

TEST REPORT

Product : WisePad 2
Trade mark : BBPOS
Model/Type reference : WPC23
Serial Number : N/A
Report Number : EED32J00095406
FCC ID : 2AB7X-WISEPAD2-3G
Date of Issue : Jun. 21, 2017
Test Standards : 47 CFR Part 15 Subpart C
Test result : PASS

Prepared for:

BBPOS International Limited
Suite 1602, 16/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road,
Tsuen Wan, NT, Hong Kong

Prepared by:

Centre Testing International Group Co., Ltd.
Hongwei Industrial Zone, Bao'an 70 District,
Shenzhen, Guangdong, China
TEL: +86-755-3368 3668
FAX: +86-755-3368 3385

Tested By:

Tom chen
Tom chen (Test Project)

Compiled by:

Mill chen
Mill chen (Project Engineer)

Reviewed by:

Kevin Yang
Kevin yang (Project Engineer)

Approved by:

Sheek Luo
Sheek Luo (Lab supervisor)

Date:

Jun. 21, 2017



Check No.:2402681052

2 Version

Version No.	Date	Description
00	Jun. 21, 2017	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
AC Power Line Conducted Emission	47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013	PASS
Radiated Emission	47 CFR Part 15 Subpart C Section 15.209; 15.225(a)(b)(c)(d)	ANSI C63.10-2013	PASS
Frequency Tolerance	47 CFR Part 15 Subpart C Section 15.225(e)	ANSI C63.10-2013	PASS
Occupied Bandwidth	47 CFR Part 15 Subpart C Section 15.215	ANSI C63.10-2013	PASS

Remark:

The tested sample and the sample information are provided by the client.

4 Contents

	Page
1 COVER PAGE.....	1
2 VERSION.....	2
3 TEST SUMMARY.....	3
4 CONTENTS.....	4
5 GENERAL INFORMATION.....	5
5.1 CLIENT INFORMATION.....	5
5.2 GENERAL DESCRIPTION OF EUT.....	5
5.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD.....	5
5.4 TEST ENVIRONMENT AND MODE.....	5
5.5 DESCRIPTION OF SUPPORT UNITS.....	5
5.6 TEST LOCATION.....	6
5.7 TEST FACILITY.....	6
5.8 DEVIATION FROM STANDARDS.....	7
5.9 ABNORMALITIES FROM STANDARD CONDITIONS.....	7
5.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER.....	7
5.11 MEASUREMENT UNCERTAINTY (95% CONFIDENCE LEVELS, K=2).....	7
6 EQUIPMENT LIST.....	8
7 TEST RESULT & MEASUREMENT DATA.....	10
7.1 ANTENNA REQUIREMENT.....	10
7.2 CONDUCTED EMISSIONS.....	11
7.3 RADIATED EMISSIONS.....	14
7.4 FREQUENCY TOLERANCE.....	21
7.5 OCCUPIED BANDWIDTH.....	23
APPENDIX 1 PHOTOGRAPHS OF TEST SETUP.....	25
PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS.....	27

5 General Information

5.1 Client Information

Applicant:	BBPOS International Limited
Address of Applicant:	Suite 1602, 16/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road, Tsuen Wan, NT, Hong Kong
Manufacturer:	BBPOS International Limited
Address of Manufacturer:	Suite 1602, 16/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road, Tsuen Wan, NT, Hong Kong

5.2 General Description of EUT

Product Name:	WisePad 2
Mode No.(EUT):	WPC23
Trade Mark:	BBPOS
EUT Supports Radios application:	13.56MHz
Power Supply:	DC 3.7V by Battery DC 5V by USB port
Battery	Li-polymer 3.7V, 750mAh

5.3 Product Specification subjective to this standard

Carrier Frequency:	13.56MHz
Modulation Type:	ASK
Sample Type:	Portable
Antenna Type:	Monopole
Test voltage:	DC 3.7V by Battery DC 5V by USB port
Sample Received Date:	May 18, 2017
Sample tested Date:	May 18, 2017 to Jun. 21, 2017

5.4 Test Environment and Mode

Operating Environment:	
Temperature:	21°C
Humidity:	54 % RH
Atmospheric Pressure:	1010mbar
Test mode:	
Transmitter mode:	Keep the EUT in transmitting mode (NFC mode) with modulation.

5.5 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Certification	Supplied by
laptop	LENOVO	E46L	FCC DOC	CTI
Keyboard	IBM	89P8300	FCC DOC	CTI
Mouse	L.Selectron	OP-200	FCC DOC	CTI

5.6 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China 518101

Telephone: +86 (0) 755 3368 3668 Fax: +86 (0) 755 3368 3385

No tests were sub-contracted.

5.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L1910

Centre Testing International Group Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories..

A2LA-Lab Cert. No. 3061.01

Centre Testing International Group Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 886427

Centre Testing International Group Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 886427.

IC-Registration No.: 7408A-2

The 3m Alternate Test Site of Centre Testing International Group Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408A-2 .

IC-Registration No.: 7408B-1

The 10m Alternate Test Site of Centre Testing International Group Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408B-1.

NEMKO-Aut. No.: ELA503

Centre Testing International Group Co., Ltd. has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10.

VCCI

The Radiation 3 & 10 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-4096.

Main Ports Conducted Interference Measurement of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-4563.

Telecommunication Ports Conducted Disturbance Measurement of

Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-2146.

The Radiation 3 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-758

5.8 Deviation from Standards

None.

5.9 Abnormalities from Standard Conditions

None.

5.10 Other Information Requested by the Customer

None.

5.11 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	Radiated Spurious emission	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-12.75GHz)
3	Conduction emission	3.6dB (9kHz to 150kHz)
		3.2dB (150kHz to 30MHz)
4	Temperature	0.64°C
5	Humidity	2.8%
6	DC power voltages	0.025%

6 Equipment List

Conducted disturbance Test					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Receiver	R&S	ESCI	100009	06-16-2016	06-13-2018
Temperature/ Humidity Indicator	TAYLOR	1451	1905	04-27-2016	05-07-2018
Communication test set	Agilent	E5515C	GB47050534	04-01-2016	03-13-2018
Communication test set	R&S	CMW500	152394	04-01-2016	03-13-2018
LISN	R&S	ENV216	100098	06-16-2016	06-12-2018
LISN	schwarzbeck	NNLK8121	8121-529	06-16-2016	06-12-2018
Voltage Probe	R&S	ESH2-Z3	--	06-13-2017	06-12-2018
Current Probe	R&S	EZ17	100106	06-16-2016	06-12-2018
ISN	TESEQ GmbH	ISN T800	30297	01-29-2015	02-22-2018

