

Radio Test Report

Report No.: CTA231120010W03

Issued for

GODOX PHOTO EQUIPMENT CO.,LTD

1st to 4th Floor, Building 2/1st to 4th Floor, Building
4 ,Yaochuan Industrial Zone, Tangwei Community, Fuhai
Street, Baoan District, Shenzhen, 518103 China

Product Name: TTL Wireless Flash Trigger

Brand Name: 

Model Name: X nano C

Series Model(s): X nano N, X nano S, X nano F, X nano O,
X nano P

FCC ID: 2ABYN106

Test Standards: FCC Part 15.249

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Shenzhen CTA Testing Technology Co., Ltd.

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China


TEST REPORT

Applicant's Name: GODOX PHOTO EQUIPMENT CO.,LTD
 Address.....: 1st to 4th Floor, Building 2/1st to 4th Floor, Building 4 ,Yaochuan Industrial Zone, Tangwei Community, Fuhai Street, Baoan District, Shenzhen, 518103 China

Manufacturer's Name: GODOX Photo Equipment Co.,Ltd.
 Address.....: 4th Floor of Building 1, 1st to 4th Floor of Building 2, 4th Floor of Building 3, 1st to 4th Floor of Building 4, Yaochuan Industrial Zone, Tangwei Community, Fuhai Street, Bao'an District, Shenzhen 518103, China

Product Description

Product Name: TTL Wireless Flash Trigger

Brand Name: 

Model Name.....: X nano C

Series Model(s).....: X nano N, X nano S, X nano F, X nano O, X nano P

Test Standards.....: FCC Part 15.249

Test Procedure.....: ANSI C63.10-2013

This device described above has been tested by CTA, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
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Date of Test.....:

Date of receipt of test item.....: 26 Oct. 2023

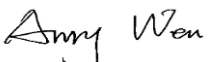
Date of performance of tests ...: 26 Oct. 2023 ~ 16 Nov. 2023

Date of Issue.....: 16 Nov. 2023


Test Result: **Pass**

Testing Engineer : 

 (Zoey Cao)

Technical Manager : 

 (Amy Wen)

Authorized Signatory : 

 (Eric Wang)

Table of Contents

Page

1. SUMMARY OF TEST RESULTS

5

1.1 TEST FACTORY

6

1.2 MEASUREMENT UNCERTAINTY

6

2. GENERAL INFORMATION

7

2.1 GENERAL DESCRIPTION OF THE EUT

7

2.2 DESCRIPTION OF THE TEST MODES

8

2.3 TEST SOFTWARE AND POWER LEVEL

8

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

9

2.5 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

10

2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

11

3. EMC EMISSION TEST

13

3.1 CONDUCTED EMISSION MEASUREMENT

13

3.2 RADIATED EMISSION MEASUREMENT

17

4.1 TEST PROCEDURE

35

4.2 TEST SETUP

35

4.3 EUT OPERATION CONDITIONS

35

4.4 TEST RESULTS

36

5. ANTENNA REQUIREMENT

38

5.1 STANDARD REQUIREMENT

38

5.2 EUT ANTENNA

38

APPENDIX- PHOTOS OF TEST SETUP

39

Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	16 Nov. 2023	CTA231120010W02	ALL	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part 15.249 , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.203	Antenna Requirement	Pass	
15.249	Radiated Spurious Emission	Pass	
15.249	Radiated Band Edge Emission	Pass	
15.249	Field Strength of fundamental	Pass	
15.215(c)	20dB Bandwidth	Pass	

NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report.
- (2) All tests are according to ANSI C63.10-2013.

1.1 TEST FACTORY

Shenzhen CTA Testing Technology Co., Ltd.

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

FCC test Firm Registration Number: 517856

IC test Firm Registration Number: 27890

A2LA Certificate No.: 6534.01

IC CAB ID: CN0127

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95** %.

Test	Range	Measurement Uncertainty
Radiated Emission	30~1000MHz	4.06 dB
Radiated Emission	1~18GHz	5.14 dB
Radiated Emission	18-40GHz	5.38 dB
Conducted Disturbance	0.15~30MHz	2.14 dB
Output Peak power	30MHz~18GHz	0.55 dB
Power spectral density	/	0.57 dB
Spectrum bandwidth	/	1.1%
Radiated spurious emission (30MHz-1GHz)	30~1000MHz	4.10 dB
Radiated spurious emission (1GHz-18GHz)	1~18GHz	4.32 dB
Radiated spurious emission (18GHz-40GHz)	18-40GHz	5.54 dB

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	TTL Wireless Flash Trigger	
Brand Name	Godox	
Model Name	X nano C	
Series Model(s)	X nano N, X nano S, X nano F, X nano O, X nano P	
Model Difference	Only different in model name	
Product Description	The EUT is a TTL Wireless Flash Trigger	
	Operation Frequency:	2.412999634 GHz –2.464499756 GHz
	Modulation Type:	GFSK
	Antenna Designation:	Ceramic
	Antenna Gain(Peak):	5.46dBi
Based on the application, features, or specification exhibited in User Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User Manual.		
Rating	Input: 5V= 2A	
Battery	Rated Voltage: 3.7V Charge Limit Voltage: 4.2V Capacity: 850mAh, 3.145Wh	
Connecting I/O Port(s)	Please refer to the Note 1.	
Hardware version number	20220805L04	
Software version number	V1.0	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.

2.

Channel List					
Channel	Frequency (GHz)	Channel	Frequency (GHz)	Channel	Frequency (GHz)
1	2.412999634	12	2.431000000	23	2.449499847
2	2.414499664	13	2.432999908	24	2.450999878
3	2.415999695	14	2.434499939	25	2.452999786
4	2.418000000	15	2.435999969	26	2.454499817
5	2.419499634	16	2.437999878	27	2.455999847
6	2.420999664	17	2.439499908	28	2.457999756
7	2.422999969	18	2.440999939	29	2.459499786
8	2.424500000	19	2.442999847	30	2.460999817
9	2.425999634	20	2.444499878	31	2.462999725
10	2.427999939	21	2.445999908	32	2.464499756
11	2.429499969	22	2.447999817	--	--

3.

