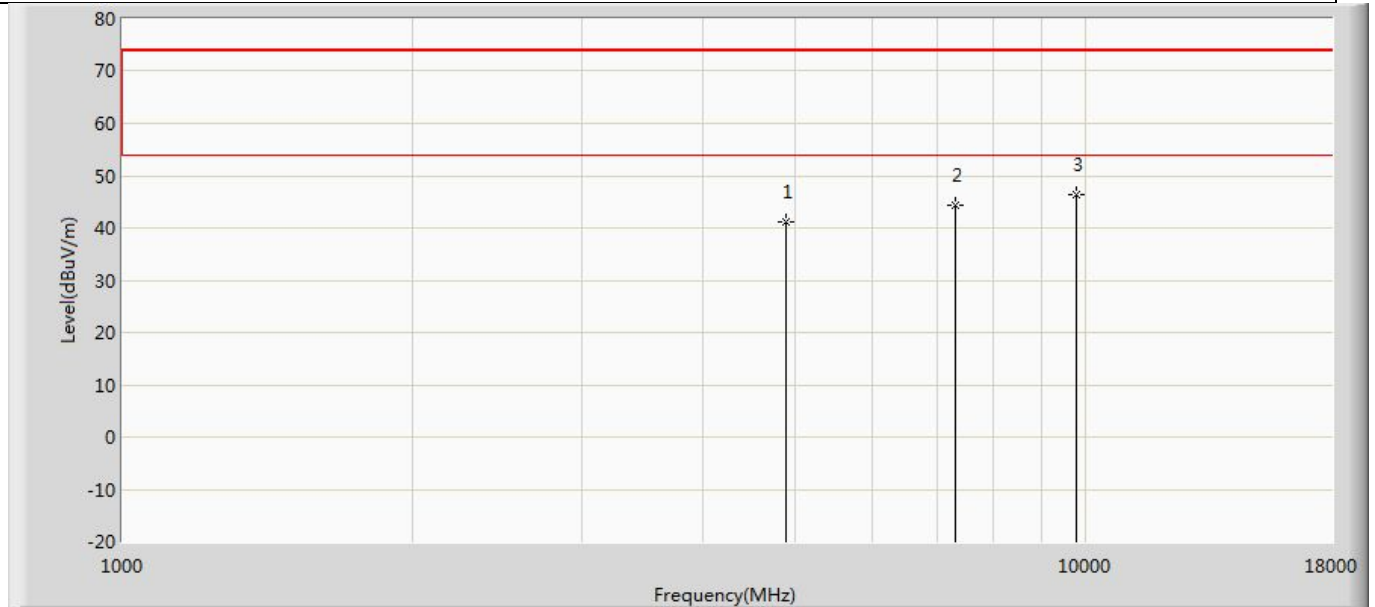
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4810.000	41.451	56.098	-32.549	74.000	-14.647	PK
2		7215.000	46.903	56.674	-27.097	74.000	-9.772	PK
3	*	9620.000	49.404	55.216	-24.596	74.000	-5.811	PK

Profile: 2320237R	Page No.: 57
Engineer: Yu Liu	
Site: AC5	Time: 2023/02/21 - 22:18
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: LED Lamp	Power: 12Vac
Note: Mode 1 : Transmit at 2440MHz by Zigbee	



