

Industrial Internet Innovation Center (Shanghai) Co.,Ltd.

EMC TEST REPORT

PRODUCT	iHelp Max 4G mobile medical device
BRAND	iHelp Max 4G mobile medical device
MODEL	EC4WHS
APPLICANT	Wearable Health Solutions, Inc.
FCC ID	XWI-EC4WHS
IC	8730A-EC4WHS
ISSUE DATE	January 18, 2023
STANDARD(S)	FCC Part 15, Subpart B, ANSI C63.4-2014, ICES-003 Issue 7.

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秦亞斌

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張旻

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1 Summary of Test Report

1.1 Test Standard (s)

No.	Test Standard(s)	Title	Version
1	FCC Part 15, Subpart B	Radio frequency devices	2021/10/1
2	ANSI C63.4	Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2014
3	ICES-003	Information Technology Equipment (Including Digital Apparatus)-Limits and Methods of Measurement	Issue 7

NOTE:

- According to customer requirements, test and report using the latest version of the standard.

1.2 Summary of Test Results

No.	Item(s)	Standard(s)	Verdicts for Single Item	Detailed Results
1	Radiated Emission	15.109(a)	Pass	See section 6.1
2	AC Conducted Emission	15.107(a)	Pass	See section 6.2

NOTE:

The EC4WHS, manufactured by Shenzhen Ecell Communication Technology Co.,Ltd is a new product for testing.

Industrial Internet Innovation Center (Shanghai) Co., Ltd. only performed test cases which identified with Pass/Fail/Inc result in section 1.3.

Industrial Internet Innovation Center (Shanghai) Co., Ltd. has verified that the compliance of the tested device specified in section 4 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 1 of this test report.

2 General Information of The Laboratory

2.1 Testing Laboratory

Lab Name	Industrial Internet Innovation Center (Shanghai) Co.,Ltd.
Address	Building 4, No. 766, Jingang Road, Pudong, Shanghai, China
Telephone	021-68866880
FCC Registration No.	958356
FCC Designation No.	CN1177
IC Designation No.	10766A
CAB identifier	CN0067

2.2 Laboratory Environmental Requirements

Temperature	15°C~35°C
Relative Humidity	25%RH~75%RH
Atmospheric Pressure	86kPa~106kPa
Supply Voltage	120V/60Hz

2.3 Project Information

Project Manager	Zhang Heng
Test Date	November 14, 2022 to December 21, 2022

3 General Information of The Customer

3.1 Applicant

Company	Wearable Health Solutions, Inc.
Address	2901 Pacific Coast Highway Ste. 200 Newport Beach, CA 92663
Telephone	+1 949 270 7460

3.2 Manufacturer

Company	Shenzhen Ecell Communication Technology Co.,Ltd
Address	801-803, Floor 8, West Zone, Block B, Building 7, Gaoxin Nanjiudao Science and Technology Ecological Park, Nanshan District, Shenzhen
Telephone	13538209196

3.3 Factory

Company	N/A
Address	N/A

4 General Information of The Product

4.1 Product Description for Equipment under Test (EUT)

Product	iHelp Max 4G mobile medical device
Model	EC4WHS
Date of Receipt	December 20, 2022
EUT ID*	S15aa
SN/IMEI	N/A
Supported Radio Technology and Bands	LTE Band 2/4/5/7/12/13/17/25/26/41 BT 4.2 WLAN 802.11b,g,n GPS Glonass BDS
Hardware Version	V1.1
Software Version	iHelp 4G V1.2
NOTE1: EUT ID is the internal identification code of the laboratory.	
NOTE2: Photographs of EUT are shown in ANNEX A of this test report.	

4.2 Description for Auxiliary Equipment (AE)

AE ID*	Description	Model	SN/Remark
CA04	Adapter	APS-M005050100W-G	N/A
CB05	Charging base	N/A	N/A
UA02	USB Cable	N/A	N/A
NOTE: *AE ID is the internal identification code of the laboratory.			

