Certificate of Test

June 2018

Adapter Technology Co., Ltd.

Product Name : AC Adapter
Model Number : KTPS120-xxxxx-VI (xxxxx can be 12090, 15080, 16075, 18066, 19063, 20060, 24050, 30040, 48025 or 560214)
Test Report Number : 1806004F-01
Date of Test : April 14, 2017

This report was reproduced GesTek report No.1704001F-01, which changed the applicant and model numbers for the requirement of marketing.

This product was tested according to the standards as below at the laboratory of Global EMC Standard Tech. Corp..

Standards:
FCC CFR 47, Part 15 Subpart B, Class B
ANSI C63.4: 2014
Canadian ICES-003 issue 6 (2016)

http : //www.gestek.com.tw

Sharon Chang, President

GLOBAL EMC STANDARD TECH. CORP.
No.3, Baodoucuokeng, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
TEL:886-2-2603-5321
FAX:886-2-2603-5325

Issue Date: June 22, 2018

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2. 1077(a)

hereby declares that the product

Product Name: AC Adapter

Model Number: KTPS120-xxxxx-VI (xxxxx can be 12090, 15080, 16075, 18066, 19063, 20060, 24050, 30040, 48025 or 560214)

Conforms to the following specifications:

FCC CFR 47, Part 15 Subpart B, Section 15.107(a), Section 15.109(a),

Class B Digital Device

Supplementary Information:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Representative Person's Name : _____

Address: _____

Telephone number:_____

Signature :_____

Date : _____

Test Report
Application for
Declaration of Conformity
on Behalf of

KAGA ELECTRONICS (USA) INC

EUT: AC Adapter

Model Number: KTPS120-xxxxx-VI (xxxxx can be 12090, 15080, 16075, 18066, 19063, 20060, 24050, 30040, 48025 or 560214)

Prepared for:
KAGA ELECTRONICS (USA) INC
780 Montague Expy, Suite 403 San Jose, CA 95131 USA

Report By : **Global EMC Standard Tech. Corp.**
No.3, Baodoucuokeng, Linkou Dist.,
New Taipei City 244, Taiwan(R.O.C.)
Tel : 886-2-2603-5321
Fax : 886-2-2603-5325

TABLE OF CONTENTS

1. CERTIFICATION

Applicant : KAGA ELECTRONICS (USA) INC
EUT Description : AC Adapter
Model Number : KTPS120-xxxxx-VI (xxxxx can be 12090, 15080, 16075, 18066, 19063, 20060, 24050, 30040, 48025 or 560214)
Brand Name : KAGA
Serial Number : N/A

MEASUREMENT PROCEDURES USED:

☑ **CFR 47, Part 15**	Radio Frequency Device Subpart B Unintentional Radiators Class B
☑ **ANSI C63.4**	Methods of Measurements of Radio-Noise Emissions from Low- Voltage Electrical and Electronic Equipment in the range of 9kHz To 40GHz: 2014
☑ **Canadian ICES-003 issue 6 (2016)**	Implementation and Interpretation off the Interference-Causing Equipment Standard for Information Technology Equipment (ITE)-Limits and methods of measurement, ICES-003 issue 6 (2016)

THE MEASUREMENT SHOWN IN THE ATTACHMENT WAS MADE IN ACCORDANCE WITH THE PROCEDURES INDICATED, AND THE MAXIMUM ENERGY EMITTED BY THE EQUIPMENT WAS FOUND TO BE WITHIN THE ABOVE LIMITS APPLICABLE.

Sample Received Data : April 07, 2017
Date of Test : April 14, 2017
Issue Date : June 22, 2018

In order to ensure the quality and accuracy of this document, the contents have been thoroughly reviewed by the following qualified personnel from Global EMC Standard Tech. Corp..

Documented By :

Mandy Chen

Mandy Chen / Report Author

Tested By :

Eric Tsai

Eric Tsai / eng. Dept. Supervisor

Approved By :

Frederic Fang

Frederic Fang / Assistant Manager

2. SUMMARY OF TEST RESULTS

The worst emission data was found as following

STANDARD	TEST ITEM	TEST RESULT	REMARKS
(1)FCC Part 15 (2)Canadian ICES-003 issue 6 (2016) Class B	Conducted emission (Mode 9)	PASS	The worst emission frequency is 0.3888 MHz. And minimum passing margin is –17.66 dB. The measurement uncertainty is 4.40 dB.
	Radiated emission (Mode 9)	PASS	The worst emission frequency is 34.2000 MHz at Horizontal. And minimum passing margin is -10.32 dB. Height of antenna is 400 cm. Angle of turntable is 124°. The measurement uncertainty is 4.30 dB.

2.1UNCERTAINTY DESCRIPTION

According to CISPR 16-4-2,
The measure level is compliance with the limit if

Lm < Llim and Lm + U(Lm)< Llim+Ucispr= Leff

Where,
Ucispr= Uncertainty value specified in Table 1 of CISPR 16-4-2

Measurement		U_{cispr}
Conducted disturbance (mains port)	(150 kHz – 30 MHz)	3.6 dB
Radiated disturbance (OATS or ATS)	(30 MHz – 1000 MHz)	5.2 dB

Lm = Measure value
Llim = Emission limit level
U(Lm) = Uncertainty value of test laboratory
Leff = Effective emission limit level

The above stated condition will be taking as a criterion for pass/fail determination.

3. GENERAL INFORMATION

3.1 PRODUCTION DESCRIPTION

Product Name	: AC Adapter
Model Number	: KTPS120-xxxxx-VI (xxxxx can be 12090, 15080, 16075, 18066, 19063, 20060, 24050, 30040, 48025 or 560214)
Serial Number	: N/A
Brand Name	: KAGA
Applicant	: KAGA ELECTRONICS (USA) INC
Address	: 780 Montague Expy, Suite 403 San Jose, CA 95131 USA
Manufacturer	: Boayang Electronics Co., Ltd.
Address	: Di Feng Gong Yu Qu 2 Hao Xiasha Liuwu Village, Shipai Town Dong Guan City P. R. China
Power Supply	: AC Input :100-240Vac, 50-60Hz, 1.6A

3.2 TEST MODES & EUT COMPONENTS DESCRIPTION

EUT: AC Adapter, M/N: KTPS120-xxxxx-VI (xxxxx can be 12090, 15080, 16075, 18066, 19063, 20060, 24050, 30040, 48025 or 560214)			
Test Mode	**Mode 1- Full Load (Pre-Scan Mode)**	**Mode 2- Full Load (Pre-Scan Mode)**	**Mode 3- Full Load (Pre-Scan Mode)**
Test Model Number	**KTPS120-12090-VI**	**KTPS120-15080-VI**	**KTPS120-16075-VI**
Test Mode	**Mode 4- Full Load (Pre-Scan Mode)**	**Mode 5- Full Load (Pre-Scan Mode)**	**Mode 6- Full Load (Pre-Scan Mode)**
Test Model Number	**KTPS120-18066-VI**	**KTPS120-19063-VI**	**KTPS120-20060-VI**
Test Mode	**Mode 7- Full Load (Pre-Scan Mode)**	**Mode 8- Full Load (Pre-Scan Mode)**	**Mode 9- Full Load (Worst Case)**
Test Model Number	**KTPS120-24050-VI**	**KTPS120-30040-VI**	**KTPS120-48025-VI**
Test Mode	**Mode 10- Full Load (Pre-Scan Mode)**		
Test Model Number	**KTPS120-560214-VI**		

