

Prüfbericht-Nr.: <i>Test report no.:</i>	CN21SAGZ 001	Auftrags-Nr.: <i>Order no.:</i>	168330327	Seite 1 von 23 Page 1 of 23
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2021-08-09	
Auftraggeber: <i>Client:</i>	Luxshare Precision Industry Co., Ltd. Floor 2, Block A, Sanyo New Industrial Area, West Haoyi Community, Shajing Subdistrict Office, Bao'an District, Shenzhen, P. R. China			
Prüfgegenstand: <i>Test item:</i>	Power Dongle for Apple Watch			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	PDAW (Trademark: PITAKA)			
Auftrags-Inhalt: <i>Order content:</i>	Type Test			
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15: Subpart C Section 15.207 CFR47 FCC Part 15: Subpart C Section 15.209 CFR47 FCC Part 15: Subpart C Section 15.215 CFR47 FCC Part 2: Subpart J Section 1.1310			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2021-08-23	Refer to photos document		
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003105959-001			
Prüfzeitraum: <i>Testing period:</i>	2021-08-24 – 2021-09-08			
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>			genehmigt von: <i>authorized by:</i>	
Datum: <i>Date:</i>	2021-09-18		Ausstellungsdatum: <i>Issue date:</i>	2021-09-18
	Signed by: Alex Lan			Signed by: Lin Lin
Stellung / Position	Senior Project Engineer		Stellung / Position	Reviewer
Sonstiges / Other:	FCC ID: 2AYYS-PDAW01			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut 3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar	5 = mangelhaft N/T = nicht
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good 3 = satisfactory F(ail) = failed a.m. test specification(s)	4 = sufficient N/A = not applicable	5 = poor N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

V05

Test Summary

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 20dB BANDWIDTH

RESULT: Pass

5.1.3 RADIATED SPURIOUS EMISSION

RESULT: Pass

5.1.4 CONDUCTED EMISSIONS

RESULT: Pass

6.1.1 ELECTROMAGNETIC FIELDS

RESULT: Pass

Contents

1	GENERAL REMARKS	4
1.1	COMPLEMENTARY MATERIALS	4
2	TEST SITES.....	5
2.1	TEST FACILITIES.....	5
2.2	LIST OF TEST AND MEASUREMENT INSTRUMENTS	5
2.3	TRACEABILITY.....	6
2.4	CALIBRATION.....	6
2.5	MEASUREMENT UNCERTAINTY	6
2.6	LOCATION OF ORIGINAL DATA	6
2.7	STATUS OF FACILITY USED FOR TESTING.....	6
3	GENERAL PRODUCT INFORMATION.....	7
3.1	PRODUCT FUNCTION AND INTENDED USE.....	7
3.2	RATINGS AND SYSTEM DETAILS	7
3.3	INDEPENDENT OPERATION MODES	7
3.4	NOISE GENERATING AND NOISE SUPPRESSING PARTS.....	7
3.5	SUBMITTED DOCUMENTS.....	7
4	TEST SET-UP AND OPERATION MODES	8
4.1	PRINCIPLE OF CONFIGURATION SELECTION.....	8
4.2	TEST OPERATION AND TEST SOFTWARE	8
4.3	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT.....	8
4.4	COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE.....	8
4.5	TEST SETUP DIAGRAM	9
5	TEST RESULTS.....	10
5.1	TRANSMITTER REQUIREMENT & TEST SUITES.....	10
5.1.1	<i>Antenna Requirement.....</i>	<i>10</i>
5.1.2	<i>20dB Bandwidth.....</i>	<i>11</i>
5.1.3	<i>Radiated Spurious Emission.....</i>	<i>12</i>
5.1.4	<i>Conducted emissions.....</i>	<i>18</i>
6	SAFETY HUMAN EXPOSURE	21
6.1	RADIO FREQUENCY EXPOSURE COMPLIANCE.....	21
6.1.1	<i>Electromagnetic Fields</i>	<i>21</i>
7	PHOTOGRAPHS OF THE TEST SET-UP.....	23
8	LIST OF TABLES	23

1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Photographs of the Test Set-up

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

No. 362 Huangguan Road Middle, Longhua District, Shenzhen 518110, China

FCC Registration No.: CN1260

IC Registration No.: 25069

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

TÜV Rheinland (Shenzhen) Co., Ltd.