5 Test Configuration Information

5.1 Laboratory Environmental Conditions

5.1.1 Permanent Facilities

Semi-anechoic chamber SAC3-1 (9 m*8m*6.2m) & SAC3-2 (9.8m*6.7m*6.7m)	
Shielding effectiveness	0.014MHz ~1MHz, >60dB; 1MHz~1000MHz, >90dB.
Electrical insulation	> 2MΩ
Ground system resistance	< 4Ω
Normalised site attenuation (NSA)	< ± 4 dB, 3m distance, from 30 to 1000 MHz
Site voltage standing-wave ratio (SVSWR)	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 6000 MHz

Shielded room	
Shielding effectiveness	0.014MHz~1MHz, >60dB; 1MHz~1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4Ω

5.2 Decision of final test mode

The EUT was tested in conjunction with the accessories in Section 4.2. We tested all of the following test modes and selected the worst mode from the test results and recorded them in the report.

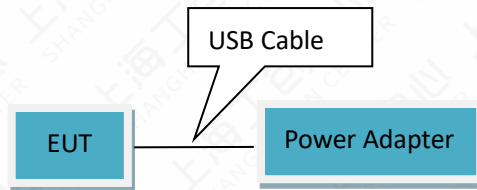
The test configuration modes are as the following:

Test Item	Test setup and operating modes
Radiated emission	30MHz-18GHz frequency range: Mode 1: LTE band 2 receiver mode Mode 2: LTE band 2 receiver mode+ CA04+ CB05+ UA02 Mode 3: LTE band 2 receiver mode+ CA04+ UA02 Mode 4: GPS receiver mode+ CA04+ UA02 Mode 5: Glonass receiver mode+ CA04+ UA02 Mode 6: BDS receiver mode+ CA04+ UA02
AC Conducted emission	Mode 2: LTE band 2 receiver mode+ CA04+ CB05+ UA02 Mode 3: LTE band 2 receiver mode+ CA04+ UA02 Mode 4: GPS receiver mode+ CA04+ UA02 Mode 5: Glonass receiver mode+ CA04+ UA02 Mode 6: BDS receiver mode+ CA04+ UA02
Note: 1. All test modes are performed, only the worst cases test data are recorded in this report. 2. After laboratory verification, LTE Band 2 is the worst mode among all receiving modes of 4G and is recorded in the report. 3. The worst case of radiated emission for 30MHz-1GHz is Mode 3 and for 1GHz -18GHz is Mode 2. 4. The worst case for conducted emission is mode 3.	

5.3 EUT System Operation

1. Connect the EUT with AE.
2. Setup the EUT according to the standard.
3. Start testing and monitoring the function.
4. Mode 4-6: EUT and GNSS simulator (SMBV100A) connection is established.

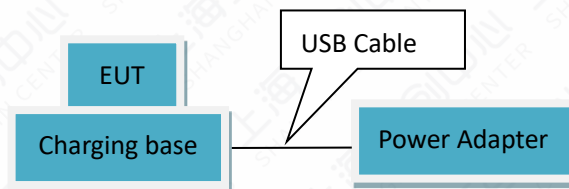
5.4 EUT Connection Diagram of Test System



<Figure 5.4-1> Mode 3~6



<Figure 5.4-2> Mode 1



<Figure 5.4-3> Mode 2

5.5 Test Equipment Utilized

No.	Name	Model	S/N	Manufacturer	Cal. Date	Cal. Interval
1	Universal Radio Communication Tester	CMW500	104178	R&S	2022-10-17	1 year
2	Test Receiver	ESCI	101235	R&S	2022-02-23	1 year
3	Test Receiver	ESU40	100307	R&S	2022-02-23	1 year
4	Trilog Antenna	VULB9163	VULB9163-515	Schwarzbeck	2022-03-11	1 year
5	Double Ridged Guide Antenna	ETS-3117	00135890	ETS	2022-03-09	2 years
6	2-Line V-Network	ENV216	101380	R&S	2022-02-21	1 year
7	EMI Test Software	EMC32 V9.15	N/A	R&S	N/A	N/A
8	GNSS simulator	SMBV100A	257904	R&S	2022-02-21	1 year