3M Semi/full-anechoic Chamber					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	06-05-2016	06-05-2019
TRILOG Broadband Antenna	SCHWARZBECK	VULB9163	9163-484	05-23-2016	05-22-2018
Microwave Preamplifier	Agilent	8449B	3008A02425	02-04-2016	02-15-2018
Horn Antenna	ETS-LINDGREN	3117	00057410	06-30-2015	06-28-2018
Horn Antenna	A.H.SYSTEMS	SAS-574	374	06-30-2015	06-28-2018
Loop Antenna	ETS	6502	00071730	07-30-2015	07-28-2017
Spectrum Analyzer	R&S	FSP40	100416	06-16-2016	06-12-2018
Receiver	R&S	ESCI	100435	06-16-2016	06-13-2018
Multi device Controller	maturo	NCD/070/10711 112	---	01-12-2016	01-11-2018
LISN	schwarzbeck	NNBM8125	81251547	06-16-2016	06-12-2018
LISN	schwarzbeck	NNBM8125	81251548	06-16-2016	06-12-2018
Signal Generator	Agilent	E4438C	MY45095744	04-01-2016	03-13-2018
Signal Generator	Keysight	E8257D	MY53401106	04-01-2016	03-13-2018
Temperature/ Humidity Indicator	TAYLOR	1451	1905	04-27-2016	05-07-2018
Communication test set	Agilent	E5515C	GB47050534	04-01-2016	03-13-2018
Cable line	Fulai(7M)	SF106	5219/6A	01-12-2016	01-11-2018
Cable line	Fulai(6M)	SF106	5220/6A	01-12-2016	01-11-2018
Cable line	Fulai(3M)	SF106	5216/6A	01-12-2016	01-11-2018
Cable line	Fulai(3M)	SF106	5217/6A	01-12-2016	01-11-2018
Communication test set	R&S	CMW500	152394	04-01-2016	03-13-2018
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-12-2016	01-11-2018
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-12-2016	01-11-2018
band rejection filter	Sinoscite	FL5CX01CA09C	---	01-12-2016	01-11-2018

		L12-0395-001			
band rejection filter	Sinoscite	FL5CX01CA08C L12-0393-001	---	01-12-2016	01-11-2018
band rejection filter	Sinoscite	FL5CX02CA04C L12-0396-002	---	01-12-2016	01-11-2018
band rejection filter	Sinoscite	FL5CX02CA03C L12-0394-001	---	01-12-2016	01-11-2018

Conducted RF test					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Spectrum Analyzer	R&S	FSP40	100416	06-13-2017	06-12-2018
Receiver	R&S	ESCI	100435	06-14-2017	06-13-2018
Noise generator	Beijing damping jidian	DM1661	126001	04-01-2017	03-31-2018
Attenuator	HuaXiang	INMET64671	INMET64671	04-01-2017	03-31-2018
Signal Generator	Agilent	E4438C	MY45095744	03-14-2017	03-13-2018
Attenuator	HuaXiang	SHX370	15040701	04-01-2017	03-31-2018
Signal Generator	Keysight	E8257D	MY53401106	03-14-2017	03-13-2018
High-pass filter(3- 18GHz)	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-12-2017	01-11-2018
High-pass filter(5- 18GHz)	MICRO- TRONICS	SPA-F-63029-4	---	01-12-2017	01-11-2018
band rejection filter	Sinoscite	FL5CX01CA09C L12-0395-001	---	01-12-2017	01-11-2018
band rejection filter	Sinoscite	FL5CX01CA08C L12-0393-001	---	01-12-2017	01-11-2018
band rejection filter	Sinoscite	FL5CX02CA04C L12-0396-002	---	01-12-2017	01-11-2018

7 Test Result & Measurement Data

7.1 Antenna Requirement

Standard Requirement:	47 CFR Part 15C Section 15.203
------------------------------	--------------------------------

15.203 Requirement:

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, 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.



The antenna is integrated on the main PCB and no consideration of replacement.

7.2 Conducted Emissions

Test Requirement: 47 CFR Part 15C Section 15.207

Test Method: ANSI C63.10-2013

Test Frequency Range: 150kHz to 30MHz

Limit:

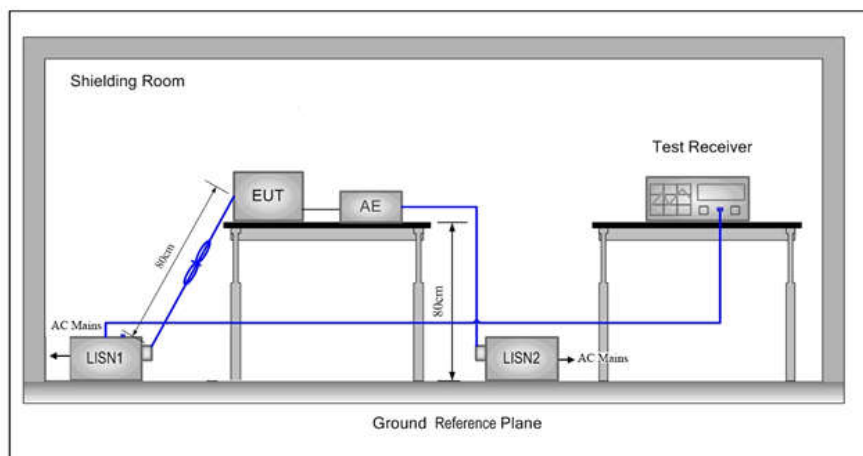
Frequency range (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

Test Procedure:

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.

Test Setup:



Test Mode:

Transmitter mode

Instruments Used:

Refer to section 6 for details

Test Results:

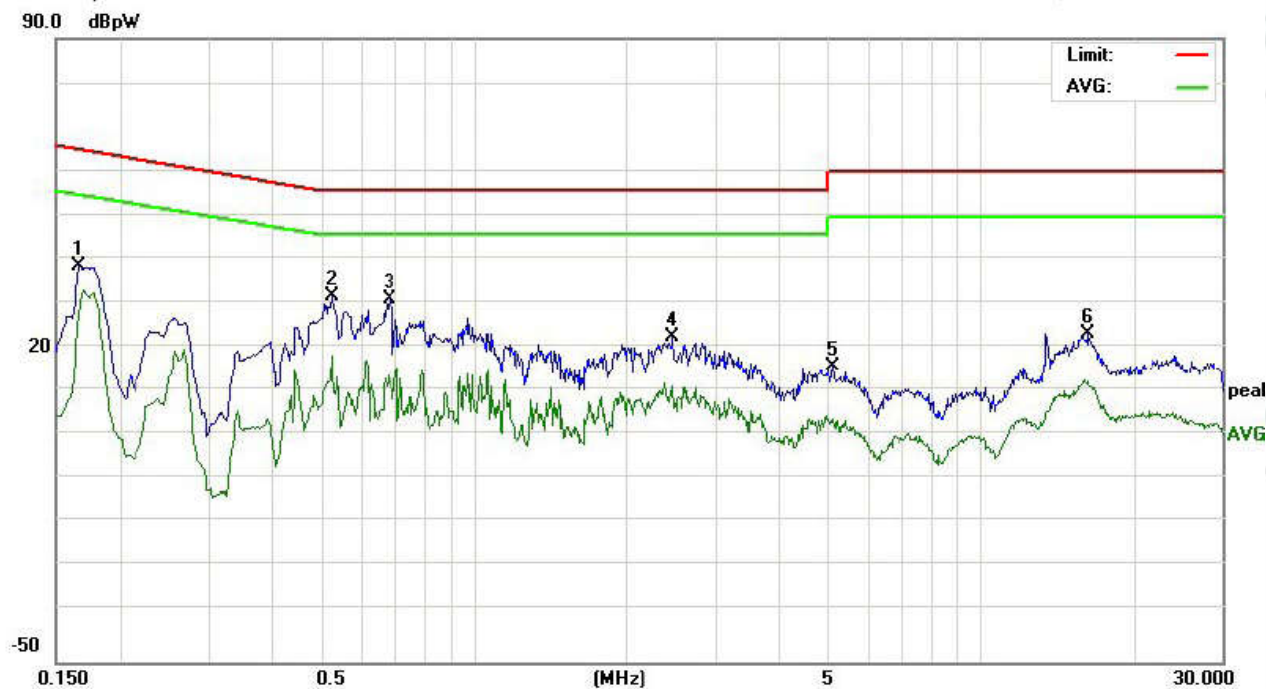
Pass

Test Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

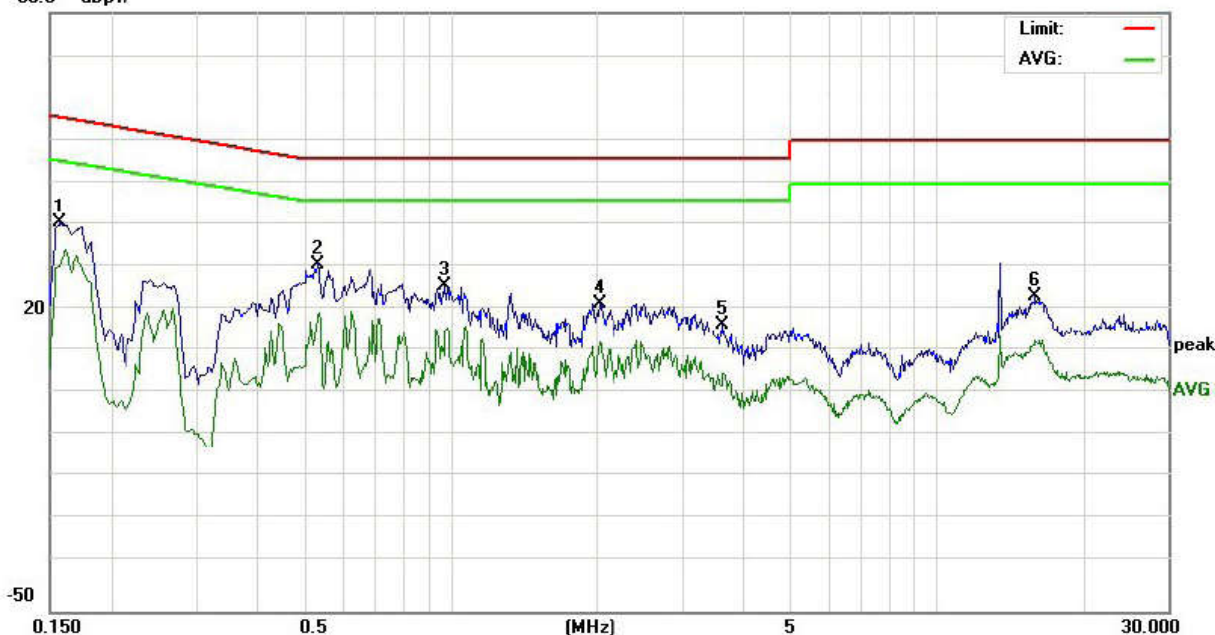
Live Line:



No.	Freq. MHz	Reading_Level (dBpW)			Correct Factor dB	Measurement (dBpW)			Limit (dBpW)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1660	28.83	25.14	18.54	9.78	38.61	34.92	28.32	65.15	55.15	-30.23	-26.83	P	
2	0.5260	22.41	18.66	9.19	9.57	31.98	28.23	18.76	56.00	46.00	-27.77	-27.24	P	
3	0.6860	10.45	5.31	-4.42	9.54	19.99	14.85	5.12	56.00	46.00	-41.15	-40.88	P	
4	2.4739	13.34	9.42	2.10	9.72	23.06	19.14	11.82	56.00	46.00	-36.86	-34.18	P	
5	5.1259	6.57	3.69	-5.32	9.59	16.16	13.28	4.27	60.00	50.00	-46.72	-45.73	P	
6	16.3618	14.29	11.24	3.07	9.35	23.64	20.59	12.42	60.00	50.00	-39.41	-37.58	P	

Neutral Line:

90.0 dBpW



No.	Freq. MHz	Reading_Level (dBpW)			Correct Factor dB	Measurement (dBpW)			Limit (dBpW)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1590	11.80	8.21	-3.05	9.79	21.59	18.00	6.74	65.51	55.51	-47.51	-48.77	P	
2	0.5340	21.52	18.25	9.77	9.57	31.09	27.82	19.34	56.00	46.00	-28.18	-26.66	P	
3	0.9779	16.47	13.51	5.82	9.50	25.97	23.01	15.32	56.00	46.00	-32.99	-30.68	P	
4	2.0299	12.36	10.11	3.03	9.65	22.01	19.76	12.68	56.00	46.00	-36.24	-33.32	P	
5	3.6299	11.85	8.33	-3.00	9.74	21.59	18.07	6.74	56.00	46.00	-37.93	-39.26	P	
6	16.0098	14.19	11.05	3.69	9.34	23.53	20.39	13.03	60.00	50.00	-39.61	-36.97	P	

