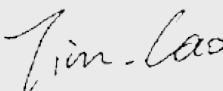
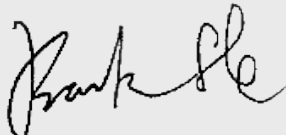


Test report No:
24B1032R-RF-US-P06V01

FCC & ISED TEST REPORT

Product Name	LED Lamp
Trademark	PHILIPS, hue, Signify
Model and /or type reference	9290042356
FCC ID	2AGBW9290042356X
IC	20812-42356X
Applicant's name / address	Signify (China) Investment Co., Ltd No.9, Lane 888, Tian Lin Road, 200233, Shanghai, China
Test method requested, standard	47 CFR FCC Part 15 (Section 15.247) ANSI C63.10: 2013 RSS-Gen Issue 5 RSS-247 Issue 3
Verdict Summary	IN COMPLIANCE
Documented by (name / position & signature)	Tim Cao/ Project Manager 
Approved by (name / position & signature)	Frank He/ Technical Manager 
Date of issue	2025-04-03
Report Version	V1.1
Report template No	Template_FCC Part 15C-RF-V1.0

INDEX

	page
General conditions.....	5
Environmental conditions	5
Possible test case verdicts	6
Abbreviations.....	6
Document History	7
Remarks and Comments.....	7
Used Equipment.....	8
Uncertainty	11
1 General Information.....	12
1.1 General Description of the Item(s)	12
1.2 Antenna Information	13
1.3 Channel List	14
2 Description of Test Setup	15
2.1 Operating mode(s) used for tests.....	15
2.2 Auxiliary equipment / Test software for the EUT	15
2.3 Test Configuration / Block diagram used for tests	16
2.4 Testing process	18
3 Verdict summary section	19
3.1 Standards	19
3.2 Deviation(s) from the Standard(s) / Test Specification(s)	19
3.3 Overview of results.....	20
3.4 Power setting in test.....	22
3.5 Test Matrix.....	22
3.6 Test Facility	23
4 Test Items Of Limit/Setup/Procedure	24
4.1 DTS Bandwidth	24
4.1.1 Limit.....	24
4.1.2 Test Setup.....	24
4.1.3 Test Procedure.....	24
4.2 Occupied Channel Bandwidth	25
4.2.1 Limit.....	25
4.2.2 Test Setup.....	25
4.2.3 Test Procedure.....	25
4.3 Maximum Conducted Output Power	26

4.3.1	Limit.....	26
4.3.2	Test Setup.....	26
4.3.3	Test Procedure.....	27
4.4	Maximum Power Spectral Density	28
4.4.1	Limit.....	28
4.4.2	Test Setup.....	28
4.4.3	Test Procedure.....	28
4.5	Band Edge Measurements.....	29
4.5.1	Limit.....	29
4.5.2	Test Setup.....	29
4.5.3	Test Procedure.....	29
4.6	Conducted Spurious Emission	30
4.6.1	Limit.....	30
4.6.2	Test Setup.....	30
4.6.3	Test Procedure.....	30
4.7	Duty cycle.....	31
4.7.1	Limit.....	31
4.7.2	Test Setup.....	31
4.7.3	Test Procedure.....	31
4.8	Emissions in Restricted Bands.....	32
4.8.1	Limit.....	32
4.8.2	Test Setup.....	34
4.8.3	Test Procedure.....	35
4.9	AC Power Line Conducted Emission	36
4.9.1	Limit.....	36
4.9.2	Test Setup.....	36
4.9.3	Test Procedure.....	36
4.10	Antenna Requirement	37
4.10.1	Limit:.....	37
4.10.2	Antenna Connector Construction:	37
5	Test setup photo and EUT Photo	37
6	Test Result	38
	Appendix A: DTS Bandwidth	38
	Appendix B: Occupied Channel Bandwidth.....	40
	Appendix C: Maximum conducted output power	42
	Appendix D: Maximum power spectral density	43
	Appendix E: Band edge measurements.....	45



Appendix F Conducted Spurious Emission	53
Appendix G: Duty Cycle	77
Appendix H: Emissions in Restricted Bands	79
Appendix I: AC Power Line Conducted Emission	87

COMPETENCES AND GUARANTEES

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

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

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

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

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

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

GENERAL CONDITIONS

Test Location	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Date(receive sample)	Dec. 04, 2024
Date (start test)	Dec. 06, 2024
Date (finish test)	Dec. 22, 2024

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
24B1032R-RF-US-P06V01	V1.0	Initial issue of report.	2025-03-20
24B1032R-RF-US-P06V01	V1.1	Page 1, 12: Update trademark, FCC ID and IC ID. (The test report No.: 24B1032R-RF-US-P06V01 V1.1 is to replace the test report No.: 24B1032R-RF-US-P06V01 V1.0, and test report 24B1032R-RF-US-P06V01 V1.0 is obsoleted.)	2025-04-03

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 47 CFR FCC Part 15 (Section 15.247),RSS-247 Issue 3, RSS-Gen Issue 5.
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

Conducted Test/ TR8

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date	Firmware Version	Software version
Wireless Connectivity Tester	R&S	CMW 270	102593	2024.05.15	2025.05.14	V 4.0.60	N/A
Coaxial Cable	N/A	N/A	2477	2024.06.11	2025.06.10	N/A	N/A
Coaxial Cable	N/A	N/A	2478	2024.06.11	2025.06.10	N/A	N/A
High and low temperature and fast temperature change test box	ASTUOD	ASTD-FBT-225K	N/A	2024.04.21	2025.04.20	N/A	N/A
Temperature/Humidity Meter	RTS	RTS-8S	RF08	2024.07.11	2025.07.10	N/A	N/A
Test system							
Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date	Firmware Version	Software version
MAX Signal Analyzer	Keysight	N9010A	MY48030494	2024.10.26	2025.10.25	A.14.03	N/A
RF Control Unit	Tonscend	JS0806-2	22G8060594	2024.02.06	2025.02.05	N/A	N/A
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY61252529	2024.05.12	2025.05.11	B.01.96	N/A
Frequency extender for EXG or MXG	Keysight	N5182BX07	MY59362500	2024.05.12	2025.05.11	N/A	N/A
EXG-B MW Analog Signal Generator	Keysight	N5173B	MY61252566	2024.07.06	2025.07.05	B.01.95	N/A
Test Software	Tonscend	TS1120	JS1120-3	N/A	N/A	N/A	V3.0.22

AC Power Line Conducted Emission / TR1

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date	Firmware Version	Software version
EMI Test Receiver	R&S	ESCI	100726	2024.07.06	2025.07.05	4.42 SP1	N/A
Two-Line V-Network	R&S	ENV 216	101044	2024.10.26	2025.10.25	N/A	N/A
Two-Line V-Network	R&S	ENV 216	101189	2024.07.06	2025.07.05	N/A	N/A
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2024.04.20	2025.04.19	N/A	N/A
Coaxial Cable	Huber+Suhner	RG 223	TR1-C1	2024.04.27	2025.04.26	N/A	N/A
Impedance Stabilization Network	Teseq GmbH	ISN T800	57318	2024.01.20	2025.01.19	N/A	N/A
Temperature/Humidity Meter	RTS	RTS-8S	EMC01	2024.07.04	2025.07.03	N/A	N/A
Dekra test software	Dekra	N/A	N/A	N/A	N/A	N/A	3

Radiated Emission(9KHz-1GHz) / AC2

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date	Firmware Version	Software version
EMI Test Receiver	R&S	ESCI	100573	2024.02.06	2025.02.05	4.42 SP3	N/A
Loop Antenna	R&S	HFH2-Z2E	101149	2024.03.27	2025.03.26	N/A	N/A
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2024.03.20	2025.03.19	N/A	N/A
Temperature/Humidity Meter	RTS	RTS-8S	AC2-TH	2024.05.17	2025.05.16	N/A	N/A
Coaxial Cable	Huber+Suhner	RTS-1909	THM-021	2024.04.27	2025.04.26	N/A	N/A
Dekra test software	Dekra	N/A	N/A	N/A	N/A	N/A	3

Radiated Emission (1GHz-40GHz) / AC5

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date	Firmware Version	Software version
EXA Spectrum Analyzer	Keysight	N9020B	MY60112218	2024.11.02	2025.11.01	A.31.05	N/A
Pre-Amplifier	SKET	LNPA_0118G-45	SK2021090101	2024.04.27	2025.04.26	N/A	N/A
Preamplifier	CHENGYI	EMC184045SE	980263	2024.07.06	2025.07.05	N/A	N/A
DRG Horn	ETS-Lindgren	3117	123988	2024.08.29	2025.08.28	N/A	N/A
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2024.05.30	2025.05.29	N/A	N/A
Filter Switch Box	MVE	MSW-F196	C070001S	2024.04.20	2025.04.19	N/A	N/A
Temperature/Humidity Meter	RTS	RTS-1909	THM-024	2024.05.17	2025.05.16	N/A	N/A
Coaxial Cable	TIMES	ROSENBERGER	LA1-C011-2000/3000	2024.01.25	2025.01.24	N/A	N/A
Cable	Rosenberger	LA1-C011-1000	0523	2024.05.26	2025.05.25	N/A	N/A
Cable	Rosenberger	LA1-C011-1000	0623	2024.05.26	2025.05.25	N/A	N/A
Dekra test software	Dekra	N/A	N/A	N/A	N/A	N/A	3

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: 2.60dB 150kHz~30MHz: 2.90dB
Peak Power Output	± 1.27 dB
Radiated Emission(30MHz~1GHz)	Horizontal: 30MHz~200MHz: 3.50 dB 200MHz~1GHz: 3.60 dB Vertical: 30MHz~200MHz: 3.60 dB 200MHz~1GHz: 3.80 dB
Radiated Emission(1GHz~26.5GHz)	Horizontal: 1GHz~18GHz: 5.00 dB Vertical: 1GHz~18GHz: 4.80 dB Horizontal: 18GHz~26.5GHz: 5.30 dB Vertical: 18GHz~26.5GHz: 4.90 dB
RF antenna conducted test	± 1.27 dB
Radiated Emission Band Edge	± 3.9 dB
DTS Bandwidth	± 1 kHz
Occupied Bandwidth	± 1 kHz
Power Density	± 1.27 dB

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Product Name.....:	LED Lamp
Model No.:	9290042356
Trademark.:	PHILIPS, hue, Signify
FCC ID.....:	2AGBW9290042356X
IC	20812-42356X
Manufacturer	Signify (China) Investment Co., Ltd
Manufacturer Address	No.9, Lane 888, Tian Lin Road, 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	
	☐	AC: 220 - 240 Vac, 50/60 Hz
	☒	AC: 120 Vac, 50/60 Hz
	☐	DC: 24 Vdc
	☐	Poe:
	☐	Adapter:
Mounting position	☐	Tabletop equipment
	☒	Wall/Ceiling mounted equipment
	☐	Floor standing equipment
	☐	Hand-held/Portable 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	☐ CDD
			☐ Beam-forming
Antenna Type	☐	External	☐ Dipole
			☐ Sectorized
	☒	Internal	☐ Ceramic Chip
			☐ PIFA
			☒ PCB
			☐ Others.....
Antenna Gain.....	-7.1 dBi		

1.3 Channel List

Working Frequency of Each Channel:							
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 , antenna information and Channel List for the EUT in clause 1 are provided and confirmed by the client.

2 DESCRIPTION OF TEST SETUP

2.1 Operating mode(s) used for tests

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

Test Mode	Mode 1: Transmit by Zigbee
-----------	----------------------------

Note : Regards to the frequency band operation: the lowest, middle and highest frequency channel were selected to perform the test, then shown on this report.

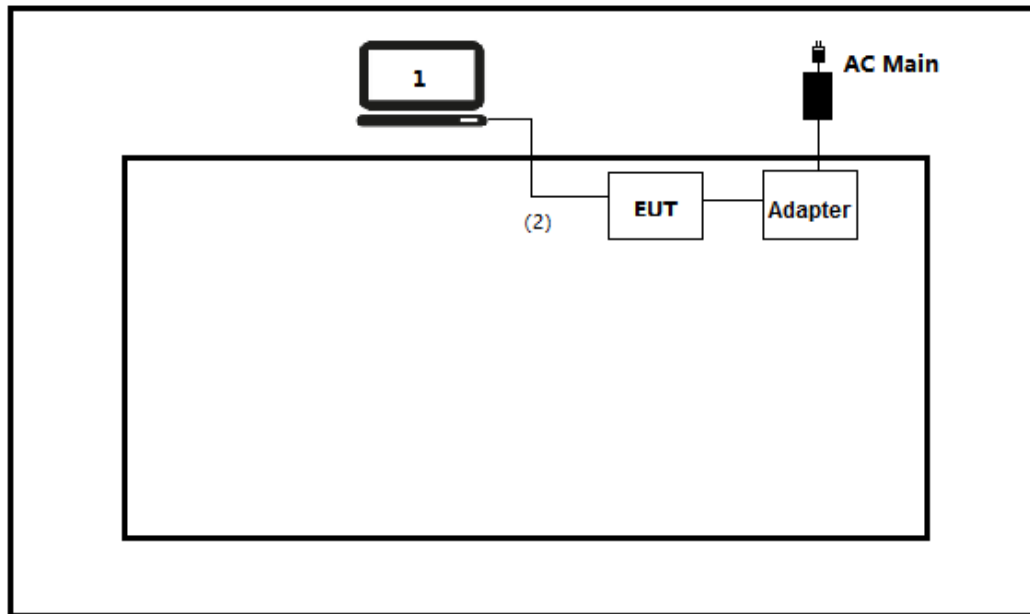
2.2 Auxiliary equipment / Test software for the EUT

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
HueApprobationTool	N/A	N/A	N/A

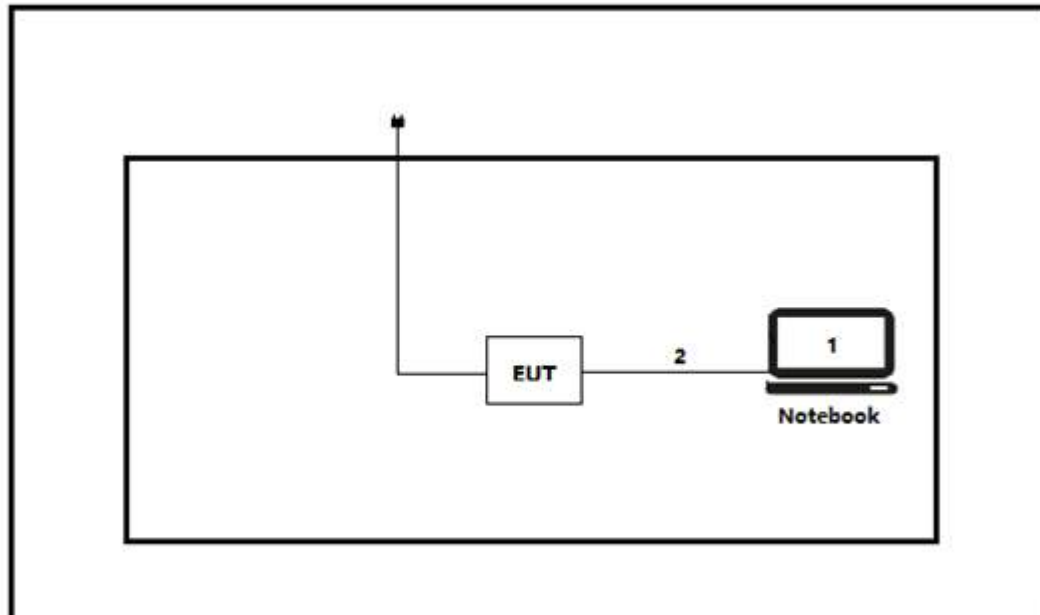
Accessories Information	Cable		
	Length used during test [m]	Attached during test	Shielded
(2)USB Control Cable	1	☒	☒
(3)USB Control Cable	8	☒	☒

2.3 Test Configuration / Block diagram used for tests

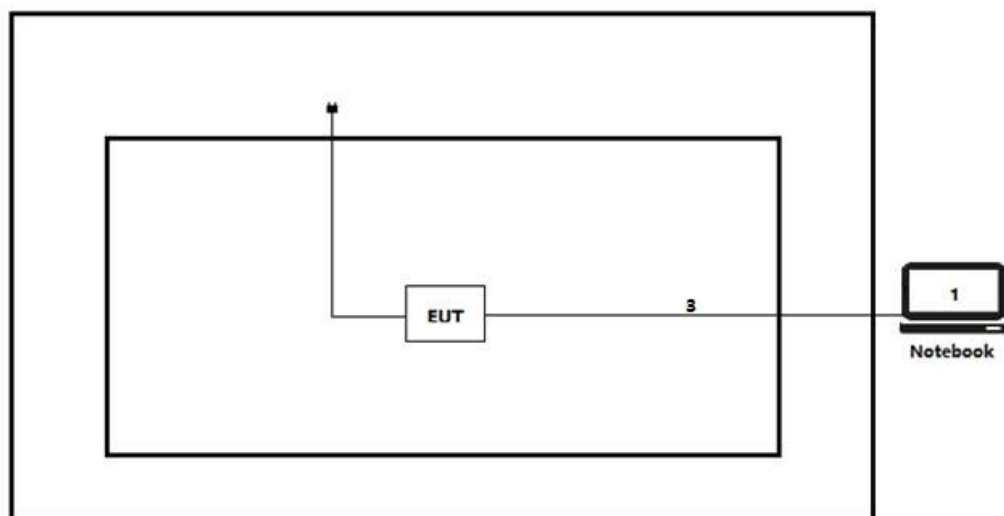
Test setup Diagram- AC Line Conducted Emission Test



Test setup Diagram- Conducted test



Test setup Diagram- Radiated Emission



2.4 Testing process

1	Setup the EUT shown in Section 2.3.
2	Execute the [HueApprobationTool]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 C	2024	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 2	2021	General Requirements for Compliance of Radio Apparatus
RSS-247 Issue 3	2023	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
20dB Emission 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 3 Paragraph 5.2	PASS	Test data please refer to Appendix A
Occupied Channel Bandwidth	RSS-Gen Issue 5 Paragraph 6.7 RSS-247 Issue 3 Paragraph 5.2	PASS	Test data please refer to Appendix B
Maximum conducted output power	RSS-247 Issue 3 Paragraph 5.4(d)	PASS	Test data please refer to Appendix C
Maximum power spectral density	RSS-247 Issue 3 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 3 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	N/A	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
Mode1	11	2405	10
	18	2440	10
	26	2480	10

3.5 Test Matrix

Test item	Model: 9290042356	
	1(#1)	2(#2)
DTS Bandwidth	☒	☐
Occupied Channel Bandwidth	☒	☐
Maximum conducted output power	☒	☐
Maximum power spectral density	☒	☐
Band edge measurements	☐	☒
Conducted Spurious Emission	☒	☐
Duty cycle	☒	☐
Emissions in Restricted Bands	☐	☒
AC Power Line Conducted Emission	☐	☒
Note1: 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

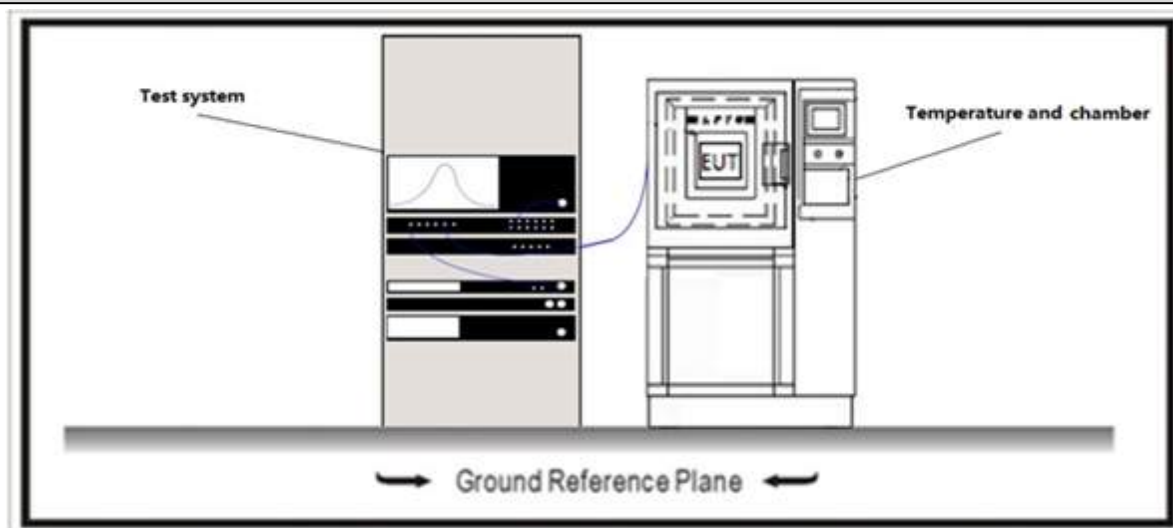
4.1.1 Limit

Standard

FCC Part 15 Subpart C Paragraph 15.247 (a)(2); RSS-247 Issue 3 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
☒	ANSI C63.10		11.8	DTS bandwidth
	☒	ANSI C63.10	11.8.1	Option 1
	☐	ANSI C63.10	11.8.2	Option 2

