DEKRA Testing and Certification (Suzhou) Co., Ltd.
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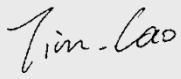
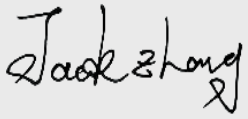
Test report No:
24B0486R-RF-US-P06V02

FCC TEST REPORT

Product Name	Wi-Fi and Bluetooth Module
Trademark	N/A
Model and /or type reference	T5-E1-IPEX
FCC ID	2ANDL-T5-E1P
Applicant´s name / address	Hangzhou Tuya Information Technology Co., Ltd Room 301,Building 1,Huace Center,Xihu District,Hangzhou City,Zhejiang Province, China
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)	Jack Zhang / Manager 
Date of issue	2024-12-23
Report Version	V1.0
Report template No	Template_FCC Part 15C-RF-V1.0

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COMPETENCES AND GUARANTEES

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

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

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

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

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GENERAL CONDITIONS

Test Location	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Date(receive sample)	Nov. 13, 2024
Date (start test)	Nov. 20, 2024
Date (finish test)	Dec. 06, 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
24B0486R-RF-US-P06V02	V1.0	Initial issue of report.	2024-12-23

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 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-1909	THM-032	2024.05.17	2025.05.16	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	2024.01.31	2025.01.30	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	2024.07.06	2025.07.05	N/A	N/A
Coaxial Cable	Huber+Suhner	RG 223	TR1-C1	2024.07.06	2025.07.05	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-1909	THM-011	2024.05.17	2025.05.16	N/A	N/A
Dekra test software	Dekra	N/A	N/A	N/A	N/A	N/A	N/A

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	100176	2024.05.12	2025.05.11	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-1909	THM-021	2024.05.17	2025.05.16	N/A	N/A
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	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	00123988	2024.09.16	2025.09.15	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
Coaxial Cable	ROSENBERGER	LA1-C011-2000/3000	AC5-40G	2024.01.25	2025.01.24	N/A	N/A
Coaxial Cable	ROSENBERGER	LA1-C011-2000/3000	AC5-40G-2	2024.05.26	2025.05.25	N/A	N/A
Cable	Rosenberger	LA1-C011-1000	0523	2024.05.26	2025.05.25	N/A	N/A
Temperature/ Humidity Meter	RTS	RTS-1909	THM-001	2024.07.11	2025.07.10	N/A	N/A
Temperature/ Humidity Meter	RTS	RTS-1909	THM-024	2024.05.17	2025.05.16	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: 2.80dB 150kHz~30MHz: 2.40dB
Peak Power Output	± 1.27 dB
Radiated Emission(30MHz~1GHz)	Horizontal: 30MHz~200MHz: 3.50 dB 300MHz~1GHz: 3.60 dB Vertical: 30MHz~200MHz: 3.60 dB 300MHz~1GHz: 3.50 dB
Radiated Emission(1GHz~26.5GHz)	Horizontal: 1GHz~18GHz: 5.00 dB Vertical: 1GHz~18GHz: 4.80 dB Horizontal: 18GHz~26.5GHz: 5.30 dB Vertical: 18GHz~26.5GHz: 4.90 dB
RF antenna conducted test	± 1.27dB
Radiated Emission Band Edge	± 3.9 dB
DTS Bandwidth	±150Hz
Occupied Bandwidth	±1kHz
Power Density	±1.27dB

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Product Name..... :	Wi-Fi and Bluetooth Module
Model No. ..... :	T5-E1-IPEX
Trademark. ..... :	N/A
FCC ID ..... :	2ANDL-T5-E1P
Hardware Version ..... :	V1.0.0
Software Version..... :	V3.5.0
Manufacturer..... :	Hangzhou Tuya Information Technology Co., Ltd
Manufacturer Address..... :	Room 301,Building 1,Huace Center,Xihu District,Hangzhou City,Zhejiang Province, China
Factory ..... :	1, Zhejiang Niuchuang Technology Co., Ltd 2, Hangzhou Xizhi Electronics Co., Ltd. 3, HuiZhou GSD Technology Co.,LTD 4, Shenzhen Sunwinon Electronics Co., Ltd. 5, Shenzhen Confidence Intelligence Electronic Co.,Ltd.
Factory address ..... :	1, No. 1 Zhushan Road, Chang'an Town, Haining City , Jiaxing City, Zhejiang Province,China 2, 2nd Floor, Building 3, No. 8, Yuyang Road, Lushan Street, Fuyang District, Hangzhou City, Zhejiang Province,China 3, No. 2 Jinda Road, Science and technology industrial park Sandong Town,Huizhou,Guangdong Province,China 4, 1-6 Floor, No.101, Building 4, 6-6 Yanshan Avenue, Yanchuan Community, Yanluo Street, Baoan District, Shenzhen,China 5, Building 7, New Development Zone, Baishixia East District, Fuyong Street, Baoan District, Shenzhen, Guangdong Province, P.R.China

Wireless specifiction..... :	Bluetooth (LE)				
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 channel..... :	40				

Rated power supply .....:	Voltage and Frequency	
	☐	AC: 220 - 240 V, 50/60 Hz
	☒	DC: 3.3 Vdc / 500 mA / 1.65 W
	☐	Battery: 3.87 Vdc , 800 mAh
Mounting position.....:	☐	Tabletop equipment
	☐	Wall/Ceiling mounted equipment
	☐	Floor standing equipment
	☐	Hand-held/Portable equipment
	☒	Other: Module

1.2 Antenna Information

Antenna Manufacture ..... :	TUYA			
Antenna Serial Number ..... :	T5-E1-IPEX Antenna			
Antenna Delivery ..... :	☒	1TX + 1RX		
	☐	2TX + 2RX		
	☐	Others: ……		
Antenna Technology ..... :	☒	SISO		
	☐	MIMO	☐	CDD
			☐	Beam-forming
Antenna Type..... :	☒	External	☐	Dipole
			☒	FPC
	☐	Internal	☐	Ceramic Chip
			☐	PIFA
			☐	FPC
			☐	Others……..
Antenna Gain ..... :	2.98 dBi			

1.3 Channel List

Bluetooth Working Frequency of Each Channel: (For LE)							
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 Operating mode(s) used for tests

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

Test Mode For Bluetooth	Mode 1: Transmit by LE_1Mbps

Note 1: Regards to the frequency band operation: the lowest, middle and highest frequency channel were selected to perform the test, then shown on this report.
Note 2: For portable device, radiated tests was verified over X, Y, Z axis, and shown the worst case on this report.

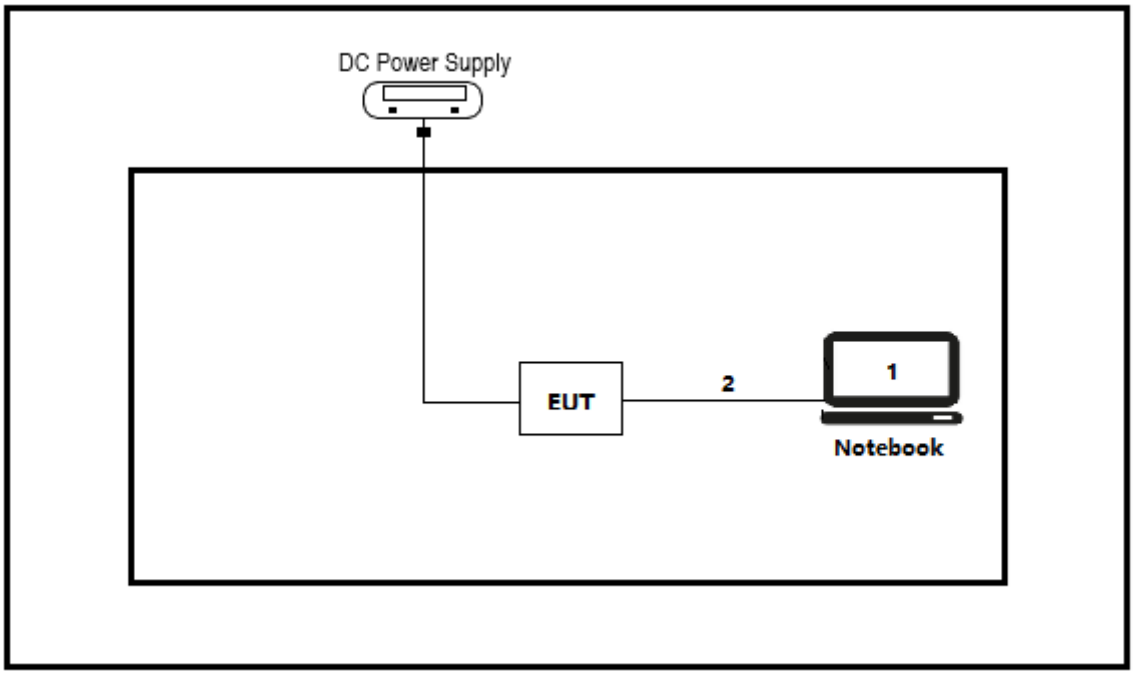
2.2 Auxiliary equipment / Test software for the EUT

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
Wi-Fi test tool	V4.0	N/A	N/A

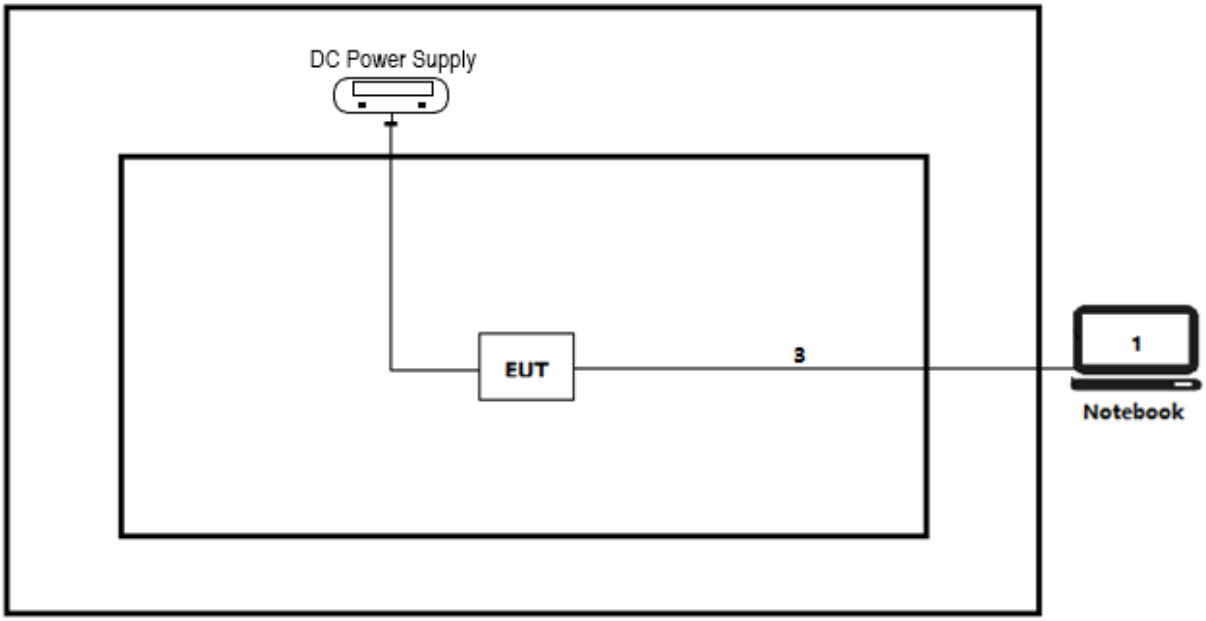
Accessories Information	Cable		
	Length used during test [m]	Attached during test	Shielded
(2)USB Control Cable	1	☒	☒
(3)USB Control Cable	8	☒	☒

2.3 Test Configuration / Block diagram used for tests

Test setup Diagram- Conducted test



Test setup Diagram- Radiated Emission



2.4 Testing process

1	Setup the EUT shown in Section 2.3.
2	Run the software “Wi-Fi test tool” on the notebook computer.
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

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 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	N/A	---
Antenna Requirement	FCC 15.203	PASS	---

3.4 Power setting in test

Mode	Channel	Frequency (MHz)	Power setting
Mode1	00	2402	default
	19	2440	default
	39	2480	default

3.5 Test Matrix

Test item	Model : T5-E1-IPEX	
	#1	#2
DTS Bandwidth	☒	☐
Maximum conducted output power	☒	☐
Maximum power spectral density	☒	☐
Band edge measurements	☐	☒
Conducted Spurious Emission	☒	☐
Duty cycle	☒	☐
Emissions in Restricted Bands	☐	☒
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

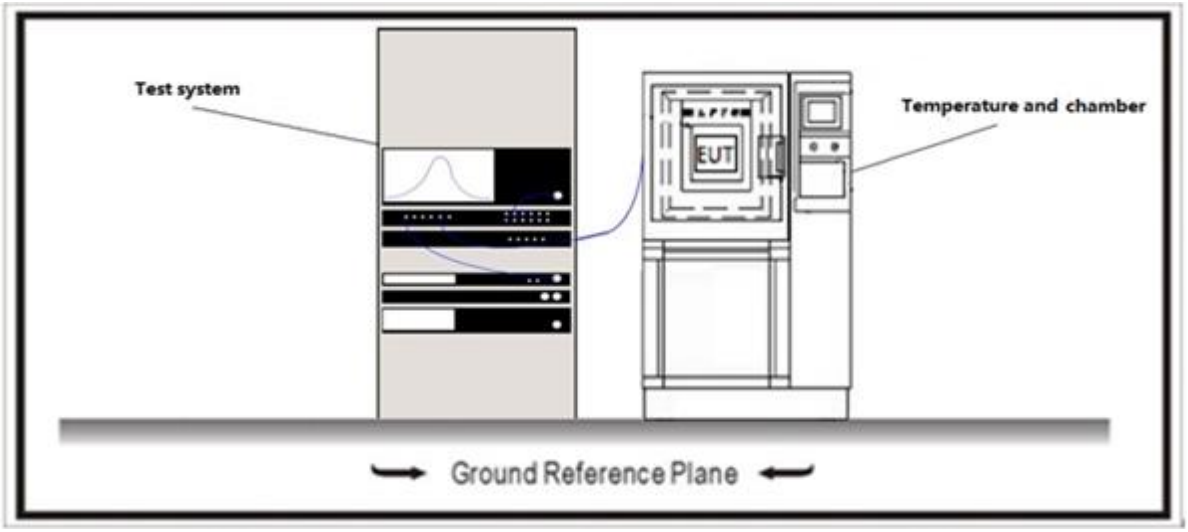
USA	**:**	**FCC Designation Number: CN1199**

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



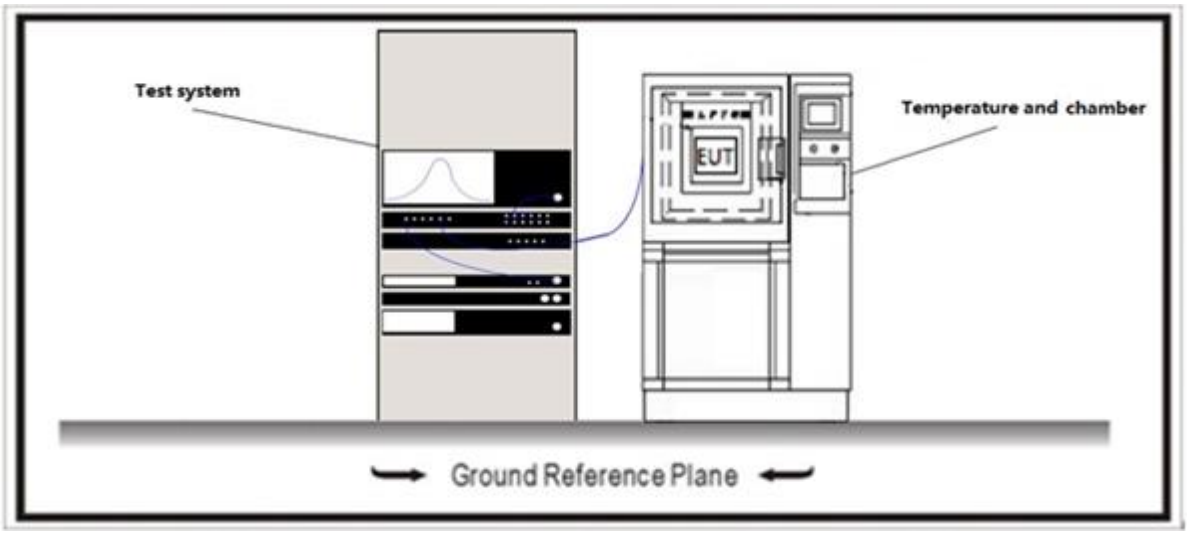
4.1.3 Test Procedure

	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 Maximum Conducted Output Power	VERDICT: PASS

4.2.1 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 .			

