
FCC Test Report

Report No.: AGC03709230501FE01

FCC ID : 2AI62-X7

PRODUCT DESIGNATION : Rugged tablet

BRAND NAME : HUGEROCK

MODEL NAME : X7, X6, X60, X70, X71, X8, X80, X101

APPLICANT : SOTEN TECHNOLOGY (HONGKONG) CO., LIMITED

DATE OF ISSUE : Jan. 25, 2024

STANDARD(S) : FCC Part 15 Subpart B

REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jan. 25, 2024	Valid	Initial Release

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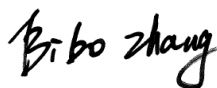
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1. General Information

Applicant	SOTEN TECHNOLOGY (HONGKONG) CO., LIMITED
Address	FLAT/RM A10 9/F SILVERCORP INTERNATIONAL TOWER 707-713 NATHAN ROAD MONGKOK KL HONG KONG
Manufacturer	Shenzhen SOTEN Technology Co., Ltd
Address	10th Floor, 2nd Building, BaiWang Research and development building, No. 5308 Shahe west road, Xili, Nanshan district, ShenZhen, China
Factory	Shenzhen SOTEN Technology Co., Ltd
Address	10th Floor, 2nd Building, BaiWang Research and development building, No. 5308 Shahe west road, Xili, Nanshan district, ShenZhen, China
Product Designation	Rugged tablet
Brand Name	HUGEROCK
Test Model	X7
Series Model(s)	X6, X60, X70, X71, X8, X80, X101
Difference Description	Just the model name is different
Date of receipt of test item	Jun. 02, 2023
Date of Test	Jun. 02, 2023~Jan. 25, 2024
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCTR-ER-FCC-SDOC V1.0

Prepared By



Bibo Zhang
(Project Engineer)

Jan. 25, 2024

Reviewed By



Calvin Liu
(Reviewer)

Jan. 25, 2024

Approved By



Max Zhang
Authorized Officer

Jan. 25, 2024

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2. Product Information

2.1 Product Technical Description

Housing Type	Plastic and metal
Highest Operating Frequency	Greater than 108MHz
Equipment Type	Table-Top
Hardware Version	X7V1-MainBoard_P4
Software Version	X7_2021_PAD_EN_20240105_13_GMS
Power Supply	DC 3.7V 7000mAh by battery or DC 5V by PC

I/O Port Information (☒Applicable ☐Not Applicable)

I/O Port of EUT			
I/O Port Type	Q'TY	Cable	Tested with
USB Port	1	1.0m unshielded	1

2.2 Auxiliary Surrounding Description

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

☒ Test Accessories Come From The Laboratory

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	Huawei adapter	HW-200325CP0	huawei	Input: AC100-240V 50/60Hz,1.8A Output: DC 5V2A	1.0m unshielded

☒ Test Accessories Come From The Manufacturer

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	Battery	608297P	SHENZHEN City Waitley Power CO.,LTD	DC 3.7V 7000mAh	--
2	USB Cable	N/A	N/A	N/A	1.0m unshielded

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2.2 Test Methodology

The tests were performed according to following standards:

No.	Identity	Document Title
1	FCC 47 CFR Part 15	Radio Frequency Devices
2	ANSI C63.4-2014	American National Standard for Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

2.3 Definition of Device Classification

Unintentional radiator:

A device which is not intended to emit RF energy by radiation or induction.

Class A Digital Device:

A digital device which is marketed for use in commercial or business environment.

Class B Digital Device:

A digital device which is marketed for use by the general public or in a residential environment.

Note:

A manufacturer may also qualify a device intended to be marketed in a commercial, business or industrial environment as a Class B digital device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B Digital Device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B Digital Device, Regardless of its intended use.

2.3 Description of Test Modes

No.	Test Mode
1	Data transmission mode (connect computer for data transmitting)

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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
Temperature range (°C)	15 - 35
Relative humidity range	20 % - 75 %
Pressure range (kPa)	86 - 106

3.4 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%.

