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

Test report No:
2520983R.702

FCC TEST REPORT

Product Name	Smart Controller
Trademark	N/A
Model and /or type reference	TENSO-DUAL
FCC ID	2A8JK-TENSO-2BAND
Applicant´s name / address	ACSL Ltd. Hulic Kasai Rinkai Building 2F, 3-6-4 Rinkaicho, Edogawa-ku, Tokyo 134-0086, Japan
Test method requested, standard	47 CFR FCC Part 15 (Section 15.247) ANSI C63.10: 2013
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	2025-04-20
Report Version	V1.0
Report template No	Template_FCC Part 15C-RF-V1.0

INDEX

page

COMPETENCES AND GUARANTEES

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

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

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

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

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

GENERAL CONDITIONS

Test Location A	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Test Location B	No. 8213, Fanhua Avenue, Baohe District, Hefei City, Anhui Province, China
Date(receive sample)	Feb. 20, 2025
Date (start test)	Mar. 10, 2025
Date (finish test)	Mar. 30, 2025

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
2520983R.702	V1.0	Initial issue of report.	2025-04-20

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).
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 Channel List.

USED EQUIPMENT

Test Location A :AC Power Line Conducted Emission / TR1

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI	100726	2024.07.06	2025.07.05
Two-Line V-Network	R&S	ENV 216	101044	2024.10.26	2025.10.25
Two-Line V-Network	R&S	ENV 216	101189	2024.07.06	2025.07.05
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2024.04.20	2025.04.19
Coaxial Cable	Huber+Suhner	RG 223	TR1-C1	2024.04.27	2025.04.26
Impedance Stabilization Network	Teseq GmbH	ISN T800	57318	2024.02.27	2025.02.26
Impedance Stabilization Network	Teseq GmbH	ISN T800	57318	2025.02.25	2026.02.24
Temperature/Humidity Meter	RTS	RTS-8S	EMC01	2024.07.04	2025.07.03
Dekra test software	Dekra	N/A	N/A	N/A	N/A

Test Location A :Conducted Test/ TR8

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Wireless Connectivity Tester	R&S	CMW 270	102593	2024.05.15	2025.05.14
Coaxial Cable	N/A	N/A	2477	2024.06.11	2025.06.10
Coaxial Cable	N/A	N/A	2478	2024.06.11	2025.06.10
High and low temperature and fast temperature change test box	ASTUOD	ASTD-FBT-225K	N/A	2024.04.21	2025.04.20
Temperature/Humidity Meter	RTS	RTS-8S	RF07	2024.07.04	2025.07.03
Test system					
Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
MAX Signal Analyzer	Keysight	N9010A	MY48030494	2024.10.26	2025.10.25
RF Control Unit	Tonscend	JS0806-2	22G8060594	2025.01.26	2026.01.25
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY61252529	2024.05.12	2025.05.11
Frequency extender for EXG or MXG	Keysight	N5182BX07	MY59362500	2024.05.12	2025.05.11
EXG-B MW Analog Signal Generator	Keysight	N5173B	MY61252566	2024.07.06	2025.07.05
Test Software	Tonscend	TS1120	JS1120-3	N/A	N/A

Test Location A :Radiated Emission(9KHz-1GHz) / AC2

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date

EMI Test Receiver	R&S	ESCI	100176	2024.05.12	2025.05.11
Loop Antenna	R&S	HFH2-Z2E	101149	2024.03.27	2025.03.26
Bilog Antenna	Teseq GmbH	CBL6112D	27613	2024.09.08	2025.09.07
Temperature/Humidity Meter	RTS	RTS-8S	AC2-TH	2024.07.04	2025.07.03
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2024.04.27	2025.04.26
Dekra test software	Dekra	N/A	N/A	N/A	N/A

Test Location B: Radiated Emission Band Edge / AC103

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal analyzer	keysight	N9020B	MY63490118	2024.07.26	2025.07.25
Bilog Antenna	TESEQ	CBL6112D	64164	2024.11.23	2025.11.22
Horn Antenna	RF SPIN	DRH18-E	KV2D11A18ES	2024.11.02	2025.11.01
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	01312	2024.10.28	2025.10.27
Amplifier	ESE	LNA0118	LNA23100009	2024.08.10	2025.08.09
Amplifier	Tonscend	TAP01018048S	AP23J8060307	2024.11.16	2025.11.15
Band Reject Filter Group	Tonscend	JS0806-F	23G806F0701	2024.11.20	2025.11.19
Temperature/Humidity Meter	RTS	RTS-8S	026	2024.09.04	2025.09.03
Test Software	Tonscend	JS36	N/A	N/A	N/A

Test Location A :AC Power Line Conducted Emission / TR1

Instrument	Manufacturer	Model No.	Serial No.	Firmware Versiom	Software version
EMI Test Receiver	R&S	ESCI	100726	4.42 SP1	N/A
Two-Line V-Network	R&S	ENV 216	101044	N/A	N/A
Two-Line V-Network	R&S	ENV 216	101189	N/A	N/A
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	N/A	N/A
Coaxial Cable	Huber+Suhner	RG 223	TR1-C1	N/A	N/A
Impedance Stabilization Network	Teseq GmbH	ISN T800	57318	N/A	N/A
Impedance Stabilization Network	Teseq GmbH	ISN T800	57318	N/A	N/A
Temperature/Humidity Meter	RTS	RTS-8S	EMC01	N/A	N/A
Dekra test software	Dekra	N/A	N/A	N/A	N/A

Test Location A :Conducted Test/ TR8

Instrument	Manufacturer	Model No.	Serial No.	Firmware Versiom	Software version
Wireless Connectivity Tester	R&S	CMW 270	102593	V 4.0.60	N/A
Coaxial Cable	N/A	N/A	2477	N/A	N/A
Coaxial Cable	N/A	N/A	2478	N/A	N/A
High and low temperature and fast temperature change test box	ASTUOD	ASTD-FBT-225K	N/A	N/A	N/A
Temperature/Humidity Meter	RTS	RTS-8S	RF07	N/A	N/A
Test system					
Instrument	Manufacturer	Model No.	Serial No.	Firmware Versiom	Software version
MAX Signal Analyzer	Keysight	N9010A	MY48030494	A.14.03	N/A
RF Control Unit	Tonscend	JS0806-2	22G8060594	N/A	N/A
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY61252529	B.01.96	N/A
Frequency extender for EXG or MXG	Keysight	N5182BX07	MY59362500	N/A	N/A
EXG-B MW Analog Signal Generator	Keysight	N5173B	MY61252566	B.01.95	N/A
Test Software	Tonscend	TS1120	JS1120-3	N/A	V3.0.22

Test Location A :Radiated Emission(9KHz-1GHz) / AC2

Instrument	Manufacturer	Model No.	Serial No.	Firmware Versiom	Software version
EMI Test Receiver	R&S	ESCI	100176	4.42 SP3	N/A
Loop Antenna	R&S	HFH2-Z2E	101149	N/A	N/A

Bilog Antenna	Teseq GmbH	CBL6112D	27613	N/A	N/A
Temperature/Humidity Meter	RTS	RTS-8S	AC2-TH	N/A	N/A
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	N/A	N/A
Dekra test software	Dekra	N/A	N/A	N/A	3

Test Location B: Radiated Emission Band Edge / AC103

Instrument	Manufacturer	Model No.	Serial No.	Firmware Versiom	Software version
Signal analyzer	keysight	N9020B	MY63490118	A 08.54	N/A
Bilog Antenna	TESEQ	CBL6112D	64164	N/A	N/A
Horn Antenna	RF SPIN	DRH18-E	KV2D11A18ES	N/A	N/A
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	01312	N/A	N/A
Amplifier	ESE	LNA0118	LNA23100009	N/A	N/A
Amplifier	Tonscend	TAP01018048S	AP23J8060307	N/A	N/A
Band Reject Filter Group	Tonscend	JS0806-F	23G806F0701	N/A	N/A
Temperature/Humidity Meter	RTS	RTS-8S	026	N/A	N/A
Test Software	Tonscend	JS36	N/A	N/A	5.0.0

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 Test Location A	Uncertainty
AC Power Line Conducted Emission	9kHz~150kHz: 2.8 dB 150kHz~30MHz: 2.4 dB
Peak Power Output	± 1.3 dB
Radiated Emission(30MHz~1GHz)	Horizontal: 30MHz~300MHz: 3.5 dB, 300MHz~1GHz: 3.6 dB Vertical: 30MHz~300MHz: 3.6 dB, 300MHz~1GHz: 3.5 dB
Radiated Emission(1GHz~40GHz)	Horizontal: 1GHz~40GHz: 5.0 dB Vertical: 1GHz~40GHz: 4.8 dB
RF antenna conducted test	± 1.3 dB
Radiated Emission Band Edge	± 5.0 dB
DTS Bandwidth	± 1 kHz
Occupied Bandwidth	± 1 kHz
Power Density	± 1.3 dB

Test item Test Location B	Uncertainty
Radiated Emission(30MHz~1GHz)	Horizontal: 30MHz~300MHz: 4.9 dB, 300MHz~1GHz: 4.9 dB Vertical: 30MHz~300MHz: 4.9 dB, 300MHz~1GHz: 4.9 dB
Radiated Emission(1GHz~40GHz)	Horizontal: 1GHz~40GHz: 6.0 dB Vertical: 1GHz~40GHz: 5.8 dB
Radiated Emission Band Edge	± 6.0 dB

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Product Name ..... :	Smart Controller					
Trademark ..... :	N/A					
Model No. ..... :	TENSO-DUAL					
FCC ID..... :	2A8JK-TENSO-2BAND					
Hardware Version..... :	V1.1					
Software Version ..... :	T44					
Operating Temperature ..... :	-40℃ ~ 70℃					
Power Supply ..... :	DC 3.3 V, 4.5 A 15 W from internal rechargeable battery which can be charged by AC/DC adapter.					
Manufacturer ..... :	Aerora North America, Inc.					
Manufacturer address ..... :	2445 Augustine Drive, Suites 150, Santa Clara, CA 95054					
Factory..... :	ROTOTEK VIETNAM CO., LTD					
Factory address..... :	House S4_2nd floor, Hap Linh Industrial Park, Bac Ninh City, Vietnam					
Test Matrix/ IMEI ..... :	RF Conducted	G55V462337F3B00203				
	RSE	G55V462337F3B00216				
Wireless specification..... :	Bluetooth					
Operating frequency range(s) :	2402~2480MHz					
Type of Modulation..... :	GFSK					
PHYs ..... :	☒	LE 1M	☐	LE 2M	☐	LE Coded S=2/8
Data Rate ..... :	☒	1Mbit/s	☐	2Mbit/s	☐	500/125 Kbit/s
Number of channels ..... :	40					
Antenna Type ..... :	FPC					
Antenna Gain ..... :	0.90 dBi					

1.2 Channel List

Bluetooth Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2404 MHz	02	2406 MHz	03	2408 MHz
04	2410 MHz	05	2412 MHz	06	2414 MHz	07	2416 MHz
08	2418 MHz	09	2420 MHz	10	2422 MHz	11	2424 MHz
12	2426 MHz	13	2428 MHz	14	2430 MHz	15	2432 MHz
16	2434 MHz	17	2436 MHz	18	2438 MHz	19	2440 MHz
20	2442 MHz	21	2444 MHz	22	2446 MHz	23	2448 MHz
24	2450 MHz	25	2452 MHz	26	2454 MHz	27	2456 MHz
28	2458 MHz	29	2460 MHz	30	2462 MHz	31	2464 MHz
32	2466 MHz	33	2468 MHz	34	2470 MHz	35	2472 MHz
36	2474 MHz	37	2476 MHz	38	2478 MHz	39	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 Auxiliary equipment / Test software for the EUT

Auxiliary equipment	Type / Version	Manufacturer	Supplied by
(1) N/A	N/A	N/A	N/A
(2) N/A	N/A	N/A	N/A
(3) N/A	N/A	N/A	N/A
software	Type / Version	Manufacturer	Supplied by
QRCT	N/A	N/A	N/A

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

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	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 B**
Maximum power spectral density	FCC 15.247(e)	PASS	Test data please refer to **Appendix C**
Band edge measurements	FCC 15.247(d) FCC 15.205 FCC 15.209	PASS	Test data please refer to **Appendix D**
Conducted Spurious Emission	FCC 15.247(d), FCC 15.209	PASS	Test data please refer to **Appendix E**
Duty cycle	ANSI C63.10:2013	PASS	Test data please refer to **Appendix F**
Emissions in Restricted Bands	FCC 15.205 FCC 15.209	PASS	Test data please refer to **Appendix G**
AC Power Line Conducted Emission	FCC 15.207	PASS	Test data please refer to **Appendix H**
Antenna Requirement	FCC 15.203	PASS	---

3.4 Power setting in test

Mode	Channel	Frequency (MHz)	Power setting
BLE_1M	00	2402	Default
	19	2440	Default
	39	2480	Default

3.5 Test Facility

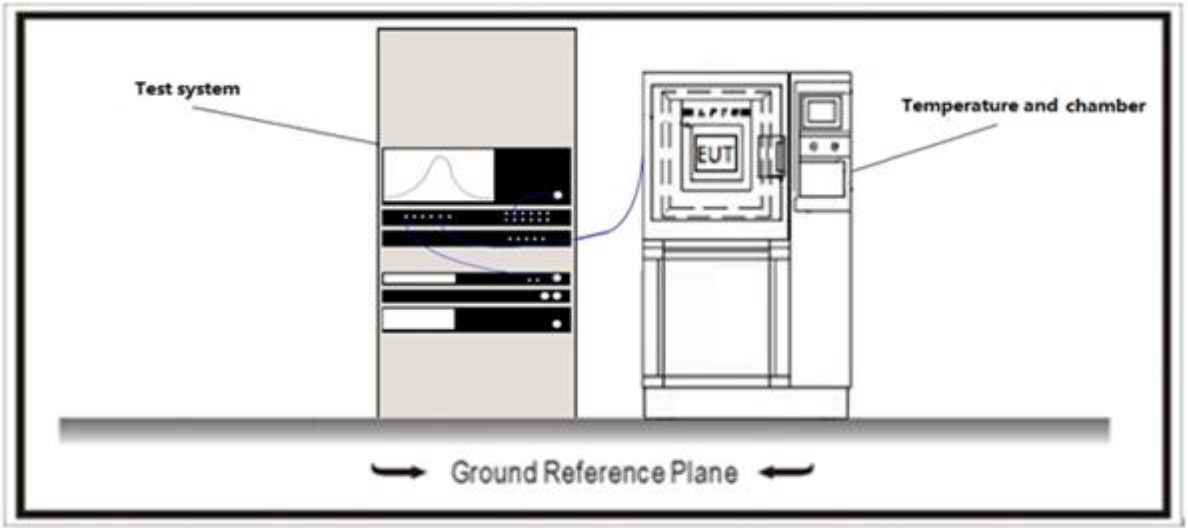
Tset Location A	**:**	**FCC Designation Number: CN1199**
Tset Location B	**:**	**FCC Designation Number: CN1321**

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);
Systems using digital modulation techniques operate in the2400-2483.5 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

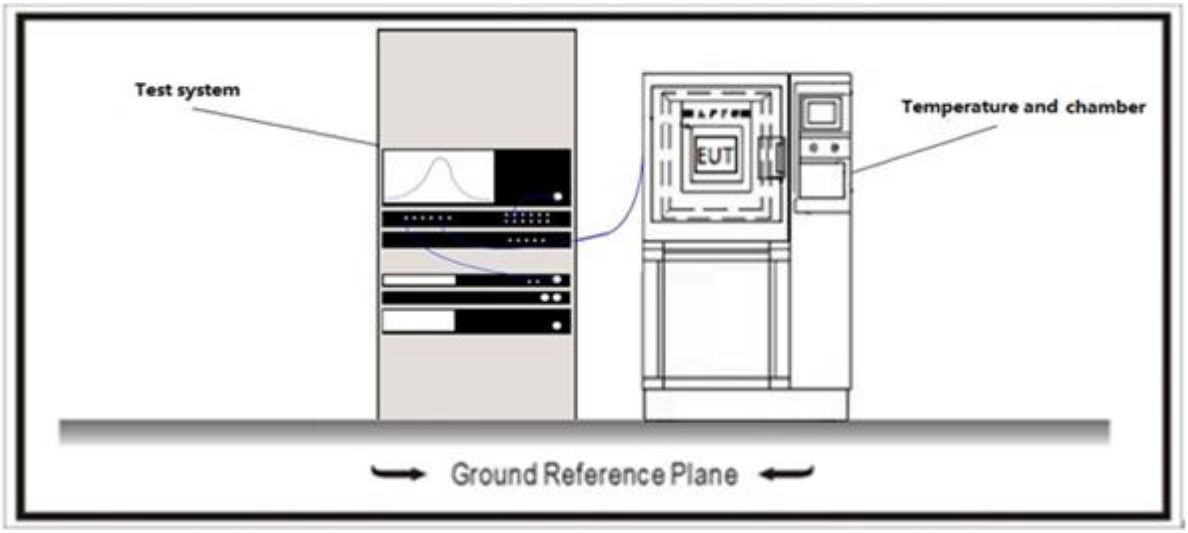
4.2 Occupied Channel Bandwidth	VERDICT: PASS

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



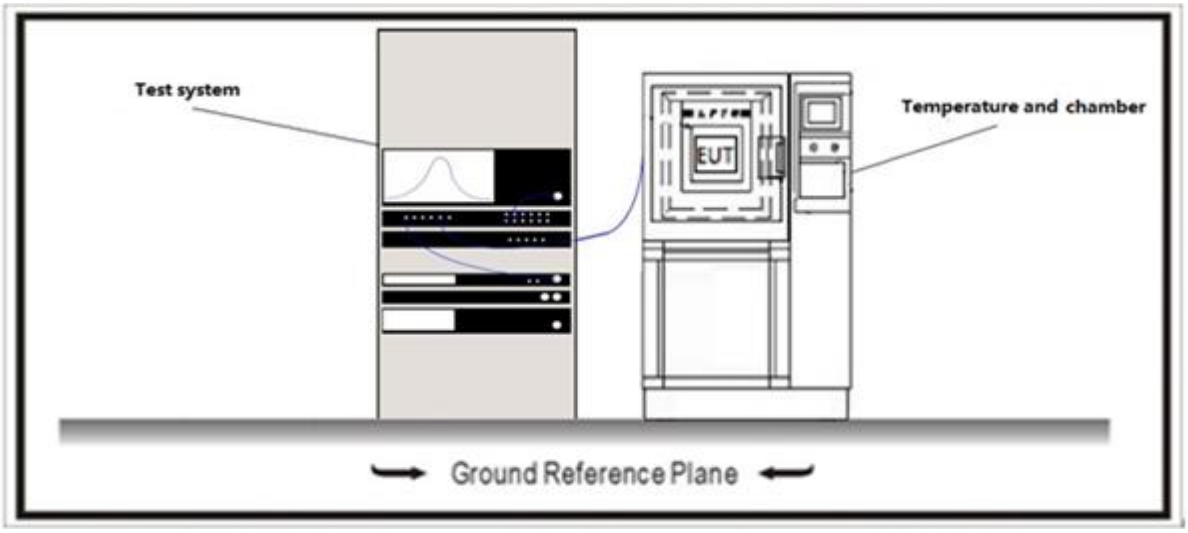
4.2.3 Test Procedure

	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);	
☒	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