Note:

1. According to pre-scan data, we determine the data (Mode 9) shown in this test report, which reflects the worst-case data for each operation mode.
2. The EUT has serial model numbers for the requirement of marketing.
   The difference of model numbers are shown as below:

Model No.	Input Rated	Output Rated	Transformer
KTPS120-12090-VI	100-240Vac, 50-60Hz, 1.6A	12Vdc, 9A	T1
KTPS120-15080-VI		15Vdc, 8A	T2
KTPS120-16075-VI		16Vdc, 7.5A	T2
KTPS120-18066-VI		18Vdc, 6.6A	T3
KTPS120-19063-VI		19Vdc, 6.3A	T3
KTPS120-20060-VI		20Vdc, 6A	T3
KTPS120-24050-VI		24Vdc, 5A	T4
KTPS120-30040-VI		30Vdc, 4A	T5
KTPS120-48025-VI		48Vdc, 2.5A	T6
KTPS120-560214-VI		56Vdc, 2.14A	T7

3. This report was reproduced GesTek report No.1704001F-01, which changed the applicant and model numbers for the requirement of marketing.

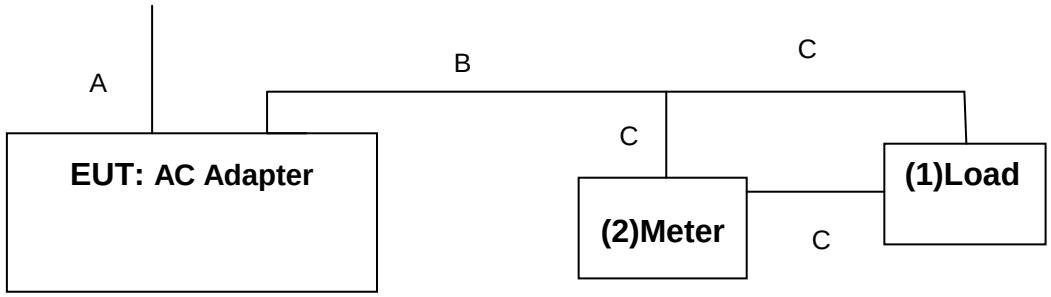
3.3 CONFIGURATION OF THE TESTED SYSTEM

The FCC IDs/Types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards, which have grants) are:

Item	Device	No.	Configuration
1	Load	-----	Full Load: 19.2Ω for mode 9
2	Meter	-----	0-10A

Note: All the peripherals above were selected specifically after confirming that there is no impact on test results.

3.4 BLOCK DIAGRAM OF CONNECTIONS BETWEEN EUT AND SIMULATORS



Signal Cable Description of the above support units				
No.	Signal Cable	Shielded	Core type	Length (m)
A	Power Line	☐Yes ☒No	☒No ☐1(near EUT) ☐1(near Aux) ☐2	1.8
B	Power Line	☒Yes ☐No	☐No ☐1(near EUT) ☒1(near Aux) ☐2	1.2
C	Power Line*3	☐Yes ☒No	☒No ☐1(near EUT) ☐1(near Aux) ☐2	0.5

3.5 LAB AMBIENT

Items	Range Requirement
Temperature (°C)	10-40
Humidity (%RH)	10-90
Barometric pressure (mbar)	860-1060

3.6 TEST FACILITY AUTHORIZATION AND ACCREDITATION

Global EMC Standard Tech. Corp. is accredited in respect of laboratory and the accreditation criteria is ISO/IEC 17025: 2005.

AUTHORIZATION	
FCC SITE DESCRIPTION	Aug. 10, 1995 /Aug. 25, 1998 File on FCC Engineering Laboratory Federal Communications Commission Designation Number: TW1031, TW1032

ACCREDITATION	
Taiwan Accreditation Foundation (TAF)	Recognized by the Council of Taiwan Accreditation Foundation and confirmed to meet the requirements of ISO/IEC 17025. Registration No.: 1082 Registration on TAF effective through Sep. 18, 2018

4. CONDUCTED EMISSION MEASUREMENT

4.1 TEST EQUIPMENTS

Item	Instrument	Manufacturer	Model	S/N or Version	Next Cal. Date
1	TEST RECEIVER	RS	ESCS30	100352	2017.12.05
2	L.I.S.N.(EUT)	RS	ENV216	100006	2017.08.17
3	CABLE	GTK	N/A	GTK-E-A154-01	2018.01.07
4	Software	FARAD	EZ-EMC	2A1.1(USB)	N/A

Note: 1. All equipments are calibrated and will be valid only for a period of 1 year.

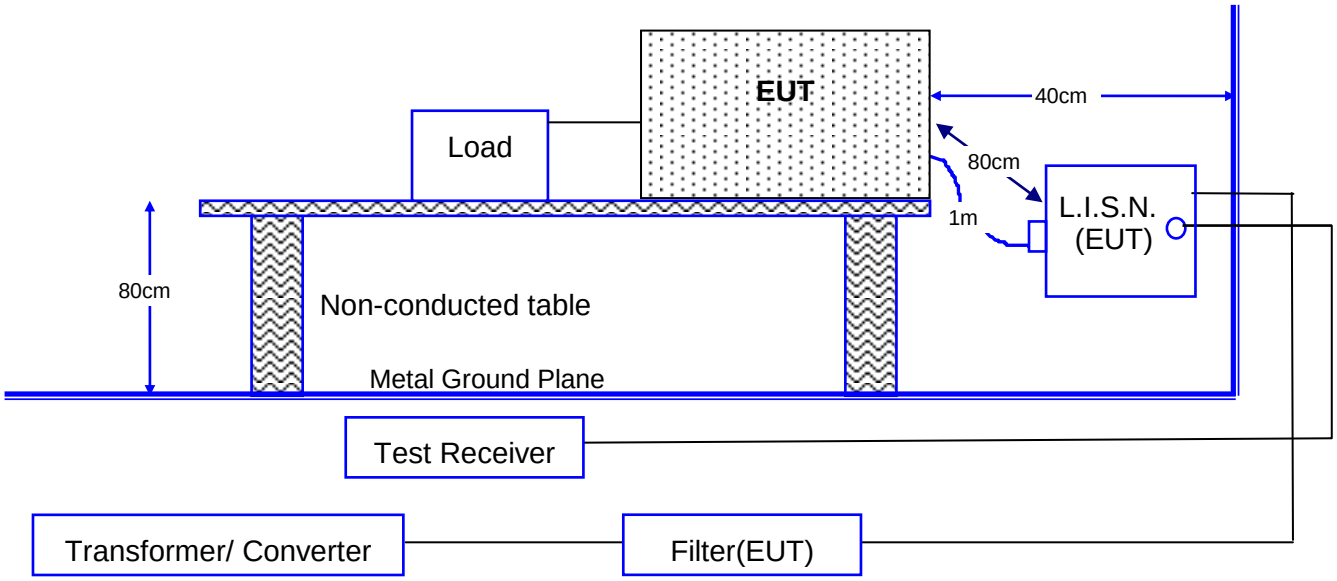
2. The test was performed at GTK Shielded Room B5.

