

TEST REPORT		
Report Number.:	90957-22-72-22-PP002	
Date of issue.....:	2022-12-26	
Tested by (+signature).....:	Duke	<i>Duke Chen</i>
Approved by (+signature):	Jason	<i>Jason gao</i>
Testing Laboratory name	SLG-CPC Testlaboratory Co., Ltd.	
Address	No. 11, Wu Song Road, Dongcheng District, Dongguan, Guangdong Province, China 523117	
Applicant's name.....:	Shenzhen View lighting Technology Co.,Ltd	
Address	301, Building d, Xinwei Third Industrial Zone, Xinshi Community, Dalang Street, Longhua District, Shenzhen City	
Manufacturer's name	Shenzhen View lighting Technology Co.,Ltd	
Address	301, Building d, Xinwei Third Industrial Zone, Xinshi Community, Dalang Street, Longhua District, Shenzhen City	
Factory's name	Shenzhen View lighting Technology Co.,Ltd	
Address	301, Building d, Xinwei Third Industrial Zone, Xinshi Community, Dalang Street, Longhua District, Shenzhen City	
Standard(s)	FCC Part 1(1.1310) and Part 2(2.1091& 2.1093) KDB 680106 D01 RF Exposure Wireless Charging App v03r01 2022.04 TCBC WORKSHOP "4.1 Part 18 & Wireless Power Transfer"	
Test item description	Portable Apple Watch Charger	
Trade Mark	N/A	
Model/Type reference	F2	
FCC ID	2A7OT-F2	
Date of receipt of test item...:	2022-11-08	
Date (s) of performance of test	2022-11-09 to 2023-02-06	
Summary of Test Results	Pass	
The Summary of Test Results based on a technical opinion belongs to the standard(s).		
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Modified Information

Report No.	Revision Data	Summary
90957-22-72-22-PP002	2023-02-06	Original Version

1. SUMMARY OF TEST RESULT

EMISSION		
Description of Test Item	Standard & Limits	Results
MPE	FCC Part 1(1.1310) and Part 2(2.1091) Portable rule section part 2.1093. KDB 680106 D01 RF Exposure Wireless Charging App v03r01	Pass
Note: N/A is an abbreviation for Not Applicable.		

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Product Name	Portable Apple Watch Charger
Trade Name	N/A
Model Name	F2
Series Model	/
Output	Wireless Output : 5W
Operation frequency	325-327kHz
Modulation Type	MSK
Antenna Type	Inductive Loop Antenna with 0dBi
Power Supply	Input: DC 5V 1A Adapter DC 3.7 by battery 1200mAh
Hardware version number	V1.0
Software version number	V1.0
Connecting I/O Port(s)	Please refer to the User's Manual

2.2. Description of test modes

All the test modes were carried out with the EUT in normal operation, the final test mode of the EUT was the worst test mode for emission test, which was shown in this report and defined as:

Mode:	TEST MODE DESCRIPTION
1	AC/DC Adapter + EUT + Wireless Output (5W)
2	EUT + Wireless Output (5W)
Note: 1. All test modes were pre - tested, but we only recorded the worst case in this report. The worst case is mode 1	

2.3. Description of Support Device

No.	Equipment	Trade name	Model	S/N	Power Cord
1	Adapter	HUAWEI	HW-200675CD1	/	/
2	iWatch	Apple	S8	/	/

2.4. Description of Test Facility

Site Description

EMC Lab. : Accredited by FCC, October 04 2021
 Designation Number: CN0126
 Test Firm Registration Number: 27767
 Accredited by A2LA, October 04 2021
 The Certificate Registration Number is 6325.01

Name of Firm : SLG-CPC Testlaboratory Co., Ltd.
 Site Location : No. 11, Wu Song Road, Dongcheng District, Dongguan,
 Guangdong Province, China 523117

2.5. Measurement Uncertainty

Test Item	Uncertainty
Magnetic field measurements(9kHz~30MHz)	±2.3%
Electric field measurements(9kHz~30MHz)	±2.1%

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

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. For MPE Measurement

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☒	EMF Electromagnetic Field Probe (9kHz~30MHz)	Narda	EHP-200A	1802X11012	Mar 31, 2022	1 Year

4. RF EXPOSURE

4.1. Measuring Standard

FCC Part 1(1.1310) and Part 2(2.1091)
Portable rule section part 2.1093.