5.6 Measurement Uncertainty

Item (s)	Uncertainty
Radiated Emission 30MHz-1000MHz	4.94 dB
Radiated Emission 1000MHz-18000MHz	5.02 dB
Conducted Emission	3.56 dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

6 Test Results

6.1 Radiated Emission

6.1.1 Method of Measurement

- a. For 30MHz -1000MHz, the EUT was placed on the top of a rotating 0.8m table above the ground at a semi-anechoic chamber. The distance between the EUT and the received antenna was 3 meters. The table was rotated 360 degree and the received antenna mounted on a variable-height antenna tower was varied from 1m to 4m to find the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna were set during the measurement.
- b. For 1000MHz -18000MHz, the EUT was placed on the top of a 0.8m table above the ground at a 3m fully anechoic chamber. The maximal emission value was acquired by adjusting the antenna height, The table was rotated 360 degree to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna were set during the measurement

6.1.2 EUT Connection Diagram of Test System

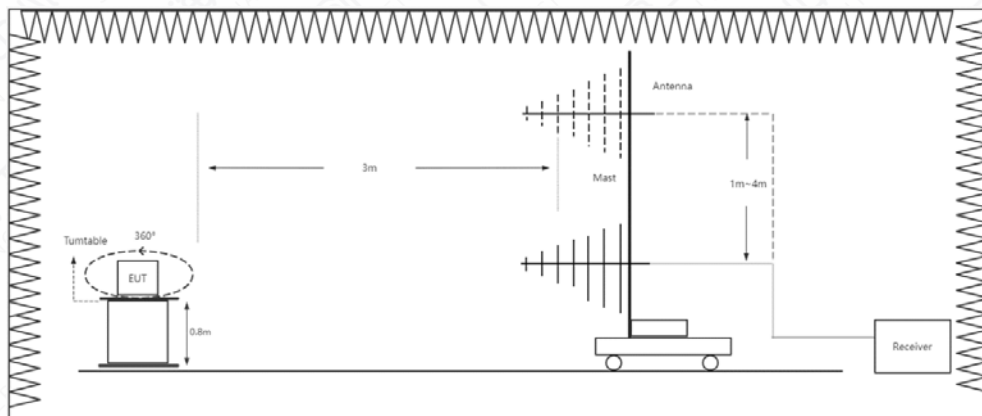


Figure 6.1.2-1 RE 30MHz-1GHz Connection Diagram

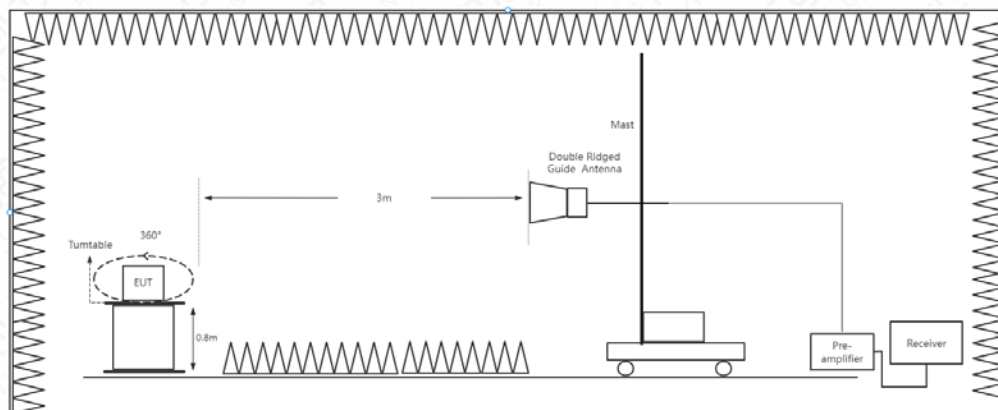


Figure 6.1.2-2 RE Above 1GHz Connection Diagram

6.1.3 Test Condition

Frequency Range (MHz)	RBW/VBW	Sweep Time (s)
30-1000	120kHz/300kHz	AUTO
1000-18000	1MHz/3MHz	AUTO