Spurious Emissions Testing				
Description	Manufacturer	Model	Serial No.	Cal. until
EMI Test Receiver	R&S	ESR 7	102021	2022-08-10
Signal Analyzer	R&S	FSV 40	101439	2022-08-09
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	2022-08-09
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2022-08-09
Amplifier	R&S	SCU-18F	180070	2022-08-09
Amplifier	R&S	SCU40A	100475	2022-08-09
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2022-08-08
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2022-08-08
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2022-08-08
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2022-09-13
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	2024-06-22
Conducted Emissions				
Description	Manufacturer	Model	Serial No.	Cal. until
EMI Test Receiver	R&S	ESR3	102428	2022-08-10
Artificial Mains Network	R&S	ENV216	102333	2022-08-10
EMC32 test software	R&S	EMC32(Ver.10.50.0 0)	N/A	N/A

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table

Test	Parameters	Expanded uncertainty (U_{lab})	Expanded uncertainty (U_{cisp})
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 3.70 dB ± 3.30 dB	± 3.8 dB ± 3.4 dB
Radiated Emission (3m SAC)	Level accuracy (30MHz to 1000MHz)	± 4.52 dB	± 6.3 dB
	Level accuracy (above 1000MHz)	± 4.37 dB	N/A

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at No. 362 Huangguan Road Middle, Longhua District, Shenzhen 518110, China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The device is a Power Dongle for Apple Watch.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment	Power Dongle for Apple Watch
Type Designation	PDAW
Trademark	PITAKA
FCC ID	2AYYS-PDAW01
Input Voltage	DC 5V via Type-C port
Test voltage	AC 120V, 60Hz
Technical Specification of WPT	
Operating Frequency	326.5KHz
Modulation	FSK
Antenna Type	Coil Antenna
Antenna number	1
Wireless Charger output power	Max. 5W

3.3 Independent Operation Modes

The basic operation modes are:

- A. On, Wireless charging
- B. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- ID Label and Location Info

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5&6. All testing were performed according to the procedures in ANSI C63.10: 2013.

4.3 Special Accessories and Auxiliary Equipment

Table 3: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Adapter	TUVR	AC/DC Adapter1	SE-002	Output: 5Vdc, 1.2A max
USB cable	TUVR	/	/	Unshielded and length 15cm
Adapter	TUVR	AC/DC Adapter2	KA25-0501200CN	Output: 5Vdc, 1.2A max
Apple Watch	Apple	M02G3CH/A	GY6F236QQ1RF	---

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 30MHz)

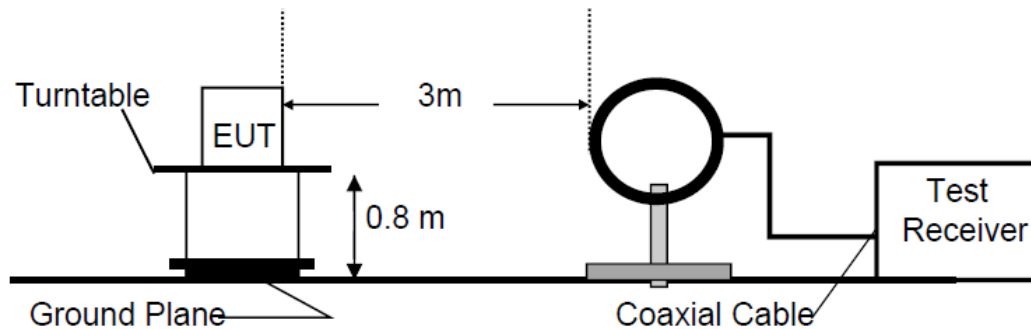


Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

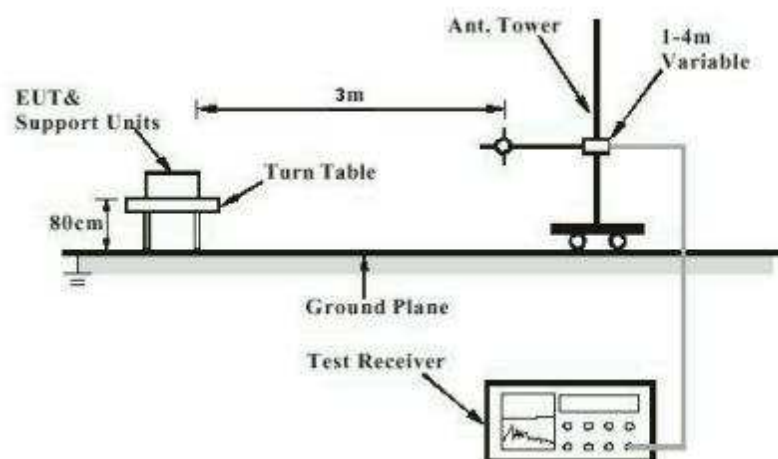
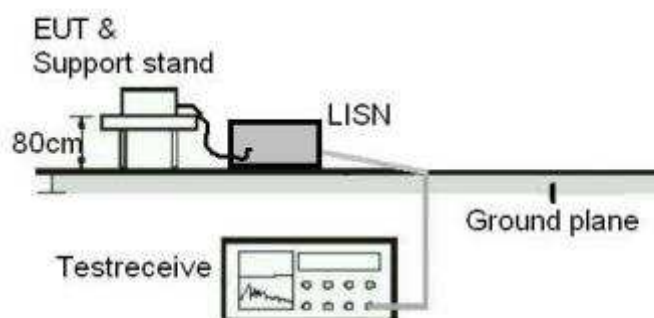