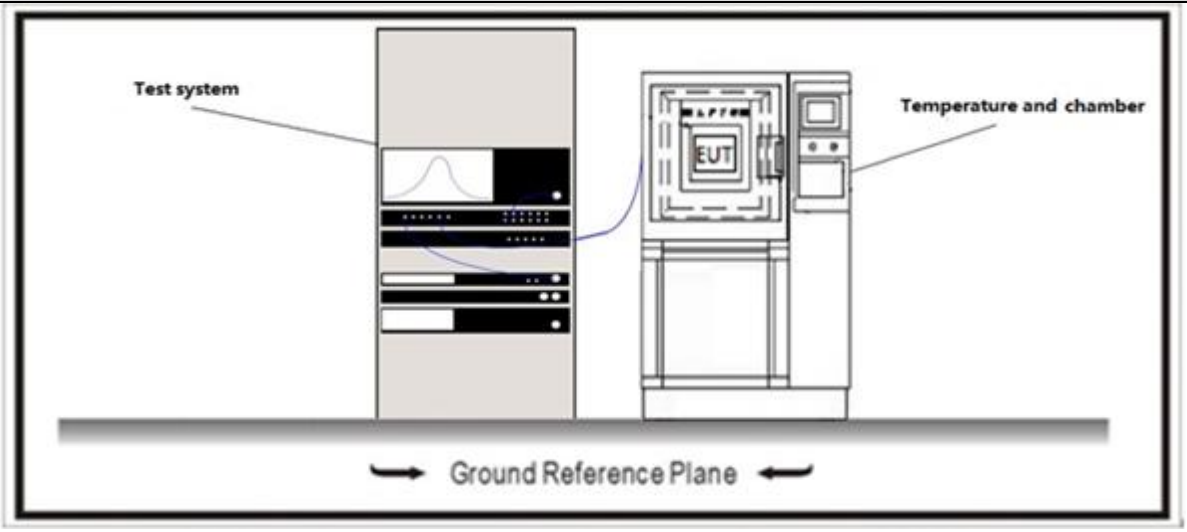


4.3.3 Test Procedure									
	References Rule							Chapter	Description
☒	ANSI C63.10							11.9	Fundamental emission output power
	☐	ANSI C63.10						11.9.1	Maximum peak conducted output power
		☐	ANSI C63.10					11.9.1.1	RBW ≥ DTS bandwidth
		☐	ANSI C63.10					11.9.1.2	Integrated band power method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

4.4 Maximum Power Spectral Density	VERDICT: PASS

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

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≥98%)
	☐	ANSI C63.10	11.10.4	Method AVGPSD-1A(Duty cycle≥98%)
	☐	ANSI C63.10	11.10.5	Method AVGPSD-2(Duty cycle＜98%)
	☐	ANSI C63.10	11.10.6	Method AVGPSD-2A(Duty cycle＜98%)
	☐	ANSI C63.10	11.10.7	Method AVGPSD-3
	☐	ANSI C63.10	11.10.8	Method AVGPSD-3A

4.5 Band Edge Measurements — VERDICT: PASS

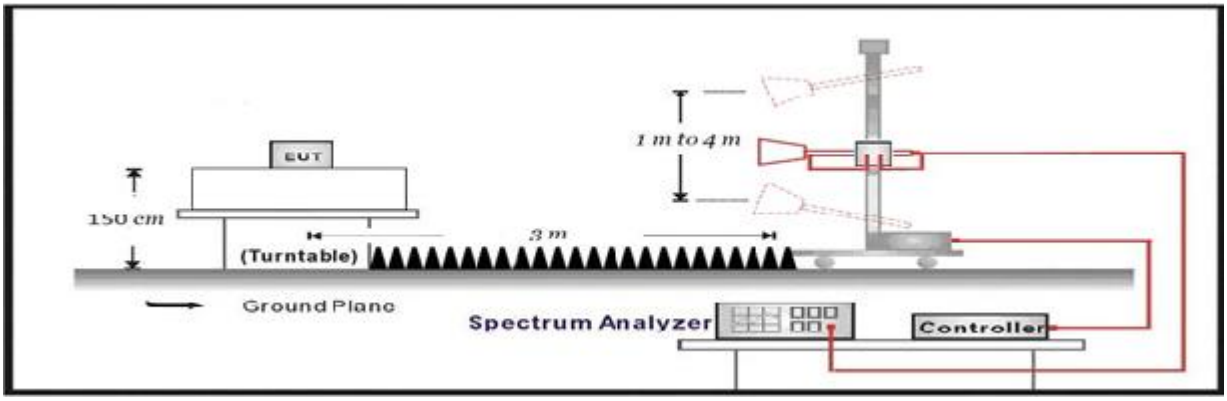
4.5.1 Limit

Standard	FCC Part 15 Subpart C Paragraph 15.247(d) , 15.209;			
Frequency bands (MHz)	Detector	Limit (dBμV/m)	RBW (MHz)	Distance (m)
2310-2390 2483.5-2500	PK	74	1	3
	AV	54	1	3

Note: The field strength of emissions appearing within these frequency bands shall not exceed the limits.

4.5.2 Test Setup

Above 1GHz Test Setup:



4.5.3 Test Procedure

	References Rule	Chapter	Description
☒	ANSI C63.10	6.10	Band-edge testing
	☒ ANSI C63.10	6.10.5	Restricted-band band-edge measurements
	☐ ANSI C63.10	6.10.6	Marker-delta method
☒	ANSI C63.10	11.12	Emissions in restricted frequency bands
	☒ ANSI C63.10	11.12.1	Radiated emission measurements
	☒ ANSI C63.10	11.12.2.7	Radiated spurious emission test
☐	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
☐	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency rangeof 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

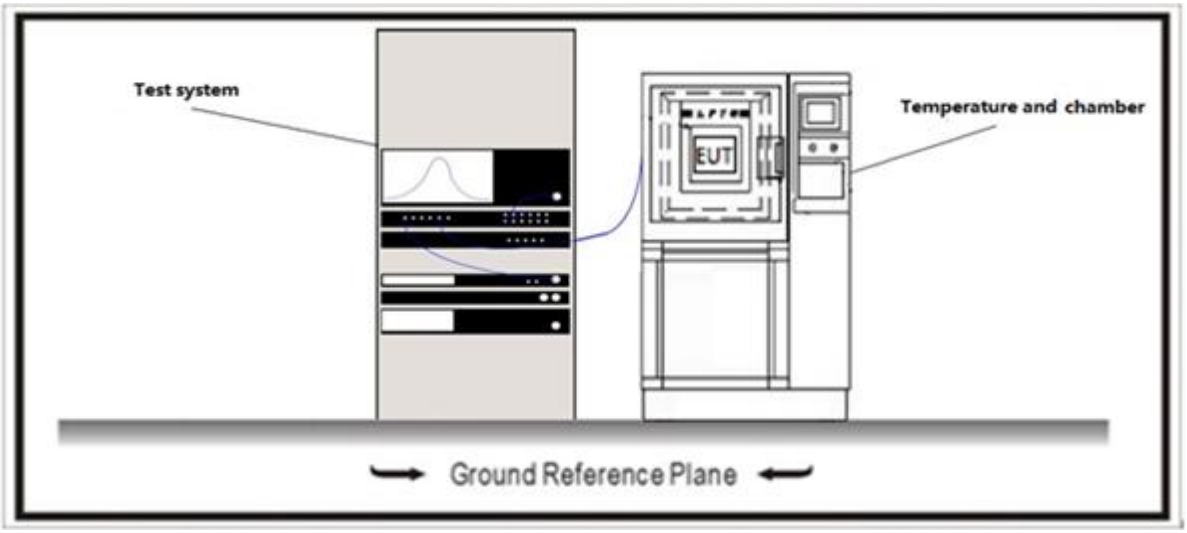
4.6.1 Limit

Standard	FCC Part 15 Subpart C Paragraph 15.247(d);
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

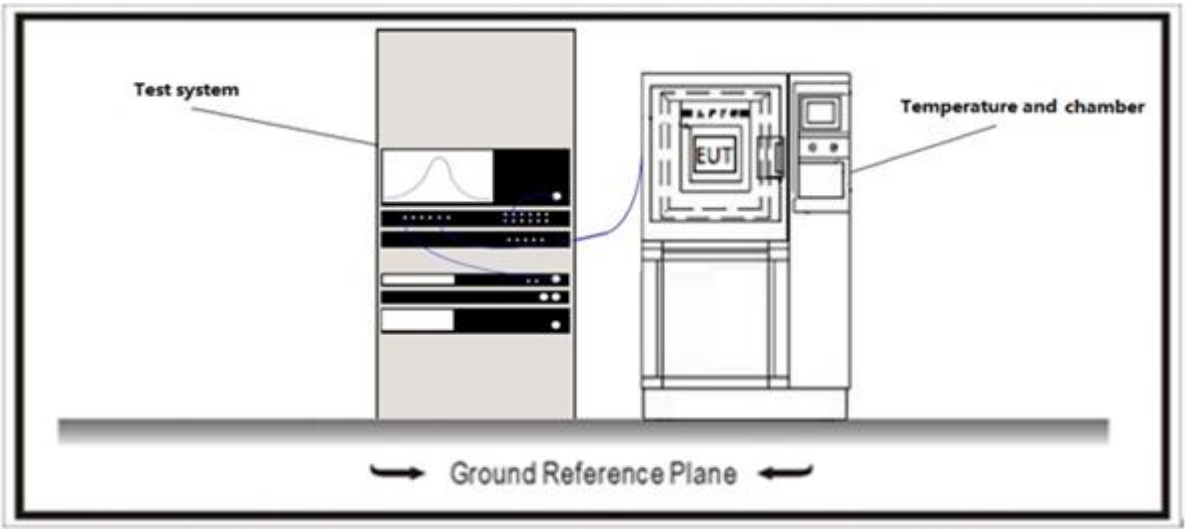
References Rule			Chapter	Description
☒	ANSI C63.10		11.11	Emissions in non-restricted frequency bands
	☒	ANSI C63.10	11.11.1	General
	☒	ANSI C63.10	11.11.2	Reference level measurement
	☒	ANSI C63.10	11.11.3	Emission level measurement

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			

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)

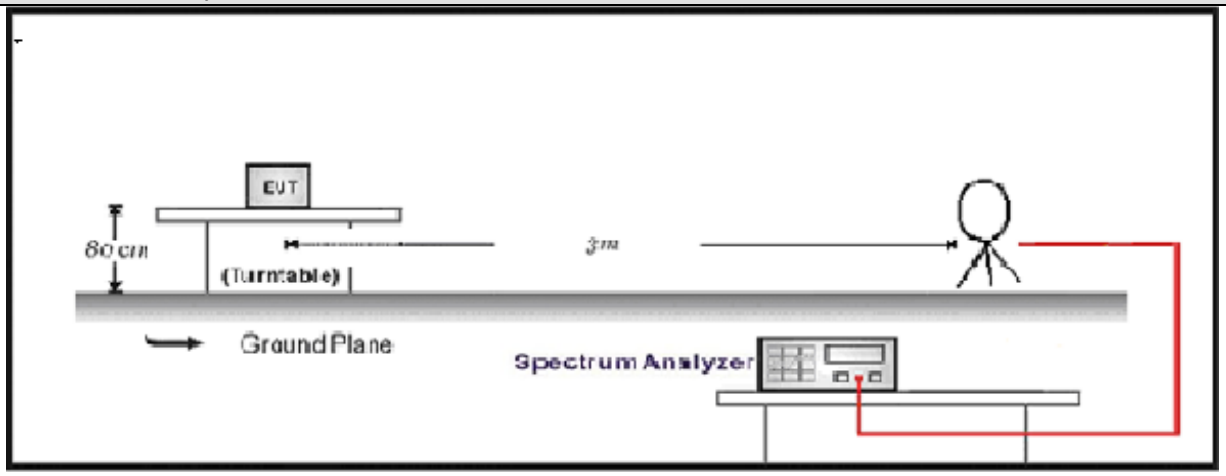
Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed 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.

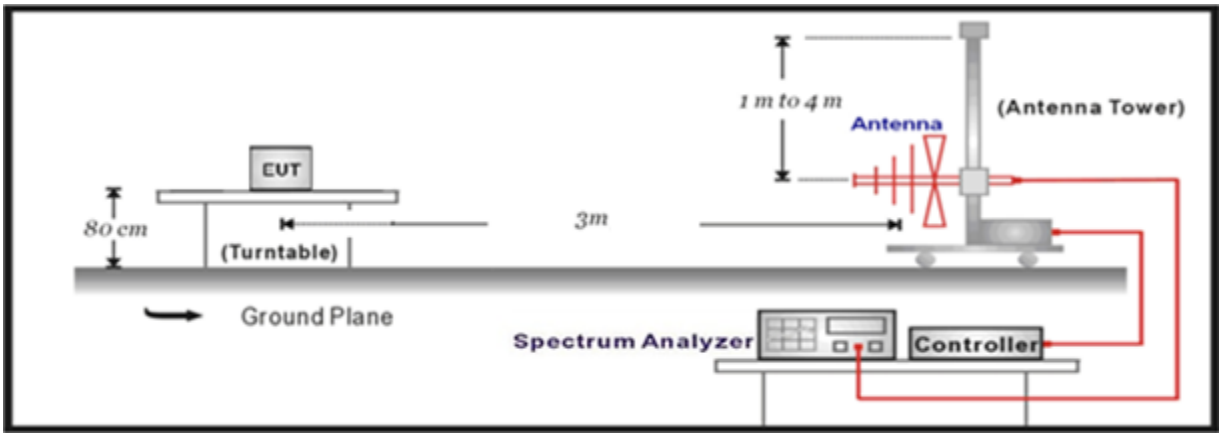
Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified 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

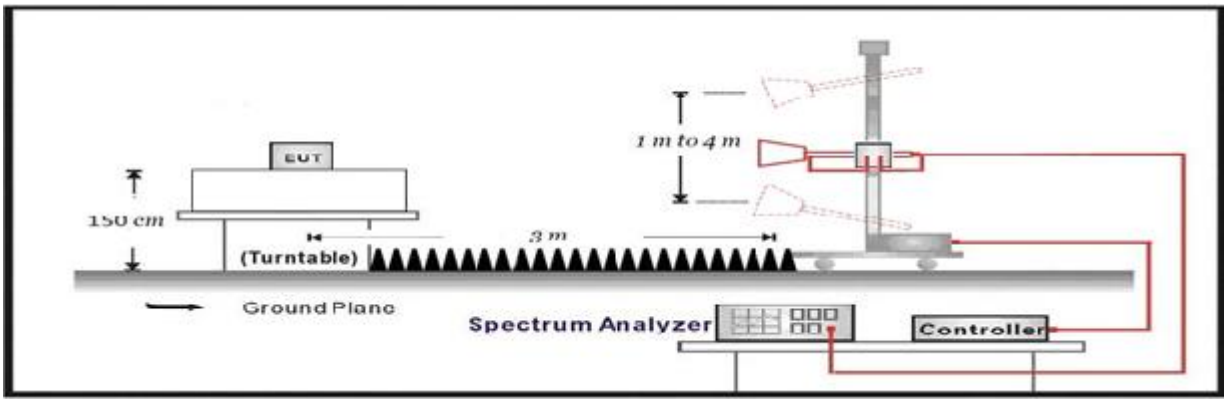
Below 30MHz Test Setup:



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 ;	
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

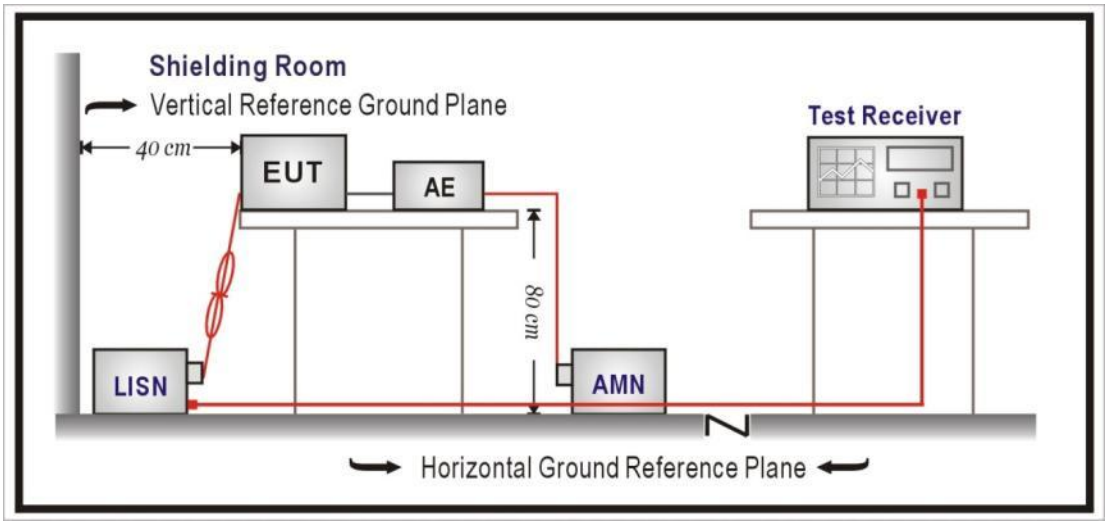
[1)] At the transition frequency, the lower limit applies.

[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;
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.

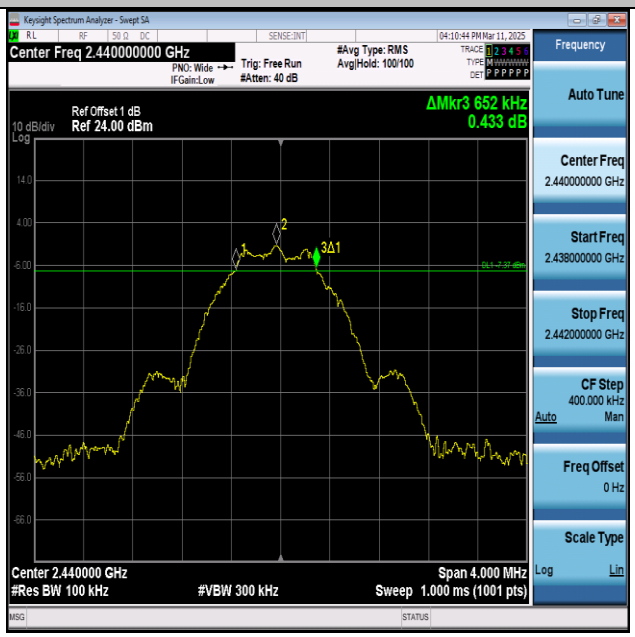
6 TEST RESULT

Appendix A: DTS Bandwidth

TestMode	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	2402	0.656	2401.636	2402.292	0.5	PASS
BLE_1M	2440	0.652	2439.636	2440.288	0.5	PASS
BLE_1M	2480	0.648	2479.644	2480.292	0.5	PASS

Test Graphs

BLE_1M-Ant1-2402-PASS



BLE_1M-Ant1-2440-PASS

BLE_1M-Ant1-2480-PASS

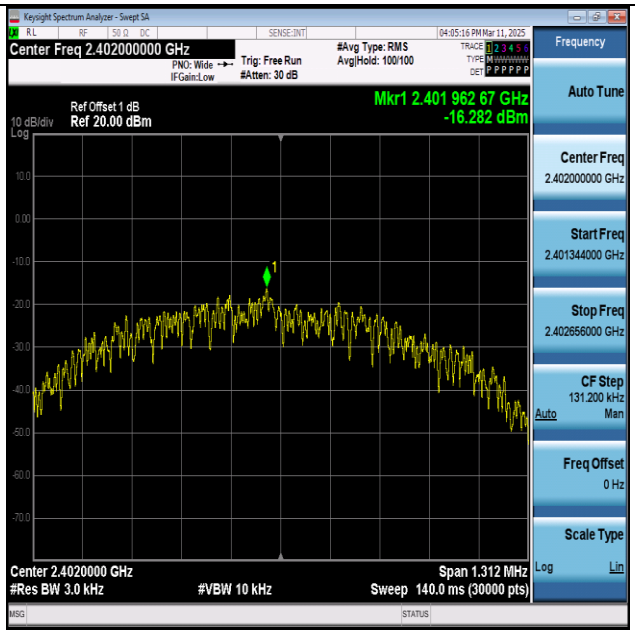
Appendix B: Maximum conducted output power

Test Mode	Frequency [MHz]	Conducted Power [dBm]	Limit [dBm]	Verdict
BLE	2402	0.06	≦30	PASS
	2440	0.51	≦30	PASS
	2480	-0.69	≦30	PASS

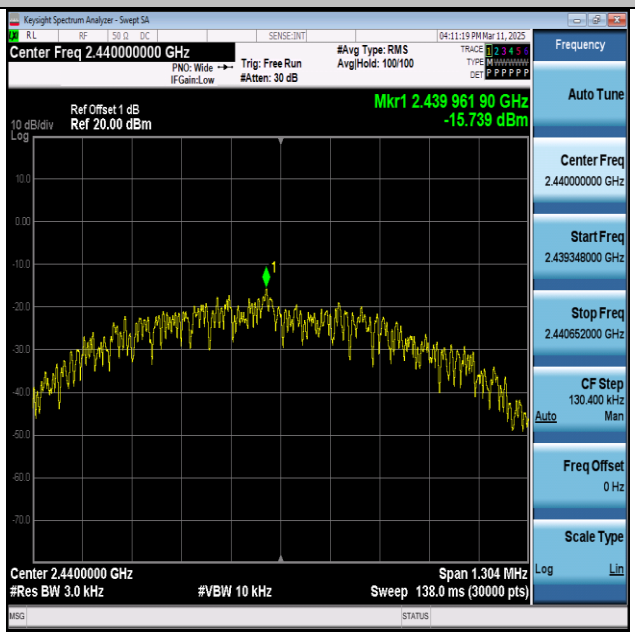
Appendix C: Maximum power spectral density