4.2.2 Test Setup

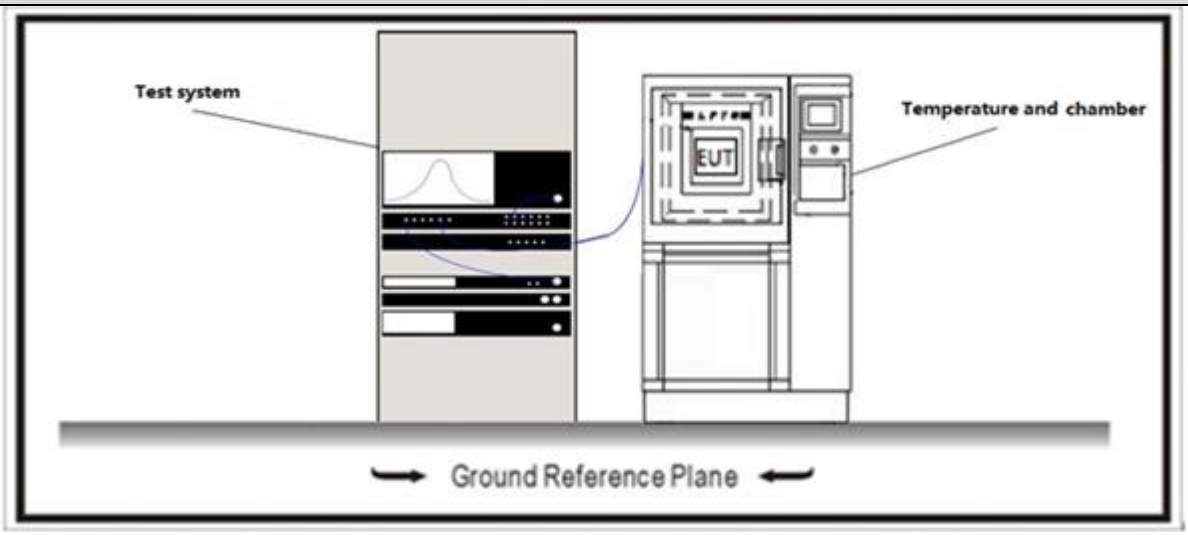


4.2.3 Test Procedure						
	References Rule				Chapter	Description
☒	ANSI C63.10				11.9	Fundamental emission output power
	☐	ANSI C63.10			11.9.1	Maximum peak conducted output power
		☐	ANSI C63.10		11.9.1.1	RBW ≥ DTS bandwidth
		☐	ANSI C63.10		11.9.1.2	Integrated band power method
		☐	ANSI C63.10		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

4.3 Maximum Power Spectral Density	VERDICT: PASS

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

4.3.2 Test Setup



4.3.3 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

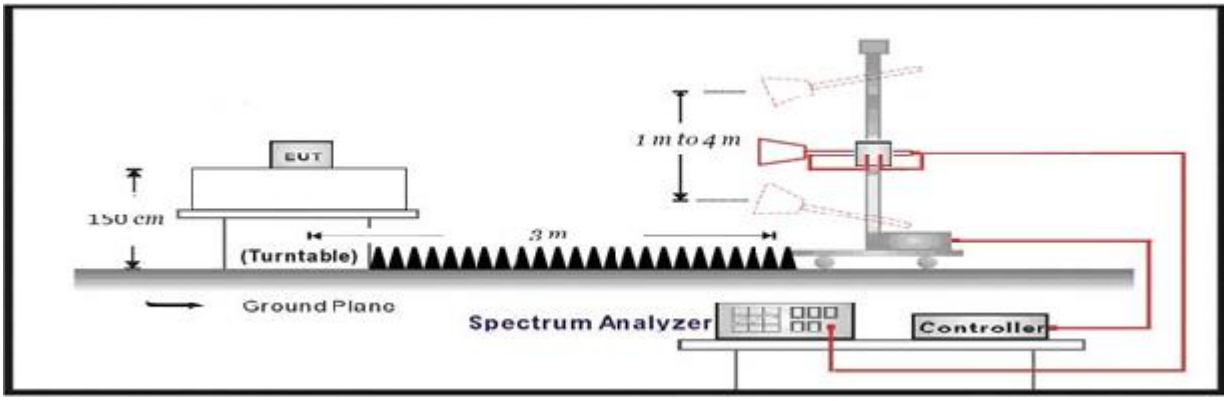
4.4 Band Edge Measurements — VERDICT: PASS

4.4.1 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.				

4.4.2 Test Setup

Above 1GHz Test Setup:



4.4.3 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

4.5 Conducted Spurious Emission	VERDICT: PASS

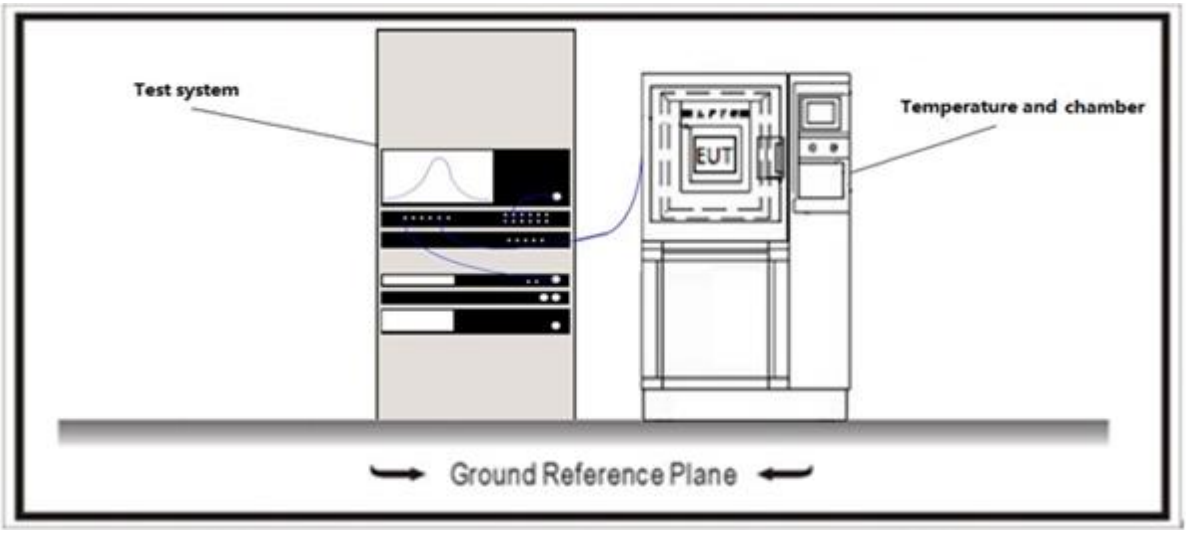
4.5.1 Limit

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).

4.5.2 Test Setup



4.5.3 Test Procedure

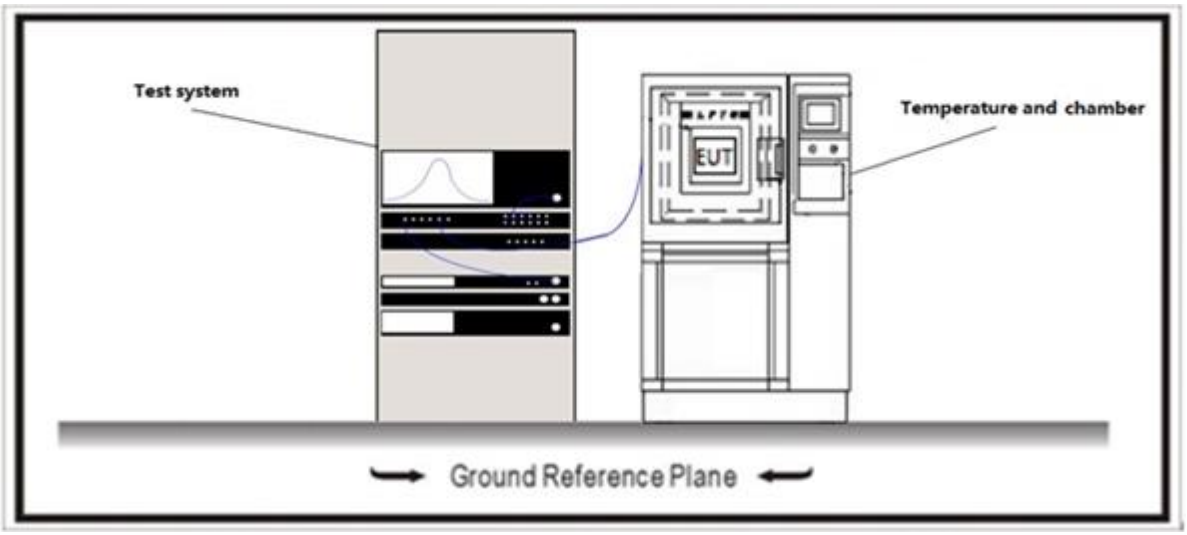
References Rule			Chapter	Description
☒	ANSI C63.10		11.11	Emissions in non-restricted frequency bands
	☒	ANSI C63.10	11.11.1	General
	☒	ANSI C63.10	11.11.2	Reference level measurement
	☒	ANSI C63.10	11.11.3	Emission level measurement

4.6 Duty cycle	VERDICT: PASS

4.6.1 Limit

N/A

4.6.2 Test Setup



4.6.3 Test Procedure

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

4.7 Emissions in Restricted Bands — VERDICT: PASS

4.7.1 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			

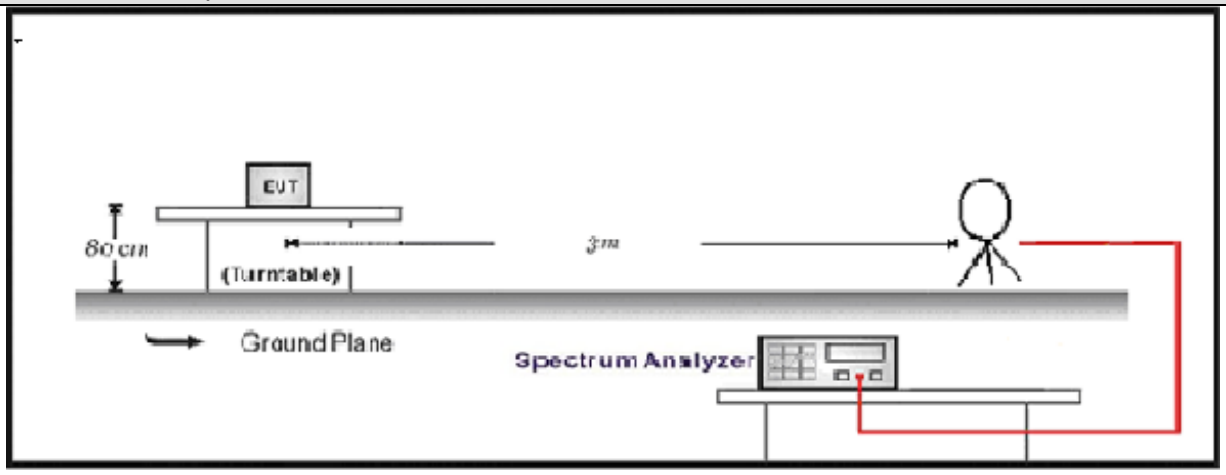
Restricted Band Emissions Limit			
FCC Part 15 Subpart C Paragraph 15.209			
Frequency (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Measurement distance (m)
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300(Note 1)
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30(Note 1)
1.705 - 30	30	29.5	30(Note 1)
30 - 88	100	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).

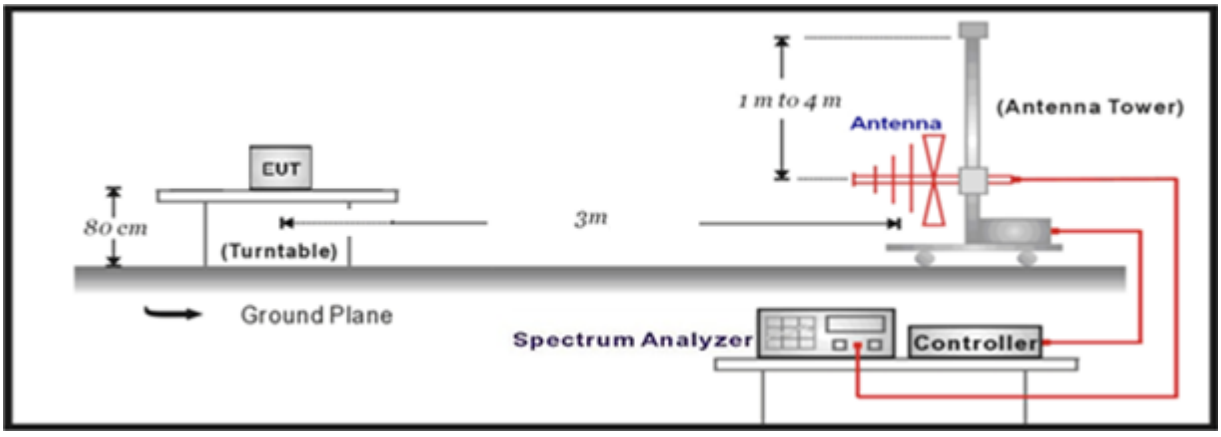
Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated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

4.7.2 Test Setup

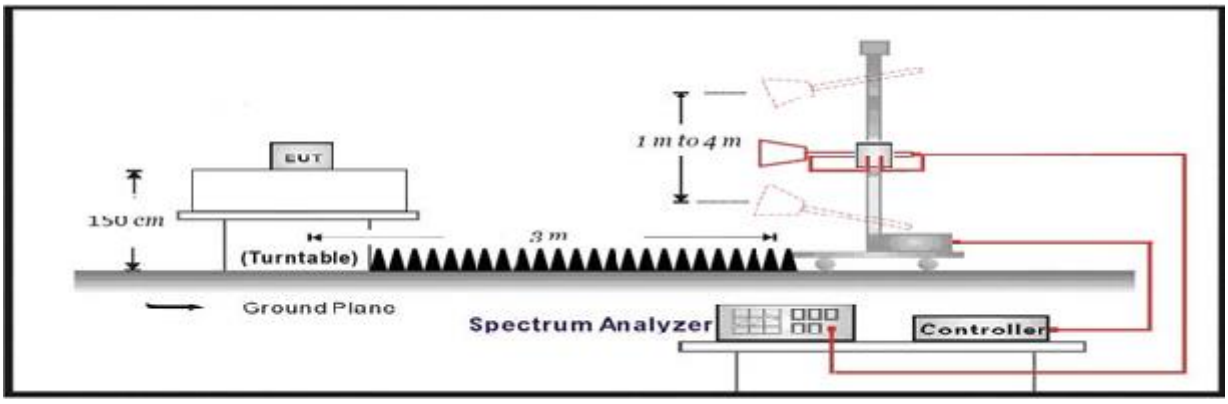
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