Diagram of Measurement Equipment Configuration for Mains Conduction Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:

Pass

Test Specification

Test standard : FCC Part 15.203

According to the manufacturer declared, the EUT has an internal antenna, and the antenna is permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

5.1.2 20dB Bandwidth

RESULT:

Pass

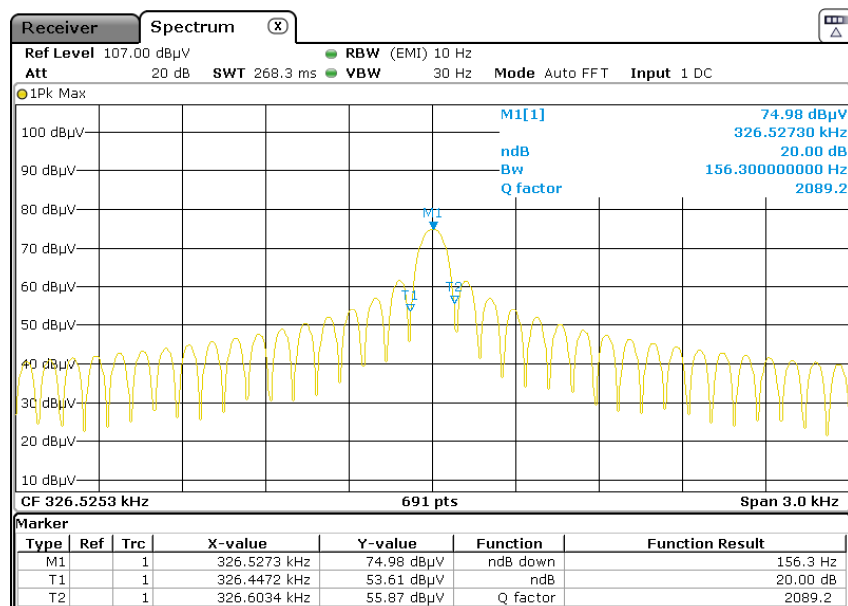
Test Specification

Test standard : FCC Part 15.215(c)
Basic standard : ANSI C63.10: 2013
Kind of test site : Shielded Room

Test Setup

Date of testing : 2021-08-24 – 2021-09-08
Input voltage : AC 120V, 60Hz
Operation mode : A
Ambient temperature : 25 °C
Relative humidity : 56 %
Atmospheric pressure : 101 kPa

For details refer to following test result.



5.1.3 Radiated Spurious Emission

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.209 & 15.205
Basic standard	: ANSI C63.10: 2013
Limits	: Refer to 15.209(a)
Kind of test site	: 3m Semi-anechoic Chamber

Test Setup

Date of testing	: 2021-08-24 – 2021-09-08
Input voltage	: AC 120V, 60Hz
Operation mode	: A
Ambient temperature	: 23 °C
Relative humidity	: 49 %
Atmospheric pressure	: 101 kPa

Measurements are to be taken in dBuV/m, corrected, and the end result shall be mathematically converted to the dBuA/m for RSS and presented against the correct limit.

$$E [\text{dB}\mu\text{A/m}] = AF [\text{dBS/m}] + V [\text{dB}\mu\text{V}] + \text{Cable loss [dB]}$$

E [dBμA/m] is the magnetic field strength (Final Test results)

