



TEST REPORT

Report Reference No..... : TRE1606009701 R/C.....:69473
FCC ID..... : ZLZEPC002
Applicant's name..... : Shenzhen Mindray BIO-Medical electronics Co.,LTD.
Address..... : Mindray Building,Keji 12th Road South,High-tech Industrial Park,Nanshan,Shenzhen, China
Manufacturer..... : Shenzhen Mindray BIO-Medical electronics Co.,LTD.
Address..... : Mindray Building,Keji 12th Road South,High-tech Industrial Park,Nanshan,Shenzhen, China
Test item description : ECG Patch Charger (Professional)
Trade Mark : Mindray
Model/Type reference..... : EPC002
Listed Model(s) : -
Standard : FCC CFR Title 47 Part 18
Date of receipt of test sample..... : Jun.16, 2016
Date of testing : Jun.17, 2016- Jul.08,2016
Date of issue..... : Jul.08,2016
Result..... : PASS

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Hans Hu

Testing Laboratory Name : Shenzhen Huatongwei International Inspection Co., Ltd.

Address..... : 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

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Contents

<u>1.</u>	<u>APPLICABLE STANDARDS AND TEST DESCRIPTION</u>	<u>3</u>
1.1.	Applicable Standards	3
1.2.	Test Description	3
<u>2.</u>	<u>SUMMARY</u>	<u>4</u>
2.1.	Client Information	4
2.2.	Product Description	4
2.3.	Operation state	4
2.4.	EUT configuration	4
2.5.	Modifications	4
<u>3.</u>	<u>TEST ENVIRONMENT</u>	<u>5</u>
3.1.	Address of the test laboratory	5
3.2.	Test Facility	5
3.3.	Equipments Used during the Test	6
3.4.	Environmental conditions	7
3.5.	Statement of the measurement uncertainty	7
<u>4.</u>	<u>TEST CONDITIONS AND RESULTS</u>	<u>8</u>
4.1.	Conducted Emission	8
4.2.	Radiated Emission	11
<u>5.</u>	<u>TEST SETUP PHOTOS OF THE EUT</u>	<u>13</u>
<u>6.</u>	<u>EXTERNAL AND INTERNAL PHOTOS OF THE EUT</u>	<u>14</u>

1. APPLICABLE STANDARDS AND TEST DESCRIPTION

1.1. Applicable Standards

The tests were performed according to following standards:

[FCC Rules Part 18:2016](#) Industrial, Scientific, and medical equipment

[ANSI C63.10-2013](#): American National Standard of Procedures for Compliance Testing of
Unlicensed Wireless Devices

1.2. Test Description

Test Item	Section in CFR 47	Result
Conducted Emission (150kHz to 30 MHz)	PART 18.307(b)	Pass
Radiated Emission (9kHz to 30 MHz)	PART 18.305(b),(c)	Pass

Remark: The measurement uncertainty is not included in the test result.

2. SUMMARY

2.1. Client Information

Applicant:	Shenzhen Mindray BIO-Medical electronics Co.,LTD.
Address:	Mindray Building,Keji 12th Road South,High-tech Industrial Park,Nanshan,Shenzhen, China
Manufacturer:	Shenzhen Mindray BIO-Medical electronics Co.,LTD.
Address:	Mindray Building,Keji 12th Road South,High-tech Industrial Park,Nanshan,Shenzhen, China

2.2. Product Description

Name of EUT	ECG Patch Charger (Professional)
Trade Mark:	Mindray
Model No.:	EPC002
Listed Model(s):	-
Power Supply:	AC 120V/60Hz
Adapter Information:	-
Hardware Version:	-
Software Version:	-
Wireless Charger	
Operation Frequency Range:	100kHz~205kHz

2.3. Operation state

Keep the EUT in wireless charging mode.

2.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

☐	PowerCable	Length (m) :	/
☐		Shield :	/
☐		Detachable :	/
☐	Multimeter	Manufacturer :	/
☐		Model No. :	/

2.5. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.

Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

Phone: 86-755-26748019 Fax: 86-755-26748089

3.2. Test Facility

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

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection 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: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: February 28, 2015. Valid time is until February 27, 2018.

A2LA-Lab Cert. No. 3902.01

Shenzhen Huatongwei International Inspection 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: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until December 31, 2016.