TestMode	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	2402	-16.28	≤8.00	PASS
BLE_1M	2440	-15.74	≤8.00	PASS
BLE_1M	2480	-16.68	≤8.00	PASS

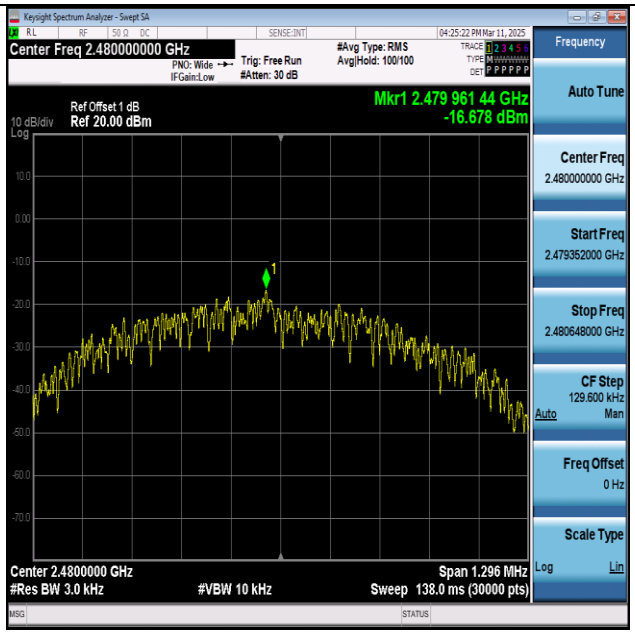
Test Graphs



BLE_1M-Ant1-2402-PASS



BLE_1M-Ant1-2440-PASS



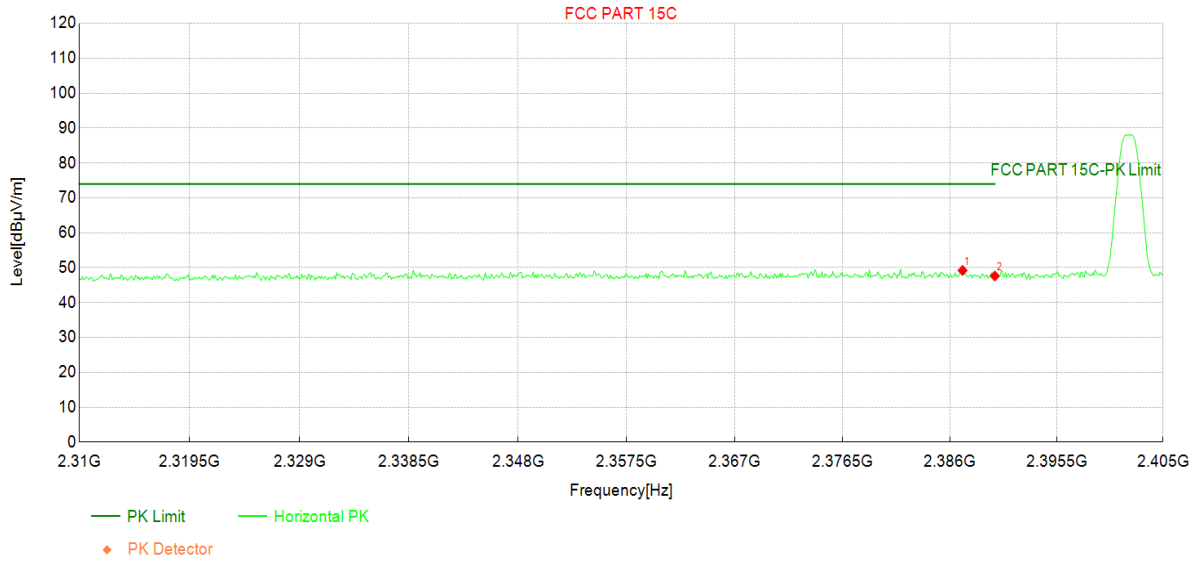
BLE_1M-Ant1-2480-PASS

Appendix D: Band edge measurements

Test Report

Project Information			
Profile:	2520983R	EUT:	Smart Controller
Mode:	Mode1:Transmit at 2402MHz by LE 1M	Volta	120 Vac / 60 Hz
Environment:	Temp: 25℃; Humi:60%	Engi	Reyn Chen
Test Standard:	FCC PART 15C		

Test Graph

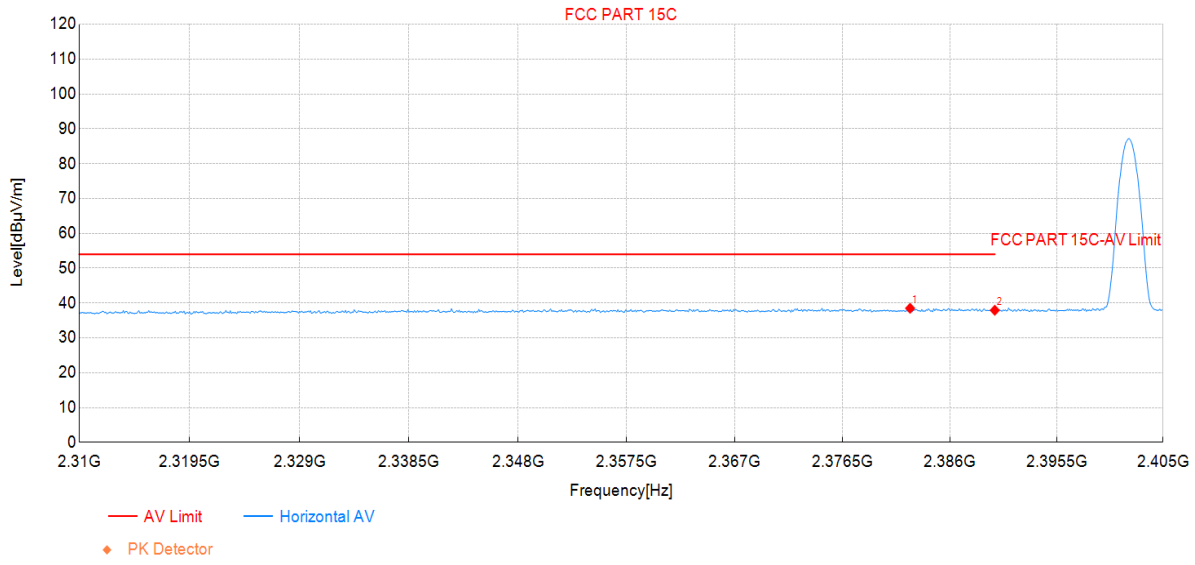


Suspected Data List									
NO.	Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Det	Pol	Verdict
1	2387.14	45.57	49.20	3.63	74.00	24.80	PK	Horizo	PASS
2	2390.00	43.95	47.60	3.65	74.00	26.40	PK	Horizo	PASS

Test Report

Project Information			
Profile:	2520983R	EUT:	Smart Controller
Mode:	Mode1:Transmit at 2402MHz by LE 1M	Volta	120 Vac / 60 Hz
Environment:	Temp: 25℃; Humi:60%	Engi	Reyn Chen
Test Standard:	FCC PART 15C		

Test Graph



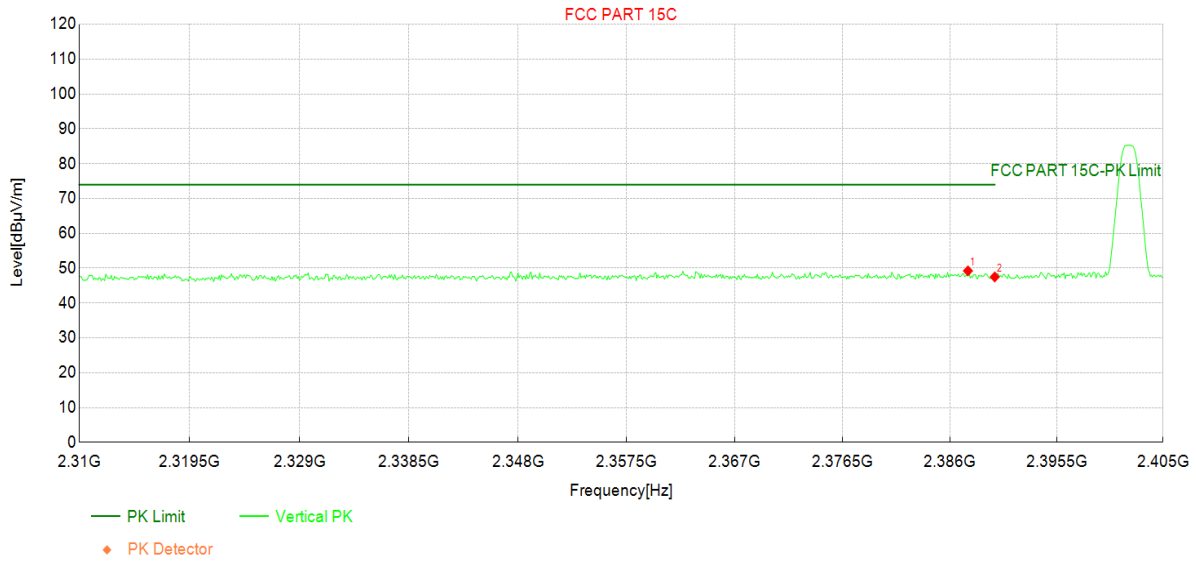
Suspected Data List

NO.	Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Det	Pol	Verdict
1	2382.49	34.86	38.48	3.62	54.00	15.52	AV	Horizo	PASS
2	2390.00	34.27	37.92	3.65	54.00	16.08	AV	Horizo	PASS

Test Report

Project Information			
Profile:	2520983R	EUT:	Smart Controller
Mode:	Mode1:Transmit at 2402MHz by LE 1M	Volta	120 Vac / 60 Hz
Environment:	Temp: 25℃; Humi:60%	Engi	Reyn Chen
Test Standard:	FCC PART 15C		

Test Graph



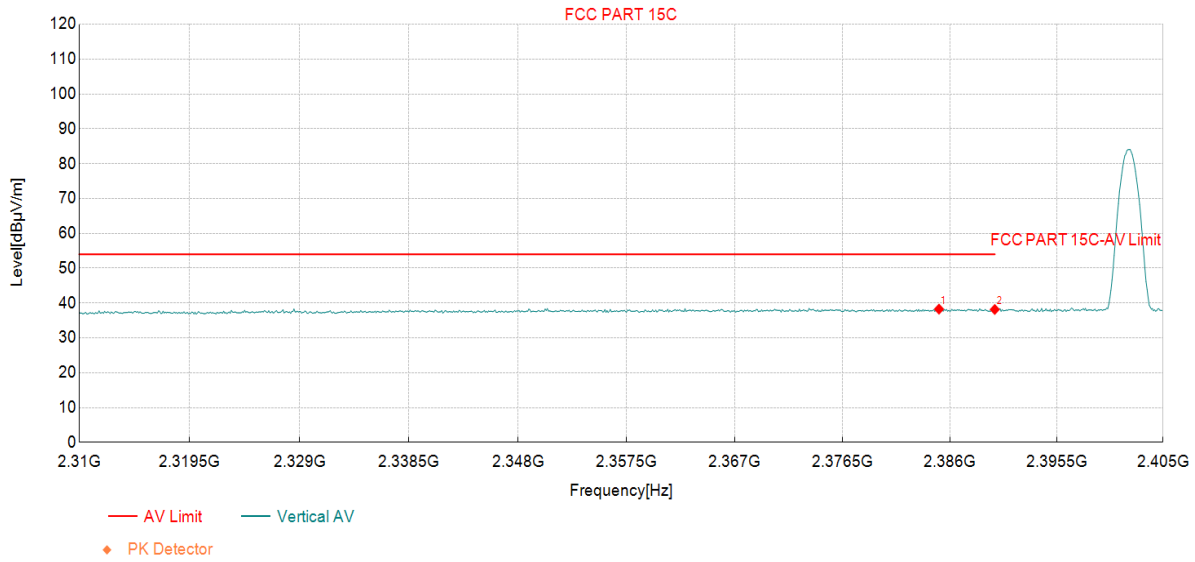
Suspected Data List

NO.	Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Det	Pol	Verdict
1	2387.62	45.59	49.22	3.63	74.00	24.78	PK	Vertic	PASS
2	2390.00	43.84	47.49	3.65	74.00	26.51	PK	Vertic	PASS

Test Report

Project Information			
Profile:	2520983R	EUT:	Smart Controller
Mode:	Mode1:Transmit at 2402MHz by LE 1M	Volta	120 Vac / 60 Hz
Environment:	Temp: 25℃; Humi:60%	Engi	Reyn Chen
Test Standard:	FCC PART 15C		

Test Graph



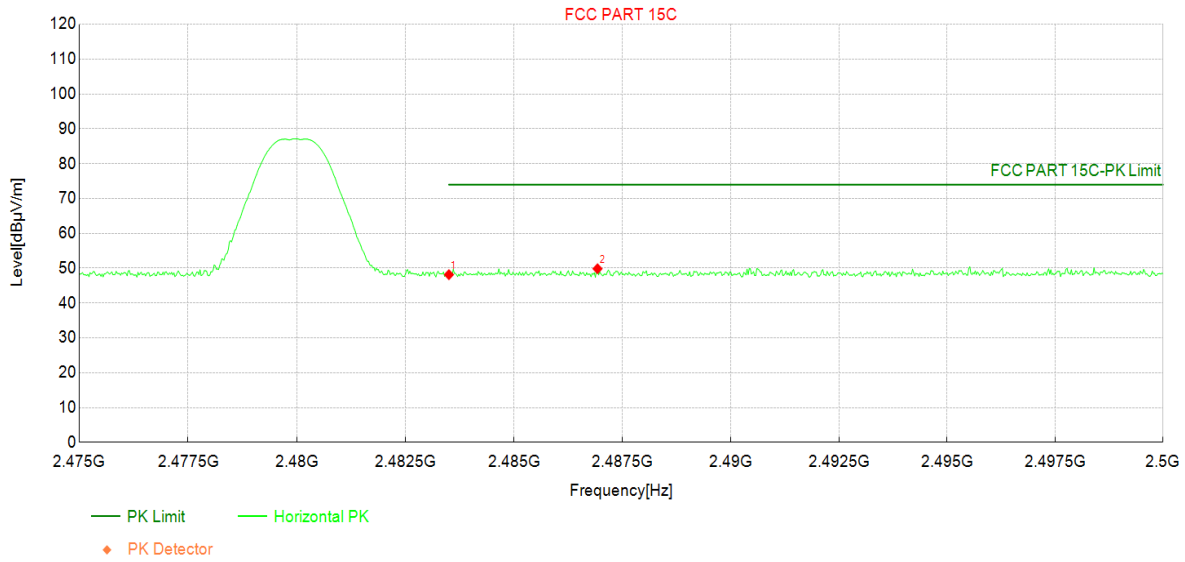
Suspected Data List

NO.	Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Det	Pol	Verdict
1	2385.05	34.62	38.25	3.63	54.00	15.75	AV	Vertic	PASS
2	2390.00	34.50	38.15	3.65	54.00	15.85	AV	Vertic	PASS

Test Report

Project Information			
Profile:	2520983R	EUT:	Smart Controller
Mode:	Mode1:Transmit at 2480MHz by LE 1M	Volta	120 Vac / 60 Hz
Environment:	Temp: 25℃; Humi:60%	Engi	Reyn Chen
Test Standard:	FCC PART 15C		

Test Graph

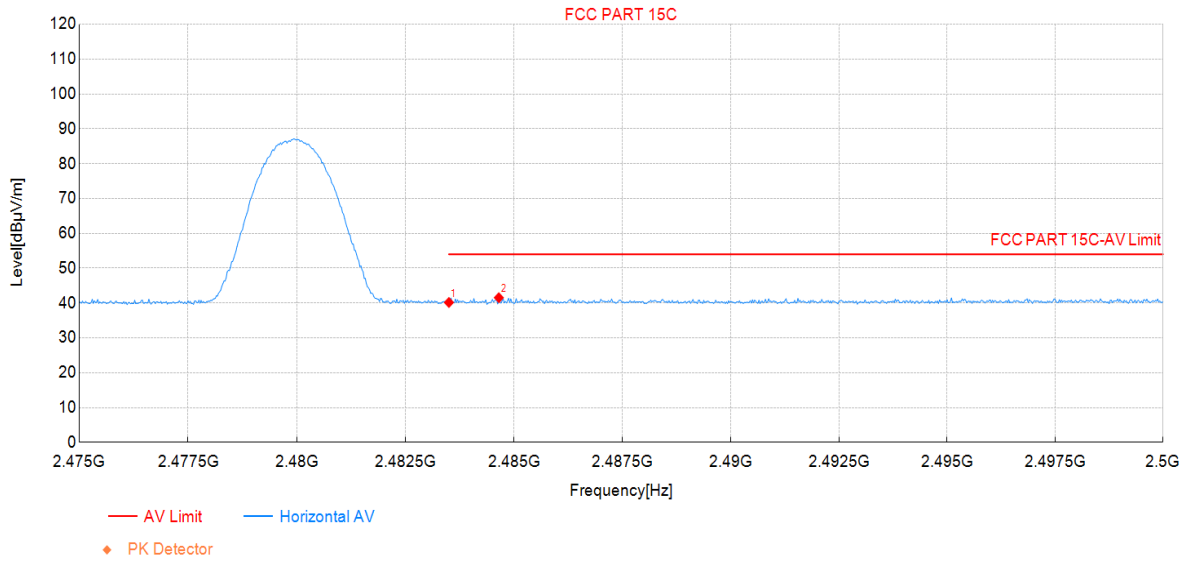


Suspected Data List									
NO.	Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Det	Pol	Verdict
1	2483.50	44.05	48.14	4.09	74.00	25.86	PK	Horizo	PASS
2	2486.93	45.73	49.84	4.11	74.00	24.16	PK	Horizo	PASS

Test Report

Project Information			
Profile:	2520983R	EUT:	Smart Controller
Mode:	Mode1:Transmit at 2480MHz by LE 1M	Volta	120 Vac / 60 Hz
Environment:	Temp: 25℃; Humi:60%	Engi	Reyn Chen
Test Standard:	FCC PART 15C		

Test Graph



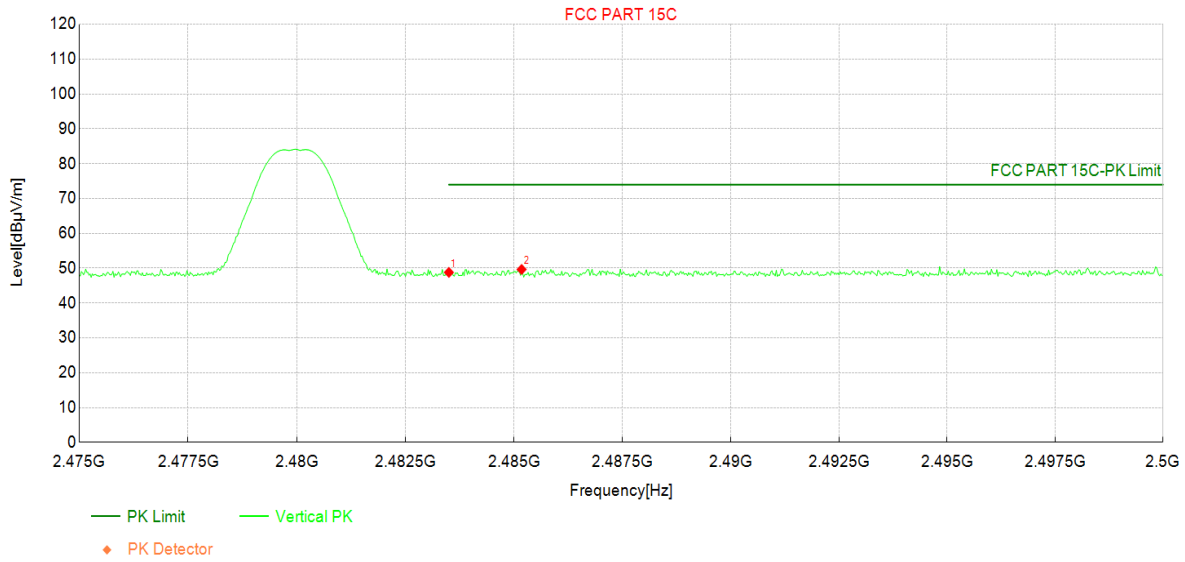
Suspected Data List

NO.	Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Det	Pol	Verdict
1	2483.50	36.07	40.16	4.09	54.00	13.84	AV	Horizo	PASS
2	2484.65	37.42	41.53	4.11	54.00	12.47	AV	Horizo	PASS