4.2 Occupied Channel Bandwidth

VERDICT: PASS

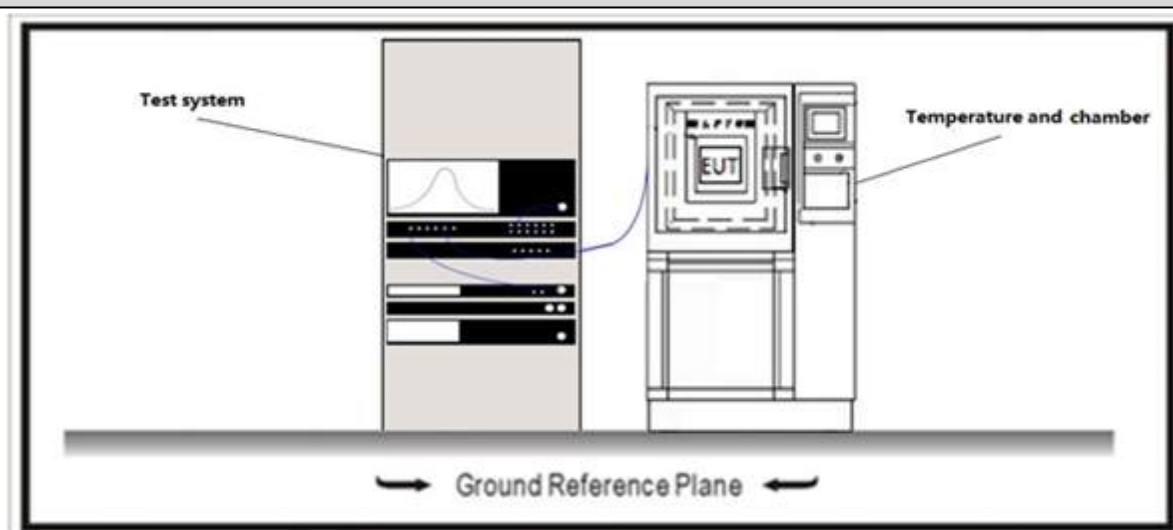
4.2.1 Limit

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
☒	ANSI C63.10	6.9	Occupied bandwidth tests
☐	ANSI C63.10	6.9.2	Option 1
☒	ANSI C63.10	6.9.3	Option 2

4.3 Maximum Conducted Output Power

VERDICT: PASS

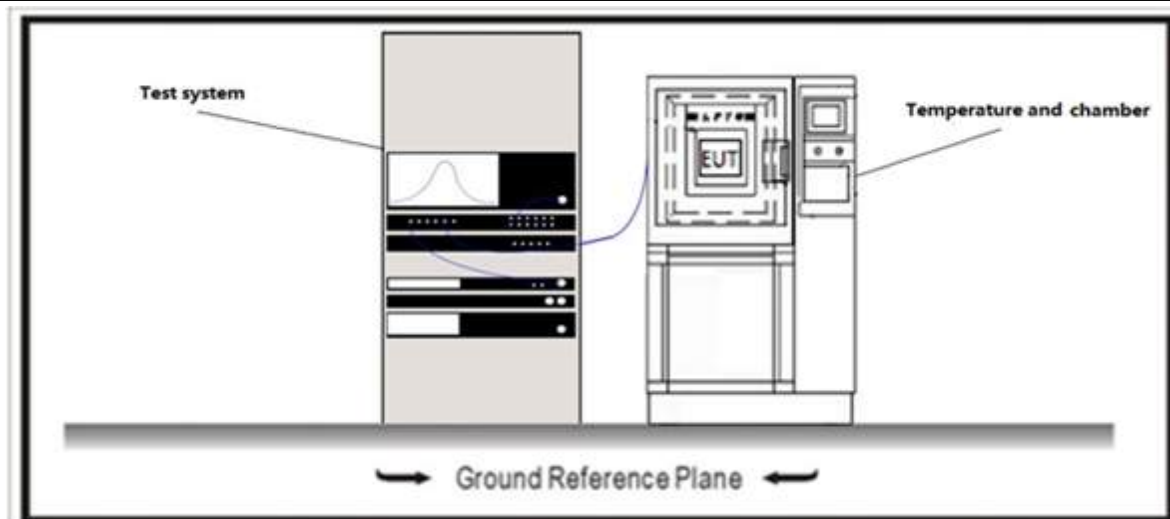
4.3.1 Limit

Standard		FCC Part 15 Subpart C Paragraph 15.247 (b)(3); RSS-247 Issue 3 Paragraph 5.4(d).
☒	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 .

4.3.2 Test Setup



4.3.3 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 $\geq$ 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 $\geq 98\%$)
		☐ ANSI C63.10	11.9.2.2.3	Method AVGSA-1A(Duty cycle $\geq 98\%$)
		☐ ANSI C63.10	11.9.2.2.4	Method AVGSA-2(Duty cycle $\leq 98\%$)
		☐ ANSI C63.10	11.9.2.2.5	Method AVGSA-2A(Duty cycle $\leq 98\%$)
		☐ 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

4.4 Maximum Power Spectral Density

VERDICT: PASS

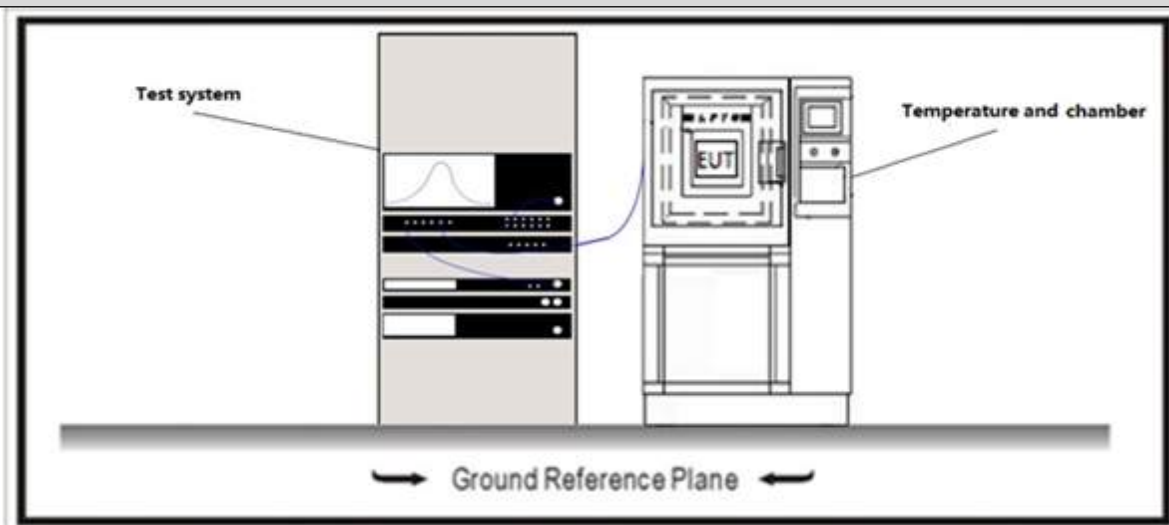
4.4.1 Limit

Standard

 FCC Part 15 Subpart C Paragraph 15.247 (b)(3);
 RSS-247 Issue 3 Paragraph 5.2(b).

 Power Spectral Density $\leq 8\text{dBm}/3\text{kHz}$

4.4.2 Test Setup



4.4.3 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 $\geq 98\%$)
	☐	ANSI C63.10	11.10.4	Method AVGPSD-1A(Duty cycle $\geq 98\%$)
	☐	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

4.5 Band Edge Measurements

VERDICT: PASS

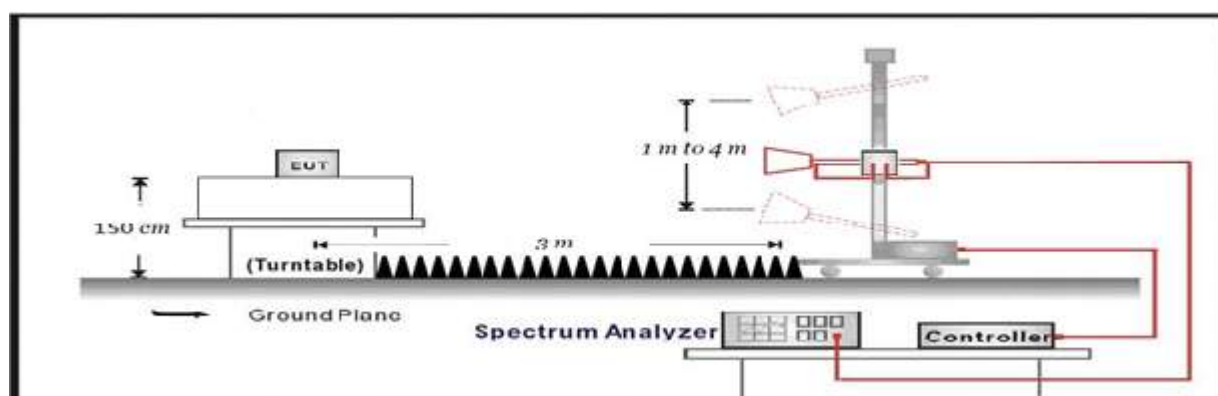
4.5.1 Limit

Standard		FCC Part 15 Subpart C Paragraph 15.247(d) , 15.209; RSS-Gen Issue 5 Paragraph 8.10.		
Frequency bands (MHz)	Detector	Limit (dB μ V/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.

4.5.2 Test Setup

Above 1GHz Test Setup:



4.5.3 Test Procedure

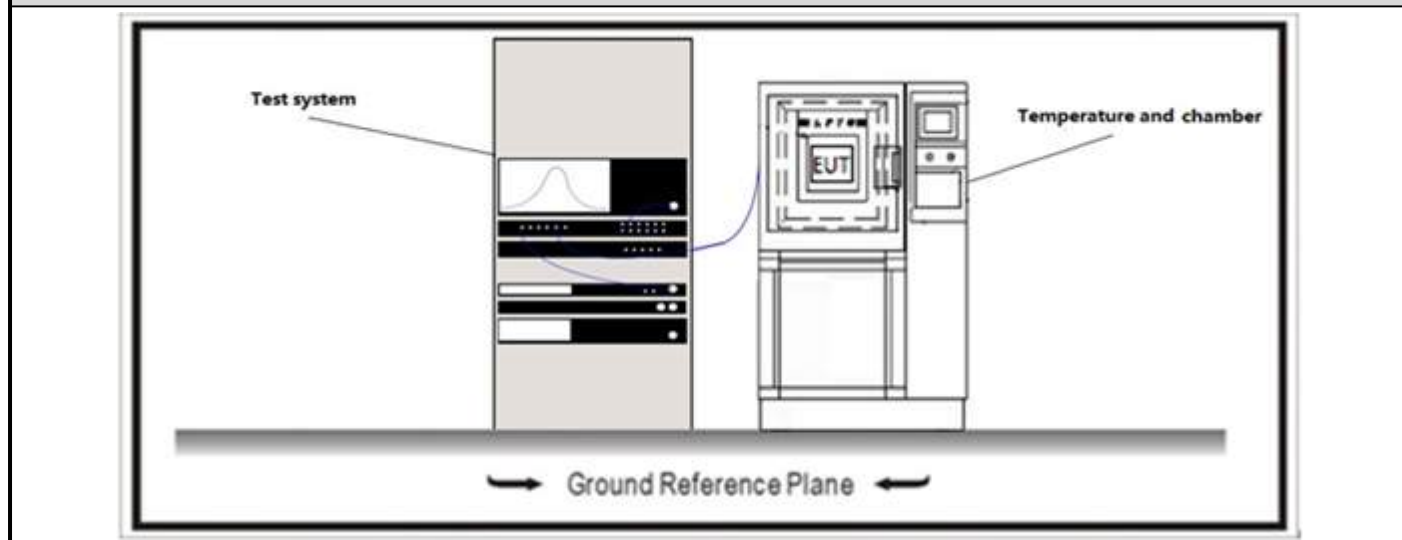
	References Rule	Chapter	Description
☒	ANSI C63.10	6.10	Band-edge testing
☒	ANSI C63.10	6.10.5	Restricted-band band-edge measurements
☐	ANSI C63.10	6.10.6	Marker-delta method
☒	ANSI C63.10	11.12	Emissions in restricted frequency bands
☒	ANSI C63.10	11.12.1	Radiated emission measurements
☒	ANSI C63.10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

4.6 Conducted Spurious Emission**VERDICT: PASS****4.6.1 Limit**

Standard	FCC Part 15 Subpart C Paragraph 15.247(d); RSS-247 Issue 3 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).

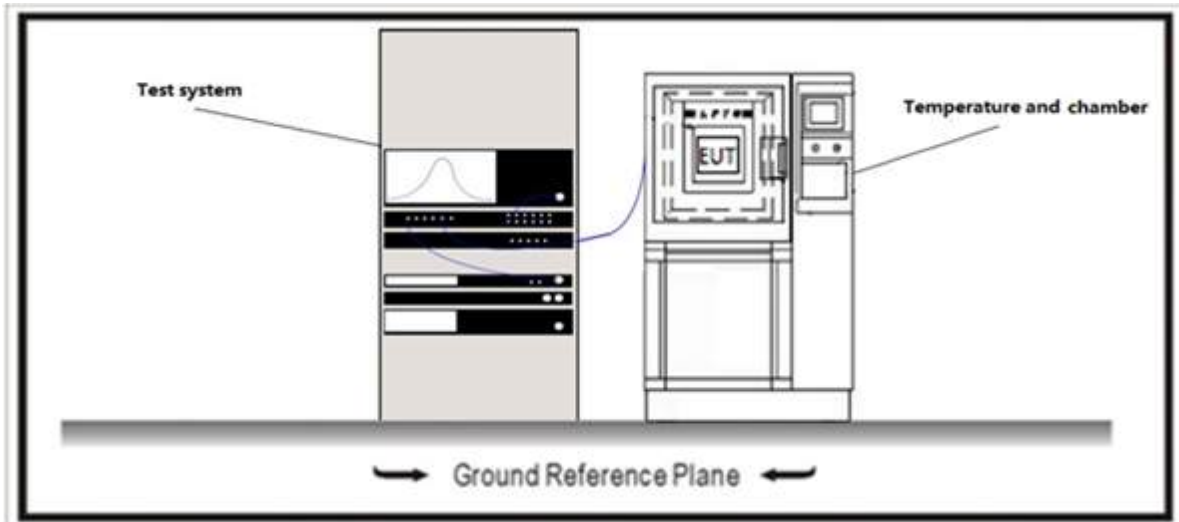
Note 2: If the maximum peak conducted output power procedure was used, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).

4.6.2 Test Setup**4.6.3 Test Procedure**

References Rule	Chapter	Description
☒ 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

4.7 Duty cycle**VERDICT: PASS****4.7.1 Limit**

N/A

4.7.2 Test Setup**4.7.3 Test Procedure**

References Rule		Chapter	Description
☒	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 ($\mu\text{V/m}$)	Field strength ($\text{dB}\mu\text{V/m}$)	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.

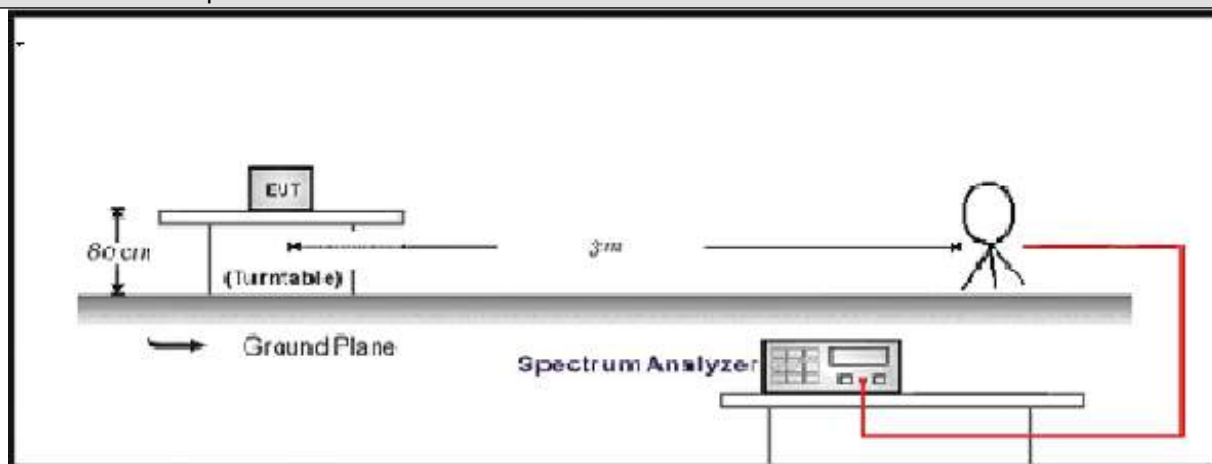
Frequency (MHz)	Field strength	Field strength ($\text{dB}\mu\text{V/m}$)	Measurement distance (m)
0.009 - 0.49	6.37/F(kHz) $\mu\text{A/m}$	48.5 – 13.8	300 _(Note 1)
0.49 - 1.705	63.7/F(kHz) $\mu\text{A/m}$	33.8 - 23	30 _(Note 1)
1.705 - 30	30 $\mu\text{V/m}$	29.5	30 _(Note 1)
30 - 88	100 $\mu\text{V/m}$	40	3 _(Note 2)
88 - 216	150 $\mu\text{V/m}$	43.5	3 _(Note 2)
216 - 960	200 $\mu\text{V/m}$	46	3 _(Note 2)
Above 960	500 $\mu\text{V/m}$	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).

