FCC Test Report

Report No.: AGC03946220903FE10

FCC ID	:	2AYA9L-WP-05A9
APPLICATION PURPOSE		Original Equipment
PRODUCT DESIGNATION	:	transparent magnetic power bank
BRAND NAME	:	LOOWOKO
MODEL NAME	:	L-WP-05A9, L-WP-05A9-T1, L-WP-05A9-T2, L-WP-05A9-T3, L-WP-05A9-T4, L-WP-05A9-T5, L-WP-05A9-T6
APPLICANT	:	ShenZhen Loowoko Technology Limited
DATE OF ISSUE	:	Sep. 27, 2022
STANDARD(S)	:	FCC Part 15 Subpart C
REPORT VERSION	:	V 1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Sep. 27, 2022	Valid	Initial Release

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1. GENERAL INFORMATION

Applicant	ShenZhen Loowoko Technology Limited
Address	4F, E building, Jin Bao Bao Industry Dist., No2 North Part, Shang Xue Industry City, Long Gang, Shenzhen, 518129, P.R.China
Manufacturer	ShenZhen Loowoko Technology Limited
Address	4F, E building, Jin Bao Bao Industry Dist., No2 North Part, Shang Xue Industry City, Long Gang, Shenzhen, 518129, P.R.China
Factory	ShenZhen Loowoko Technology Limited
Address	4F, E building, Jin Bao Bao Industry Dist., No2 North Part, Shang Xue Industry City, Long Gang, Shenzhen, 518129, P.R.China
Product Designation	transparent magnetic power bank
Brand Name	LOOWOKO
Test Model	L-WP-05A9
Series model	L-WP-05A9-T1, L-WP-05A9-T2, L-WP-05A9-T3, L-WP-05A9-T4, L-WP-05A9-T5, L-WP-05A9-T6
Difference description	All the same except for the appearance pattern
Date of Test	Sep. 16, 2022 to Sep. 26, 2022
Deviation from Standard	No any deviation from the test method
Test Result	Pass
Test Report Form No	AGCTR-ER-FCC-WPTV1.0

Prepared By	Bibo Zhang (Project Engineer)	Sep. 27, 2022
Reviewed By	Calvin Liu (Reviewer)	Sep. 27, 2022
Approved By	Max Zhang (Authorized Officer)	Sep. 27, 2022

2. PRODUCT INFORMATION

2.1 PRODUCT TECHNICAL DESCRIPTION

Hardware Version	WZ-2354-V2
Software Version	WZ-2354-V2
Operation Frequency	110.5KHz-205KHz
Modulation Type	ASK
Number of channels	1 Channel
Field Strength of Fundamental	63.87dBuV/m (Max)
Antenna Designation	Inductive loop coil Antenna
Antenna Gain	0dBi
Power Supply	Type-C Input:DC 5V3A, DC 9V2.2A, DC 12V1.67A Type-C Output:DC 5V2.4A, DC 9V1A, DC 12V1A Wireless Output:5W, 7.5W Total Output:DC 5V3A Capacity:5000mAh/3.85V/19.25Wh
Adapter Information	N/A

2.2 TEST FREQUENCY LIST

Frequency Band	Channel Number	Frequency
110.5KHz-205KHz	01	143.8 KHz

2.3 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AYA9L-WP-05A9** filing to comply with Part 2, Part 15 of the Federal Communication Commission rules.

2.4 TEST METHODOLOGY

The tests were performed according to following standards:

No.	Identity	Document Title
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations
2	FCC 47 CFR Part 15	Radio Frequency Devices
3	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

2.5 SPECIAL ACCESSORIES

Not available for this EUT intended for grant.

2.6 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2.7 ANTENNA REQUIREMENT

Standard Requirement
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 antennathat uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a brokenantenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
EUT Antenna:
The non-detachable antenna inside the device cannot be replaced by the user at will. The gain of the antenna is 0 dBi.

3. TEST ENVIRONMENT

3.1 ADDRESS OF THE TEST LABORATORY

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

3.2 TEST FACILITY

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

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) 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: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) 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 with Registration 975832.

IC-Registration No.: 24842 (CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.

3.3 ENVIRONMENTAL CONDITIONS

	NORMAL CONDITIONS	EXTREME CONDITIONS
Temperature range (℃)	15 - 35	-20 - 50
Relative humidty range	20 % - 75 %	20 % - 75 %
Pressure range (kPa)	86 - 106	86 - 106
Power supply	--	--
Note: The Extreme Temperature and Extreme Voltages declared by the manufacturer.		

3.4 MEASUREMENT UNCERTAINTY

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

Item	Measurement Uncertainty
Uncertainty of Conducted Emission for AC Port	U_c = ±2.9 dB
Uncertainty of Radiated Emission below 150kHz	U_c = ±4.2 dB
Uncertainty of Radiated Emission below 30MHz	U_c = ±3.8 dB
Uncertainty of Radiated Emission below 1GHz	U_c = ±4.0 dB
Uncertainty of total RF power, conducted	U_c = ±0.8 dB
Uncertainty of RF power density, conducted	U_c = ±2.6 dB
Uncertainty of spurious emissions, conducted	U_c = ±2 %
Uncertainty of Occupied Channel Bandwidth	U_c = ±2 %

3.5 LIST OF EQUIPMENTS USED

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESPI	101206	Mar. 28, 2022	Mar. 27, 2023
Artificial power network	R&S	ESH2-Z5	100086	Jun. 08, 2022	Jun. 07, 2023
Test Software	FARA	EZ-EMC(Ver. AGC-CON03A1)	N/A	N/A	N/A
Test Receiver	R&S	ESCI	10096	Mar. 28, 2022	Mar. 27, 2023
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Nov. 17, 2021	Nov. 16, 2022
Active Loop Antenna (9K-30Mhz)	ZHINAN	ZN30900C	18051	Mar. 12, 2022	Mar. 11, 2024
Wideband Antenna	SCHWARZBECK	VULB9168	VULB9168-494	Jan. 08, 2021	Jan. 07, 2023
Test Software	FARA	EZ-EMC(Ver.RA-03A)	N/A	N/A	N/A

4.SYSTEM TEST CONFIGURATION

4.1 EUT CONFIGURATION

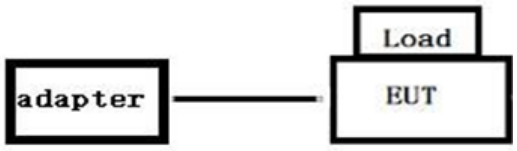
The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