Item	Measurement Uncertainty
Uncertainty of Conducted Emission	$U_c = \pm 2.9 \text{ dB}$
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 3.9 \text{ dB}$
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.9 \text{ dB}$

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3.5 List of Equipment Used

● Radiated Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☐	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2023/02/18	2024/02/17
☒	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2023/06/03	2024/06/02
☒	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2021/05/13	2023/05/12
☒	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2023/05/11	2025/05/10
☒	AGC-EM-E029	Horn Antenna	ETS	3117	00034609	2023/03/23	2024/03/22
☒	AGC-EM-E096	Pre-amplifier	ETS	3117-PA	00246148	2022/08/04	2024/08/03
☐	AGC-EM-S003	Test Software	FARA	V.RA-03A	N/A	N/A	N/A
☒	AGC-EM-S004	Test Software	Tonscend	4.0.0.0	N/A	N/A	N/A

● Conducted Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-EM-E045	EMI Test Receiver	R&S	ESPI	101206	2023/06/03	2024/06/02
☒	AGC-EM-E023	AMN	R&S	100086	ESH2-Z5	2023/06/03	2024/06/02
☒	AGC-EM-S001	Test Software	R&S	ES-K1 (Ver.V1.71)	N/A	N/A	N/A

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4. Summary Of Test Results

Item	FCC Rules	Description Of Test	Class/Severity	Result
1	Section 15.107	Radiated Emission	Class B	Pass
2	Section 15.109	Conducted Emission	Class B	Pass

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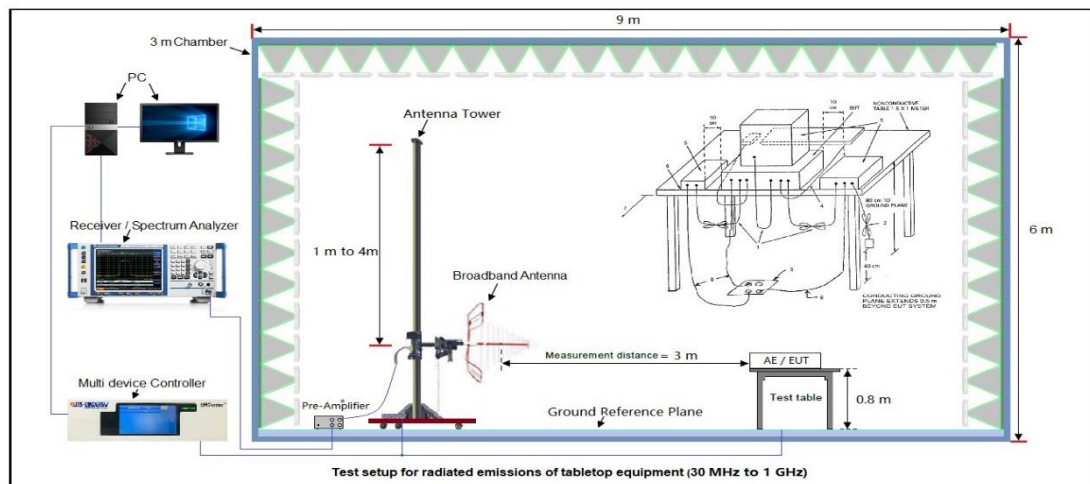
5. Radiated Emission Measurements

5.1 Provisions Applicable

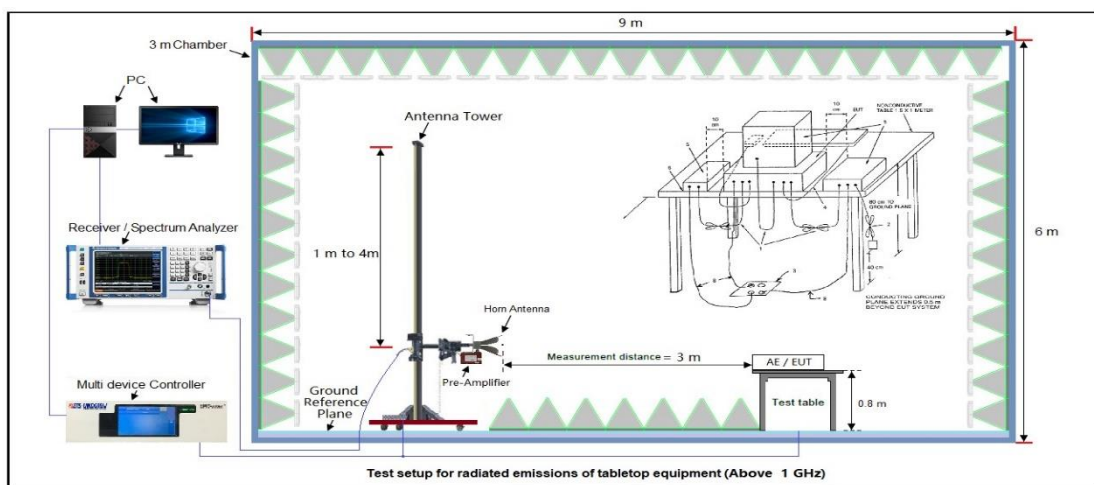
FCC CFR Title 47 Part 15 Subpart B Section 15.109:

Frequency Range	Class B Limit (dBuV/m @3m)	Class A Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	50.00	Quasi-peak
88MHz-216MHz	43.50	53.50	Quasi-peak
216MHz-960MHz	46.00	56.00	Quasi-peak
960MHz-1GHz	54.00	64.00	Quasi-peak
Above 1GHz	54.00	60.00	Average
	74.00	80.00	Peak

5.2 Measurement Setup



Radiated Emission Measurements Test Setup for 30MHz to 1GHz



Radiated Emission Measurements Test Setup for above 1GHz

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5.3 Measurement Procedure

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 turntable with a height of 0.8 meters is used which is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is 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 C63.4.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
4. The EUT received power by AC 120V/60Hz.
5. The antenna was placed at 3 meter away from the EUT as stated in FCC Part 15. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
6. The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
7. The test mode(s) were scanned during the test:
8. Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented. For emissions below 1GHz, use 120KHz RBW and VBW $\geq$ 3RBW for QP reading.
9. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
10. 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.
11. 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.
12. 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.
13. 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.
14. The test data of the worst case condition (mode 1) was reported on the following Data page.

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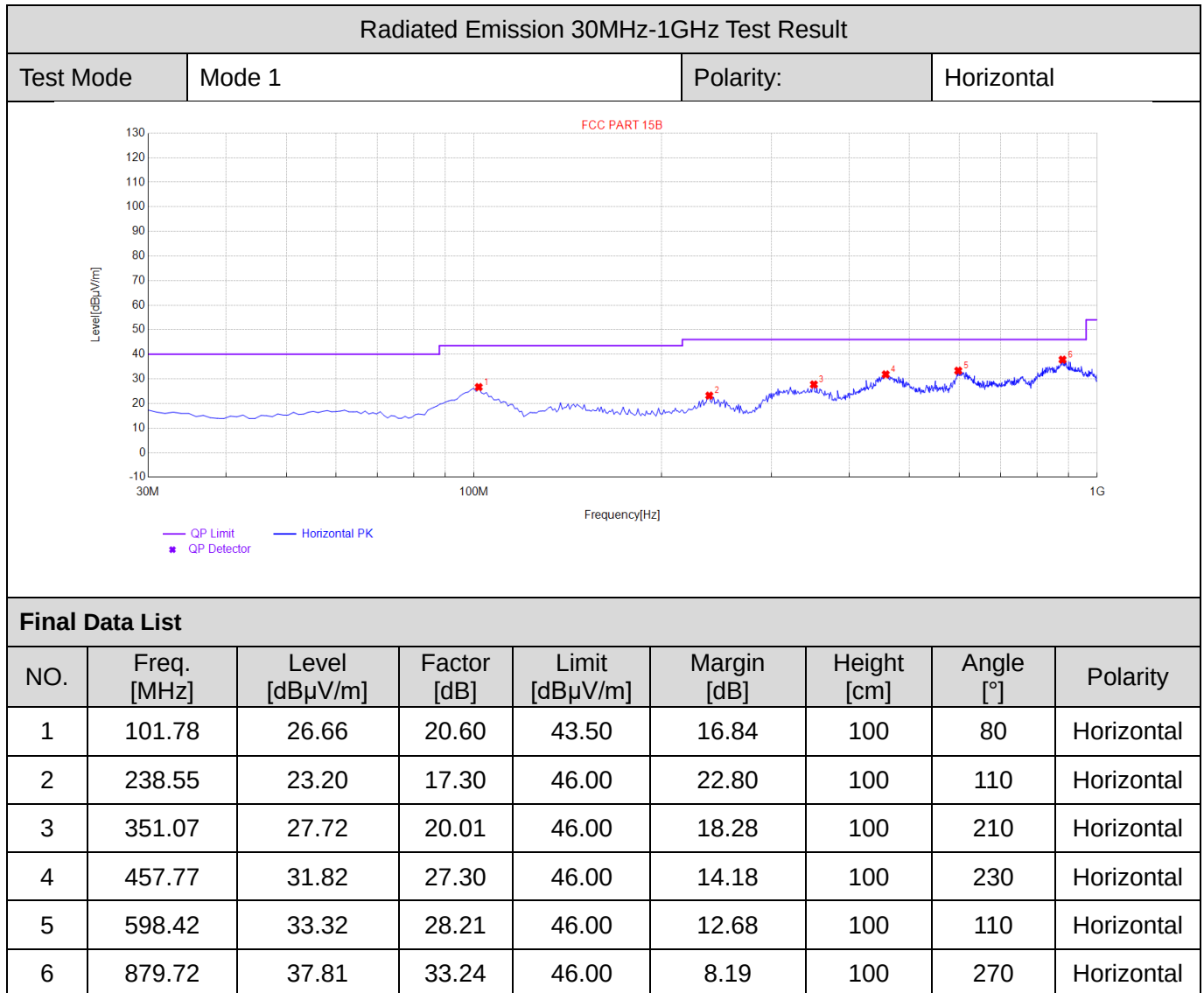
Emi Test Receiver Setup:

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurment
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

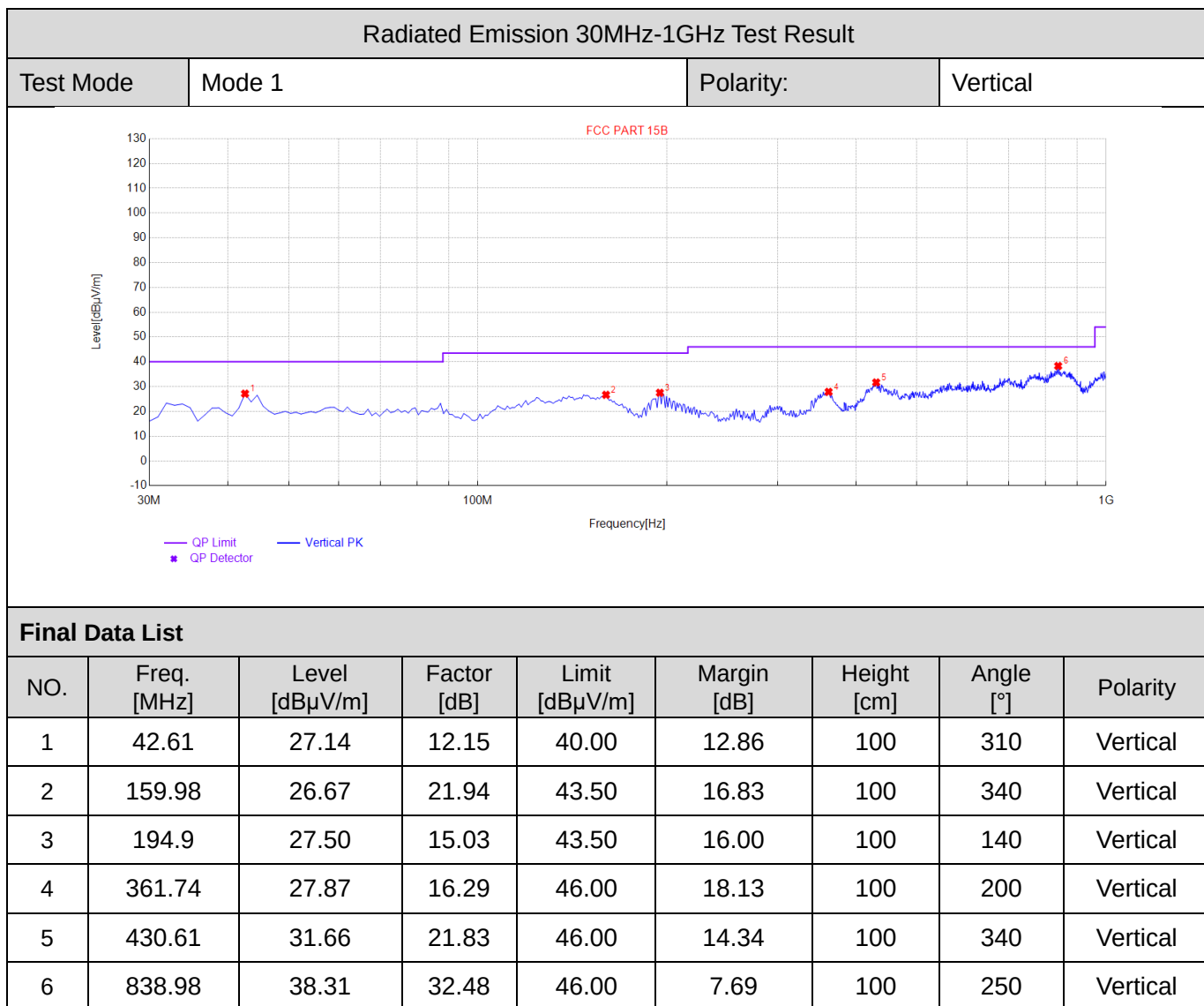
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5.4 Measurement Result