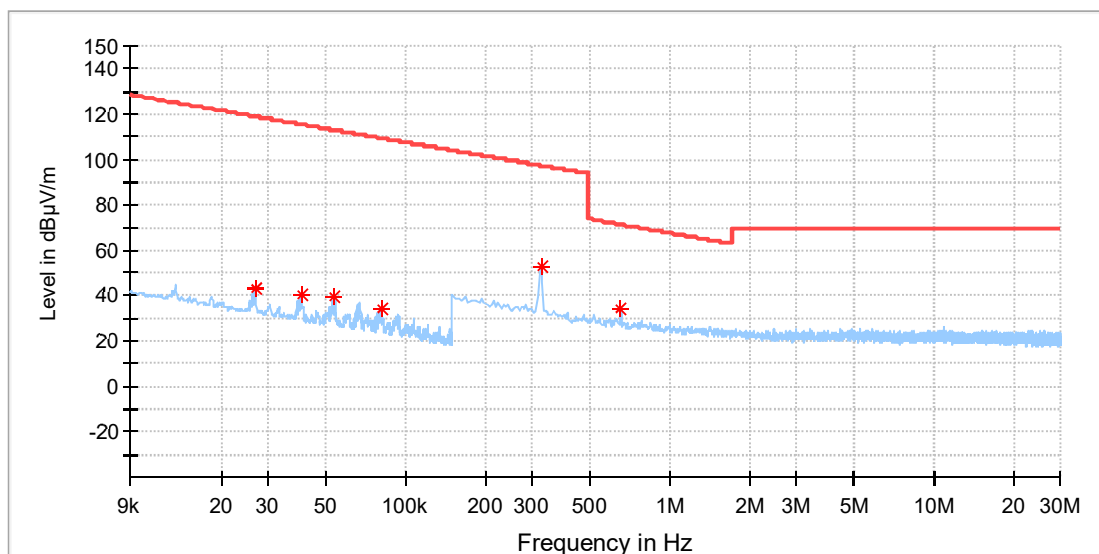
AF [dBS/m] is the magnetic antenna factor of the antenna (H-field)

V [dBμV] is the reading level on the spectrum analyzer

Note that when using the AF [dBS/m] the 51.5 dB is already account for into the antenna factor.

EUT Information

EUT Name: Power Dongle for Apple Watch
 Model: PDAW
 Test Mode: Wireless charging
 Test Voltage:: 120Vac, 60Hz
 Remark: Temp 23 Humi:49%
 Test Standard: FCC 15.209
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

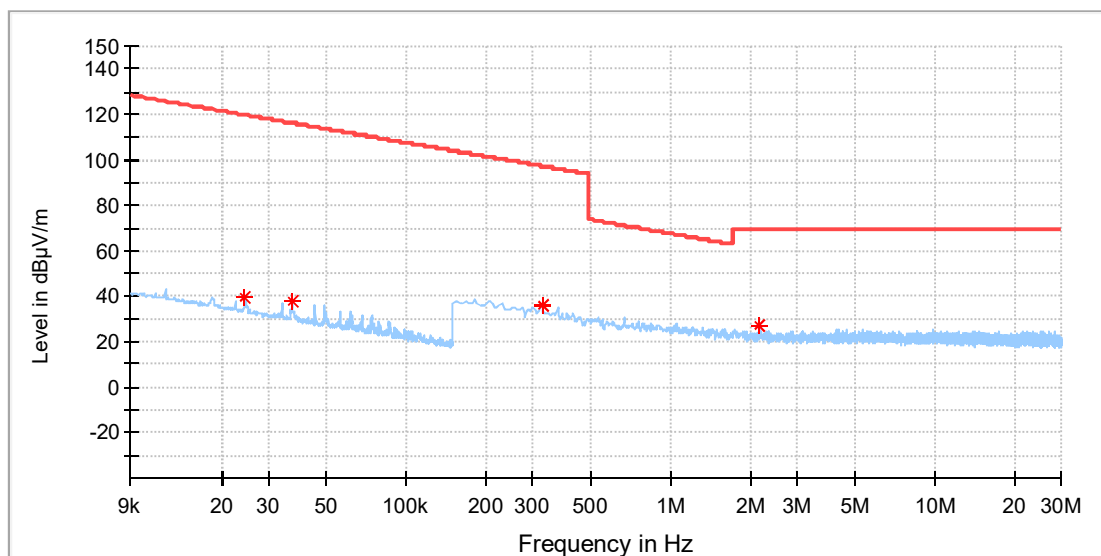


Critical_Freqs

Frequency (MHz)	Max Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.026826	43.01	119.02	76.01	100.0	X	46.0	20.0
0.040221	40.86	115.50	74.65	100.0	X	55.0	20.0
0.053516	39.23	113.02	73.80	100.0	X	64.0	20.0
0.080608	34.46	109.47	75.01	100.0	X	46.0	20.0
0.325588	52.42	97.35	44.93	100.0	X	328.0	20.0
0.650427	34.45	71.35	36.89	100.0	X	52.0	20.0