FCC-Registration No.: 317478

Shenzhen Huatongwei International Inspection 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. Registration 317478, Renewal date Jul. 18, 2014, valid time is until Jul. 18, 2017.

IC-Registration No.: 5377A&5377B

The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377A on Dec. 31, 2013, valid time is until Dec. 31, 2016.

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377B on Dec.03, 2014, valid time is until Dec.03, 2017.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

VCCI

Radiated disturbance above 1GHz measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-292. Date of Registration: Dec. 24, 2013. Valid time is until Dec. 23, 2016.

Telecommunication Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-1837. Date of Registration: May 07, 2013. Valid time is until May 06, 2016.

DNV

Shenzhen Huatongwei International Inspection Co., Ltd. has been found to comply with the requirements of DNV towards subcontractor of EMC and safety testing services in conjunction with the EMC and Low voltage Directives and in the voluntary field. The acceptance is based on a formal quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025 (2005), in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors. Valid time is until Aug. 24, 2016.

3.3. Equipments Used during the Test

Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	R&S	ESCI	100106	2015/11/03
2	Artificial Mains	SCHWARZBECK	NNLK 8121	573	2015/11/03
3	Pulse Limiter	R&S	ESH3-Z2	101488	2015/11/03
4	Test Software	R&S	ES-K1	N/A	N/A
5	Adapter (see note)	HUNTKEY	HW-050100C2W	HWHKAPE51309936	-

NOTE: Adapter is Auxiliary equipment.

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	Rohde&Schwarz	ESCI	100900	2015/11/02
2	Loop Antenna	Rohde&Schwarz	HZ-9	838622\013	2015/11/08
3	EMI TEST SOFTWARE	Rohde&Schwarz	ESK1	N/A	N/A
4	TURNTABLE	MATURO	TT2.0	----	N/A
5	ANTENNA MAST	MATURO	TAM-4.0-P	----	N/A
6	Test cable	Siva Cables Italy	RG 58A/U	W14.02	2015/12/05

The Cal.Interval was one year

3.4. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Conducted Emission 9KHz-30MHz	3.39 dB	(1)
Radiated Emission 9KHz-30MHz	4.24 dB	(1)

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.

4. TEST CONDITIONS AND RESULTS

4.1. Conducted Emission

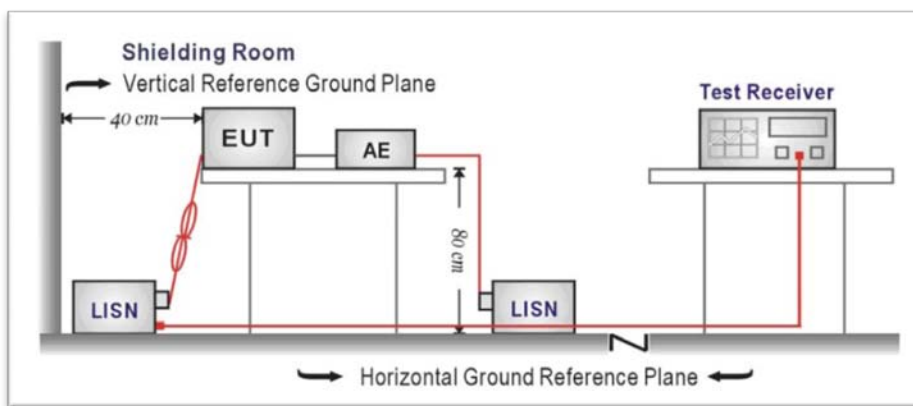
LIMIT

FCC CFR Title 47 Part 18.307(b):

Frequency range (MHz)	Limit (dBuV)	
	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.

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was setup according to ANSI C63.10:2013 for compliance to FCC 47CFR 18.307(b) requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