Test channel List		
Test Channel	EUT Channel	Test Frequency (MHz)
lowest	CH01	2.412999634
middle	CH16	2.437999878
highest	CH32	2.464499756

Note: The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report.

2.2 DESCRIPTION OF THE TEST MODES

For conducted test items and radiated spurious emissions

Each of these EUT operation mode(s) or test configuration mode(s) mentioned below was evaluated respectively.

Pretest Mode	Description	Data/Modulation
Mode 1	TX/CH01	MSK
Mode 2	TX/CH16	MSK
Mode 3	TX/CH32	MSK

Note:

(1) All above mode have been measurement, only worst data was reported.

For AC Conducted Emission

Test Case	
AC Conducted Emission	Mode 4 : Keeping TX

2.3 TEST SOFTWARE AND POWER LEVEL

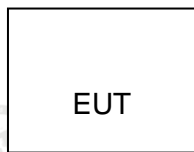
During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

RF Function	Type	Mode Or Modulation type	ANT Gain(dBi)	Power Class	Software For Testing
SRD	2.4G	MSK	5.46	Default	The EUT has signal transmission when it is powered on

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters.

Radiated Spurious Emission Test



Conducted Emission Test



2.5 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
E-1	Adapter	N/A	ICP06C-050-1200B	N/A	N/A
C-1	USB Cable	N/A	N/A	150cm	N/A

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
N/A	N/A	N/A	N/A	N/A	N/A

Note:

- (1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Test Equipment	Manufacturer	Model No.	Equipment No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	CTA-308	2023/08/02	2024/08/01
LISN	R&S	ENV216	CTA-314	2023/08/02	2024/08/01
EMI Test Receiver	R&S	ESPI	CTA-307	2023/08/02	2024/08/01
EMI Test Receiver	R&S	ESCI	CTA-306	2023/08/02	2024/08/01
Spectrum Analyzer	Agilent	N9020A	CTA-301	2023/08/02	2024/08/01
Spectrum Analyzer	R&S	FSP	CTA-337	2023/08/02	2024/08/01
Vector Signal generator	Agilent	N5182A	CTA-305	2023/08/02	2024/08/01
Analog Signal Generator	R&S	SML03	CTA-304	2023/08/02	2024/08/01
WIDEBAND RADIO COMMUNICATION TESTER	CMW500	R&S	CTA-302	2023/08/02	2024/08/01
Temperature and humidity meter	Chigo	ZG-7020	CTA-326	2023/08/02	2024/08/01
Ultra-Broadband Antenna	Schwarzbeck	VULB9163	CTA-310	2023/10/17	2024/10/16
Horn Antenna	Schwarzbeck	BBHA 9120D	CTA-309	2023/10/13	2024/10/12
Loop Antenna	Zhinan	ZN30900C	CTA-311	2023/10/17	2024/10/16
Horn Antenna	Beijing Hangwei Dayang	OBH100400	CTA-336	2021/08/07	2024/08/06
Amplifier	Schwarzbeck	BBV 9745	CTA-312	2023/08/02	2024/08/01
Amplifier	Taiwan chengyi	EMC051845B	CTA-313	2023/08/02	2024/08/01
Directional coupler	NARDA	4226-10	CTA-303	2023/08/02	2024/08/01
High-Pass Filter	XingBo	XBLBQ-GTA18	CTA-402	2023/08/02	2024/08/01
High-Pass Filter	XingBo	XBLBQ-GTA27	CTA-403	2023/08/02	2024/08/01
Automated filter bank	Tonscend	JS0806-F	CTA-404	2023/08/02	2024/08/01
Power Sensor	Agilent	U2021XA	CTA-405	2023/08/02	2024/08/01
Amplifier	Schwarzbeck	BBV9719	CTA-406	2023/08/02	2024/08/01
Test Equipment	Manufacturer	Model No.	Version	Calibration	Calibration

			number	Date	Due Date
EMI Test Software	Tonscend	TS@JS32-RE	5.0.0.2	N/A	N/A
EMI Test Software	Tonscend	TS@JS32-CE	5.0.0.1	N/A	N/A
RF Test Software	Tonscend	TS@JS1120-3	3.1.65	N/A	N/A
RF Test Software	Tonscend	TS@JS1120	3.1.46	N/A	N/A

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table.

FREQUENCY (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

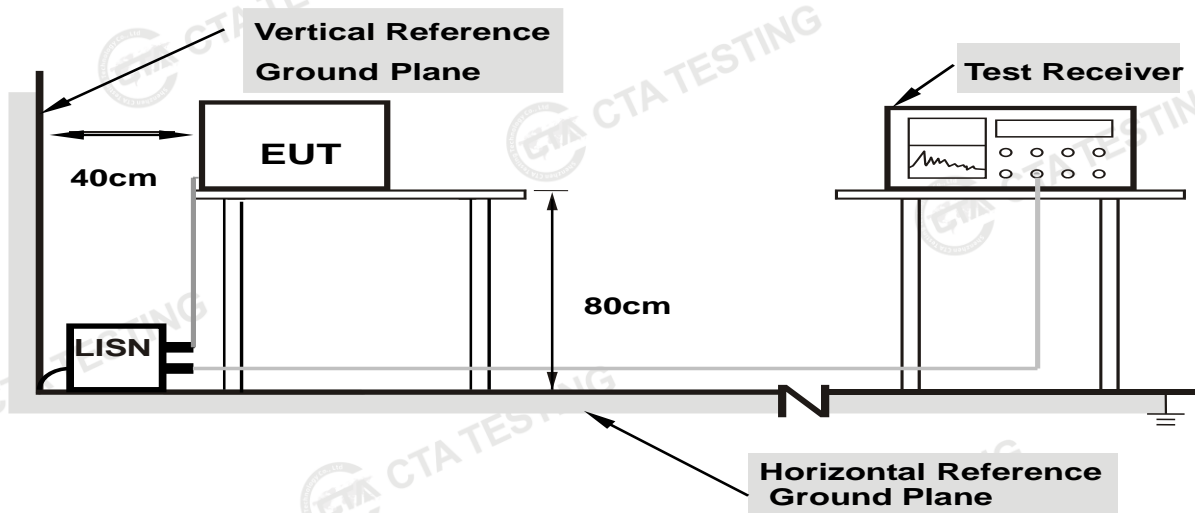
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

- The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN is at least 80 cm from the nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



Note: 1.Support units were connected to second LISN.