4.2 TEST METHOD

According to CISPR 22 3rd Edition:1997

ANSI C63.4: 2014

4.3 BLOCK DIAGRAM OF TEST SETUP



Note: This is a representative setup diagram for Table-top EUT.
For Floor-standing EUT, the table will be removed with all others setup condition remain the same.

4.4 CONDUCTED EMISSION LIMITS

Frequency	Voltage limits dB(μV)	
	Class B	
MHz	QUASI-PEAK	AVERAGE
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5.0	56	46
5.0 to 30	60	50

Remarks : In the Above Table, the tighter limit applies at the band edges.

4.5 TEST CONFIGURATION ON MEASUREMENT

The equipments that are listed in section 4.1 are installed on Conducted Power Line Test in order to meet the requirement of the Commission and operating in a manner, which tends to maximize its emission characteristics in a normal application.

The device under test, installed in a representative system as described in section 4.3, was placed on a non-conductive table whose total height equal to 80cm. Powered from one L.I.S.N. which signal output to receiver, and the other peripherals was powered from another L.I.S.N. which signal output was terminated by 50Ω.

4.6 CONDUCTED EMISSION MEASURED PROCEDURE AND DATA

The measurement range of conducted emission, which is from 0.15 MHz to 30 MHz, was scan for peak emission curve of all the test modes. The worst mode is then measured using an average and/or quasi peak detector and record at least the disturbance levels and the frequencies of the six highest disturbances. The final measurement value is equal to the receiver reading plus the correction factor. If AMN insertion loss is more than 0.5dB, automatically the receiver will add the correction factor to the reading level.

4.7 OPERATING CONDITIONS OF THE EUT

The exercise program used during conducted emission measurement was designed to exercise the EUT in a manner similar to a typical use. The exercise sequence is listed as below:

1. Setup the EUT and simulators as shown on 4.3.
2. Turn on the power of all equipments.
3. Start test.

4.8 CONDUCTED EMISSION MEASUREMENT RESULTS

Date of Test	April 11, 2017	**Temperature**	20 ℃
EUT	AC Adapter	**Humidity**	60 %
Test Mode	Mode 9	**Display Pattern**	N/A
Test Power Supply	AC 120V/60Hz		

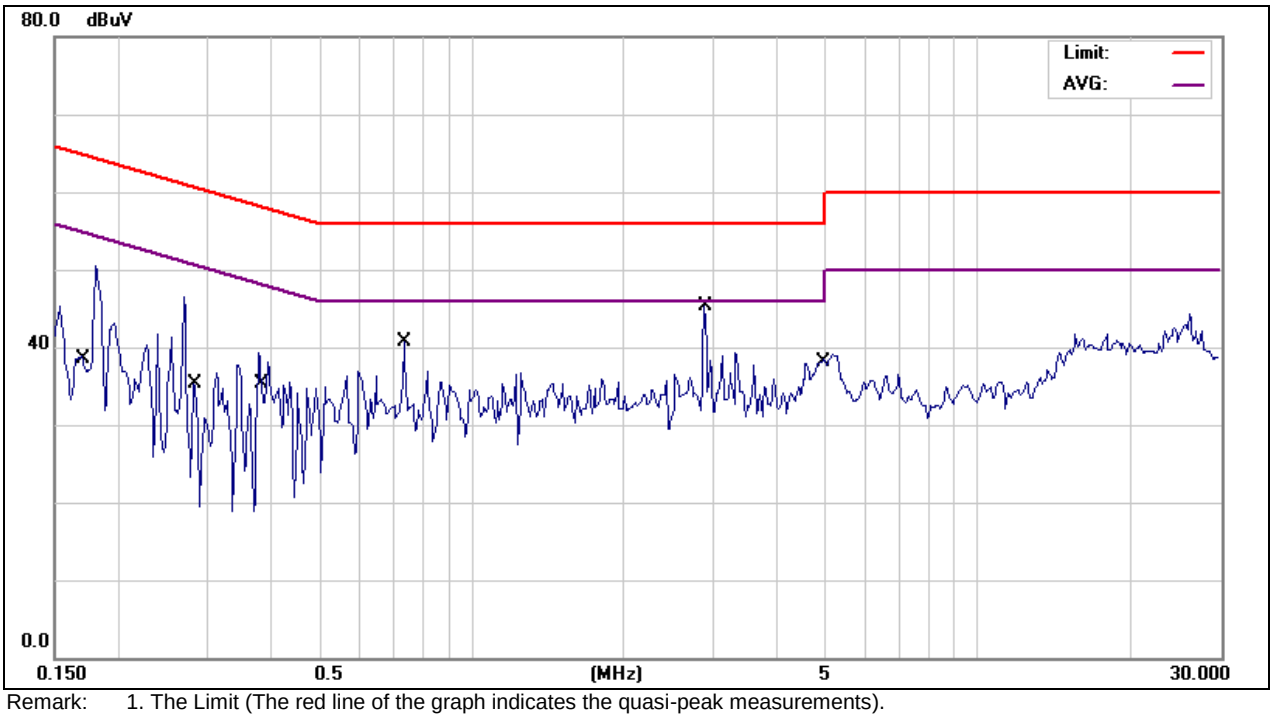
Line

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV	Limit dBμV	Over Limit dB	Detector
1	0.1720	28.15	9.65	37.80	64.86	-27.06	QP
2	0.1720	21.72	9.65	31.37	54.86	-23.49	AVG
3	0.2785	24.79	9.65	34.44	60.86	-26.42	QP
4	0.2785	14.72	9.65	24.37	50.86	-26.49	AVG
5	0.3888	25.79	9.64	35.43	58.09	-22.66	QP
6	★0.3888	20.79	9.64	30.43	48.09	-17.66	AVG
7	0.7376	21.77	9.65	31.42	56.00	-24.58	QP
8	0.7376	17.01	9.65	26.66	46.00	-19.34	AVG
9	2.8857	20.15	9.71	29.86	56.00	-26.14	QP
10	2.8857	13.52	9.71	23.23	46.00	-22.77	AVG
11	4.8752	22.89	9.76	32.65	56.00	-23.35	QP
12	4.8752	17.20	9.76	26.96	46.00	-19.04	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = L.I.S.N. insertion loss + cable loss
5. " ★ " means that this data is the worse case measurement level.
6. The measurement uncertainty is 4.40 dB.

Line



Remark: 1. The Limit (The red line of the graph indicates the quasi-peak measurements).
2. The AVG (The purple line of the graph indicates the average measurements).
3. The scan curve indicates peak detector measurement.