4.2 EUT EXERCISE

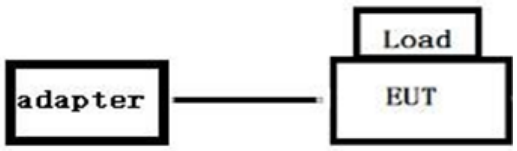
The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

4.3 CONFIGURATION OF TESTED SYSTEM

Radiated Emission Configure:



Conducted Emission Configure:



4.4 EQUIPMENT USED IN TESTED SYSTEM

The Following Peripheral Devices And Interface Cables Were Connected During The Measurement:

☒ Test Accessories Come From The Laboratory

Item	Equipment	Model No.	Identifier	Note
1	Adapter	HW-200325CP01	DC 5V	Accessories
2	Mobile Phone	iPhone12	N/A	Accessories

☒ Test Accessories Come From The Manufacturer

Item	Equipment	Model No.	Identifier	Note
1	transparent magnetic power bank	L-WP-05A9	2AYA9L-WP-05A9	EUT
2	Charger line	N/A	0.32m unshielded	Accessories

4.5 SUMMARY OF TEST RESULTS

Item	FCC Rules	Description Of Test	Result
1	§15.203	Antenna Equipment	Pass
2	§15.209(a)(f)	Radiated Spurious Emission	Pass
3	§15.215(c)	20dB Bandwidth	Pass
4	§15.205(a)	Restricted Bands of Operation	Pass
5	§15.207	AC Power Line Conducted Emission	Pass

5. DESCRIPTION OF TEST MODES

Summary table of Test Cases	
Test Item	Equipment type / Modulation
	WPT_(TX:143.8KHz)/ ASK
Radiated&Conducted Test Cases	Mode 1: AC/DC Adapter+EUT+Mobile Phone(Battery Status: ＜1%) Mode 2: AC/DC Adapter+EUT+Mobile Phone(Battery Status: ＜50%) Mode 3: AC/DC Adapter+EUT+Mobile Phone(Battery Status: ＜100%) Mode 4: EUT+Mobile Phone(Battery Status: ＜1%) Mode 5: EUT+Mobile Phone(Battery Status: ＜50%) Mode 6: EUT+Mobile Phone(Battery Status: 100%)
AC Conducted Emission	Mode 1: AC/DC Adapter+EUT+Mobile Phone(Battery Status: ＜1%) Mode 2: AC/DC Adapter+EUT+Mobile Phone(Battery Status: ＜50%) Mode 3: AC/DC Adapter+EUT+Mobile Phone(Battery Status: ＜100%) Mode 4: EUT+Mobile Phone(Battery Status: ＜1%) Mode 5: EUT+Mobile Phone(Battery Status: ＜50%) Mode 6: EUT+Mobile Phone(Battery Status: 100%)

Note:
1. Only the result of the worst case was recorded in the report, if no other cases.
2. The battery is full-charged during the test.
3. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
4. Wireless output up to 5W when charging.

6. FIELD STRENGTH OF FUNDAMENTAL

6.1 PROVISIONS APPLICABLE

Test Requirement:	FCC Part15 C Section 15.209
Test Method:	ANSI C63.10:2013
Test Frequency Range:	9kHz to 1GHz
Test site:	Measurement Distance: 3m

Receiver setup:

Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Limits for frequency below 30MHz

Frequency	Limit (uV/m)	Measurement Distance(m)	Remark
0.009-0.490	2400/F(kHz)	300	Quasi-peak Value
0.490-1.705	24000/F(kHz)	30	Quasi-peak Value
1.705-30	30	30	Quasi-peak Value

Limits for frequency Above 30MHz

Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.00	Quasi-peak Value
88MHz-216MHz	43.50	Quasi-peak Value
216MHz-960MHz	46.00	Quasi-peak Value
960MHz-1GHz	54.00	Quasi-peak Value
Above 1GHz	54.00	Average Value
	74.00	Peak Value

Remark： (1) Emission level dB μV = 20 log Emission level μV/m
(2) The smaller limit shall apply at the cross point between two frequency bands.
(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

6.2 MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

6.3 FIELD STRENGTH CALCULATION

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

FS = RA + AF + CF - AG - AV

where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB/m
AG = Amplifier Gain in dB
AV = Average Factor in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

FS = RR + LF

where FS = Field Strength in dBµV/m
RR = RA - AG - AV in dBµV
LF = CF + AF in dB

Assume a receiver reading of 52.0 dBµV is obtained. The antenna factor of 7.4 dB/m and cable factor of 1.6 dB are added. The amplifier gain of 29 dB and average factor of 5 dB are subtracted, giving a field strength of 27 dBµV/m.
This value in dBµV/m was converted to its corresponding level in µV/m.

RA = 52.0 dBµV/m
AF = 7.4 dB/m RR = 18.0 dBµV
CF = 1.6 dB LF = 9.0 dB
AG = 29.0 dB
AV = 5.0 dB
FS = RR + LF
FS = 18 + 9 = 27 dBµV/m

Level in µV/m = Common Antilogarithm [(27 dBµV/m)/20] = 22.4 µV/m

Magnetic field strength calculation (9 kHz – 30 MHz)

When the limit is in terms of magnetic field, the following equation applies:

H[dB(µA/m)] = V[dB(µV)] + LC [dB] - GPA [dB]+ AFH [dB(S/m)]

Where,
H is the magnetic field strength (to be compared with the limit),
V is the voltage level measured by the receiver or spectrum analyzer,
LC is the cable loss,
GPA is the gain of the preamplifier (if used), and
AFH is the magnetic antenna factor.