Test Report

Project Information			
Profile:	2520983R	EUT:	Smart Controller
Mode:	Mode1:Transmit at 2480MHz by LE 1M	Volta	120 Vac / 60 Hz
Environment:	Temp: 25℃; Humi:60%	Engi	Reyn Chen
Test Standard:	FCC PART 15C		

Test Graph



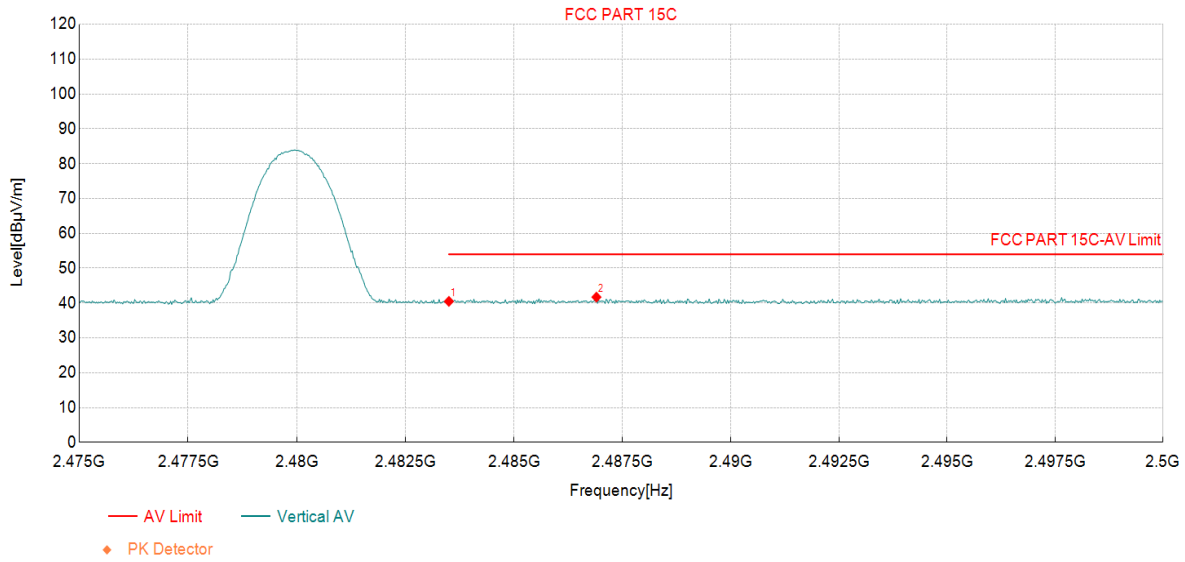
Suspected Data List

NO.	Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Det	Pol	Verdict
1	2483.50	44.70	48.79	4.09	74.00	25.21	PK	Vertic	PASS
2	2485.18	45.53	49.64	4.11	74.00	24.36	PK	Vertic	PASS

Test Report

Project Information			
Profile:	2520983R	EUT:	Smart Controller
Mode:	Mode1:Transmit at 2480MHz by LE 1M	Volta	120 Vac / 60 Hz
Environment:	Temp: 25℃; Humi:60%	Engi	Reyn Chen
Test Standard:	FCC PART 15C		

Test Graph



Suspected Data List

NO.	Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Det	Pol	Verdict
1	2483.50	36.39	40.48	4.09	54.00	13.52	AV	Vertic	PASS
2	2486.90	37.59	41.70	4.11	54.00	12.30	AV	Vertic	PASS

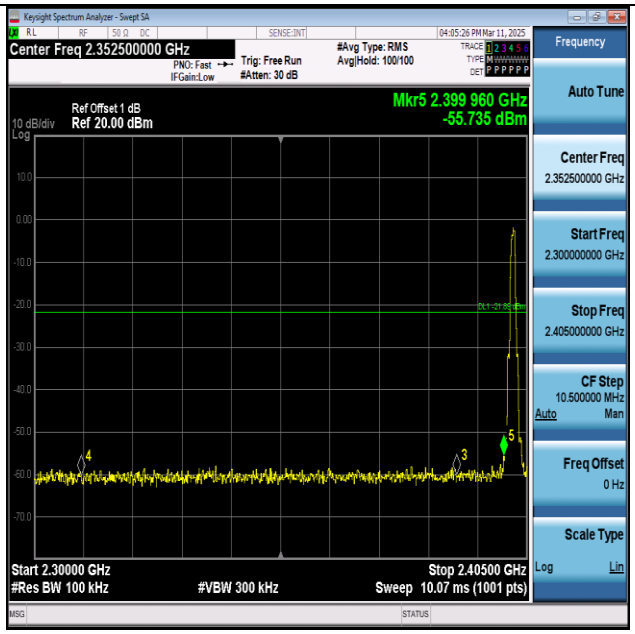
Note:
1.Level=Reading+Factor .
2. Margin=Limit-Level.

Appendix E: Conducted Spurious Emission

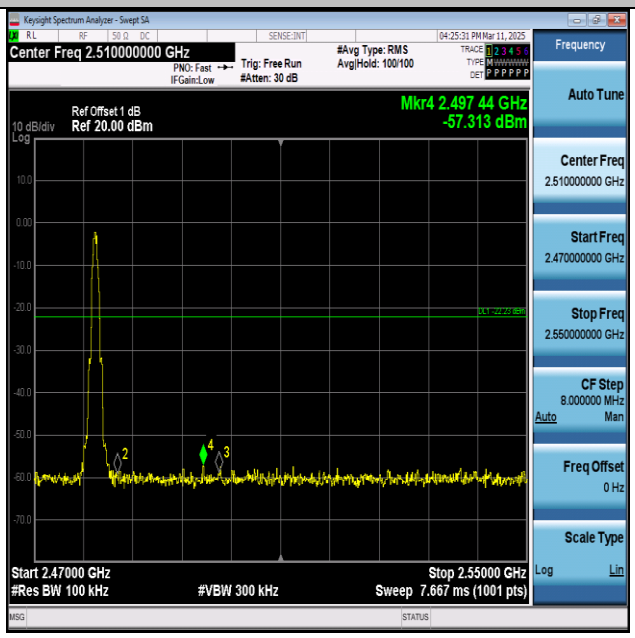
Band edge measurements：

TestMode	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Low	2402	-1.89	-55.74	≤-21.89	PASS
BLE_1M	High	2480	-2.23	-57.31	≤-22.23	PASS

Test Graphs



BLE_1M-Ant1-2402-PASS

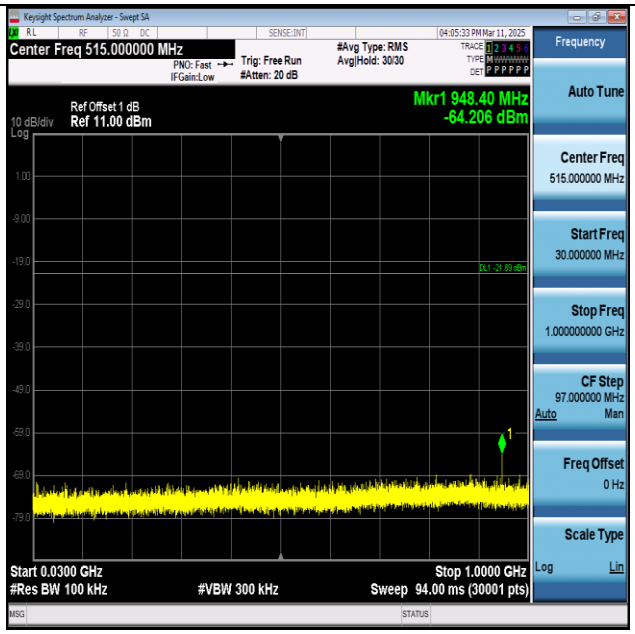


BLE_1M-Ant1-2480-PASS

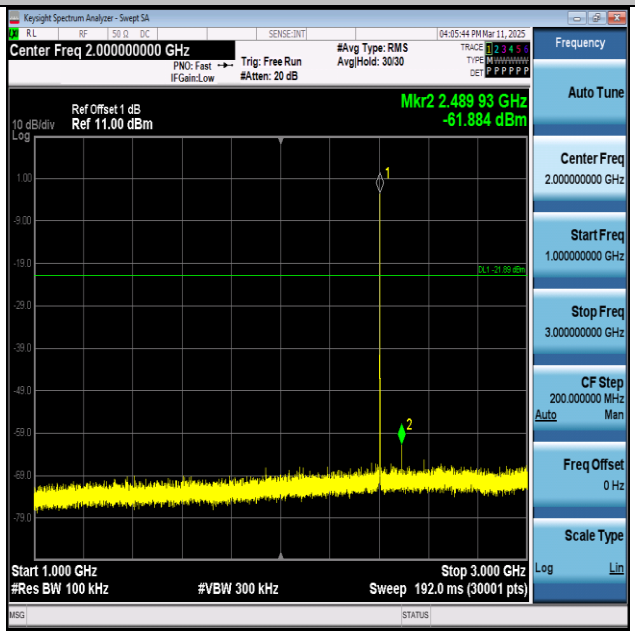
Conducted Spurious Emission :

TestMode	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	2402	30~1000	-1.89	-64.21	≤-21.89	PASS
BLE_1M	2402	1000~3000	-1.89	-61.88	≤-21.89	PASS
BLE_1M	2402	3000~5000	-1.89	-64.24	≤-21.89	PASS
BLE_1M	2402	5000~7000	-1.89	-61.88	≤-21.89	PASS
BLE_1M	2402	7000~9000	-1.89	-65.09	≤-21.89	PASS
BLE_1M	2402	9000~11000	-1.89	-64.55	≤-21.89	PASS
BLE_1M	2402	11000~13000	-1.89	-66.29	≤-21.89	PASS
BLE_1M	2402	13000~15000	-1.89	-64.25	≤-21.89	PASS
BLE_1M	2402	15000~17000	-1.89	-65.34	≤-21.89	PASS
BLE_1M	2402	17000~19000	-1.89	-63.41	≤-21.89	PASS
BLE_1M	2402	19000~21000	-1.89	-63.5	≤-21.89	PASS
BLE_1M	2402	21000~23000	-1.89	-62.33	≤-21.89	PASS
BLE_1M	2402	23000~25000	-1.89	-61.69	≤-21.89	PASS
BLE_1M	2440	30~1000	-1.34	-65.34	≤-21.34	PASS
BLE_1M	2440	1000~3000	-1.34	-66.07	≤-21.34	PASS
BLE_1M	2440	3000~5000	-1.34	-64	≤-21.34	PASS
BLE_1M	2440	5000~7000	-1.34	-60.85	≤-21.34	PASS
BLE_1M	2440	7000~9000	-1.34	-65.63	≤-21.34	PASS
BLE_1M	2440	9000~11000	-1.34	-65.13	≤-21.34	PASS
BLE_1M	2440	11000~13000	-1.34	-66.01	≤-21.34	PASS
BLE_1M	2440	13000~15000	-1.34	-65.32	≤-21.34	PASS
BLE_1M	2440	15000~17000	-1.34	-65.06	≤-21.34	PASS
BLE_1M	2440	17000~19000	-1.34	-63.83	≤-21.34	PASS
BLE_1M	2440	19000~21000	-1.34	-62.97	≤-21.34	PASS
BLE_1M	2440	21000~23000	-1.34	-62.28	≤-21.34	PASS
BLE_1M	2440	23000~25000	-1.34	-61.45	≤-21.34	PASS
BLE_1M	2480	30~1000	-2.23	-67.08	≤-22.23	PASS
BLE_1M	2480	1000~3000	-2.23	-62.07	≤-22.23	PASS
BLE_1M	2480	3000~5000	-2.23	-63.78	≤-22.23	PASS
BLE_1M	2480	5000~7000	-2.23	-61.9	≤-22.23	PASS
BLE_1M	2480	7000~9000	-2.23	-65.7	≤-22.23	PASS
BLE_1M	2480	9000~11000	-2.23	-65.47	≤-22.23	PASS
BLE_1M	2480	11000~13000	-2.23	-65.55	≤-22.23	PASS
BLE_1M	2480	13000~15000	-2.23	-65.51	≤-22.23	PASS
BLE_1M	2480	15000~17000	-2.23	-64.92	≤-22.23	PASS
BLE_1M	2480	17000~19000	-2.23	-64.06	≤-22.23	PASS
BLE_1M	2480	19000~21000	-2.23	-63.26	≤-22.23	PASS
BLE_1M	2480	21000~23000	-2.23	-62.67	≤-22.23	PASS
BLE_1M	2480	23000~25000	-2.23	-61.76	≤-22.23	PASS

