TECHNICAL REPORT

Report No.:	EMC1807094-01
File reference No.:	2018-07-16
Applicant:	
Product:	Wireless charger
Model No.:	W2F
Trademark:	N/A
Test Standards:	ETSI EN301 489-1 v 2.1.1 (2017-02) ETSI EN301 489-3 v 2.1.1 (2017-03)
Test result:	The EMC testing has been performed on the submitted samples and found in compliance with council RE Directive 2014/53/EU

Approved By

Jack Chung

EMC Manager

Dated: July 16,2018

Results appearing herein relate only to the sample tested

The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TESTING LABORATORIES.

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Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meets with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

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

CNAS-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of testing Laboratories.

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1. General Information

1.1 Notes

The test results of this report relate exclusively to the test item specified in 1.5. The TIMEWAY Lab does not assume Responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the TIMEWAY Lab.

1.2 Testing Laboratory

SHENZHEN TIMEWAY TESTING LABORATORIES.

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Site on File With the Federal Communications and Commission – United States
Registration Number: 899988
For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada
Registration Number: IC: 5205A-02
For 3m & 10 m OATS

1.3 Details of Applicant

Name:
Address:

1. 4 Application Details

Date of Receipt of Application: July 13, 2018
Date of Receipt of Test Item: July 13, 2018
Date of Test: July 13, 2018~ July 16, 2018

1.5 Test Item

Manufacturer:
Address:

Brand Name: N/A
Model No.: W2F
Additional Model: N/A
Description: Wireless charger

Additional Information

Frequency: 111.5-205 kHz
Modulation Type: MSK
Power Supply: DC5V from a power supply
Operation Distance: N/A
Resolution: N/A
Extreme Temp. Tolerance: -20℃ to 55℃

Note: Classification according to CEPT/ERC Recommendation 70-03 & ETSI EN301 489-3 v 2.1.1 (2017-03)

1.6 Equipment Classification

Equipment Category: 3

1.7 List of Ports

Port	Description	Classification[1]	Maximum cable Length	Cable Type
N/A				

Note [1]prots shall be classified as ac power, dc power or signal/control port.
[2]Maximum cable length corresponding to the appropriate ports shall be classified as ≤3m or >3m.

1. 8 Ancillary and Peripheral Devices

Description	Designation	Serial No.	Manufacturer
N/A			

List of Peripheral Devices Used for Testing

Description	Designation	Serial No.	Manufacturer
N/A			

Note: An Equipment (apparatus) used in connection with a receiver or transmitter is considered as an ancillary Equipment (apparatus) if:

a. The equipment is intended for use in conjunction with a receiver or transmitter to provide additional operational and/or control features to the radio equipment. (e.g. to extend control to another position or location); and

b. The equipment cannot be used on a stand alone basis to provide user functions independently of a receiver or transmitter; and

c. The receiver or transmitter to which it is connected, is capable of providing some intended operation such as transmitting and/or receiving without the ancillary equipment (i.e. it is not a sub-unit of the main equipment essential to the main equipment basic functions).

1.9 Test Standards

ETSI EN 301 489-1 v 2.1.1 (2017-02)
Electromagnetic compatibility and Radio spectrum Matters (ERM);
Electromagnetic Compatibility (EMC) standard for radio equipment and services;
Part 1: Common technical requirements
ETSI EN 301 489-3 v 2.1.1 (2017-03)
ElectroMagnetic Compatibility (EMC) standard for radio equipment and services
Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz;
Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU

Note: All radiated measurements were made in all three orthogonal planes. The values reported are the maximum values.

1.10 Test or Witness Test Engineering

Test By:

Printing Name: Terry Tang

2. Technical Test

2. 1 Summary of Test Results

No deviations from the technical specification(s) were ascertained in the course of the tests Performed	
Final Verdict: (Only "Passed" if all Measurements are "Passed")	**Pass**

2.2 Test Report

Emission (EMI)

EMI Phenomenon	Port	Requirement		EUT Setup	Result	Applicability
		Standard	Basic Standard			
Conducted Interference Voltage	AC Mains	ETSI EN 301489-1: 2017-02 Clause 8.4	EN 55032:2015	Refer to Section 4	Complies	Applicable
Radiated Interference Field Strength 30~6000MHz	Enclosure	ETSI EN 301 489-1: 2017-02 Clause 8.2	EN 55032: 2015	Refer to Section 4	Complies	Applicable
Harmonic Current Emissions	AC Mains Input Port	ETSI EN 301 489-1: 2017-02 Clause 8.5	EN 61000-3-2:2014	Refer to Section 4	Complies	Not Applicable
Flicker & Voltage Fluctuation	AC Mains Input Port	ETSI EN 301 489-1: 2017-02 Clause 8.6	EN 61000-3-3:2013	Refer to Section 4	Complies	Not Applicable

Immunity (EMS)

EM3 Phenomenon	Port	Requirement		EUT Setup	Result	Applicability
		Standard	Basic Standard			
Electronic Discharge (ESD)	Enclosure	ETSI EN 301 489-1: 2017-02 Clause 9.3	EN 61000-4-2: 2009	Refer to Section 4	Complies	Applicable
RF-Electro-Magnetic Field (80-1000MHz) And 1400-2700MHz)	Enclosure	ETSI EN 301 489-1: 2017-02 Clause 9.2	EN 61000-4-3: 2006	Refer to Section 4	Complies	Applicable
Fast Transients, Burst	Power Line AC/DC	ETSI EN 301 489-1: 2017-02 Clause 9.4	EN 61000-4-4: 2012	Refer to Section 4	Complies	Applicable
Surge	Power Line (1 phase)	ETSI EN 301 489-1: 2017-02 Clause 9.8	EN 61000-4-5: 2014	Refer to Section 4	Complies	Applicable
Transients & Surge Vehicular Environment	Power Line (Car Charge)	ETSI EN 301 489-1: 2017-02 Clause 9.6	ISO 7637-1/2:1990	Refer to Section 4	Complies	Not Applicable
RF Common Mode (0.15-80MHz)	Power Line AC/DC signal Lines	ETSI EN 301 489-1: 2017-02 Clause 9.5	EN 61000-4-6: 2014	Refer to Section 4	Complies	Applicable
Vol. Dips, Interruptions& Fluctuations (AC Power)	Input& Output AC Ports only	ETSI EN 301 489-1: 2017-02 Clause 9.7	EN 61000-4-11 2004	Refer to Section 4	Complies	Applicable

N/A=Not Applicable

-Performance criteria A for immunity tests with phenomena of a continuous nature;

Communication between the Tx and Rx in the front of pings should not drop during the test.

-Performance criteria B for immunity tests with phenomena of a transient nature;

N/A

-Performance criteria C for immunity tests with power interruptions exceeding a certain time.

N/A

Note: For details see subclause 6.1 ETSI EN 301 489-3
A Switching power supply was selected by the test lab for full tests. When export, no power supply is provided to the EUT.
Switching Power Supply Model: BI 05A-050200-I1;
Rating: Input: 100-240V~, 50/60Hz, 0.35A, Output: DC5V, 2A
Switching Power Supply Manufacturer: BI

2.3 Measurement Uncertainty

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

Test Item	Uncertainty
Conducted Emissions	3.6dB
Radiated Emissions	4.7dB (Below 1GHz); 5.0dB (above 1GHz)
Harmonic Current Emission	1.2%
Voltage Fluctuations and Flicker	1.5%
Electrostatic Discharge	The waveform of voltage: 1.6%; Time: 3.1%
RF Electromagnetic Field	3.1dB
Electrical Fast Transients	The waveform of voltage: 1.5%; Time: 2.9%
Surge	The waveform of voltage: 1.5%; Time: 2.9%
RF Common Mode	3.9dB
Voltage Dips and Interruptions	The waveform of voltage: 1.5%; Time: 2.9%

Clause 8.2 Emission Test – Radiated Emission

This test assesses that ability of ancillary equipment to limit their internal noise from being radiated from the enclosure.