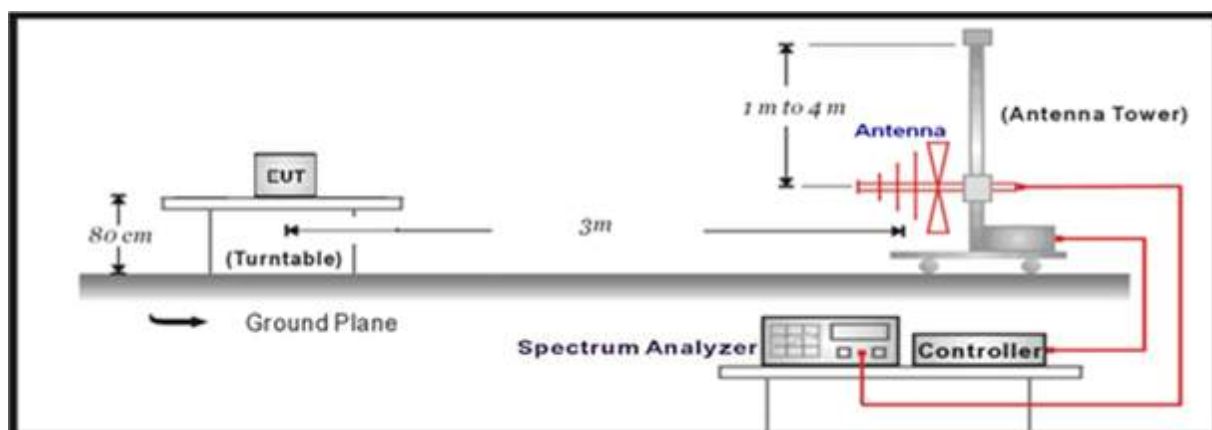
Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated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

4.8.2 Test Setup

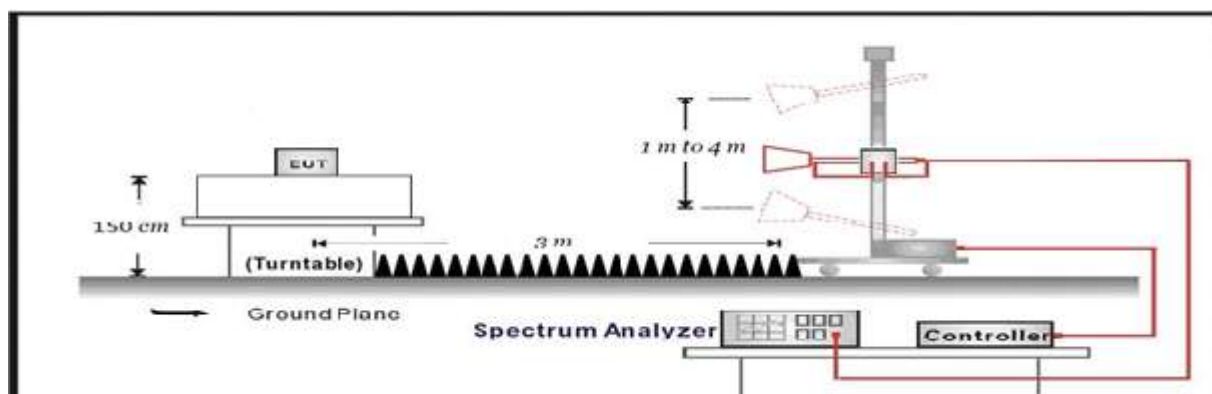
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



Above 1GHz Test Setup:



4.8.3 Test Procedure

	References Rule		Chapter	Description
☒	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

4.9 AC Power Line Conducted Emission**VERDICT: PASS****4.9.1 Limit**

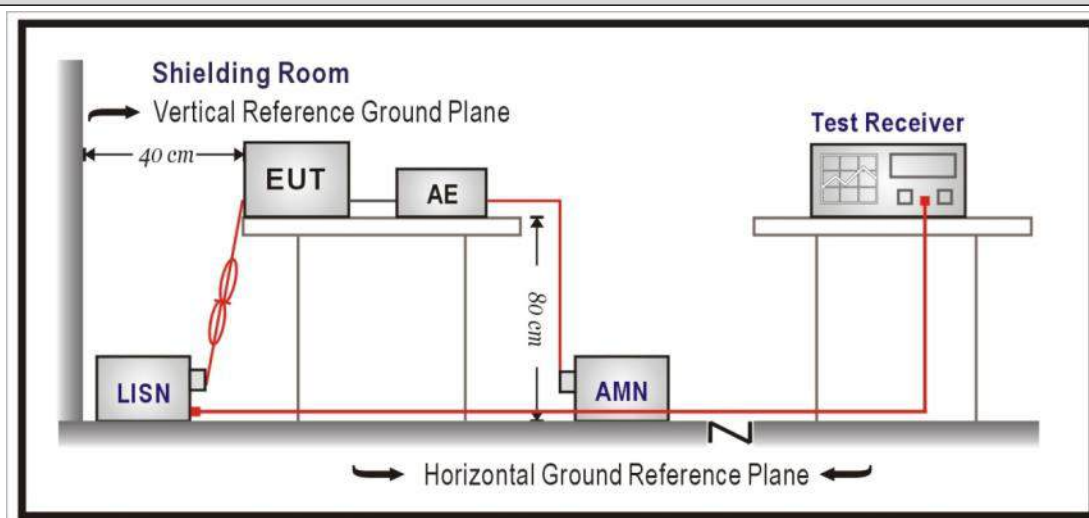
Standard	FCC Part 15 Subpart C Paragraph 15.207 ; RSS-Gen Issue 5 Paragraph 8.8.	
Frequency range [MHz]	Limit: QP [dB(μV) ¹⁾]	Limit: AV [dB(μV) ¹⁾]
0,15 - 0,50	66 – 56 ²⁾	56 - 46 ²⁾
0,50 - 5,0	56	46
5,0 - 30	60	50

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
☒	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****4.10.1 Limit:****Standard**FCC Part 15 Subpart C Paragraph 15.203;
RSS-Gen Issue 5 Paragraph 6.8.

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:

- | | |
|-------------------------------------|--|
| ☒ | 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.

5 TEST SETUP PHOTO AND EUT PHOTO

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

6 TEST RESULT

Appendix A: DTS Bandwidth

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
Mode 1	Ant1	2405	1.700	2404.290	2405.990	0.5	PASS
	Ant1	2440	1.620	2439.310	2440.930	0.5	PASS
	Ant1	2480	1.630	2479.300	2480.930	0.5	PASS



ZIGB-Ant1-2405-PASS



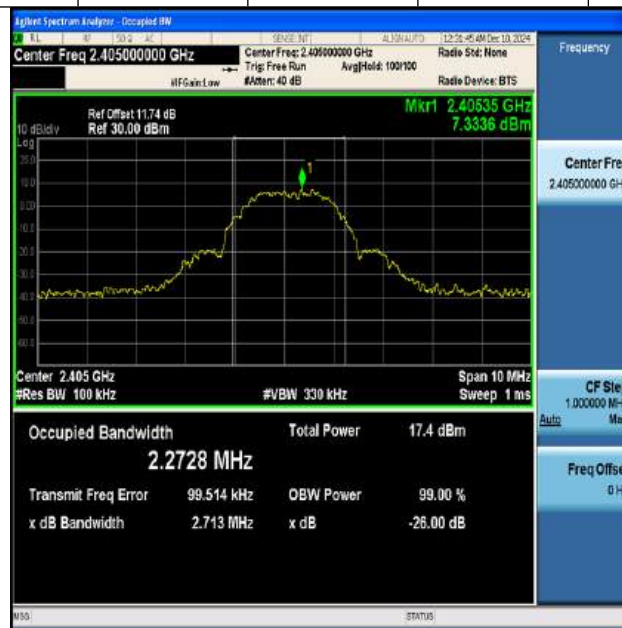
ZIGB-Ant1-2440-PASS



ZIGB-Ant1-2480-PASS

Appendix B: Occupied Channel Bandwidth

TestMode	Antenna	Frequency [MHz]	OCB [MHz]	FL [MHz]	FH [MHz]	Limit[MHz]	Verdict
Mode 1	Ant1	2405	2.2728	2403.9631	2406.2359	With 2400~2483.5MHz	Pass
	Ant1	2440	2.2750	2438.9644	2441.2394	With 2400~2483.5MHz	Pass
	Ant1	2480	2.2932	2478.9584	2481.2516	With 2400~2483.5MHz	Pass



ZIGB-Ant1-2405



ZIGB-Ant1-2440



ZIGB-Ant1-2480

Appendix C: Maximum conducted output power

Test Mode	Frequency (MHz)	Measured Power (dBm)	EIRP (dBm)	Conducted Limit(dBm)	EIRP Limit (dBm)
Mode1	2405	11.66	4.56	≤30	≤36
	2440	11.97	4.87	≤30	≤36
	2480	12.04	4.94	≤30	≤36
Note 1: EIRP=Measured power+Antenna gain					
Note 2: The antenna gain please refer to clause 1.2					

Appendix D: Maximum power spectral density

TestMode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
Mode 1	Ant1	2405	-3.63	≤8.00	PASS
	Ant1	2440	-3.28	≤8.00	PASS
	Ant1	2480	-3.19	≤8.00	PASS



ZIGB-Ant1-2405-PASS



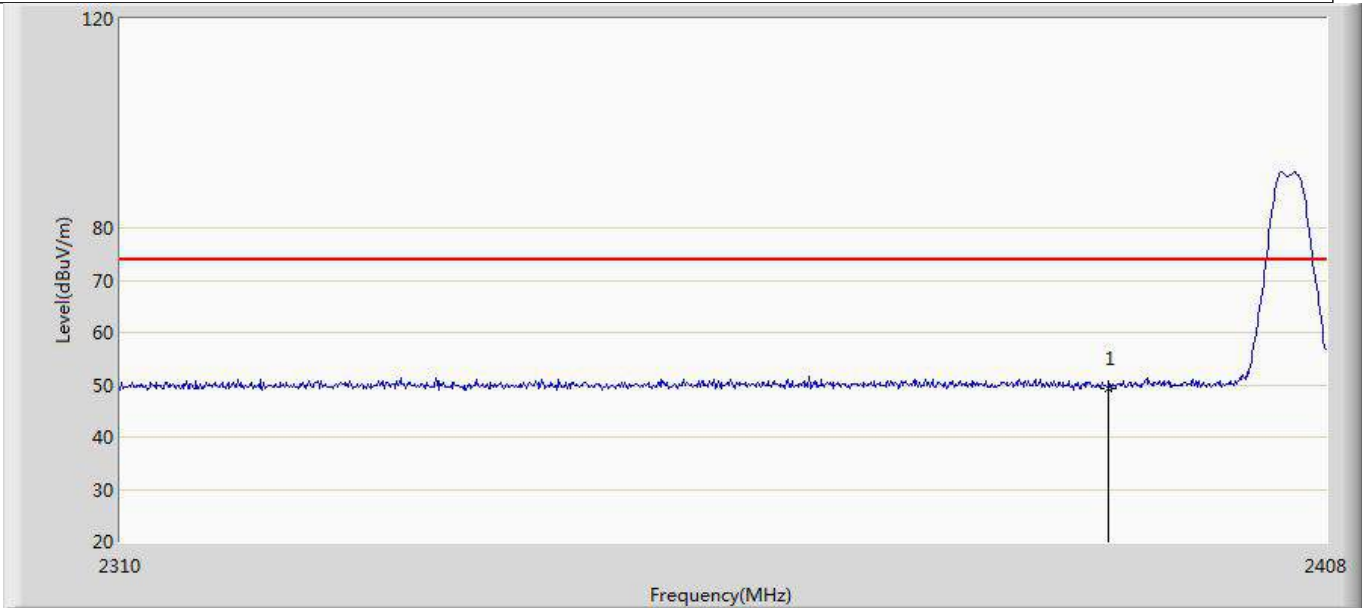
ZIGB-Ant1-2440-PASS



ZIGB-Ant1-2480-PASS

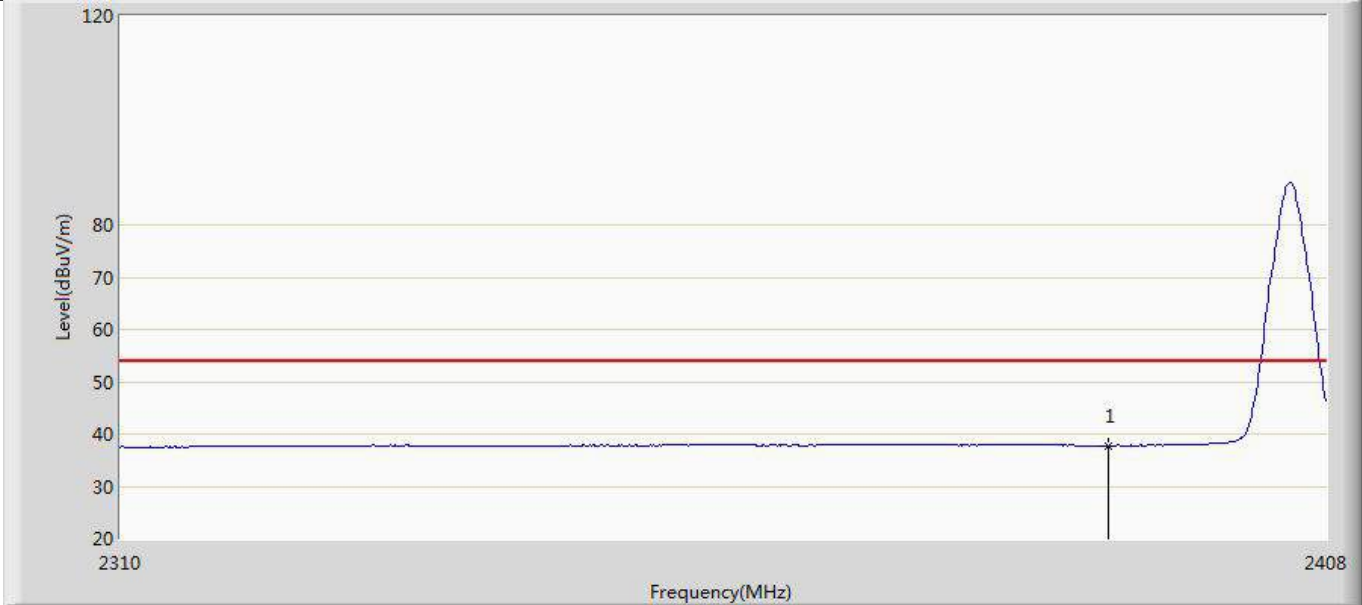
Appendix E: Band edge measurements

Profile: 24B1032R	Page No.: 33
Engineer: Yuliu	
Site: AC5	Time: 2024/11/20 - 01:53
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Horizontal
EUT: LED Lamp	Power: 120Vac/60Hz
Note: Mode 1:Transmit at 2405MHz by Zigbee	



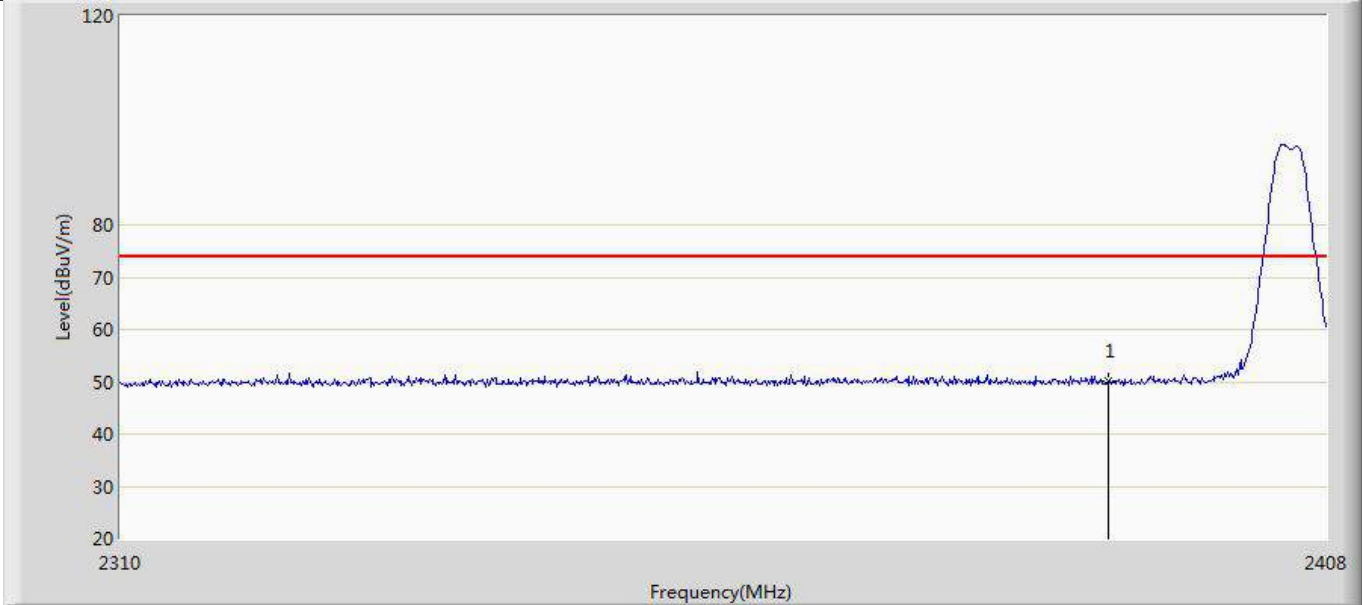
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	49.395	15.294	-24.605	74.000	34.102	PK

Profile: 24B1032R	Page No.: 34
Engineer: Yuliu	
Site: AC5	Time: 2024/11/20 - 01:55
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Horizontal
EUT: LED Lamp	Power: 120Vac/60Hz
Note: Mode 1:Transmit at 2405MHz by Zigbee	



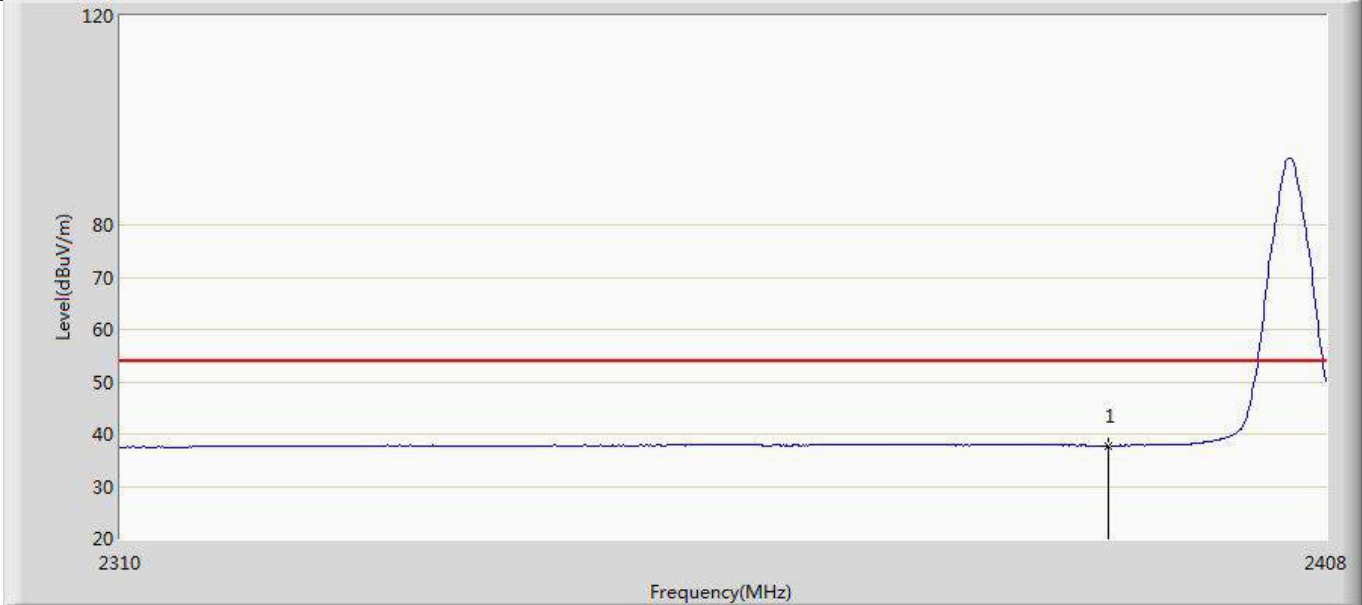
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	37.754	3.653	-16.246	54.000	34.102	AV

Profile: 24B1032R	Page No.: 35
Engineer: Yuliu	
Site: AC5	Time: 2024/11/20 - 01:56
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Vertical
EUT: LED Lamp	Power: 120Vac/60Hz
Note: Mode 1:Transmit at 2405MHz by Zigbee	



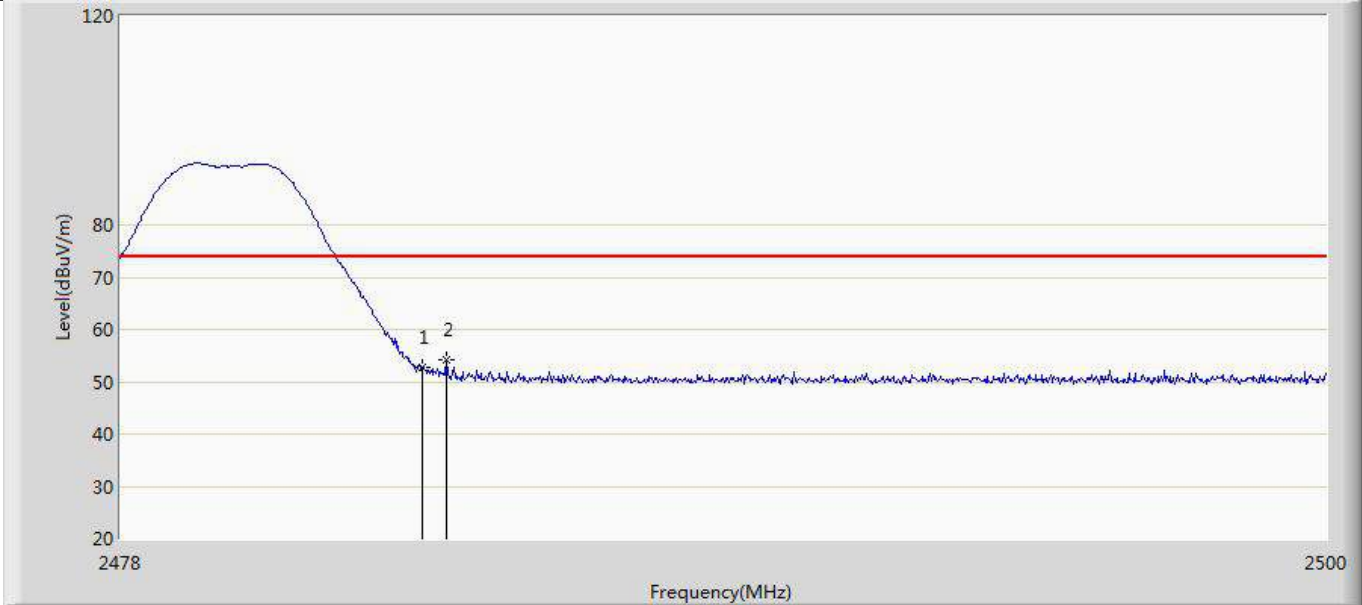
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	50.230	16.129	-23.770	74.000	34.102	PK