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

7.3 Radiated Emissions

Test Requirement: 47 CFR Part 15 Subpart C Section 15.209; 15.225(a)(b)(c)(d)

Test Method: ANSI C63.10-2013

Test Site: 3m (Semi-Anechoic Chamber)

Requirements:

- (a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Quasi-peak	10kHz	30kHz	Peak
0.009MHz-0.090MHz	Quasi-peak	10kHz	30kHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
0.110MHz-0.490MHz	Quasi-peak	10kHz	30kHz	Peak
0.110MHz-0.490MHz	Quasi-peak	10kHz	30kHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120 kHz	300kHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Test Setup:

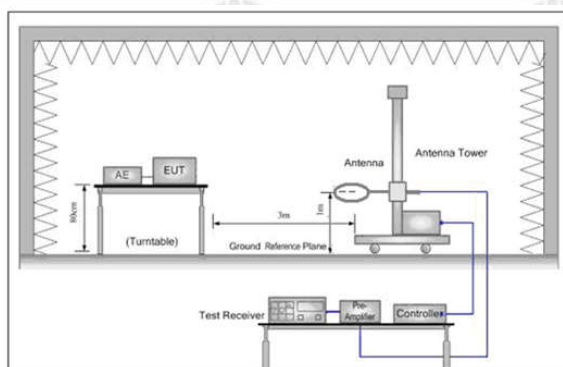


Figure 1. Below 30MHz

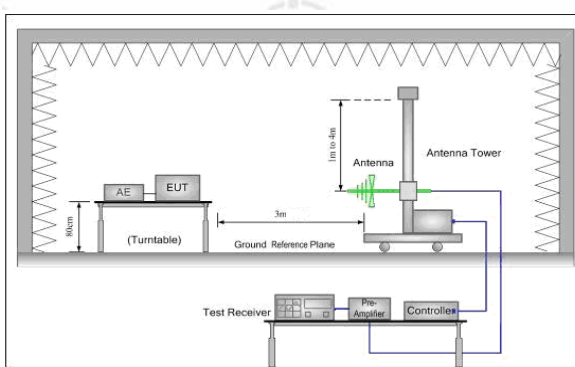


Figure 2. 30MHz to 1GHz

Test Procedure:

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The limit 1.705MHz to 30MHz in clause 4.3 are specified at 30 meters, and measurements were made at 3 meters, the limit is translated to 3 meters by using a formula as follows:
$$\text{Limit}_{3m} = \text{Limit}_{30m} + 40\log(30m/3)$$
8. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode:

Transmitter mode

Instruments Used:

Refer to section 6 for details

Test Result:

Pass

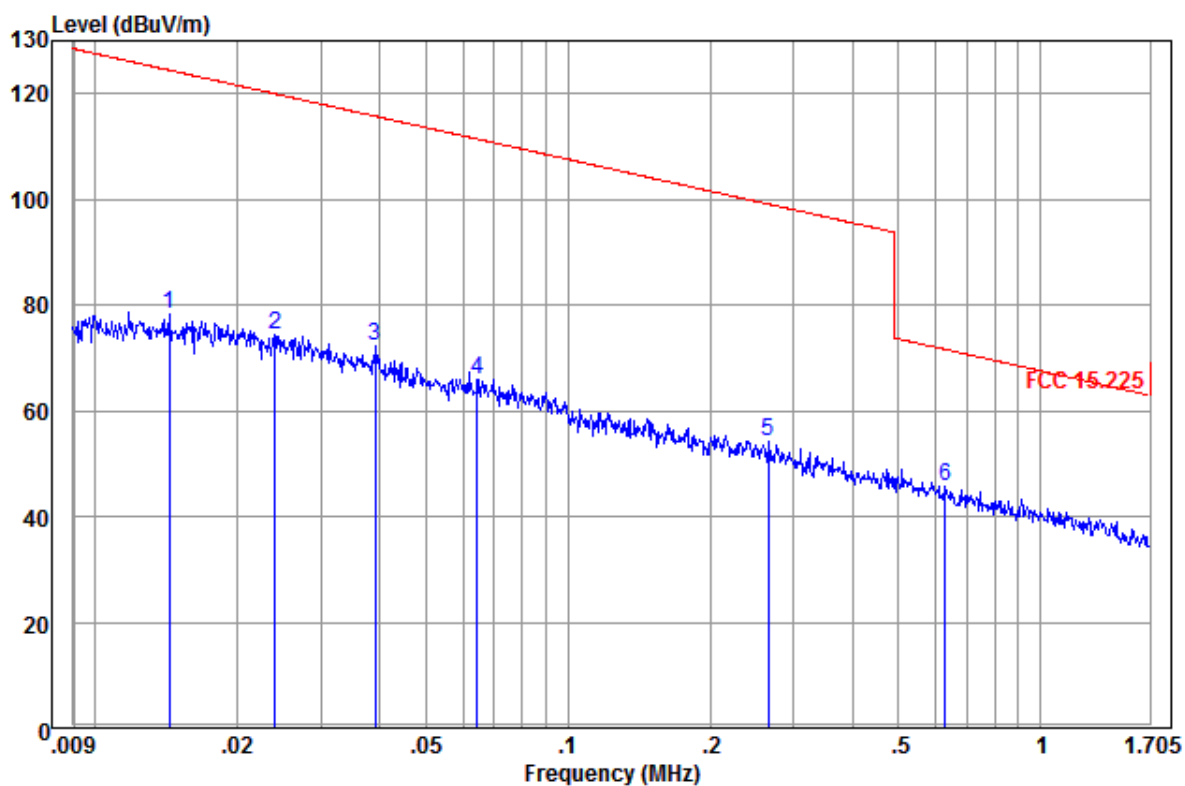
1.705-30MHz

Mode

Test Procedure: For testing performed with the loop antenna, testing was performed in accordance to ANSI C63.4: 2014, section 8.2.1. The center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.