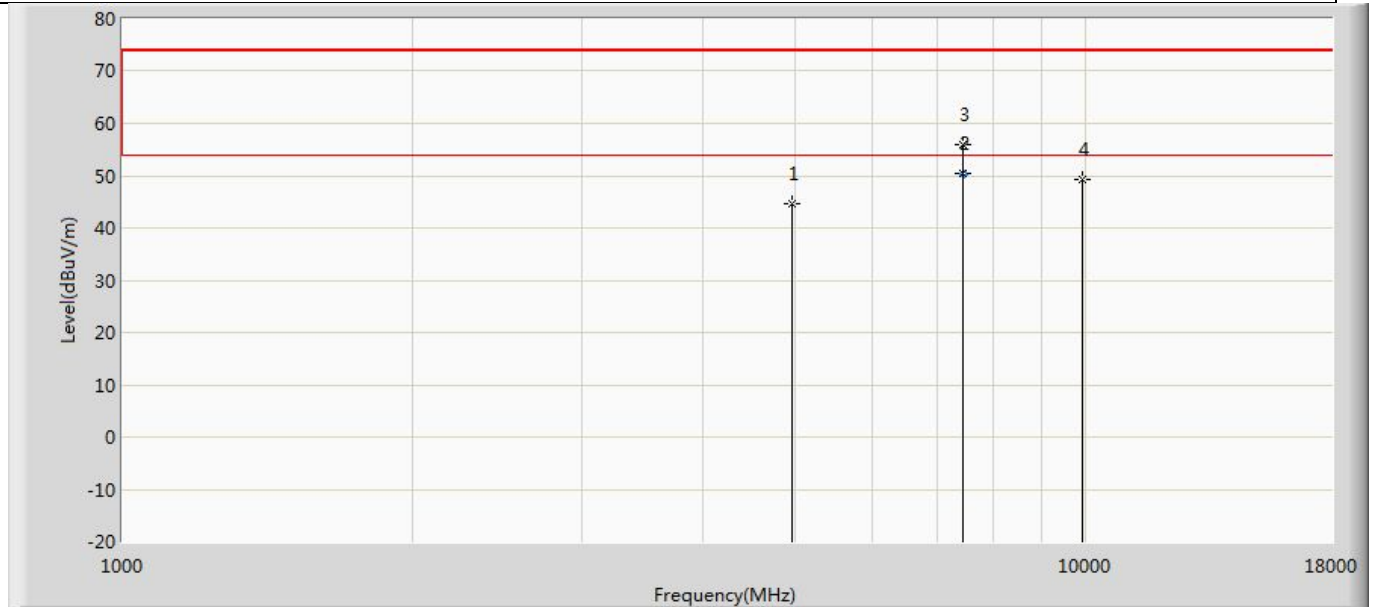
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4880.000	42.807	57.101	-31.193	74.000	-14.294	PK
2	*	7318.110	50.891	60.627	-3.109	54.000	-9.736	AV
3		7324.000	55.902	65.628	-18.098	74.000	-9.726	PK
4		9760.000	49.260	54.811	-24.740	74.000	-5.550	PK

Profile: 2320237R	Page No.: 58
Engineer: Yu Liu	
Site: AC5	Time: 2023/02/21 - 22:18
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: LED Lamp	Power: 12Vac
Note: Mode 1 : Transmit at 2440MHz by Zigbee	



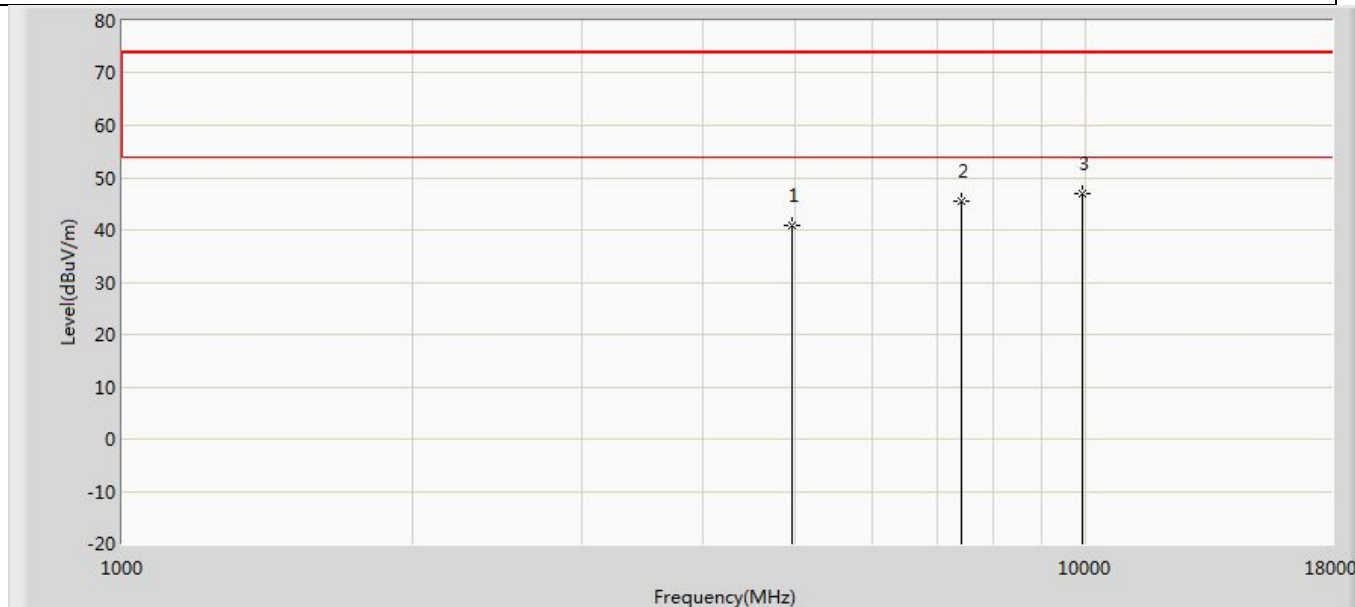
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4880.000	41.263	55.557	-32.737	74.000	-14.294	PK
2		7320.000	44.261	53.993	-29.739	74.000	-9.732	PK
3	*	9760.000	46.460	52.011	-27.540	74.000	-5.550	PK