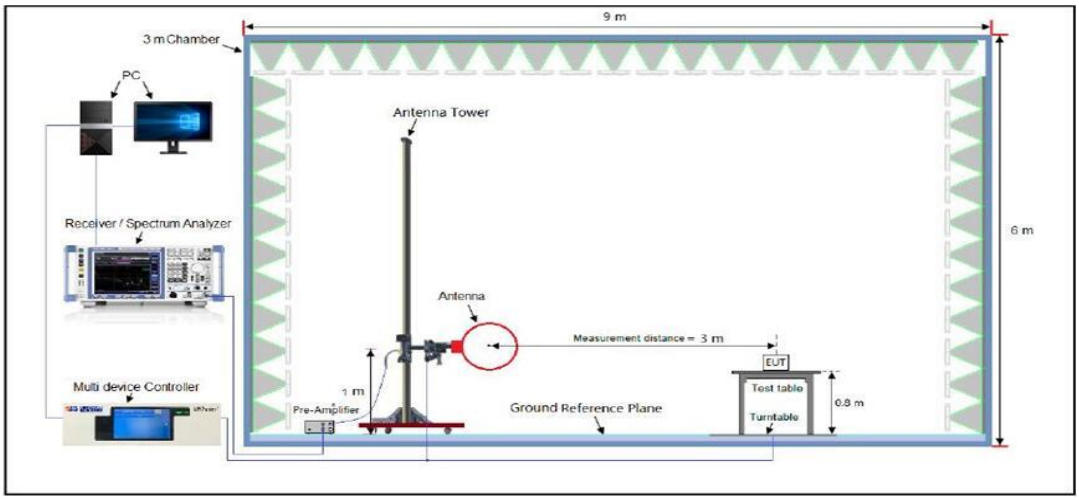
If the “electrical” antenna factor is used instead, the above equation becomes:

H[dB(µA/m)] =V[dB(µV)] + LC [dB] – GPA [dB] + AFE [dB(m-1)] - 51.5 [dBΩ]

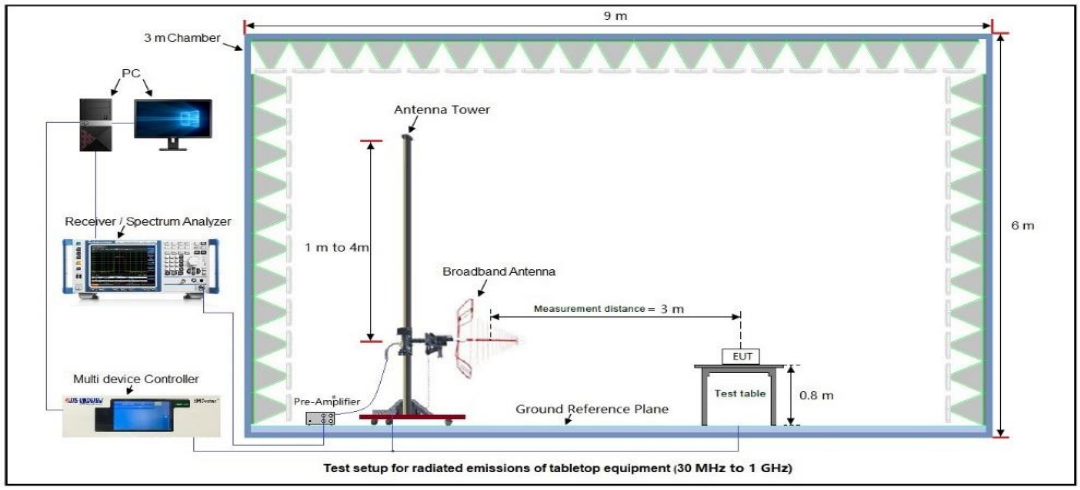
where AFE is the “electric” antenna factor, as provided by the antenna calibration laboratory.

6.4 MEASUREMENT SETUP (BLOCK DIAGRAM OF CONFIGURATION)

RADIATED EMISSION TEST SETUP 9KHz-30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz

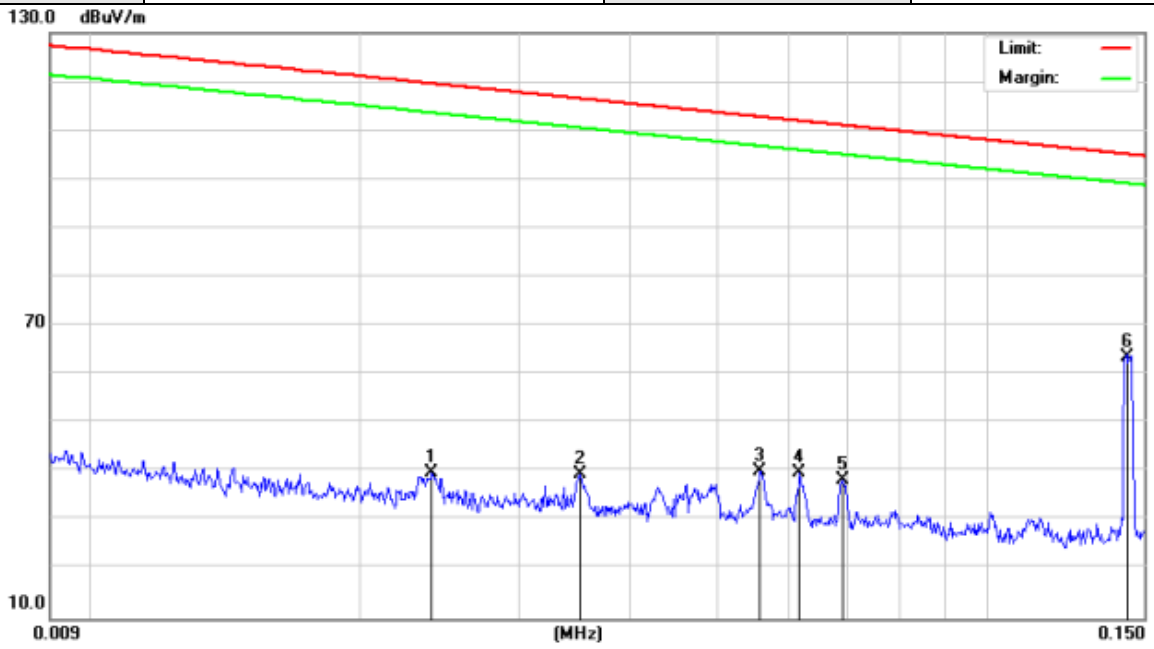


The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.205 limits.