Date of Test	April 11, 2017	**Temperature**	20 ℃
EUT	AC Adapter	**Humidity**	60 %
Test Mode	Mode 9	**Display Pattern**	N/A
Test Power Supply	AC 120V/60Hz		

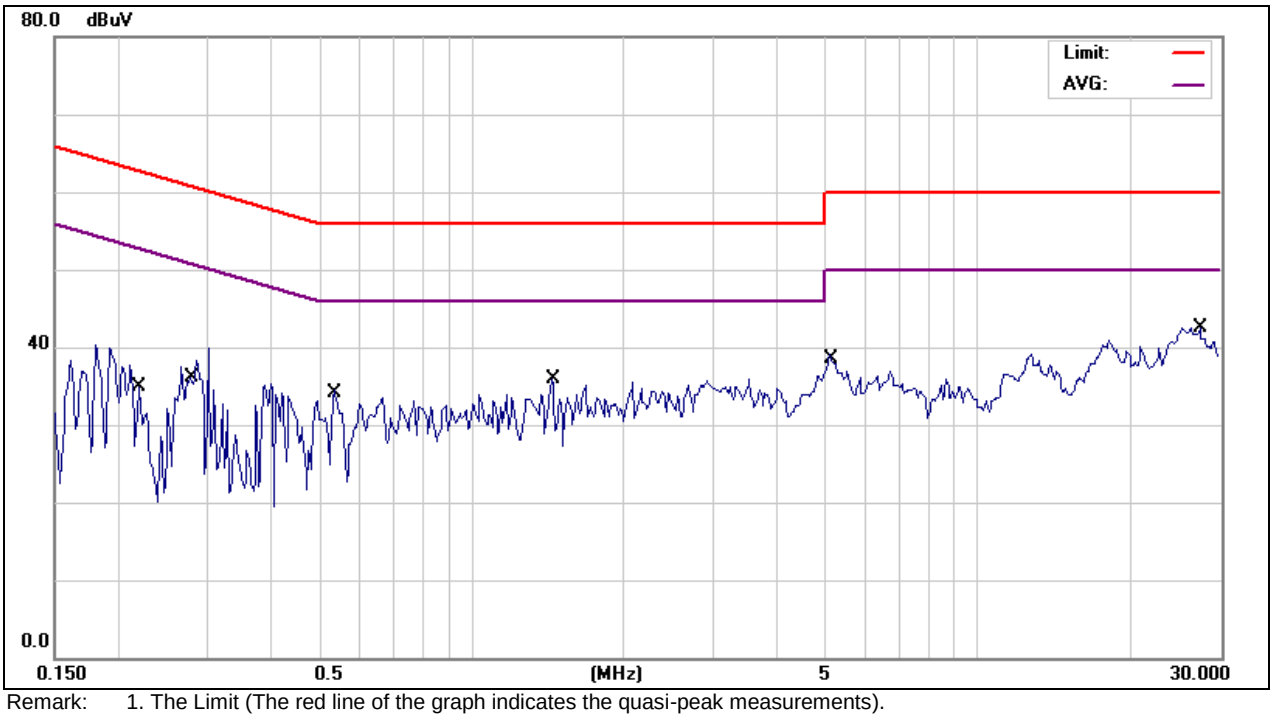
Neutral

No.	Frequency MHz	Reading Level dBµV	Factor dB	Measurement dBµV	Limit dBµV	Over Limit dB	Detector
1	0.2164	25.49	9.64	35.13	62.96	-27.83	QP
2	0.2164	18.03	9.64	27.67	52.96	-25.29	AVG
3	0.2797	25.93	9.64	35.57	60.82	-25.25	QP
4	0.2797	15.77	9.64	25.41	50.82	-25.41	AVG
5	0.5408	21.89	9.63	31.52	56.00	-24.48	QP
6	0.5408	10.93	9.63	20.56	46.00	-25.44	AVG
7	1.4397	20.89	9.66	30.55	56.00	-25.45	QP
8	1.4397	12.43	9.66	22.09	46.00	-23.91	AVG
9	5.1827	21.30	9.77	31.07	60.00	-28.93	QP
10	5.1827	15.13	9.77	24.90	50.00	-25.10	AVG
11	27.459	27.36	10.28	37.64	60.00	-22.36	QP
12	★27.459	21.08	10.28	31.36	50.00	-18.64	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = L.I.S.N. insertion loss + cable loss
5. " ★ " means that this data is the worse case measurement level.
6. The measurement uncertainty is 4.40 dB.

Neutral



Remark: 1. The Limit (The red line of the graph indicates the quasi-peak measurements).
2. The AVG (The purple line of the graph indicates the average measurements).
3. The scan curve indicates peak detector measurement.

5. RADIATED EMISSION MEASUREMENT

5.1 TEST EQUIPMENT

The following test equipments are used during the radiated emission tests:

Item	Instrument	Manufacturer	Model	S/N or Version	Next Cal. Date
1	TEST RECEIVER	RS	ESCS30	10392	2018.03.21
2	SPECTRUM	Agilent	E4411B	MY45108015	2017.12.07
3	PRE-AMPLIFIER	EMV-Technik	PA303	GTK-E-A393-01	2017.06.29
4	BILOG ANTENNA	SCHWARZBECK	VULB 9168	9168-253	2017.04.25
5	CABLE	PEWC	CFD400-NL	GTK-E-A395-01	2017.06.29
6	Software	FARAD	EZ-EMC	2A1.1(USB)	N/A

Note: 1. All equipments are calibrated and will be valid only for a period of 1 year.

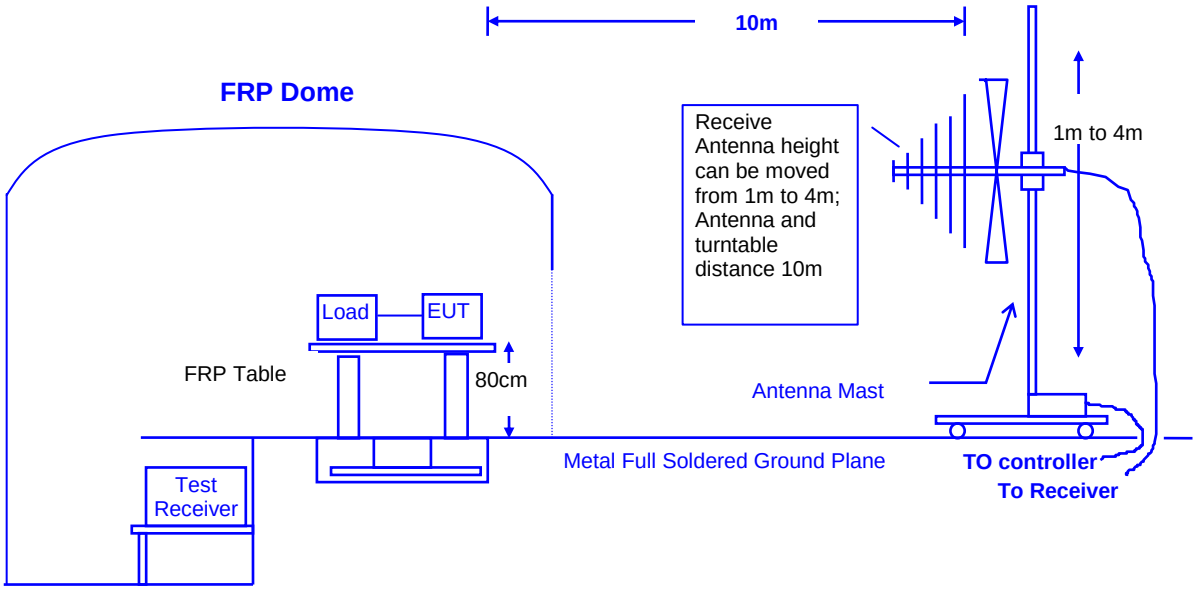
2. The test was performed at GTK Open Site C2.