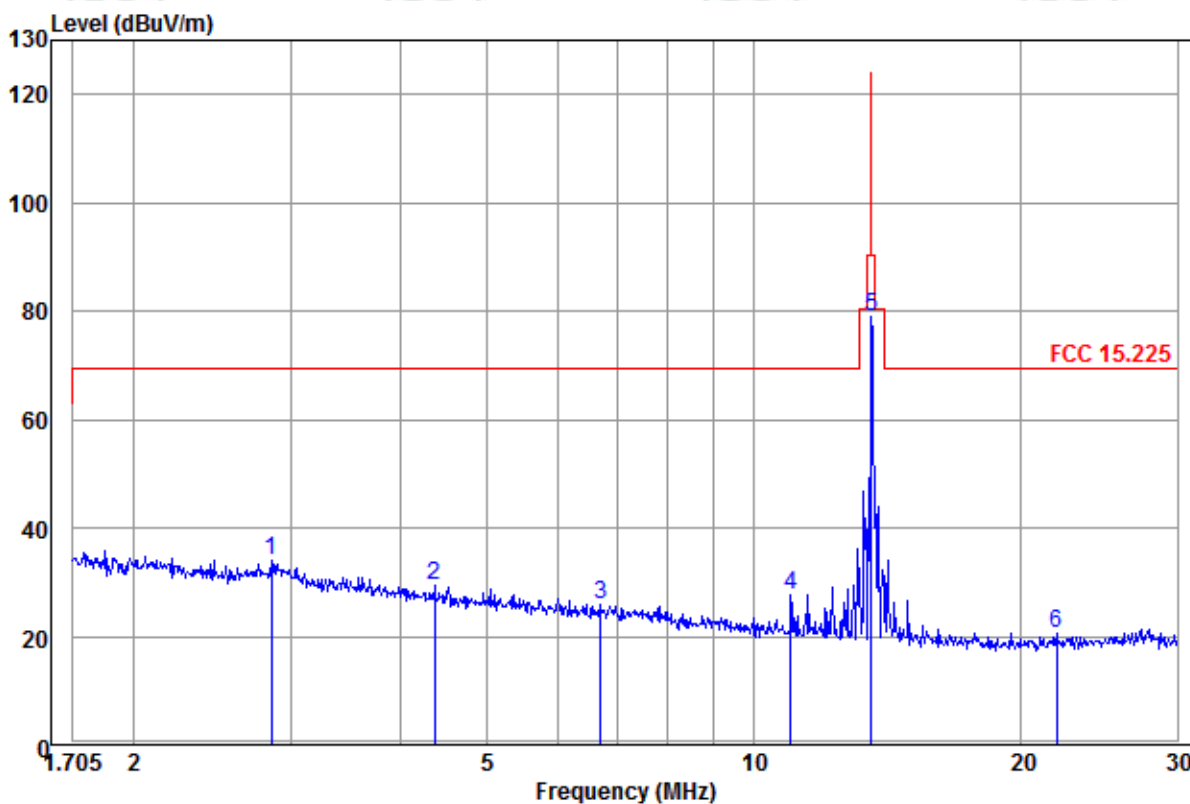
Test data:

9 kHz-1.705MHz

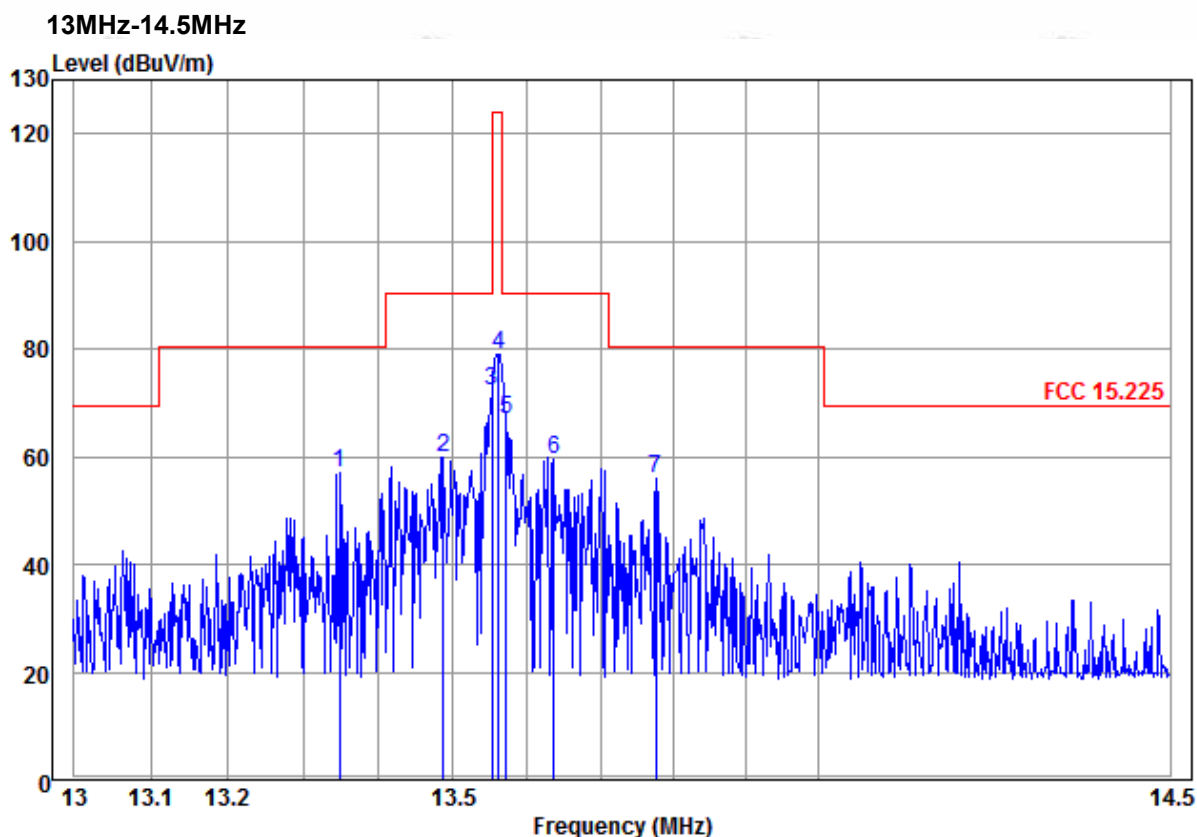


Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Polarization	Remark
0.01435	17.65	0.04	60.64	78.33	124.45	-46.12	X	PK
0.02400	15.55	0.05	58.71	74.31	119.99	-45.68	X	PK
0.03908	12.99	0.06	59.33	72.38	115.75	-43.37	X	PK
0.06431	11.58	0.08	54.29	65.95	111.43	-45.48	X	PK
0.26638	11.30	0.11	42.68	54.09	99.09	-45.00	X	PK
0.62951	11.30	0.12	34.12	45.54	71.61	-26.07	X	QP