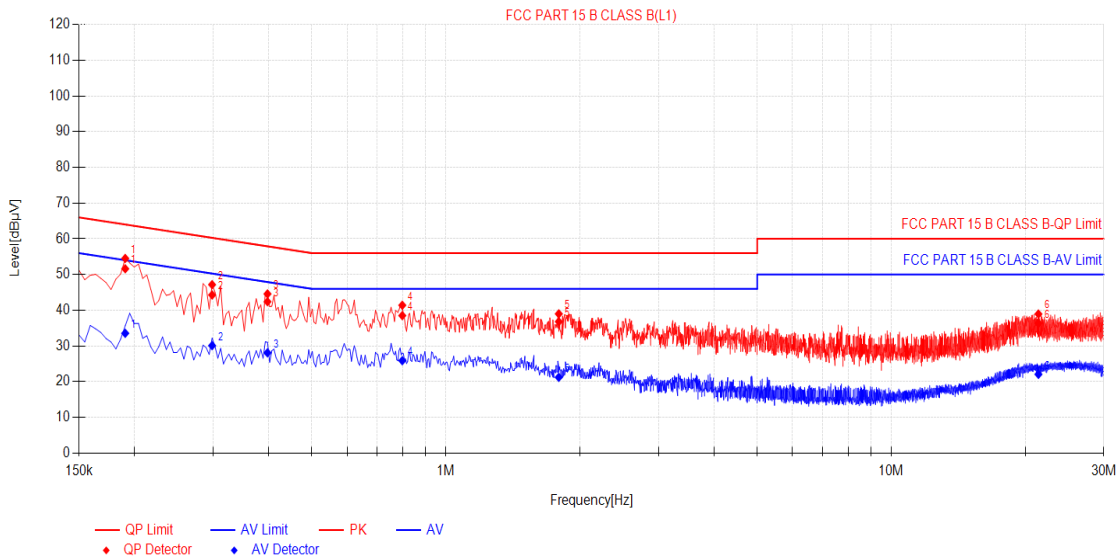
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes support.

3.1.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.5 TEST RESULT

Temperature:	26.2(C)	Relative Humidity:	54%RH
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 4		



Final Data List											
NO.	Freq. [MHz]	Factor [dB]	QP Reading [dBµV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.1905	10.50	41.12	51.62	64.01	12.39	23.05	33.55	54.01	20.46	PASS
2	0.2985	10.50	33.78	44.28	60.28	16.00	19.59	30.09	50.28	20.19	PASS
3	0.3975	10.50	31.89	42.39	57.91	15.52	17.59	28.09	47.91	19.82	PASS
4	0.798	10.50	28.01	38.51	56.00	17.49	15.39	25.89	46.00	20.11	PASS
5	1.7925	10.50	26.31	36.81	56.00	19.19	10.73	21.23	46.00	24.77	PASS
6	21.4035	10.50	28.85	39.35	60.00	23.65	11.55	22.05	50.00	27.95	PASS

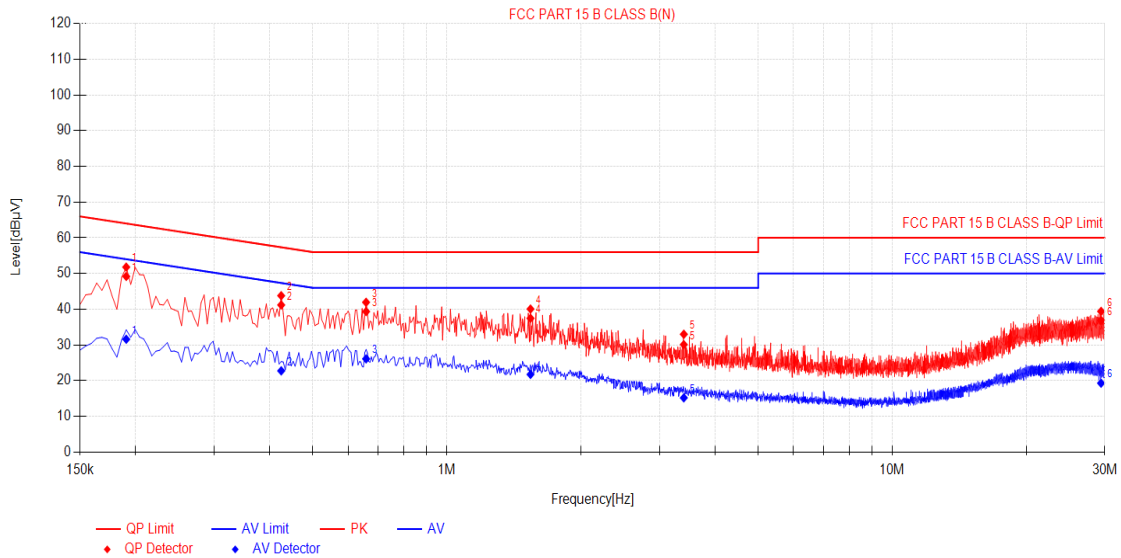
Note:1).QP Value (dBµV)= QP Reading (dBµV)+ Factor (dB)

2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)

3). QPMargin(dB) = QP Limit (dBµV) - QP Value (dBµV)

4). AVMargin(dB) = AV Limit (dBµV) - AV Value (dBµV)

Temperature:	26.2(C)	Relative Humidity:	54%RH
Test Voltage:	AC 120V/60Hz	Phase:	N