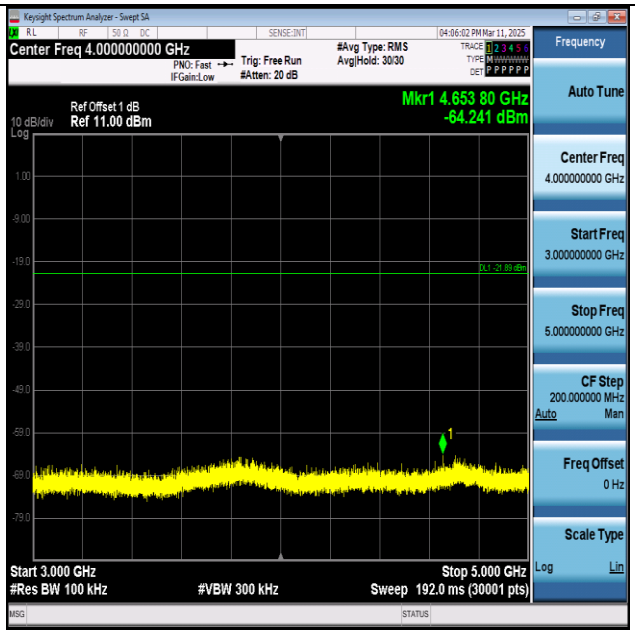
Test Graphs



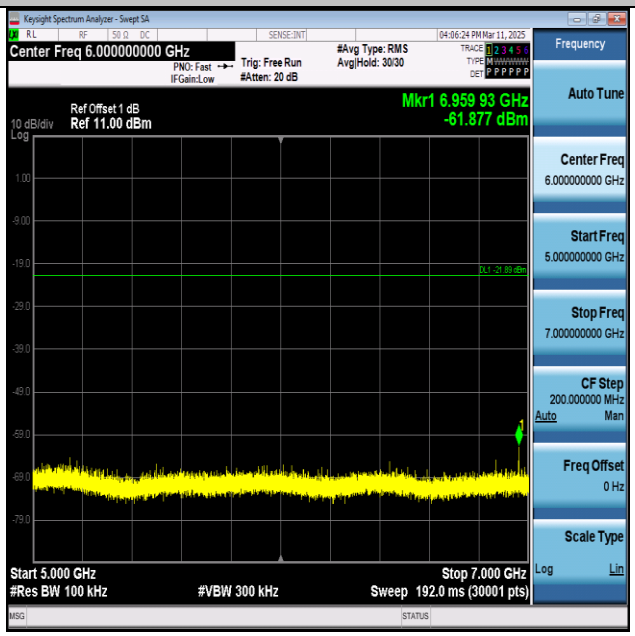
BLE_1M-Ant1-2402-30~1000-PASS



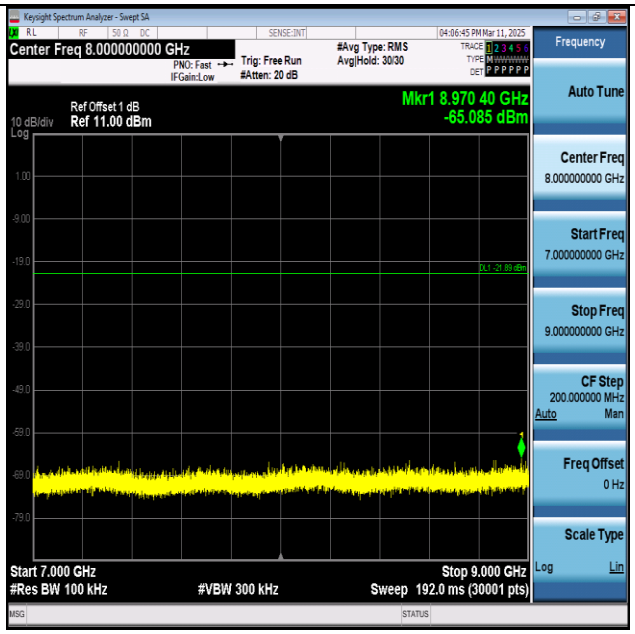
BLE_1M-Ant1-2402-1000~3000-PASS



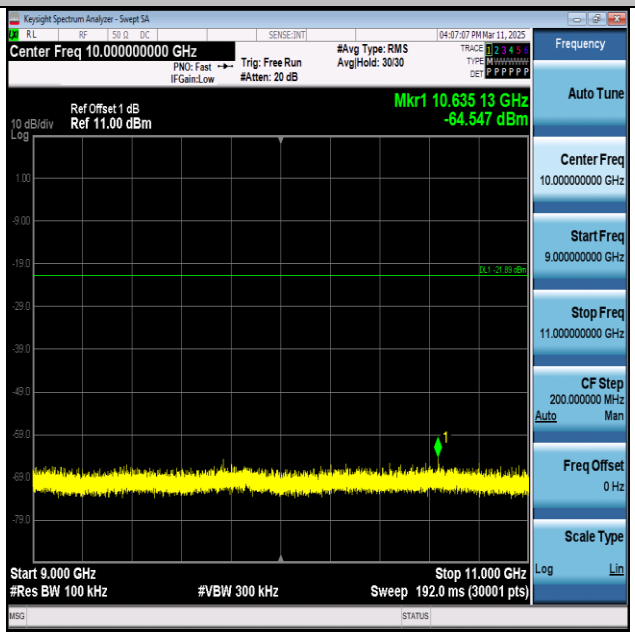
BLE_1M-Ant1-2402-3000~5000-PASS



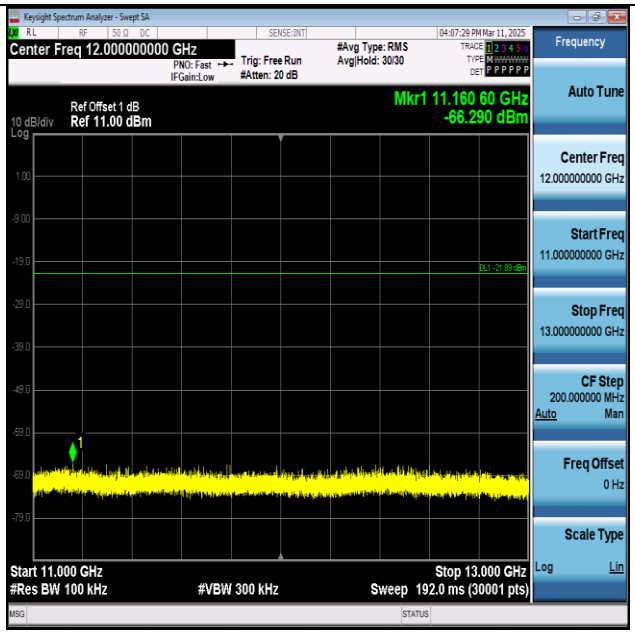
BLE_1M-Ant1-2402-5000~7000-PASS



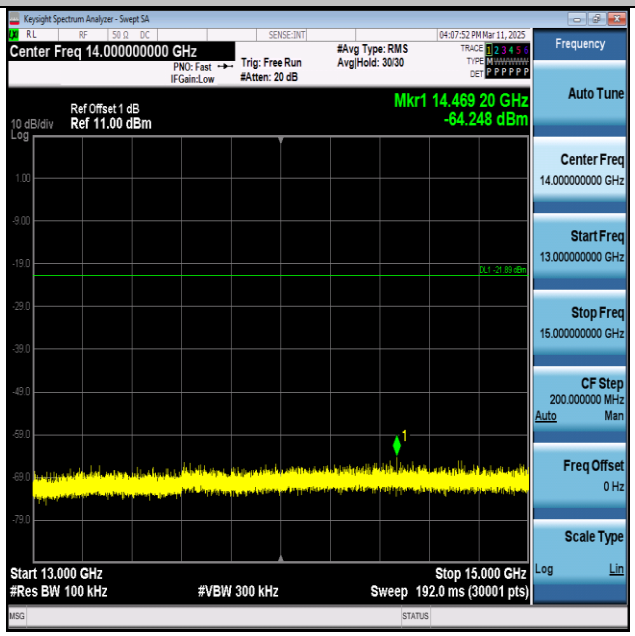
BLE_1M-Ant1-2402-7000~9000-PASS



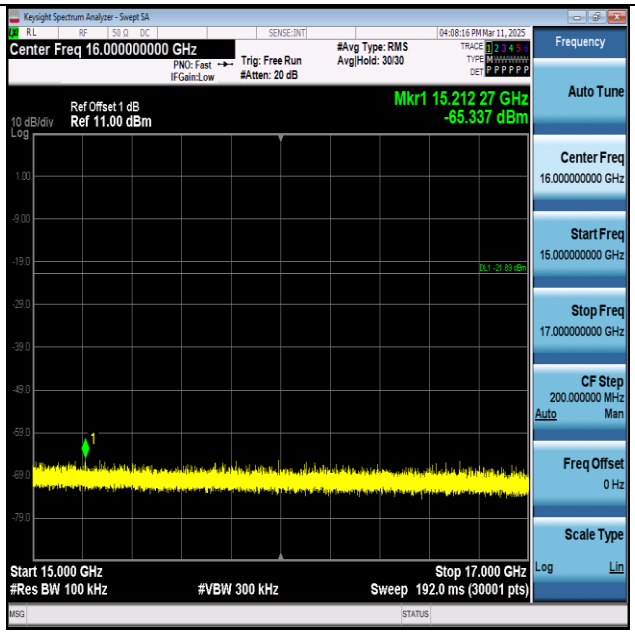
BLE_1M-Ant1-2402-9000~11000-PASS



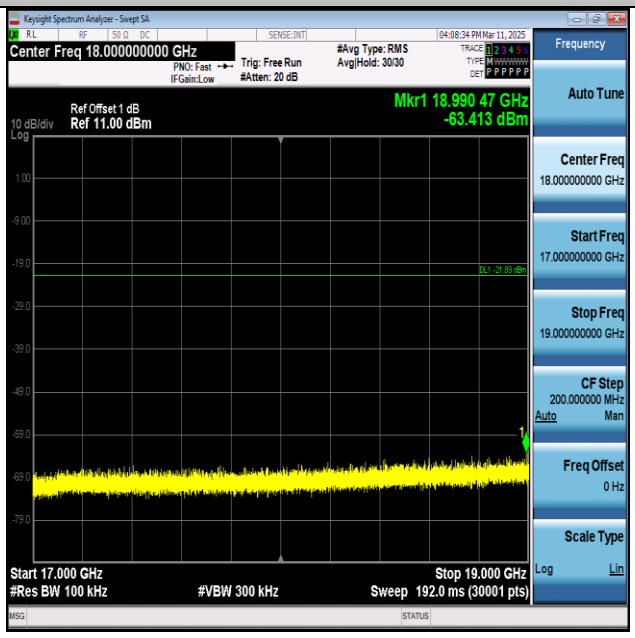
BLE_1M-Ant1-2402-11000~13000-PASS



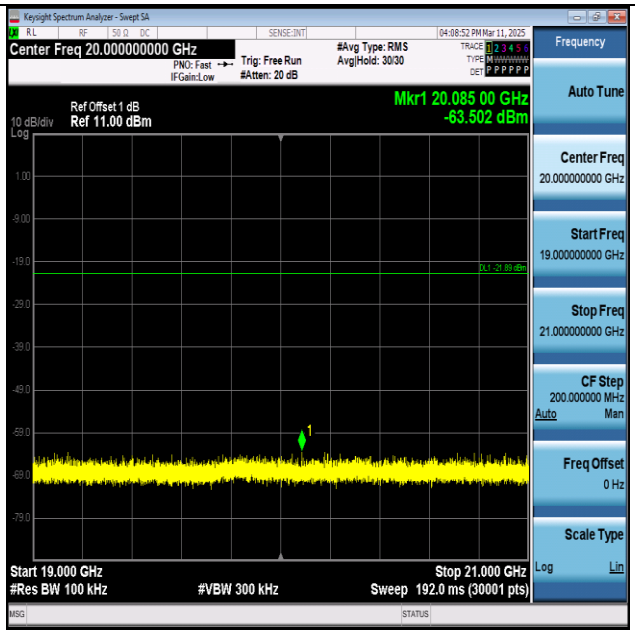
BLE_1M-Ant1-2402-13000~15000-PASS



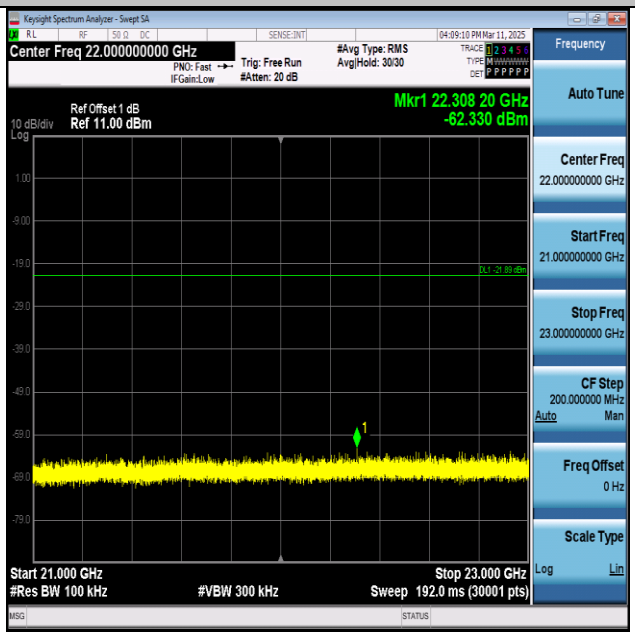
BLE_1M-Ant1-2402-15000~17000-PASS



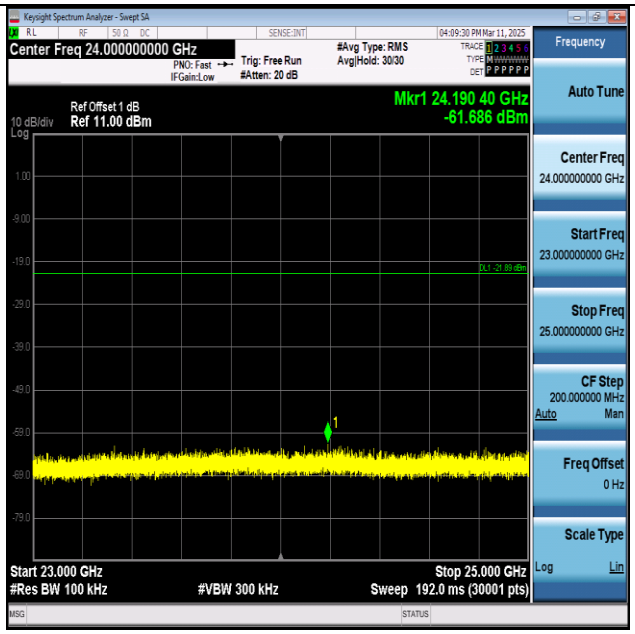
BLE_1M-Ant1-2402-17000~19000-PASS



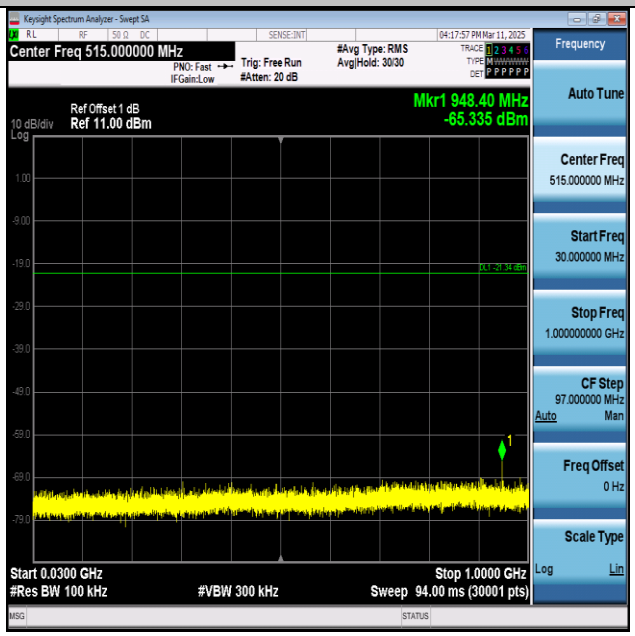
BLE_1M-Ant1-2402-19000~21000-PASS



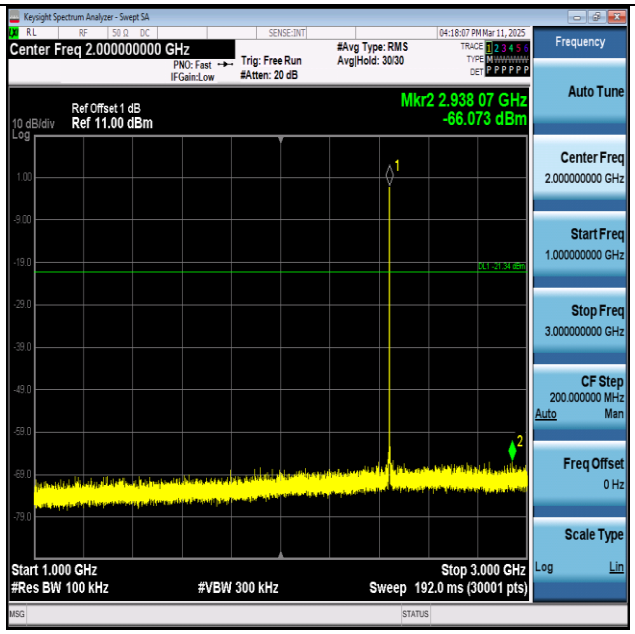
BLE_1M-Ant1-2402-21000~23000-PASS



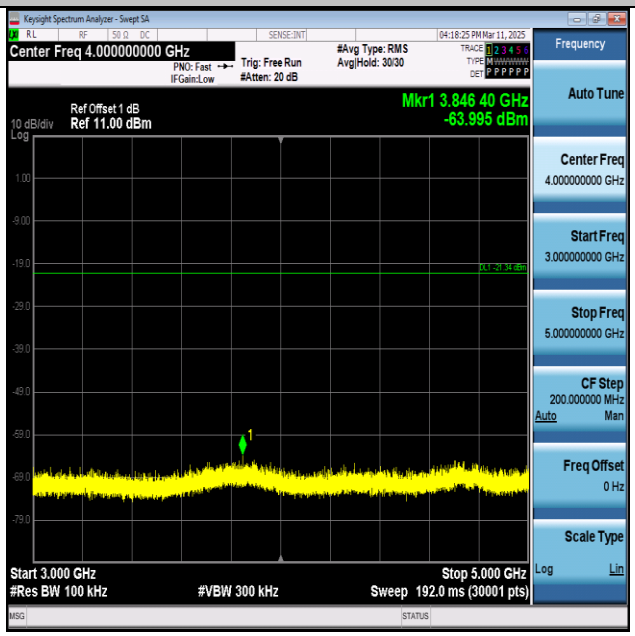
BLE_1M-Ant1-2402-23000~25000-PASS



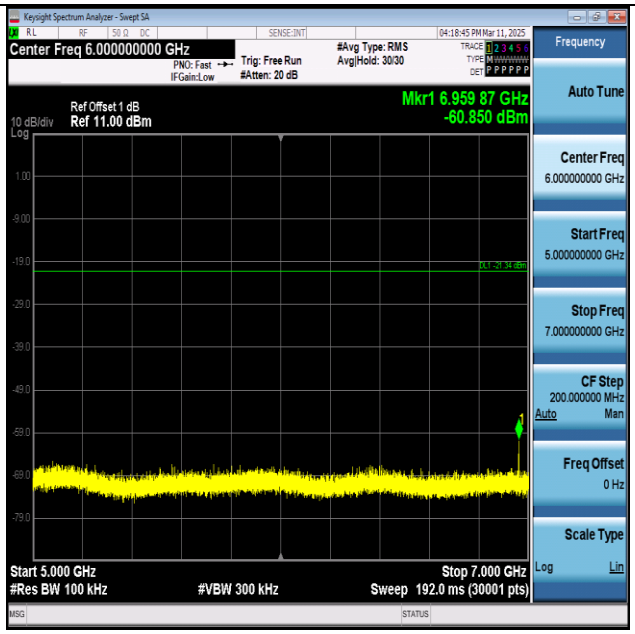
BLE_1M-Ant1-2440-30~1000-PASS



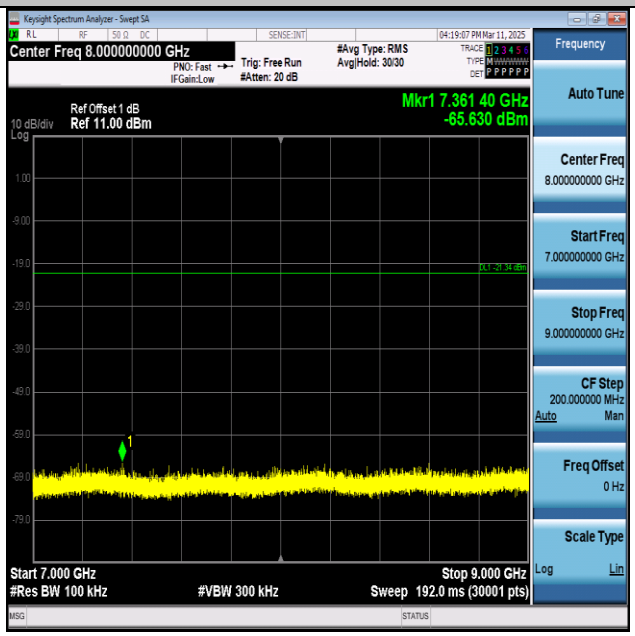
BLE_1M-Ant1-2440-1000~3000-PASS



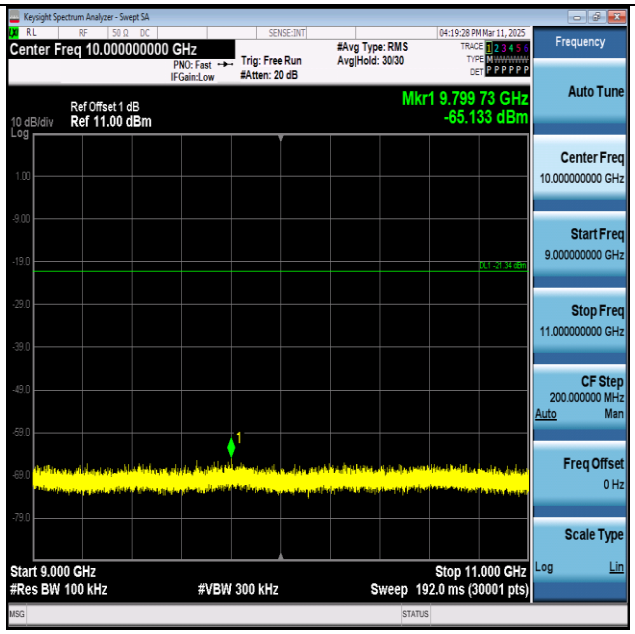
BLE_1M-Ant1-2440-3000~5000-PASS



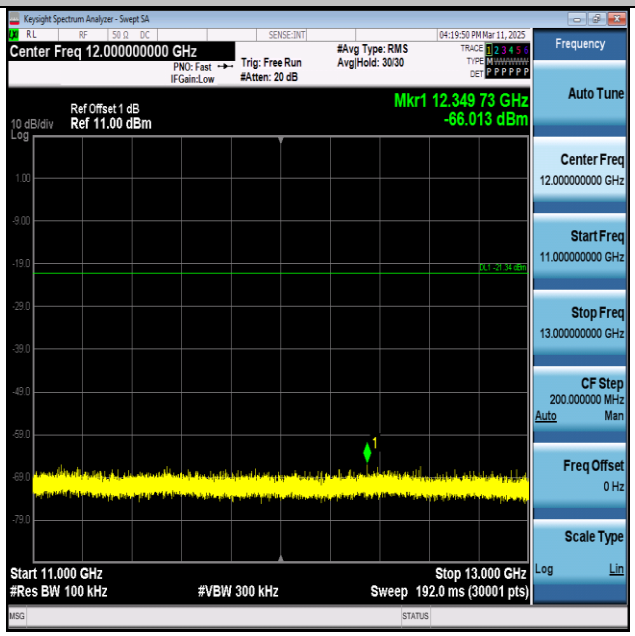
BLE_1M-Ant1-2440-5000~7000-PASS



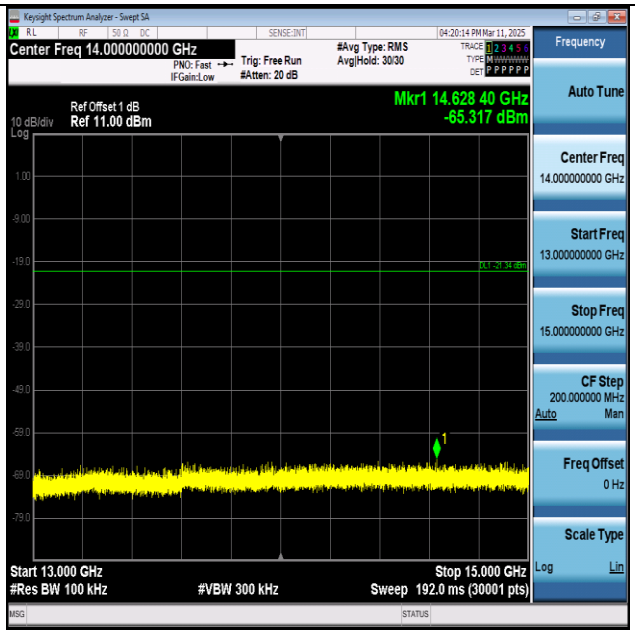
BLE_1M-Ant1-2440-7000~9000-PASS



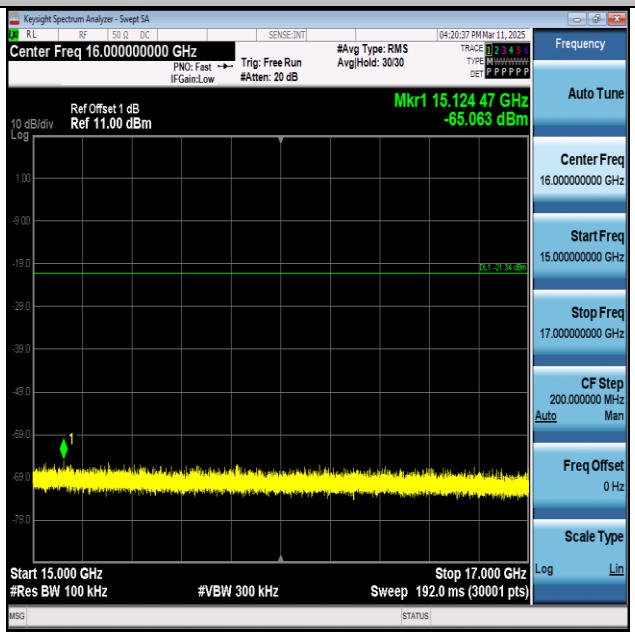
BLE_1M-Ant1-2440-9000~11000-PASS



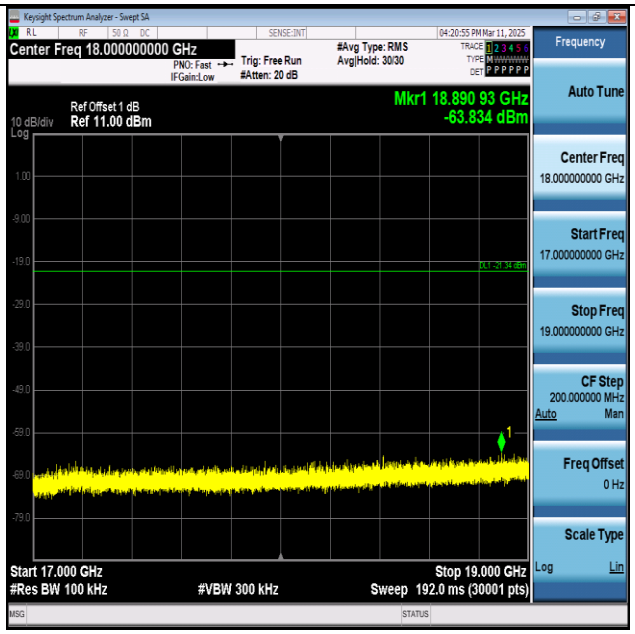
BLE_1M-Ant1-2440-11000~13000-PASS



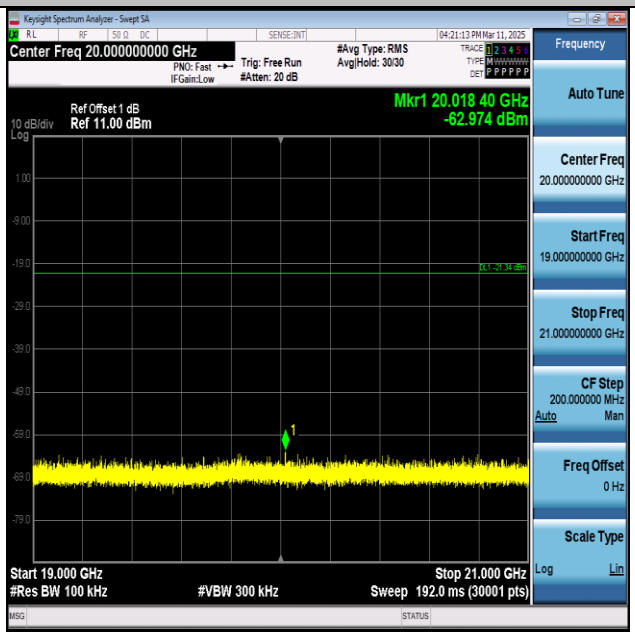
BLE_1M-Ant1-2440-13000~15000-PASS



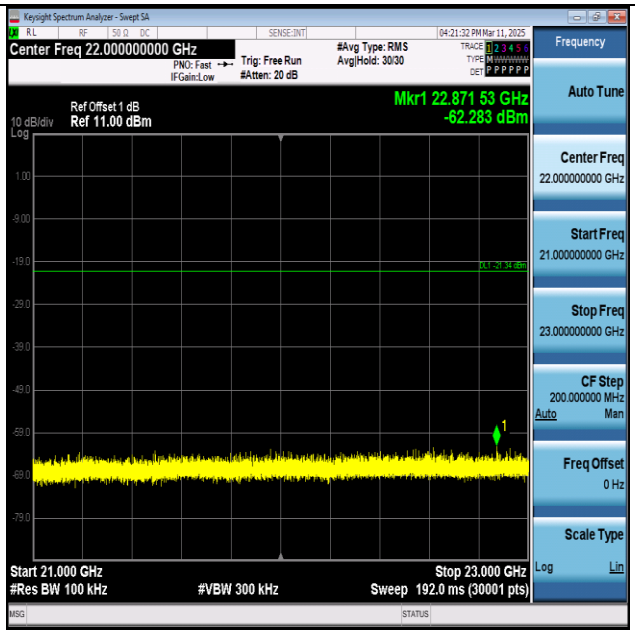
BLE_1M-Ant1-2440-15000~17000-PASS



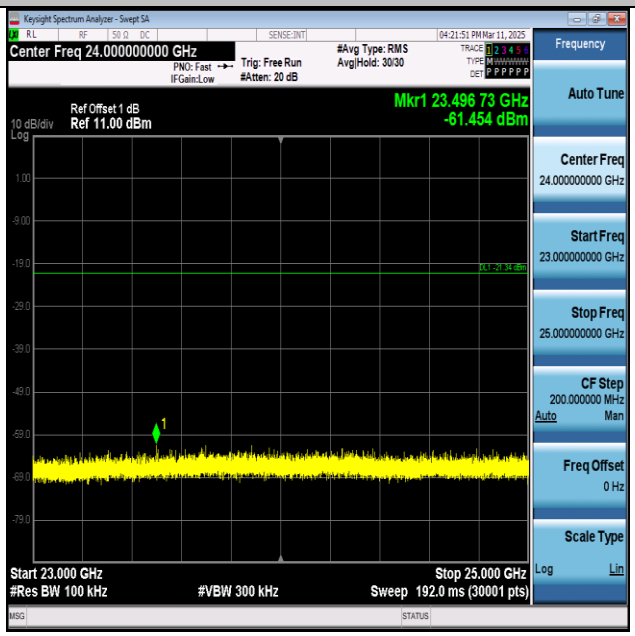
BLE_1M-Ant1-2440-17000~19000-PASS



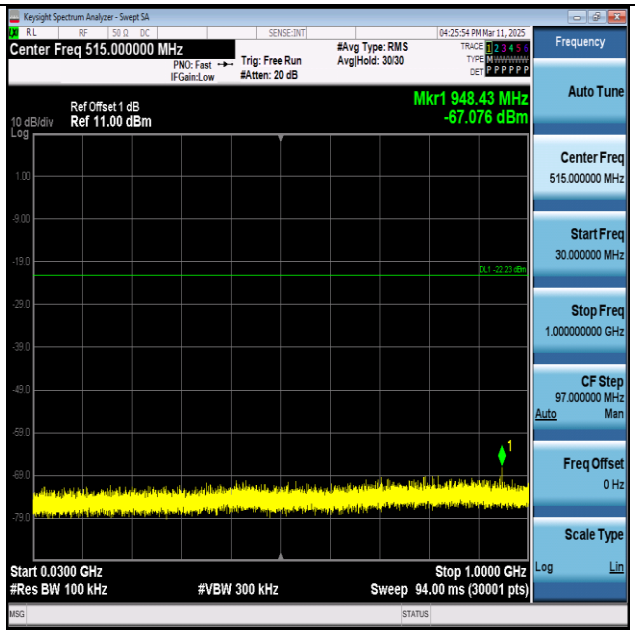
BLE_1M-Ant1-2440-19000~21000-PASS



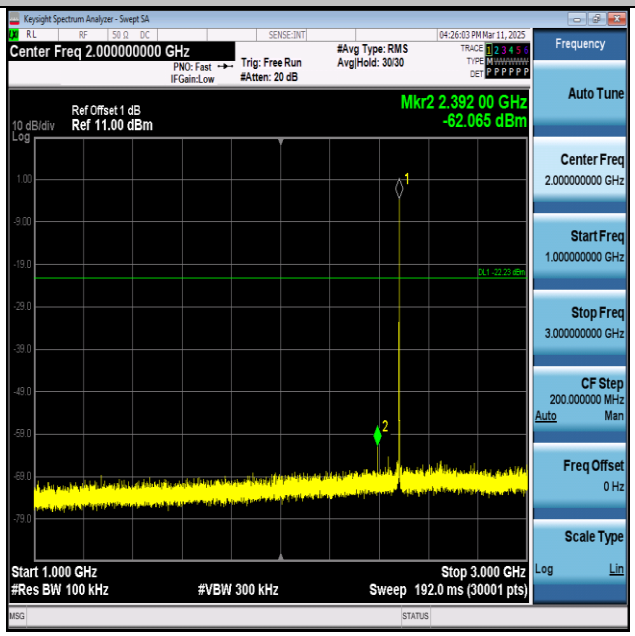
BLE_1M-Ant1-2440-21000~23000-PASS



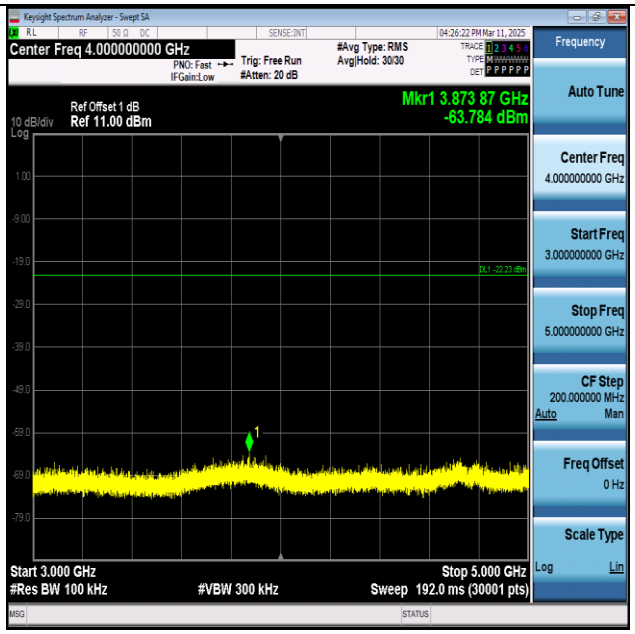
BLE_1M-Ant1-2440-23000~25000-PASS