Profile: 24B1032R	Page No.: 36
Engineer: Yuliu	
Site: AC5	Time: 2024/11/20 - 01:58
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Vertical
EUT: LED Lamp	Power: 120Vac/60Hz
Note: Mode 1:Transmit at 2405MHz by Zigbee	



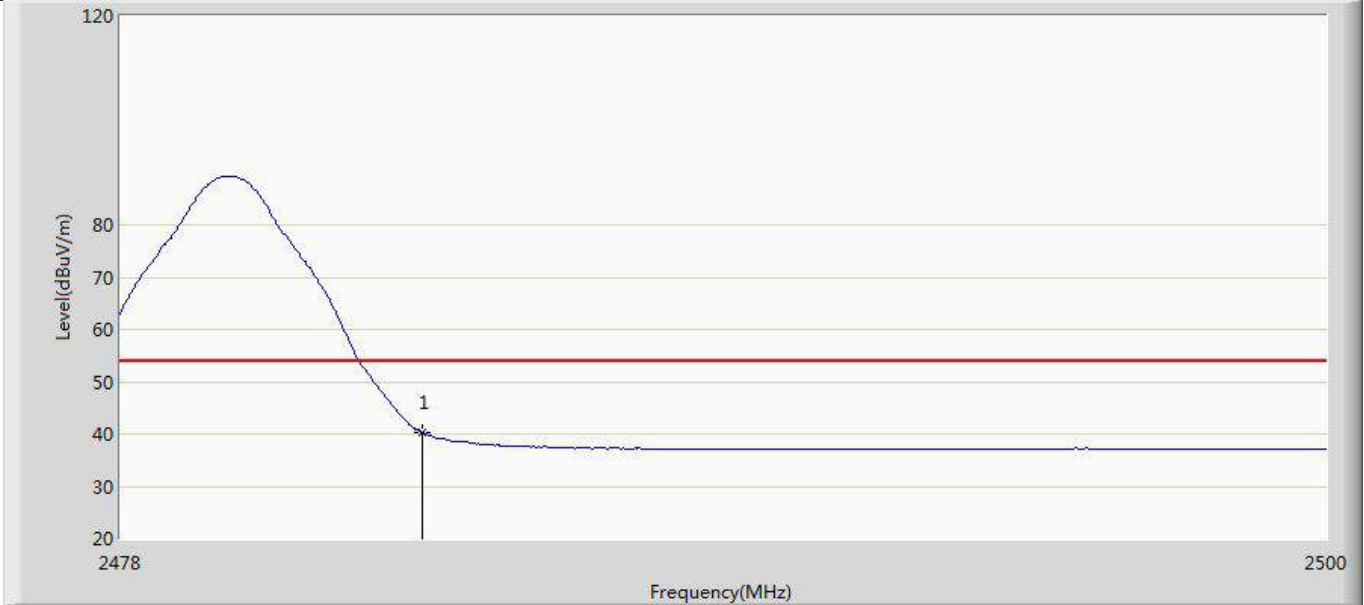
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	37.782	3.681	-16.218	54.000	34.102	AV

Profile: 24B1032R	Page No.: 37
Engineer: Yuliu	
Site: AC5	Time: 2024/11/20 - 01:59
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Horizontal
EUT: LED Lamp	Power: 120Vac/60Hz
Note: Mode 1:Transmit at 2480MHz by Zigbee	



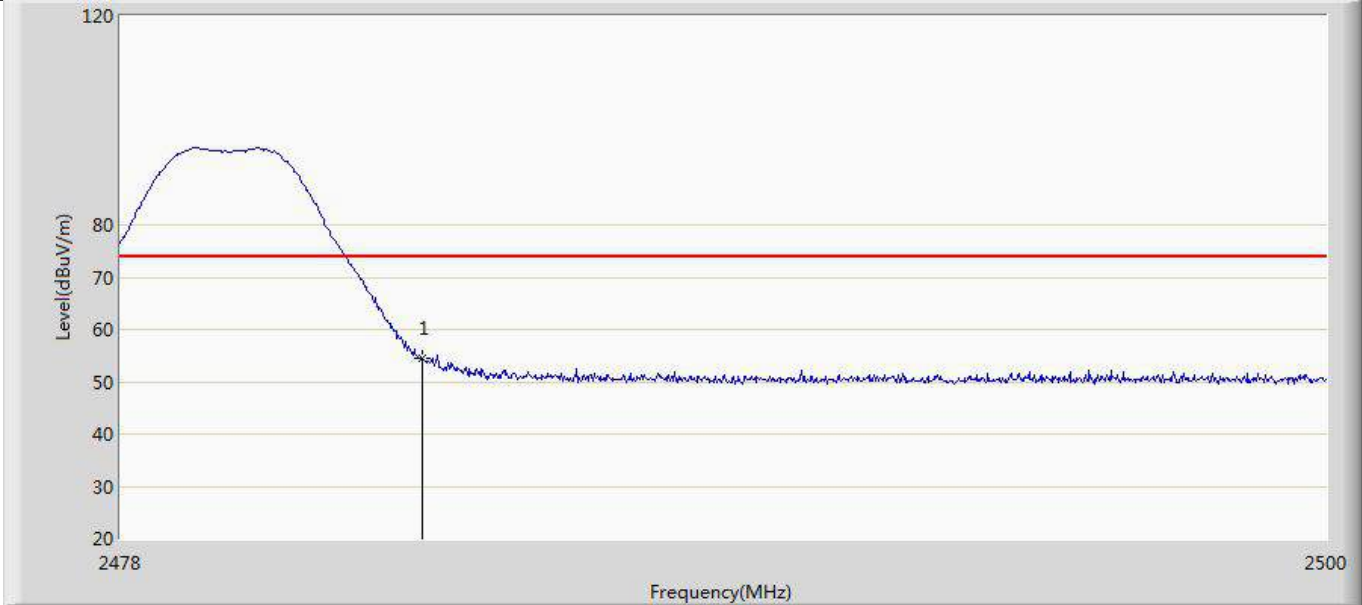
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2483.500	52.729	18.616	-21.271	74.000	34.114	PK
2	*	2483.940	54.094	19.977	-19.906	74.000	34.117	PK

Profile: 24B1032R	Page No.: 38
Engineer: Yuliu	
Site: AC5	Time: 2024/11/20 - 02:01
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Horizontal
EUT: LED Lamp	Power: 120Vac/60Hz
Note: Mode 1:Transmit at 2480MHz by Zigbee	



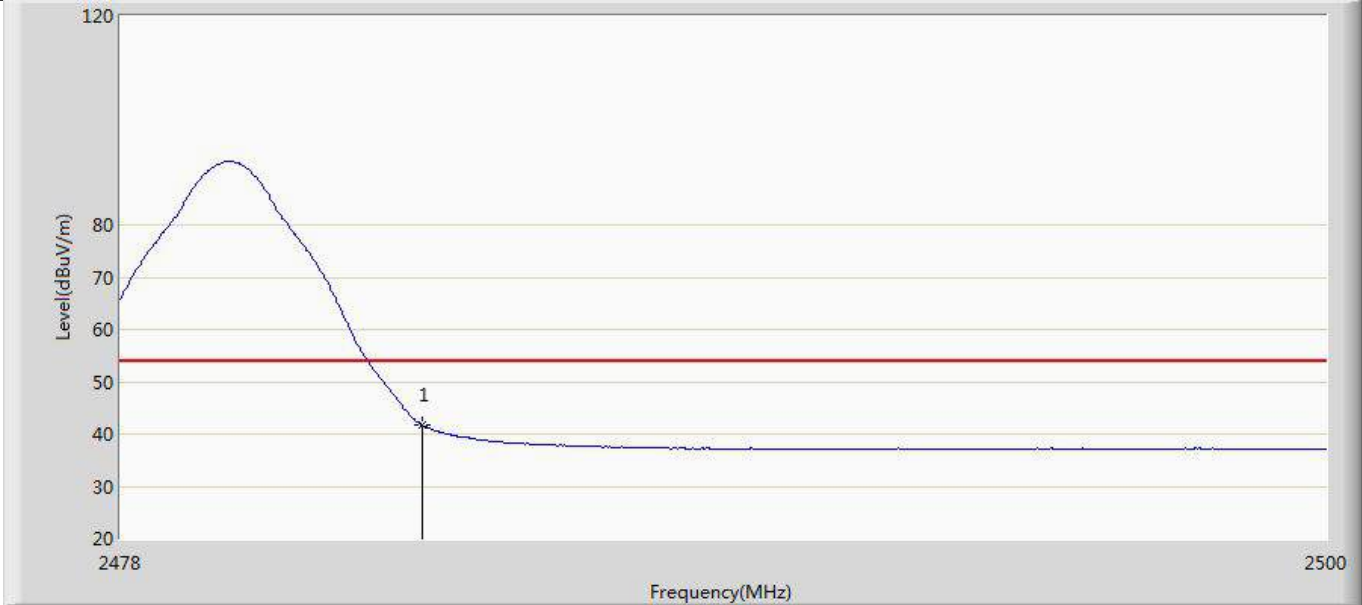
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	40.295	6.182	-13.705	54.000	34.114	AV

Profile: 24B1032R	Page No.: 39
Engineer: Yuliu	
Site: AC5	Time: 2024/11/20 - 02:03
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Vertical
EUT: LED Lamp	Power: 120Vac/60Hz
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	54.423	20.310	-19.577	74.000	34.114	PK

Profile: 24B1032R	Page No.: 40
Engineer: Yuliu	
Site: AC5	Time: 2024/11/20 - 02:05
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Vertical
EUT: LED Lamp	Power: 120Vac/60Hz
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	41.659	7.546	-12.341	54.000	34.114	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

Reference level measurement :

TestMode	Antenna	Freq(MHz)	Max.Point[MHz]	Result[dBm]
Mode 1	Ant1	2405	2405.59	7.17
	Ant1	2440	2439.82	7.52
	Ant1	2480	2479.83	7.82



ZIGB-Ant1-2405-PASS



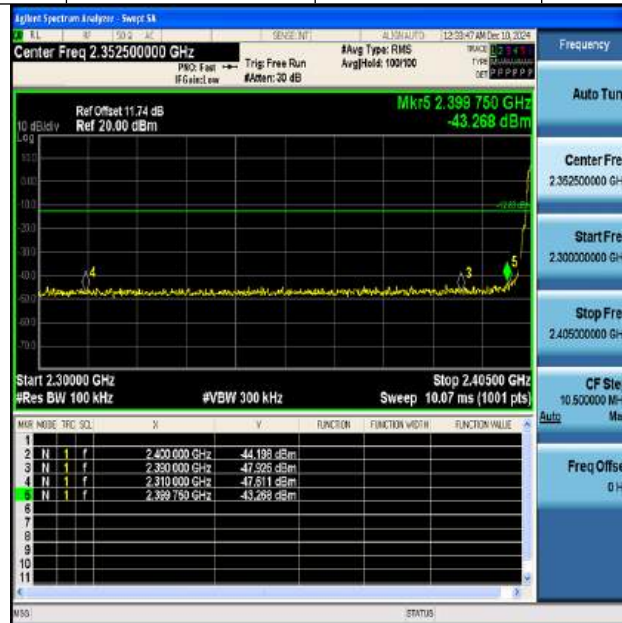
ZIGB-Ant1-2440-PASS



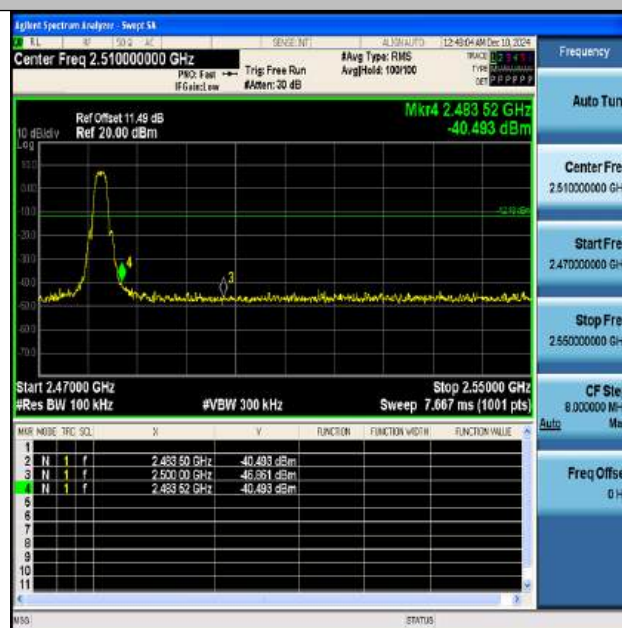
ZIGB-Ant1-2480-PASS

Band edge measurements:

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
Mode 1	Ant1	Low	2405	7.17	-43.27	≤-12.83	PASS
	Ant1	High	2480	7.82	-40.49	≤-12.18	PASS



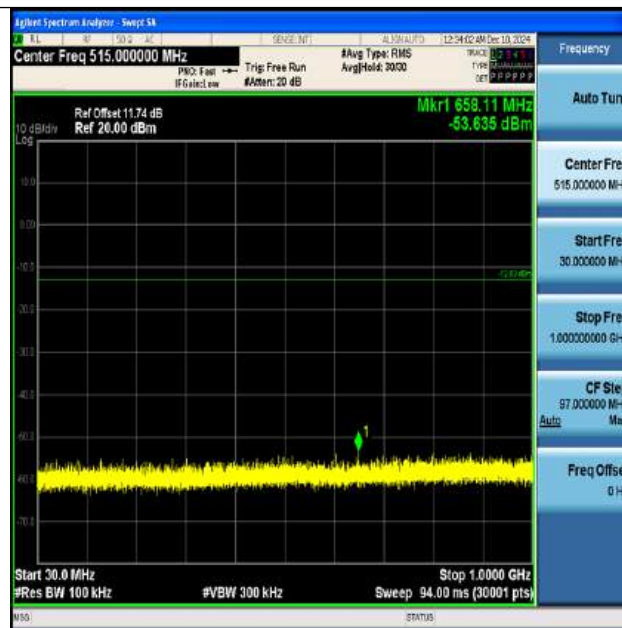
ZIGB-Ant1-2405-PASS



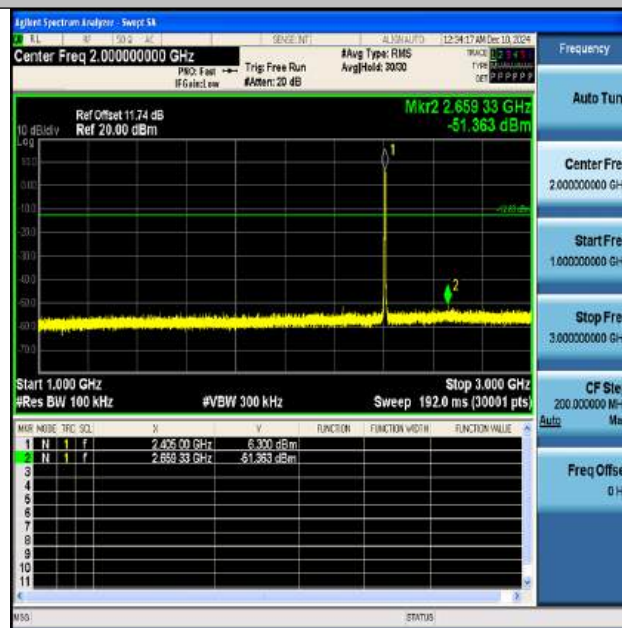
ZIGB-Ant1-2480-PASS

Conducted Spurious Emission:

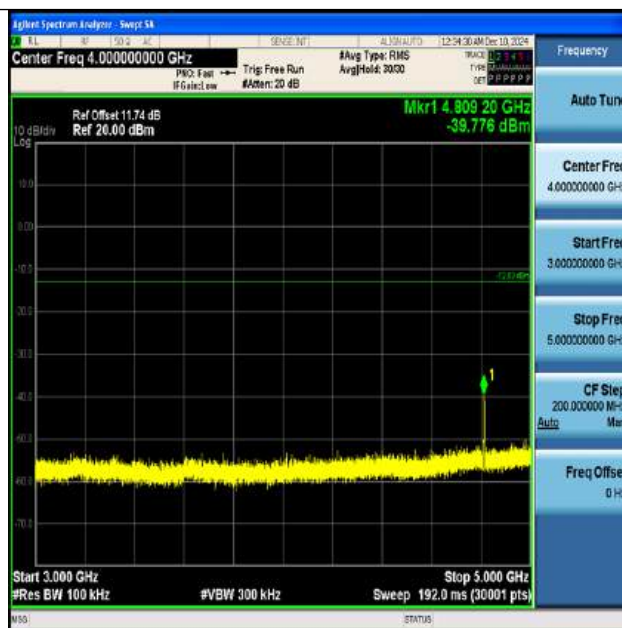
TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
ZIGB	Ant1	2405	30~1000	7.17	-53.64	≤-12.83	PASS
ZIGB	Ant1	2405	1000~3000	7.17	-51.36	≤-12.83	PASS
ZIGB	Ant1	2405	3000~5000	7.17	-39.78	≤-12.83	PASS
ZIGB	Ant1	2405	5000~7000	7.17	-50.3	≤-12.83	PASS
ZIGB	Ant1	2405	7000~9000	7.17	-51.52	≤-12.83	PASS
ZIGB	Ant1	2405	9000~11000	7.17	-51.69	≤-12.83	PASS
ZIGB	Ant1	2405	11000~13000	7.17	-50.6	≤-12.83	PASS
ZIGB	Ant1	2405	13000~15000	7.17	-47.15	≤-12.83	PASS
ZIGB	Ant1	2405	15000~17000	7.17	-45.7	≤-12.83	PASS
ZIGB	Ant1	2405	17000~19000	7.17	-44.35	≤-12.83	PASS
ZIGB	Ant1	2405	19000~21000	7.17	-43.1	≤-12.83	PASS
ZIGB	Ant1	2405	21000~23000	7.17	-42.24	≤-12.83	PASS
ZIGB	Ant1	2405	23000~25000	7.17	-41.95	≤-12.83	PASS
ZIGB	Ant1	2440	30~1000	7.52	-53.85	≤-12.48	PASS
ZIGB	Ant1	2440	1000~3000	7.52	-51.44	≤-12.48	PASS
ZIGB	Ant1	2440	3000~5000	7.52	-40.35	≤-12.48	PASS
ZIGB	Ant1	2440	5000~7000	7.52	-51.5	≤-12.48	PASS
ZIGB	Ant1	2440	7000~9000	7.52	-51.8	≤-12.48	PASS
ZIGB	Ant1	2440	9000~11000	7.52	-51.03	≤-12.48	PASS
ZIGB	Ant1	2440	11000~13000	7.52	-50.54	≤-12.48	PASS
ZIGB	Ant1	2440	13000~15000	7.52	-47.29	≤-12.48	PASS
ZIGB	Ant1	2440	15000~17000	7.52	-44.84	≤-12.48	PASS
ZIGB	Ant1	2440	17000~19000	7.52	-44.88	≤-12.48	PASS
ZIGB	Ant1	2440	19000~21000	7.52	-43.52	≤-12.48	PASS
ZIGB	Ant1	2440	21000~23000	7.52	-43.29	≤-12.48	PASS
ZIGB	Ant1	2440	23000~25000	7.52	-42.18	≤-12.48	PASS
ZIGB	Ant1	2480	30~1000	7.82	-53.55	≤-12.18	PASS
ZIGB	Ant1	2480	1000~3000	7.82	-52.16	≤-12.18	PASS
ZIGB	Ant1	2480	3000~5000	7.82	-44.2	≤-12.18	PASS
ZIGB	Ant1	2480	5000~7000	7.82	-50.03	≤-12.18	PASS
ZIGB	Ant1	2480	7000~9000	7.82	-52.24	≤-12.18	PASS
ZIGB	Ant1	2480	9000~11000	7.82	-51.57	≤-12.18	PASS
ZIGB	Ant1	2480	11000~13000	7.82	-50.96	≤-12.18	PASS
ZIGB	Ant1	2480	13000~15000	7.82	-47.05	≤-12.18	PASS
ZIGB	Ant1	2480	15000~17000	7.82	-44.44	≤-12.18	PASS
ZIGB	Ant1	2480	17000~19000	7.82	-44.28	≤-12.18	PASS
ZIGB	Ant1	2480	19000~21000	7.82	-43.08	≤-12.18	PASS
ZIGB	Ant1	2480	21000~23000	7.82	-42.98	≤-12.18	PASS
ZIGB	Ant1	2480	23000~25000	7.82	-42.43	≤-12.18	PASS