4.2. Requirments

Three different categories of transmitters are defined by the FCC in OET Bulletin 65. These categories are fixed installation, mobile, and portable and are defined as follows:

- o Fixed Installations: fixed location means that the device, including its antenna, is physically secured at a permanent location and is not able to be easily moved to another location. Additionally, distance to humans from the antenna is maintained to at least 2 meters.
- o Mobile Devices: a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to be generally used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structures and the body of the user or nearby persons. Transmitters designed to be used by consumers or workers that can be easily re-located, such as a wireless modem operating in a laptop computer, are considered mobile devices if they meet the 20 centimeter separation requirement. The FCC rules for evaluating mobile devices for RF compliance are found in 47 CFR §2.1091.
- o Portable Devices: a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user. Portable device requirements are found in Section 2.1093 of the FCC's Rules (47 CFR§2.1093). The FCC also categorizes the use of the device as based upon the user's awareness and ability to exercise control over his or her exposure. The two categories defined are Occupational/ Controlled Exposure and General Population/Uncontrolled Exposure. These two categories are defined as follows:

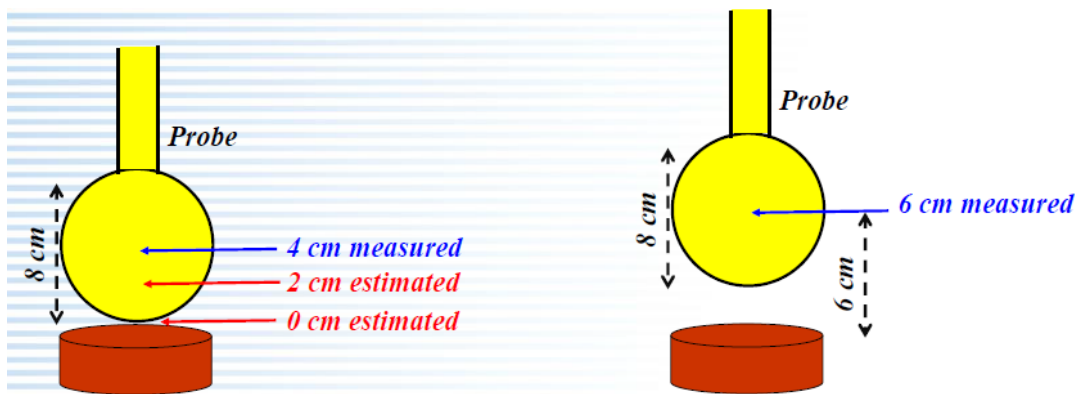
Occupational/Controlled Exposure: In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means. Awareness of the potential for RF exposure in a workplace or similar environment can be provided through specific training as part of a RF safety program. If appropriate, warning signs and labels can also be used to establish such awareness by providing prominent information on the risk of potential exposure and instructions on methods to minimize such exposure risks.

General Population/Uncontrolled Exposure: The general population / uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

4.3. Test configuration

For portable exposure conditions:

- 1 The RF exposure test was performed in anechoic chamber.
- 2 Perform H-field/E-field measurements are taken along all three axes the device from 0cm~20cm in 2cm minimum increment for each edge surface of the host/client pair. If the center of the probe sensing element is more than 5mm from the probe outer edge, the field strengths need to be estimated for the positions that are not reachable.



*Example of probe measurements in points close to the device surface:
estimates compared with measurements at 4 and 6 cm provide validation*