6.1.4 Limit/Criterion

Frequency Range (MHz)	Quasi-Peak (dBμV/m)	Peak (dBμV/m)	Average (dBμV/m)
30-88	40	N/A	N/A
88-216	43.5	N/A	N/A
216-960	46	N/A	N/A
Above 960	54	N/A	N/A
Above 1000	N/A	74	54

6.1.5 Test environmental conditions

Temperature	23.0℃
Relative Humidity	54.8%RH
Atmospheric Pressure	102.0 kPa

6.1.6 Test Results

Mode	Frequency (MHz)	Test Results	Verdicts
Mode 3: LTE band 2 receiver mode+ CA04+ UA02	30-1000	See Annex A.1-1	Pass
Mode 2: LTE band 2 receiver mode+ CA04+ CB05+ UA02	1000-18000	See Annex A.1-2 & A.1-3	Pass
NOTE Abbreviations used in this clause: Pass—P; Fail—F; Not applicable—N/A			

6.2 Conducted Emission

6.2.1 Method of Measurement

The EUT was placed on a 0.8m height table with EUT being connected to the power mains through a line impedance stabilization network (LISN). Both lines of the power mains connected to the EUT were checked for maximum conducted interference. The frequency range from 150 kHz to 30 MHz was searched.

6.2.2 EUT Connection Diagram of Test System

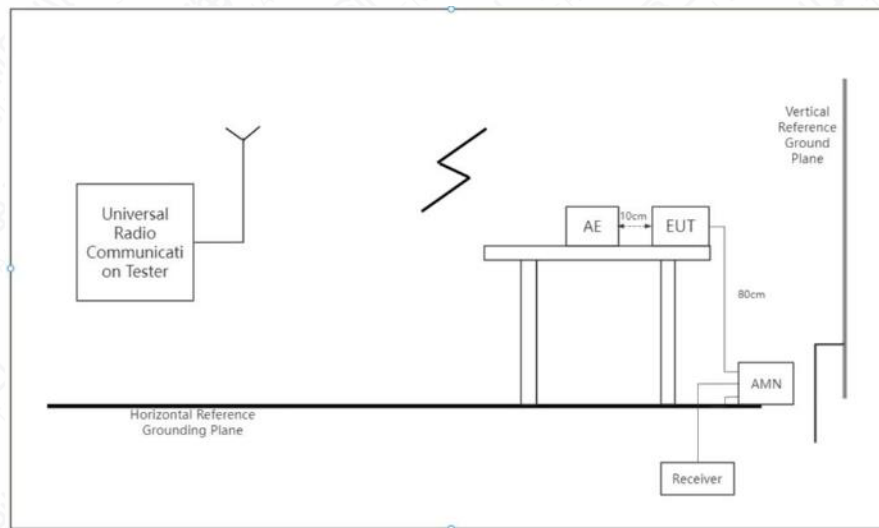


Figure 6.2.2-1 CE Connection Diagram

6.2.3 Test Condition

Test Condition in Charging Mode

Voltage (V)	Frequency (Hz)	RBW	Sweep Time (s)
120	60	9 kHz	AUTO

6.2.4 Limit

Frequency Range (MHz)	Conducted 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		

6.2.5 Testing environmental conditions

Temperature	24.9℃
Relative Humidity	50.5%RH
Atmospheric Pressure	101.7 kPa

6.2.6 Test Results

Mode	Frequency (MHz)	Test Results	Verdicts
Mode 3: LTE band 2 receiver mode+CA04+ UA02	0.15-30	See Annex A.2-1	Pass
NOTE Abbreviations used in this clause: Pass—P; Fail—F; Not applicable—N/A			