EUT Information

EUT Name:	Power Dongle for Apple Watch
Model:	PDAW
Test Mode:	Wireless charging
Test Voltage::	120Vac, 60Hz
Remark:	Temp 23 Humi:49%
Test Standard:	FCC 15.209
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

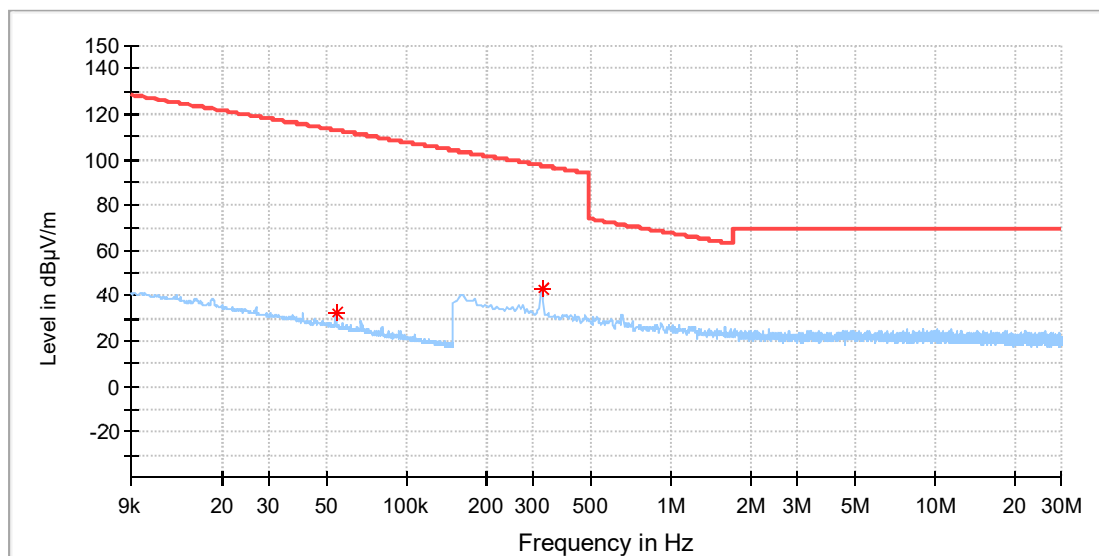


Critical_Freqs

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.024510	39.43	119.80	80.37	100.0	Y	350.0	20.0
0.036797	38.06	116.28	78.22	100.0	Y	350.0	20.0
0.325588	36.13	97.35	61.22	100.0	Y	28.0	20.0
2.164875	27.24	69.50	42.26	100.0	Y	287.0	20.0

EUT Information

EUT Name:	Power Dongle for Apple Watch
Model:	PDAW
Test Mode:	Wireless charging
Test Voltage::	120Vac, 60Hz
Remark:	Temp 23 Humi:49%
Test Standard:	FCC 15.209
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