Final Data List											
NO.	Freq. [MHz]	Factor [dB]	QP Reading [dBµV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.1905	10.50	38.70	49.20	64.01	14.81	21.11	31.61	54.01	22.40	PASS
2	0.4245	10.50	30.70	41.20	57.36	16.16	12.26	22.76	47.36	24.60	PASS
3	0.6585	10.50	28.85	39.35	56.00	16.65	15.62	26.12	46.00	19.88	PASS
4	1.5405	10.50	26.96	37.46	56.00	18.54	11.25	21.75	46.00	24.25	PASS
5	3.4035	10.50	19.59	30.09	56.00	25.91	4.70	15.20	46.00	30.80	PASS
6	29.4405	10.50	26.37	36.87	60.00	23.13	8.81	19.31	50.00	30.69	PASS

- Note:1). QP Value (dBµV) = QP Reading (dBµV) + Factor (dB)
 2). Factor (dB) = insertion loss of LISN (dB) + Cable loss (dB)
 3). QPMargin (dB) = QP Limit (dBµV) - QP Value (dBµV)
 4). AVMargin (dB) = AV Limit (dBµV) - AV Value (dBµV)

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on Part 15.249 and the Part 15.209(a) limit in the table below has to be followed.

Standard FCC 15.209

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3
Above 1000	Other:74.0 dB(μ V)/m (Peak) 54.0 dB(μ V)/m (Average)	3

Standard FCC 15.249

Frequency of Emission (MHz)	Field Strength of fundamental (millivolts /meter)	Field Strength of Harmonics (microvolts/meter)
900~928	50	500
2400~2483.5	50	500
5725~5875	50	500
24000~242500	250	2500

Notes:

- (1) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.
- (2) Emission level (dBuV/m) =20log Emission level (μ V/m).

LIMITS OF RESTRICTED FREQUENCY BANDS

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
8.41425-8.41475	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	Above 38.6
13.36-13.41			

Spectrum Parameter	Setting
Detector	Peak/AV
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB (emission in restricted band)	>20BW
VB (emission in restricted band)	=3xRB

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
	90kHz~110kHz / RB 200Hz for QP
	110kHz~490kHz / RB 200Hz for PK & AV
	490kHz~30MHz / RB 9kHz for QP
	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

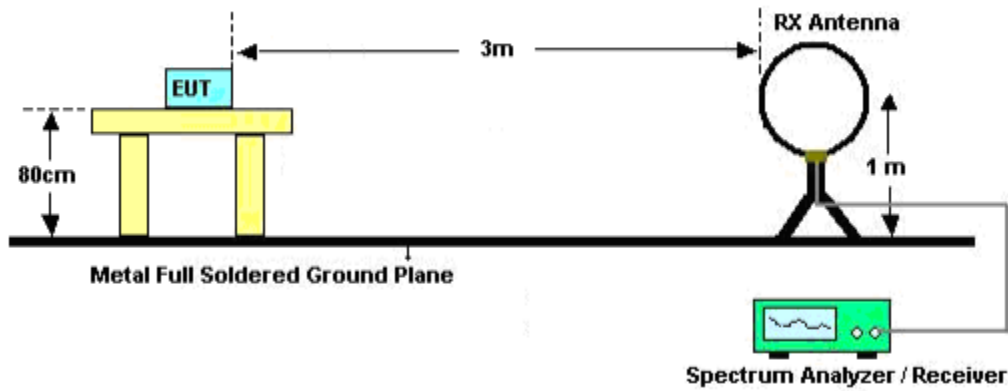
- a. The measuring distance of 3m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation (Below 1GHz)
- b. The measuring distance of 3m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation (Above 1GHz)
- c. The height of the test antenna shall vary between 1m to 4m. Both horizontal and vertical polarization of the antenna are set to make the measurement.
- d. The initial step in collecting radiated emission data is a receive peak detector mode. Pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. All readings are peak unless otherwise stated QP in column of Note. Peak denoted that the Peak reading compliance with the QP limits and then QP Mode measurement didn't perform (Below 1GHz)
- f. All readings are Peak mode value unless otherwise stated AVG in column of Note. If the Peak mode measured value compliance with the Peak limits and lower than AVG Limits, the EUT shall be deemed to meet Peak & AVG limits and then only Peak mode was measured, but AVG mode didn't perform. (Above 1GHz)
- g. For the actual test configuration, please refer to the related Item –EUT Test Photos.
Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