6.5 MEASUREMENT RESULTS

ELECTRIC FIELD TEST IN THE FREQUENCY RANGE 9KHz-150KHz

EUT	transparent magnetic power bank	Model Name	L-WP-05A9
Temperature	22°C	Relative Humidity	55%
Pressure	985hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Face

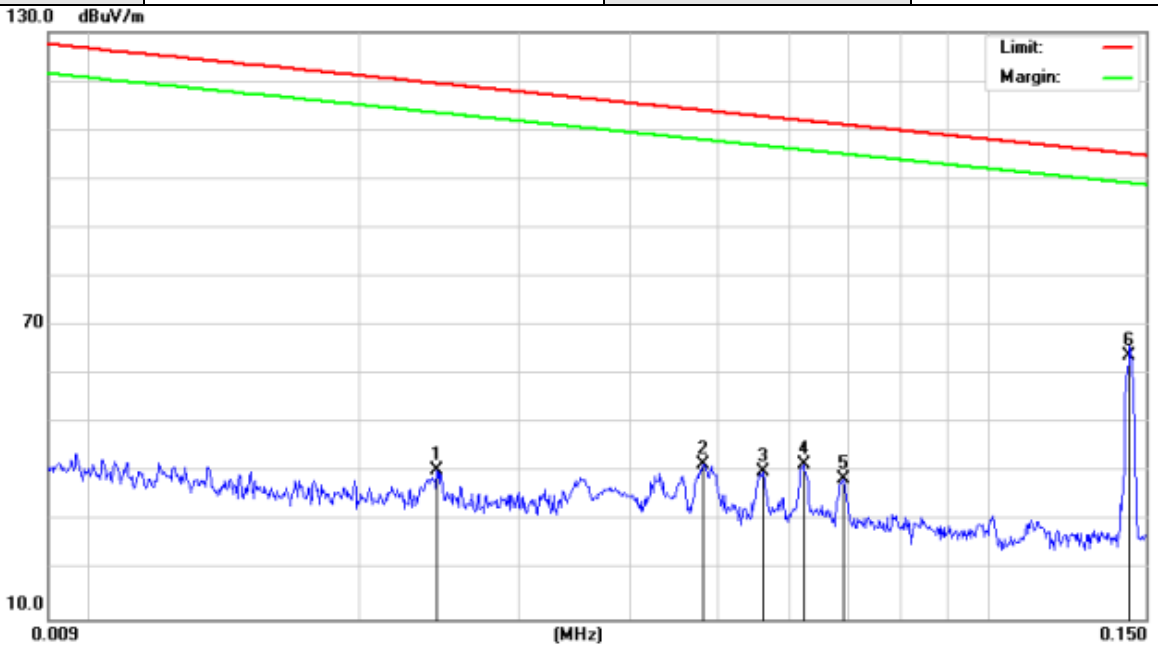


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		0.0240	12.49	27.29	39.78	119.6	-79.85	peak
2		0.0351	13.02	26.47	39.49	116.5	-77.06	peak
3		0.0559	15.17	24.91	40.08	112.7	-72.70	peak
4		0.0618	15.34	24.47	39.81	111.9	-72.16	peak
5		0.0690	14.53	23.93	38.46	111.0	-72.62	peak
6	*	0.1438	42.06	21.54	63.60	105.1	-41.54	peak

RESULT: PASS

ELECTRIC FIELD TEST IN THE FREQUENCY RANGE 9KHz-150KHz

EUT	transparent magnetic power bank	Model Name	L-WP-05A9
Temperature	22°C	Relative Humidity	55%
Pressure	985hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Side

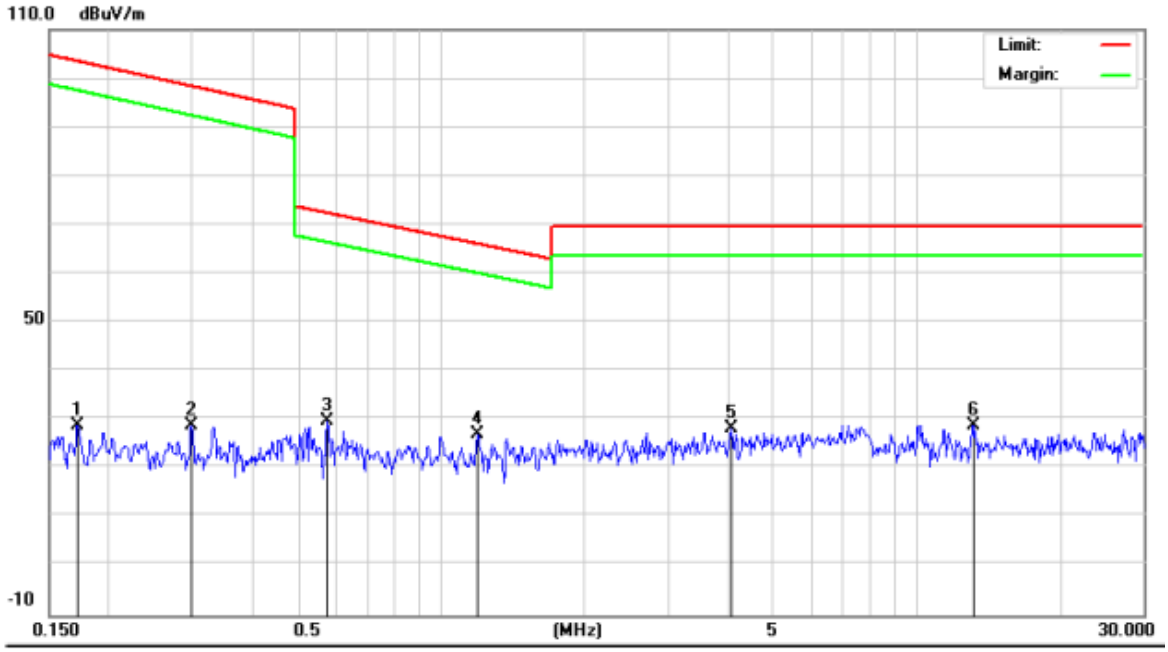


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		0.0244	13.16	27.27	40.43	119.4	-79.06	peak
2		0.0483	16.15	25.48	41.63	113.9	-72.34	peak
3		0.0562	15.14	24.89	40.03	112.7	-72.71	peak
4		0.0624	17.13	24.43	41.56	111.8	-70.33	peak
5		0.0690	14.85	23.94	38.79	111.0	-72.29	peak
6	*	0.1438	42.33	21.54	63.87	105.1	-41.27	peak

RESULT: PASS

ELECTRIC FIELD TEST IN THE FREQUENCY RANGE 150KHz-30MHz

EUT	transparent magnetic power bank	Model Name	L-WP-05A9
Temperature	22°C	Relative Humidity	55%
Pressure	985hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Face