Above 1GHz Test Setup:



4.7.3 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

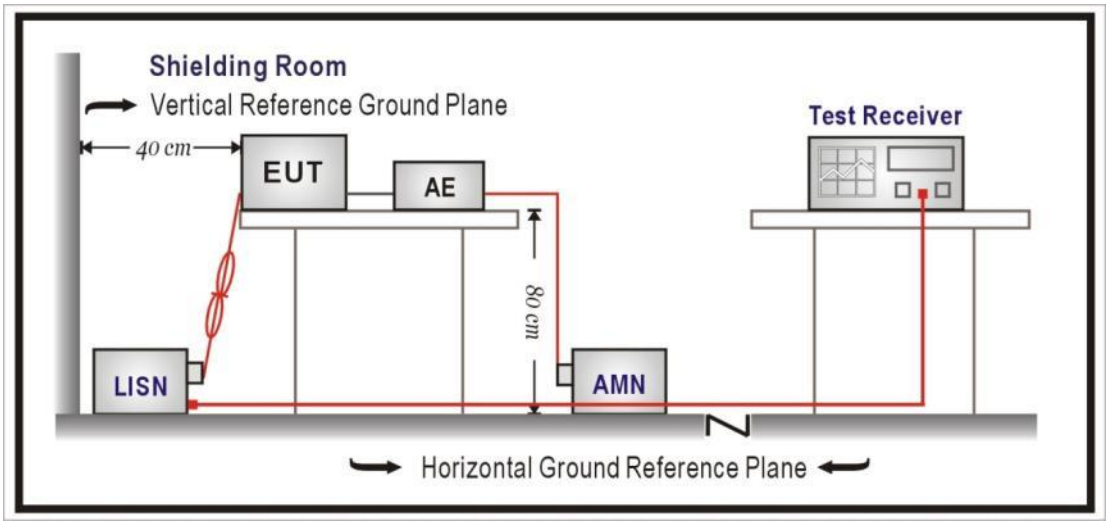
4.8 AC Power Line Conducted Emission — VERDICT: N/A

4.8.1 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.

4.8.2 Test Setup



4.8.3 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

Note: The EUT uses DC power supply.

4.9 Antenna Requirement	VERDICT: PASS

4.9.1 Limit:	
Standard	FCC Part 15 Subpart C Paragraph 15.203
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.	

4.9.2 Antenna Connector Construction:	
☒	The use of a permanently attached antenna
☐	The antenna use of a unique coupling to the intentional radiator
☐	The use of a nonstandard antenna jack or electrical connector
Please refer to the attached document “Internal Photograph” to show the antenna connector.	

5 TEST SETUP PHOTO AND EUT PHOTO

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

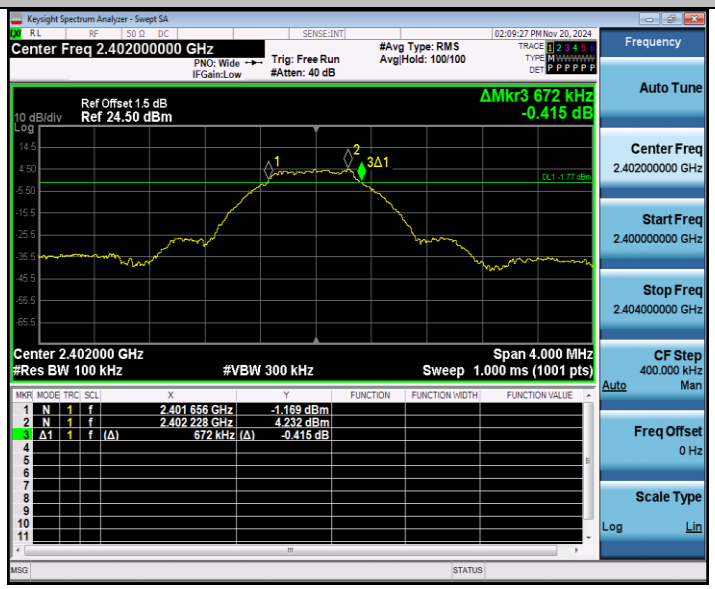
6 TEST RESULT

Appendix A: DTS Bandwidth

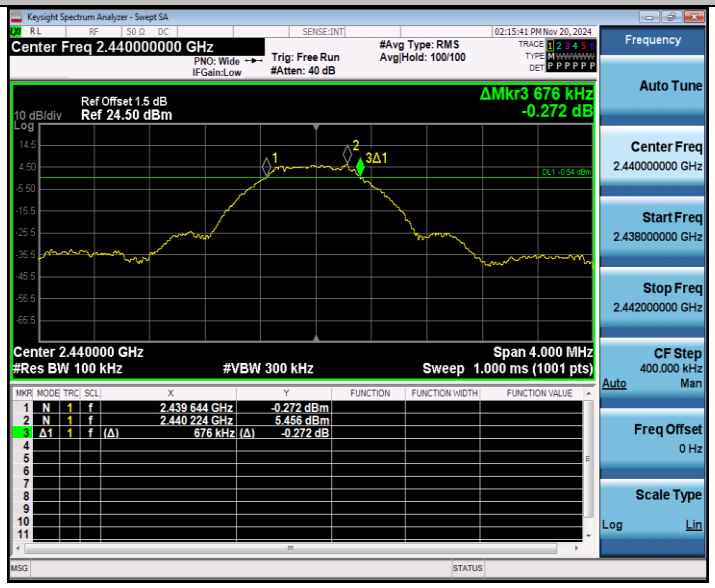
TestMode	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	2402	0.672	2401.656	2402.328	0.5	PASS
	2440	0.676	2439.644	2440.320	0.5	PASS
	2480	0.668	2479.660	2480.328	0.5	PASS

Test Graphs

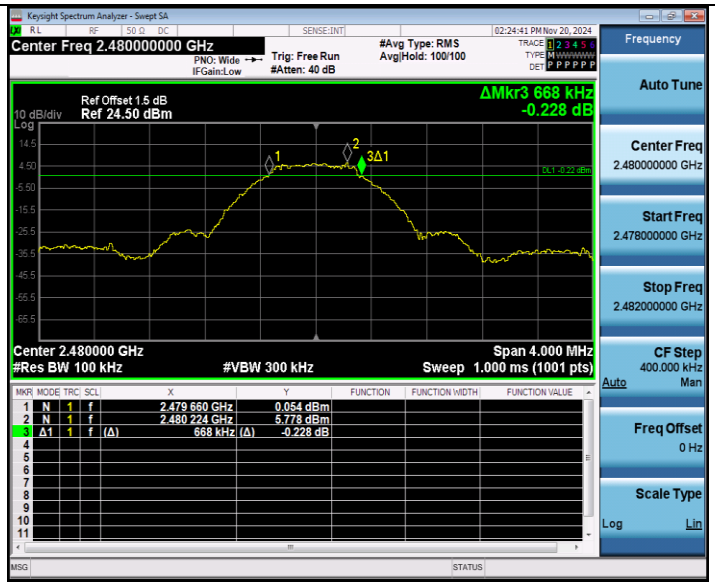
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 100/100
02:24:41 PM Nov 20, 2024
Ref Offset 1.5 dB
10 dB/div
Ref 24.50 dBm
ΔMkr3 668 kHz
-0.228 dB
Center 2.480000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 4.000 MHz
Sweep 1.000 ms (1001 pts)
1 N 1 f 2.479 660 GHz 0.054 dBm
2 N 1 f 2.480 224 GHz 5.778 dBm
3 Δ1 1 f (Δ) 668 kHz (Δ) -0.228 dB
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.478000000 GHz
Stop Freq
2.482000000 GHz
CF Step
400.000 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

Appendix B: Maximum conducted output power

Test Mode	Frequency [MHz]	Conducted Power[dBm]	Conducted Limit[dBm]	EIRP [dBm]	EIRP Limit[dBm]	Verdict
BLE_1M	2402	5.45	≤30	8.43	≤36	PASS
	2440	6.59	≤30	9.57	≤36	PASS
	2480	6.53	≤30	9.51	≤36	PASS

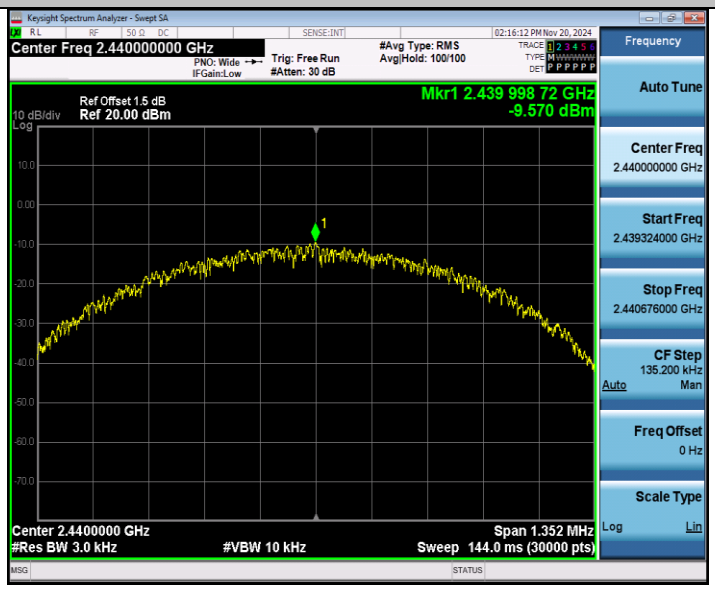
Appendix C: Maximum power spectral density

TestMode	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	2402	-10.66	≤8.00	PASS
	2440	-9.57	≤8.00	PASS
	2480	-9.12	≤8.00	PASS

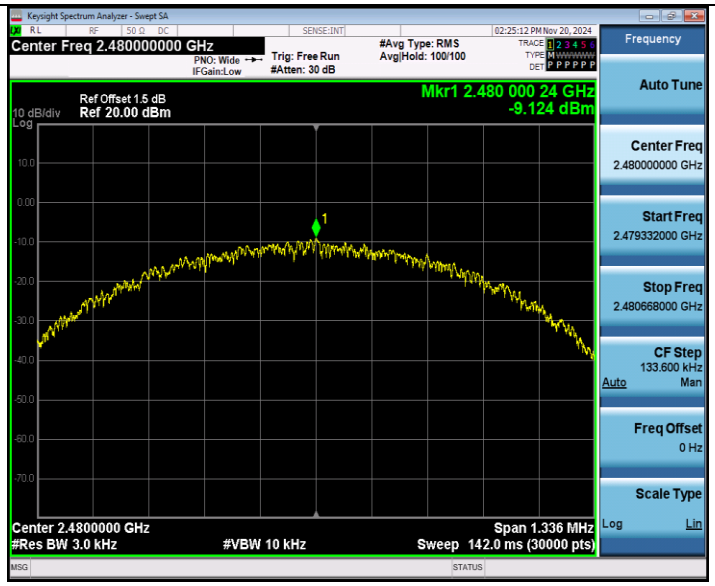
Test Graphs

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

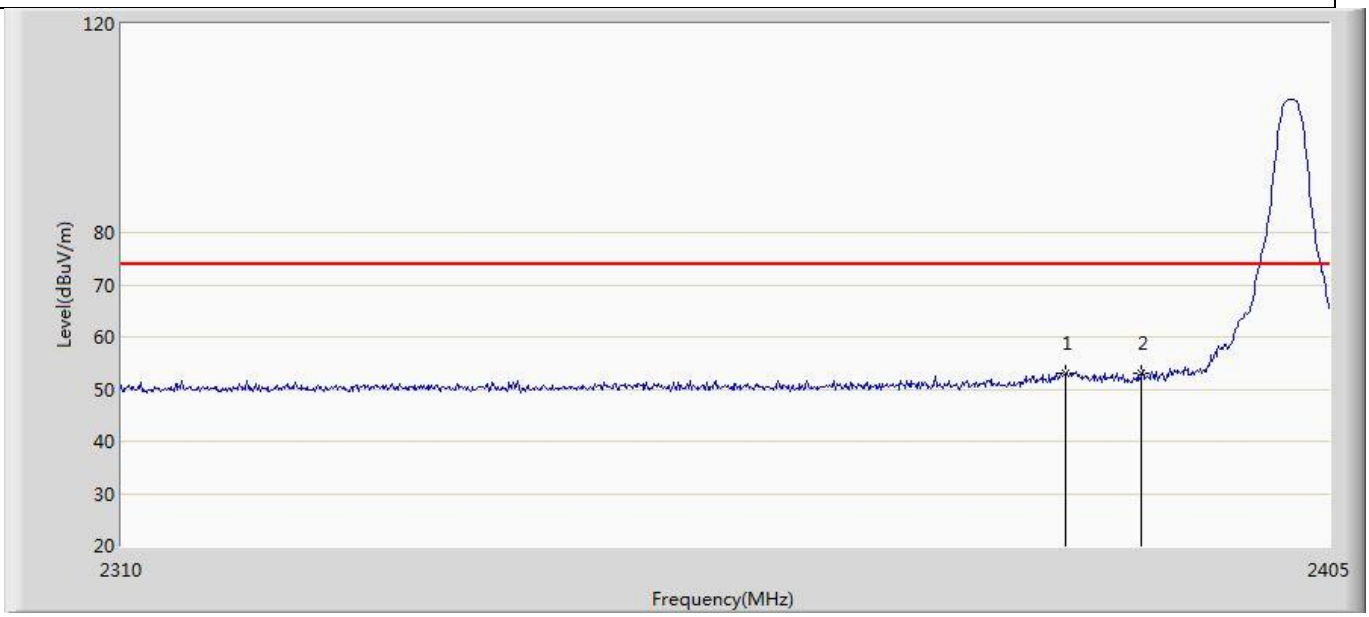


BLE_1M_Ant1_2480


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 100/100
02:25:12 PM Nov 20, 2024
Ref Offset 1.5 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.480 000 24 GHz
-9.124 dBm
Center 2.4800000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 1.336 MHz
Sweep 142.0 ms (30000 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.479332000 GHz
Stop Freq
2.480668000 GHz
CF Step
133.600 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