3.2.3 DEVIATION FROM TEST STANDARD

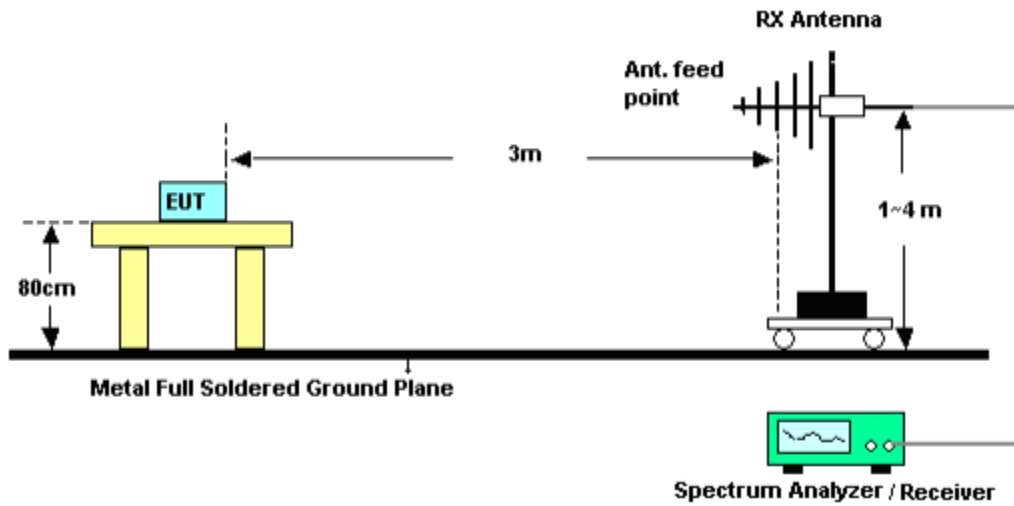
No deviation

3.2.4 TEST SETUP

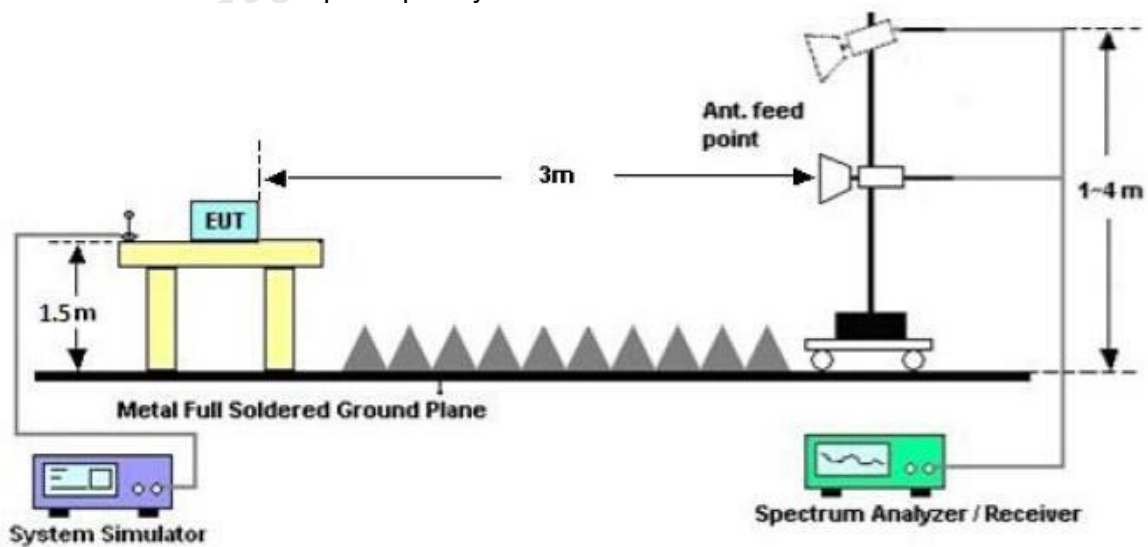
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

Margin=PL-PK L or AL- AV L; Margin only shown the worst case.

Where

PR = Peak Reading

AR = Average Reading

PL = Peak Level

AL = Average Level

AF = Antenna Factor

PK L = Peak Limit

AV L = AV Limit

For example

Frequency	PR	AR	AF	PL	AL	PK L	AV L	Margin
(MHz)	(dB μ V/m)	(dB μ V/m)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB μ V/m)	(dB μ V/m)	(dB)
2178	40.23	30.31	9.83	50.06	40.14	74.00	54.00	-13.86

3.2.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

Below 30 MHz

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Polarization:	---
Test Mode:	TX Mode		

Freq. (MHz)	Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	State P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

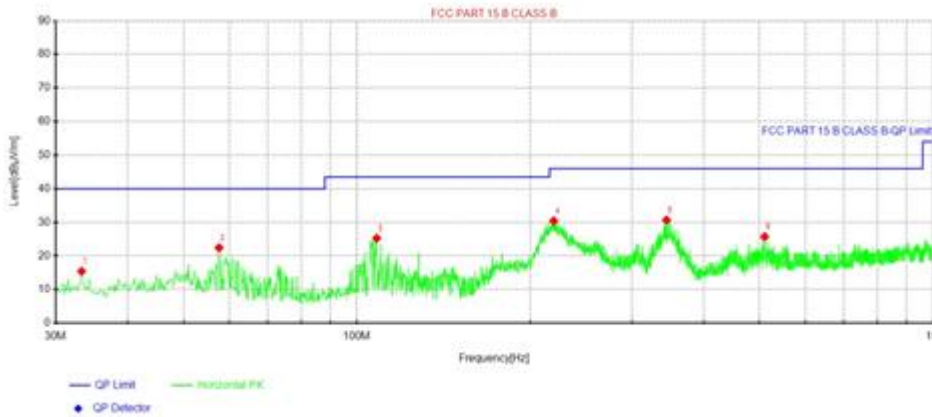
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

Between 30MHz – 1000 MHz Radiation Spurious

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	Mode 1/2/3(worst mode 2)		



Suspected Data List									
NO.	Freq. [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	33.2738	33.59	15.43	-18.16	40.00	24.57	100	147	Horizontal
2	57.645	40.13	22.43	-17.70	40.00	17.57	100	327	Horizontal
3	108.206	44.00	25.24	-18.76	43.50	18.26	100	1	Horizontal
4	219.635	49.24	30.42	-18.82	46.00	15.58	100	238	Horizontal
5	344.643	46.85	30.66	-16.19	46.00	15.34	100	213	Horizontal
6	510.271	39.86	25.71	-14.15	46.00	20.29	100	245	Horizontal

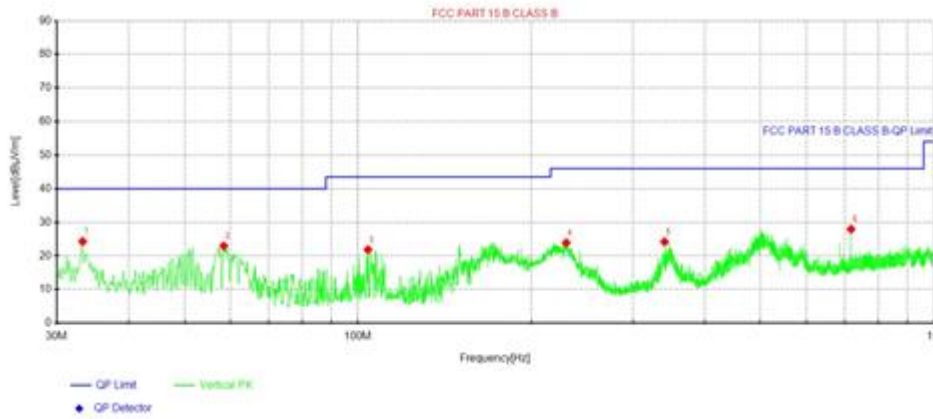
Note:1). Level (dBuV/m)= Reading (dBuV)+ Factor (dB/m)

2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin(dB) = Limit (dBuV/m) - Level (dBuV/m)

4). All modes have been tested,only show the worst case.