Annex A: Measurement Data

A.1 Radiated Emission

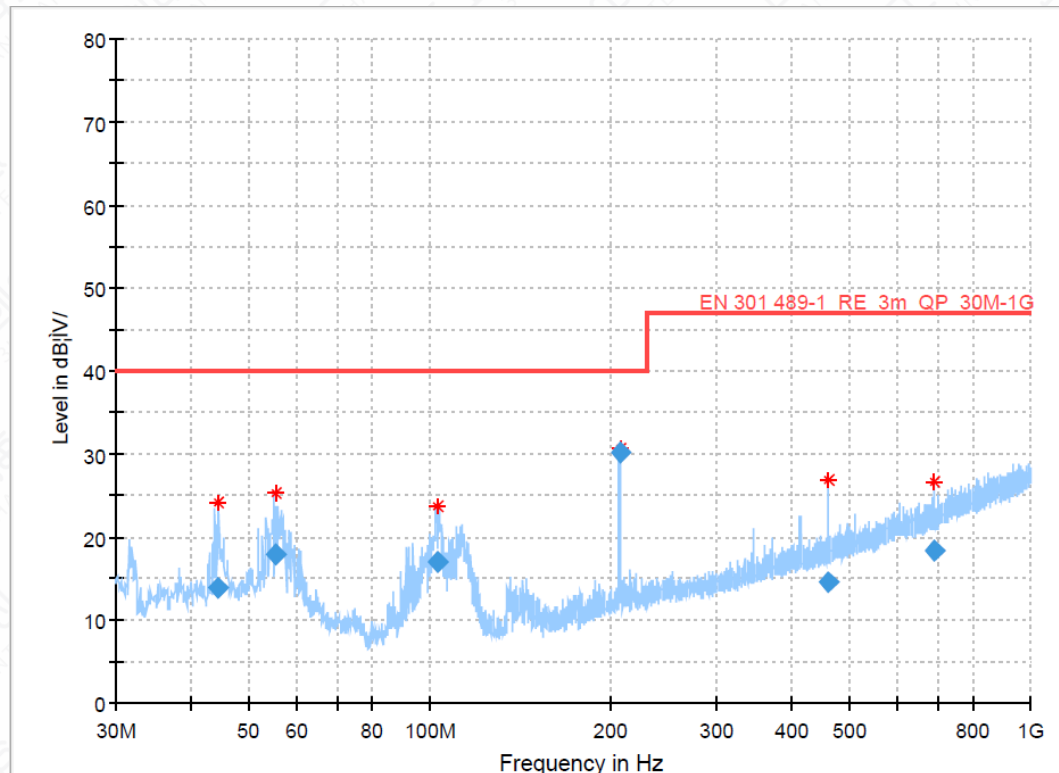


Figure A.1-1 Mode 3 (30M-1GHz)

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
44.278760	13.81	40.00	26.19	200.0	V	144.0	-12.0
55.242360	17.77	40.00	22.23	100.0	V	359.0	-12.2
102.932040	16.90	40.00	23.10	100.0	V	0.0	-13.2
206.827040	30.12	40.00	9.88	100.0	H	46.0	-12.7
460.812640	14.47	47.00	32.53	200.0	H	281.0	-6.2
691.508560	18.42	47.00	28.58	200.0	H	248.0	-2.0

Note:

1.Horizontal and vertical polarity is all have been tested, the result of them is synthesized in the above data diagram.