According to EMC basic standard (EN 55032)

Measurement according to EMC basic standard, The test results correspond to the 3m Semi-Anechoic Chamber results.

The EUT and it simulators are placed on a turntable which is 0.8 meter above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna is set on measurement. In order to find the maximum emission, all of The interface cables must be manipulated according to EN55032: 2015 on radiated measurement.

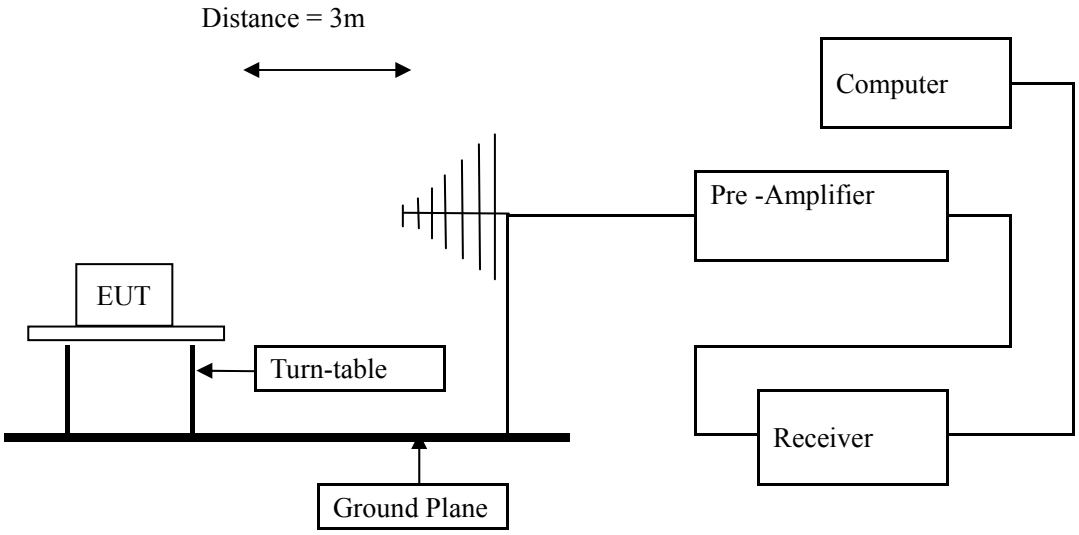
Radiated emissions were invested over the frequency range from 30MHz to 1 GHz using a receiver bandwidth of 120kHz.

Radiated emissions were invested over the frequency range from 30MHz to 6 GHz

Radiated Emission was performed at an antenna to EUT distance of 3 meters.

Radiated Emission Test

Block diagram of Test setup



Power line conducted Emission Limit

Frequency Range (MHz)	Distance (m)	Quasi-Peak limits (dB μ V/m)
30-230	10/3	30.0/40.0
230-1000	10/3	37.0/47.0
1000-3000	3	50 （AV）/70（PK）
3000-6000	3	54 （AV）/74（PK）

Note: The lower limit shall apply at the transition frequencies

Test result

Please refer to following table

Product	Wireless charger	Model:	W2F
Test Mode	Normal Operation	Test Voltage	230V~
Test Item	Radiated Emission	Humidity	56% RH
Temperature	24 deg. C,	Test result	Pass

A: Radiated Disturbance (30MHz----1000MHz)

EUT Operating Environment

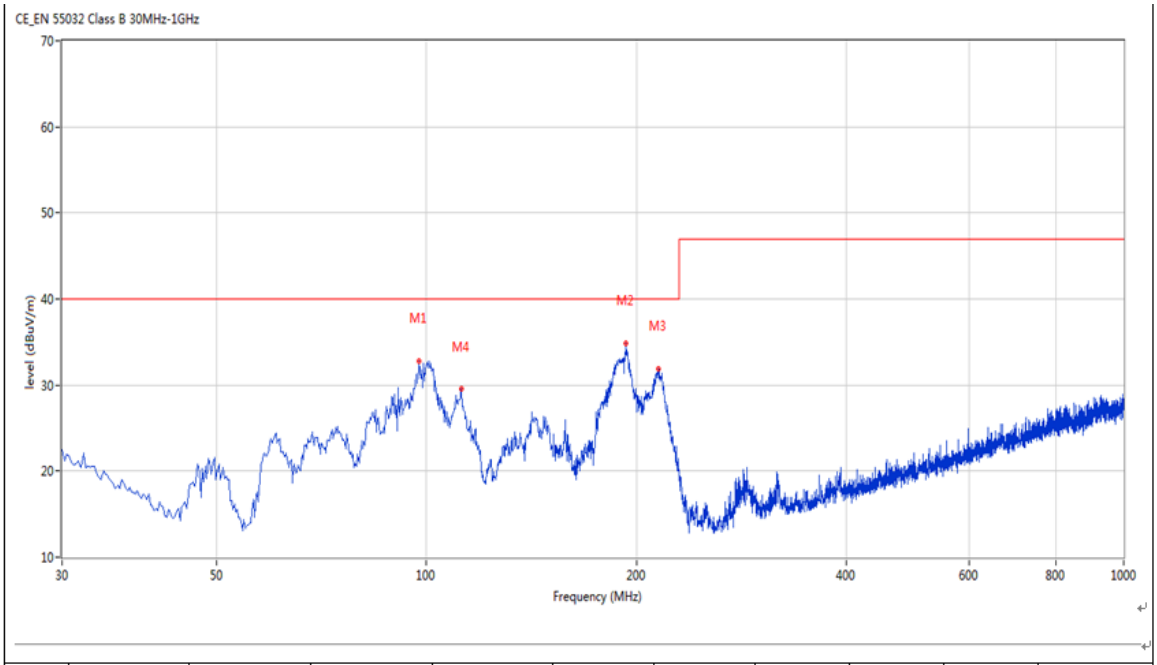
Temperature: 25℃ Humidity: 55%RH Atmospheric Pressure: 101 kPa

EUT set Condition: Charging mode

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	97.641	32.76	-14.22	40.0	7.24	Peak	178.00	200	H	Pass
2	192.919	34.81	-15.18	40.0	5.19	Peak	360.00	200	H	Pass
3	214.739	31.87	-14.42	40.0	8.13	Peak	3.00	100	H	Pass
4	112.187	29.51	-13.60	40.0	10.49	Peak	360.00	200	H	Pass

B: Radiated Disturbance (30MHz----1000MHz)

EUT Operating Environment

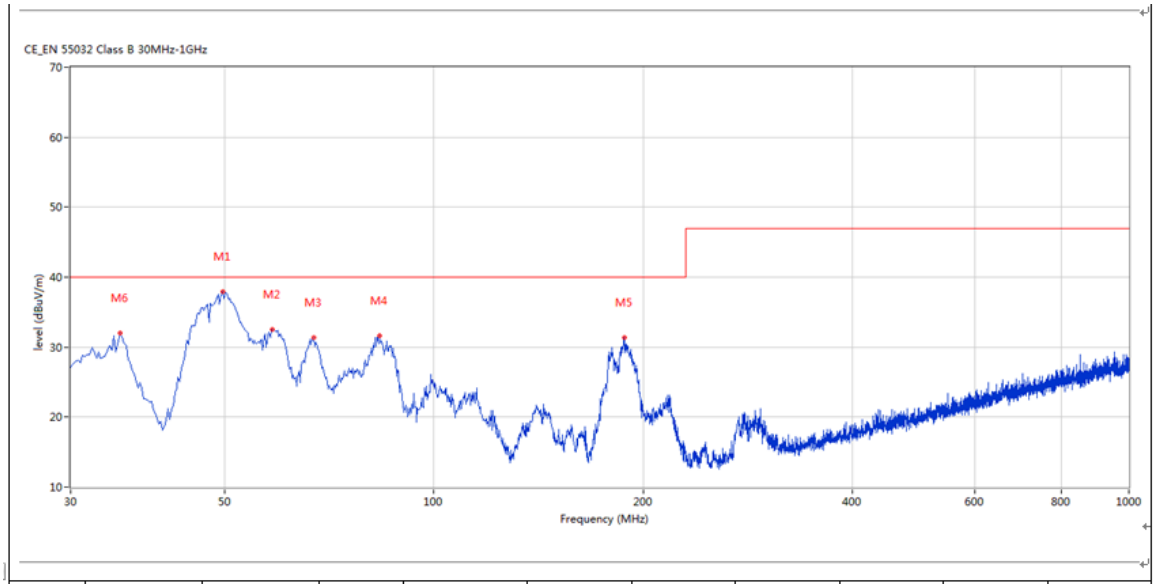
Temperature:25℃ Humidity: 55%RH Atmospheric Pressure: 101 kPa