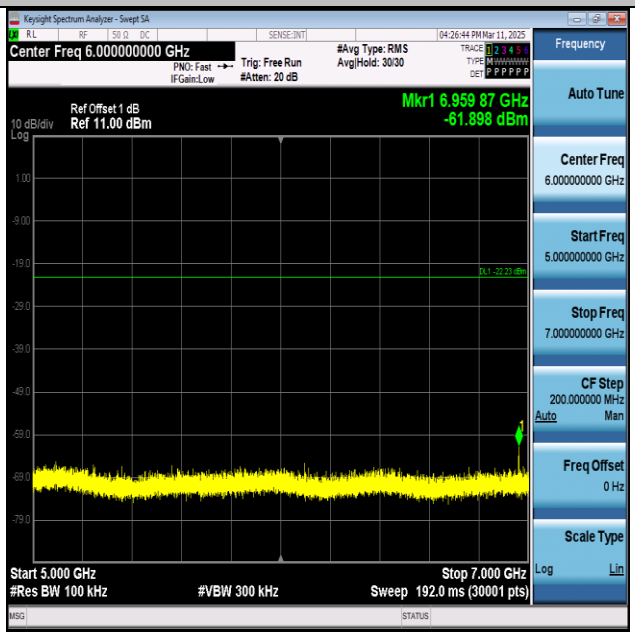
BLE_1M-Ant1-2480-30~1000-PASS



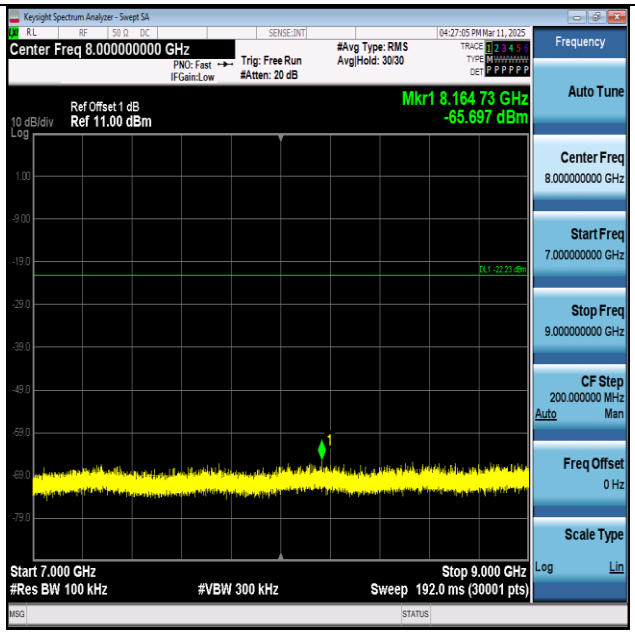
BLE_1M-Ant1-2480-1000~3000-PASS



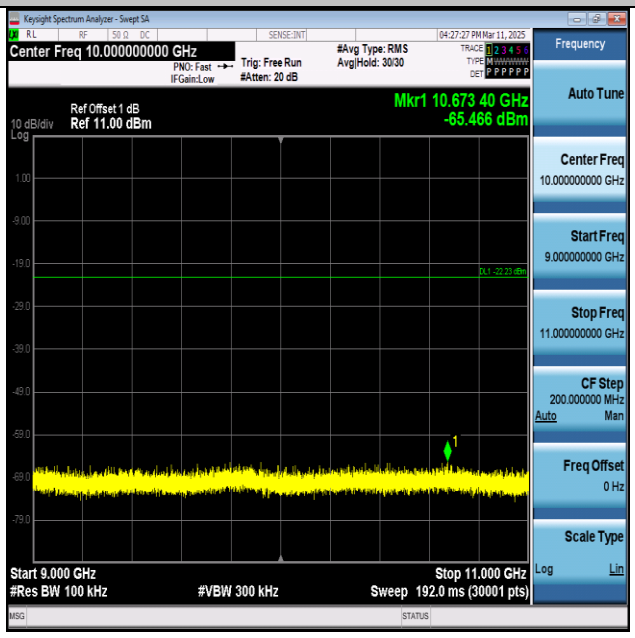
BLE_1M-Ant1-2480-3000~5000-PASS



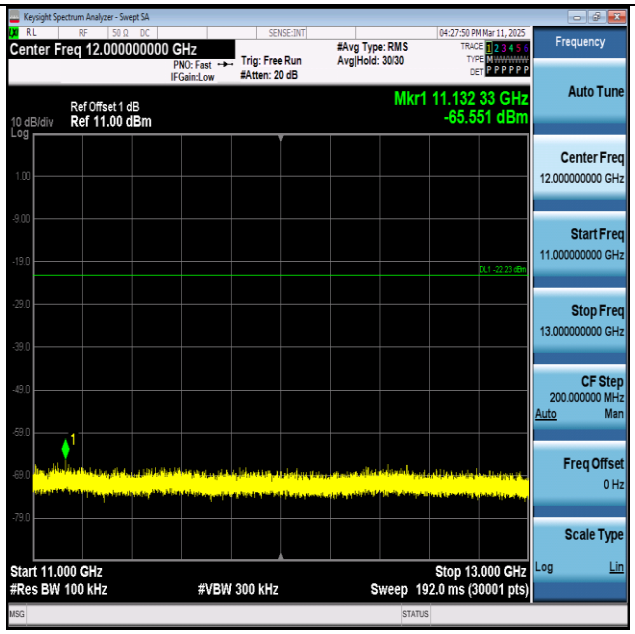
BLE_1M-Ant1-2480-5000~7000-PASS



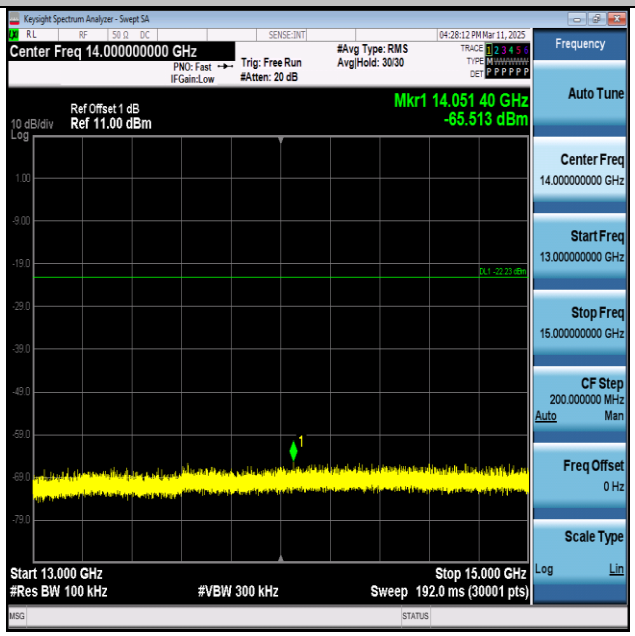
BLE_1M-Ant1-2480-7000~9000-PASS



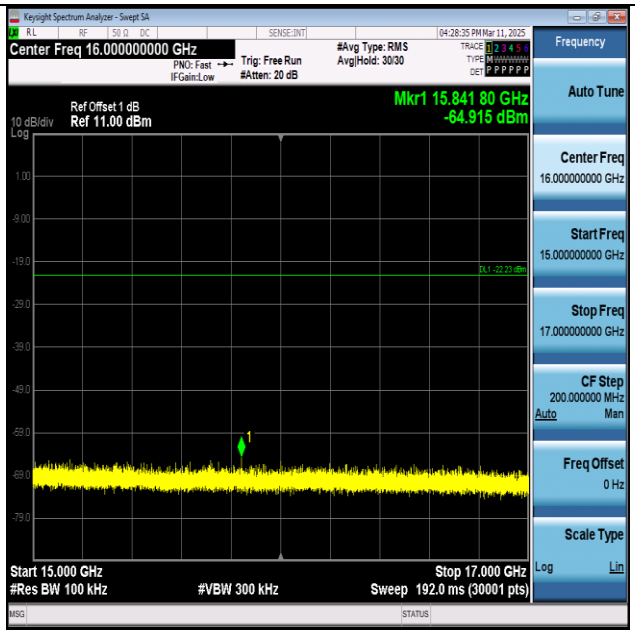
BLE_1M-Ant1-2480-9000~11000-PASS



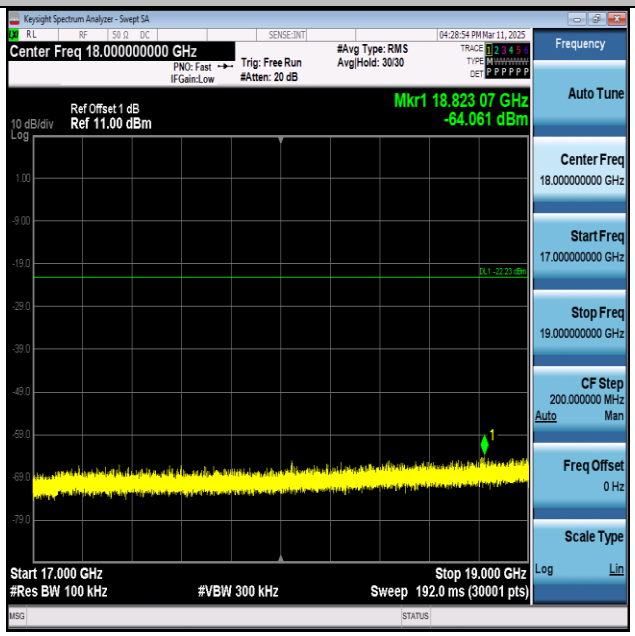
BLE_1M-Ant1-2480-11000~13000-PASS



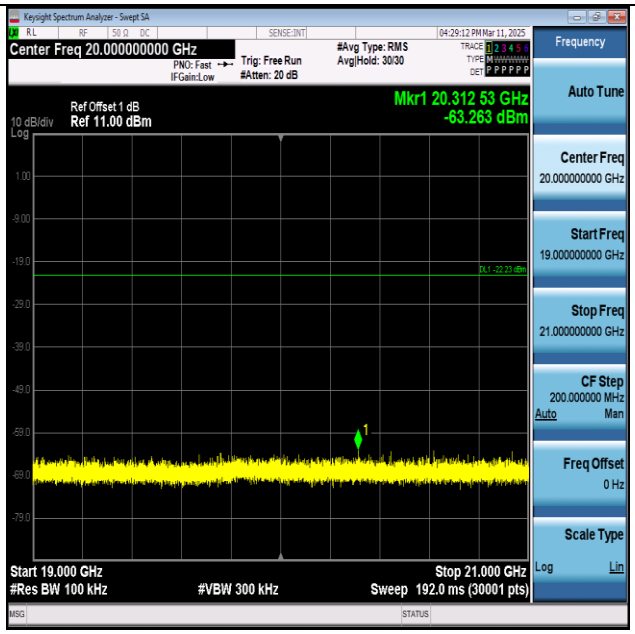
BLE_1M-Ant1-2480-13000~15000-PASS



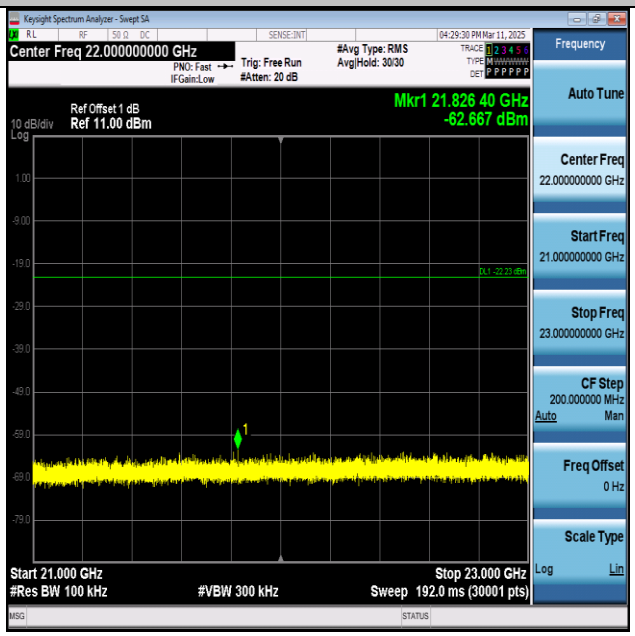
BLE_1M-Ant1-2480-15000~17000-PASS



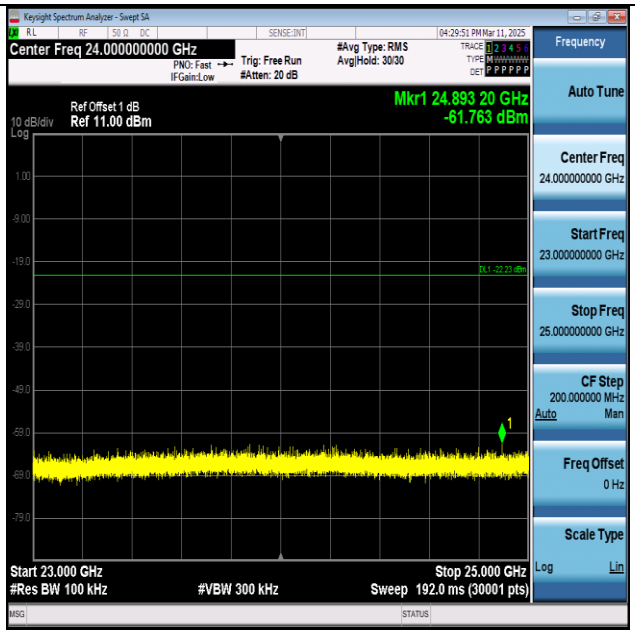
BLE_1M-Ant1-2480-17000~19000-PASS



BLE_1M-Ant1-2480-19000~21000-PASS



BLE_1M-Ant1-2480-21000~23000-PASS

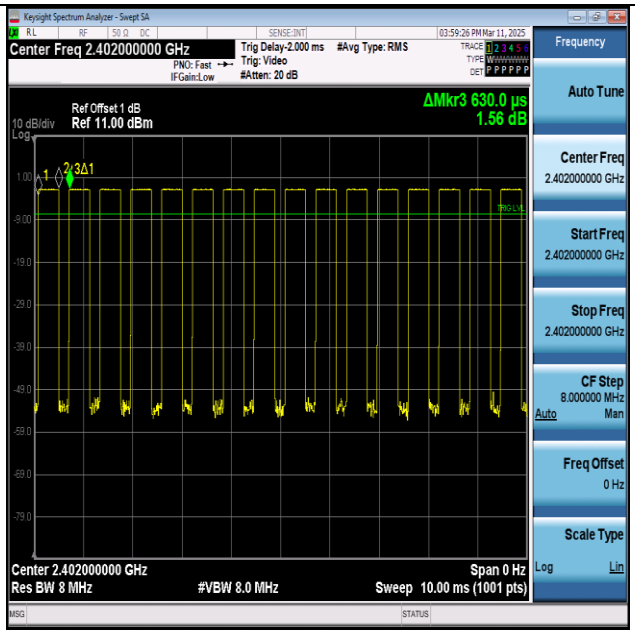


BLE_1M-Ant1-2480-23000~25000-PASS

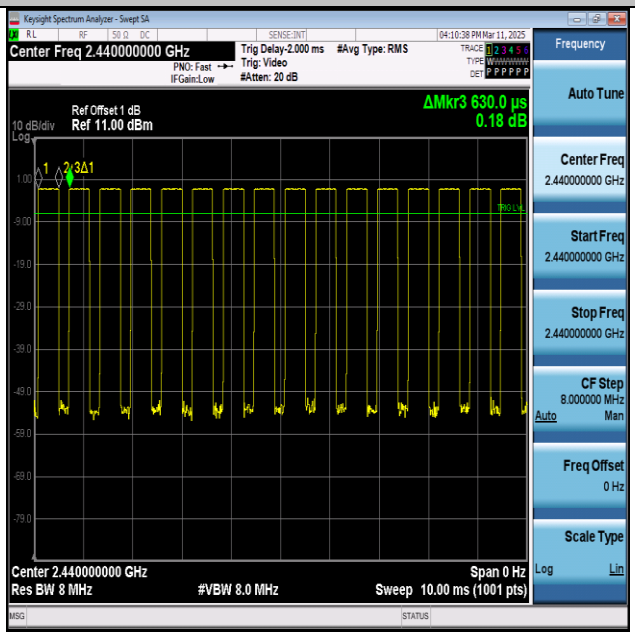
Appendix F: Duty Cycle

TestMode	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
BLE_1M	2402	0.41	0.63	65.08	1.87
BLE_1M	2440	0.41	0.63	65.08	1.87
BLE_1M	2480	0.41	0.63	65.08	1.87

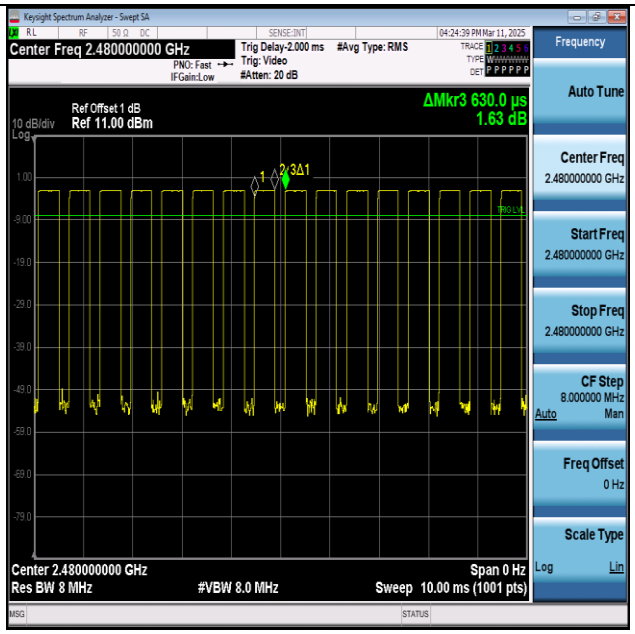
Test Graphs



NTNV-BLE_1M-Ant1-2402



NTNV-BLE_1M-Ant1-2440



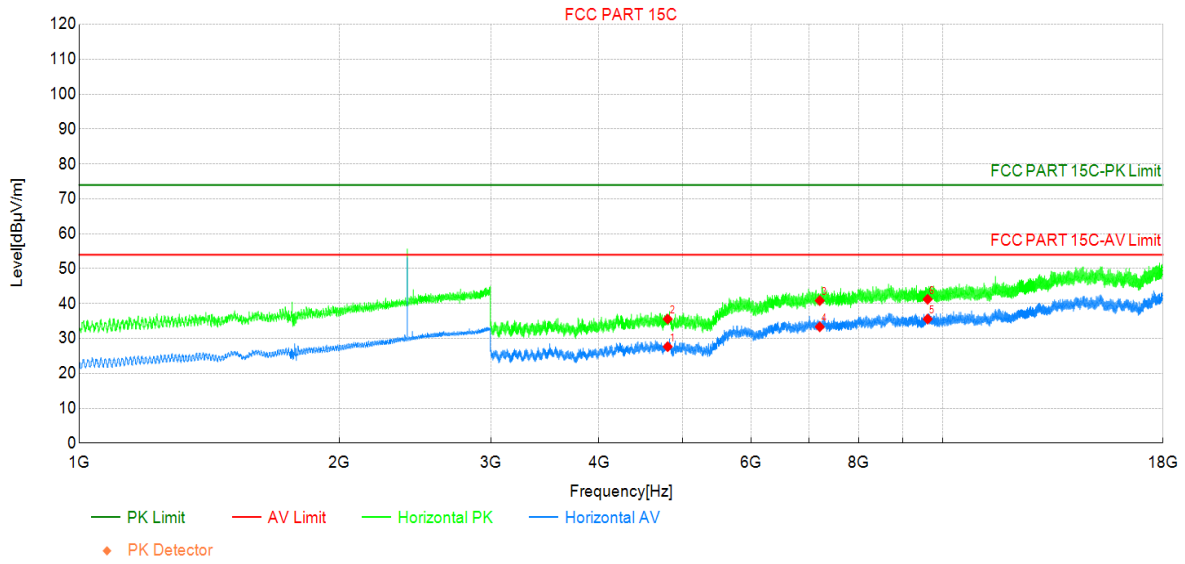
NTNV-BLE_1M-Ant1-2480

Appendix G: Emissions in Restricted Bands

Test Report

Project Information			
Profile:	2520983R	EUT:	Smart Controller
Mode:	Mode1:Transmit at 2402MHz by LE 1M	Volta	120 Vac / 60 Hz
Environment:	Temp: 25℃; Humi:60%	Engi	Reyn Chen
Test Standard:	FCC PART 15C		

Test Graph

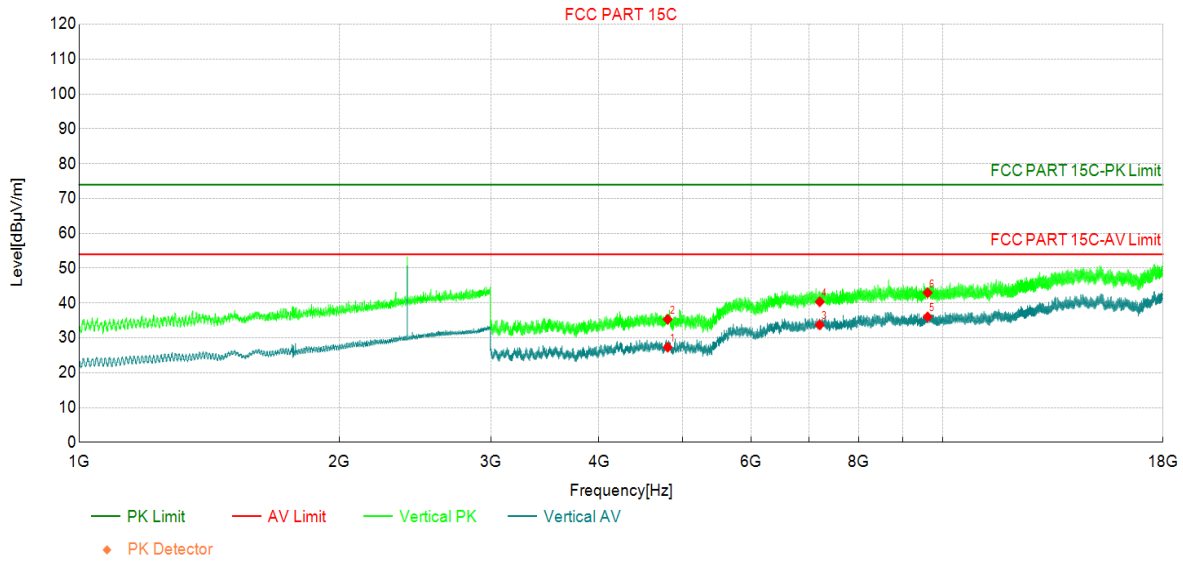


Suspected Data List									
NO.	Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Det	Pol	Verdict
1	4804.00	33.67	27.64	-6.03	54.00	26.36	AV	Horizo	PASS
2	4804.00	41.59	35.56	-6.03	74.00	38.44	PK	Horizo	PASS
3	7206.00	37.87	40.84	2.97	74.00	33.16	PK	Horizo	PASS
4	7206.00	30.36	33.33	2.97	54.00	20.67	AV	Horizo	PASS
5	9608.00	29.62	35.56	5.94	54.00	18.44	AV	Horizo	PASS
6	9608.00	35.29	41.23	5.94	74.00	32.77	PK	Horizo	PASS

Test Report