5.2 TEST METHOD

According to CISPR 22 3rd Edition:1997

ANSI C63.4: 2014

5.3 OPEN AREA TEST SITE SETUP DIAGRAM



Note: This is a representative setup diagram for Table-top EUT.
For Floor-standing EUT, the table will be removed with all others setup condition remain the same.

5.4 RADIATED EMISSION LIMIT

Frequency	CISPR Class B	
	Distance	Field Strength
MHz	Meter	dB(μV/m)
30 to 230	10	30
230 to 1000	10	37

Remark :1. The tighter limit shall apply at the edge between two frequency bands.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

5.5 TEST CONFIGURATION

The equipments which are listed 5.1 are installed on Radiated Emission Test to meet the Commission requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

The device under test, installed in a representative system as described in section 5.3., was placed on a non-conductive table whose total height equaled 80 cm. This table can be rotated 360 degree. The measurement antenna was mounted to a non-conductive mast capable of moving the antenna vertically. Antenna height was varied from 1 meter to 4 meters and the system under test was rotated from 0 degree through 360 degrees relative to the antenna position and polarization (Horizontal and Vertical). Also the I/O cable position was investigated to find the maximum emission condition.

5.6 OPERATING CONDITION OF EUT

Same as section 4.7.

5.7 RADIATED EMISSION DATA

According 47CFR PART 15 subpart B section 15.33(b)(1), the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement rang (MHz)
Below 1.705	30
1.705-108	1000
108-500	2000
500-1000	5000
Above 1000	5^{th} harmonic of the highest frequency or 40 GHz, whichever is lower

Remark: The highest tested frequency is generated by the **65 kHz**.
At least, the upper frequency of measurement range is **1GHz.**

5.7.1 30 MHz to 1 GHz

The measurement range of radiated emission, which is from **30 MHz to 1 GHz,** was investigated. All readings are quasi-peak values with a resolution bandwidth of 120 kHz. The initial step in collecting radiated emission data is a spectrum analyzer peak scans of the measurement range for all the test modes and then use test receiver for final measurement and record at least the disturbance levels and the frequencies of the six highest disturbances. Then the worst modes were reported the following data pages.

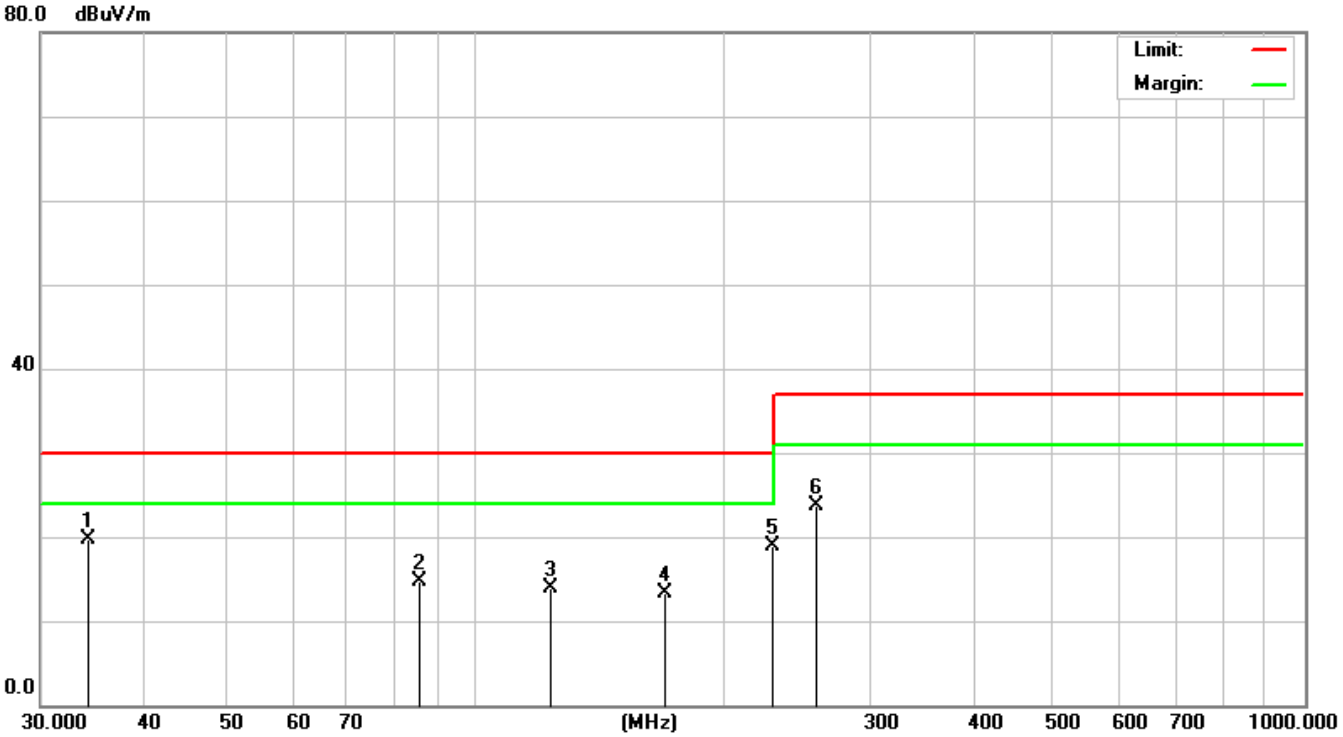
5.8 RADIATED EMISSIONS MEASUREMENT RESULTS

Date of Test	April 14, 2017	**Temperature**	20 deg/C
EUT	AC Adapter	**Humidity**	53 %RH
Working Cond.	Mode 9	**Display Pattern**	N/A
Antenna distance	10m at **Horizontal**	**Test Frequency Range**	30-1000MHz
Test Power Supply	AC 120V/60Hz		

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV/m	Limit dBμV/m	Over Limit dB	Detector
1	★34.2000	31.02	-11.34	19.68	30.00	-10.32	QP
2	85.8000	29.78	-15.13	14.65	30.00	-15.35	QP
3	123.3000	25.66	-11.82	13.84	30.00	-16.16	QP
4	169.8000	23.36	-10.11	13.25	30.00	-16.75	QP
5	227.7000	31.02	-12.20	18.82	30.00	-11.18	QP
6	257.5500	34.01	-10.39	23.62	37.00	-13.38	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. " ★ " means that this data is the worst case measurement level.
6. The antenna height could have ±1cm tolerance and the turn table degree could have ±1° tolerance.
7. The measurement uncertainty is 4.30 dB.