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	Mode 1/2/3(worst mode 2)		



Suspected Data List									
NO.	Freq. [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	33.2738	42.45	24.29	-18.16	40.00	15.71	100	269	Vertical
2	58.4938	40.83	22.94	-17.89	40.00	17.06	100	244	Vertical
3	104.083	40.41	21.85	-18.56	43.50	21.65	100	205	Vertical
4	229.941	42.37	23.90	-18.47	46.00	22.10	100	284	Vertical
5	340.642	40.46	24.17	-16.29	46.00	21.83	100	253	Vertical
6	717.851	39.39	27.98	-11.41	46.00	18.02	100	293	Vertical

Note:1).Level (dBuV/m)= Reading (dBuV)+ Factor (dB/m)

2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin(dB) = Limit (dBuV/m) - Level (dBuV/m)

4). All modes have been tested,only show the worst case.

Above 1G Radiation Spurious

CH01
Horizontal

Frequency (MHz)	Peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	Table (o)	Height (cm)	Verdict
1900.000	42.75	31.69	0.84	74.0	54.0	-22.31	66.90	100	Pass
2948.500	48.55	37.13	5.89	74.0	54.0	-16.87	163.20	100	Pass
4826.000	51.76	48.97	-6.83	74.0	54.0	-5.03	355.90	100	Pass
8765.500	57.58	47.50	4.96	74.0	54.0	-6.50	178.10	100	Pass
10729.000	62.46	50.75	8.32	74.0	54.0	-3.25	320.30	100	Pass
14906.250	63.04	52.20	9.91	74.0	54.0	-1.80	201.50	100	Pass

Vertical

Frequency (MHz)	Peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	Table (o)	Height (cm)	Verdict
1434.500	41.64	29.93	-0.61	74.0	54.0	-24.07	111.30	100	Pass
2944.000	48.01	36.89	5.86	74.0	54.0	-17.11	241.00	100	Pass
4826.000	49.35	45.14	-6.83	74.0	54.0	-8.86	122.30	100	Pass
8828.750	57.76	47.20	4.67	74.0	54.0	-6.80	134.80	100	Pass
11064.500	62.55	51.60	9.87	74.0	54.0	-2.40	65.60	100	Pass
15640.500	63.93	51.62	10.19	74.0	54.0	-2.38	137.90	100	Pass

CH16
Horizontal

Frequency (MHz)	Peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	Table (o)	Height (cm)	Verdict
1879.500	42.57	31.98	0.82	74.0	54.0	-22.02	102.00	100	Pass
2920.500	47.75	37.03	5.73	74.0	54.0	-16.97	169.90	100	Pass
4876.000	50.24	46.54	-6.53	74.0	54.0	-7.46	19.20	100	Pass
8669.250	57.41	46.30	4.82	74.0	54.0	-7.70	59.70	100	Pass
10973.750	62.84	51.77	10.02	74.0	54.0	-2.23	105.70	100	Pass
15038.250	63.11	52.84	10.36	74.0	54.0	-1.16	119.90	100	Pass

Vertical

Frequency (MHz)	Peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	Table (o)	Height (cm)	Verdict
1616.000	41.13	29.98	-0.49	74.0	54.0	-24.02	188.90	100	Pass
2925.000	47.31	36.62	5.75	74.0	54.0	-17.38	287.90	100	Pass
4876.000	50.05	46.22	-6.53	74.0	54.0	-7.78	62.50	100	Pass
8751.750	57.74	47.80	5.00	74.0	54.0	-6.20	331.10	100	Pass
11254.250	63.35	51.42	9.56	74.0	54.0	-2.58	280.50	100	Pass
14419.500	62.74	52.87	11.19	74.0	54.0	-1.13	19.20	100	Pass

CH32
Horizontal

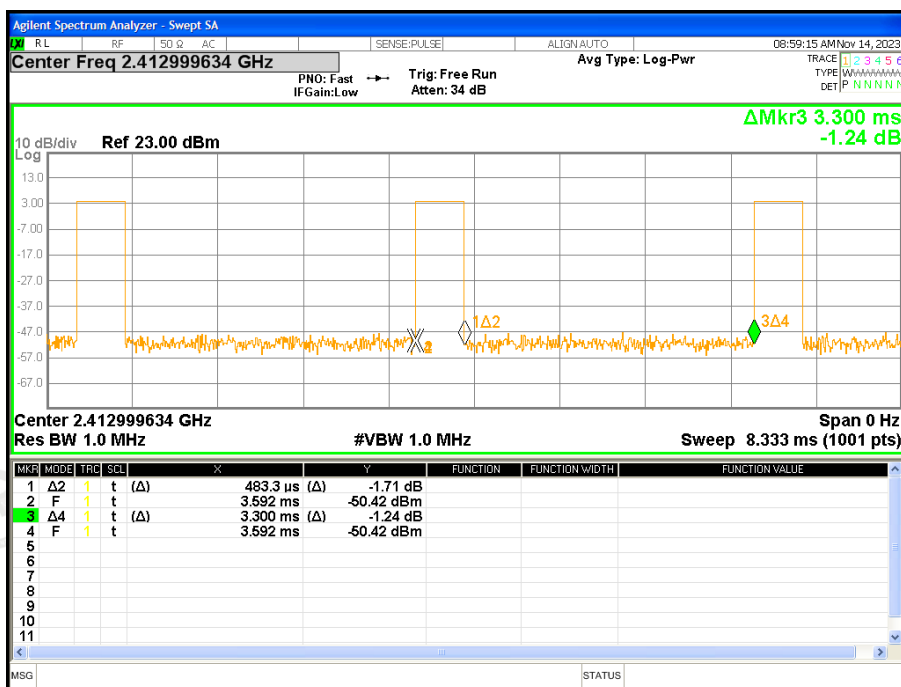
Frequency (MHz)	Peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	Table (o)	Height (cm)	Verdict
1851.500	42.26	31.36	0.78	74.0	54.0	-22.64	122.80	100	Pass
2974.000	47.89	37.21	6.00	74.0	54.0	-16.79	180.80	100	Pass
4929.000	48.88	44.13	-6.39	74.0	54.0	-9.87	18.00	100	Pass
10146.000	61.58	50.47	7.15	74.0	54.0	-3.53	79.70	100	Pass
11188.250	62.69	51.40	9.61	74.0	54.0	-2.60	279.70	100	Pass
14408.500	63.60	52.73	11.32	74.0	54.0	-1.27	223.80	100	Pass