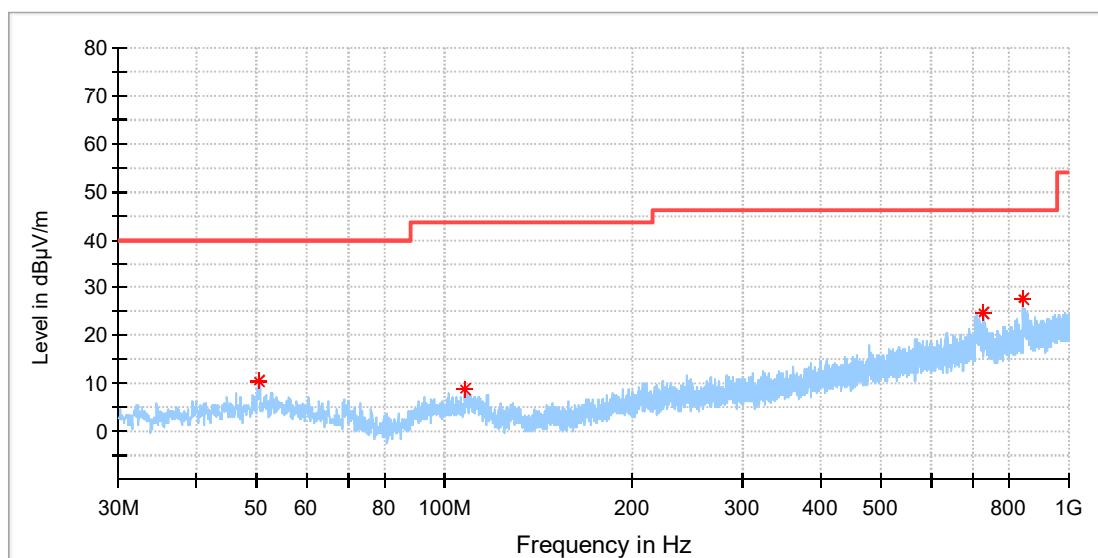


Critical_Freqs

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.053818	32.26	112.98	80.71	100.0	Z	36.0	20.0
0.325588	42.99	97.35	54.36	100.0	Z	327.0	20.0

EUT Information

EUT Name: Power Dongle for Apple Watch
 Model: PDAW
 Test Mode: Wireless charging
 Test Voltage:: 120Vac, 60Hz
 Remark: Temp 23 Humi:49%
 Test Standard: FCC 15.209
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

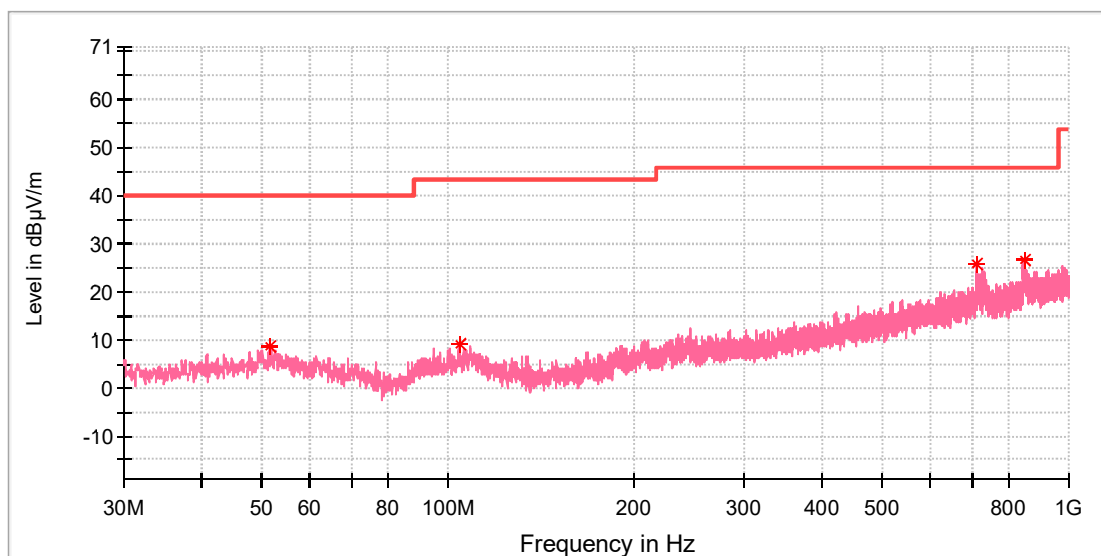


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
50.127500	10.47	---	40.00	29.53	100.0	H	122.0	-18.3
107.600000	8.88	---	43.50	34.62	100.0	H	6.0	-18.9
728.691000	24.72	---	46.00	21.28	100.0	H	242.0	-7.5
844.897000	27.58	---	46.00	18.42	100.0	H	91.0	-5.6

EUT Information

EUT Name:	Power Dongle for Apple Watch
Model:	PDAW
Test Mode:	Wireless charging
Test Voltage::	120Vac, 60Hz
Remark:	Temp 23 Humi:49%
Test Standard:	FCC 15.209
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
51.437000	8.65	---	40.00	31.35	100.0	V	306.0	-18.3
104.156500	8.97	---	43.50	34.53	100.0	V	244.0	-18.8
710.261000	25.78	---	46.00	20.22	100.0	V	81.0	-7.8
848.825500	26.60	---	46.00	19.40	100.0	V	39.0	-5.5

5.1.4 Conducted emissions

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.207
Basic standard	: ANSI C63.10: 2013
Frequency range	: 150KHz - 30MHz
Classification	: Class B
Limit	FCC Part 15.207 (a)
Kind of test site	: Shielded Room