Project Information			
Profile:	2520983R	EUT:	Smart Controller
Mode:	Mode1:Transmit at 2402MHz by LE 1M	Volta	120 Vac / 60 Hz
Environment:	Temp: 25℃; Humi:60%	Engi	Reyn Chen
Test Standard:	FCC PART 15C		

Test Graph



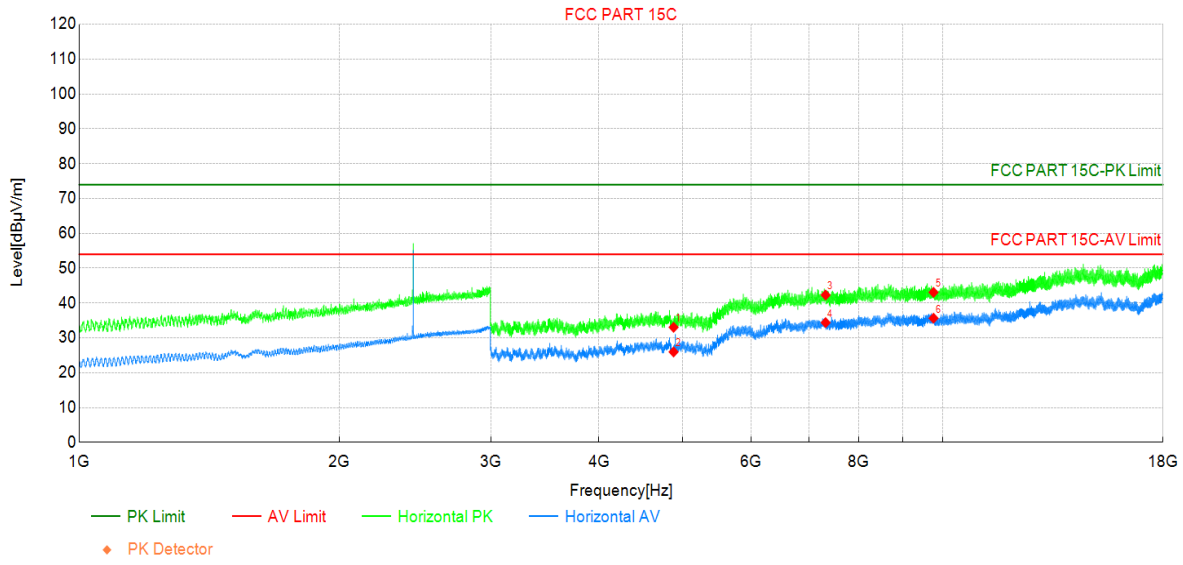
Suspected Data List

NO.	Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Det	Pol	Verdict
1	4804.00	33.33	27.30	-6.03	54.00	26.70	AV	Vertic	PASS
2	4804.00	41.34	35.31	-6.03	74.00	38.69	PK	Vertic	PASS
3	7206.00	30.78	33.75	2.97	54.00	20.25	AV	Vertic	PASS
4	7206.00	37.38	40.35	2.97	74.00	33.65	PK	Vertic	PASS
5	9608.00	30.08	36.02	5.94	54.00	17.98	AV	Vertic	PASS
6	9608.00	37.01	42.95	5.94	74.00	31.05	PK	Vertic	PASS

Test Report

Project Information			
Profile:	2520983R	EUT:	Smart Controller
Mode:	Mode1:Transmit at 2440MHz by LE 1M	Volta	120 Vac / 60 Hz
Environment:	Temp: 25℃; Humi:60%	Engi	Reyn Chen
Test Standard:	FCC PART 15C		

Test Graph

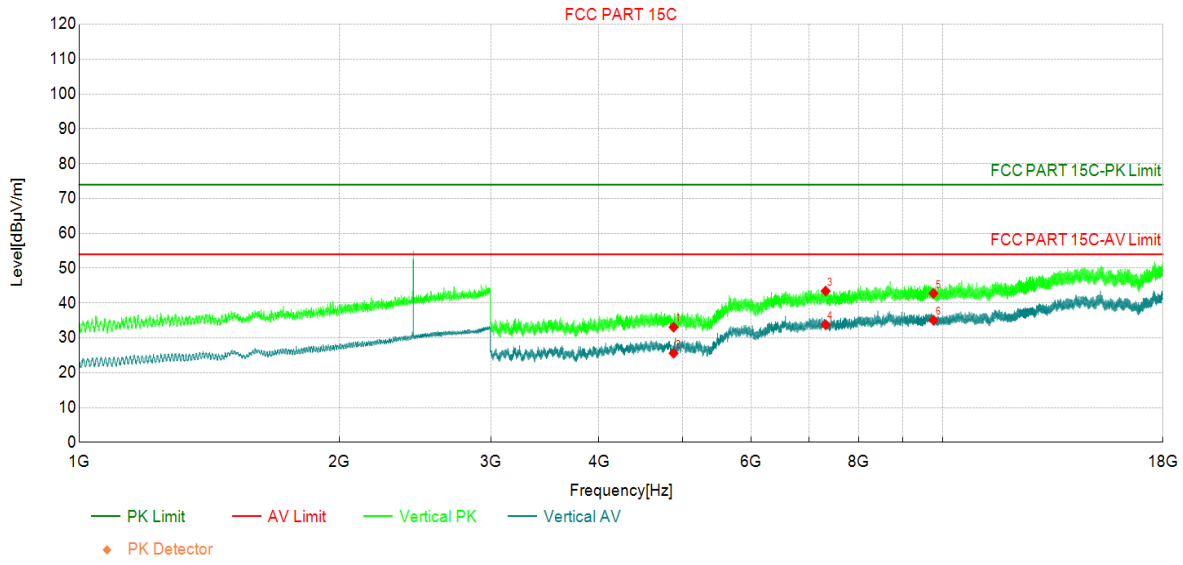


Suspected Data List									
NO.	Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Det	Pol	Verdict
1	4880.00	39.11	33.03	-6.08	74.00	40.97	PK	Horizo	PASS
2	4880.00	32.04	25.96	-6.08	54.00	28.04	AV	Horizo	PASS
3	7320.00	39.50	42.30	2.80	74.00	31.70	PK	Horizo	PASS
4	7320.00	31.58	34.38	2.80	54.00	19.62	AV	Horizo	PASS
5	9760.00	36.94	43.07	6.13	74.00	30.93	PK	Horizo	PASS
6	9760.00	29.50	35.63	6.13	54.00	18.37	AV	Horizo	PASS

Test Report

Project Information			
Profile:	2520983R	EUT:	Smart Controller
Mode:	Mode1:Transmit at 2440MHz by LE 1M	Volta	120 Vac / 60 Hz
Environment:	Temp: 25℃; Humi:60%	Engi	Reyn Chen
Test Standard:	FCC PART 15C		

Test Graph



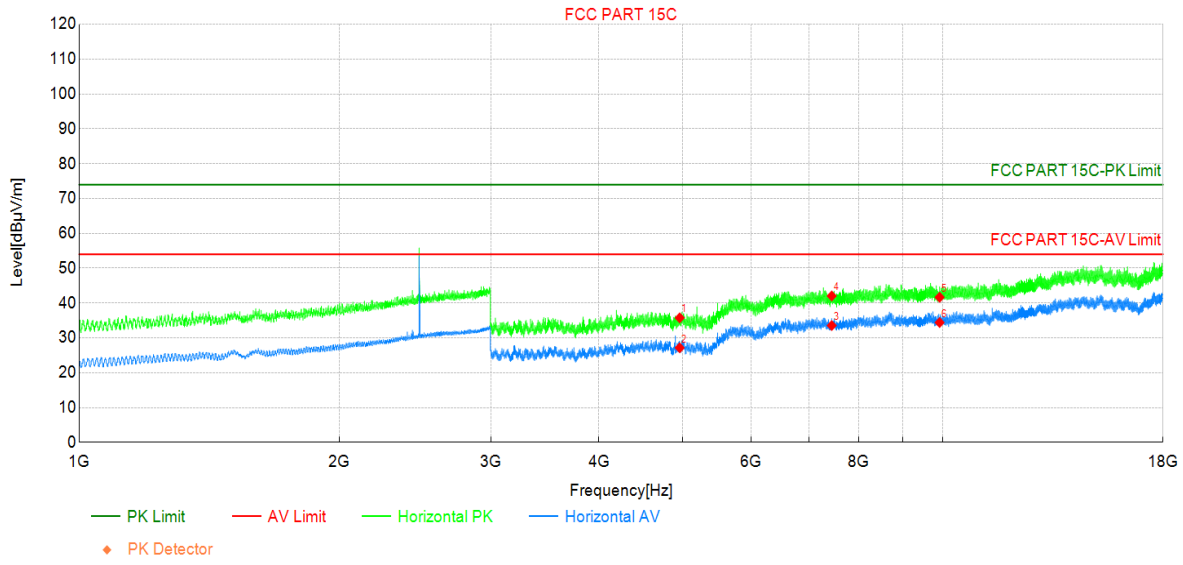
Suspected Data List

NO.	Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Det	Pol	Verdict
1	4880.00	39.15	33.07	-6.08	74.00	40.93	PK	Vertic	PASS
2	4880.00	31.66	25.58	-6.08	54.00	28.42	AV	Vertic	PASS
3	7320.00	40.63	43.43	2.80	74.00	30.57	PK	Vertic	PASS
4	7320.00	30.96	33.76	2.80	54.00	20.24	AV	Vertic	PASS
5	9760.00	36.63	42.76	6.13	74.00	31.24	PK	Vertic	PASS
6	9760.00	28.95	35.08	6.13	54.00	18.92	AV	Vertic	PASS