EUT set Condition: Charging mode

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	49.638	37.99	-15.39	40.0	2.01	Peak	304.00	100	V	Pass
2	58.608	32.52	-19.64	40.0	7.48	Peak	255.00	200	V	Pass
3	67.093	31.37	-17.72	40.0	8.63	Peak	217.00	200	V	Pass
4	83.579	31.67	-14.70	40.0	8.33	Peak	360.00	200	V	Pass
5	187.828	31.42	-15.19	40.0	8.58	Peak	0.00	100	V	Pass
6	35.334	32.03	-7.01	40.0	7.97	Peak	117.00	100	V	Pass

C: Radiated Disturbance (1000MHz----6000MHz)

EUT Operating Environment

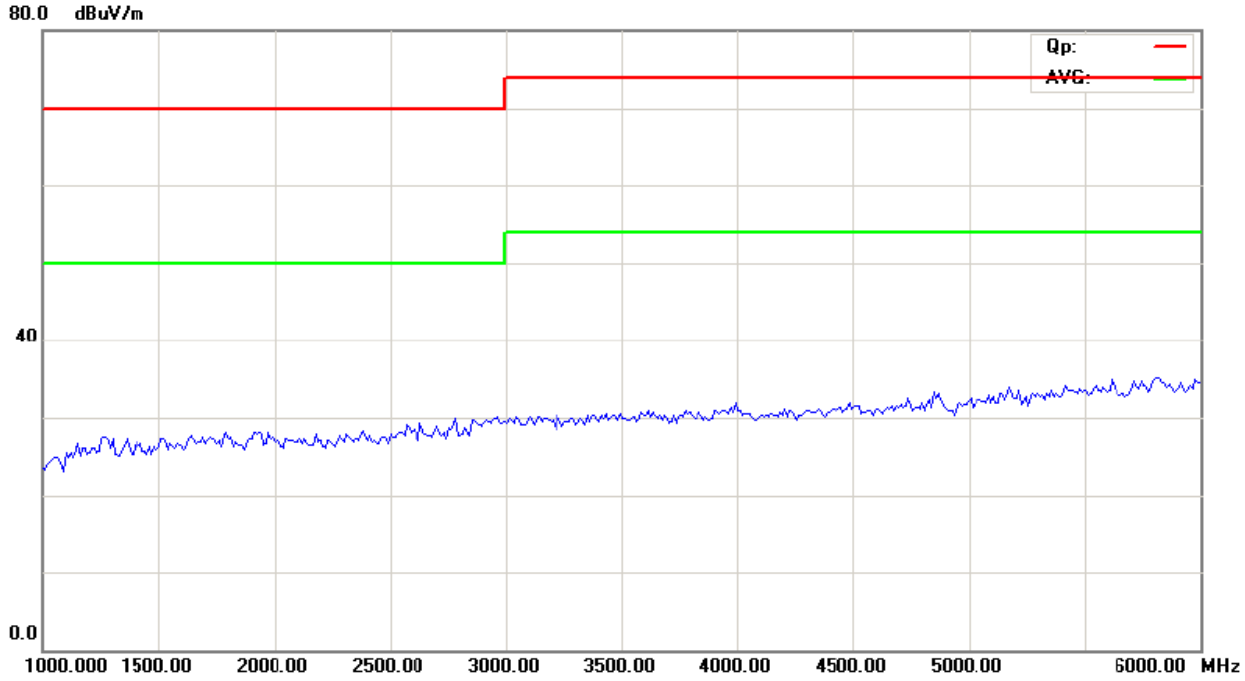
Temperature: 25℃ Humidity: 55%RH Atmospheric Pressure: 101 kPa

EUT set Condition: Charging mode

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
--	--	H	--
--	--	H	--

Note: The emission level less than the limit for more than 10dB, no necessary to take down the record.

D: Radiated Disturbance (1000MHz----6000MHz)

EUT Operating Environment

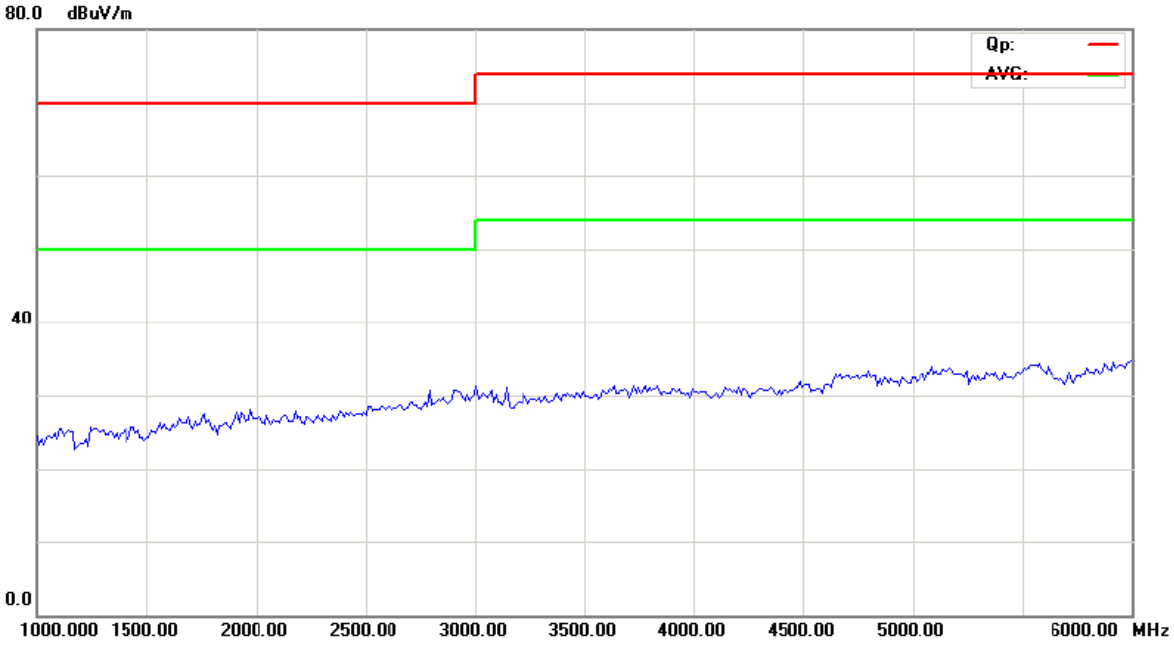
Temperature:25℃ Humidity: 55%RH Atmospheric Pressure: 101 kPa

EUT set Condition: Charging mode

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
--	--	V	--
--	--	V	--

Note: The emission level less than the limit for more than 10dB, no necessary to take down the record.

Clause 8.4 AC Line Conducted Emissions

According to EMC Basic Standard (EN 55032 Class-B)

1. For the table top EUT the distance to the reference ground plane (wall) should be 40 cm.
2. AC input line plugged into LISN.