RESULT: PASS

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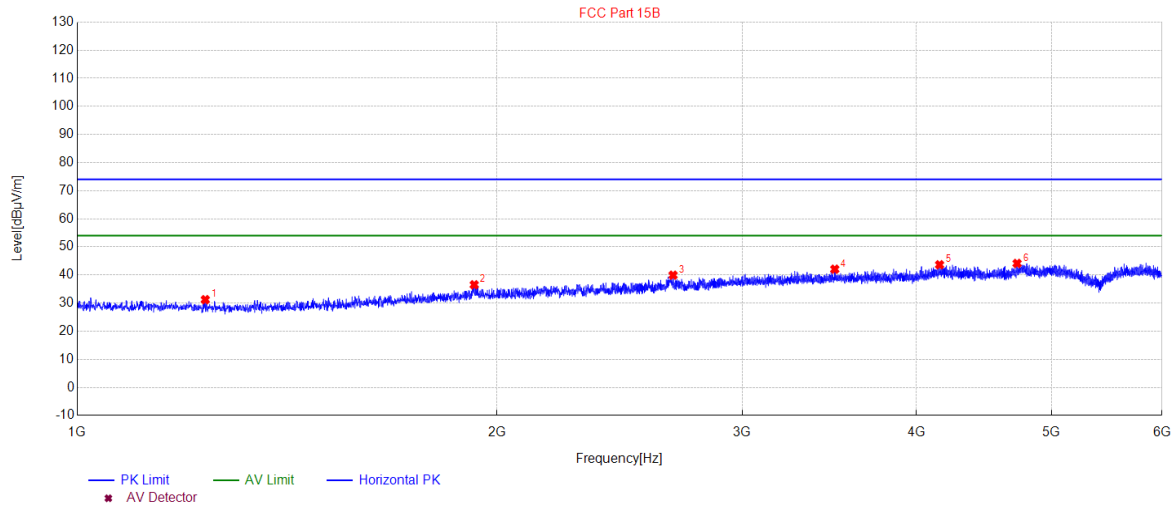
RESULT: PASS

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Radiated Emission Above 1GHz Test Result

Test Mode	Mode 1	Polarity:	Horizontal
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Final Data List