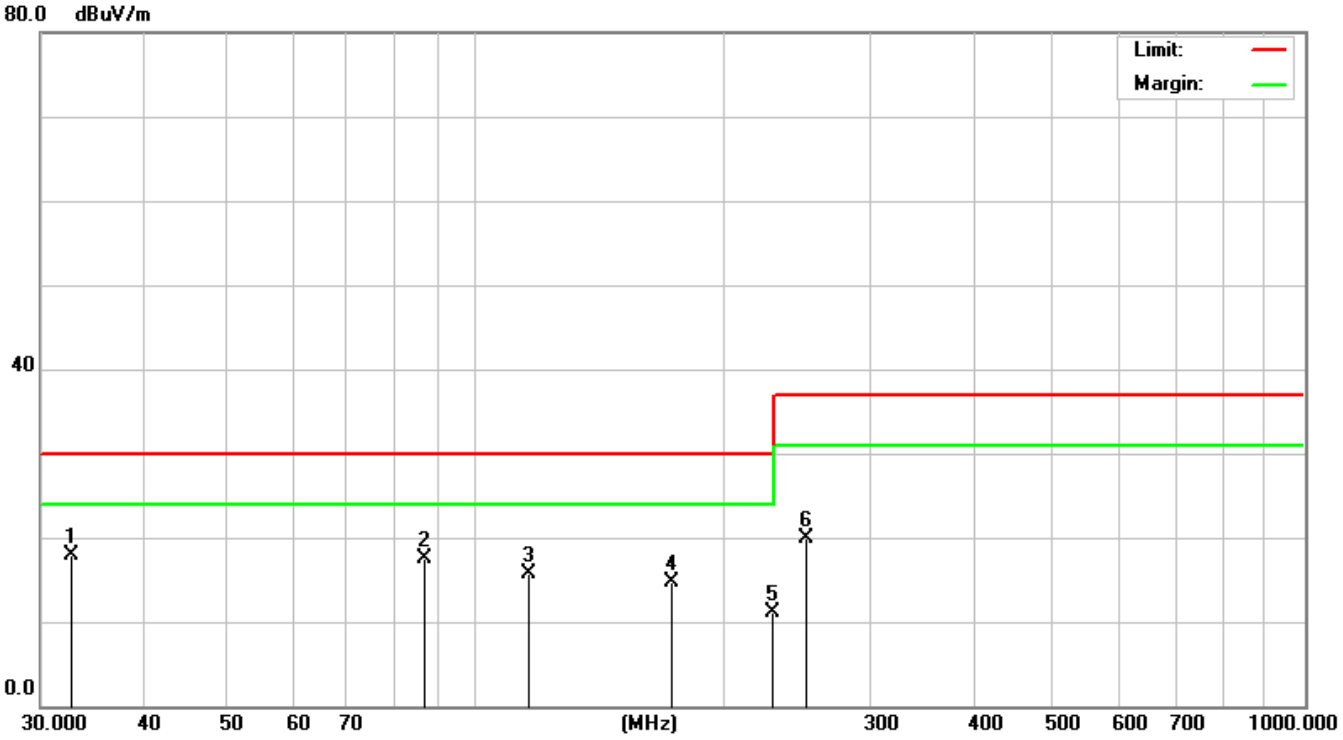
Remark: 1. The Limit (The red line of the graph indicates the quasi -peak measurements).
2. The Margin (The green line of the graph indicates the 6dB margin).

Date of Test	April 14, 2017	**Temperature**	20 deg/C
EUT	AC Adapter	**Humidity**	53 %RH
Working Cond.	Mode 9	**Display Pattern**	N/A
Antenna distance	10m at **Vertical**	**Test Frequency Range**	30-1000MHz
Test Power Supply	AC 120V/60Hz		

No.	Frequency MHz	Reading Level dBµV	Factor dB	Measurement dBµV/m	Limit dBµV/m	Over Limit dB	Detector
1	★32.5935	29.64	-11.64	18.00	30.00	-12.00	QP
2	86.9500	32.67	-15.25	17.42	30.00	-12.58	QP
3	116.6500	27.98	-12.23	15.75	30.00	-14.25	QP
4	172.3800	25.35	-10.61	14.74	30.00	-15.26	QP
5	227.5800	23.24	-12.20	11.04	30.00	-18.96	QP
6	250.9800	30.44	-10.60	19.84	37.00	-17.16	QP

Remarks:

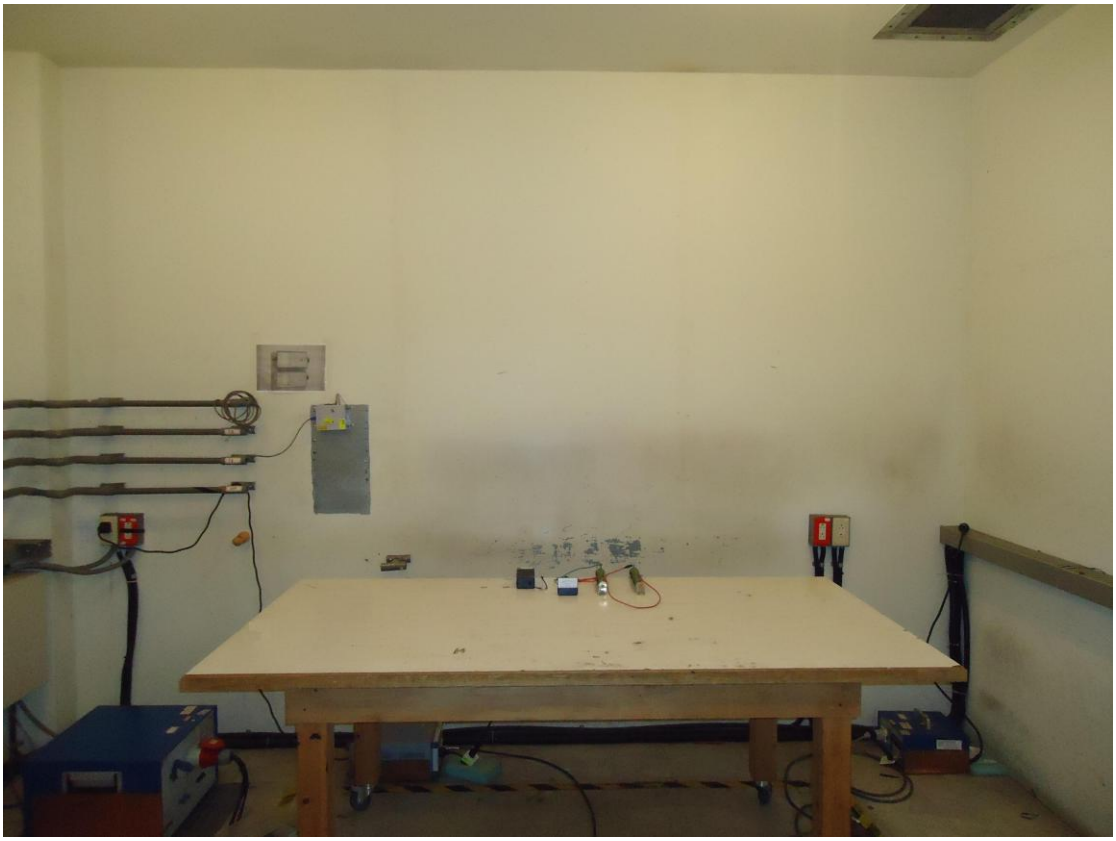
1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. " ★ " means that this data is the worst case measurement level.
6. The antenna height could have ±1cm tolerance and the turn table degree could have ±1° tolerance.
7. The measurement uncertainty is 4.30 dB.