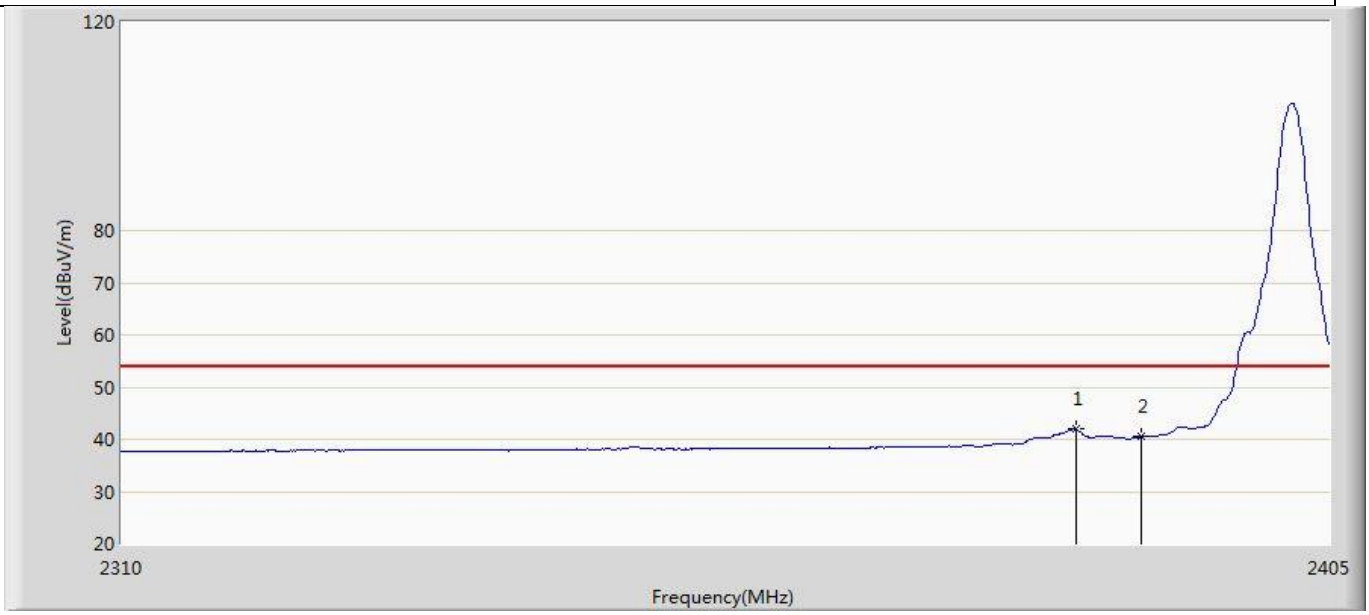
Appendix D: Band edge measurements

Profile: 24B0486R	Page No.: 1
Engineer: Yuliu	
Site: AC5	Time: 2024/11/26 - 23:58
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Horizontal
EUT: Wi-Fi and Bluetooth Module	Power: 3.3 Vdc
Note: Mode 1：Transmit at 2402MHz by LE_1Mbps	



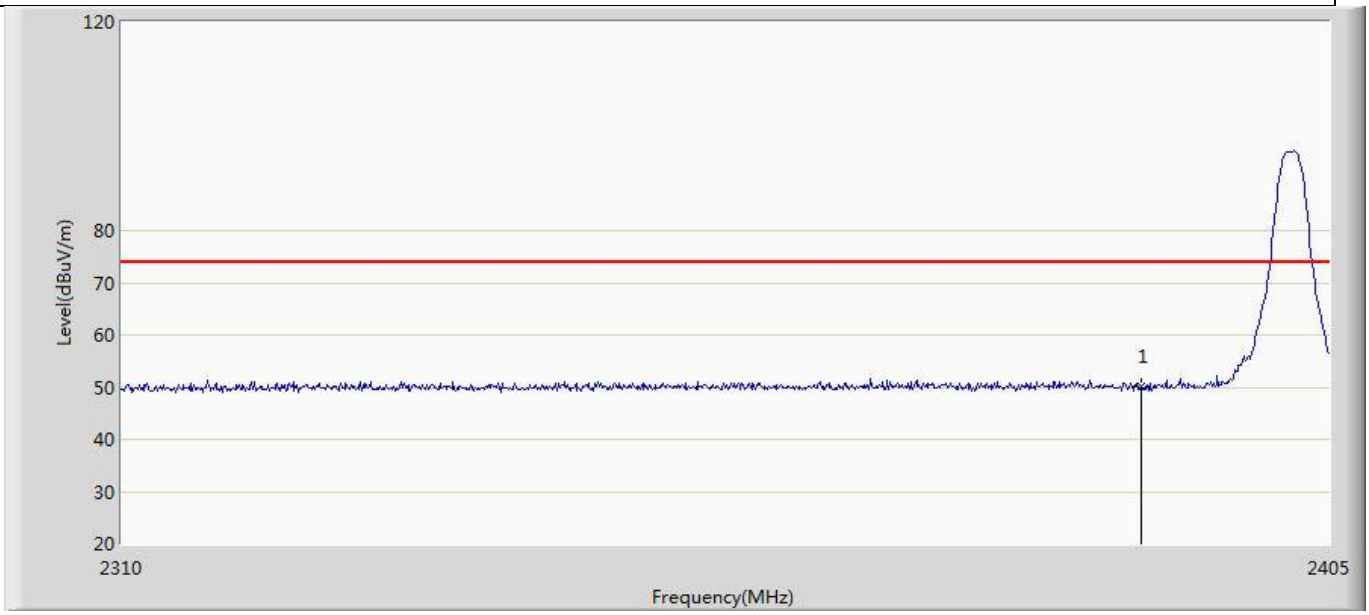
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2384.005	53.076	18.983	-20.924	74.000	34.093	PK
2		2390.000	52.916	18.815	-21.084	74.000	34.102	PK

Profile: 24B0486R	Page No.: 2
Engineer: Yuliu	
Site: AC5	Time: 2024/11/26 - 23:59
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Horizontal
EUT: Wi-Fi and Bluetooth Module	Power: 3.3 Vdc
Note: Mode 1：Transmit at 2402MHz by LE_1Mbps	



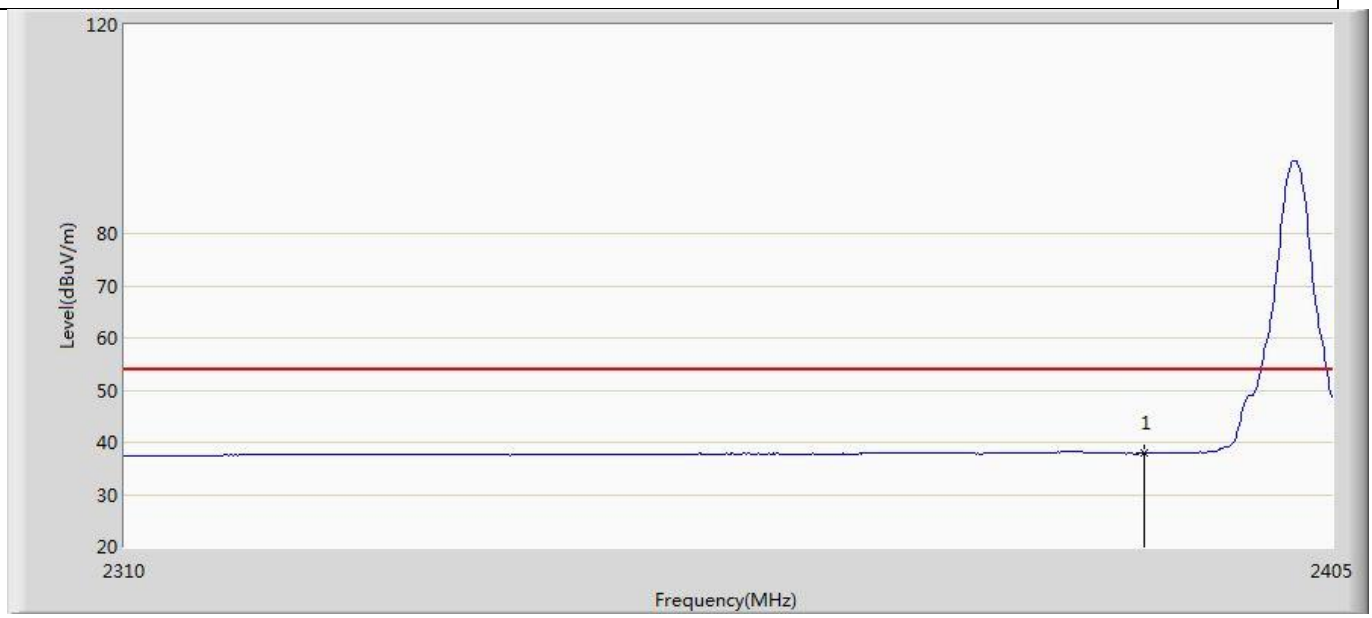
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2384.765	41.960	7.866	-12.040	54.000	34.094	AV
2		2390.000	40.616	6.515	-13.384	54.000	34.102	AV

Profile: 24B0486R	Page No.: 3
Engineer: Yuliu	
Site: AC5	Time: 2024/11/27 - 00:01
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Vertical
EUT: Wi-Fi and Bluetooth Module	Power: 3.3 Vdc
Note: Mode 1：Transmit at 2402MHz by LE_1Mbps	



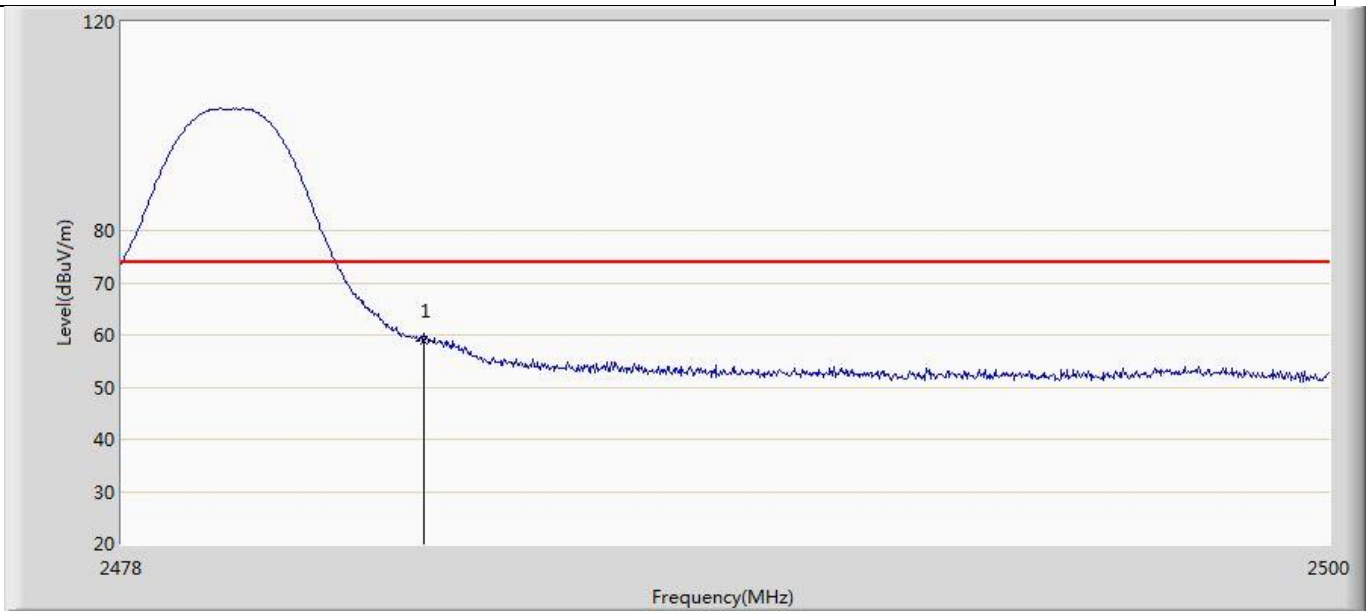
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	50.165	16.064	-23.835	74.000	34.102	PK

Profile: 24B0486R	Page No.: 4
Engineer: Yuliu	
Site: AC5	Time: 2024/11/27 - 00:03
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Vertical
EUT: Wi-Fi and Bluetooth Module	Power: 3.3 Vdc
Note: Mode 1：Transmit at 2402MHz by LE_1Mbps	



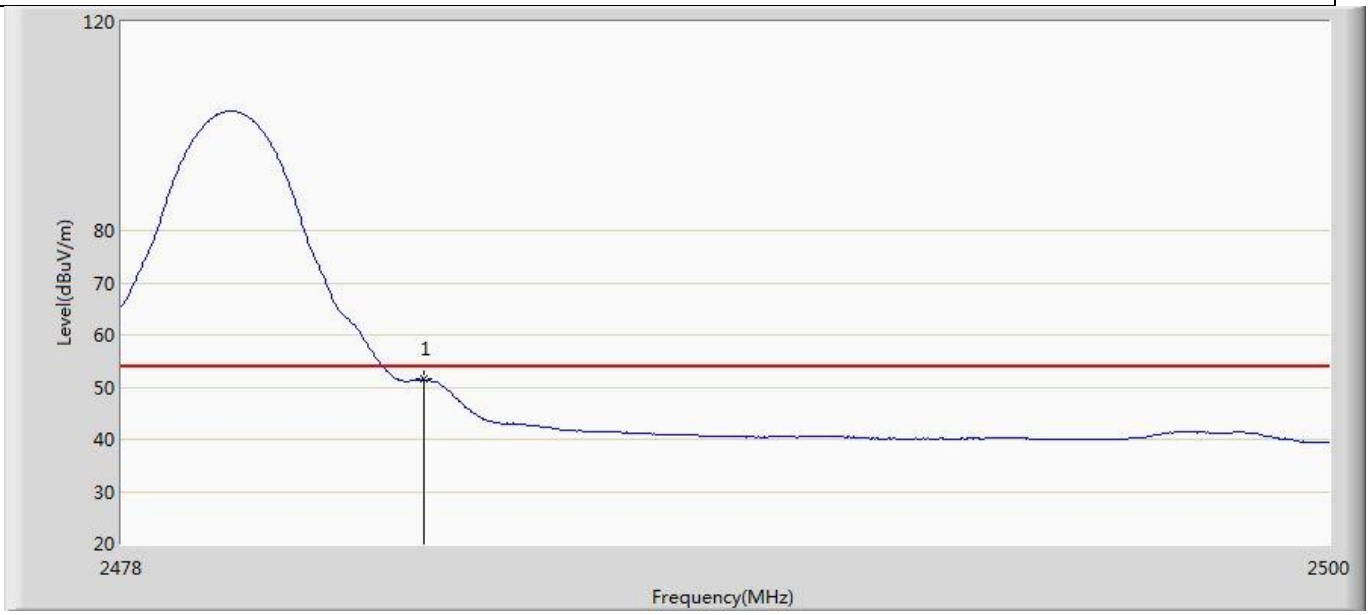
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	37.879	3.778	-16.121	54.000	34.102	AV

Profile: 24B0486R	Page No.: 5
Engineer: Yuliu	
Site: AC5	Time: 2024/11/27 - 00:04
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Horizontal
EUT: Wi-Fi and Bluetooth Module	Power: 3.3 Vdc
Note: Mode 1：Transmit at 2480MHz by LE_1Mbps	