EUT Operating Mode
Charging mode

Results

Power Line (L, N)	EUT Operating mode or operating mode no.	Detector (Peak, AV, QP)	Additional (scan-) Information (e.g. Pre-test Fast scan, Maxhold, Final measurement.)	Result (Passed / Failed)
L=>GND	Charging mode	QP & AV	--	Pass
N=>GND		QP & AV	--	Pass

The frequency spectrum from 0.15MHz to 30MHz was investigated. All readings are quasi -peak values with a resolution bandwidth of 9 KHz
Temperature: 25℃
Humidity: 53% RH

A: Conducted Emission on Live Terminal (150kHz to 30MHz)

EUT Operating Environment

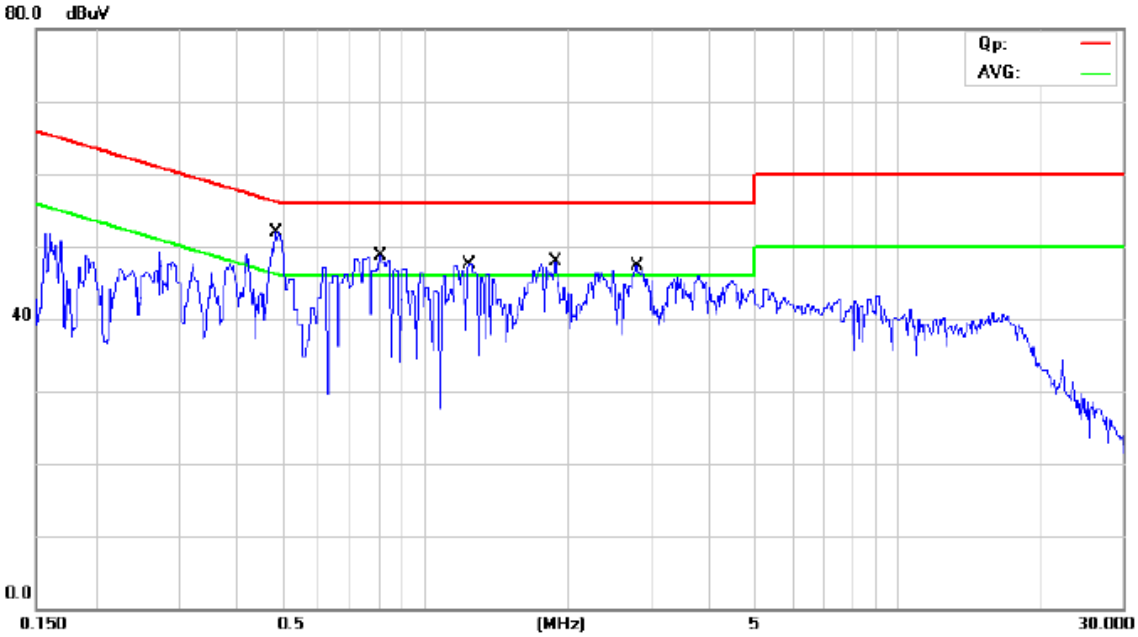
Temperature: 25℃ Humidity: 75%RH Atmospheric Pressure: 101 kPa

EUT set Condition: Charging mode

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.4815	38.60	10.25	48.85	56.31	-7.46	QP	
2		0.4815	24.90	10.25	35.15	46.31	-11.16	AVG	
3		0.8060	35.20	10.66	45.86	56.00	-10.14	QP	
4		0.8060	21.60	10.66	32.26	46.00	-13.74	AVG	
5		1.2386	32.80	10.90	43.70	56.00	-12.30	QP	
6		1.2386	11.90	10.90	22.80	46.00	-23.20	AVG	
7		1.8838	31.80	10.88	42.68	56.00	-13.32	QP	
8		1.8838	16.00	10.88	26.88	46.00	-19.12	AVG	
9		2.7850	31.70	10.86	42.56	56.00	-13.44	QP	
10		2.7850	16.60	10.86	27.46	46.00	-18.54	AVG	

B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

EUT Operating Environment

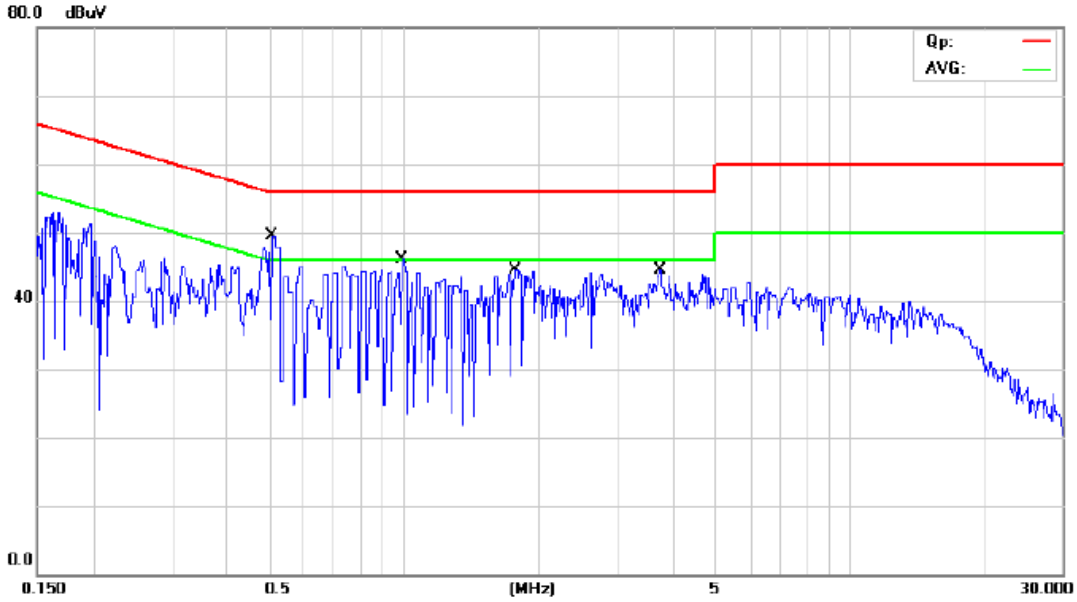
Temperature: 25℃ Humidity: 75%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Charging mode

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.5032	29.80	10.28	40.08	56.00	-15.92	QP	
2		0.5032	1.30	10.28	11.58	46.00	-34.42	AVG	
3		0.9901	27.10	10.89	37.99	56.00	-18.01	QP	
4		0.9901	4.70	10.89	15.59	46.00	-30.41	AVG	
5	*	1.7781	29.50	10.88	40.38	56.00	-15.62	QP	
6		1.7781	9.30	10.88	20.18	46.00	-25.82	AVG	
7		3.7271	25.20	10.85	36.05	56.00	-19.95	QP	
8		3.7271	8.10	10.85	18.95	46.00	-27.05	AVG	

Remarks:

1. Uncertainty in conducted emission measured is 3.6dB.
2. QP and AV are abbreviations of quasi-peak and average individually.
3. The emission levels of other frequencies were very low against the limit.

Clause 8.5 Harmonic Current Emissions

This test was performed as per EMC Basic Standard EN61000-3-2 :2014

EUT Operating Mode

Charging mode

Results: **N/A**

Port	EUT Operating mode or operating mode no.	Result (Passed / Failed)
AC Input	Charging mode	N/A

Please see the following test figure:

Table 1 - Limit of Harmonics Current Measurement	
Limits for Class A equipment	
Harmonics order (n)	**Max. permissible harmonics current (A)**
Odd harmonics	
3	2.3
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15<=n<=39	0.15 x 15/n
Even harmonics	
2	1.08
4	0.43
6	0.30
8<=n<=40	0.23 x 8/n

Note:

1. For Class A equipment, the harmonics of the input current shall not exceed the absolute values given in table 1.
2. For Class B equipment, the harmonics of the input current shall not exceed the values given in table 1 multiplied by factor of 1, 5.