Vertical

Frequency (MHz)	Peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)	Table (o)	Height (cm)	Verdict
1200.000	41.73	28.97	-1.21	74.0	54.0	-25.03	267.20	100	Pass
2827.500	47.70	36.54	5.46	74.0	54.0	-17.46	5.00	100	Pass
4929.000	47.88	41.93	-6.39	74.0	54.0	-12.07	244.20	100	Pass
9552.000	58.86	47.57	5.44	74.0	54.0	-6.43	271.00	100	Pass
11026.000	61.93	52.00	10.08	74.0	54.0	-2.00	190.70	100	Pass
14425.000	62.56	52.71	11.13	74.0	54.0	-1.29	258.00	100	Pass

Note: The peak value is less than the AV limit, so AV data does not need to be tested.

Duty cycle



Ton (μs)	Tp (μs)	Duty Factor
0.4833	3.3	16.69

Note: Duty Factor=20*LOG10(1/(Ton/Tp))

(Radiation Band edge)

2412.999634MHz

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	Mode 1		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2387.160	40.37	4.30	44.67	74.00	-29.33	peak
2	2390.000	37.85	4.34	42.19	74.00	-31.81	peak
3	2400.000	38.17	4.49	42.66	74.00	-31.34	peak

Fundamental Frequency

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Duty cycle Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4	2413.000	82.45	4.49	-	86.94	114	-27.06	peak
5	2413.000	82.45	4.49	16.69	70.25	94	-23.75	AVG

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	Mode 1		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2387.480	39.39	4.30	43.69	74.00	-30.31	peak
2	2390.000	38.82	4.34	43.16	74.00	-30.84	peak
3	2400.000	38.06	4.49	42.55	74.00	-31.45	peak

Fundamental Frequency

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Duty cycle Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4	2413.000	86.06	4.49	-	90.55	114	-23.45	peak
5	2413.000	86.06	4.49	16.69	73.86	94	-20.14	AVG

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	Mode 2		

Fundamental Frequency

No.	Frequency (MHz)	Reading (dBUV)	Correct Factor(dB/m)	Duty cycle Factor(dB/m)	Result (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Remark
1	2438.000	84.94	4.51	-	89.45	114	-24.55	peak
2	2438.000	84.94	4.51	16.69	72.76	94	-21.24	AVG

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	Mode 2		

Fundamental Frequency

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Duty cycle Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2438.000	84.91	4.51	-	89.42	114	-24.58	peak
2	2438.000	84.91	4.51	16.69	73.01	94	-20.99	AVG

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 3.7V	Phase:	Horizontal
Test Mode:	Mode 3		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2	2483.500	38.48	4.60	43.08	74.00	-30.92	peak
3	2490.760	42.13	4.63	46.76	74.00	-27.24	peak

Fundamental Frequency

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Duty cycle Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2464.500	85.33	4.56	-	89.89	114	-24.11	peak
4	2464.500	85.33	4.56	16.69	73.20	94	-20.80	AVG

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	DC 3.7V	Phase:	Vertical
Test Mode:	Mode 3		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2	2483.500	38.48	4.60	43.08	74.00	-30.92	peak
3	2490.760	42.13	4.63	46.76	74.00	-27.24	peak

Fundamental Frequency

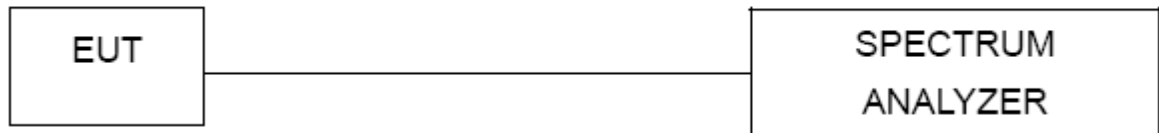
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Duty cycle Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2464.500	85.33	4.56	-	89.89	114	-24.11	peak
4	2464.500	85.33	4.56	16.69	73.20	94	-20.80	AVG

4. BANDWIDTH TEST

4.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Spectrum Setting : RBW= 1% to 5% OBW, VBW \geq RBW, Sweep time = Auto.