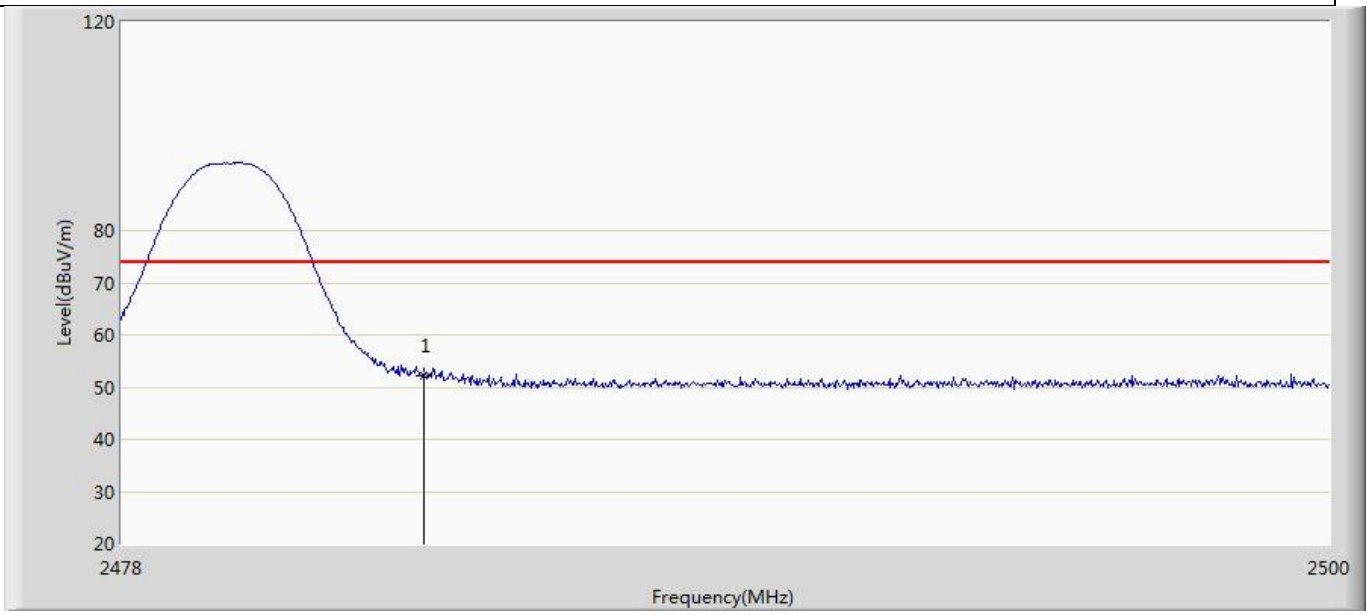
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	58.840	24.727	-15.160	74.000	34.114	PK

Profile: 24B0486R	Page No.: 6
Engineer: Yuliu	
Site: AC5	Time: 2024/11/27 - 00:06
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Horizontal
EUT: Wi-Fi and Bluetooth Module	Power: 3.3 Vdc
Note: Mode 1：Transmit at 2480MHz by LE_1Mbps	



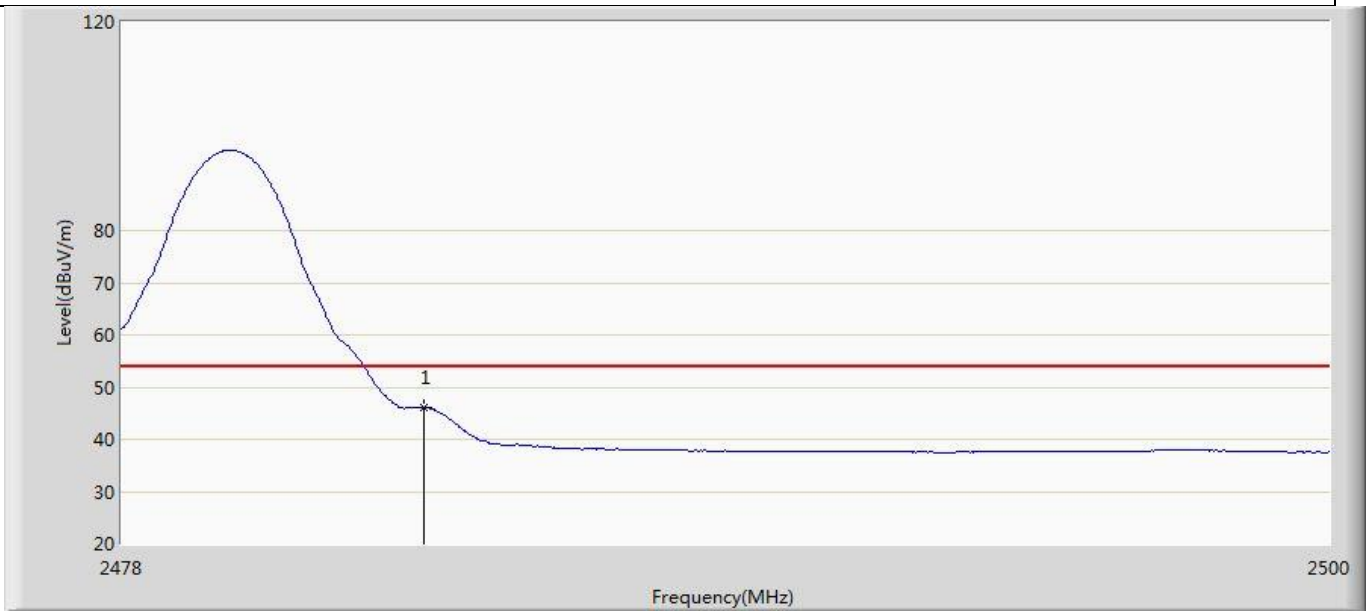
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	51.467	17.354	-2.533	54.000	34.114	AV

Profile: 24B0486R	Page No.: 7
Engineer: Yuliu	
Site: AC5	Time: 2024/11/27 - 00:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Vertical
EUT: Wi-Fi and Bluetooth Module	Power: 3.3 Vdc
Note: Mode 1：Transmit at 2480MHz by LE_1Mbps	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	52.032	17.919	-21.968	74.000	34.114	PK

Profile: 24B0486R	Page No.: 8
Engineer: Yuliu	
Site: AC5	Time: 2024/11/27 - 00:10
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055_(1-18GHz)	Polarity: Vertical
EUT: Wi-Fi and Bluetooth Module	Power: 3.3 Vdc
Note: Mode 1：Transmit at 2480MHz by LE_1Mbps	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	46.144	12.031	-7.856	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 E: Conducted Spurious Emission

Test Result for Reference level

TestMode	Freq(MHz)	Max.Point[MHz]	Result[dBm]
BLE_1M	2402	2402.22	4.15
	2440	2440.23	5.32
	2480	2480.23	5.66

Test Result for Band edge

TestMode	ChName	Frequency [MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Low	2402	4.15	-36.63	≤-15.85	PASS
	High	2480	5.66	-42.84	≤-14.34	PASS

Test Result for Spurious Emission

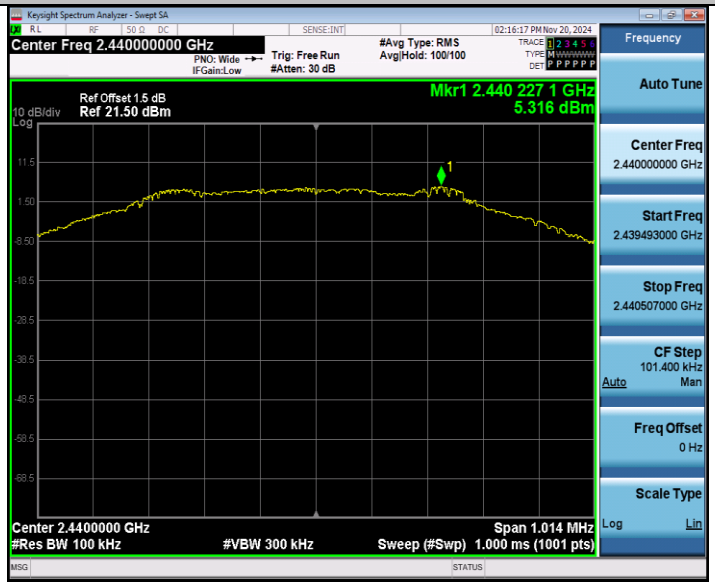
TestMode	Frequency [MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	2402	30~1000	4.15	-65.19	≤-15.85	PASS
		1000~3000	4.15	-52.64	≤-15.85	PASS
		3000~5000	4.15	-57.6	≤-15.85	PASS
		5000~7000	4.15	-65.18	≤-15.85	PASS
		7000~9000	4.15	-64.4	≤-15.85	PASS
		9000~11000	4.15	-65.02	≤-15.85	PASS
		11000~13000	4.15	-64.71	≤-15.85	PASS
		13000~15000	4.15	-64.07	≤-15.85	PASS
		15000~17000	4.15	-64.35	≤-15.85	PASS
		17000~19000	4.15	-63.39	≤-15.85	PASS
		19000~21000	4.15	-62.9	≤-15.85	PASS
		21000~23000	4.15	-62.15	≤-15.85	PASS
		23000~25000	4.15	-60.66	≤-15.85	PASS
	2440	30~1000	5.32	-65.63	≤-14.68	PASS
		1000~3000	5.32	-53.01	≤-14.68	PASS
		3000~5000	5.32	-57.87	≤-14.68	PASS
		5000~7000	5.32	-65.06	≤-14.68	PASS
		7000~9000	5.32	-65.38	≤-14.68	PASS
		9000~11000	5.32	-64.72	≤-14.68	PASS
		11000~13000	5.32	-65.35	≤-14.68	PASS
		13000~15000	5.32	-64.08	≤-14.68	PASS
		15000~17000	5.32	-64.43	≤-14.68	PASS
		17000~19000	5.32	-63.06	≤-14.68	PASS
		19000~21000	5.32	-63.42	≤-14.68	PASS
		21000~23000	5.32	-61.98	≤-14.68	PASS
		23000~25000	5.32	-61.22	≤-14.68	PASS
	2480	30~1000	5.66	-65.04	≤-14.34	PASS
		1000~3000	5.66	-53.23	≤-14.34	PASS

		3000~5000	5.66	-58.33	≤-14.34	PASS
		5000~7000	5.66	-64.24	≤-14.34	PASS
		7000~9000	5.66	-65.42	≤-14.34	PASS
		9000~11000	5.66	-65.08	≤-14.34	PASS
		11000~13000	5.66	-65.72	≤-14.34	PASS
		13000~15000	5.66	-65.1	≤-14.34	PASS
		15000~17000	5.66	-64.64	≤-14.34	PASS
		17000~19000	5.66	-63.65	≤-14.34	PASS
		19000~21000	5.66	-62.66	≤-14.34	PASS
		21000~23000	5.66	-62	≤-14.34	PASS
		23000~25000	5.66	-61.43	≤-14.34	PASS

Test Graphs for Reference level

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

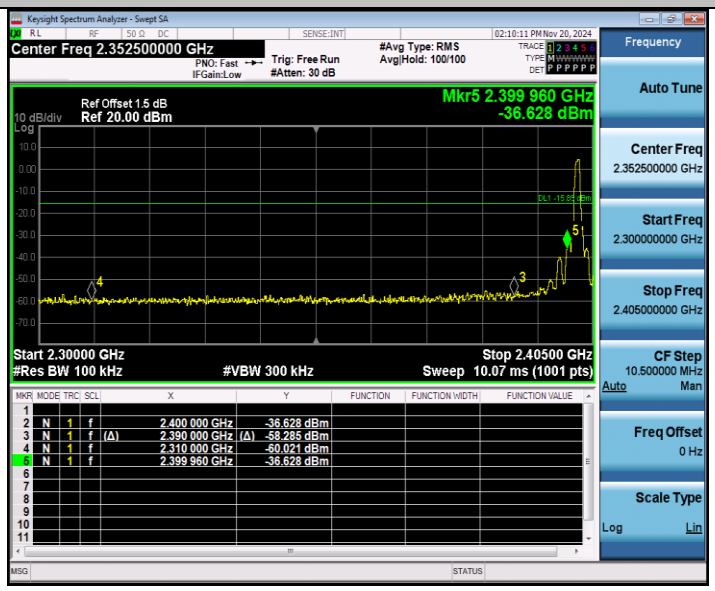


BLE_1M_Ant1_2480

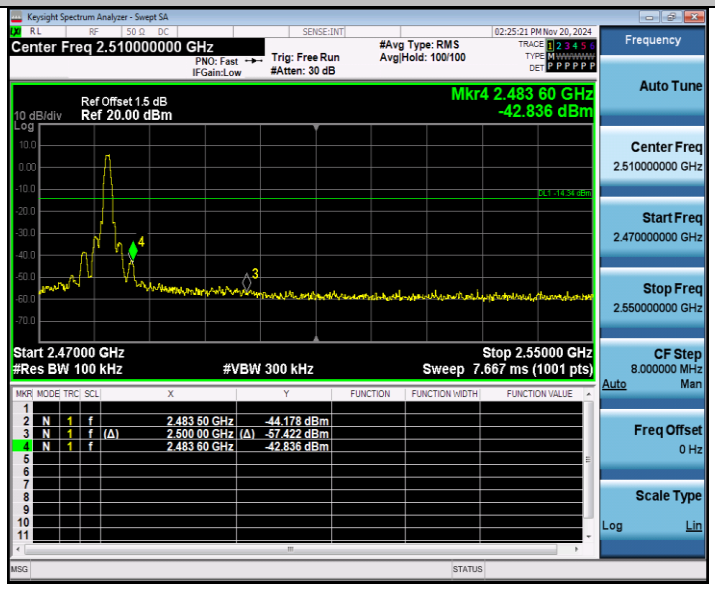

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 100/100
02:25:16 PM Nov 20, 2024
Ref Offset 1.5 dB
10 dB/div
Ref 21.50 dBm
Log
Mkr1 2.480 229 5 GHz
5.660 dBm
Center 2.4800000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.002 MHz
Sweep (#Swp) 1.000 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.479499000 GHz
Stop Freq
2.480501000 GHz
CF Step
100.200 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

Test Graphs for Band edge

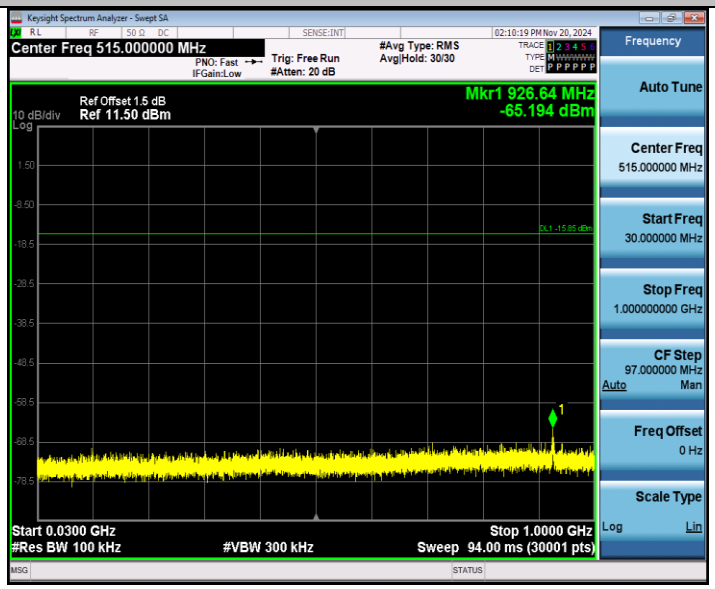
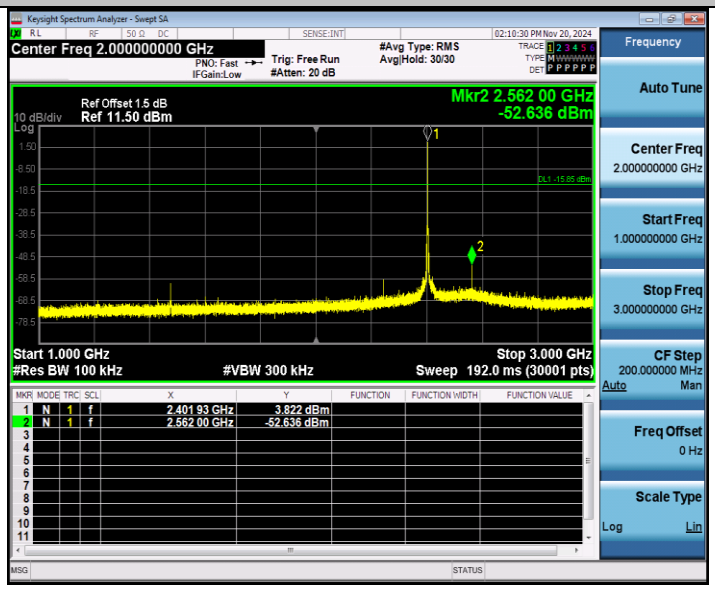
BLE_1M_Ant1_Low_2402