Table 2 - Limit of Harmonics Current Measurement	
Limits for Class C equipment	
Harmonics order (n)	**Max. permissible harmonics current expressed as a percentage of the input current at the fundamental frequency (A)**

Odd harmonics only	
2	2
3	30× λ *
5	10
7	7
9	5
11<= n<=39	3

Note: The harmonic current limits of lighting equipment shall not exceed the relative limits given in table 2.

Table 3 - Limit of Harmonics Current Measurement		
Limits for Class D equipment		
Harmonics order (n)	**Maximum permissible harmonic current per watt mA/W**	**Maximum permissible harmonic current A**
Odd harmonics only		
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
13<=n<=39	3.85/n	See table 1
11<= n<=39	3	

Note: The harmonic of the input current shall not exceed the values that can be derived form table 3.

Test Equipment

Please refer to Section 6 this report.

Test Procedure

a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

b. The EUT is classified as follows:

Class A Balanced three-phase equipment and all other equipment, except that stated in one of the following classes.

Class B Portable tools.

Class C Lighting equipment, including dimming devices.

Class D Equipment having an input current with “special wave shape” and an active input power, P≤600W

Note: Due to the rated power less than 75W for the dongle. This test item not applicable.

Clause 8.6 Flicker and Voltage Fluctuation

This test was performed as per EMC Basic Standard EN 61000-3-3: 2013

Environmental conditions: Temperature: 25°C; Humidity: 50%RH

EUT Operating Mode

Charging mode

Results

Port	EUT Operating mode or operating mode no.	Result (Passed / Failed)
AC Input	Charging mode	**N/A**

Please refer to the following test figure

Test Equipment

Please refer to Section 6 this report.

Test Procedure

a.. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.

b. During the flick measurement, the measure time shall include that part of whole operation cycle in which t he EUT 10 minutes and the observation period for long- term flicker indicator is 2 hours.

Note: Tests need not be made on equipment which is unlikely to produce significant voltage fluctuations or flicker.

Clause 9.2 Immunity Test – Radiated, RF Electromagnetic Field

According to EMC Basic Standard (EN 61000-4-3[9])

Operating Mode: Charging mode

Environmental conditions: Temperature: 25°C; Humidity: 50%RH

Type of Port: Enclosure

Performance Criterion: CT/CR

The distance between the turn-table axis and Tx&Rx-antenna is 3m.

Field strength = 3V/m

Start Frequency = 80MHz Stop Frequency = 6000MHz

Frequency Step = lin 1MHz

Modulation = AM, 400Hz,1kHz, 80%

Results

Frequency (MHz)	Antenna Polarity	Radiation to	Reaction of the EUT During and after test	Result
80-6000	Horizontal	Front	No reactions recognized	Passed
80-6000	Vertical	Front	No reactions recognized	Passed
80-6000	Horizontal	Rear	No reactions recognized	Passed
80-6000	Vertical	Rear	No reactions recognized	Passed
80-6000	Horizontal	Left	No reactions recognized	Passed
80-6000	Vertical	Left	No reactions recognized	Passed
80-6000	Horizontal	Right	No reactions recognized	Passed
80-6000	Vertical	Right	No reactions recognized	Passed

Note: Performance criteria A observed.

Test Equipment

Please refer to Section 6 this report.

Test Procedure

The EUT and load, which are placed on a table that is 0.8 meter above ground, are placed with one coincident with

The calibration plane such that the distance from antenna to the EUT was 3 meters.

Both horizontal and vertical polarization of the antenna and four sides of the EUT are set on measurement.

In order to judge the EUT performance, a CCD camera is used to monitor EUT screen.

Clause 9.3 Electrostatic Discharge

According to EMC basic standard (EN61000-4-2[10]

Operating Mode: Charging mode

Environmental conditions: Temperature: 24°C; Humidity: 50%RH

Type of Port: Enclosure, USB Port, Screw

Performance Criterion: TT/TR

For the table top EUT the distance to the reference ground plane should be 80 cm.

Direct contact discharge on conducting surfaces of EUT

Indirect air discharge on insulating surfaces of EUT

±2kV, ±4kV direct discharge & ±2kV, ±4kV, ±8kV air discharge

Test Results

Item	Contact Discharge to conducted surfaces and to coupling planes		Air Discharge at insulating surfaces
	Direct Contact Discharge	Indirect Contact Discharge	
Test Voltage	Reaction of EUT / Result	Reaction of EUT / Result	Reaction of EUT / Result
+2kV	n.r.r Passed	n.r.r Passed	**n.r.r Passed**
-2kV	n.r.r Passed	n.r.r Passed	**n.r.r Passed**
+4kV	n.r.r Passed	n.r.r Passed	**n.r.r Passed**
-4kV	n.r.r Passed	n.r.r Passed	**n.r.r Passed**
+8kV	-	-	**n.r.r Passed**
-8kV	-	-	**n.r.r Passed**

Remarks: n.r.r. = no reaction recognized

Performance Criteria A observed and No any function degraded during the tests.

Clause 9.4 Fast Transients Common Mode

According to EMC basic standard (EN61000-4-4 [11]

Operating Mode: Charging mode

Environmental conditions: Temperature: 25°C; Humidity: 51%RH

Type of Port: AC mains power input/output port

Performance Criterion: TT/TR

For the table top EUT the distance to the reference ground plane should be 10 cm.

The test level for ac mains power input ports shall be 1kV open circuit.

Test Setup

Burst on Power Line (direct injection)

Test Results

Adjustment on UCS 500 M4: Trigger "AUTO", Burst length: 15ms		Test Time:	60s for every voltage and polarity					
			120s for every voltage and polarity					
Testing on power Line (direct injection)		Reaction of The Test Object During and after Test						Result
Test Voltage	Repetition Frequency	L1 =>GND (+=>GND)	L2=> GND	L3=> GND	N=> GND	PE=> GND	L1, N, => GND	
-0.5kV	5kHz	n.r.r	N/A	N/A	n.r.r	N/A	n.r.r	**Pass**
+0.5kV	5kHz	n.r.r	N/A	N/A	n.r.r	N/A	n.r.r	**Pass**
-1.0kV	5kHz	n.r.r	N/A	N/A	n.r.r	N/A	n.r.r	**Pass**
+1.0kV	5kHz	n.r.r	N/A	N/A	n.r.r	N/A	n.r.r	**Pass**

Clause 9.5 RF Common Mode

According to EMC basic standard (EN61000-4-6 [10])

Operating Mode: Charging mode

Environmental conditions: Temperature: 25°C; Humidity: 51%RH

Type of Port: AC mains power input/output port

Performance Criterion: CT/CR

Start Frequency = 150KHz Stop Frequency = 80MHz

Frequency Step = 50kHz in the range of 150kHz-5MHz

1% increment in the range of 5MHz-80MHz

Modulation = AM, 400Hz, 1kHz, 80%

Test Setup

Injection via CDN or BIC clamp

Test Results

Injection On	Injection Via	Reaction of the EUT During and after test	Result
AC input power line	CDN	No reactions recognized	**Pass**

Clause 9.7 Voltage Dips

According to EMC basic standard (EN61000-4-11 [13])

Operating Mode: Charging mode

Environmental conditions: Temperature: 24°C; Humidity: 49%RH

Type of Port: AC mains power input/output port

Performance Criterion: TT/TR

For the table top EUT the distance to the reference ground plane should be 80 cm.