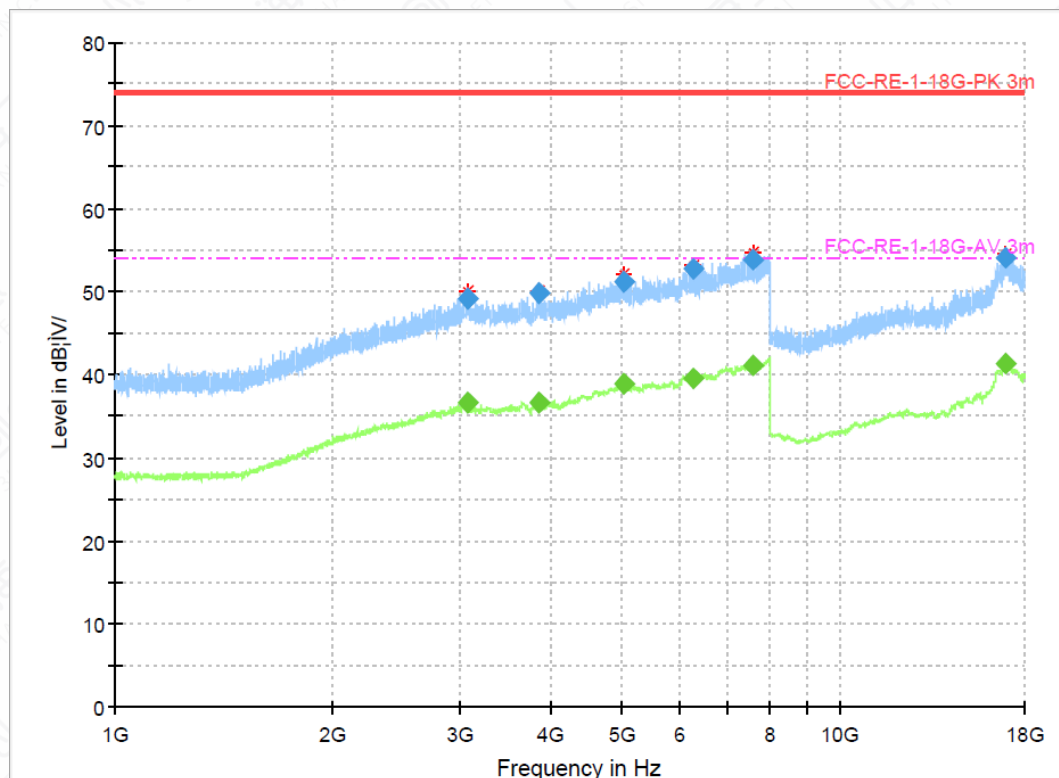


Figure A.1-2 Mode 2 (1GHz-18GHz)-H

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
3073.2487	---	36.57	54.00	17.43	500.0	1000.0	115.0	H	359.0	12.7
3073.2487	49.10	---	74.00	24.90	500.0	1000.0	115.0	H	359.0	12.7
3849.8775	---	36.66	54.00	17.34	500.0	1000.0	100.0	H	256.0	13.0
3849.8775	49.76	---	74.00	24.24	500.0	1000.0	100.0	H	256.0	13.0
5047.0125	---	38.77	54.00	15.23	500.0	1000.0	215.0	H	297.0	16.0
5047.0125	51.23	---	74.00	22.77	500.0	1000.0	215.0	H	297.0	16.0
6277.2700	52.72	---	74.00	21.28	500.0	1000.0	100.0	H	256.0	18.0
6277.2700	---	39.56	54.00	14.44	500.0	1000.0	100.0	H	256.0	18.0
7585.0312	---	41.13	54.00	12.87	500.0	1000.0	215.0	H	37.0	20.7
7585.0312	53.81	---	74.00	20.19	500.0	1000.0	215.0	H	37.0	20.7
16908.210	54.09	---	74.00	19.91	500.0	1000.0	111.0	H	118.0	22.5
16908.210	---	41.25	54.00	12.75	500.0	1000.0	111.0	H	118.0	22.5