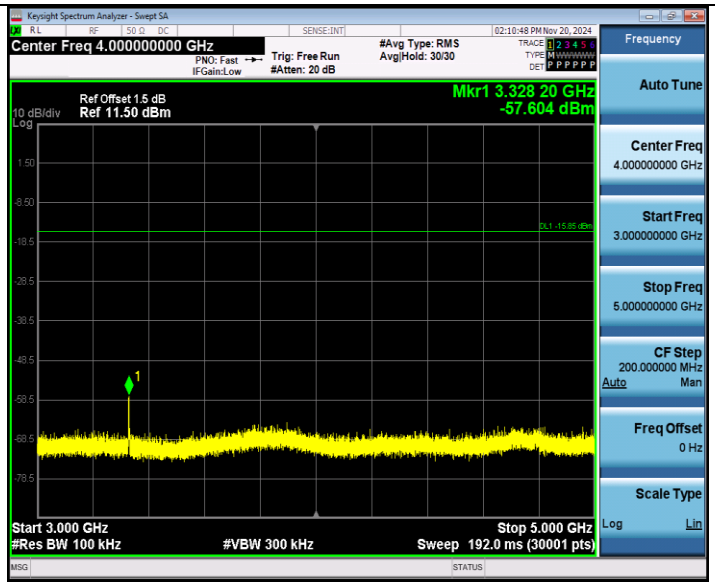


BLE_1M_Ant1_High_2480

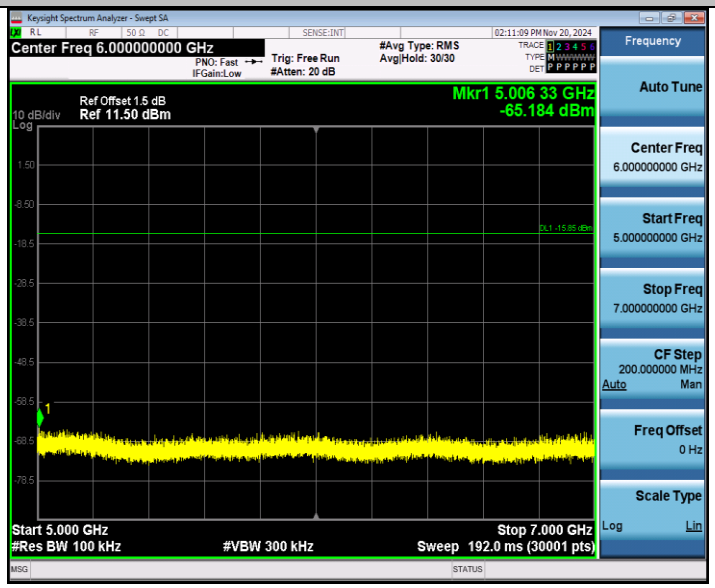


Test Graphs for Spurious Emission

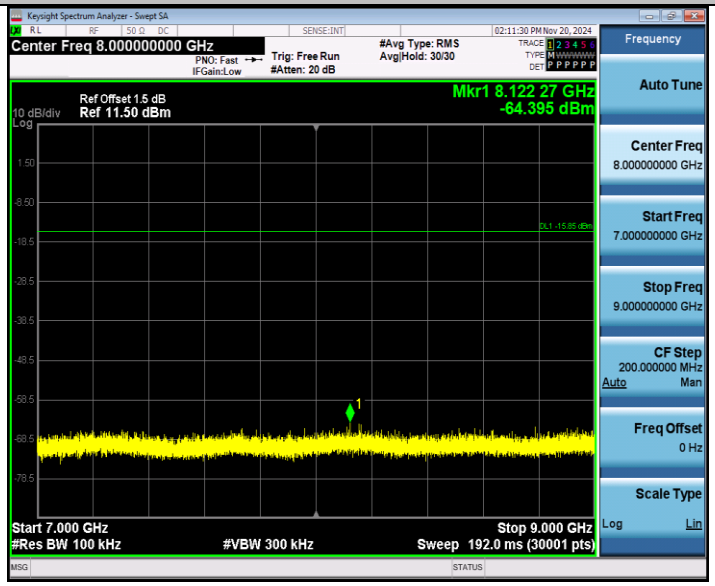
BLE_1M_Ant1_2402_30~1000

BLE_1M_Ant1_2402_1000~3000

BLE_1M_Ant1_2402_3000~5000



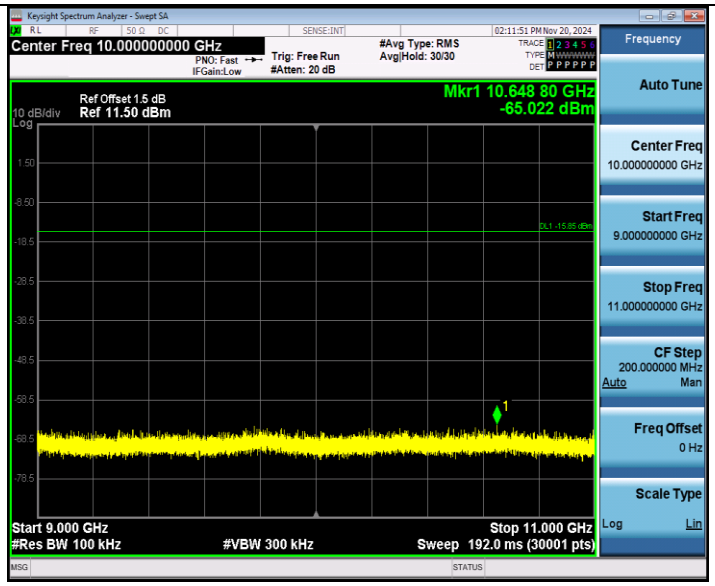
BLE_1M_Ant1_2402_5000~7000



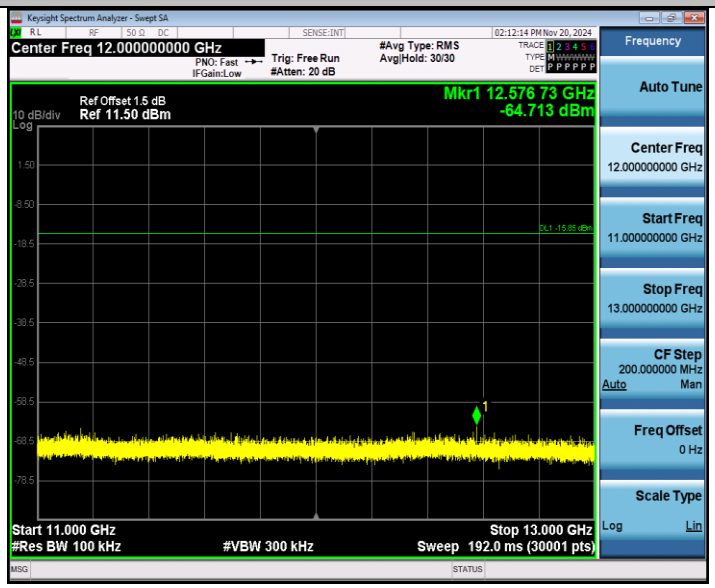
BLE_1M_Ant1_2402_7000~9000



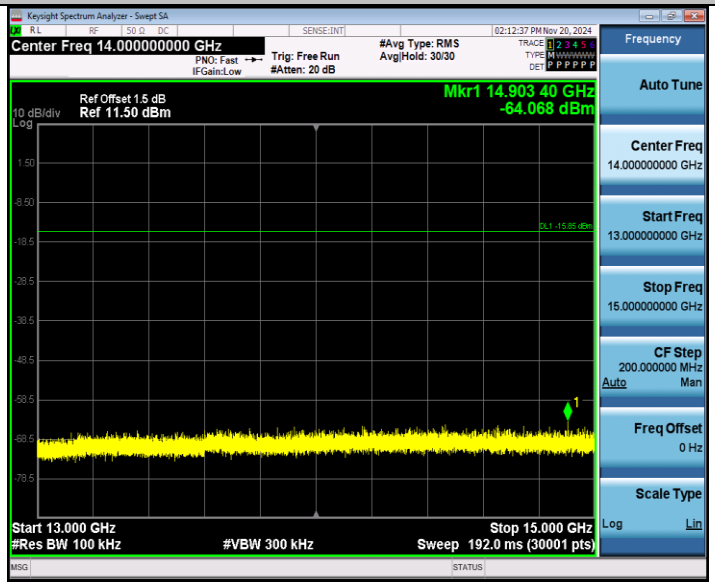
BLE_1M_Ant1_2402_9000~11000



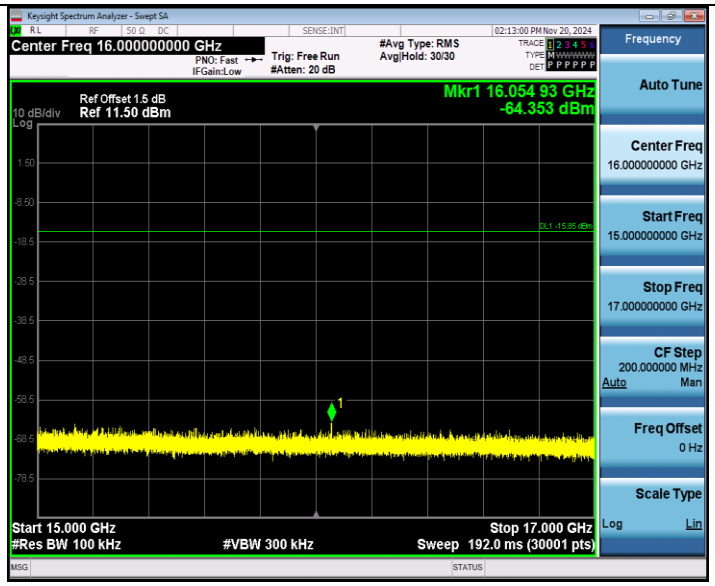
BLE_1M_Ant1_2402_11000~13000



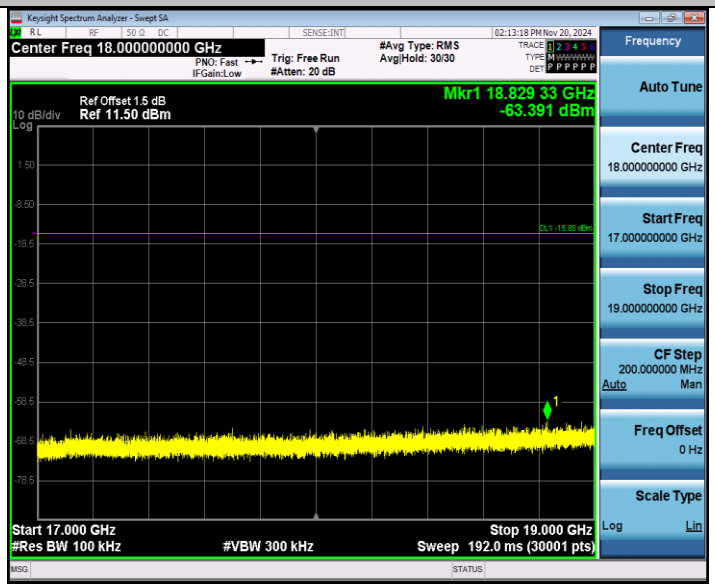
BLE_1M_Ant1_2402_13000~15000



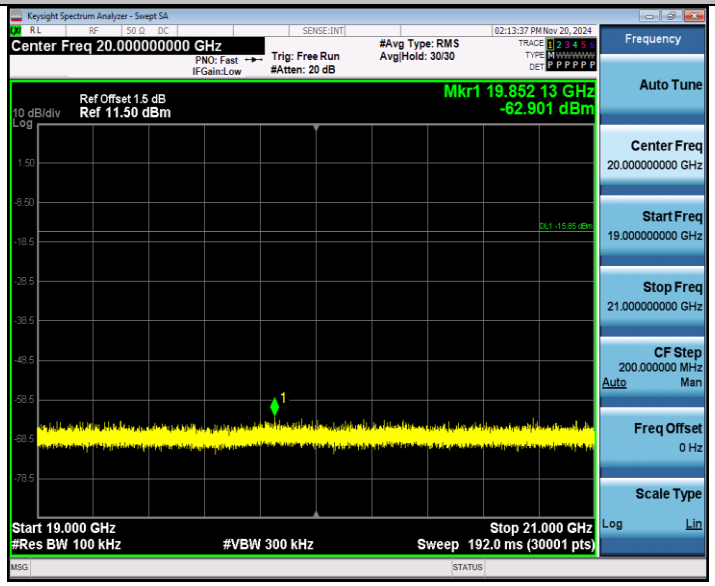
BLE_1M_Ant1_2402_15000~17000



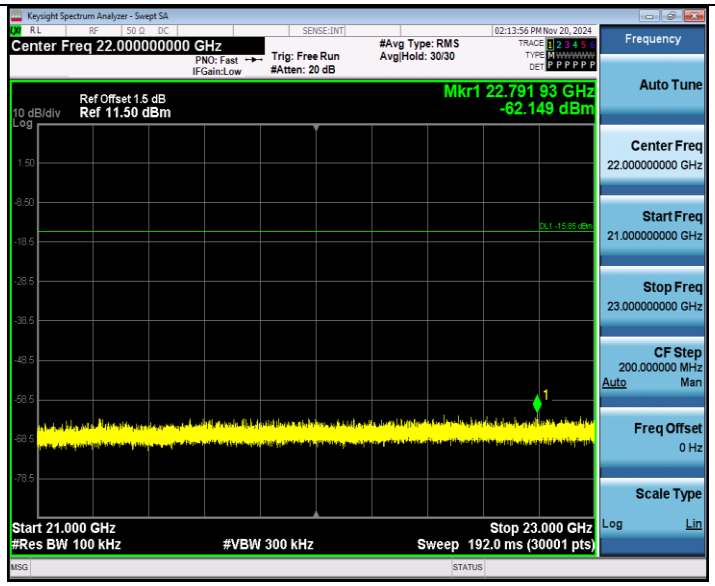
BLE_1M_Ant1_2402_17000~19000



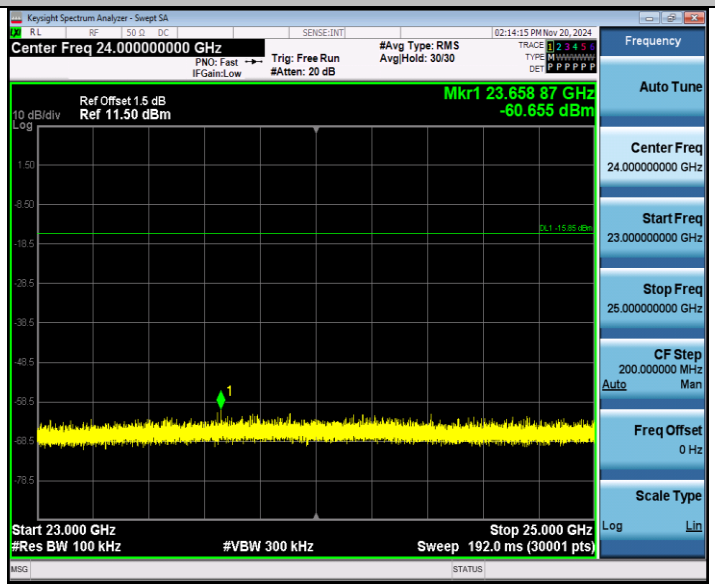
BLE_1M_Ant1_2402_19000~21000