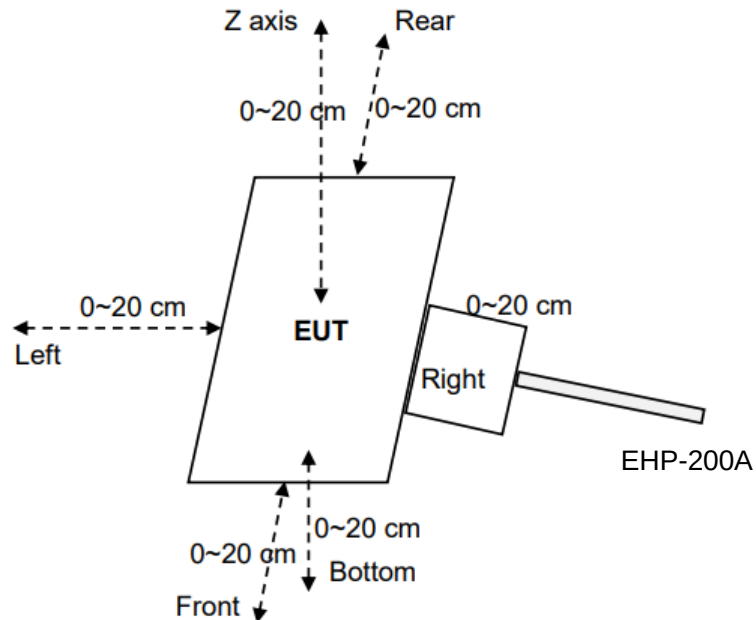
- 3 The highest emission level was recorded and compared with limit.
- 4 EUT is a loop/coil emitting structure, so E-field not required.
- 5 According to Calibration information and specification about EHP-200A, The Probe EHP-200A's sensitive elements center is located in the probe's center, and the dimensions is 92x92x109mm. so the actual 0cm, 2cm, 4cm field strengths need to be estimated for the positions that are not reachable. The Extrapolated Value Calculation Method please see the page 13. And the result of test distance 6cm~20cm was measured value.

For mobile exposure conditions:

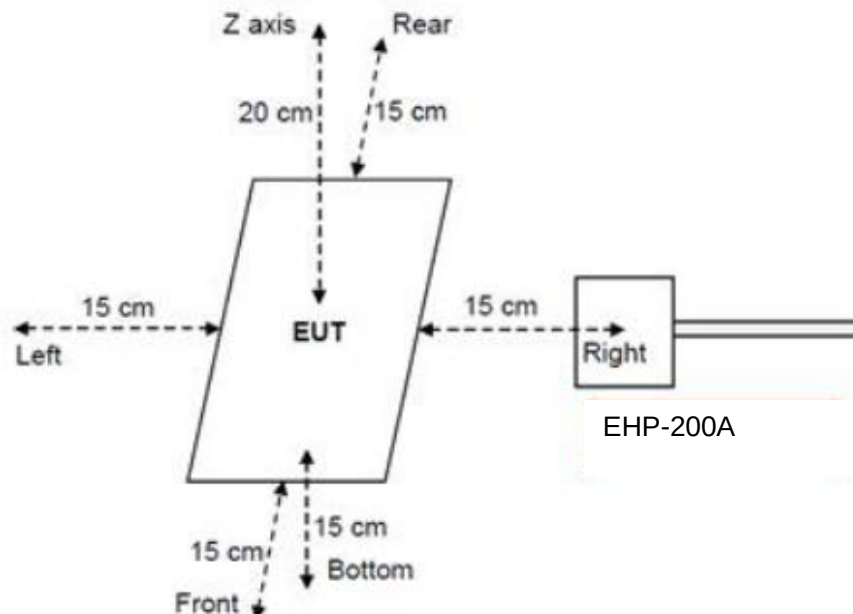
- 1 The RF exposure test was performed in anechoic chamber.
- 2 The field strength of both E-field and H-field was measured at 15cm(the 15 cm measured from the center of the probe(s) to the edge of the device) using the equipment list above for determining compliance with the MPE requirements of FCC Part 1.1310.
- 3 The RF power density was measured at 3 different charge conditions: min load, mid load, max load.
- 4 Maximum E-field and H-field measurements were made 15cm from each side of the EUT. Along the side of the EUT and still 15cm away from the edge of the EUT, the field probes were positioned at the location where there is maximum field strength. The maximum E-field and H-field is reported below.
- 5 The highest emission level was recorded and compared with limit.
- 6 The EUT were measured according to the dictates of KDB 680106D01v03

4.4. Block Diagram of Test Setup

For portable exposure conditions



For mobile exposure conditions:



4.5. Limits

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

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

4.6. Measuring Results

Result:

a) Power transfer frequency is less than 1 MHz.

Yes, The device operates in the frequency 325kHz-327kHz.

b) Output power from each primary coil is less than or equal to 15watts.

Yes, The maximum output power of the primary coil is $\text{Max } 5\text{W} \leq 15\text{W}$.

c) The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils.