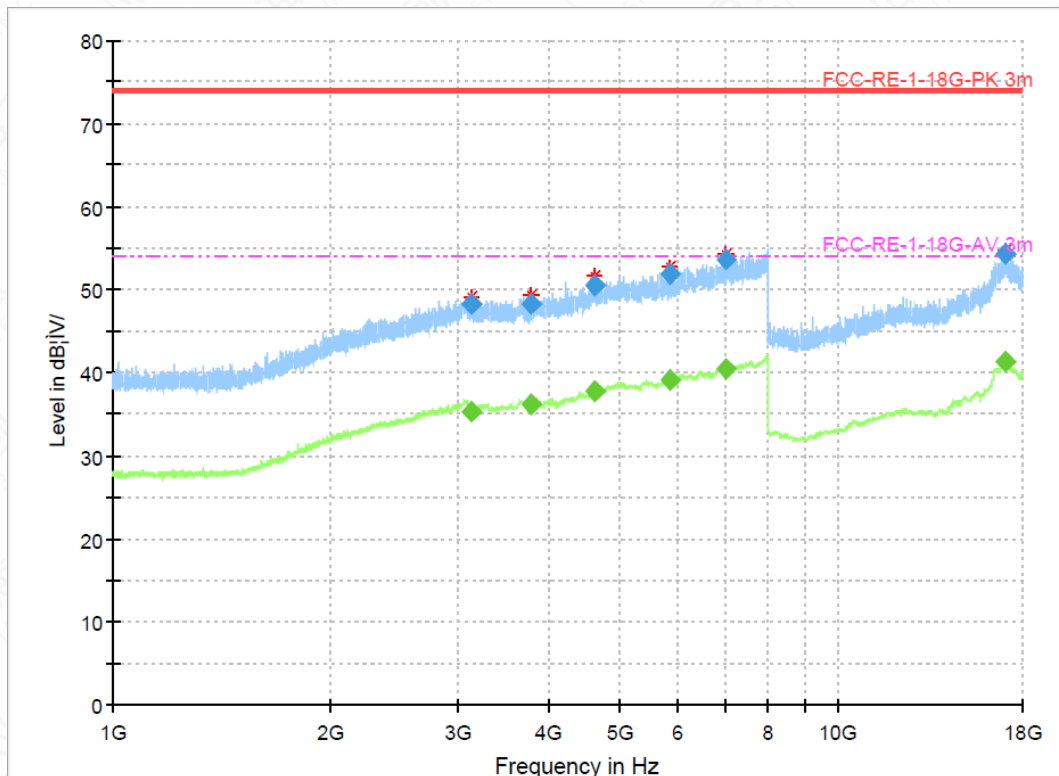


Figure A.1-3 Mode 2 (1GHz-18GHz)-V

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
3129.2050	---	35.40	54.00	18.60	500.0	1000.0	100.0	V	323.0	12.5
3129.2050	48.29	---	74.00	25.71	500.0	1000.0	100.0	V	323.0	12.5
3787.8275	48.31	---	74.00	25.69	500.0	1000.0	215.0	V	97.0	13.1
3787.8275	---	36.13	54.00	17.87	500.0	1000.0	215.0	V	97.0	13.1
4629.0937	---	37.83	54.00	16.17	500.0	1000.0	215.0	V	1.0	14.9
4629.0937	50.57	---	74.00	23.43	500.0	1000.0	215.0	V	1.0	14.9
5868.6512	---	39.04	54.00	14.96	500.0	1000.0	185.0	V	32.0	17.4
5868.6512	51.74	---	74.00	22.26	500.0	1000.0	185.0	V	32.0	17.4
7001.3200	53.60	---	74.00	20.40	500.0	1000.0	102.0	V	323.0	19.7
7001.3200	---	40.51	54.00	13.49	500.0	1000.0	102.0	V	323.0	19.7
17078.391	---	41.25	54.00	12.75	500.0	1000.0	215.0	V	117.0	22.5
17078.391	54.21	---	74.00	19.79	500.0	1000.0	215.0	V	117.0	22.5