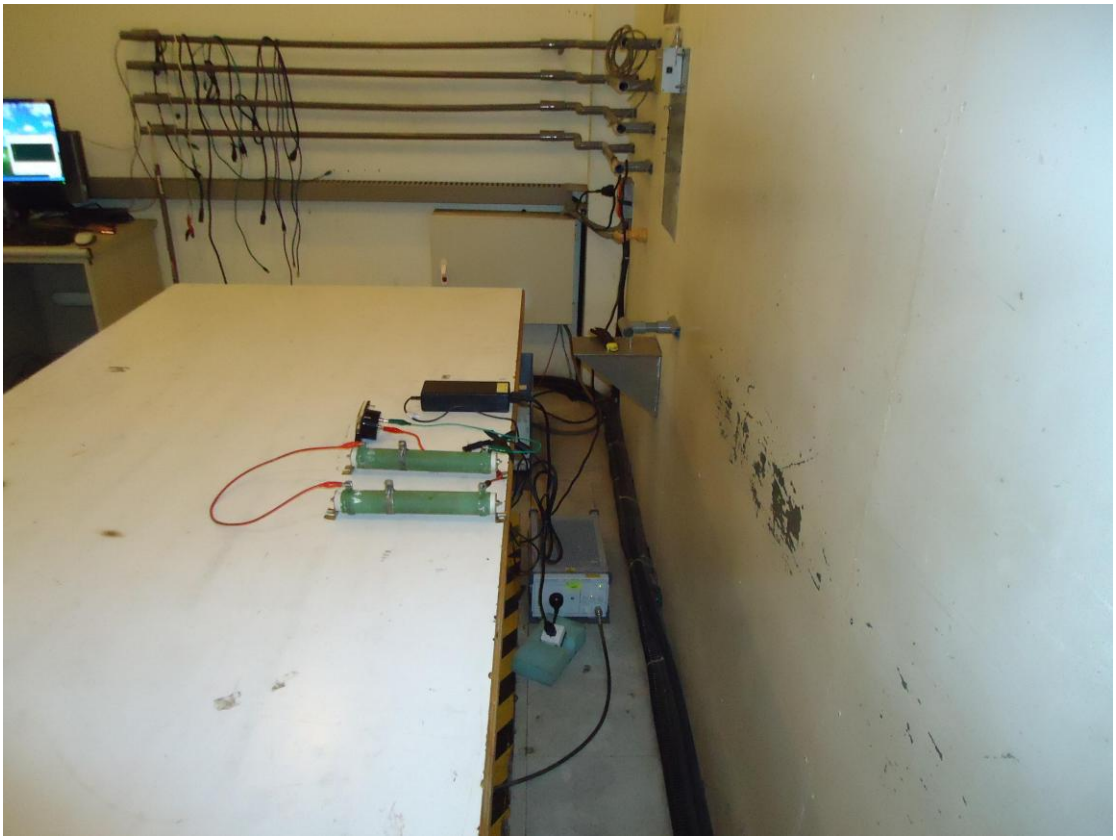


Remark: 1. The Limit (The red line of the graph indicates the quasi -peak measurements).
2. The Margin (The green line of the graph indicates the 6dB margin).

6. PHOTOGRAPHS FOR TEST

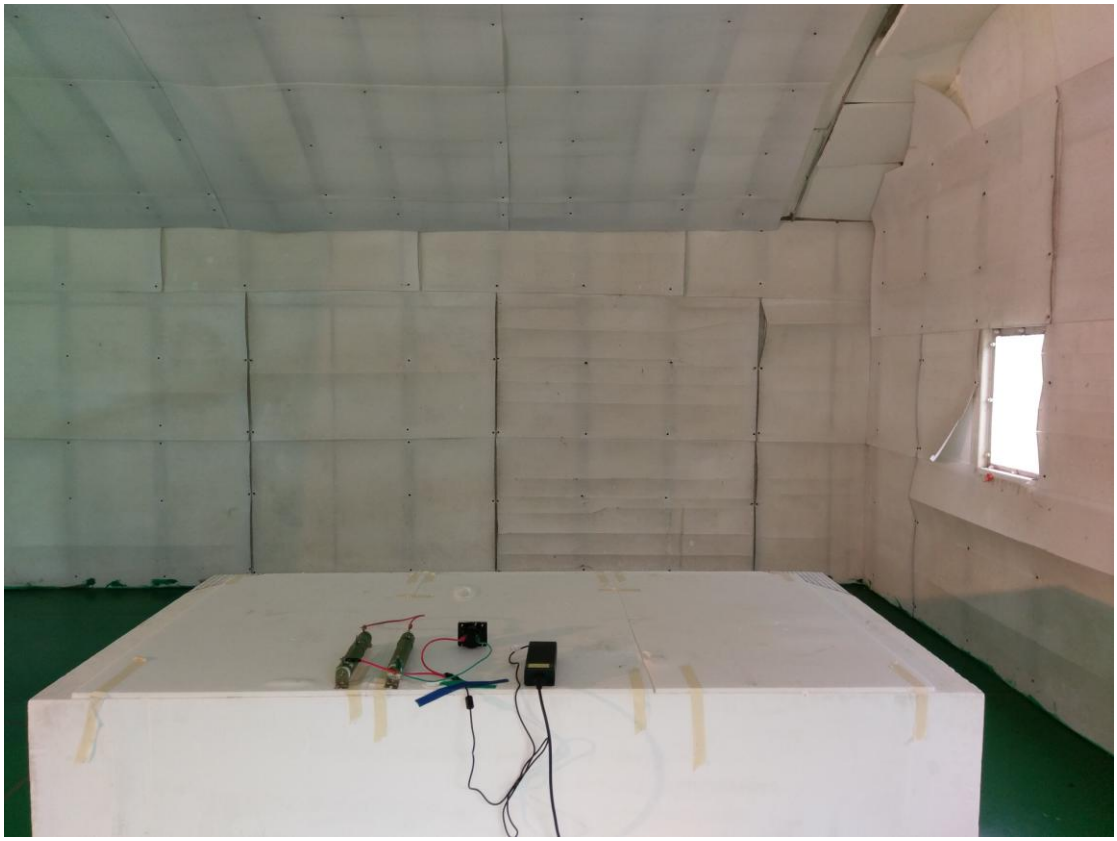
6.1 TEST PHOTOGRAPHS FOR CONDUCTION





6.2 TEST PHOTOGRAPHS FOR RADIATED

(30 MHz to 1 GHz)