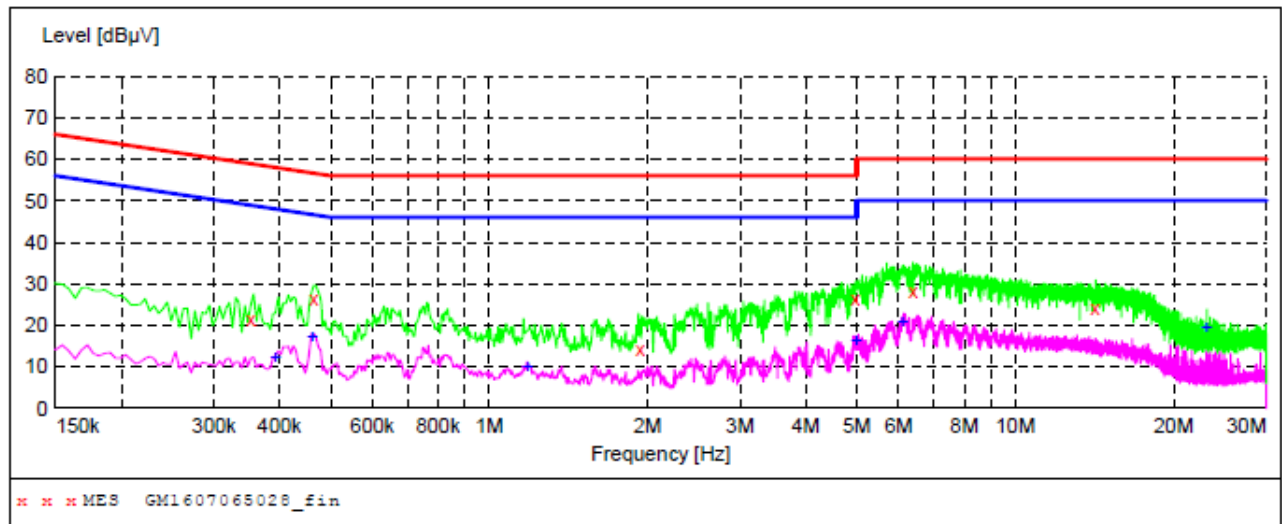
TEST RESULTS

Test mode:

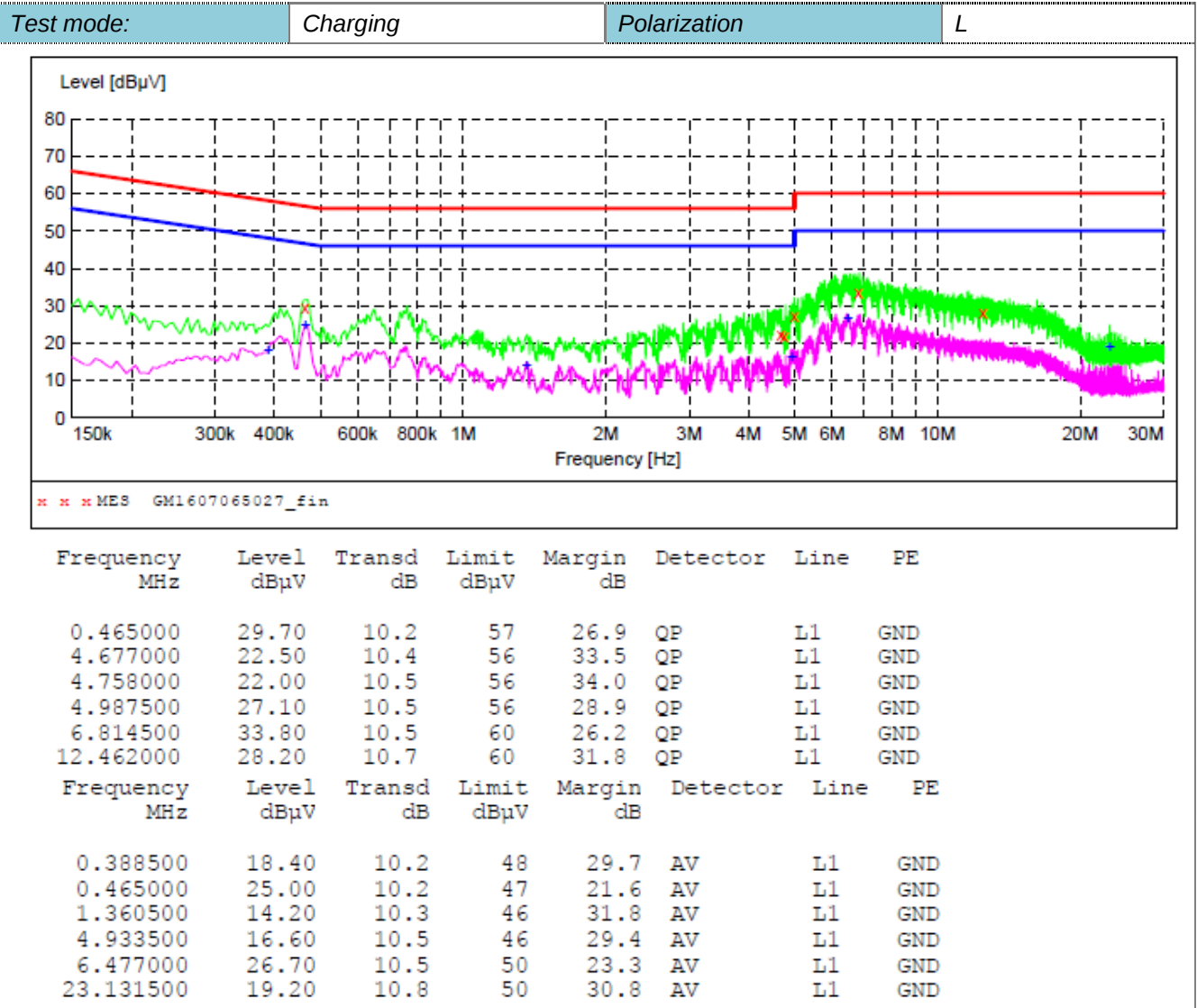
Charging

Polarization

N



Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.393000	12.40	10.2	48	35.6	AV	N	GND
0.460500	17.60	10.2	47	29.1	AV	N	GND
1.185000	10.30	10.3	46	35.7	AV	N	GND
4.983000	16.50	10.5	46	29.5	AV	N	GND
6.099000	21.20	10.5	50	28.8	AV	N	GND
23.131500	19.70	10.8	50	30.3	AV	N	GND
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.393000	12.40	10.2	48	35.6	AV	N	GND
0.460500	17.60	10.2	47	29.1	AV	N	GND
1.185000	10.30	10.3	46	35.7	AV	N	GND
4.983000	16.50	10.5	46	29.5	AV	N	GND
6.099000	21.20	10.5	50	28.8	AV	N	GND
23.131500	19.70	10.8	50	30.3	AV	N	GND



4.2. Radiated Emission

LIMIT

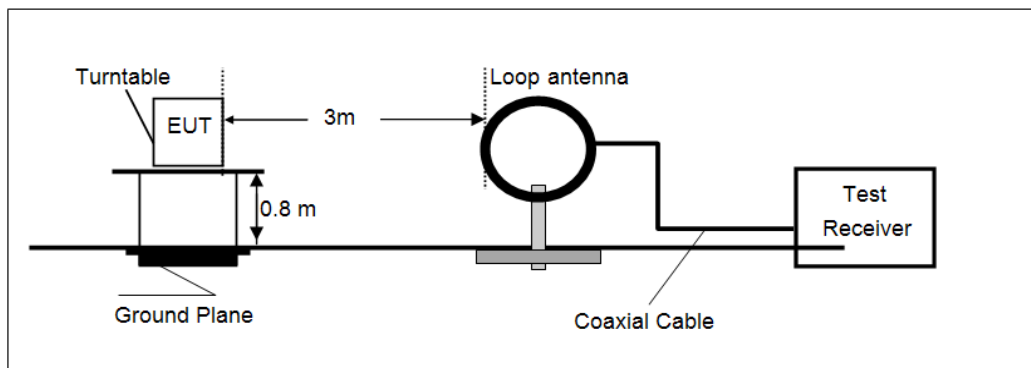
FCC CFR Title 47 Part 18.305(b),(c):

Frequency	Limit (dBuV/m @3m)	Value
0.009MHz-30MHz	63.52	Quasi-peak
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-1000MHz	46.00	Quasi-peak

Remark:According to the article 18.305(b),the operating frequency is non-ISM frequency;The RF Power generated by equipment is below 500(watts);According to the clause 18.305(c),the EUT belongs to Consumer equipment.

Testing for compliance with these limits may be made at closer distances, provided a sufficient number of measurements are taken to plot the radiation pattern, to determine the major lobes of radiation, and to determine the expected field strength level at 30, 300, or 1600 meters. Alternatively, if measurements are made at only one closer fixed distance, then the permissible field strength limits shall be adjusted using 1/d as an attenuation factor.