Profile: 2320237R	Page No.: 59
Engineer: Yu Liu	
Site: AC5	Time: 2023/02/21 - 22:18
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: LED Lamp	Power: 12Vac
Note: Mode 1 : Transmit at 2480MHz by Zigbee	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4960.000	44.501	58.652	-29.499	74.000	-14.151	PK
2	*	7441.490	50.348	59.739	-3.652	54.000	-9.391	AV
3		7443.000	56.047	65.467	-17.953	74.000	-9.421	PK
4		9920.000	49.180	54.092	-24.820	74.000	-4.913	PK

Profile: 2320237R	Page No.: 60
Engineer: Yu Liu	
Site: AC5	Time: 2023/02/21 - 22:18
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: LED Lamp	Power: 12Vac
Note: Mode 1 : Transmit at 2480MHz by Zigbee	



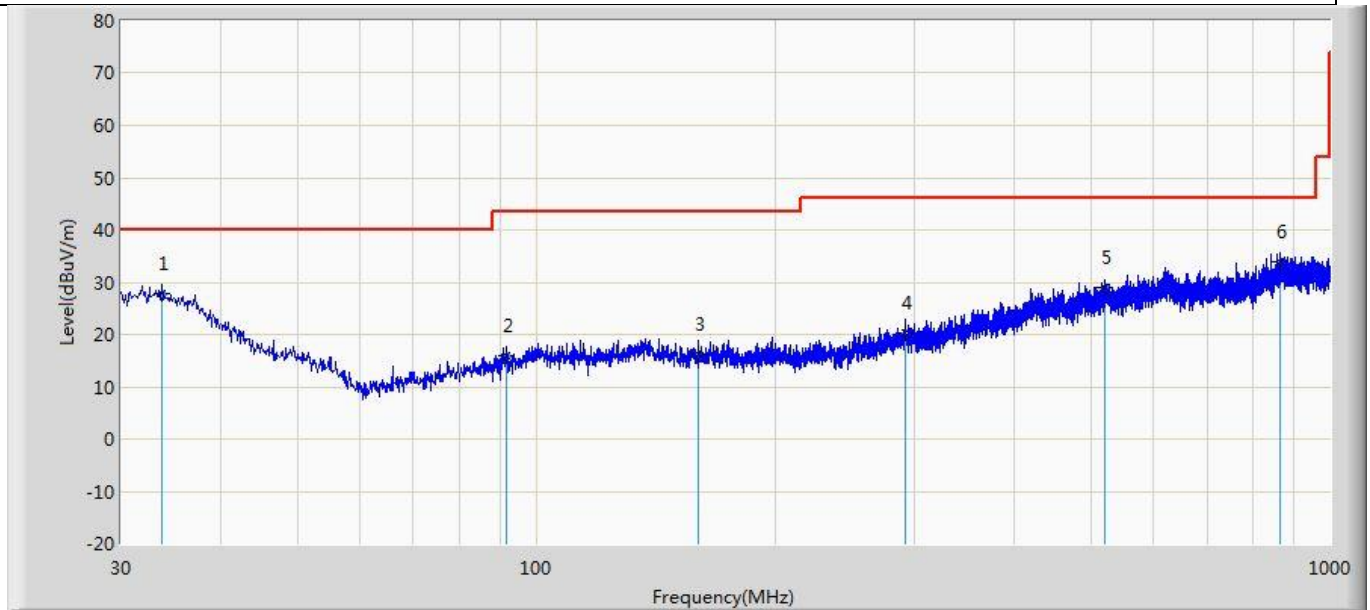
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4960.000	40.852	55.003	-33.148	74.000	-14.151	PK
2		7440.000	45.628	54.990	-28.372	74.000	-9.362	PK
3	*	9920.000	46.976	51.888	-27.024	74.000	-4.913	PK