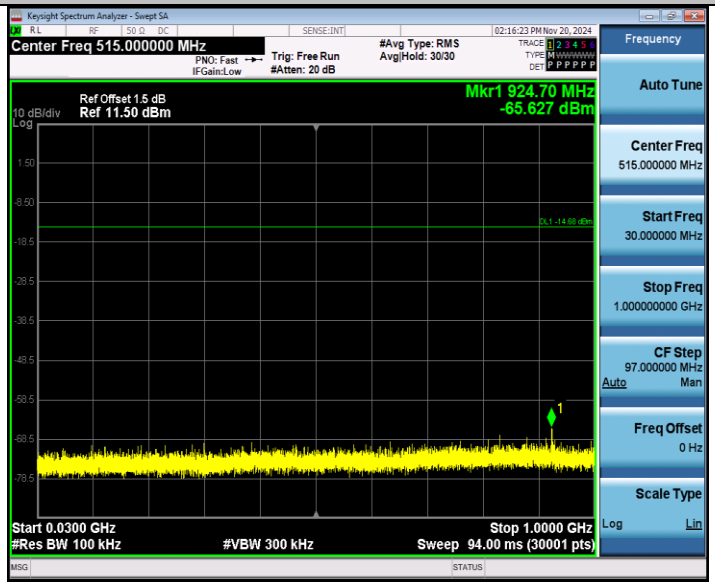
BLE_1M_Ant1_2402_21000~23000



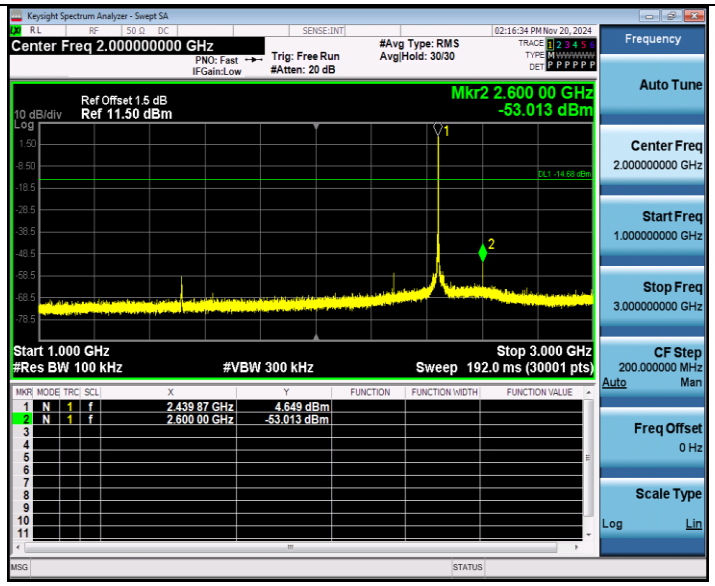
BLE_1M_Ant1_2402_23000~25000



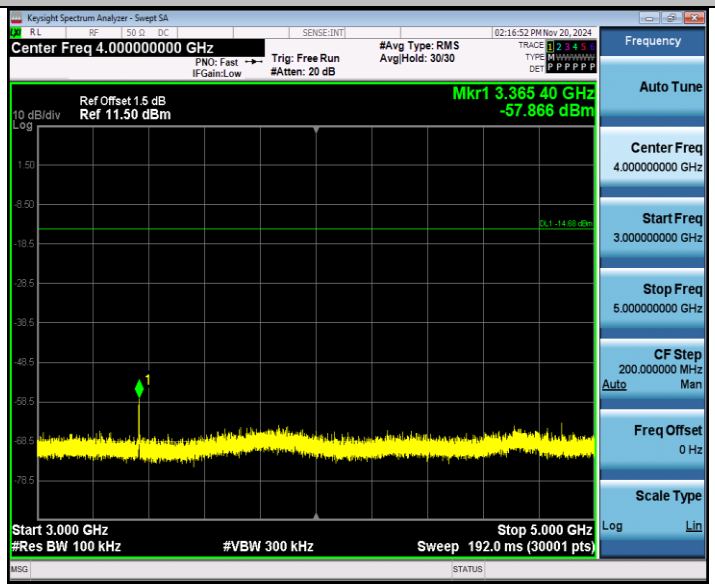
BLE_1M_Ant1_2440_30~1000



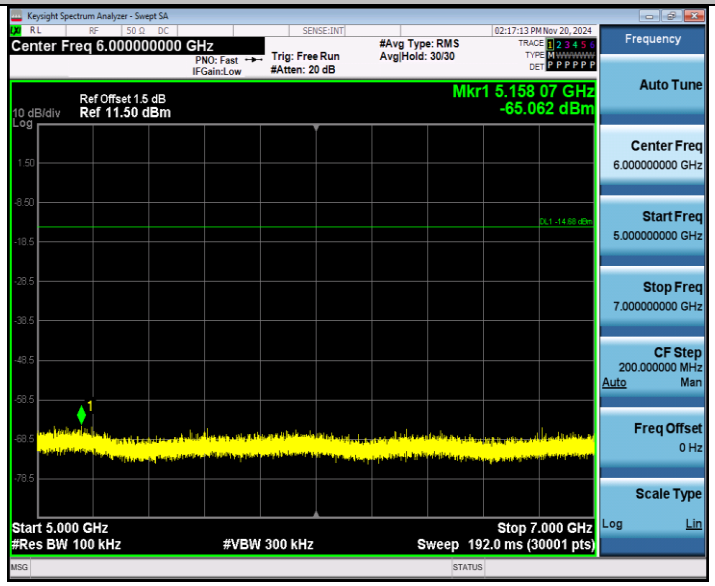
BLE_1M_Ant1_2440_1000~3000



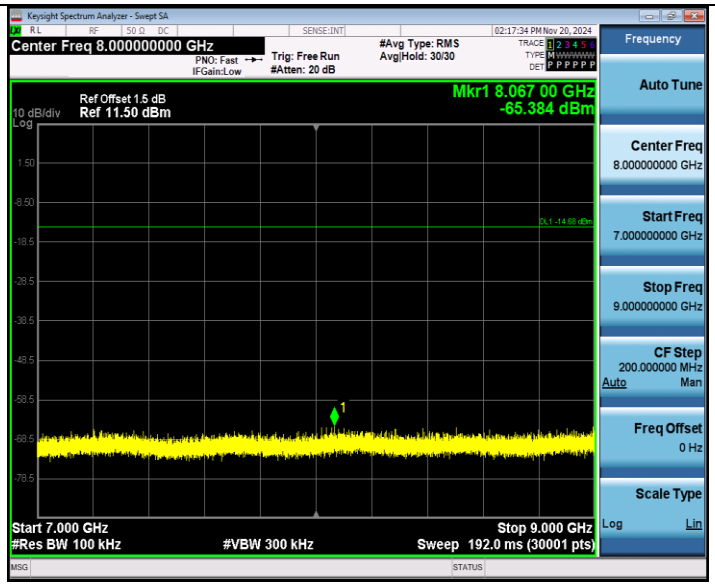
BLE_1M_Ant1_2440_3000~5000



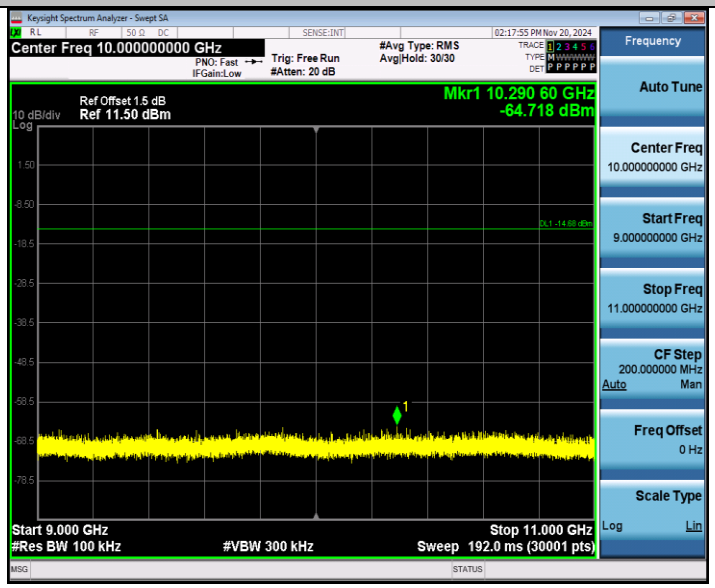
BLE_1M_Ant1_2440_5000~7000



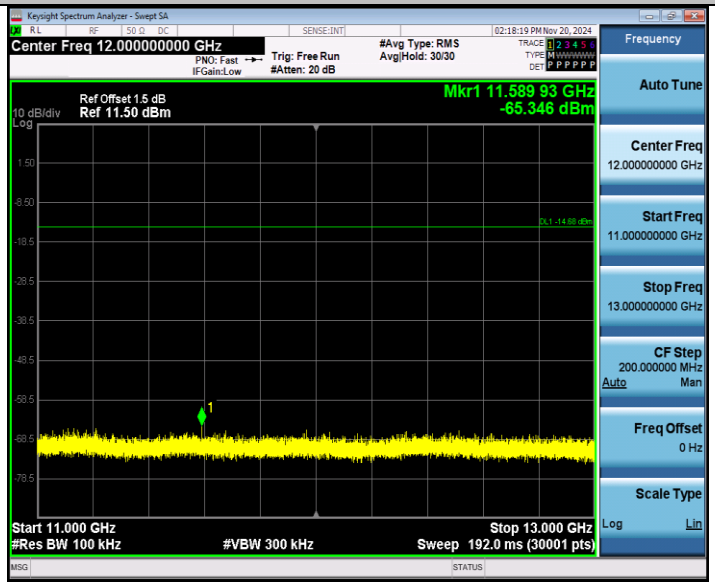
BLE_1M_Ant1_2440_7000~9000



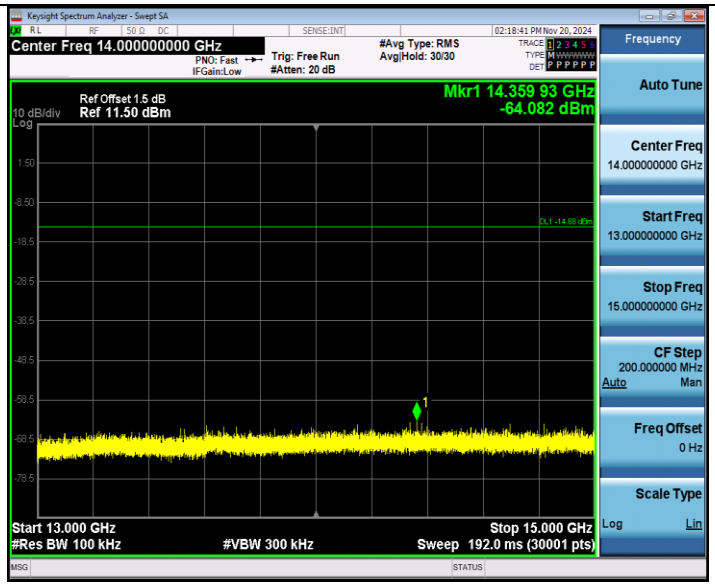
BLE_1M_Ant1_2440_9000~11000



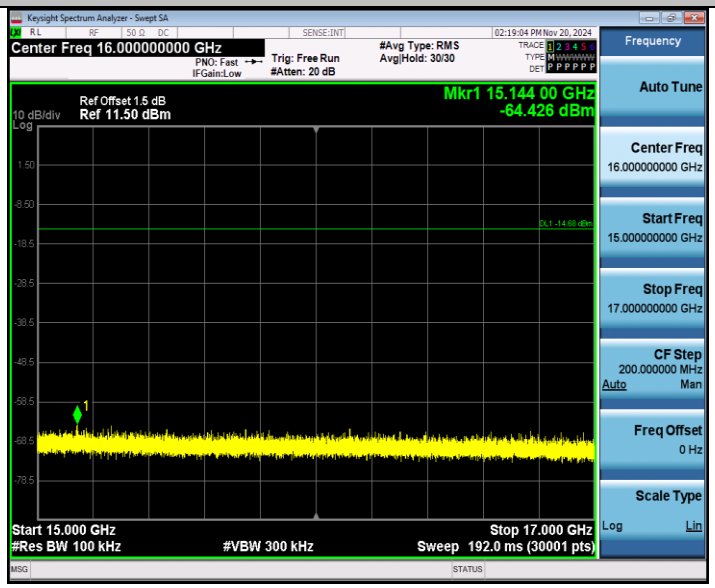
BLE_1M_Ant1_2440_11000~13000



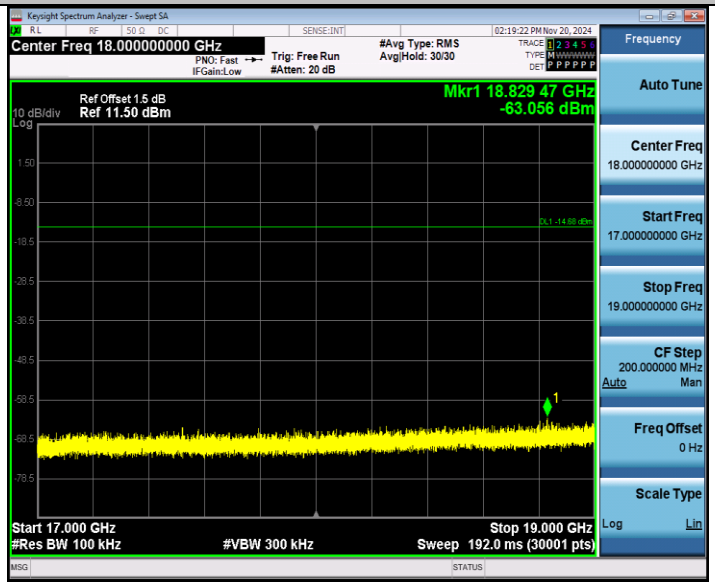
BLE_1M_Ant1_2440_13000~15000



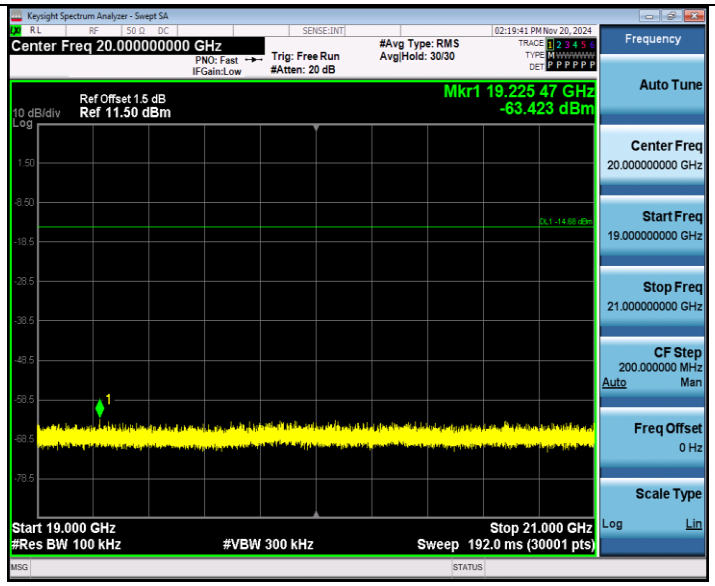
BLE_1M_Ant1_2440_15000~17000



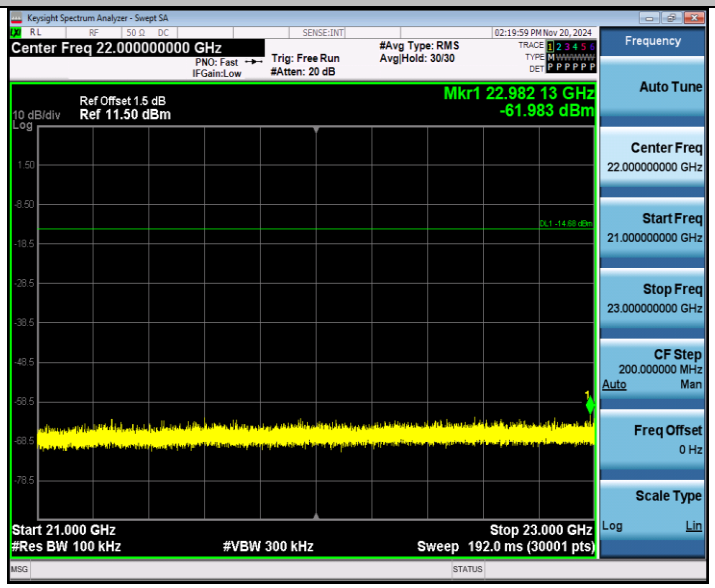