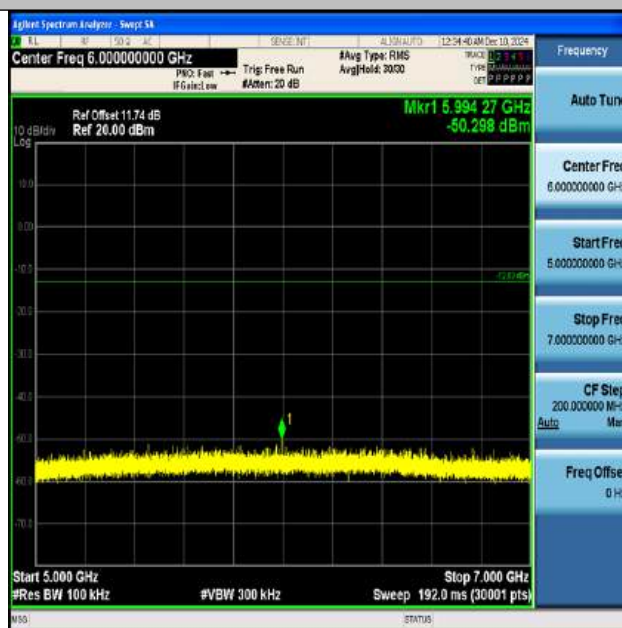
ZIGB-Ant1-2405-30~1000-PASS



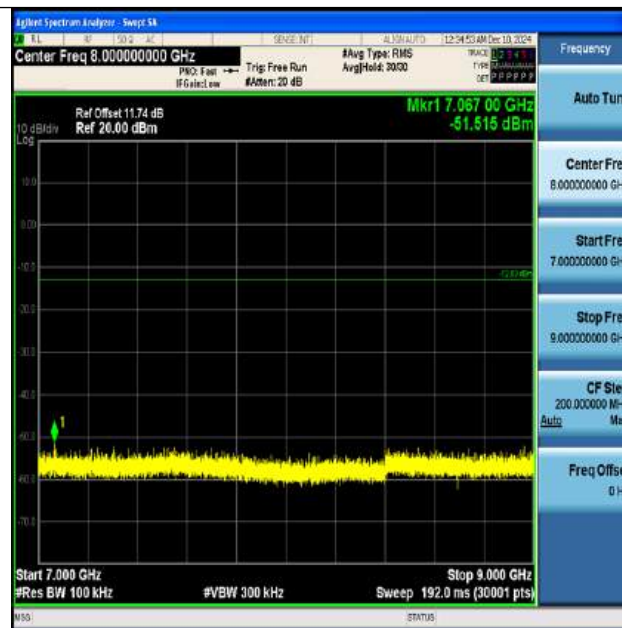
ZIGB-Ant1-2405-1000~3000-PASS



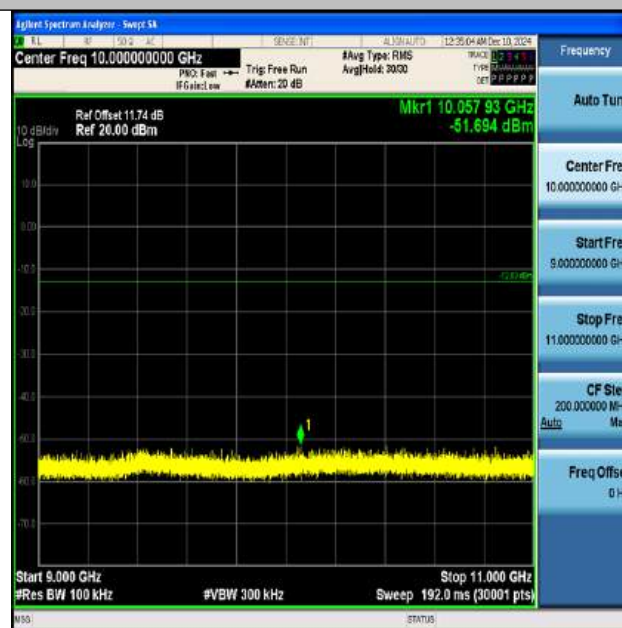
ZIGB-Ant1-2405-3000~5000-PASS



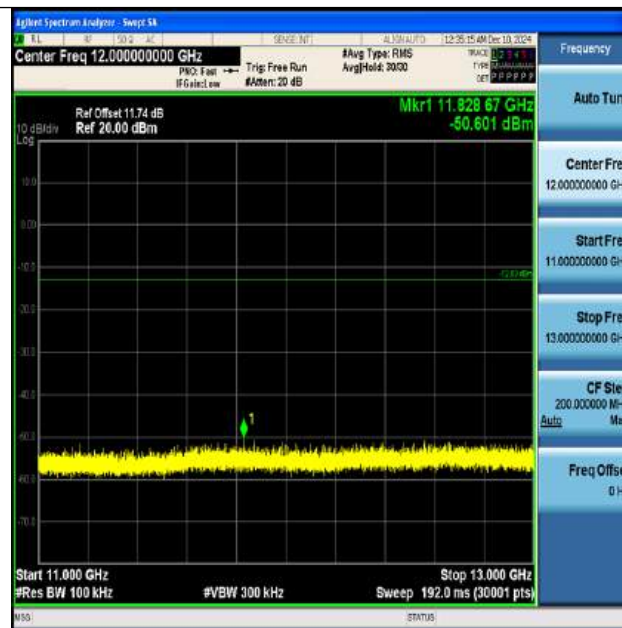
ZIGB-Ant1-2405-5000~7000-PASS



ZIGB-Ant1-2405-7000~9000-PASS



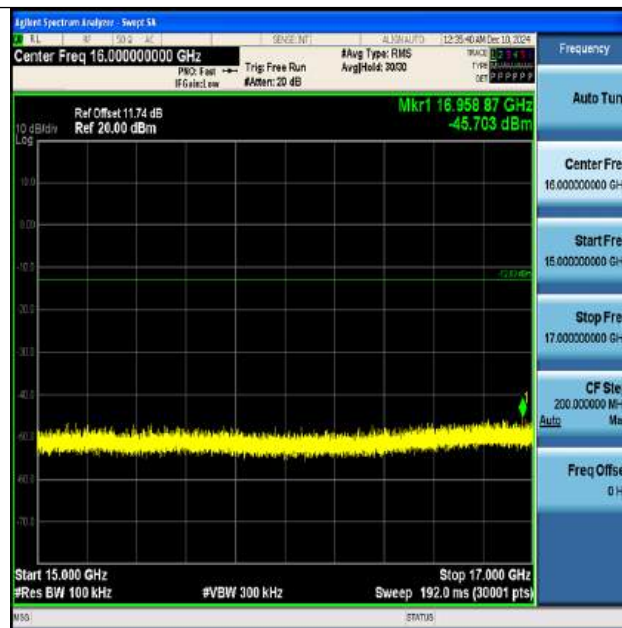
ZIGB-Ant1-2405-9000~11000-PASS



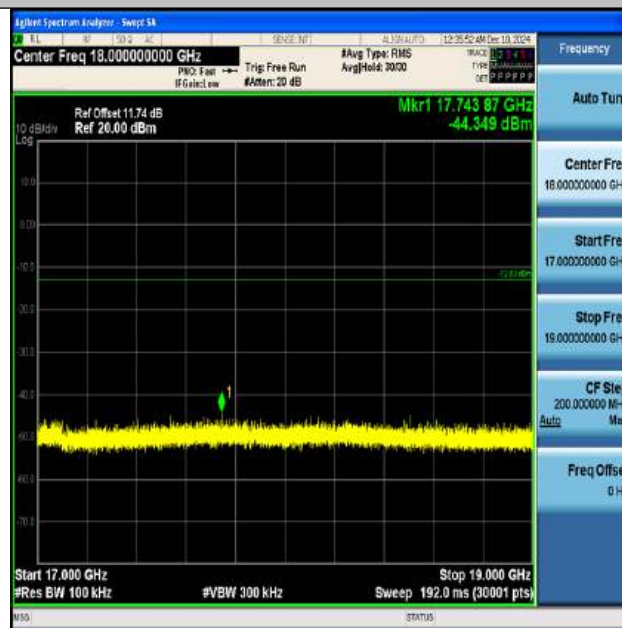
ZIGB-Ant1-2405-11000~13000-PASS



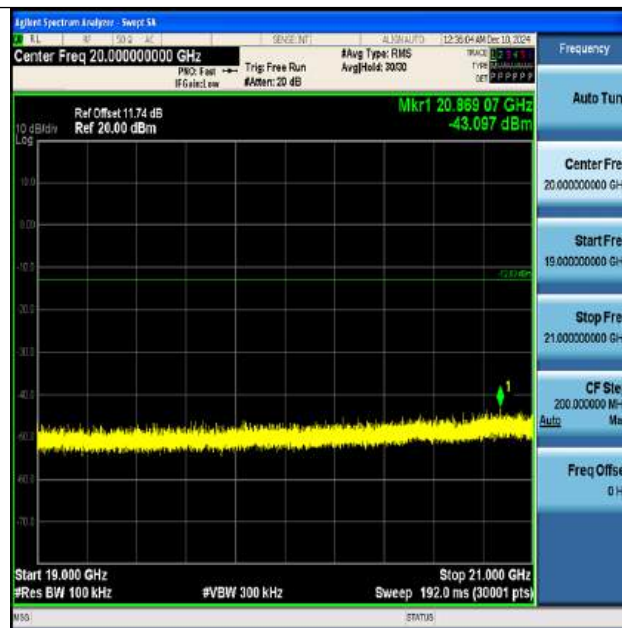
ZIGB-Ant1-2405-13000~15000-PASS



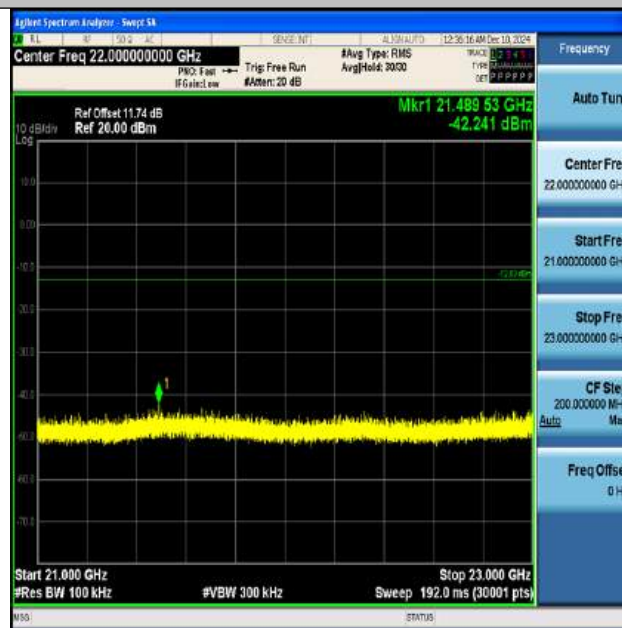
ZIGB-Ant1-2405-15000~17000-PASS



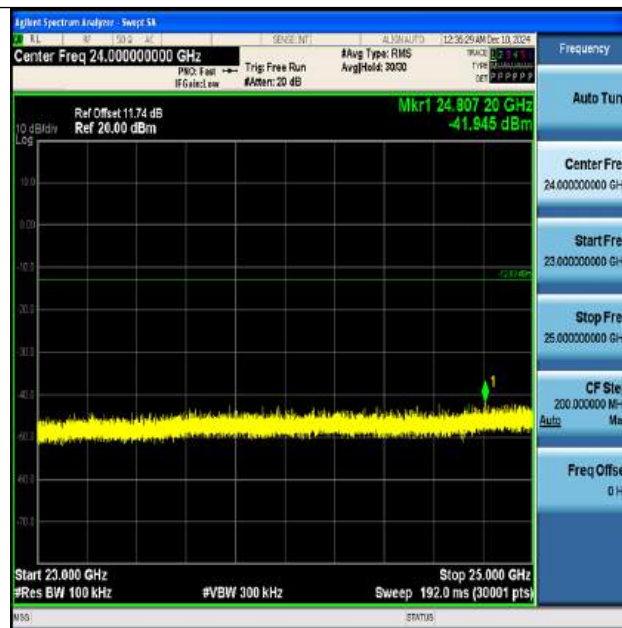
ZIGB-Ant1-2405-17000~19000-PASS



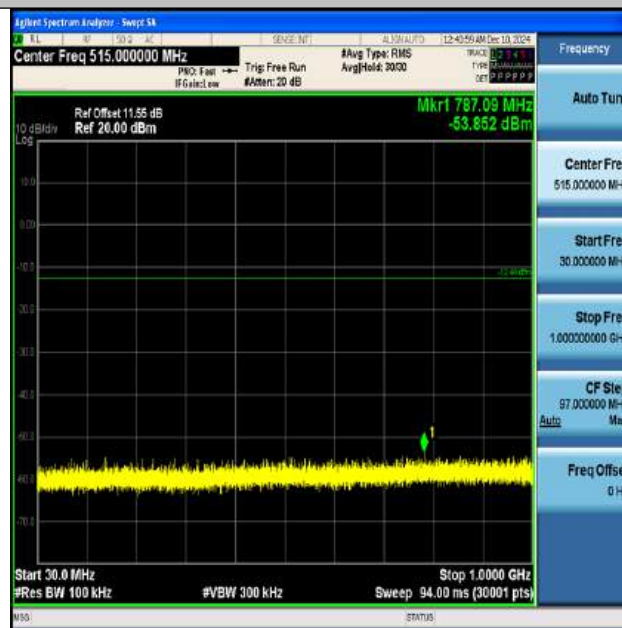
ZIGB-Ant1-2405-19000~21000-PASS



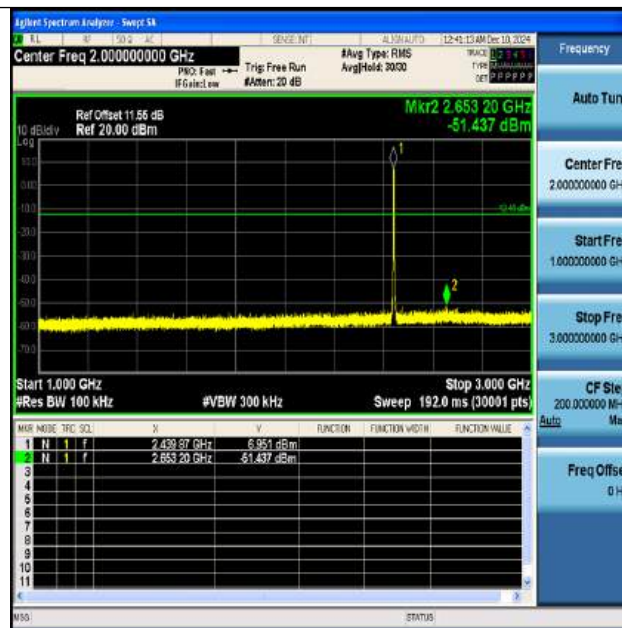
ZIGB-Ant1-2405-21000~23000-PASS



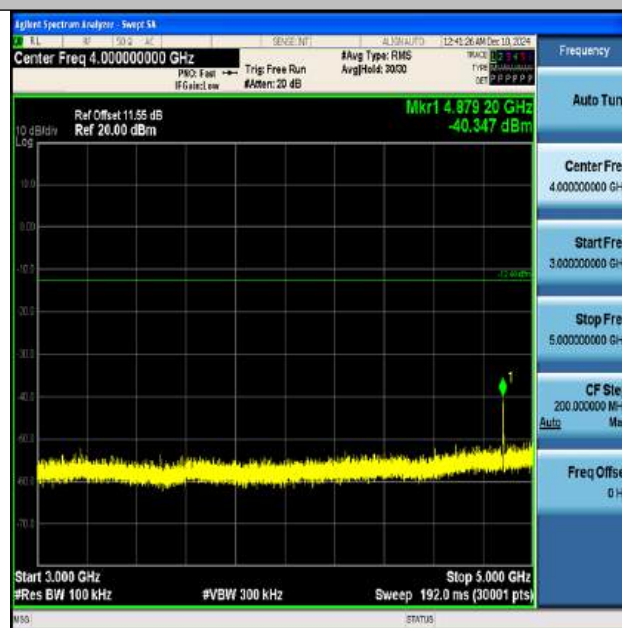
ZIGB-Ant1-2405-23000~25000-PASS



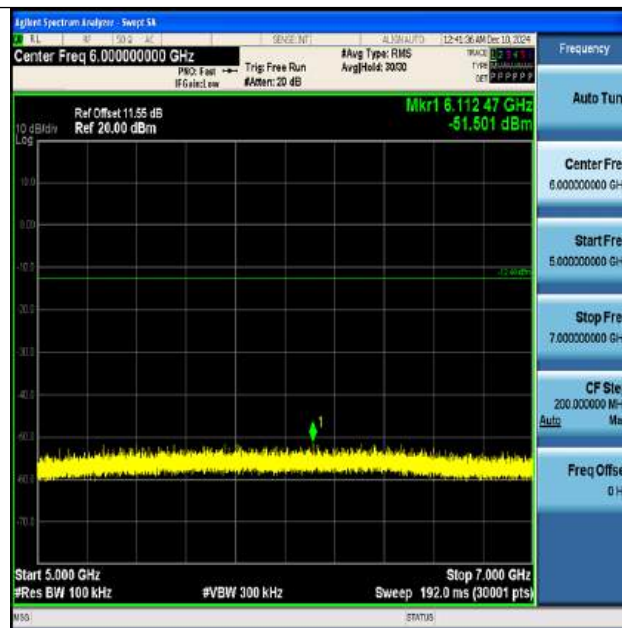
ZIGB-Ant1-2440-30~1000-PASS



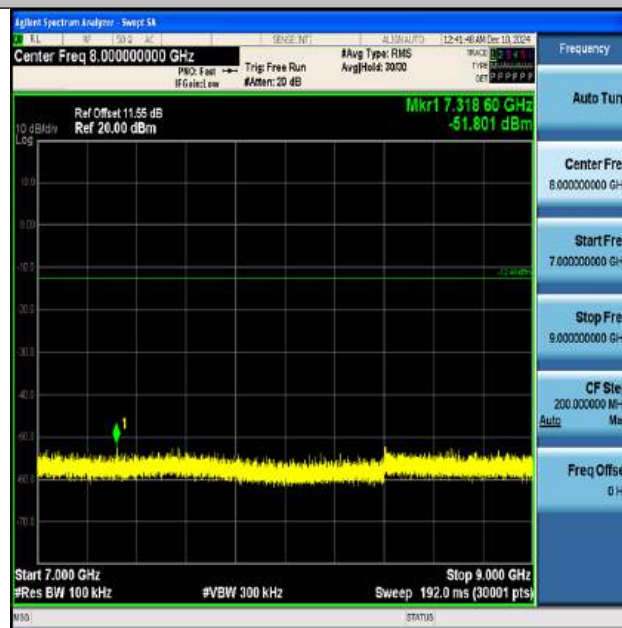
ZIGB-Ant1-2440-1000~3000-PASS



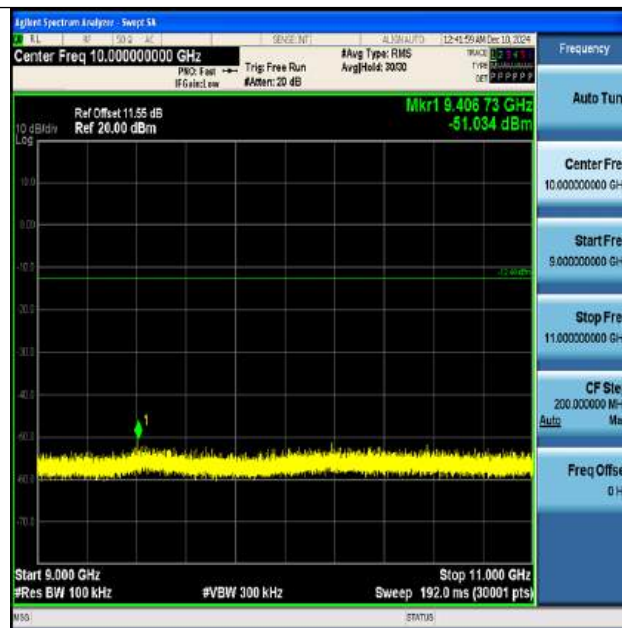
ZIGB-Ant1-2440-3000~5000-PASS



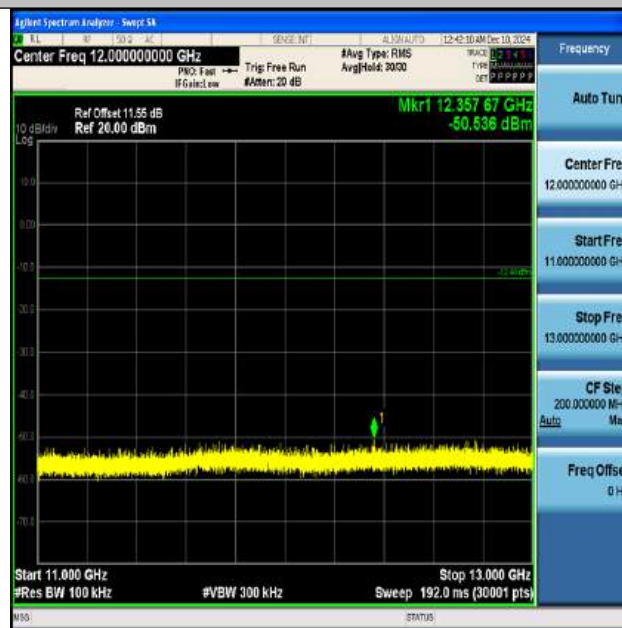
ZIGB-Ant1-2440-5000~7000-PASS



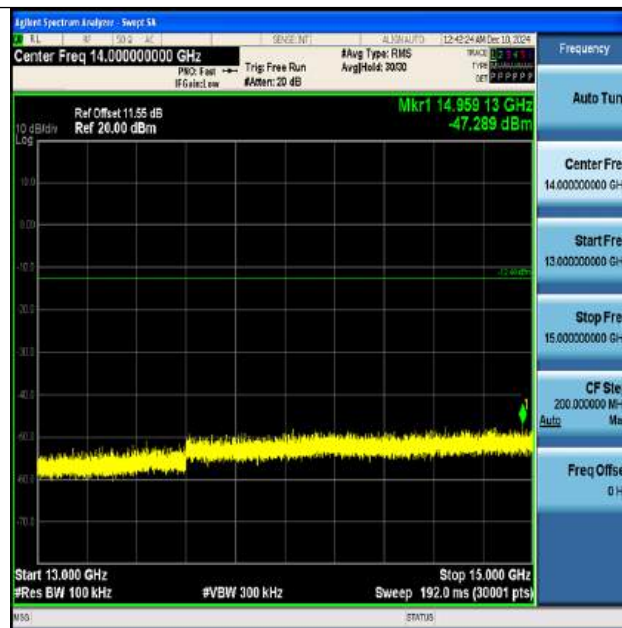
ZIGB-Ant1-2440-7000~9000-PASS



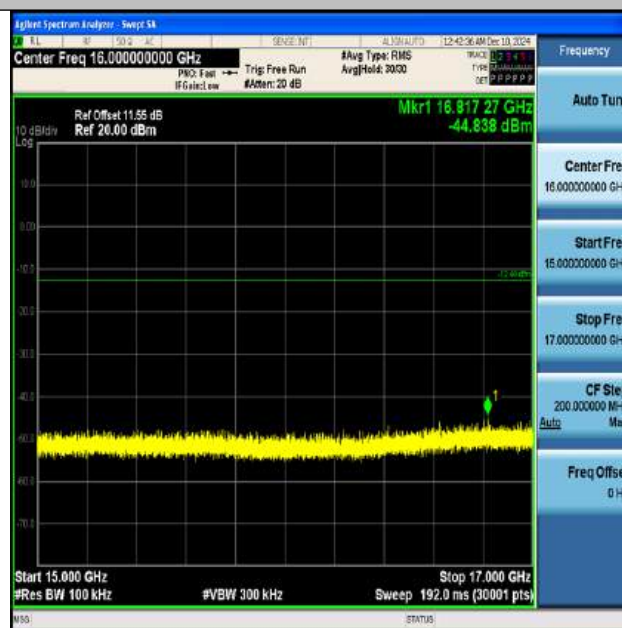
ZIGB-Ant1-2440-9000~11000-PASS



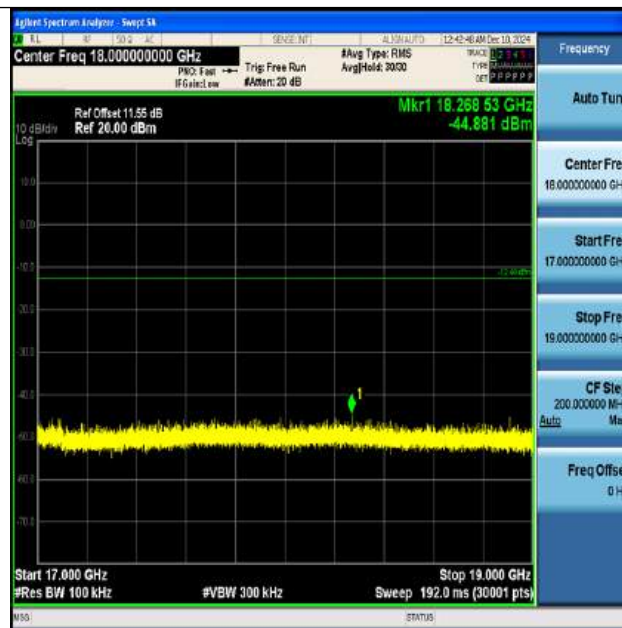