A.2 Conducted Emission

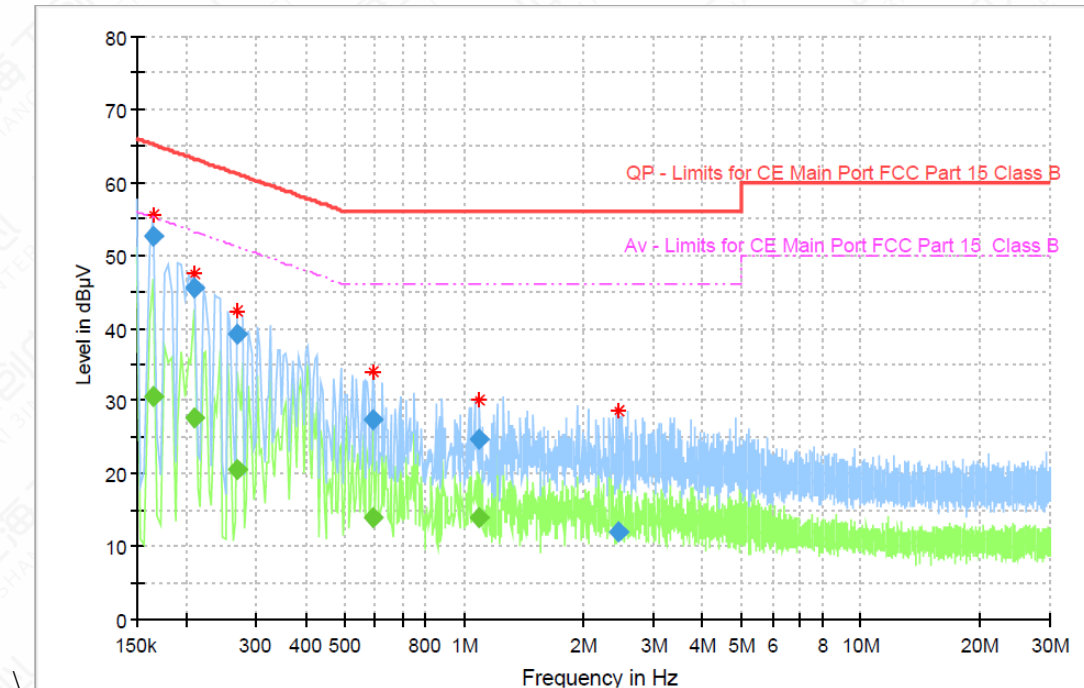


Figure A.2-1 Mode 3 (150kHz-30MHz)

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.164925	---	30.46	55.21	24.75	15000	9.000	L1	ON	9.6
0.164925	52.61	---	65.21	12.60	15000	9.000	L1	ON	9.6
0.209700	---	27.65	53.22	25.57	15000	9.000	L1	ON	9.6
0.209700	45.49	---	63.22	17.73	15000	9.000	L1	ON	9.6
0.269400	---	20.56	51.14	30.57	15000	9.000	L1	ON	9.6
0.269400	39.14	---	61.14	22.00	15000	9.000	L1	ON	9.6
0.590288	---	13.91	46.00	32.09	15000	9.000	L1	ON	9.6
0.590288	27.30	---	56.00	28.70	15000	9.000	L1	ON	9.6
1.097738	---	13.91	46.00	32.09	15000	9.000	N	ON	9.6
1.097738	24.71	---	56.00	31.29	15000	9.000	N	ON	9.6
2.452181	---	-0.77	46.00	46.77	15000	9.000	N	ON	9.7
2.452181	11.94	---	56.00	44.06	15000	9.000	N	ON	9.7

Note: L1 and N line is all have been tested, the result of them is synthesized in the above data diagram.

Annex B: Revised History

Version	Revised Content
V00	Initial

Annex C: Accreditation Certificate





Accredited Laboratory

A2LA has accredited

**INDUSTRIAL INTERNET INNOVATION CENTER
(SHANGHAI) CO., LTD.**

Shanghai, People's Republic of China

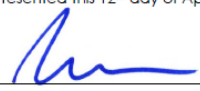
for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 12th day of April 2021.



Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3682.01
Valid to February 28, 2023

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.