Note:

1. " * ", means this data is the worst emission level.
2. Measured Level = Reading Level + Factor.
3. The test frequency range 9kHz~30MHz and above 18GHz, worst case are at least 20dB below the limits, therefore no data appear in the report.
4. This limit applies for both peak and average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

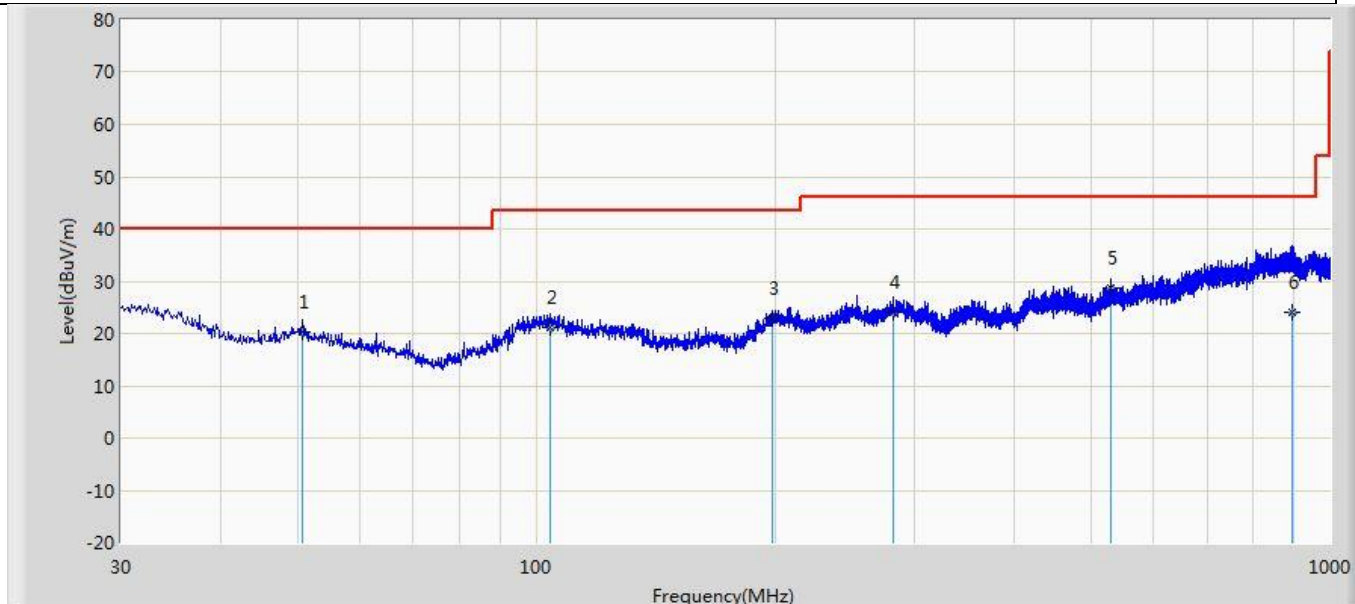
The worst case of Radiated Emission below 1GHz:

Profile: 2320237R	Page No.: 1
Engineer: Yu Liu	
Site: AC2	Time: 2023/02/24 - 19:49
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Horizontal
EUT: LED Lamp	Power: 12Vac
Note: Mode 1: Transmit at 2405MHz by Zigbee	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		33.759	27.885	0.818	-12.115	40.000	27.067	QP
2		91.716	15.933	1.986	-27.567	43.500	13.947	QP
3		159.980	16.357	-0.726	-27.143	43.500	17.083	QP
4		291.415	20.260	-0.360	-25.740	46.000	20.620	QP
5		521.305	28.934	0.349	-17.066	46.000	28.584	QP
6	*	866.140	33.930	1.006	-12.070	46.000	32.924	QP

Profile: 2320237R	Page No.: 2
Engineer: Yu Liu	
Site: AC2	Time: 2023/02/24 - 19:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Vertical
EUT: LED Lamp	Power: 12Vac
Note: Mode 1:Transmit at 2405MHz by Zigbee	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		50.734	20.269	0.971	-19.731	40.000	19.298	QP
2		104.205	21.139	-1.122	-22.361	43.500	22.262	QP
3		198.659	22.917	-0.222	-20.583	43.500	23.140	QP
4		281.594	24.128	-0.910	-21.872	46.000	25.038	QP
5	*	530.520	28.719	1.544	-17.281	46.000	27.175	QP
6		896.937	24.138	-9.301	-21.862	46.000	33.439	QP