ZIGB-Ant1-2440-11000~13000-PASS



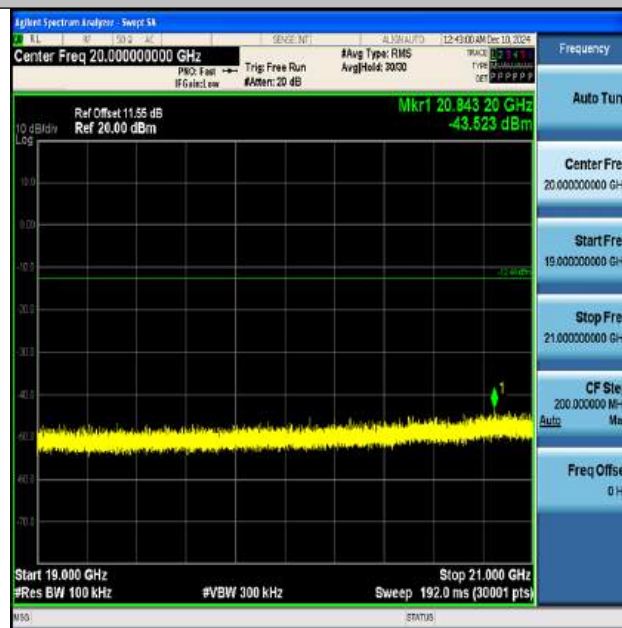
ZIGB-Ant1-2440-13000~15000-PASS



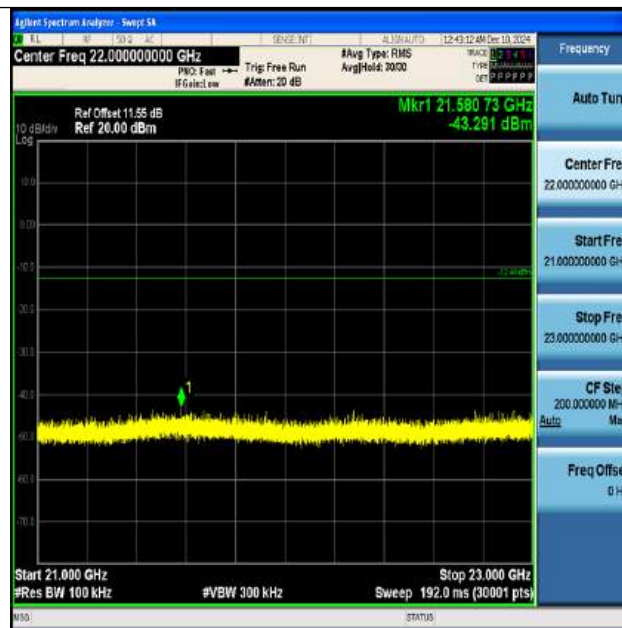
ZIGB-Ant1-2440-15000~17000-PASS



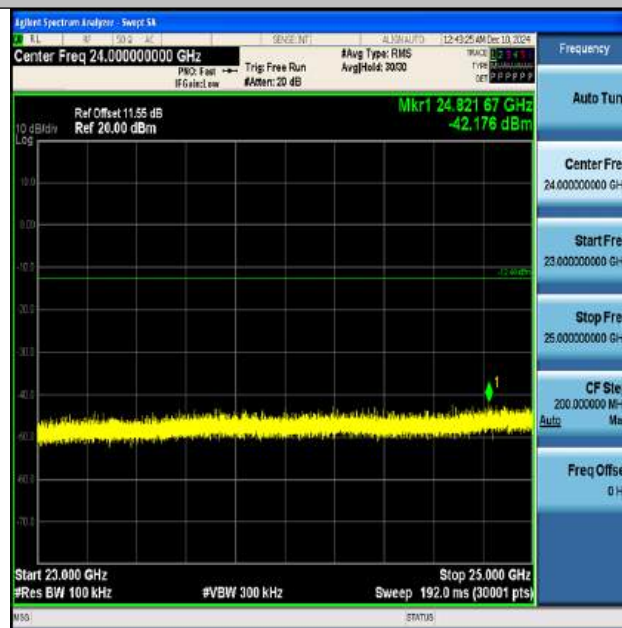
ZIGB-Ant1-2440-17000~19000-PASS



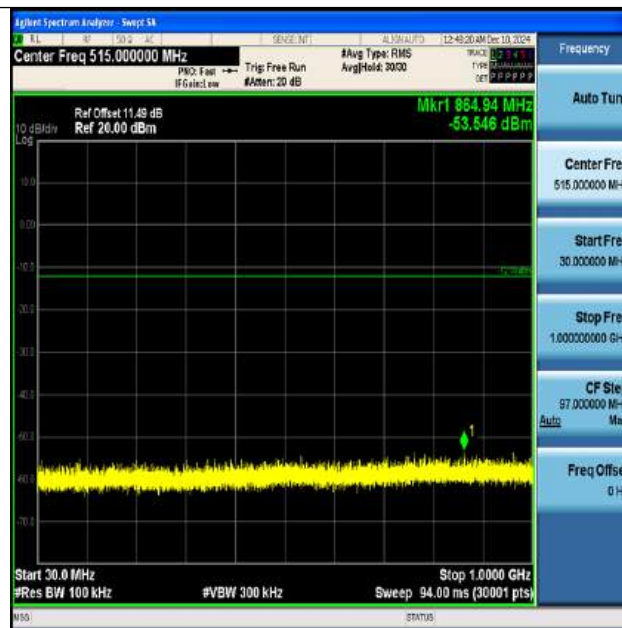
ZIGB-Ant1-2440-19000~21000-PASS



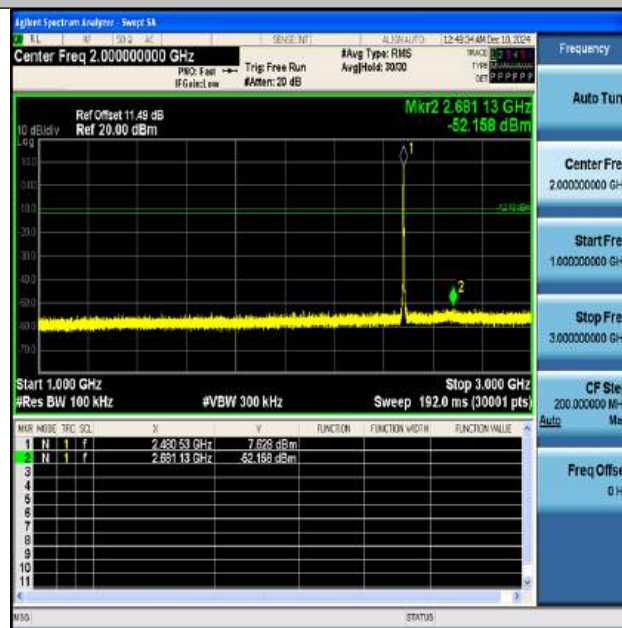
ZIGB-Ant1-2440-21000~23000-PASS



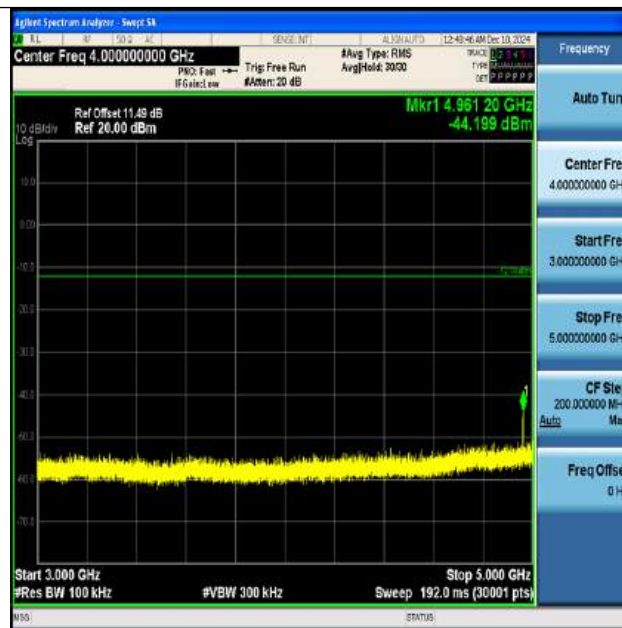
ZIGB-Ant1-2440-23000~25000-PASS



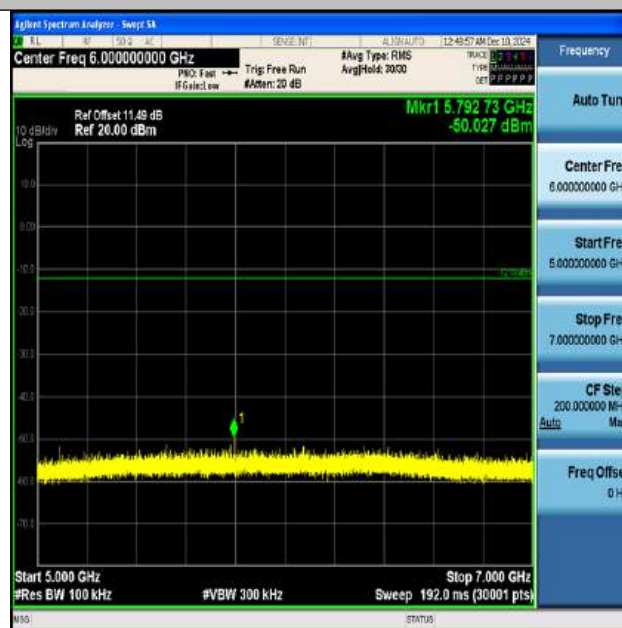
ZIGB-Ant1-2480-30~1000-PASS



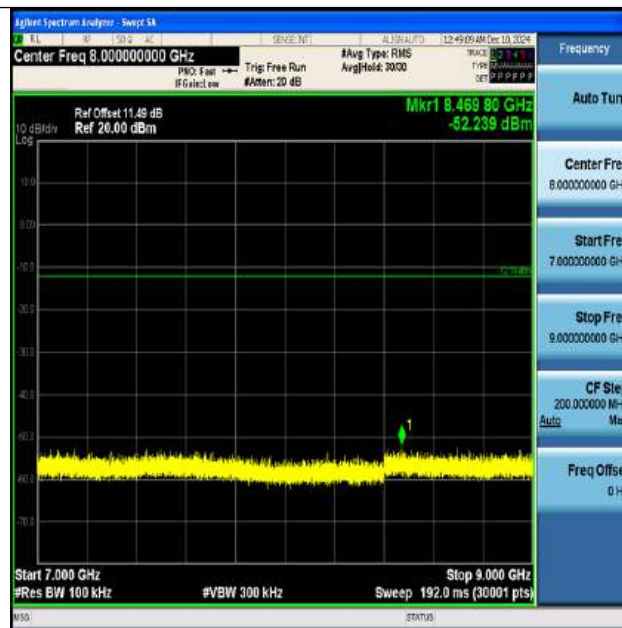
ZIGB-Ant1-2480-1000~3000-PASS



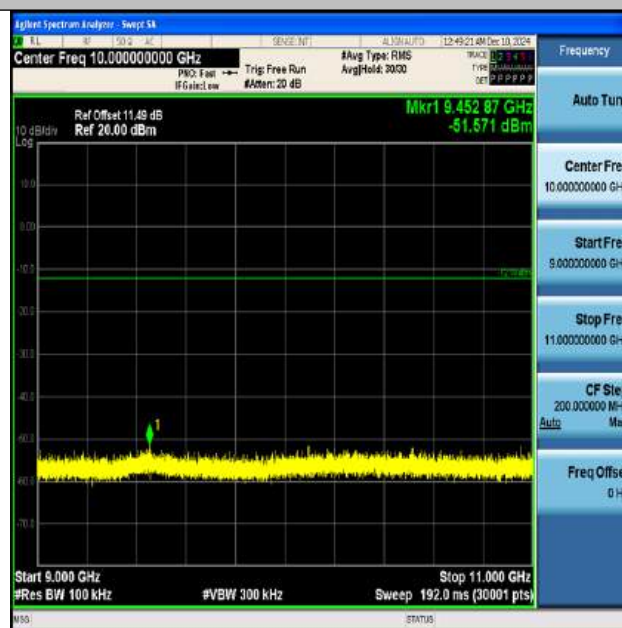
ZIGB-Ant1-2480-3000~5000-PASS



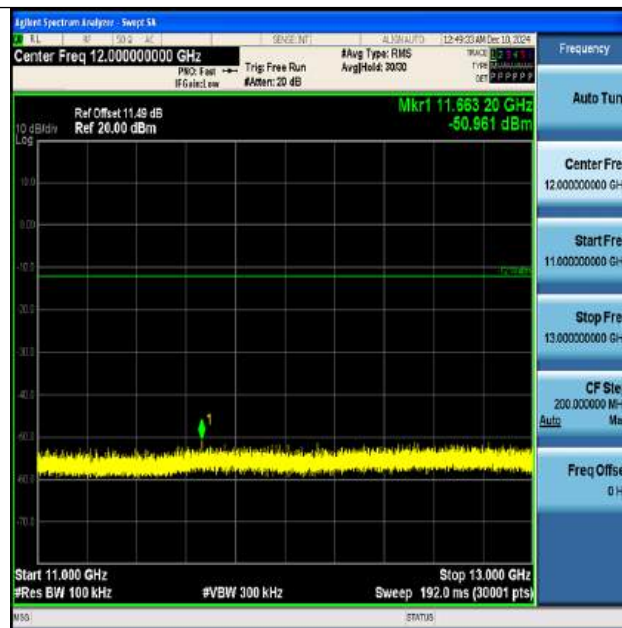
ZIGB-Ant1-2480-5000~7000-PASS



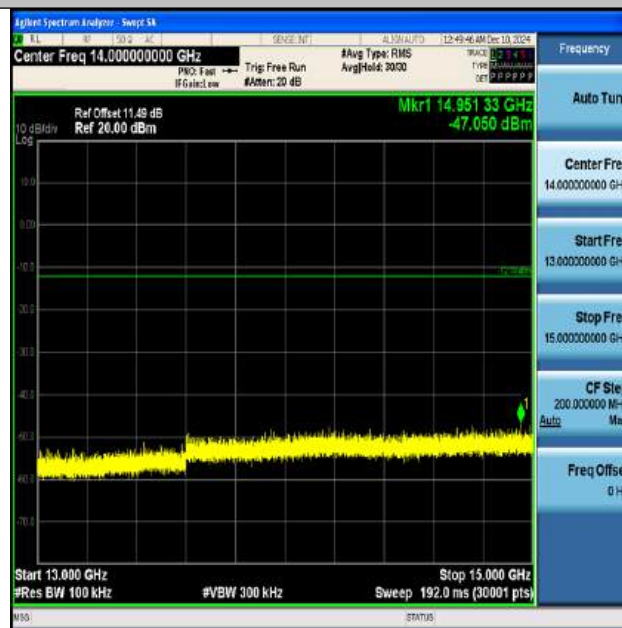
ZIGB-Ant1-2480-7000~9000-PASS



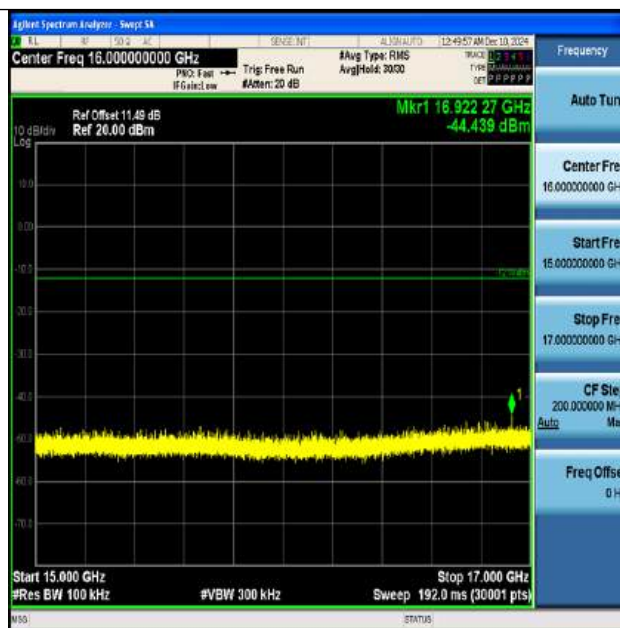
ZIGB-Ant1-2480-9000~11000-PASS



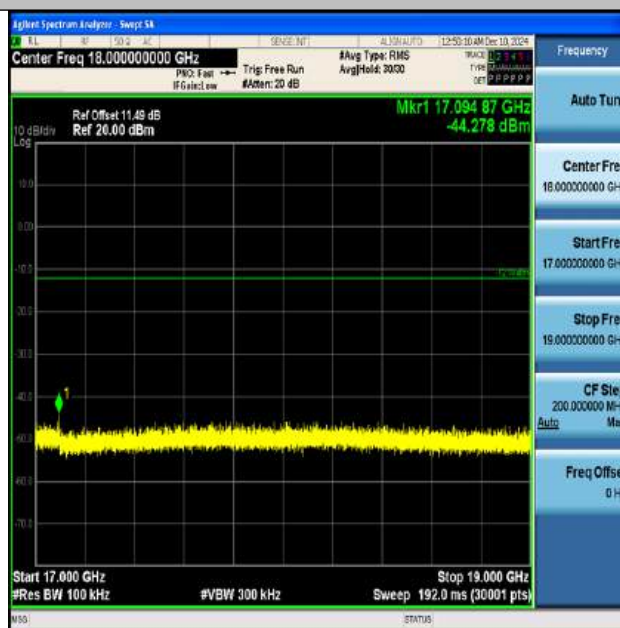
ZIGB-Ant1-2480-11000~13000-PASS



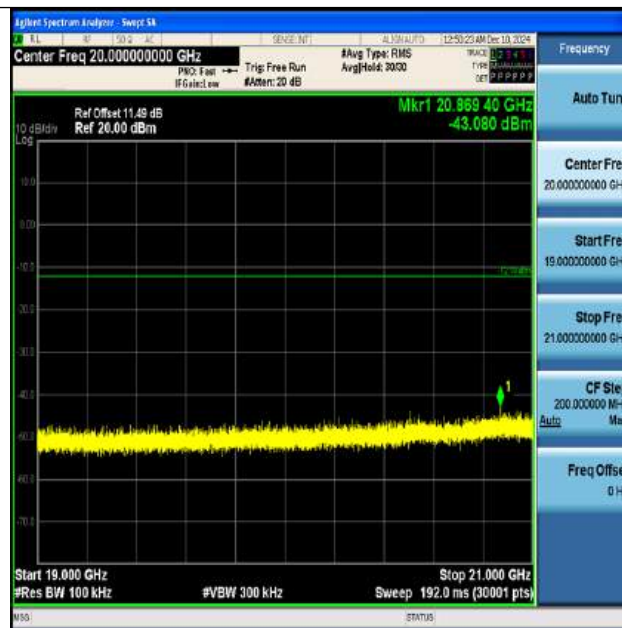
ZIGB-Ant1-2480-13000~15000-PASS



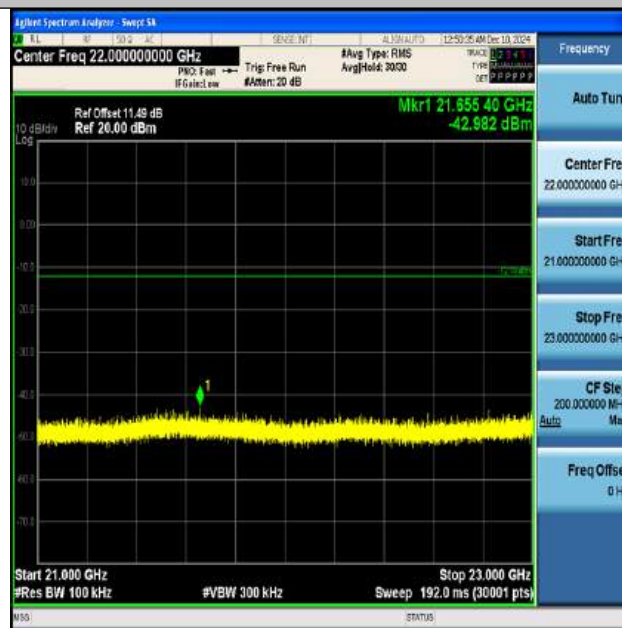
ZIGB-Ant1-2480-15000~17000-PASS



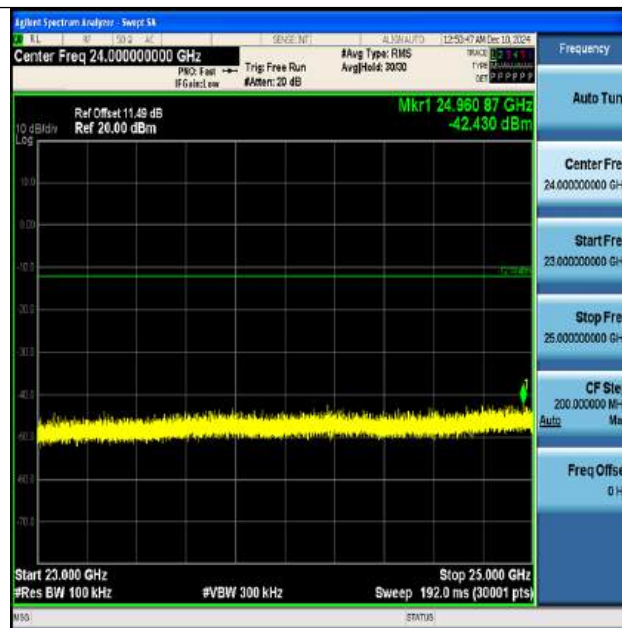
ZIGB-Ant1-2480-17000~19000-PASS



ZIGB-Ant1-2480-19000~21000-PASS



ZIGB-Ant1-2480-21000~23000-PASS



ZIGB-Ant1-2480-23000~25000-PASS

Appendix G: Duty Cycle

TestMode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Duty Cycle [%]	Limit