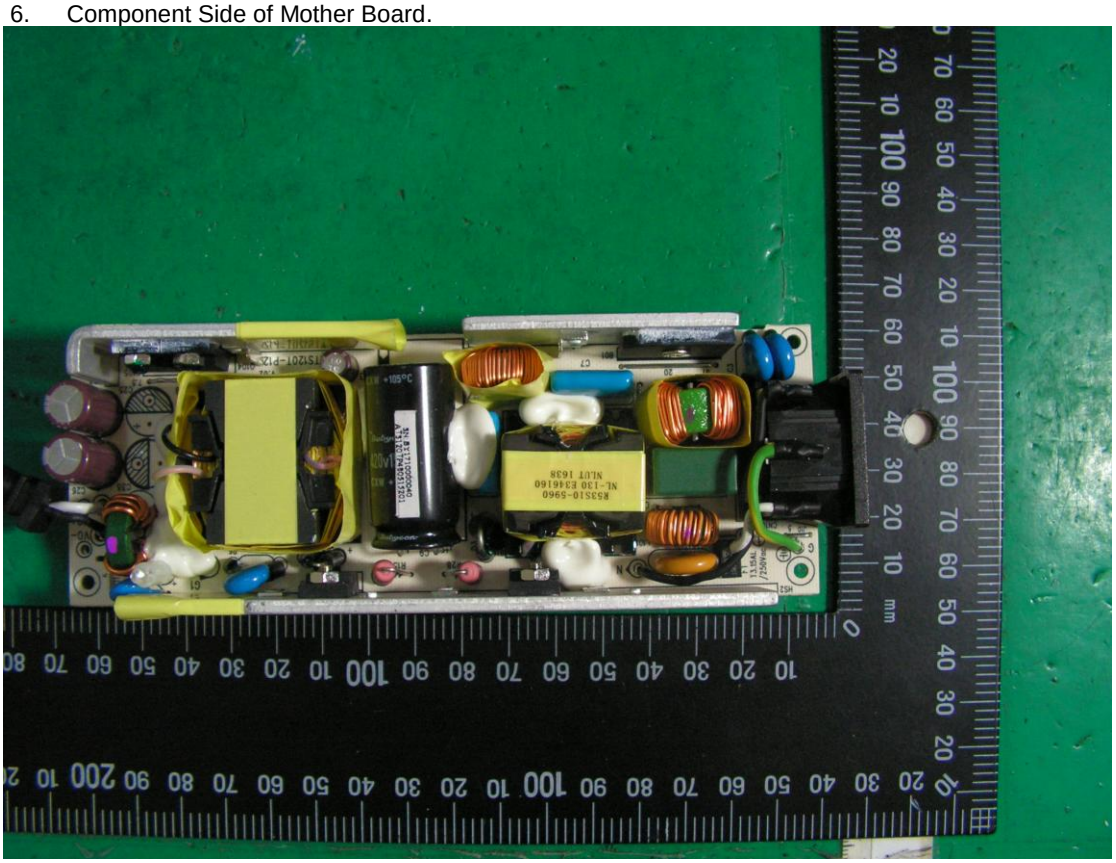


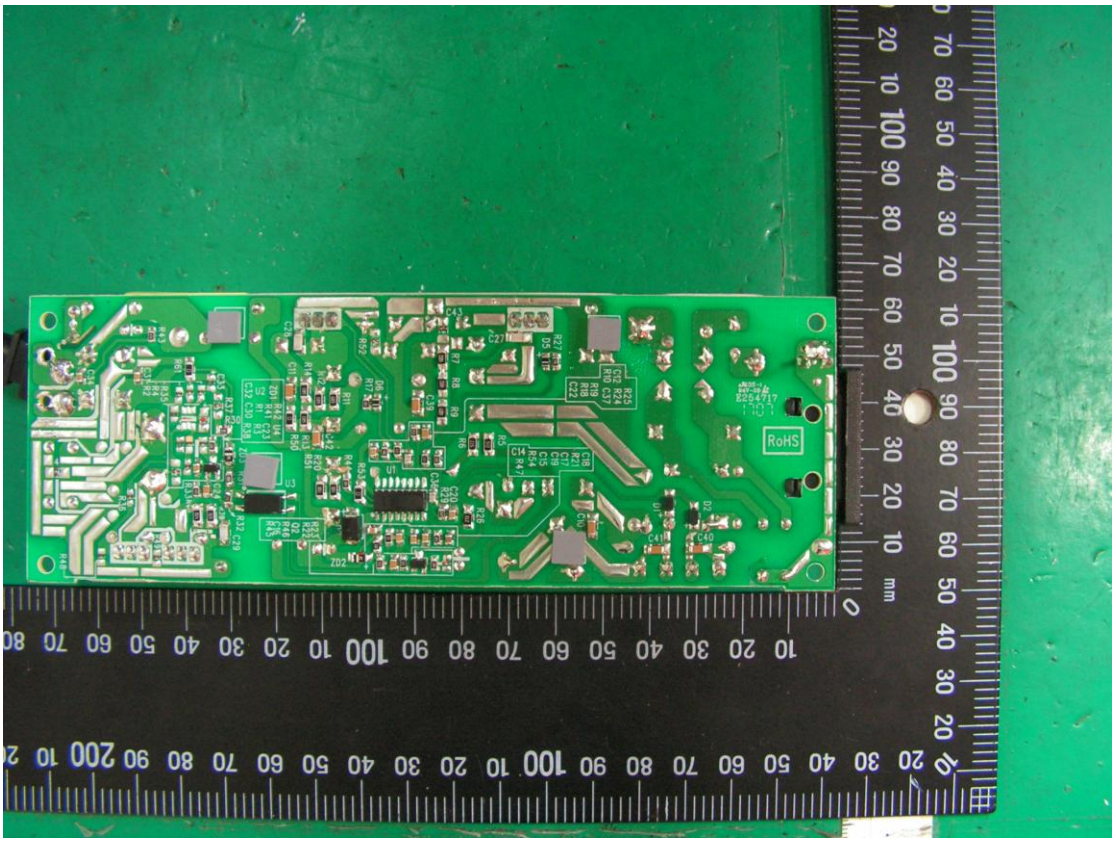
7. PHOTOGRAPHS FOR PRODUCT

1. Front View of AC Adapter.
2. Back View of AC Adapter.

3. Inner 1.
4. Inner 2.

5. Component Side of Mother Board.
6. Component Side of Mother Board.





8. EMI/EMS REDUCTION METHOD DURING COMPLIANCE TESTING

No modification was made during testing.

Appendix A

Circuit (Block) Diagram

(Shall be added by Applicant)

Appendix B

User Manual

(Shall be added by Applicant)