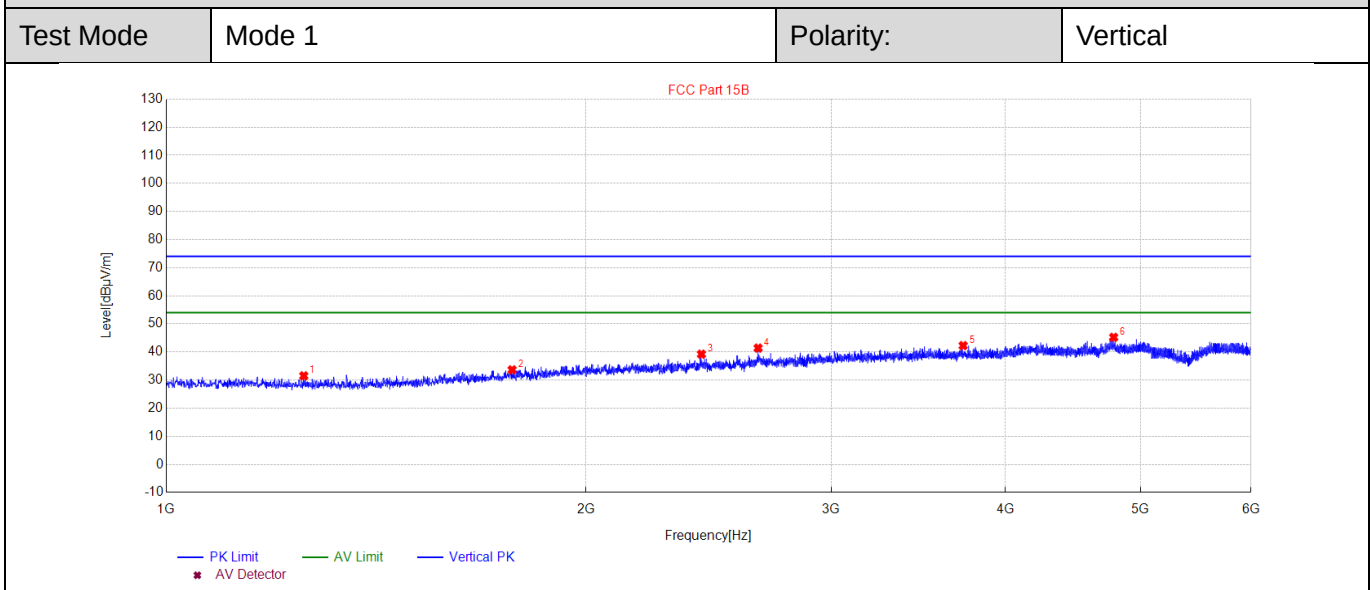
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1235.5236	31.21	-19.88	74.00	42.79	100	60	Horizontal
2	1926.5927	36.51	-16.59	74.00	37.49	100	260	Horizontal
3	2675.6676	39.92	-12.46	74.00	34.08	100	10	Horizontal
4	3494.7495	42.05	-9.72	74.00	31.95	100	130	Horizontal
5	4155.3155	43.63	-7.91	74.00	30.37	100	310	Horizontal
6	4722.8723	44.11	-6.97	74.00	29.89	100	240	Horizontal

RESULT: PASS

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Radiated Emission Above 1GHz Test Result



Final Data List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1255.0255	31.50	-19.89	74.00	42.50	100	280	Vertical
2	1770.5771	33.64	-17.81	74.00	40.36	100	310	Vertical
3	2420.6421	39.22	-13.58	74.00	34.78	100	0	Vertical
4	2658.1658	41.38	-12.52	74.00	32.62	100	90	Vertical
5	3729.773	42.26	-8.96	74.00	31.74	100	270	Vertical
6	4782.3782	45.21	-6.83	74.00	28.79	100	160	Vertical

RESULT: PASS

Note:

- Factor=Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Measurement.
- The “Factor” value can be calculated automatically by software of measurement system.

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6. Conducted Emission Measurements