The test level shall be- a vol. Reduction of the supply vol. 100% for 10ms, 100% for 20ms , 30% for 500ms And 100% for 5000ms

Test Results

Voltage Dip:

Test Level % Ut	Reduction	Duration (periods)	Phase Angle	Reaction of EUT during and after Test	Result
0	100%	10ms	0° - 360°	n.r.r- performance criteria A observed	**Pass**
0	100%	20ms	0° - 360°	n.r.r- performance criteria A observed	**Pass**
70	30%	500ms	0° - 360°	n.r.r- performance criteria A observed	**Pass**

Voltage Interceptions:

Test Level % Ut	Reduction	Duration (periods)	Phase Angle	Reaction of EUT during and after Test	Result
0	100%	5000ms	0° - 360°	n.r.r- performance criteria B observed	**Pass**

Clause 9.8 Surges Common & Differential Mode (1-phase)

According to EMC basic standard (EN61000-4-5 [14])

Operating Mode: Charging mode

Environmental conditions: Temperature: 25°C; Humidity: 50%RH

Type of Port: AC mains power input/output port

Performance Criterion: TT/TR

For the table top EUT the distance to the reference ground plane should be 80 cm.

1KV open circuit for common mode & 0.5kV open circuit for differential mode.

Test Results

5 pulses for each polarity and test voltage, alternating and negative/positive, triggered in case of AC- powerline: 0^o, 45^o, 90^o 180^o, 270^o, referred to the line frequency. (L1)

Repetition rate is 1 per min.

Test Voltage	Reaction of the test object during and after test by trigger angle/pulse no.(coupling on DC-lines =>trigger angle not relevant).					Result
	0^o/pulse no1, 2	45^0/pulse, no.3, 4	90^o/pulse, no. 5, 6	180^o/pulse, no. 7, 8	270^o/pulse, no. 9, 10	
Capacitive coupling on AC line: L1=>N or DC lines lines +=>- (Ri=2Ω/C =18uF)						
-0.5kV +0.5kV	No reaction Recognized	No reaction Recognized	No reaction Recognized	No reaction Recognized	No reaction Recognized	**Pass**
-1.0kV +1.0kV	No reaction Recognized	No reaction Recognized	No reaction Recognized	No reaction Recognized	No reaction Recognized	**Pass**
-2.0Kv +2.0kV	N/A	N/A	N/A	N/A	N/A	**N/A**
- kV +kV	N/A	N/A	N/A	N/A	N/A	**N/A**

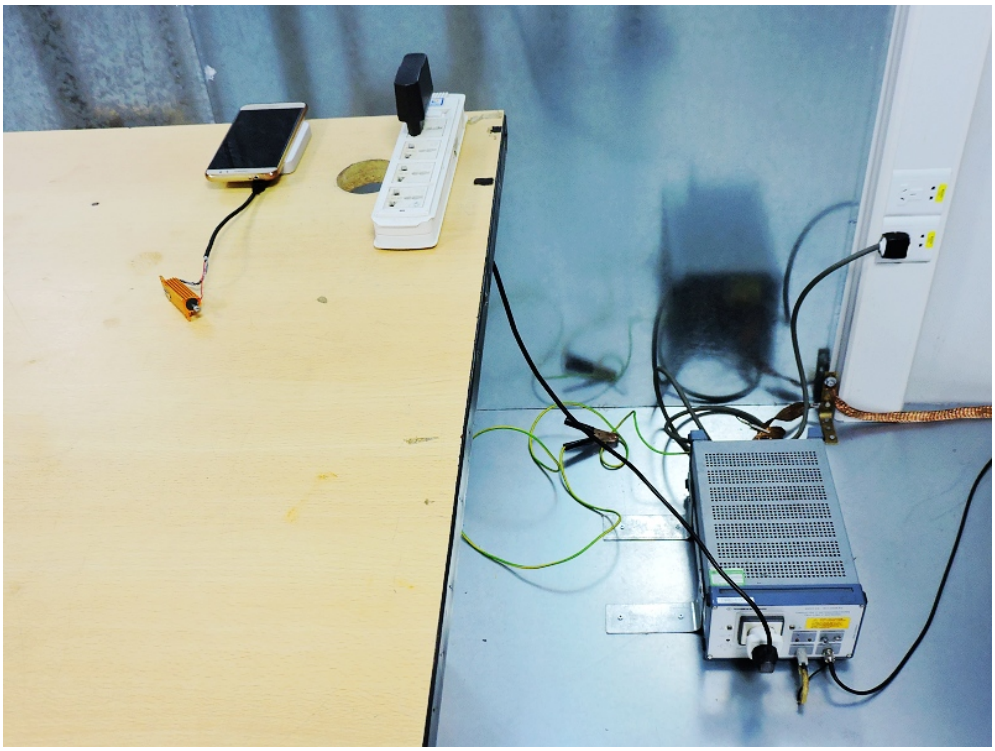
3. CE Mark label specification

Text of the mark is black or white in color and is left justified. Labels are printed in indelible ink on permanent adhesive backing and shall be affixed at a conspicuous location on the EUT or silk-screened onto the EUT.