ZIGB	Ant1	2405	N/A	100	N/A
ZIGB	Ant1	2440	N/A	100	N/A
ZIGB	Ant1	2480	N/A	100	N/A



NTNV-ZIGB-Ant1-2405



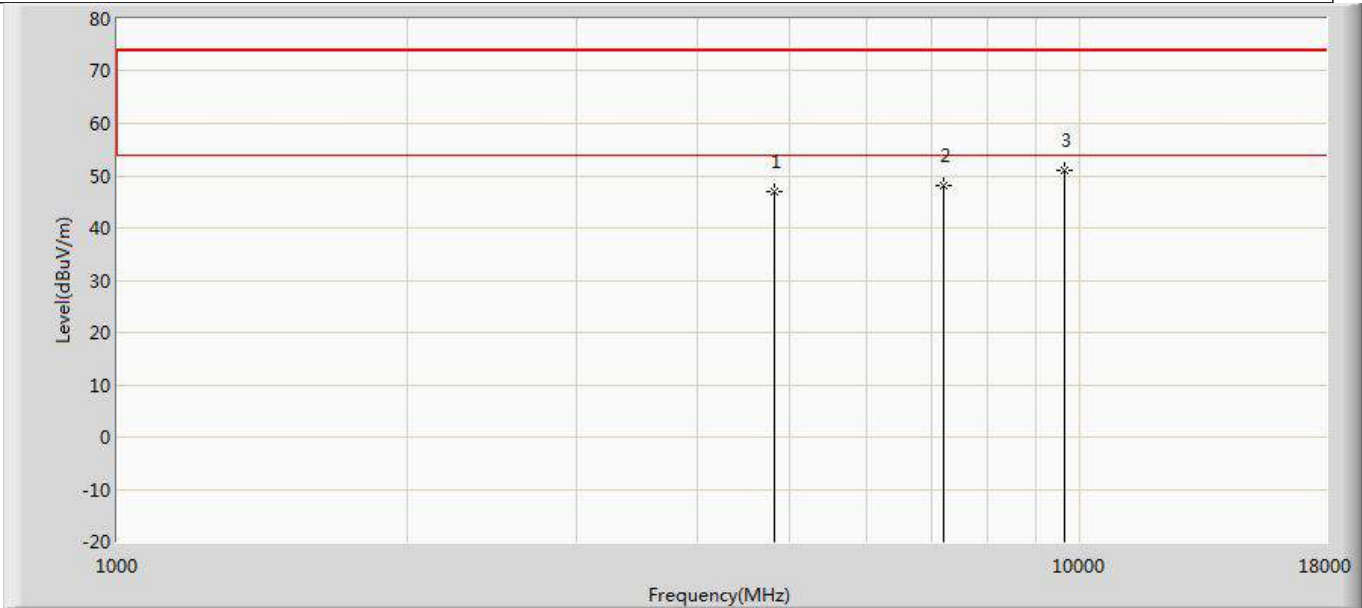
NTNV-ZIGB-Ant1-2440



NTNV-ZIGB-Ant1-2480

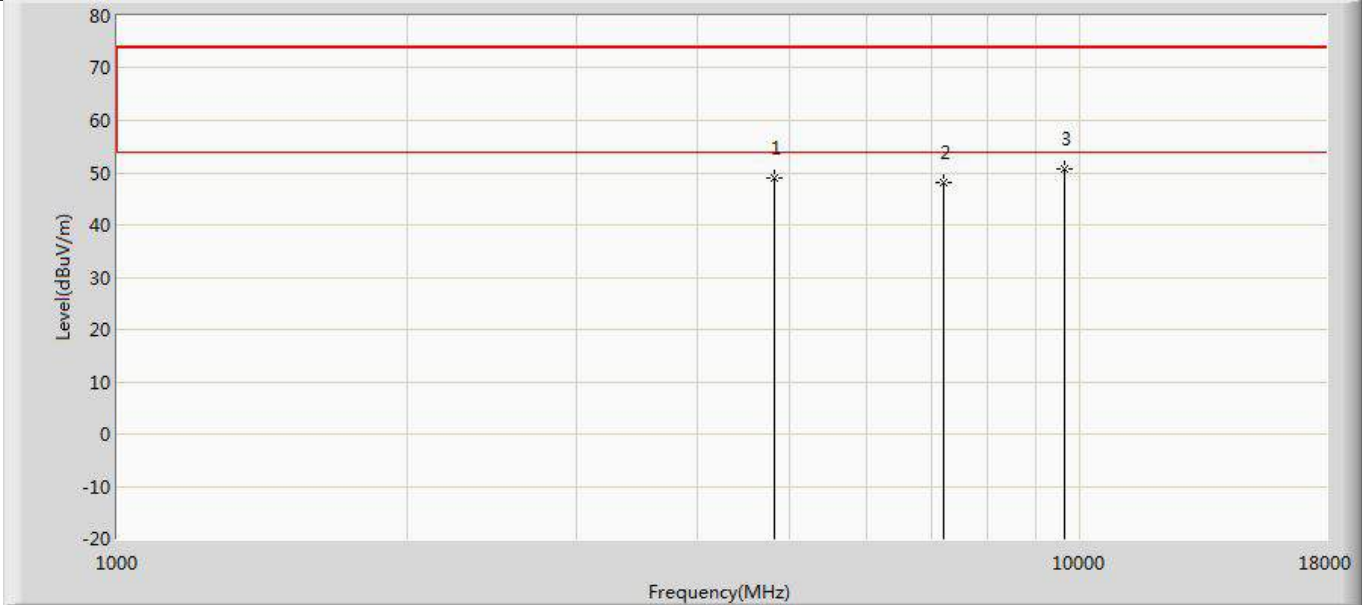
Appendix H: Emissions in Restricted Bands

Profile: 24B1032R	Page No.: 55
Engineer: Yu Liu	
Site: AC5	Time: 2024/12/19 - 13:17
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Horizontal
EUT: LED Lamp	Power: 120Vac/60Hz
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		4808.000	47.070	59.103	-26.930	74.000	-12.033	PK
2		7215.000	48.182	54.882	-25.818	74.000	-6.699	PK
3	*	9620.000	50.981	54.684	-23.019	74.000	-3.703	PK

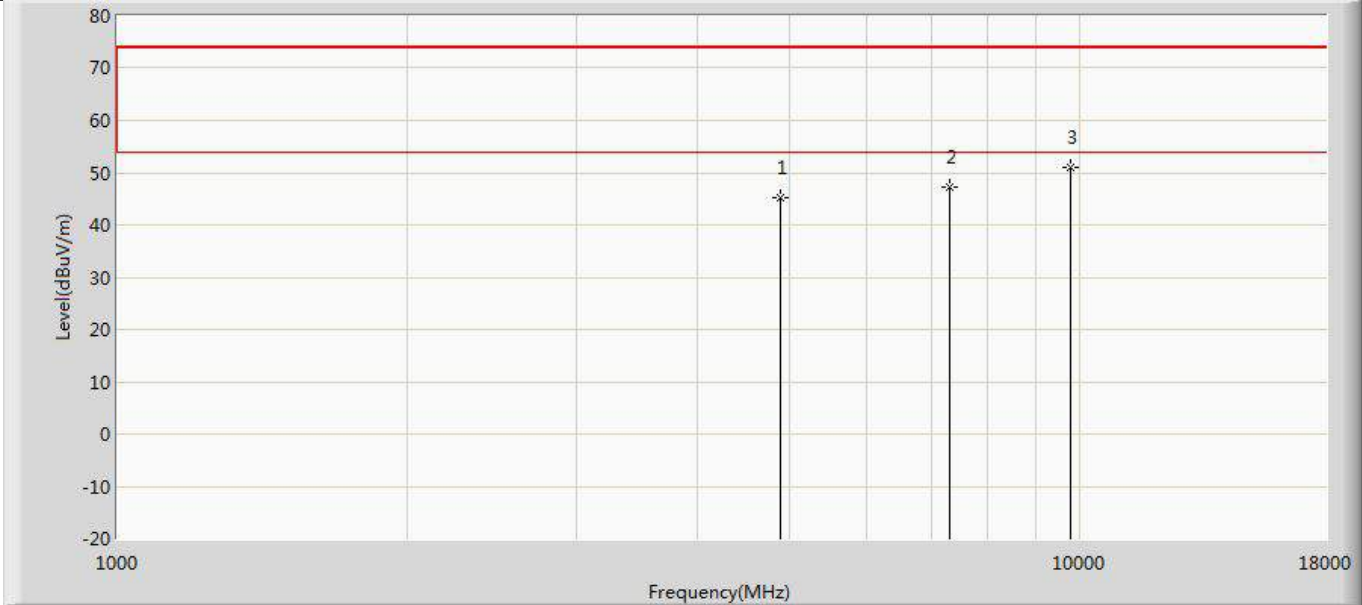
Profile: 24B1032R	Page No.: 56
Engineer: Yu Liu	
Site: AC5	Time: 2024/12/19 - 13:17
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Vertical
EUT: LED Lamp	Power: 120Vac/60Hz
Note: Mode 1:Transmit at 2405MHz by Zigbee	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4808.000	48.984	61.017	-25.016	74.000	-12.033	PK
2		7215.000	48.052	54.752	-25.948	74.000	-6.699	PK
3	*	9620.000	50.665	54.368	-23.335	74.000	-3.703	PK

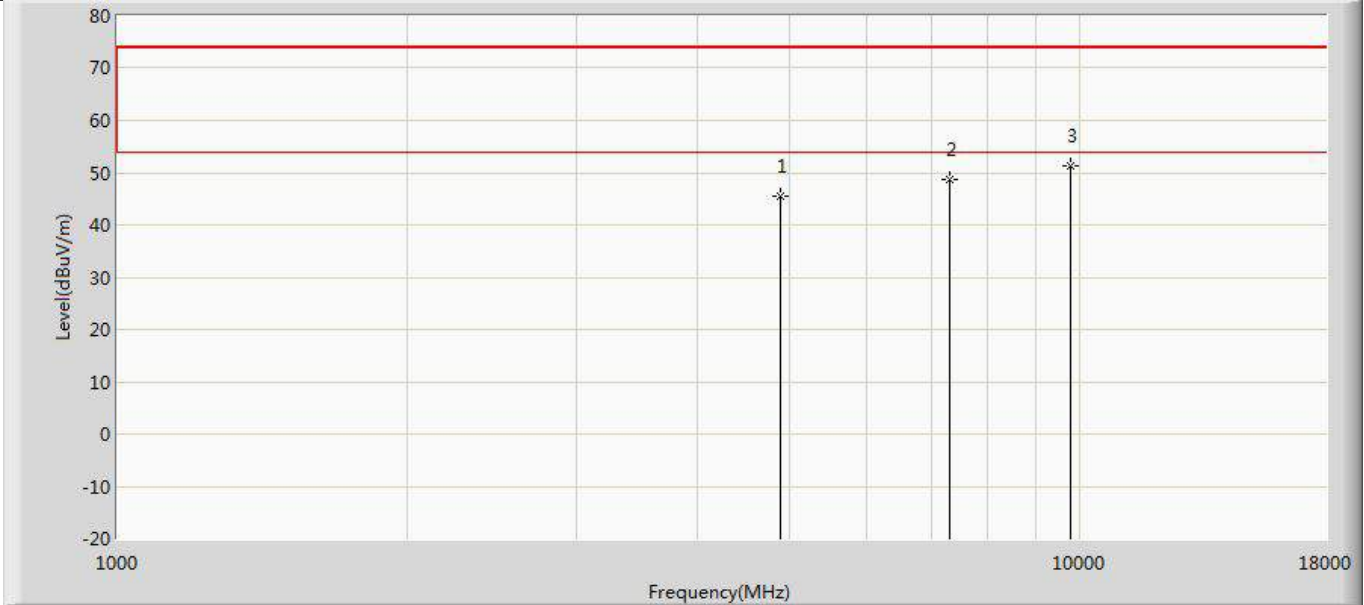


Profile: 24B1032R	Page No.: 57
Engineer: Yu Liu	
Site: AC5	Time: 2024/12/19 - 13:17
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Horizontal
EUT: LED Lamp	Power: 120Vac/60Hz
Note: Mode 1:Transmit at 2440MHz by Zigbee	