Yes, The transfer system including a charging system with only single primary coils is to detect and allow only between individual of coils.

d) Client device is placed directly in contact with the transmitter.

Yes, Client device is placed directly in contact with the transmitter.

e) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).

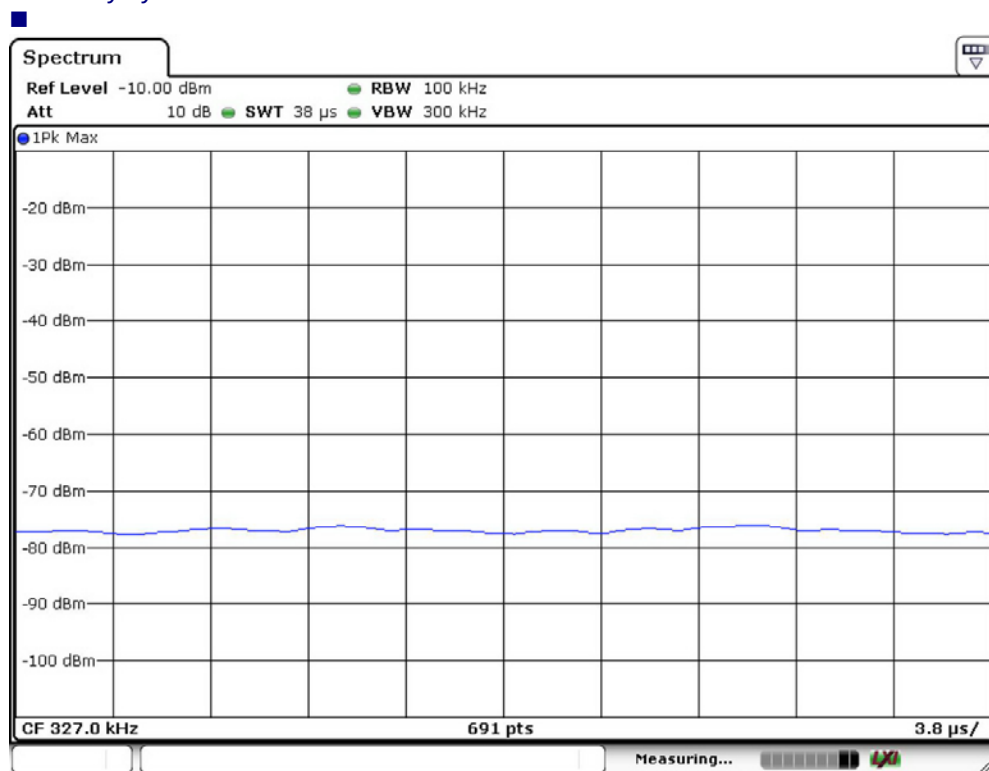
No, The EUT has portable exposure condition.

f) The aggregate H-Field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.

No, and H-field measurements for each edge/top surface of the host/client pair at every 2 cm, starting from as close as possible out to 20 cm were also evaluated for portable use condition

TEST Data:

■ Duty cycle measure



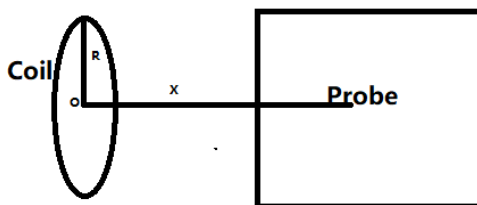
Duty cycle=100%

Duty cycle factor=20log (duty cycle) =0

For portable exposure conditions:

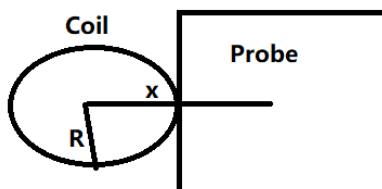
We use Biot-Savart formula theory to estimate the strength of the magnetic field that the measuring instrument cannot measure. According to Biot-Savart formula:

Top & Bottom Side:



$$B = \frac{\mu_0 * I * N * R^2}{2 * (R^2 + x^2)^{3/2}}$$

Front, left, right & rear Side:



$$B = \frac{\mu_0 * I * N}{2 * x}$$

B: means H-field value;

μ_0 is space permeability; $\mu_0 = 4 \pi * 10^{-7}$;

I: A current element passing through a coil;

R: means the Radius of coil(According to provided Antenna specification: We can get the minimum $R = 19.5/2 = 9.75\text{mm} = 0.0975\text{m}$);

x: means the evaluated point to the coil center.(For top & bottom side: $x = \text{test distance}$; For other side: $x = \text{test distance} + R$)

N: Number of turns, According to provided “Antenna specification” files: $N = 12$.