6.1 PROVISIONS APPLICABLE

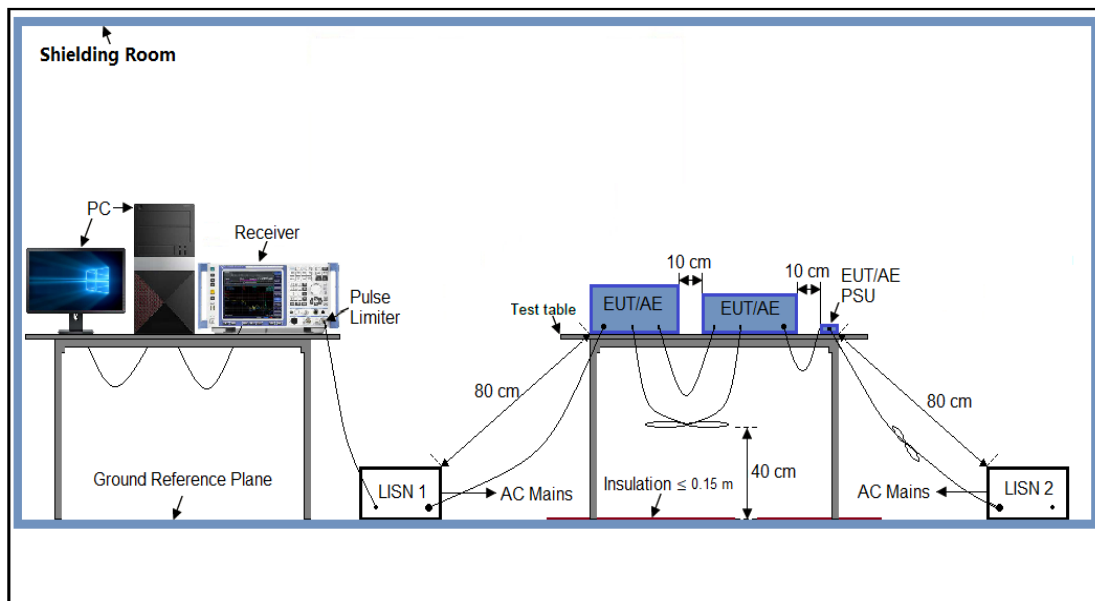
FCC CFR Title 47 Part 15 Subpart B Section 15.107:
For Class B Limits:

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

For Class A Limits:

Frequency	Maximum RF Line Voltage	
	Q.P. (dBμV)	Average (dBμV)
150kHz~500kHz	79	66
500kHz~30MHz	73	60

6.2 MEASUREMENT SETUP



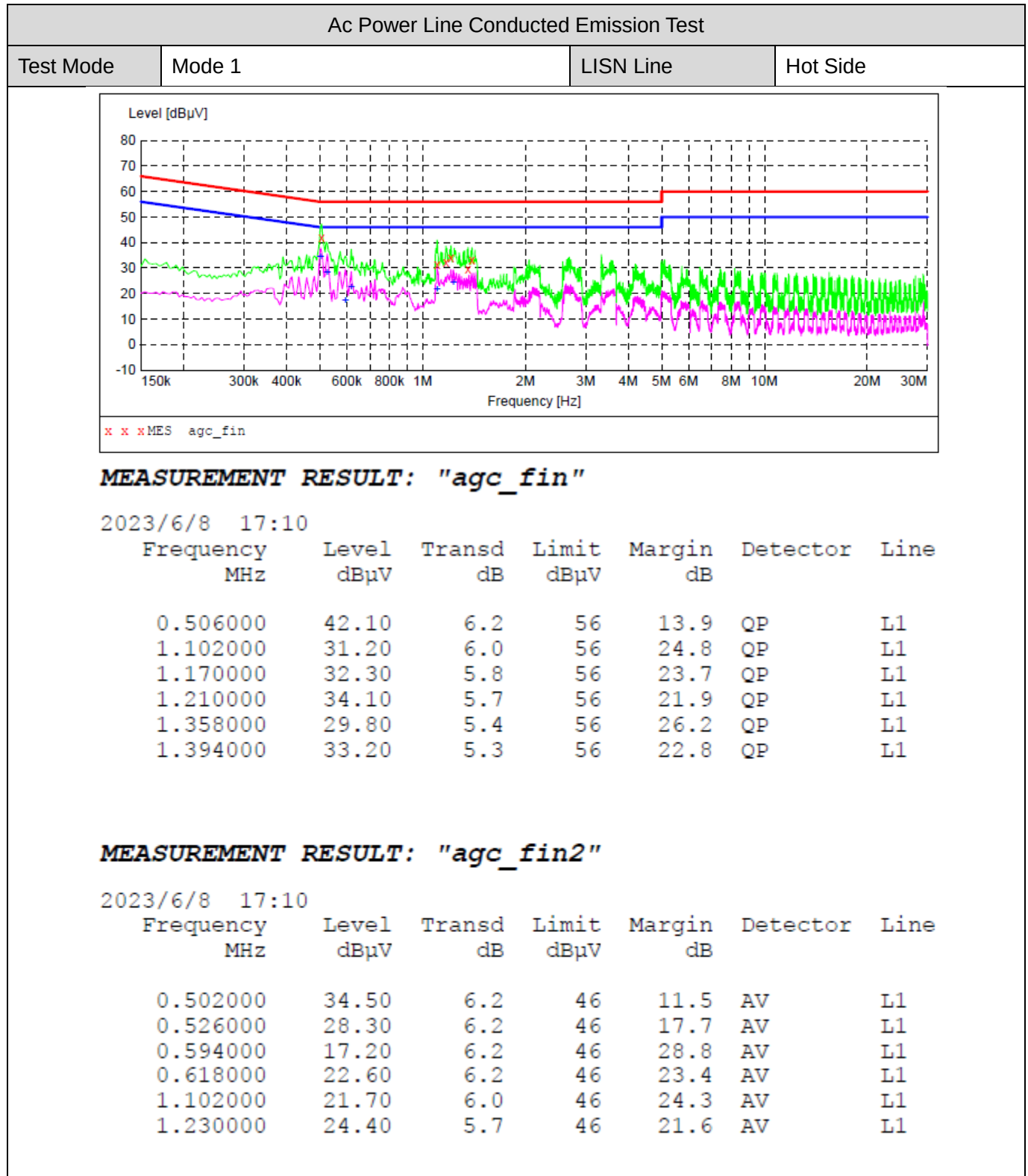
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6.3 MEASUREMENT PROCEDURE