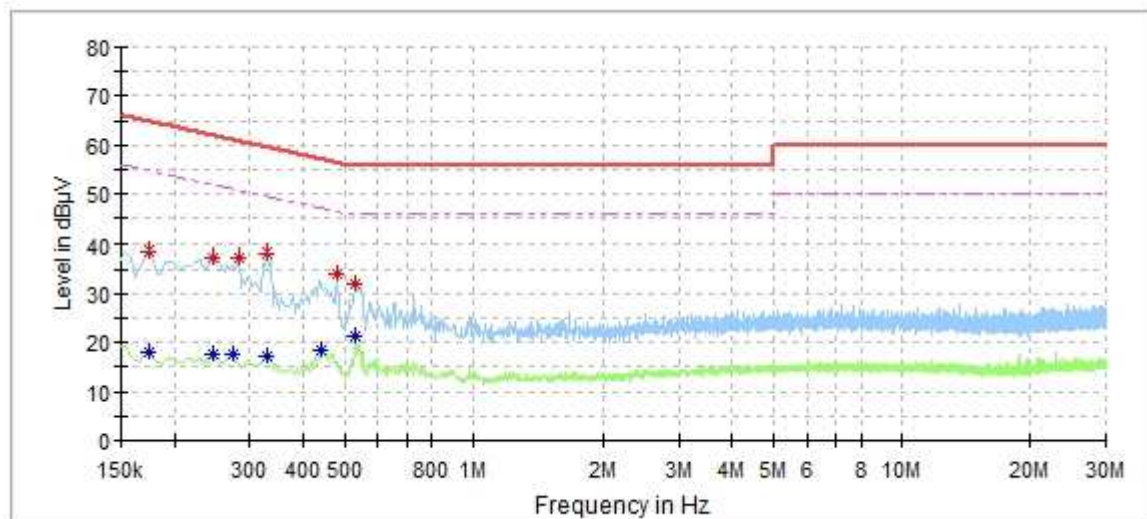
Test Setup

Date of testing	: 2021-08-24 – 2021-09-08
Input voltage	: AC 120V, 60Hz
Operation mode	: A
Ambient temperature	: 23 °C
Relative humidity	: 48 %
Atmospheric pressure	: 101 kPa

Refer to following test plots for details of test result.

EUT Information

EUT Name:	Power Dongle for Apple Watch
Model	PDAW
Test Mode:	On, Charging
Test Voltage:	AC 120V, 60Hz
Test By:	Charlie Zha
Review By:	Gary Chen
Remark:	SR1