1.705MHz-30MHz



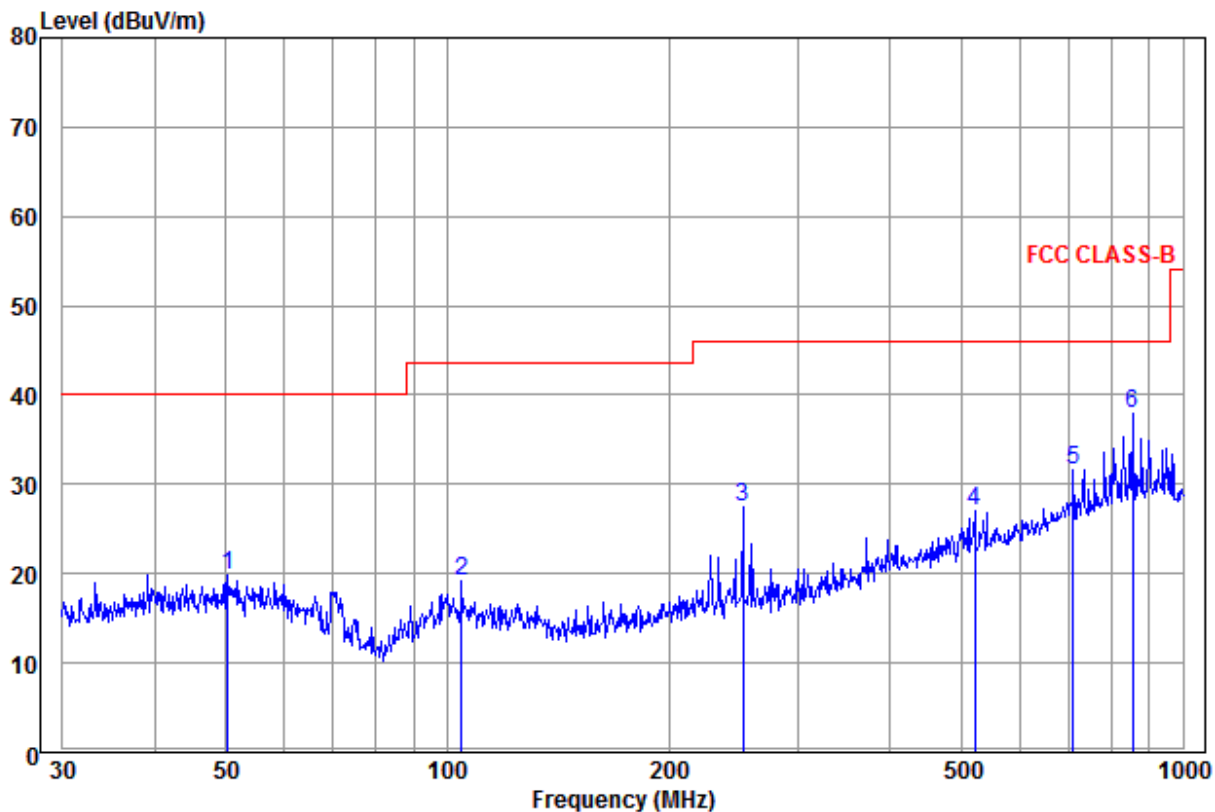
Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Polarization	Remark
2.857	11.49	0.16	22.37	34.02	69.50	-35.48	X	QP
4.355	11.26	0.18	17.96	29.40	69.50	-40.10	X	QP
6.715	11.07	0.35	14.31	25.73	69.50	-43.77	X	QP
10.996	10.85	0.65	16.12	27.62	69.50	-41.88	X	QP
13.556	10.75	0.69	67.63	79.07	123.90	-44.83	X	QP
21.947	9.85	0.88	9.69	20.42	69.50	-49.08	X	QP



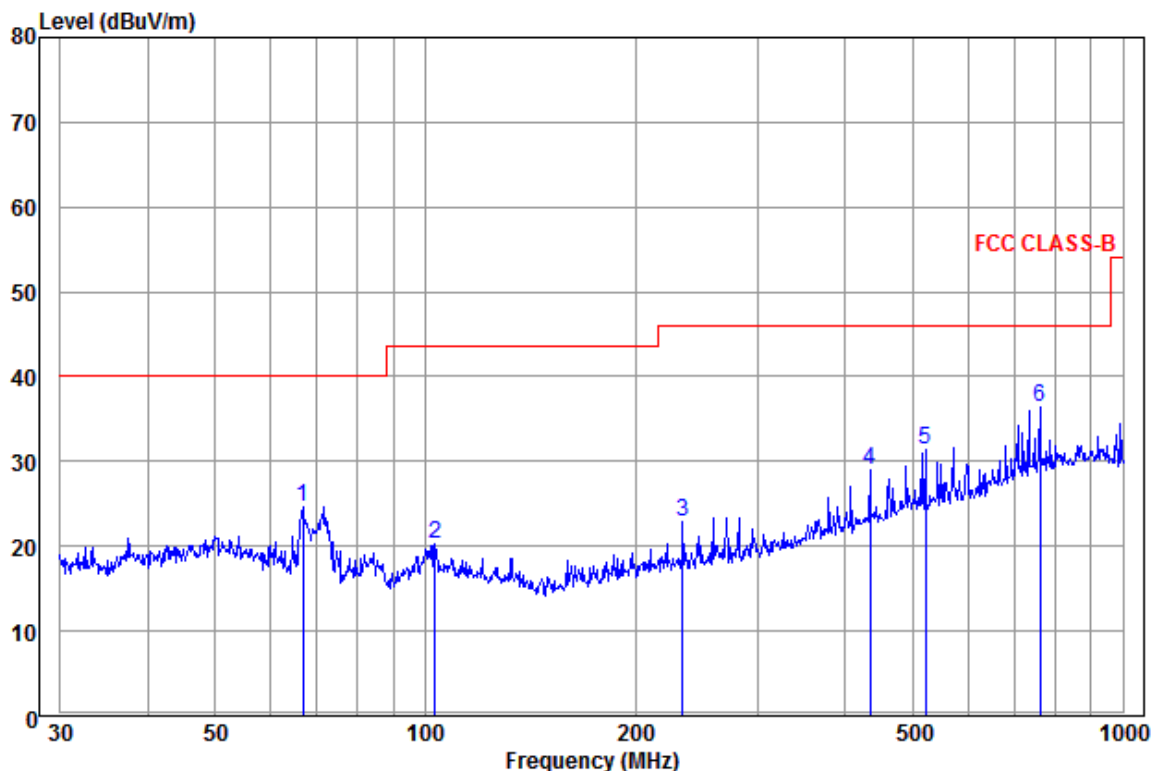
Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Polarization	Remark
13.348	10.76	0.68	45.75	57.19	80.50	-23.31	X	QP
13.487	10.75	0.68	48.58	60.01	90.40	-30.39	X	QP
13.552	10.75	0.68	60.94	72.37	90.40	-18.03	X	QP
13.561	10.75	0.69	67.73	79.17	123.90	-44.73	X	QP
13.572	10.75	0.69	55.41	66.85	90.40	-23.55	X	QP
13.637	10.75	0.69	48.10	59.54	90.40	-30.86	X	QP
13.776	10.74	0.69	44.66	56.09	80.50	-24.41	X	QP

Remark: The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case X axis is shown in the report.