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 C63.4 (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 C63.4.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
4. The EUT received AC 120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT 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 50 ohm 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.

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6.4 Measurement Result

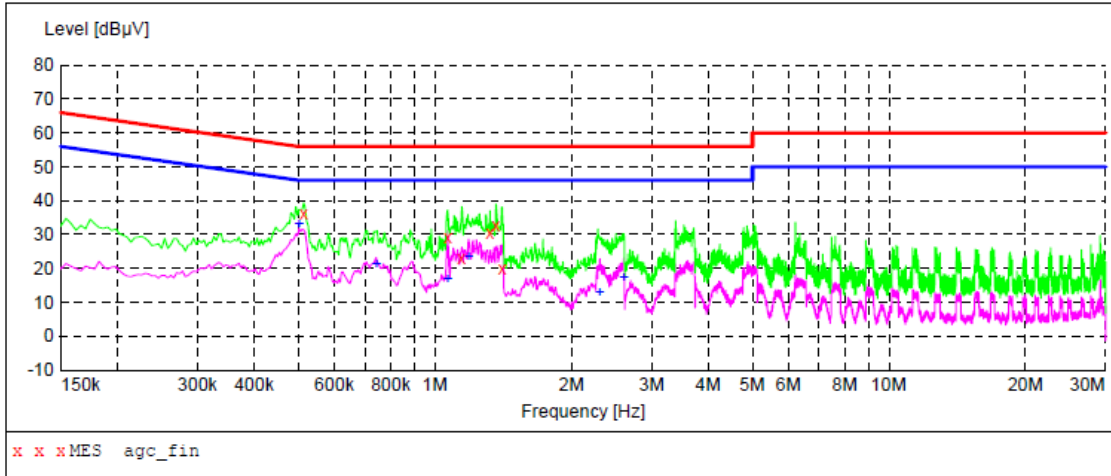


RESULT: PASS

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Ac Power Line Conducted Emission Test

Test Mode	Mode 1	LISN Line	Neutral Side
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MEASUREMENT RESULT: "agc_fin"

2023/6/8 17:16

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.514000	36.10	6.2	56	19.9	QP	N
1.066000	29.30	6.1	56	26.7	QP	N
1.146000	23.00	5.9	56	33.0	QP	N
1.322000	30.30	5.5	56	25.7	QP	N
1.362000	32.80	5.4	56	23.2	QP	N
1.406000	19.90	5.3	56	36.1	QP	N

MEASUREMENT RESULT: "agc_fin2"

2023/6/8 17:16

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.502000	33.10	6.2	46	12.9	AV	N
0.742000	21.50	6.3	46	24.5	AV	N
1.066000	16.70	6.1	46	29.3	AV	N
1.186000	23.40	5.8	46	22.6	AV	N
2.306000	12.90	4.7	46	33.1	AV	N
2.606000	17.10	4.9	46	28.9	AV	N

RESULT: PASS

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Appendix I: Photographs of Test Setup

Refer to the Report No.: AGC03709230501AP05

Appendix II: Photographs of Test EUT

Refer to the Report No.: AGC03709230501AP03

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

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