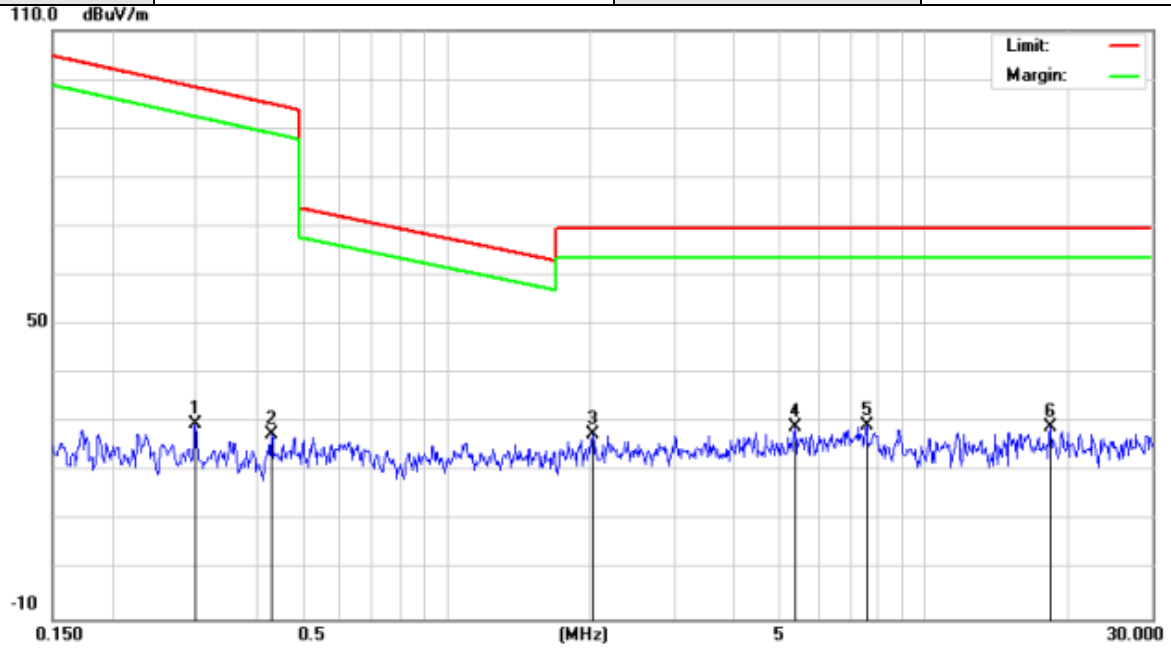


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		0.1722	7.48	21.49	28.97	103.5	-74.54	peak
2		0.2987	7.51	21.25	28.76	98.40	-69.64	peak
3		0.5762	8.89	20.94	29.83	72.39	-42.56	peak
4	*	1.1907	5.54	21.45	26.99	66.09	-39.10	peak
5		4.0704	5.46	22.74	28.20	69.54	-41.34	peak
6		13.1269	4.20	24.61	28.81	69.54	-40.73	peak

RESULT: PASS

ELECTRIC FIELD TEST IN THE FREQUENCY RANGE 150KHz-30MHz

EUT	transparent magnetic power bank	Model Name	L-WP-05A9
Temperature	22°C	Relative Humidity	55%
Pressure	985hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Face



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		0.2987	8.37	21.25	29.62	98.40	-68.78	peak
2		0.4305	6.64	21.01	27.65	95.00	-67.35	peak
3		2.0225	5.62	22.12	27.74	69.54	-41.80	peak
4		5.3615	6.17	23.12	29.29	69.54	-40.25	peak
5	*	7.5658	5.77	23.72	29.49	69.54	-40.05	peak
6		18.3283	4.04	24.99	29.03	69.54	-40.51	peak

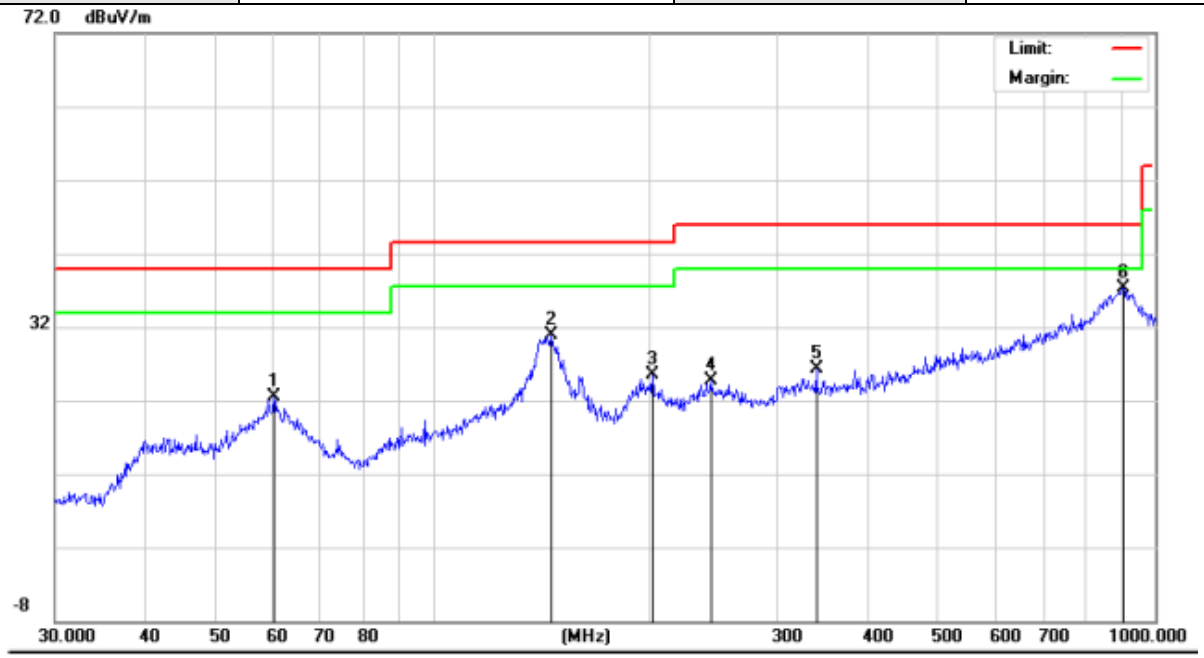
RESULT: PASS

NOTES:

1. Quasi-Peak detector is used for frequency below 30MHz.
2. Negative value in the margin column shows emission below limit.
3. All measurements were made with 0.6m loop antenna at 3m distance. All emissions are below the QP limit.
4. Corr. Factor= Antenna Factor (dB/m) + Cable Loss (dB)
5. Loop antenna is used for the emission under 30MHz.