For validation purposes: If the value to show a 30% agreement between the mode and the (E- and/or H-field) probe measurements for the two closest points to the device surface, and with 2cm increments. Then this extrapolation method is reasonable.

Note: The percent ratio of agreement is the difference between the estimated and measured values divided by the average of the estimated and measured values.

Test Mode: Mode 1(100% Load)

Test Mode: Mode 1(100% Load)

Magnetic Field Emissions							
Test Distance(cm)	Top	Left	Right	Rear	Front	Bottom	Limit(A/m)
	Measure Value (A/m)						
0(estimated)	0.1253	0.1272	0.1279	0.1268	0.1273	0.1275	1.63
2(estimated)	0.1179	0.1056	0.1062	0.1053	0.1057	0.1199	1.63
4(estimated)	0.0995	0.0903	0.0908	0.0900	0.0904	0.1012	1.63
6	0.0778	0.0789	0.0793	0.0786	0.0790	0.0791	1.63
8	0.0712	0.0732	0.0743	0.0728	0.0765	0.0729	1.63
10	0.0699	0.0691	0.0681	0.0675	0.0683	0.0695	1.63
12	0.0645	0.0672	0.0664	0.0634	0.0622	0.0612	1.63
14	0.0572	0.0631	0.0567	0.0589	0.0601	0.0574	1.63

16	0.0521	0.0555	0.0500	0.0512	0.0543	0.0508	1.63
18	0.0438	0.0510	0.0477	0.0432	0.0445	0.0468	1.63
20	0.0371	0.0364	0.0373	0.0365	0.0374	0.0366	1.63

Validation:

Magnetic Field Emissions							
Test Distance(cm)	Top	Left	Right	Rear	Front	Bottom	Conclusion
	Unit: Agreement (%); H-field (A/m)						
Agreement -6cm	19.91	4.46	5.40	21.06	25.41	20.63	Compliance
6(estimated)	0.0950	0.0825	0.0837	0.0971	0.1020	0.0973	
6(measured)	0.0778	0.0789	0.0793	0.0786	0.0790	0.0791	
Agreement -8cm	28.43	6.09	3.18	4.30	0.52	25.49	
8(estimated)	0.0948	0.0778	0.0767	0.0760	0.0769	0.0942	
8(measured)	0.0712	0.0732	0.0743	0.0728	0.0765	0.0729	

Test Mode: Mode 1(50% Load)

Magnetic Field Emissions							
Test Distance(cm)	Top	Left	Right	Rear	Front	Bottom	Limit(A/m)
	Measure Value (A/m)						
0(estimated)	0.1122	0.1103	0.1114	0.1087	0.1121	0.1109	1.63
2(estimated)	0.1055	0.0916	0.0925	0.0903	0.0931	0.1043	1.63
4(estimated)	0.0890	0.0783	0.0791	0.0772	0.0796	0.0880	1.63
6	0.0696	0.0684	0.0691	0.0674	0.0695	0.0688	1.63
8	0.0636	0.0662	0.0635	0.0617	0.0650	0.0636	1.63
10	0.0596	0.0622	0.0589	0.0580	0.0611	0.0595	1.63
12	0.0541	0.0601	0.0567	0.0531	0.0584	0.0532	1.63
14	0.0532	0.0554	0.0501	0.0498	0.0513	0.0499	1.63
16	0.0477	0.0500	0.0462	0.0484	0.0476	0.0451	1.63
18	0.0415	0.0455	0.0399	0.0421	0.0433	0.0398	1.63
20	0.0322	0.0401	0.0351	0.0323	0.0321	0.0334	1.63

Validation:

Magnetic Field Emissions							
Test Distance(cm)	Top	Left	Right	Rear	Front	Bottom	Conclusion
	Unit: Agreement (%); H-field (A/m)						
Agreement -6cm	19.81	8.67	3.41	19.91	22.02	20.95	Compliance
6(estimated)	0.0849	0.0746	0.0715	0.0823	0.0867	0.0849	
6(measured)	0.0696	0.0684	0.0691	0.0674	0.0695	0.0688	
Agreement -8cm	23.82	5.72	4.46	5.67	5.68	23.70	
8(estimated)	0.0808	0.0701	0.0664	0.0653	0.0688	0.0807	
8(measured)	0.0636	0.0662	0.0635	0.0617	0.0650	0.0636	

Test Mode: Mode 1(1% Load)

Magnetic Field Emissions							
Test Distance(cm)	Top	Left	Right	Rear	Front	Bottom	Limit(A/m)
	Measure Value (A/m)						
0(estimated)	0.0730	0.0704	0.0737	0.0688	0.0700	0.0720	1.63
2(estimated)	0.0687	0.0585	0.0612	0.0571	0.0581	0.0677	1.63
4(estimated)	0.0580	0.0500	0.0523	0.0488	0.0497	0.0571	1.63
6	0.0453	0.0437	0.0457	0.0426	0.0434	0.0446	1.63
8	0.0386	0.0399	0.0378	0.0382	0.0381	0.0392	1.63
10	0.0326	0.0358	0.0336	0.0342	0.0343	0.0337	1.63
12	0.0276	0.0312	0.0269	0.0280	0.0301	0.0294	1.63
14	0.0233	0.0281	0.0224	0.0225	0.0247	0.0230	1.63
16	0.0163	0.0197	0.0167	0.0155	0.0171	0.0159	1.63
18	0.0085	0.0173	0.0085	0.0092	0.0101	0.0098	1.63
20	0.0056	0.0131	0.0039	0.0058	0.0048	0.0046	1.63

Validation:

Magnetic Field Emissions							
Test Distance(cm)	Top	Left	Right	Rear	Front	Bottom	Conclusion
	Unit: Agreement (%); H-field (A/m)						
Agreement -6cm	12.81	2.93	7.02	17.75	15.71	15.89	Compliance
6(estimated)	0.0515	0.0450	0.0426	0.0509	0.0508	0.0523	
6(measured)	0.0453	0.0437	0.0457	0.0426	0.0434	0.0446	
Agreement -8cm	13.53	1.00	0.26	0.78	1.30	15.31	
8(estimated)	0.0442	0.0403	0.0379	0.0385	0.0386	0.0457	
8(measured)	0.0386	0.0399	0.0378	0.0382	0.0381	0.0392	

For mobile exposure conditions:**Test Mode: Mode 1(100% Load)**

Electric Field Emissions		
Test Position	Measure Value (V/m)	Limit(V/m)
Top	1.92	614
Left	1.83	614
Right	1.79	614
Rear	1.34	614
Front	1.51	614
Bottom	1.66	614
Magnetic Field Emissions		
Test Position	Measure Value (A/m)	Limit(A/m)
Top	0.0726	1.63
Left	0.0691	1.63
Right	0.0804	1.63
Rear	0.0724	1.63
Front	0.0764	1.63
Bottom	0.0770	1.63

Test Mode: Mode 1(50% Load)

Electric Field Emissions

Test Position	Measure Value (V/m)	Limit(V/m)
Top	1.54	614
Left	1.16	614
Right	1.57	614
Rear	1.47	614
Front	1.74	614
Bottom	1.90	614

Magnetic Field Emissions

Test Position	Measure Value (A/m)	Limit(A/m)
Top	0.0664	1.63
Left	0.0626	1.63
Right	0.0680	1.63
Rear	0.0584	1.63
Front	0.0658	1.63
Bottom	0.0540	1.63

Test Mode: Mode 1(1% Load)

Electric Field Emissions

Test Position	Measure Value (V/m)	Limit(V/m)
Top	1.58	614
Left	1.59	614
Right	1.42	614
Rear	1.32	614
Front	1.41	614
Bottom	1.66	614

Magnetic Field Emissions

Test Position	Measure Value (A/m)	Limit(A/m)
Top	0.0132	1.63
Left	0.0168	1.63
Right	0.0142	1.63
Rear	0.0122	1.63
Front	0.0127	1.63
Bottom	0.0158	1.63

THE END