30MHz-1000MHz



Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Read_Level (dBUV)	Level (dBUV/m)	Limit_Line (dBUV/m)	Over_Limit (dB)	Polarization	Remark
50.232	15.07	0.11	4.67	19.85	40.00	-20.15	Horizontal	QP
104.536	12.82	0.59	5.77	19.18	40.00	-20.82	Horizontal	QP
252.063	12.45	1.33	13.68	27.46	47.00	-19.54	Horizontal	QP
520.888	18.49	1.53	6.90	26.92	47.00	-20.08	Horizontal	QP
709.182	20.76	2.11	8.71	31.58	47.00	-15.42	Horizontal	QP
854.025	21.94	2.45	13.62	38.01	47.00	-8.99	Horizontal	QP



Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Polarization	Remark
66.733	11.45	0.24	12.93	24.62	40.00	-15.38	Vertical	QP
103.442	12.91	0.59	6.77	20.27	40.00	-19.73	Vertical	QP
234.168	12.17	1.27	9.54	22.98	47.00	-24.02	Vertical	QP
434.065	16.86	1.42	10.80	29.08	47.00	-17.92	Vertical	QP
520.888	18.49	1.53	11.46	31.48	47.00	-15.52	Vertical	QP
760.704	21.13	2.50	12.83	36.46	47.00	-10.54	Vertical	QP

Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

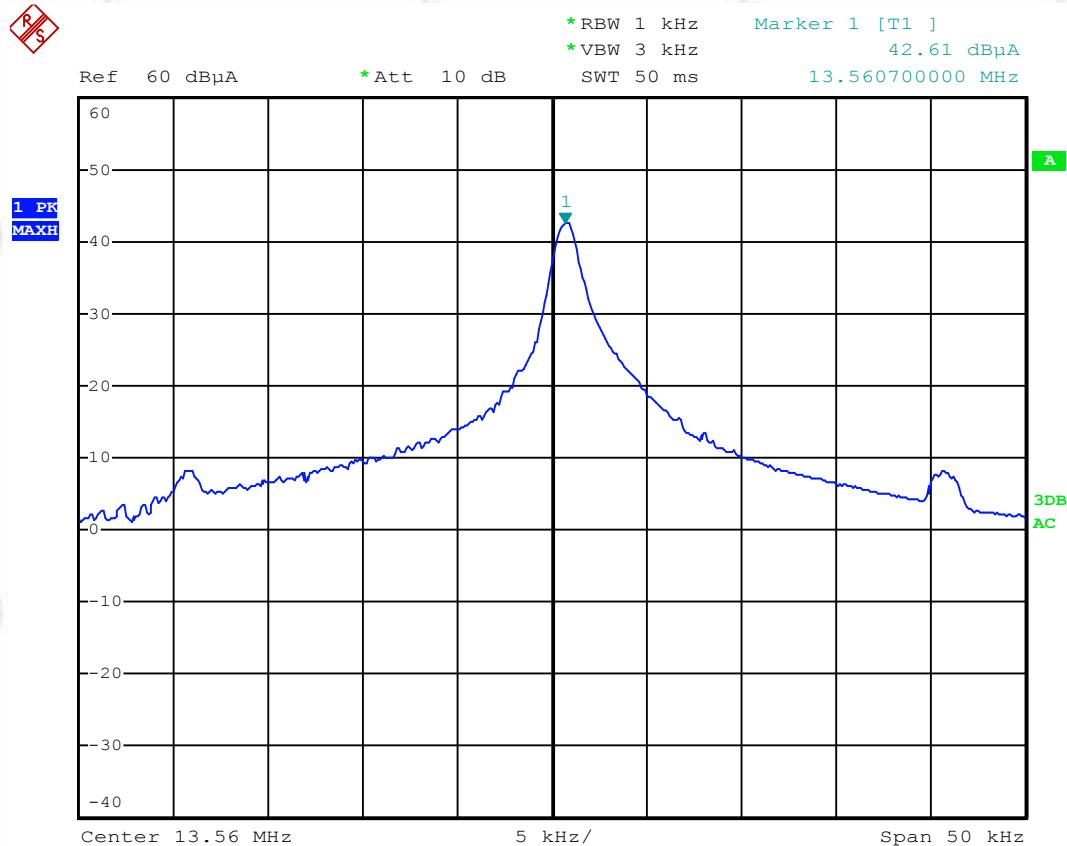
7.4 Frequency Tolerance

Test Requirement:	47 CFR Part 15 Subpart C Section 15.225(e)
Test Method:	ANSI C63.10-2013
Frequency range:	Operation within the band 13.110-14.010 MHz
Requirement :	The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.
Test Mode:	Transmitter mode
Method of measurement:	The EUT was placed in an environmental test chamber and powered such that control element received normal voltage and the transmitter provided maximum RF output.
Instruments Used:	Refer to section 6 for details
Test Result:	Pass

Test Frequency: 13.56MHz			Temperature:22°C	
Supply Voltage (V)	Test Result (MHz)	Deviation (kHz)	Limit (kHz)	Result
3.7	13.5607	0.7	1.356	Pass

Test Frequency: 13.56MHz			Temperature:20°C	
Supply Voltage (V)	Test Result (MHz)	Deviation (kHz)	Limit (kHz)	Result
3.1	13.5607	0.7	1.356	Pass
3.4	13.5605	0.5	1.356	Pass
3.7	13.5607	0.7	1.356	Pass
4.0	13.5607	0.7	1.356	Pass
4.3	13.5604	0.4	1.356	Pass

Test Frequency: 13.56MHz			Voltage: 3.7V	
Temperature (°C)	Test Result (MHz)	Deviation (kHz)	Limit (kHz)	Result
-20	13.5606	0.6	1.356	Pass
-10	13.5607	0.7	1.356	
0	13.5603	0.3	1.356	
10	13.5605	0.5	1.356	
20	13.5607	0.7	1.356	
30	13.5607	0.7	1.356	
40	13.5607	0.7	1.356	
50	13.5608	0.8	1.356	