TEST CONFIGURATION

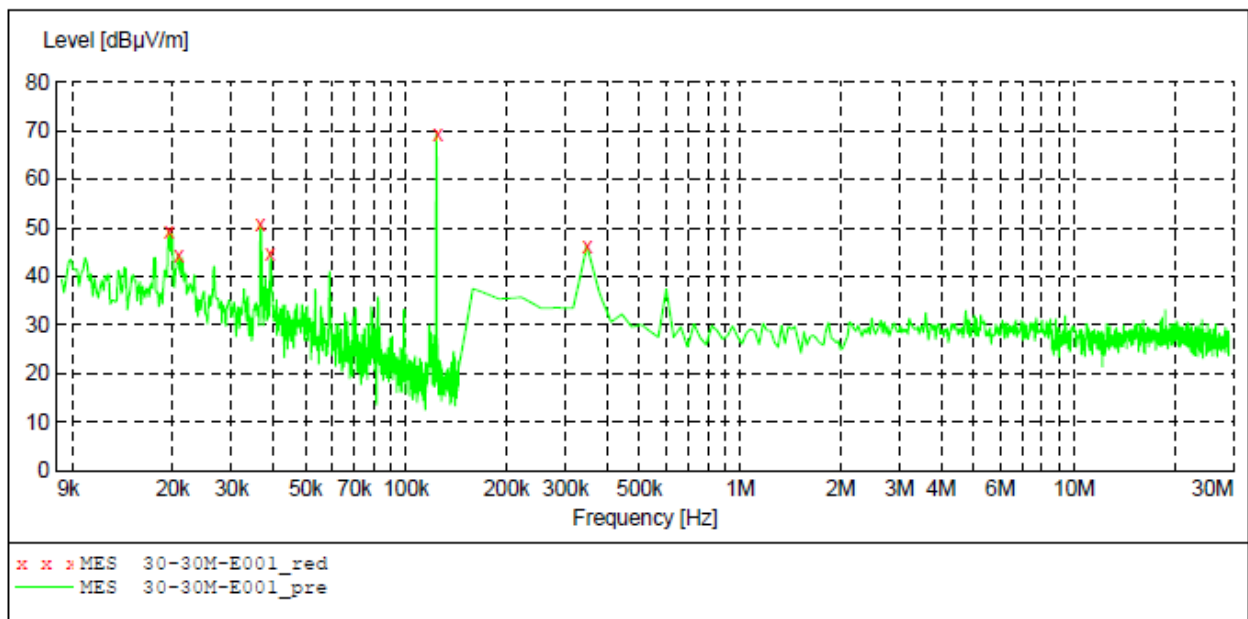


TEST PROCEDURE

1. The EUT was tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 18.305(b),(c) requirements.
2. The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna.
5. Use the following spectrum analyzer settings: The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.
6. If the emission level of the EUT in peak mode was 6dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise, the emission values would be re-tested one by one using Quasi-peak.

TEST RESULTS

Test mode:	Charging	Polarization	Horizontal
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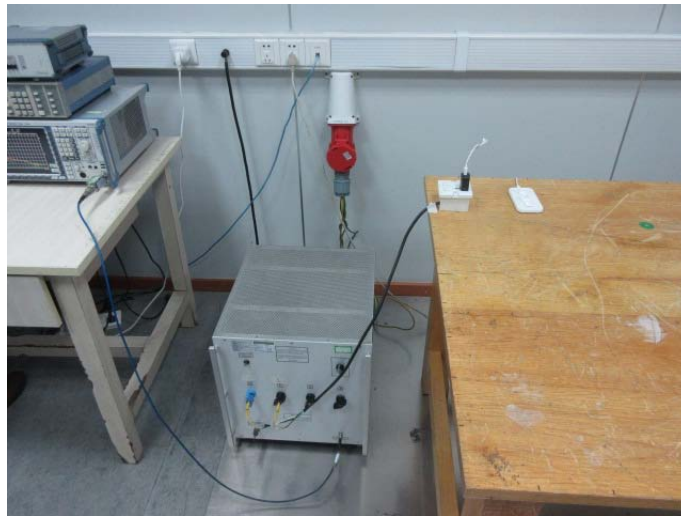
Frequency MHz	Level dBμV/m	Transd dB	Limit (dBμV/m @3m)	Margin dB	Det.	Result
0.018798	49.20	22.1	63.52	14.32	Quasi-peak	Pass
0.020076	44.30	22.1	63.52	19.22	Quasi-peak	Pass
0.035270	50.60	21.9	63.52	12.92	Quasi-peak	Pass
0.037684	44.70	21.8	63.52	18.82	Quasi-peak	Pass
0.117630	69.10	19.8	-	-	-	N/A
0.330094	46.30	21.2	63.52	17.22	Quasi-peak	Pass

Remark:

1. Level =Receiver Read level+ Transd
2. Transd=Antenna Factor+Cable Loss
3. Operation frequency is 0.117630 MHz,no applicated Limit.
4. The loop antenna rotated about both vertical and horizontal to find the maximum emission, so only the worst position (horizontal) was reported.