RADIATED EMISSION BELOW 1GHz

EUT	transparent magnetic power bank	**Model Name**	L-WP-05A9
Temperature	22°C	**Relative Humidity**	55%
Pressure	985hPa	**Test Voltage**	Normal Voltage
Test Mode	Mode 3	**Antenna**	Horizontal

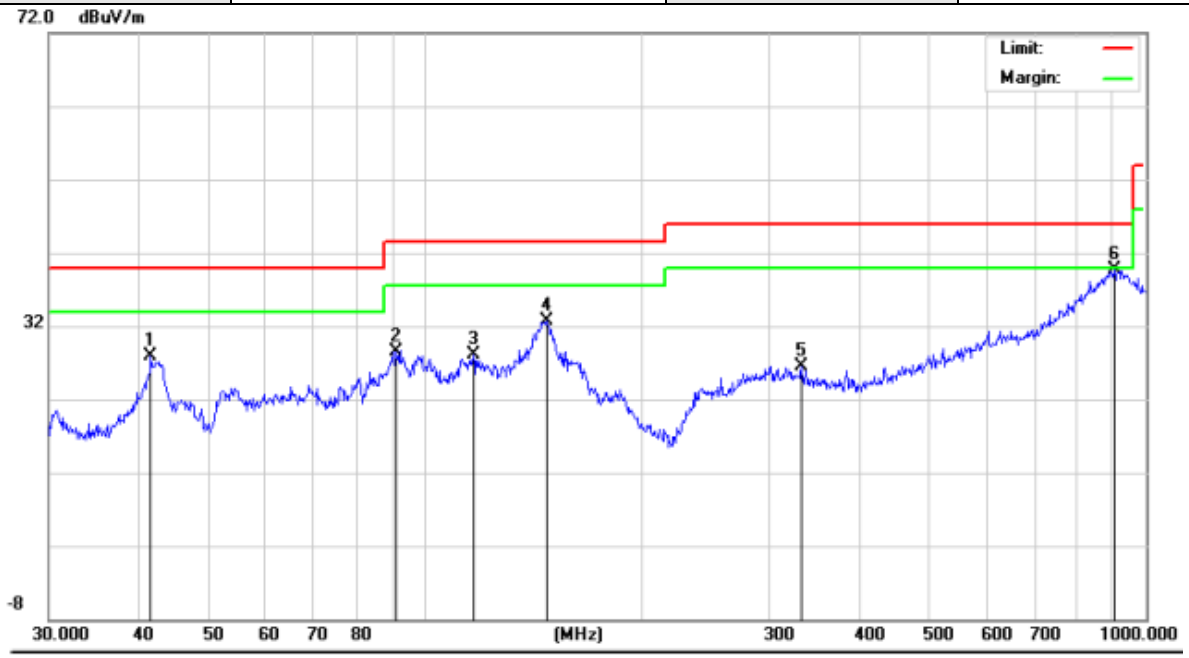


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		60.2801	6.08	16.33	22.41	40.00	-17.59	peak
2		145.8611	15.69	15.22	30.91	43.50	-12.59	peak
3		201.3930	9.42	16.00	25.42	43.50	-18.08	peak
4		242.5253	6.07	18.62	24.69	46.00	-21.31	peak
5		339.5888	8.30	17.93	26.23	46.00	-19.77	peak
6	*	903.3094	5.54	31.71	37.25	46.00	-8.75	peak

RESULT: PASS

RADIATED EMISSION BELOW 1GHz

EUT	transparent magnetic power bank	**Model Name**	L-WP-05A9
Temperature	22°C	**Relative Humidity**	55%
Pressure	985hPa	**Test Voltage**	Normal Voltage
Test Mode	Mode 3	**Antenna**	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		41.5670	12.06	15.82	27.88	40.00	-12.12	peak
2		91.1746	12.75	15.75	28.50	43.50	-15.00	peak
3		116.5401	9.95	18.11	28.06	43.50	-15.44	peak
4		147.4036	15.56	17.22	32.78	43.50	-10.72	peak
5		332.5187	6.45	19.99	26.44	46.00	-19.56	peak
6	*	903.3094	5.19	34.54	39.73	46.00	-6.27	peak

RESULT: PASS

Note: 1. Factor=Antenna Factor + Cable loss, Over=Measurement-Limit.

2. All test modes had been pre-tested. The mode 3 is the worst case and recorded in the report.

3.The “Factor” value can be calculated automatically by software of measurement system.

7. 20 dB BANDWIDTH

7.1 PROVISIONS APPLICABLE

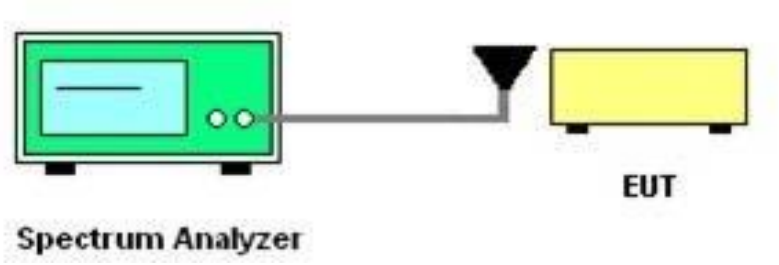
N/A

7.2 MEASUREMENT PROCEDURE

Set the parameters of SPA as below:

1. The spectrum analyzer connected via a receive antenna placed near the EUT in peak Max hold mode.
2. Centre frequency = Operation Frequency
3. The resolution bandwidth of 300 Hz and the video bandwidth of 1 kHz were used.
4. Span: 3kHz, Sweep time: Auto
5. Set the EUT to continue transmitting mode. Allow the trace to stabilize. Use the “N dB down” function of SPA to define the bandwidth.
6. Measured the spectrum width with power higher than 20dB below carrier.
7. Measured the 99% OBW.
8. Record the plots and Reported.