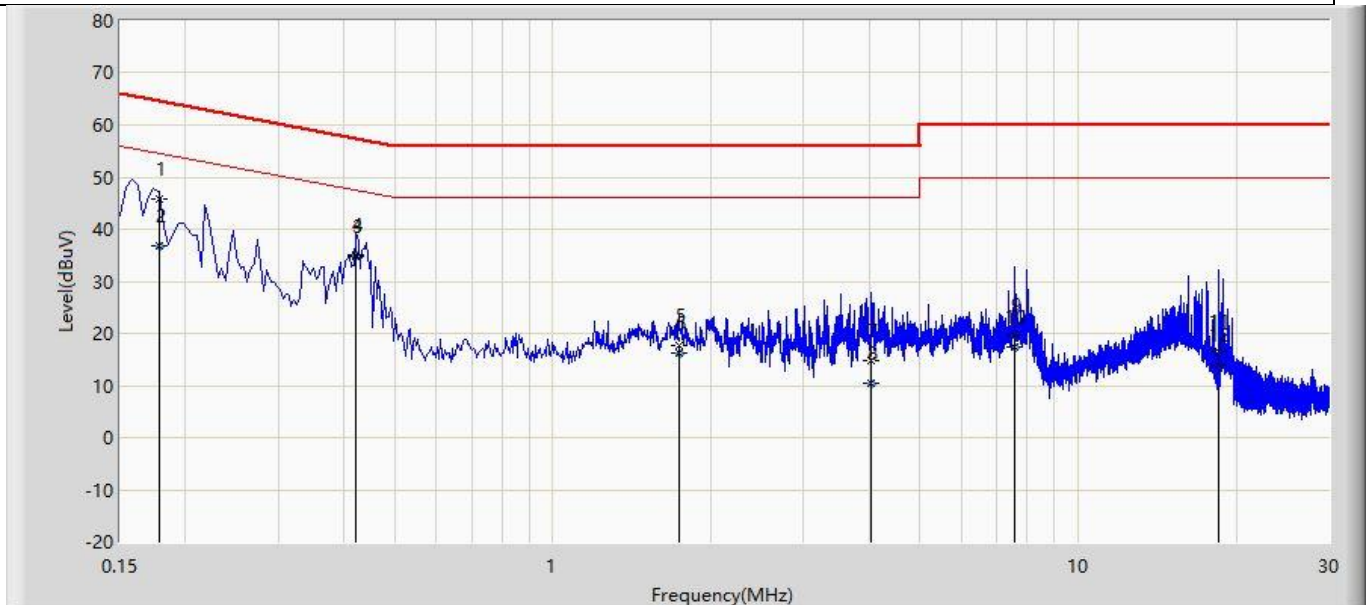
Note:

1. " * ", means this data is the worst emission level.
2. Measured Level = Reading Level + Factor.
3. The test frequency range 9kHz~30MHz and above 18GHz, worst case are at least 20dB below the limits, therefore no data appear in the report.
4. This limit applies for both peak and average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Appendix I: AC Power Line Conducted Emission