BLE_1M_Ant1_2440_17000~19000



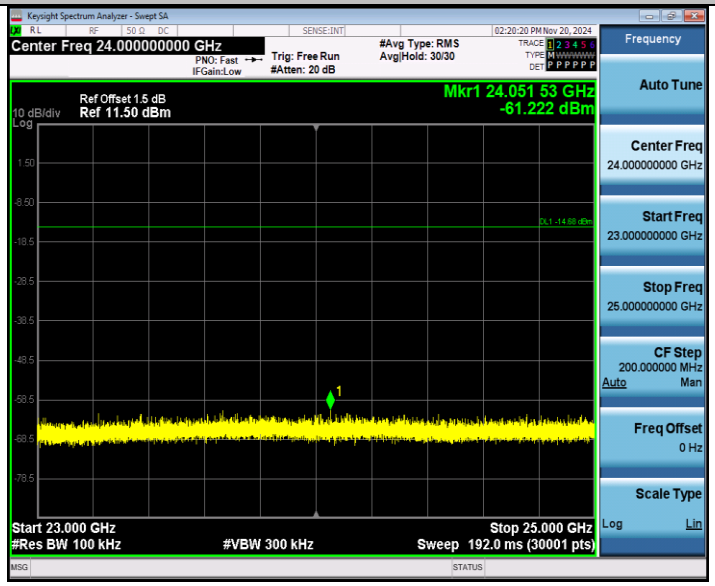
BLE_1M_Ant1_2440_19000~21000



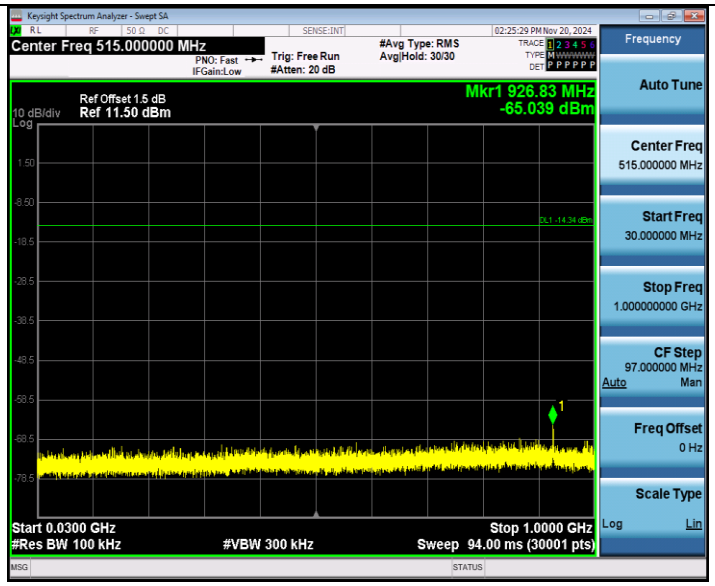
BLE_1M_Ant1_2440_21000~23000



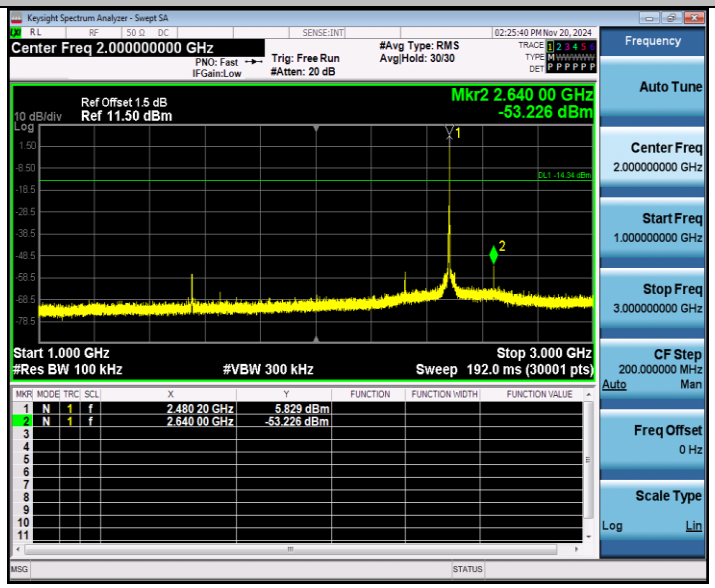
BLE_1M_Ant1_2440_23000~25000



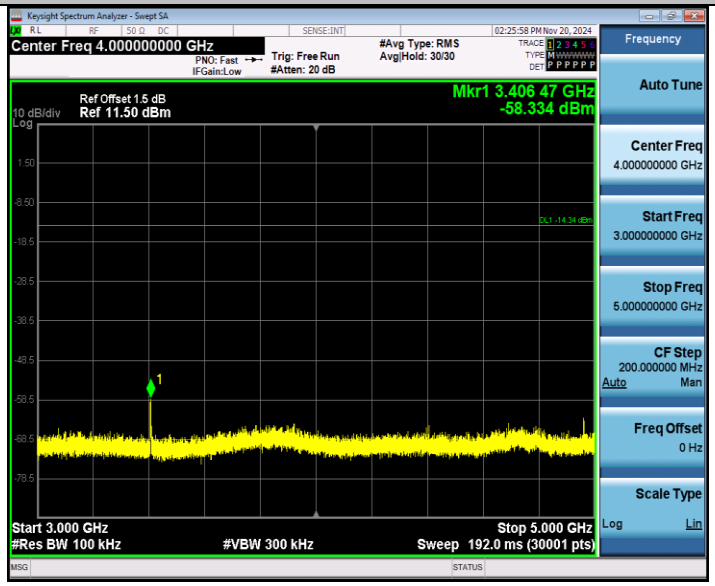
BLE_1M_Ant1_2480_30~1000



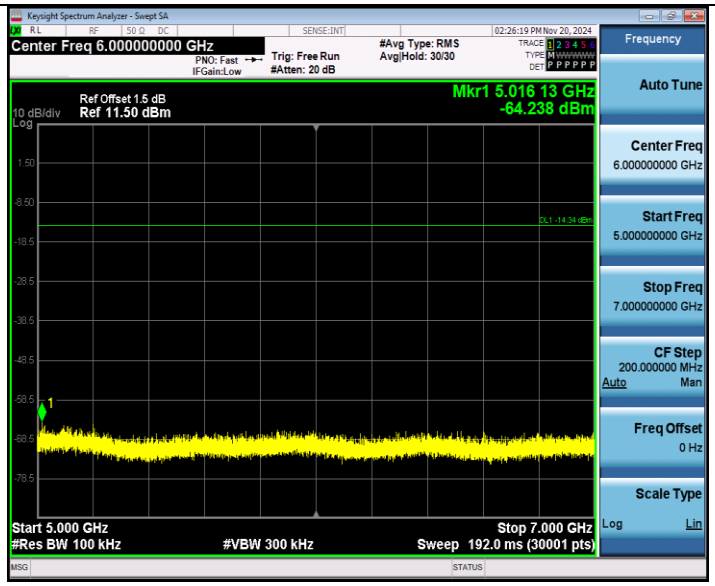
BLE_1M_Ant1_2480_1000~3000



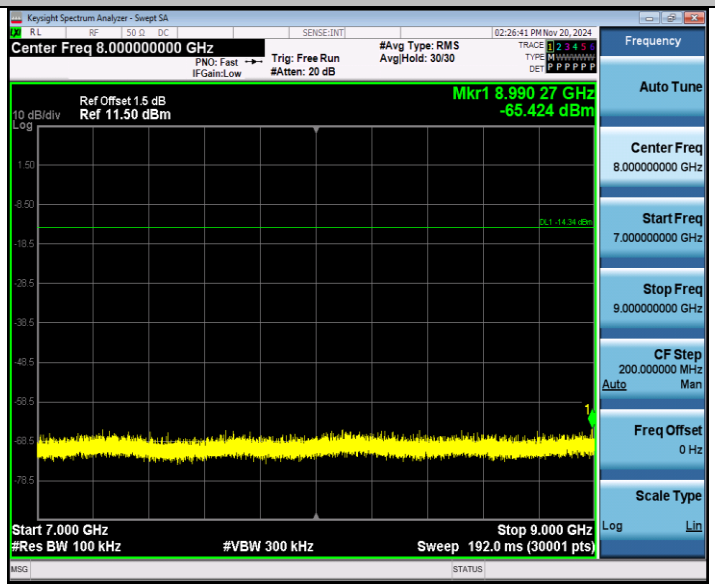
BLE_1M_Ant1_2480_3000~5000



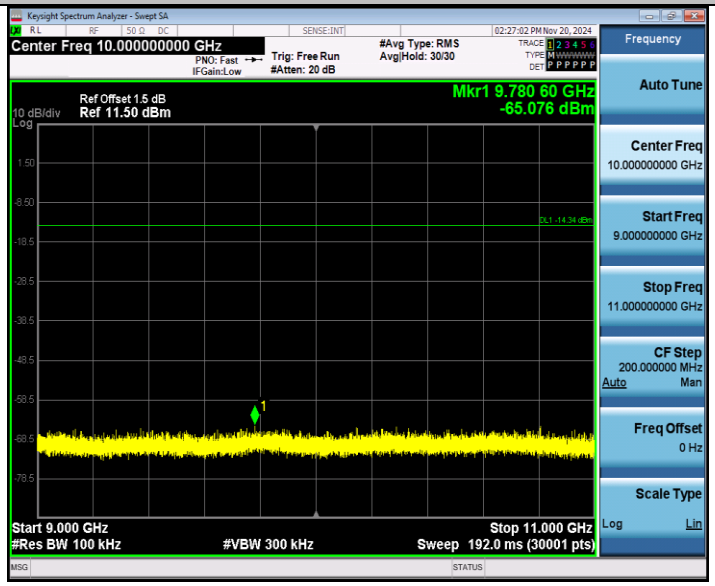
BLE_1M_Ant1_2480_5000~7000



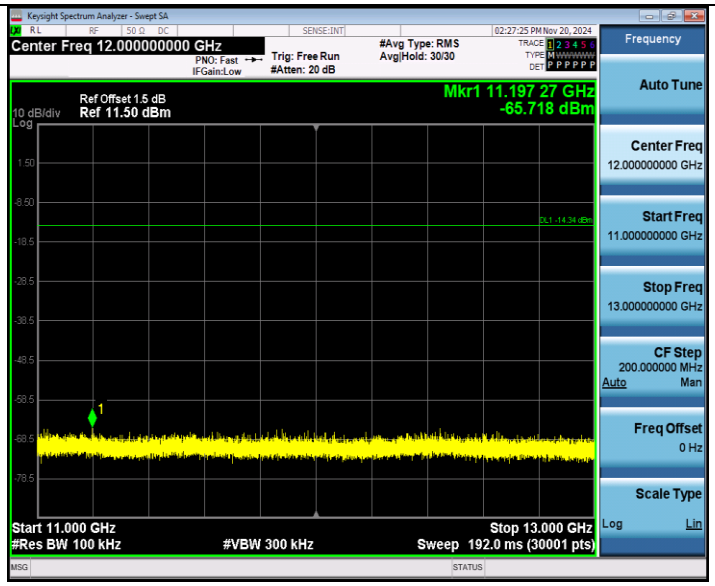
BLE_1M_Ant1_2480_7000~9000



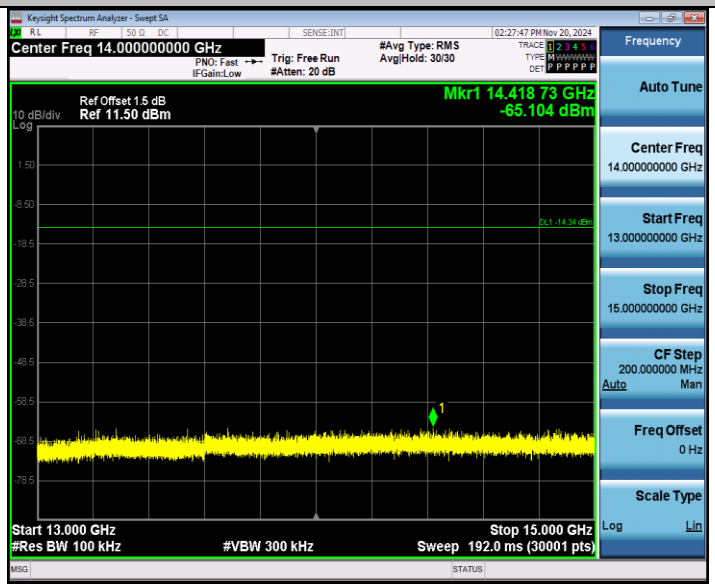
BLE_1M_Ant1_2480_9000~11000



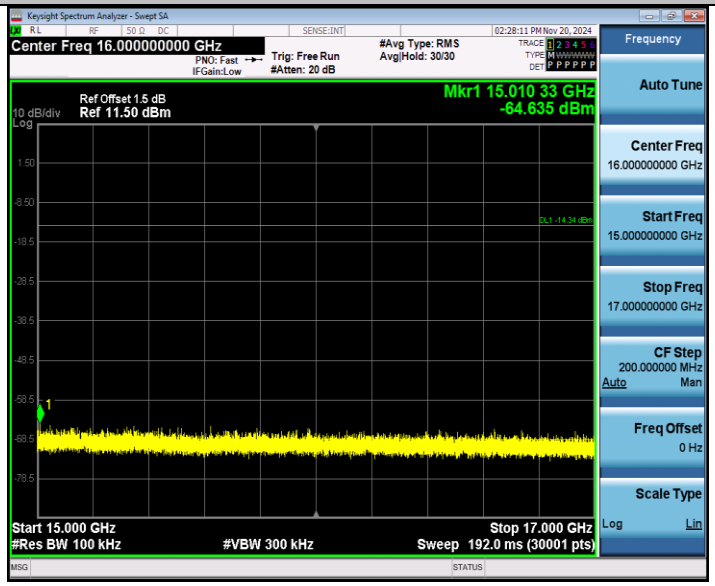
BLE_1M_Ant1_2480_11000~13000



BLE_1M_Ant1_2480_13000~15000



BLE_1M_Ant1_2480_15000~17000



BLE_1M_Ant1_2480_17000~19000