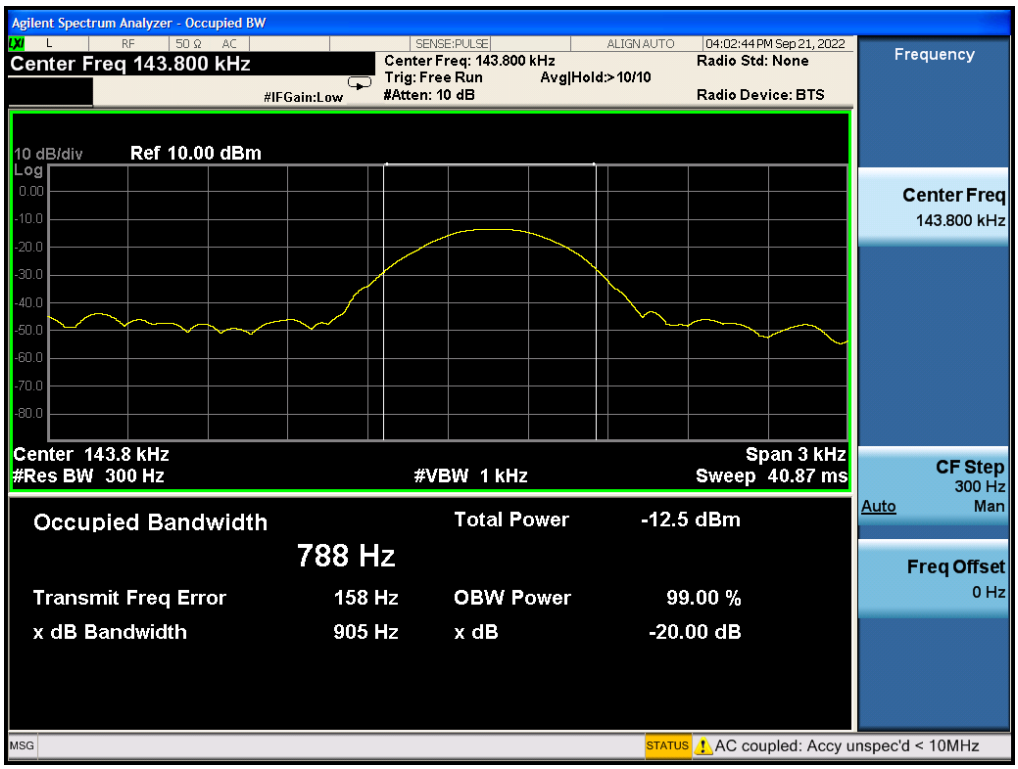
7.3 MEASUREMENT SETUP (BLOCK DIAGRAM OF CONFIGURATION)



7.4 MEASUREMENT RESULTS

Test Data of Occupied Bandwidth and -20dB Bandwidth					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (kHz)	-20dB Bandwidth (kHz)	Limits (MHz)	Pass or Fail
ASK	0.1438	0.788	0.905	N/A	Pass

Test Graphs of Occupied Bandwidth&-20dB Bandwidth



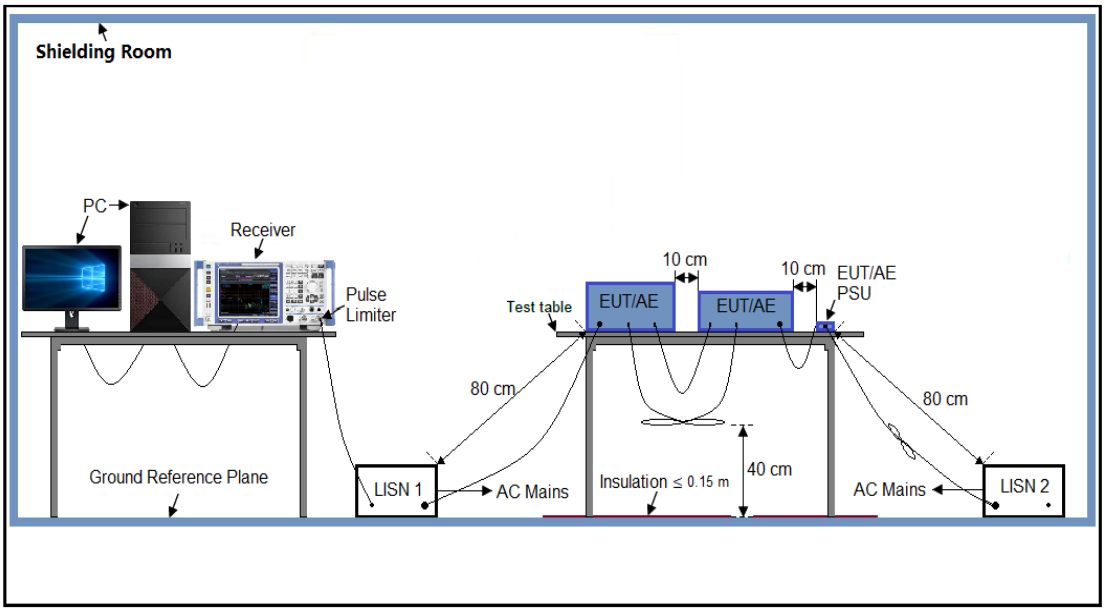
8. AC POWER LINE CONDUCTED EMISSION TEST

8.1 LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P. (dBμV)	Average (dBμV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note: 1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

8.2 MEASUREMENT SETUP (BLOCK DIAGRAM OF CONFIGURATION)



8.3 PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipment received AC120V/60Hz power from a LISN, if any.
5. The EUT received DC 5V power from adapter which received AC120V/60Hz power from a LISN.
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