Date: 20.JUN.2017 16:10:55

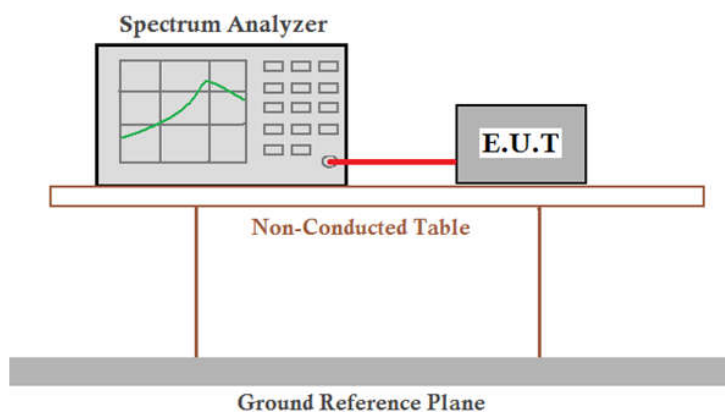
7.5 Occupied Bandwidth

Test Requirement: 47 CFR Part 15C Section 15.215 (C)
Test Method: ANSI C63.10-2013
Frequency range: Operation within the band 13.110 – 14.010 MHz

Requirement :

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that 20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equip compliance with the 20dB attenuation specification may base on measurement at the intentional radiator's antenna output terminal unless the intentional radiator uses a permanently attached antenna, in which case compliance shall be demonstrated by measuring the radiated emissions.

Test Setup:



Test Mode: Transmitter mode
Instruments Used: Refer to section 6 for details
Test Result: Pass

The graph as below: represents the emissions take for this device.

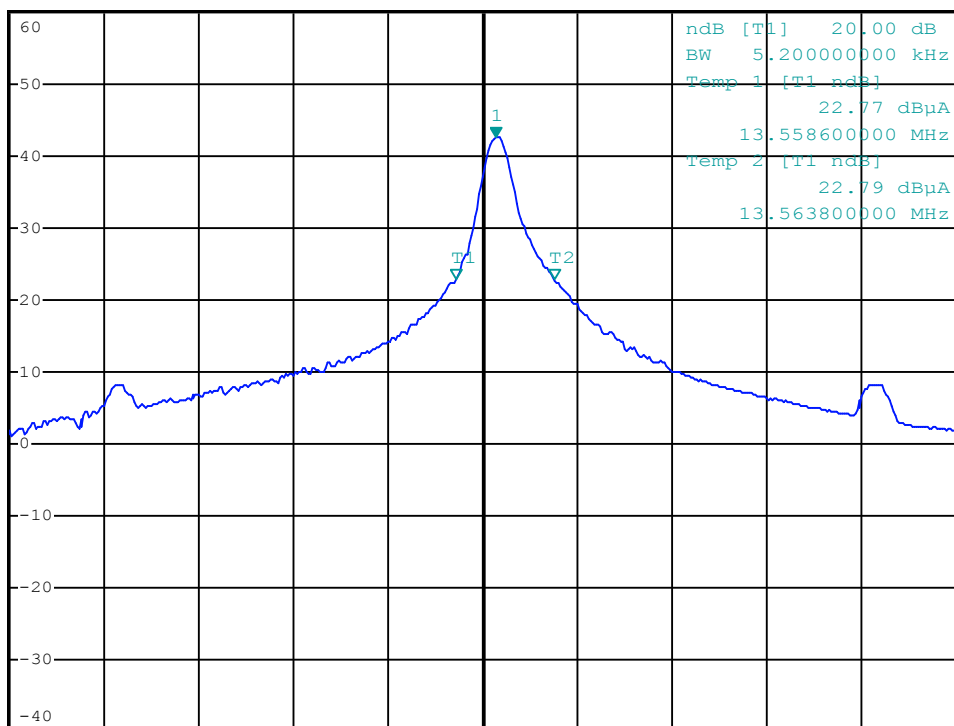


*RBW 1 kHz Marker 1 [T1]
*VBW 3 kHz 42.61 dBμA
SWT 50 ms 13.56070000 MHz

Ref 60 dBμA

*Att 10 dB

1 PK
MAXH



Center 13.56 MHz

5 kHz/

Span 50 kHz

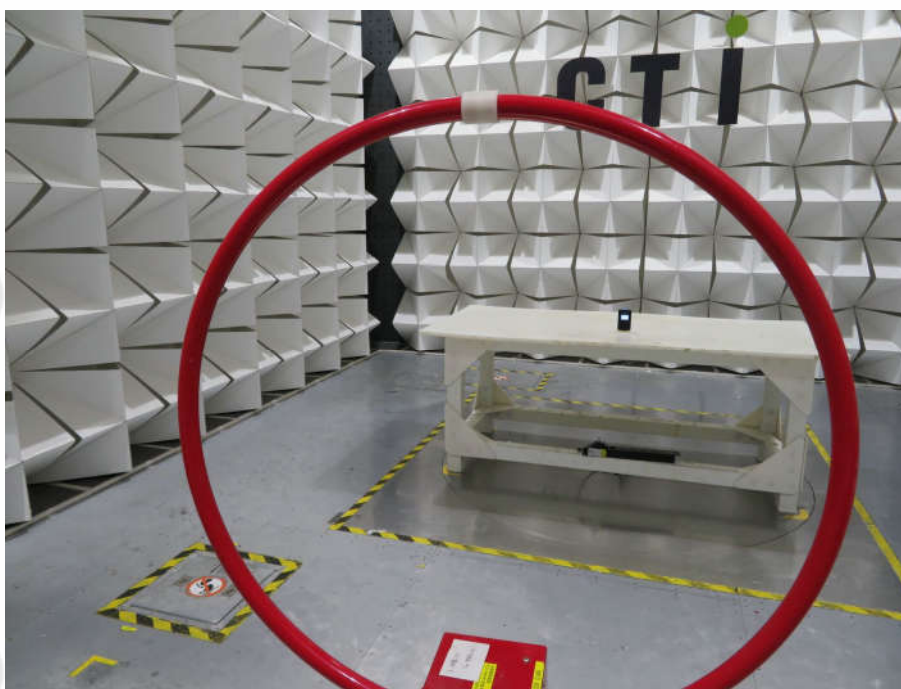
Date: 20.JUN.2017 16:11:31

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

Test Model No.: WPC23



Conducted Emissions



Radiated emission Test Setup (9kHz~30MHz)



Radiated emission Test Setup (30MHz~1000MHz)

PHOTOGRAPHS OF EUT Constructional Details

Refer to Report No. EED32J00095402 for EUT external and internal photos.

*** End of Report ***

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CTI, this report can't be reproduced except in full.