5. Test Setup Photos of the EUT

Conducted Emission

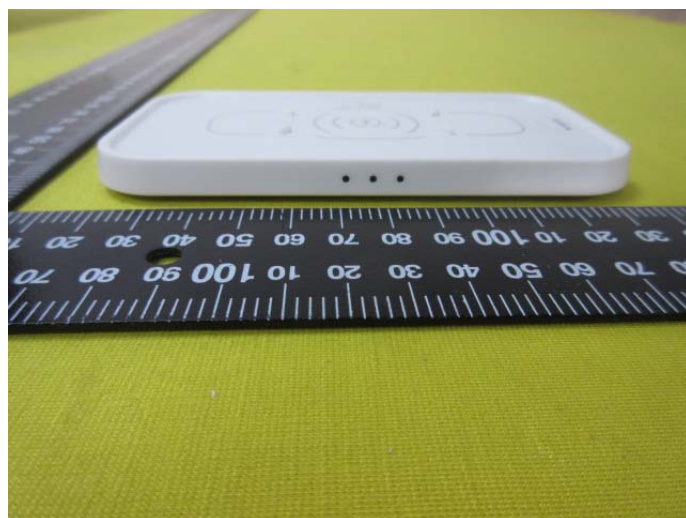


Radiated Emission



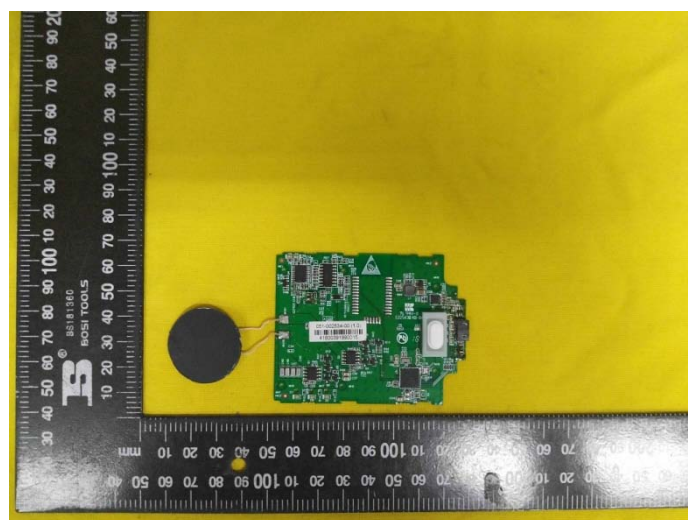
6. External and Internal Photos of the EUT

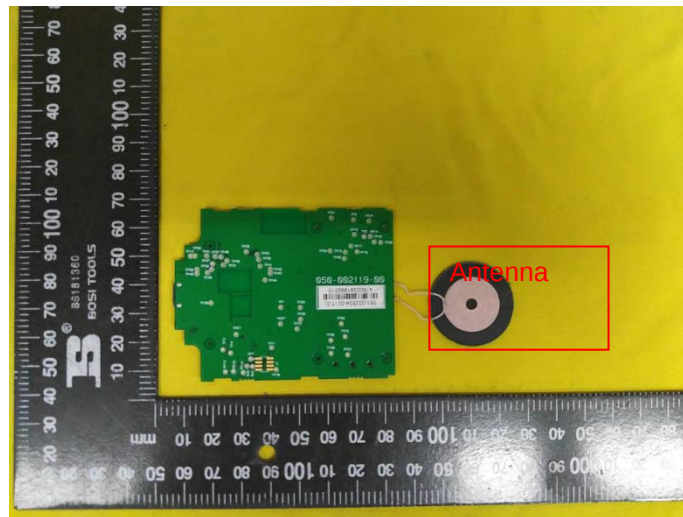
External photos





Internal photos





.....End of Report.....