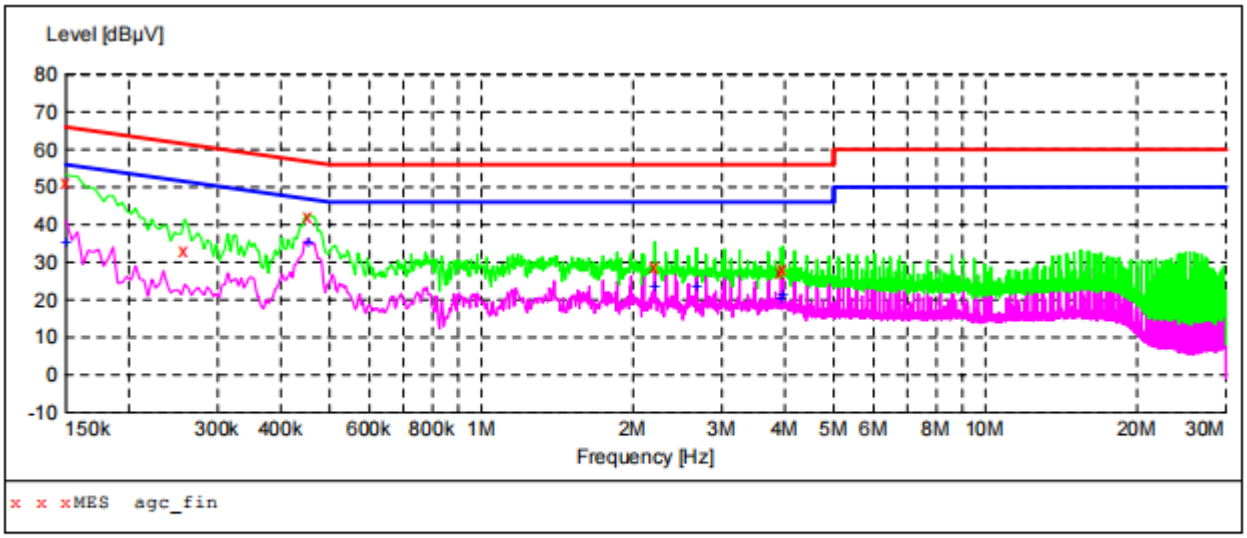
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

8.4 FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

8.5 MEASUREMENT RESULTS

AC LINE CONDUCTED EMISSION TEST			
Test Mode	Mode 3	LISN line	Hot Side



MEASUREMENT RESULT: "agc_fin"

2022/9/20 14:44

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	51.50	6.9	66	14.5	QP	L1	GND
0.258000	33.20	6.2	62	28.3	QP	L1	GND
0.454000	42.10	5.5	57	14.7	QP	L1	GND
2.210000	29.10	6.5	56	26.9	QP	L1	GND
3.930000	27.10	6.5	56	28.9	QP	L1	GND
3.974000	28.20	6.5	56	27.8	QP	L1	GND

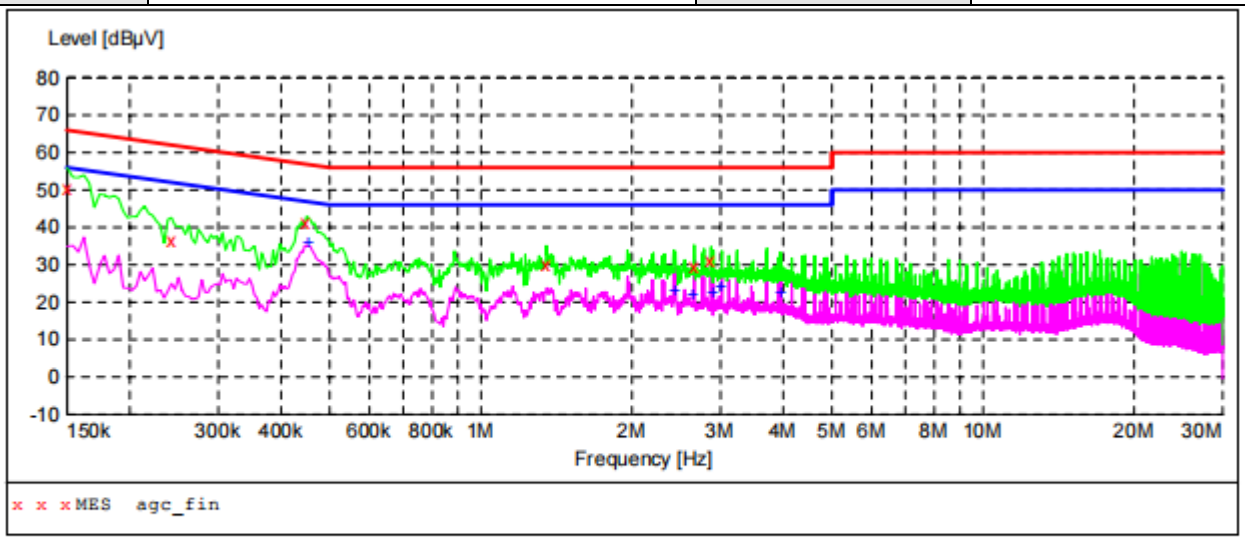
MEASUREMENT RESULT: "agc_fin2"

2022/9/20 14:44

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	35.20	6.9	56	20.8	AV	L1	GND
0.454000	35.10	5.5	47	11.7	AV	L1	GND
2.210000	23.50	6.5	46	22.5	AV	L1	GND
2.674000	23.30	6.5	46	22.7	AV	L1	GND
3.930000	20.30	6.5	46	25.7	AV	L1	GND
3.974000	21.50	6.5	46	24.5	AV	L1	GND

RESULT: PASS

AC LINE CONDUCTED EMISSION TEST			
Test Mode	Mode 3	LISN line	Neutral Side



MEASUREMENT RESULT: "agc_fin"

2022/9/20 14:40

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	50.60	6.9	66	15.4	QP	N	GND
0.242000	36.60	6.3	62	25.4	QP	N	GND
0.450000	41.10	5.5	57	15.8	QP	N	GND
1.350000	30.00	5.9	56	26.0	QP	N	GND
2.658000	29.40	6.5	56	26.6	QP	N	GND
2.874000	31.40	6.5	56	24.6	QP	N	GND

MEASUREMENT RESULT: "agc_fin2"

2022/9/20 14:40

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.454000	35.80	5.5	47	11.0	AV	N	GND
2.442000	23.10	6.5	46	22.9	AV	N	GND
2.658000	22.00	6.5	46	24.0	AV	N	GND
2.906000	22.60	6.5	46	23.4	AV	N	GND
3.022000	24.30	6.5	46	21.7	AV	N	GND
3.950000	22.80	6.5	46	23.2	AV	N	GND

RESULT: PASS

APPENDIX I: PHOTOGRAPHS OF TEST SETUP

Refer to the Report No.: AGC03946220903AP02

APPENDIX II: PHOTOGRAPHS OF TEST EUT

Refer to the Report No.: AGC03946220903AP03

-----END OF REPORT-----

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