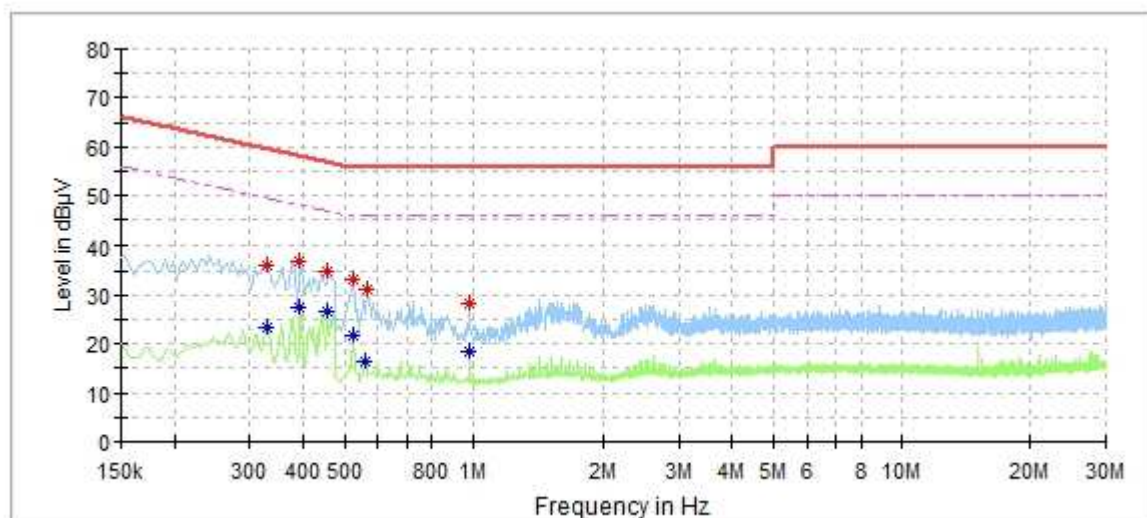


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.174000	---	18.17	54.77	36.60	L1	9.6
0.174000	38.73	---	64.77	26.04	L1	9.6
0.246000	37.36	---	61.89	24.53	L1	9.6
0.246000	---	17.47	51.89	34.42	L1	9.6
0.274000	---	17.56	51.00	33.44	L1	9.6
0.282000	37.40	---	60.76	23.36	L1	9.6
0.330000	---	17.34	49.45	32.12	L1	9.7
0.330000	38.01	---	59.45	21.44	L1	9.7
0.442000	---	18.56	47.02	28.46	L1	9.7
0.482000	33.99	---	56.31	22.31	L1	9.7
0.532000	---	21.20	46.00	24.80	L1	9.7
0.532000	32.19	---	56.00	23.81	L1	9.7

EUT Information

EUT Name:	Power Dongle for Apple Watch
Model	PDAW
Test Mode:	On, Charging
Test Voltage:	AC 120V, 60Hz
Test By:	Charlie Zha
Review By:	Gary Chen
Remark:	SR1



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.330000	---	23.51	49.45	25.94	N	9.7
0.330000	36.12	---	59.45	23.33	N	9.7
0.394000	37.03	---	57.98	20.95	N	9.7
0.394000	---	27.40	47.98	20.58	N	9.7
0.458000	---	26.84	46.73	19.89	N	9.7
0.458000	34.83	---	56.73	21.90	N	9.7
0.524000	---	21.59	46.00	24.41	N	9.7
0.524000	33.28	---	56.00	22.72	N	9.7
0.560000	---	16.28	46.00	29.72	N	9.7
0.564000	31.13	---	56.00	24.87	N	9.7
0.980000	---	18.45	46.00	27.55	N	9.7
0.980000	28.49	---	56.00	27.51	N	9.7

6 Safety Human Exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Electromagnetic Fields

RESULT:

Pass

Test Specification

Test standard

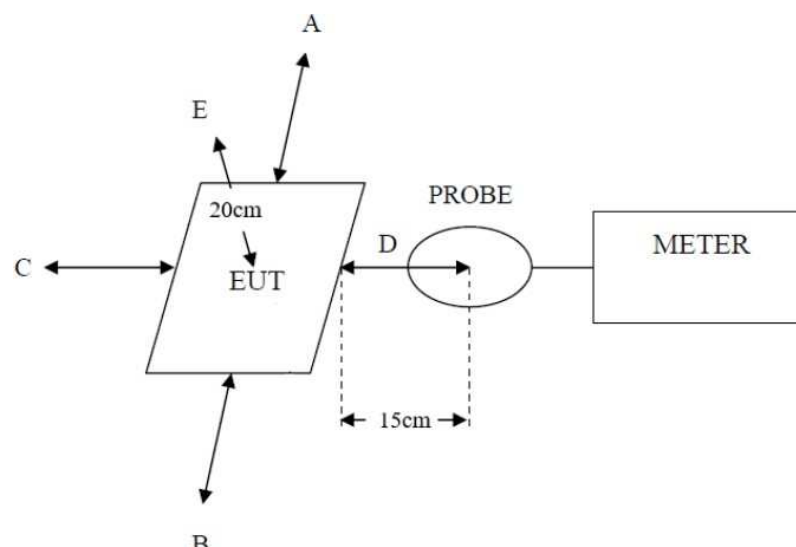
: CFR47 FCC Part 2: Subpart J Section 1.1310
FCC CFR 47 Part 1(1.1310) KDB 680106 D01 v03

According to the table 1 of FCC Part 2.1310, the reference limit as below:

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

Test Setup:



Test Result:

Table: H-Field Strength at 15 cm from the edges surrounding the EUT and 20cm from the top surface of the EUT

EUT Test Mode	Measured H-Field Strength Values (A/m)					50% Limit (A/m)	Limit (A/m)	Result
	Test Position Top	Test Position front	Test Position rear	Test Position left	Test Position right			
1% Battery Level	0.2568	0.2032	0.2488	0.2296	0.1816	0.815	1.63	Pass
50% Battery Level	0.2509	0.2021	0.2477	0.2295	0.1815	0.815	1.63	Pass
99% Battery Level	0.2560	0.2023	0.2474	0.2281	0.1805	0.815	1.63	Pass

7 Photographs of the Test Set-Up

Refer to test photo document.

8 List of Tables

Table 1: List of Test and Measurement Equipment.....	5
Table 2: Technical Specification of EUT	7
Table 3: List of Accessories and Auxiliary Equipment.....	8