4.2 TEST SETUP



4.3 EUT OPERATION CONDITIONS

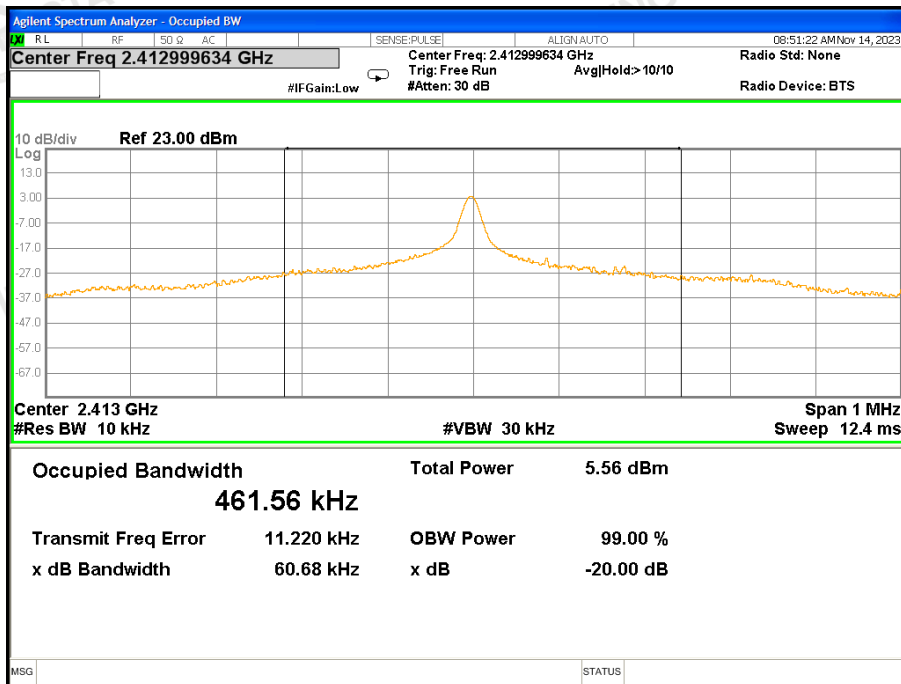
TX mode.

4.4 TEST RESULTS

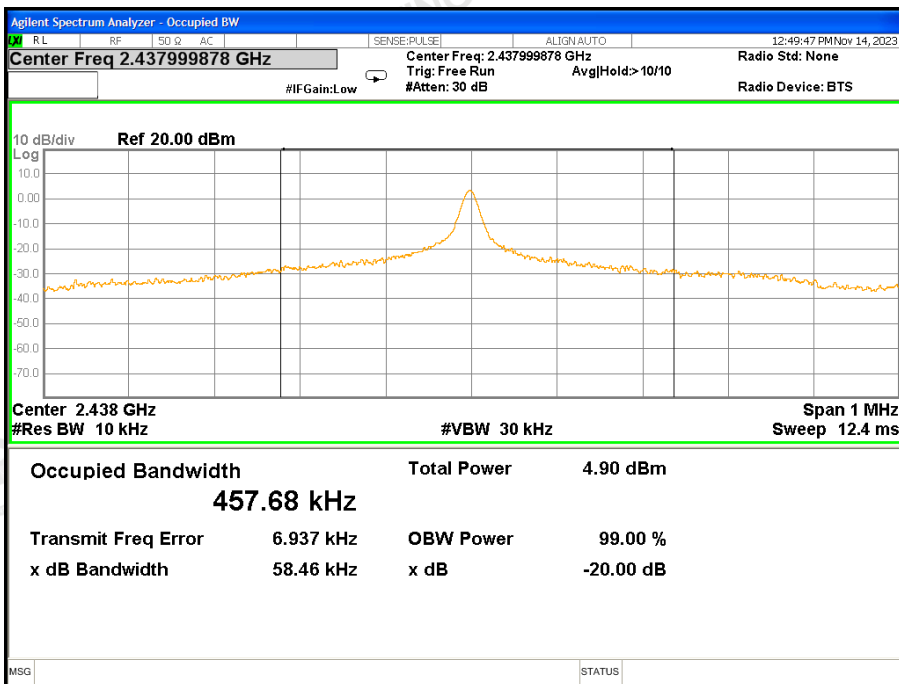
Temperature:	25°C	Relative Humidity:	50%
Test Voltage:	DC 3.7V		

Test Channel	Frequency(MHz)	20 dB Bandwidth(KHz)	99% Bandwidth(KHz)
CH01	2.412999634	60.68	461.56
CH16	2.437999878	58.46	457.68
CH32	2.464499756	57.41	458.32

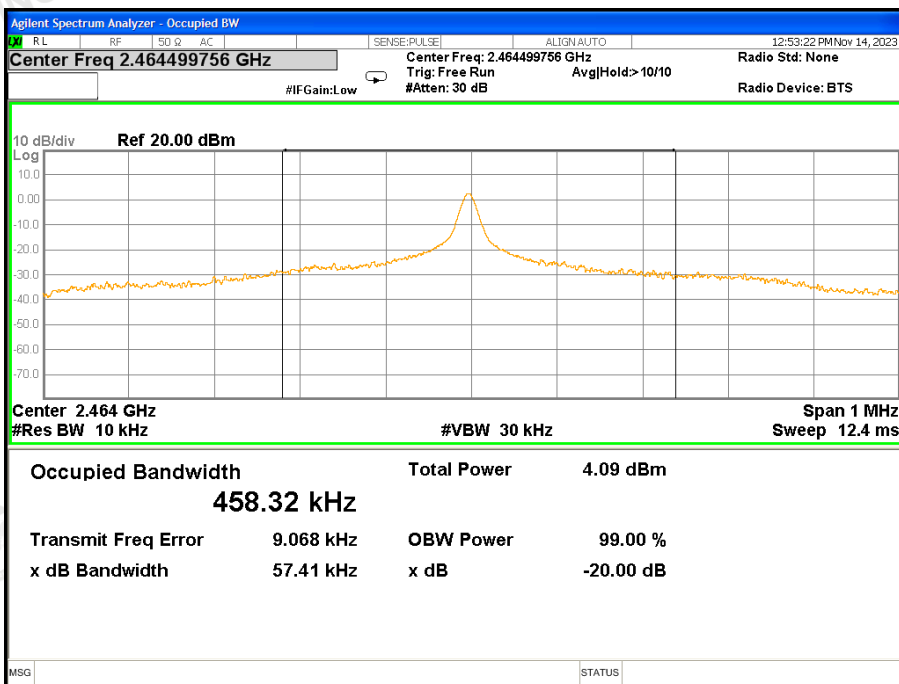
CH01



CH16



CH32



5. ANTENNA REQUIREMENT

5.1 STANDARD REQUIREMENT

According to the FCC Part 15 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.

5.2 EUT ANTENNA

The EUT antenna is Ceramic Antenna. It conforms to the standard requirements.

APPENDIX- PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

*****END OF THE REPORT*****