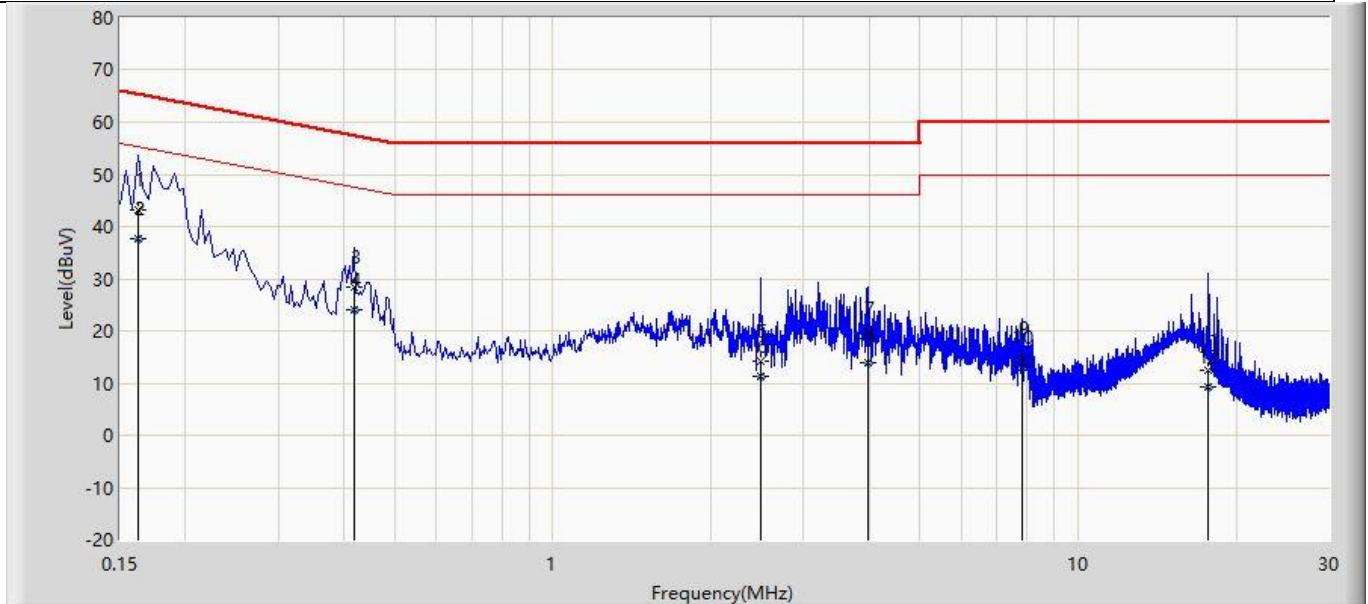
Test Result

Profile: 2320237R	Page No.: 1
Engineer: Yu Liu	
Site: TR1	Time: 2023/02/24 - 19:39
Limit: FCC_Part15.207_CE_AC Power	Margin: 0
Probe: ENV216_101190(0.009-30MHz)	Polarity: Neutral
EUT: LED Lamp	Power: 12Vac
Note: Mode 1: Transmit at 2405MHz by Zigbee	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		0.178	45.712	36.136	-18.867	64.578	9.576	QP
2		0.178	36.804	27.228	-17.775	54.578	9.576	AV
3		0.422	34.662	25.043	-22.747	57.409	9.618	QP
4	*	0.422	35.019	25.400	-12.390	47.409	9.618	AV
5		1.734	17.667	7.997	-38.333	56.000	9.671	QP
6		1.734	16.325	6.654	-29.675	46.000	9.671	AV
7		4.038	14.909	5.138	-41.091	56.000	9.771	QP
8		4.038	10.300	0.529	-35.700	46.000	9.771	AV
9		7.590	19.743	9.825	-40.257	60.000	9.918	QP
10		7.590	17.375	7.457	-32.625	50.000	9.918	AV
11		18.482	16.632	6.400	-43.368	60.000	10.233	QP
12		18.482	13.929	3.696	-36.071	50.000	10.233	AV

Profile: 2320237R	Page No.: 2
Engineer: Yu Liu	
Site: TR1	Time: 2023/02/24 - 19:43
Limit: FCC_Part15.207_CE_AC Power	Margin: 0
Probe: ENV216_101190(0.009-30MHz)	Polarity: Line
EUT: LED Lamp	Power: 12Vac
Note: Mode 1:Transmit at 2405MHz by Zigbee	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		0.162	43.250	33.669	-22.111	65.361	9.582	QP
2	*	0.162	37.555	27.973	-17.806	55.361	9.582	AV
3		0.418	28.478	18.857	-29.010	57.488	9.621	QP
4		0.418	24.155	14.533	-23.333	47.488	9.621	AV
5		2.486	14.066	4.366	-41.934	56.000	9.701	QP
6		2.486	11.398	1.697	-34.602	46.000	9.701	AV
7		3.970	18.634	8.865	-37.366	56.000	9.769	QP
8		3.970	13.941	4.172	-32.059	46.000	9.769	AV
9		7.834	14.915	4.977	-45.085	60.000	9.938	QP
10		7.834	13.174	3.236	-36.826	50.000	9.938	AV
11		17.694	12.358	2.171	-47.642	60.000	10.187	QP
12		17.694	9.317	-0.870	-40.683	50.000	10.187	AV

Note:

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

The End