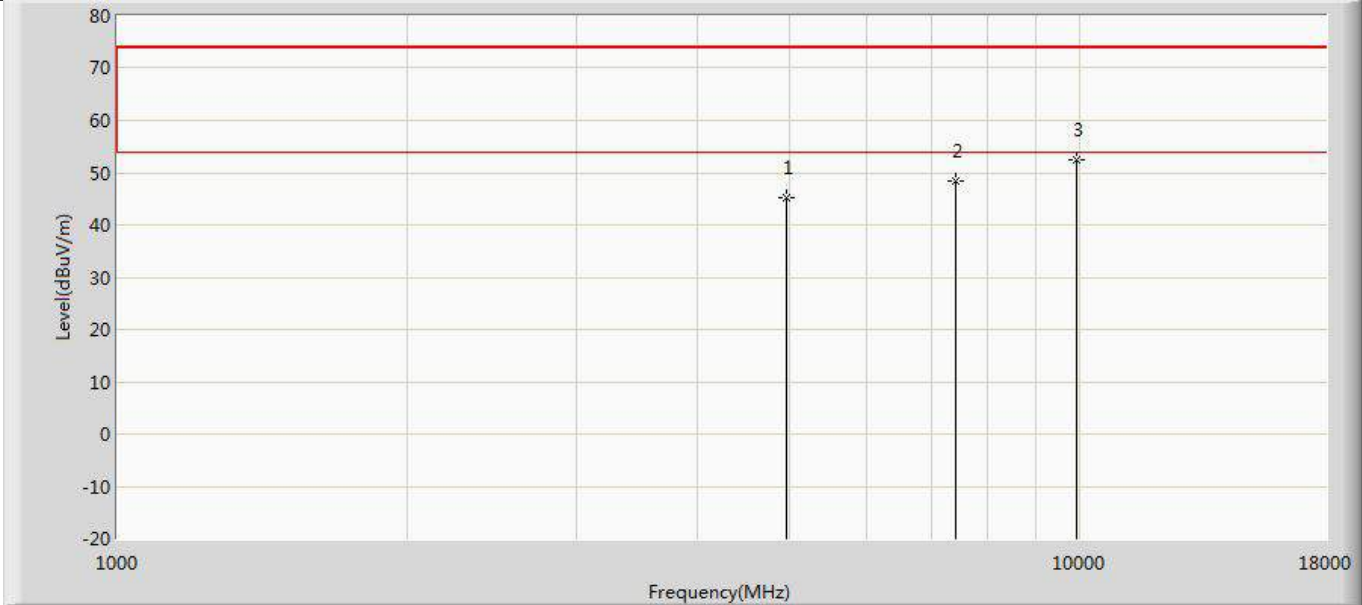
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4880.000	45.232	56.009	-28.768	74.000	-10.777	PK
2		7320.000	47.345	54.636	-26.655	74.000	-7.291	PK
3	*	9760.000	50.999	53.866	-23.001	74.000	-2.867	PK

Profile: 24B1032R	Page No.: 58
Engineer: Yu Liu	
Site: AC5	Time: 2024/12/19 - 13:17
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Vertical
EUT: LED Lamp	Power: 120Vac/60Hz
Note: Mode 1:Transmit at 2440MHz by Zigbee	



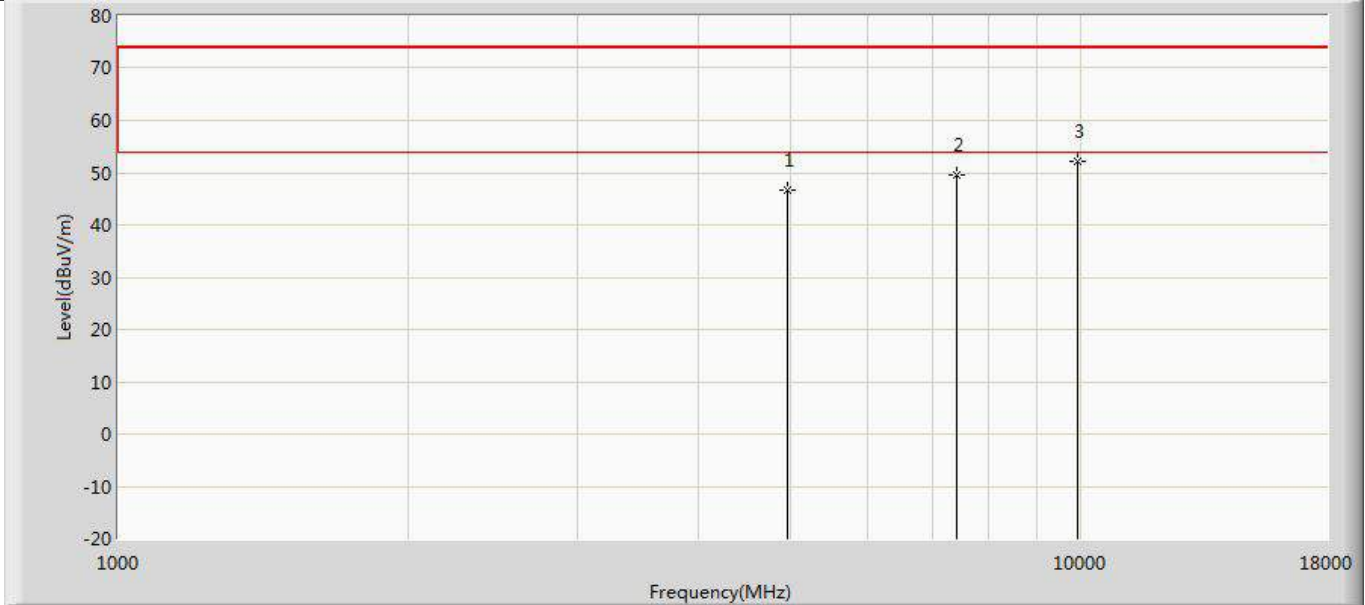
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4880.000	45.433	56.210	-28.567	74.000	-10.777	PK
2		7320.000	48.749	56.040	-25.251	74.000	-7.291	PK
3	*	9760.000	51.259	54.126	-22.741	74.000	-2.867	PK

Profile: 24B1032R	Page No.: 59
Engineer: Yu Liu	
Site: AC5	Time: 2024/12/19 - 13:17
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Horizontal
EUT: LED Lamp	Power: 120Vac/60Hz
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	45.315	56.202	-28.685	74.000	-10.888	PK
2		7440.000	48.384	55.494	-25.616	74.000	-7.110	PK
3	*	9920.000	52.478	54.343	-21.522	74.000	-1.865	PK

Profile: 24B1032R	Page No.: 60
Engineer: Yu Liu	
Site: AC5	Time: 2024/12/19 - 13:17
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Vertical
EUT: LED Lamp	Power: 120Vac/60Hz
Note: Mode 1:Transmit at 2480MHz by Zigbee	



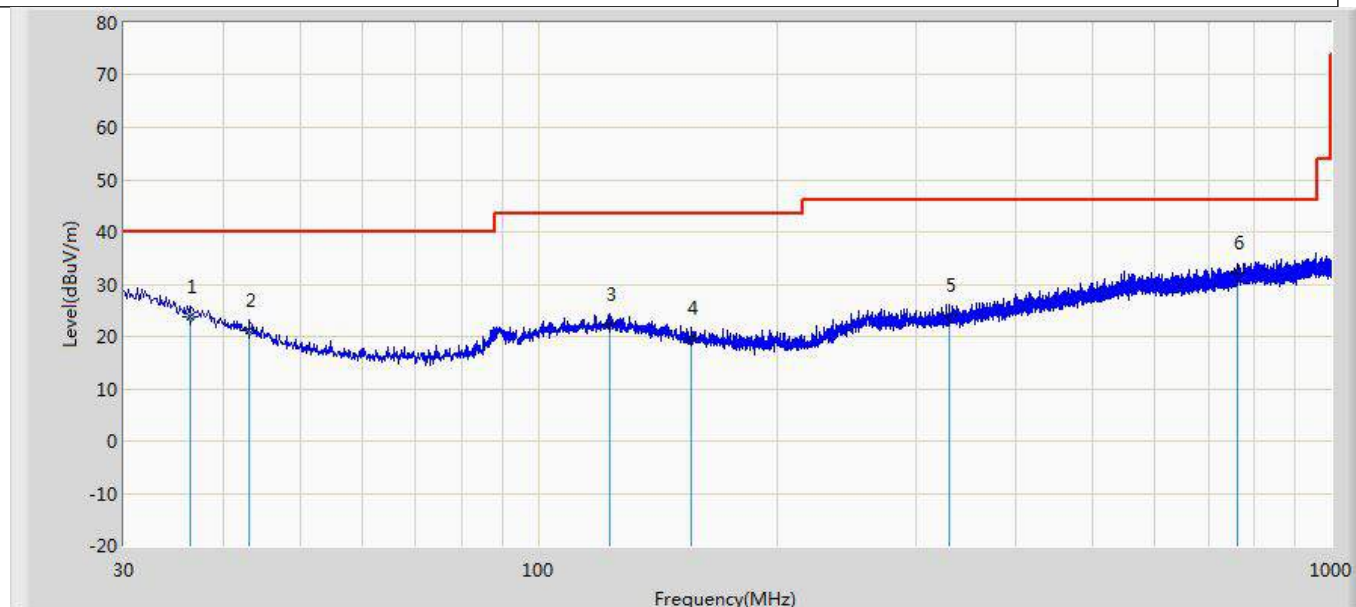
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4961.000	46.643	57.495	-27.357	74.000	-10.852	PK
2		7440.000	49.683	56.793	-24.317	74.000	-7.110	PK
3	*	9920.000	52.246	54.111	-21.754	74.000	-1.865	PK

Note:

1. Measured Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, worst case are at least 20dB below the limits, therefore no data appear in the report.
3. The test frequency range, 18GHz~26GHz test result on peak is lower than average limit, all is the noise base, therefore no data appear in the report.
4. If the test result on peak is lower than average limit, then average measurement needn't be performed.

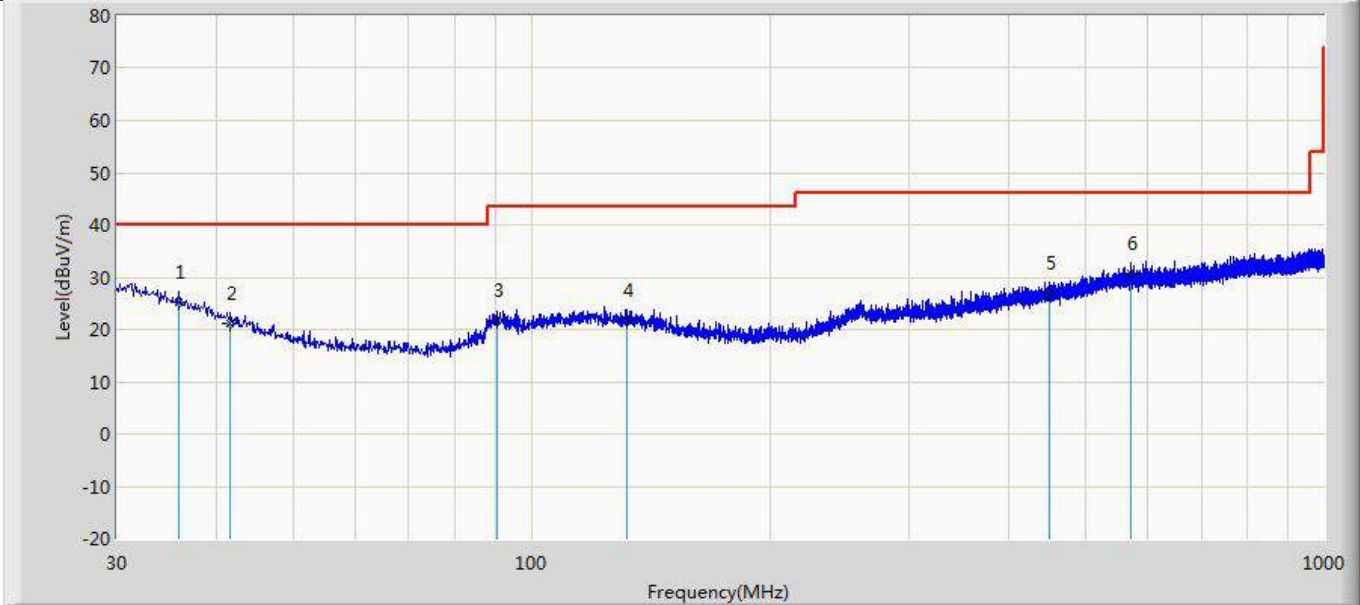
The worst case of Radiated Emission below 1GHz :

Profile: 24B1032R	Page No.: 3
Engineer: Yu Liu	
Site: AC2	Time: 2024/12/19 - 19:29
Limit: FCC_Part 15.209	Margin: 0
Probe: CBL6112D_27613(30-1000MHz)	Polarity: Horizontal
EUT: LED Lamp	Power: 120Vac/60Hz
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		36.305	23.892	2.271	-16.108	40.000	21.621	QP
2		43.216	21.161	3.275	-18.839	40.000	17.885	QP
3		122.999	22.303	2.992	-21.197	43.500	19.312	QP
4		155.857	19.807	2.647	-23.693	43.500	17.160	QP
5		329.851	24.162	2.690	-21.838	46.000	21.472	QP
6	*	760.410	32.038	3.378	-13.962	46.000	28.660	QP

Profile: 24B1032R	Page No.: 4
Engineer: Yu Liu	
Site: AC2	Time: 2024/12/19 - 19:29
Limit: FCC_Part 15.209	Margin: 0
Probe: CBL6112D_27613(30-1000MHz)	Polarity: Vertical
EUT: LED Lamp	Power: 120Vac/60Hz
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	*	35.941	25.266	3.441	-14.734	40.000	21.825	QP
2		41.761	21.278	2.634	-18.722	40.000	18.644	QP
3		90.382	21.599	5.622	-21.901	43.500	15.976	QP
4		132.214	21.650	2.779	-21.850	43.500	18.871	QP
5		450.010	26.986	2.351	-19.014	46.000	24.635	QP
6		571.745	30.643	3.500	-15.357	46.000	27.143	QP

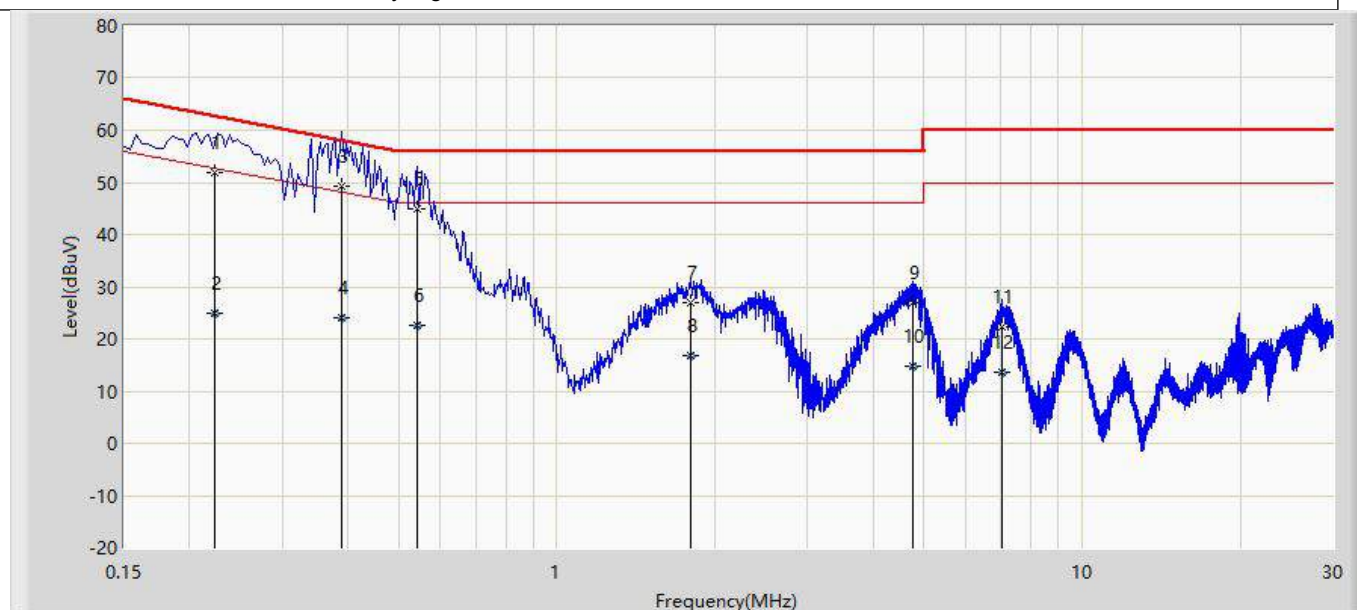
Note:

1. " * ", means this data is the worst emission level.

2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp)

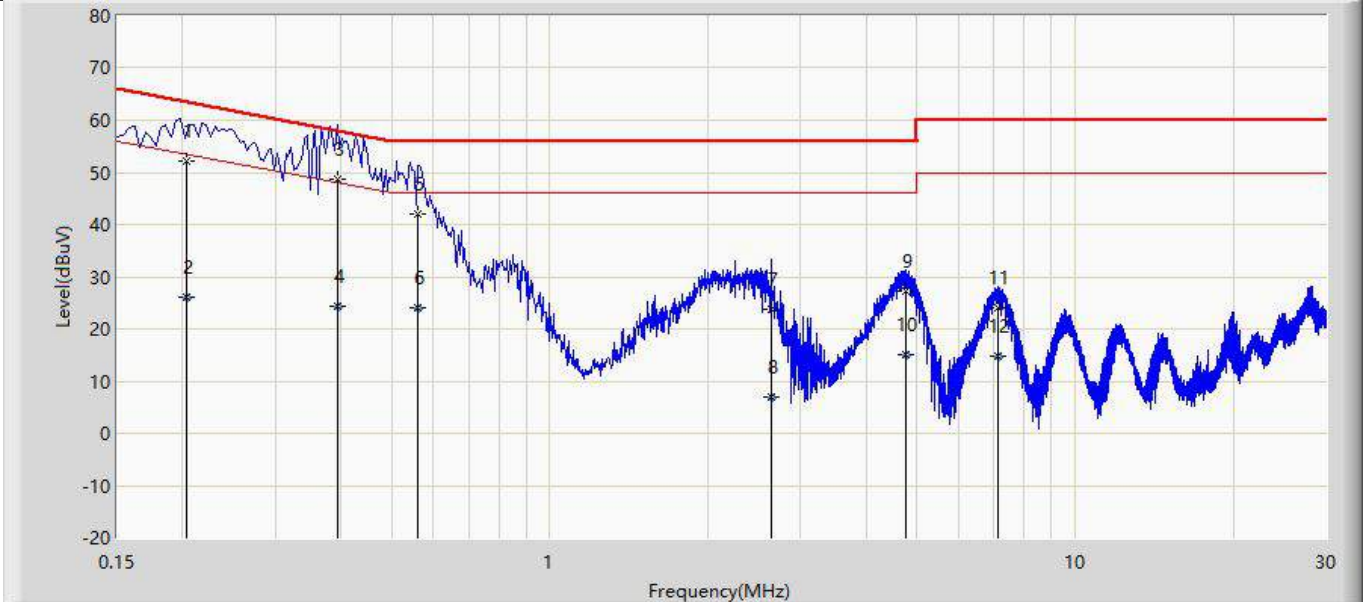
Appendix I: AC Power Line Conducted Emission

Profile: 24B1032R	Page No.: 1
Engineer: Yu Liu	
Site: TR1	Time: 2024/12/10 - 23:32
Limit: FCC_Part 15.207	Margin: 0
Probe: ENV216_101189(0.009-30MHz)	Polarity: Line
EUT: LED Lamp	Power: 120Vac/60Hz
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		0.223	51.787	42.163	-10.908	62.694	9.623	QP
2		0.223	25.043	15.420	-27.651	52.694	9.623	AV
3	*	0.390	49.258	39.627	-8.806	58.064	9.631	QP
4		0.390	24.022	14.391	-24.042	48.064	9.631	AV
5		0.542	45.030	35.392	-10.970	56.000	9.638	QP
6		0.542	22.725	13.086	-23.275	46.000	9.638	AV
7		1.802	26.826	17.136	-29.174	56.000	9.690	QP
8		1.802	16.932	7.242	-29.068	46.000	9.690	AV
9		4.754	26.852	17.097	-29.148	56.000	9.755	QP
10		4.754	14.830	5.075	-31.170	46.000	9.755	AV
11		7.054	22.368	12.551	-37.632	60.000	9.817	QP
12		7.054	13.622	3.805	-36.378	50.000	9.817	AV

Profile: 24B1032R	Page No.: 2
Engineer: Yu Liu	
Site: TR1	Time: 2024/12/10 - 23:36
Limit: FCC_Part 15.207	Margin: 0
Probe: ENV216_101189(0.009-30MHz)	Polarity: Neutral
EUT: LED Lamp	Power: 120Vac/60Hz
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		0.204	52.189	42.556	-11.263	63.452	9.633	QP
2		0.204	26.038	16.405	-27.414	53.452	9.633	AV
3	*	0.394	48.708	39.066	-9.271	57.979	9.641	QP
4		0.394	24.471	14.830	-23.507	47.979	9.641	AV
5		0.562	42.004	32.354	-13.996	56.000	9.650	QP
6		0.562	23.935	14.285	-22.065	46.000	9.650	AV
7		2.642	23.896	14.179	-32.104	56.000	9.717	QP
8		2.642	7.072	-2.645	-38.928	46.000	9.717	AV
9		4.762	27.104	17.339	-28.896	56.000	9.766	QP
10		4.762	15.044	5.279	-30.956	46.000	9.766	AV
11		7.150	23.977	14.157	-36.023	60.000	9.820	QP
12		7.150	14.685	4.865	-35.315	50.000	9.820	AV

Note:

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

The End