Test Report

Project Information			
Profile:	2520983R	EUT:	Smart Controller
Mode:	Mode1:Transmit at 2480MHz by LE 1M	Volta	120 Vac / 60 Hz
Environment:	Temp: 25℃; Humi:60%	Engi	Reyn Chen
Test Standard:	FCC PART 15C		

Test Graph

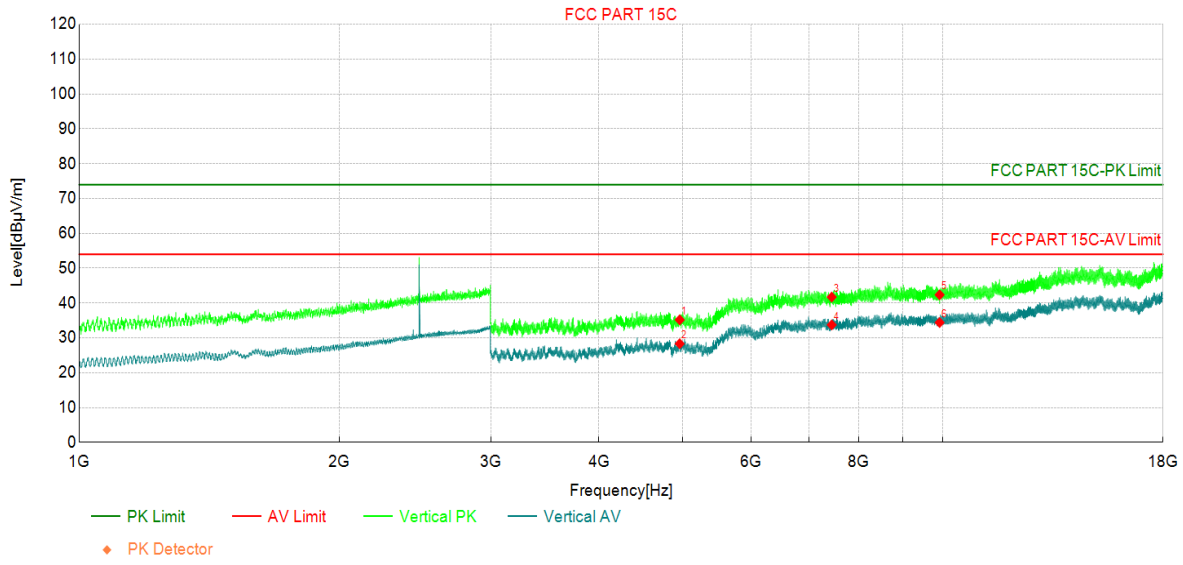


Suspected Data List									
NO.	Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Det	Pol	Verdict
1	4960.00	41.02	35.75	-5.27	74.00	38.25	PK	Horizo	PASS
2	4960.00	32.42	27.15	-5.27	54.00	26.85	AV	Horizo	PASS
3	7440.00	30.97	33.53	2.56	54.00	20.47	AV	Horizo	PASS
4	7440.00	39.47	42.03	2.56	74.00	31.97	PK	Horizo	PASS
5	9920.00	36.02	41.64	5.62	74.00	32.36	PK	Horizo	PASS
6	9920.00	28.78	34.40	5.62	54.00	19.60	AV	Horizo	PASS

Test Report

Project Information			
Profile:	2520983R	EUT:	Smart Controller
Mode:	Mode1:Transmit at 2480MHz by LE 1M	Volta	120 Vac / 60 Hz
Environment:	Temp: 25℃; Humi:60%	Engi	Reyn Chen
Test Standard:	FCC PART 15C		

Test Graph



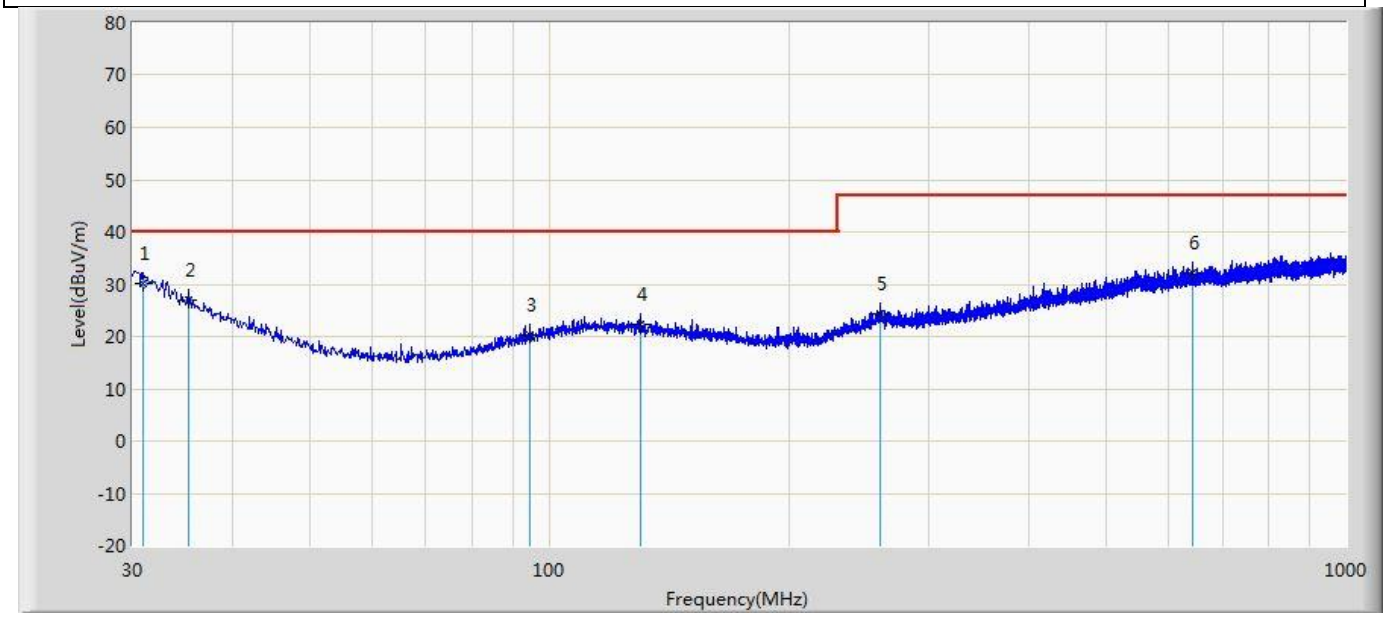
Suspected Data List

NO.	Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Det	Pol	Verdict
1	4960.00	40.44	35.17	-5.27	74.00	38.83	PK	Vertic	PASS
2	4960.00	33.58	28.31	-5.27	54.00	25.69	AV	Vertic	PASS
3	7440.00	39.15	41.71	2.56	74.00	32.29	PK	Vertic	PASS
4	7440.00	31.16	33.72	2.56	54.00	20.28	AV	Vertic	PASS
5	9920.00	36.73	42.35	5.62	74.00	31.65	PK	Vertic	PASS
6	9920.00	28.78	34.40	5.62	54.00	19.60	AV	Vertic	PASS

Note:
1.Level=Reading+Factor .
2. Margin=Limit-Level.
3. The test frequency range, 9kHz~30MHz, worst case are at least 20dB below the limits, therefore no data appear in the report.
4. 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.

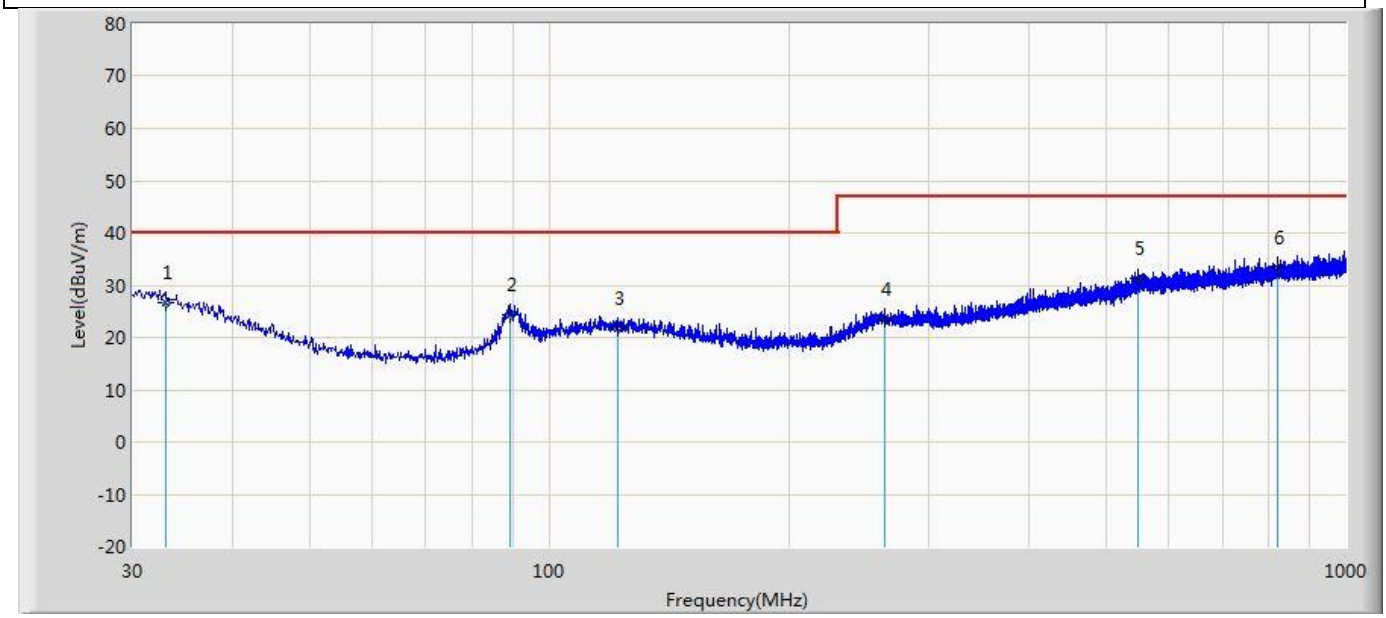
The worst case of Radiated Emission below 1GHz :

Profile: 2520983R	Page No.: 1
Engineer: Yuliu	
Site: AC2	Time: 2025/03/26
Limit: EN 55032_RE (3m)_Class B	Margin: 0
Probe: CBL6112B_2933(30-1000MHz)	Polarity: Horizontal
EUT: Smart Controller	Power: 120 Vac / 60 Hz
Note: Transmit at BLE	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	30.970	30.253	5.573	-9.747	40.000	24.680	QP
2		35.214	27.079	4.439	-12.921	40.000	22.640	QP
3		94.747	20.311	3.379	-19.689	40.000	16.932	QP
4		130.152	22.336	3.455	-17.664	40.000	18.881	QP
5		260.011	24.371	3.077	-22.629	47.000	21.294	QP
6		642.434	32.120	4.312	-14.880	47.000	27.808	QP

Profile: 2520983R	Page No.: 2
Engineer: Yuliu	
Site: AC2	Time: 2025/03/26
Limit: EN 55032_RE (3m)_Class B	Margin: 0
Probe: CBL6112B_2933(30-1000MHz)	Polarity: Vertical
EUT: Smart Controller	Power: 120 Vac / 60 Hz
Note: Transmit at BLE	



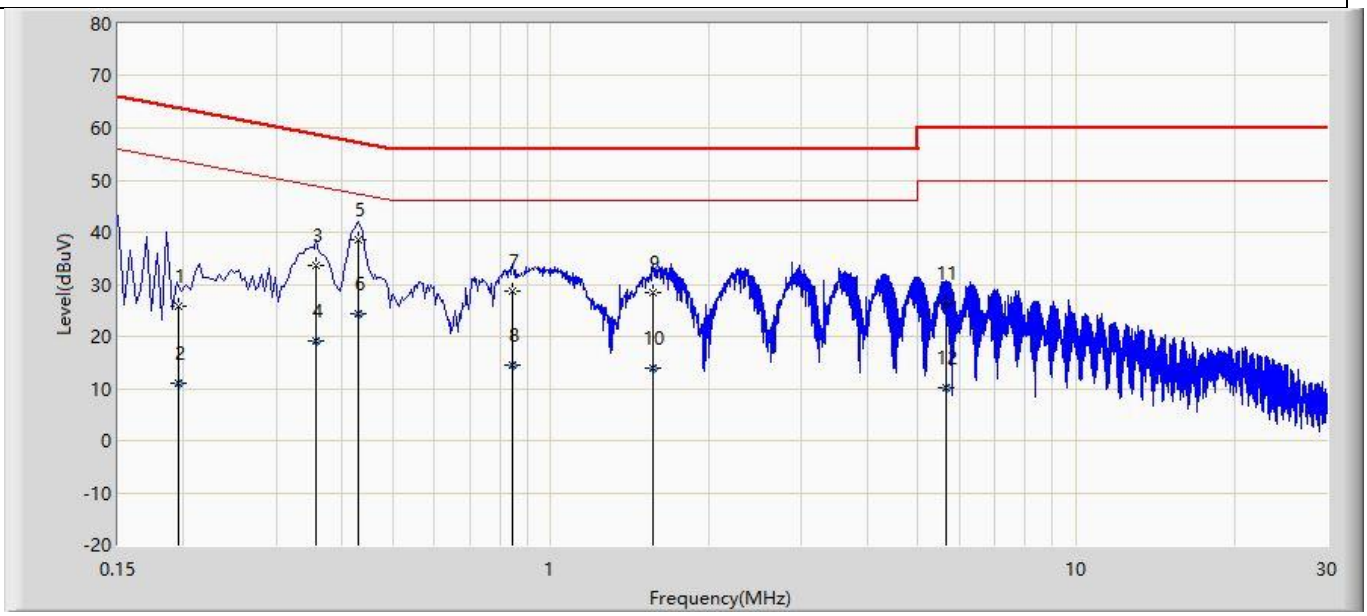
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	33.031	26.728	2.951	-13.272	40.000	23.777	QP
2		89.412	24.377	8.435	-15.623	40.000	15.942	QP
3		121.786	21.751	2.574	-18.249	40.000	19.176	QP
4		264.255	23.580	2.575	-23.420	47.000	21.004	QP
5		549.314	31.169	3.673	-15.831	47.000	27.496	QP
6		822.005	33.227	3.558	-13.773	47.000	29.669	QP

Note:

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

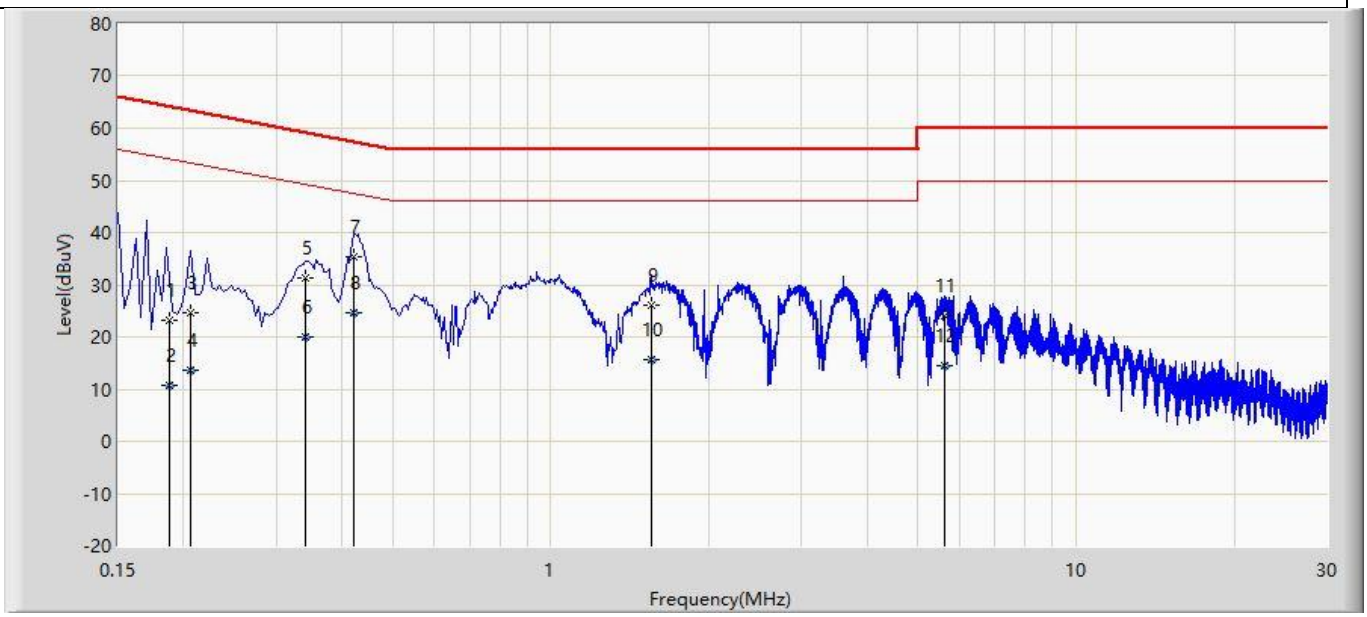
Appendix H: AC Power Line Conducted Emission

Profile: 2520983R	Page No.: 3
Engineer: Yu Liu	
Site: TR1	Time: 2025/03/26
Limit: FCC_Part 15.207	Margin: 0
Probe: ENV216_101189(0.009-30MHz)	Polarity: Line
EUT: Smart Controller	Power: 120 Vac / 60 Hz
Note: Transmit at BLE	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		0.196	25.884	16.188	-37.913	63.796	9.696	QP
2		0.196	11.142	1.446	-42.654	53.796	9.696	AV
3		0.358	33.569	23.847	-25.206	58.775	9.722	QP
4		0.358	19.023	9.302	-29.751	48.775	9.722	AV
5	*	0.430	38.693	28.959	-18.559	57.253	9.734	QP
6		0.430	24.475	14.741	-22.777	47.253	9.734	AV
7		0.846	28.582	18.855	-27.418	56.000	9.728	QP
8		0.846	14.597	4.870	-31.403	46.000	9.728	AV
9		1.562	28.326	18.545	-27.674	56.000	9.781	QP
10		1.562	13.909	4.128	-32.091	46.000	9.781	AV
11		5.646	26.345	16.477	-33.655	60.000	9.869	QP
12		5.646	10.203	0.334	-39.797	50.000	9.869	AV

Profile: 2520983R	Page No.: 4
Engineer: Yu Liu	
Site: TR1	Time: 2025/03/26
Limit: FCC_Part 15.207	Margin: 0
Probe: ENV216_101189(0.009-30MHz)	Polarity: Neutral
EUT: Smart Controller	Power: 120 Vac / 60 Hz
Note: Transmit at BLE	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		0.188	23.159	13.463	-40.982	64.141	9.697	QP
2		0.188	10.677	0.981	-43.464	54.141	9.697	AV
3		0.206	24.584	14.898	-38.781	63.365	9.686	QP
4		0.206	13.605	3.919	-39.760	53.365	9.686	AV
5		0.342	31.187	21.526	-27.968	59.155	9.660	QP
6		0.342	20.007	10.347	-29.147	49.155	9.660	AV
7	*	0.422	35.401	25.753	-22.007	57.409	9.648	QP
8		0.422	24.707	15.059	-22.702	47.409	9.648	AV
9		1.554	26.221	16.488	-29.779	56.000	9.733	QP
10		1.554	15.694	5.961	-30.306	46.000	9.733	AV
11		5.598	24.123	14.251	-35.877	60.000	9.872	QP
12		5.598	14.505	4.633	-35.495	50.000	9.872	AV

Note:

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

The End