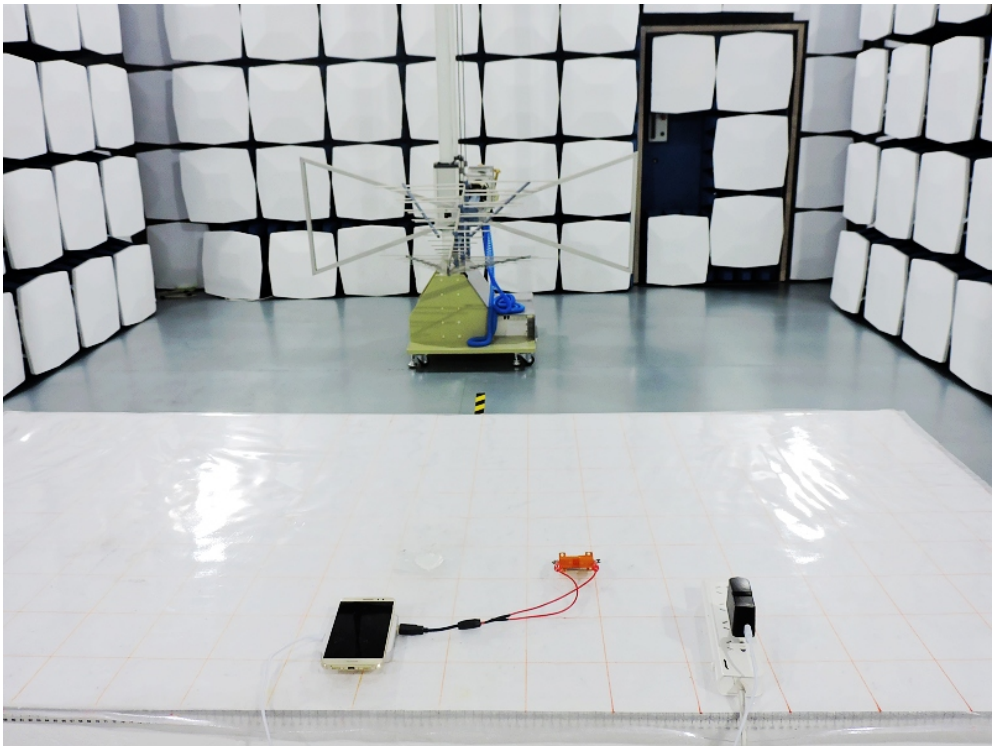
Mark Location: Rear enclosure

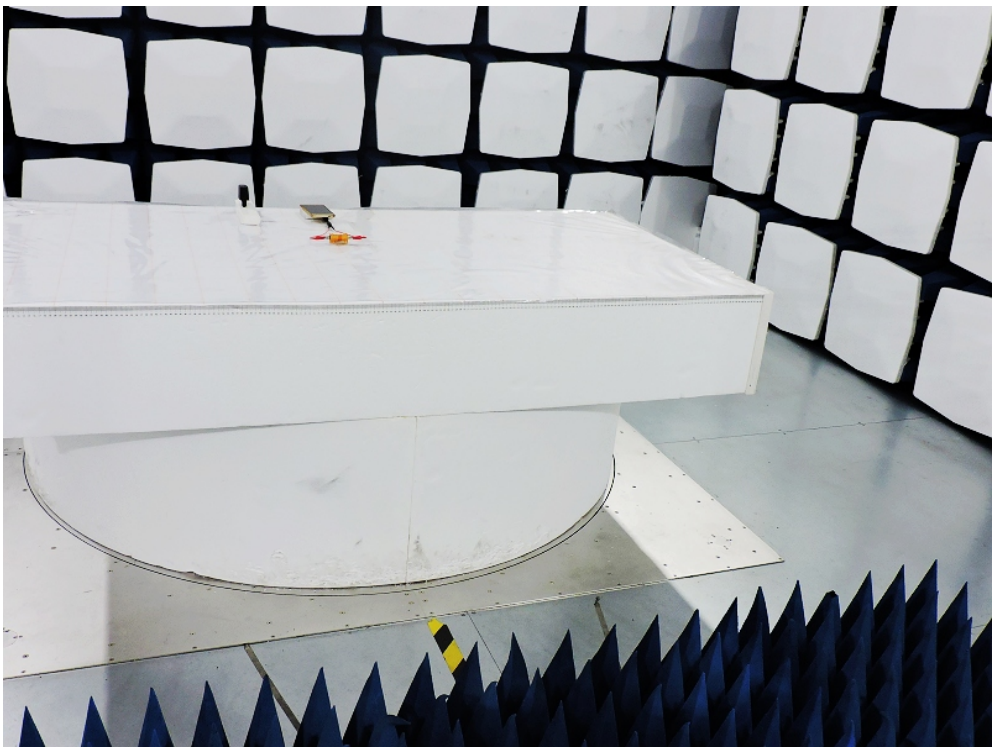
4. Photographs – Test Setup

4.1 Photograph – Conducted Test Setup:



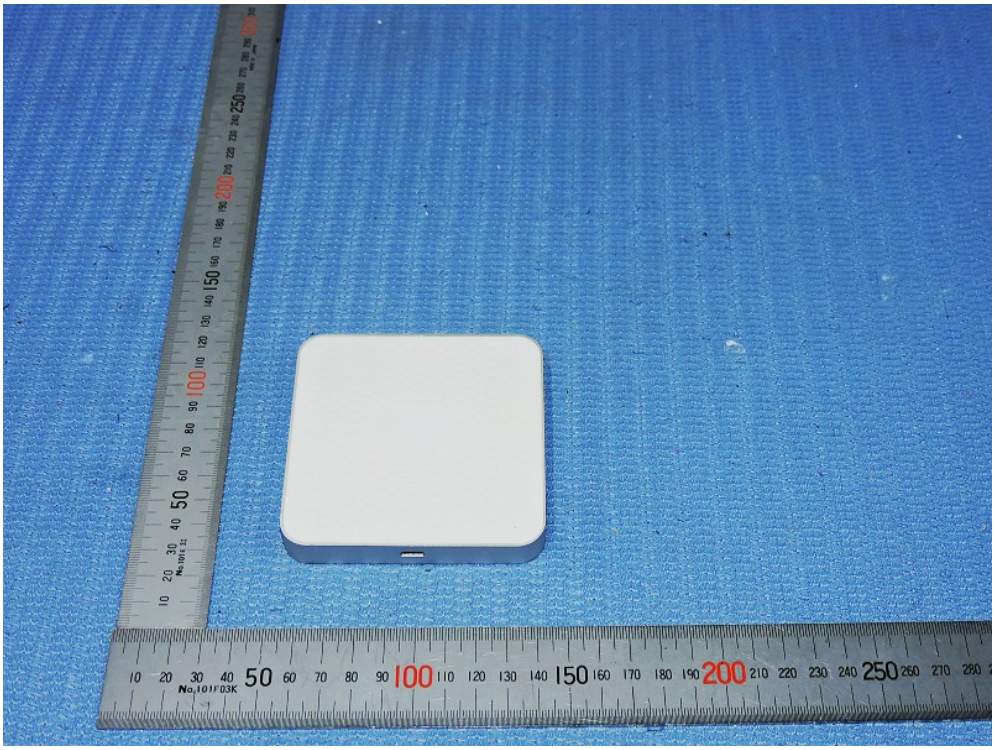
4.2 Photograph – Radiated Emission Test Setup:



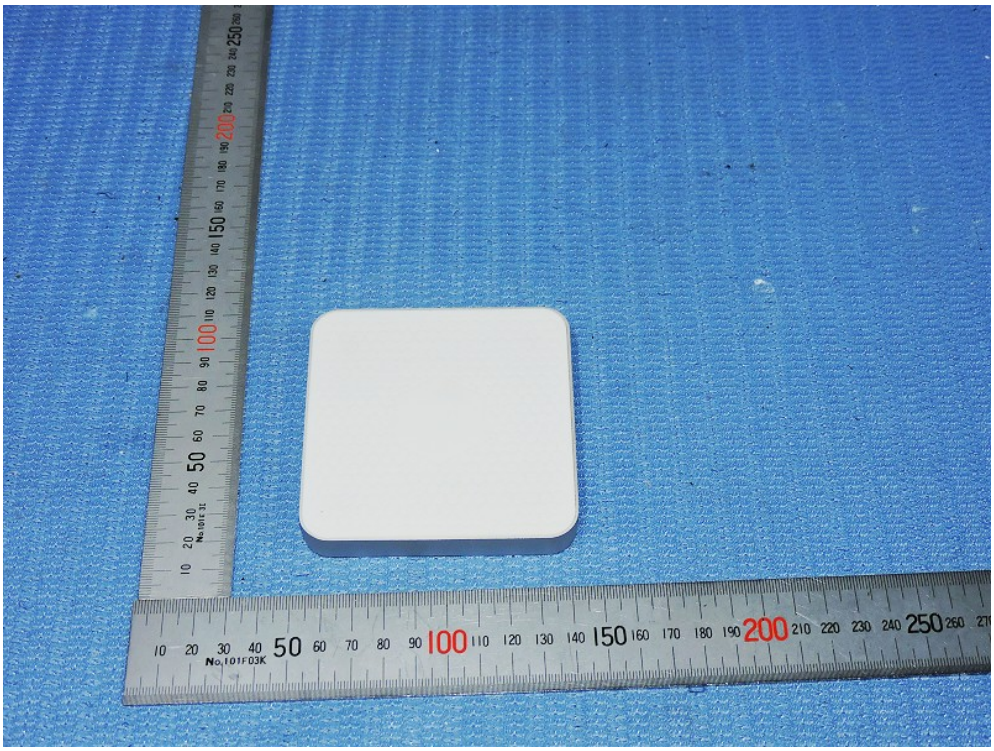


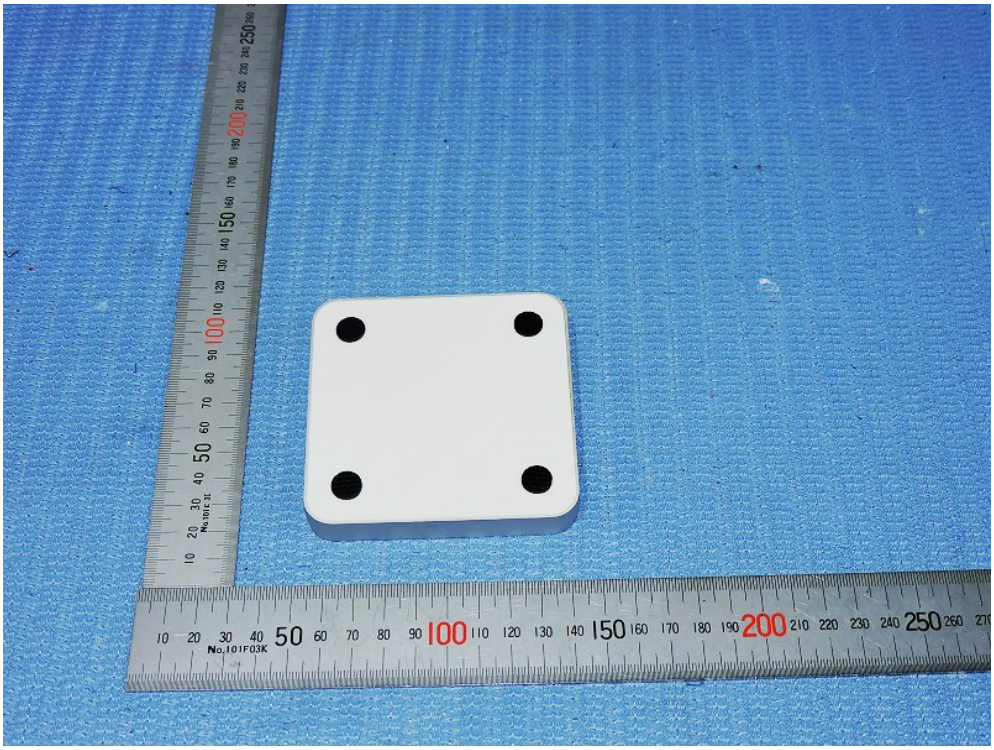
5. Photographs – EUT

External View

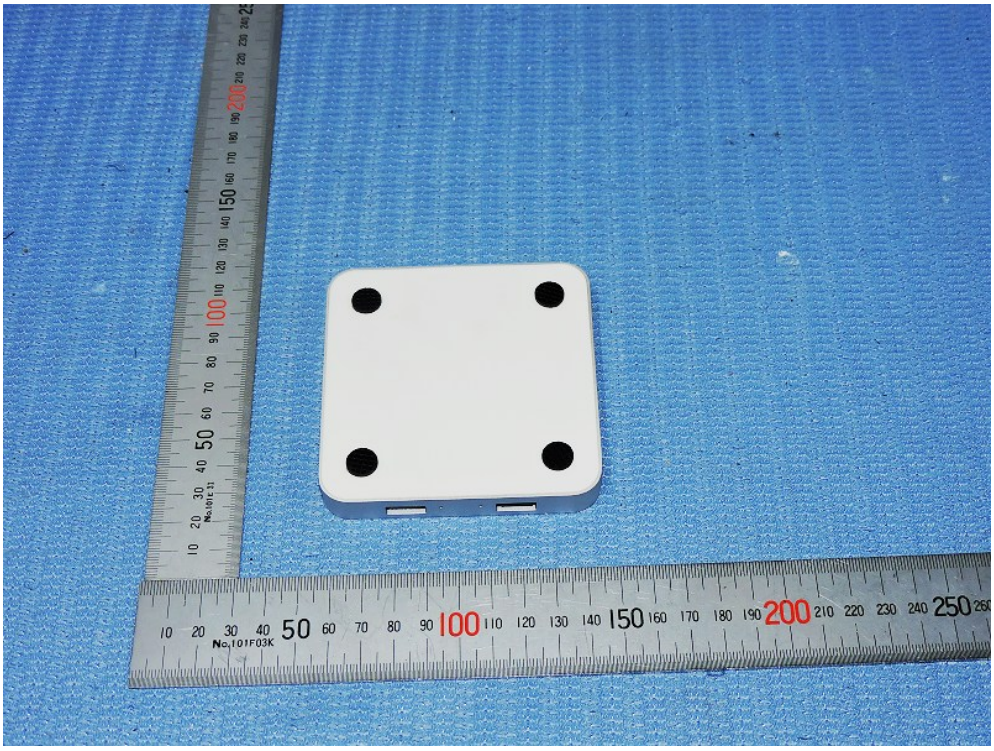


External View



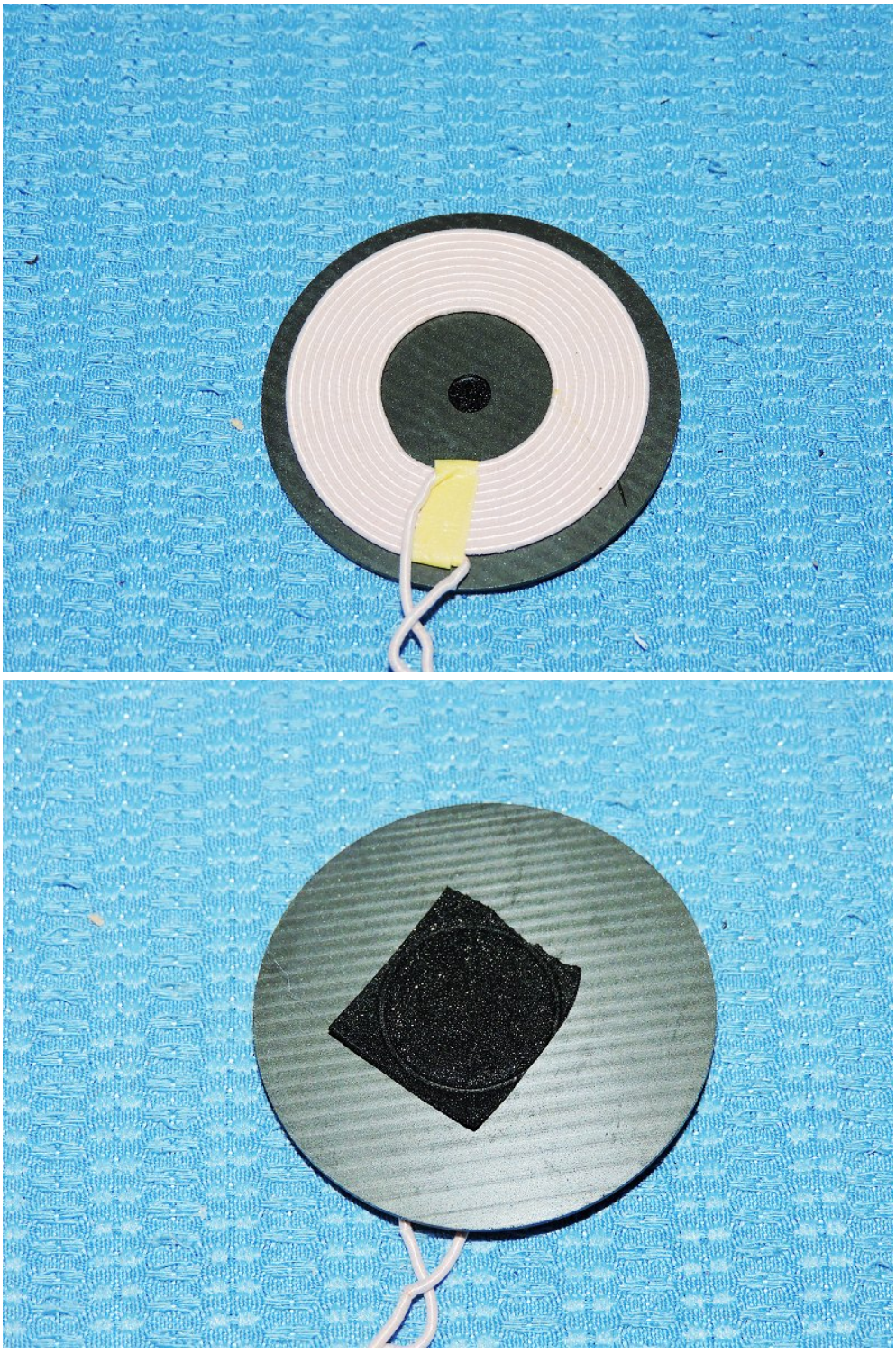


External View

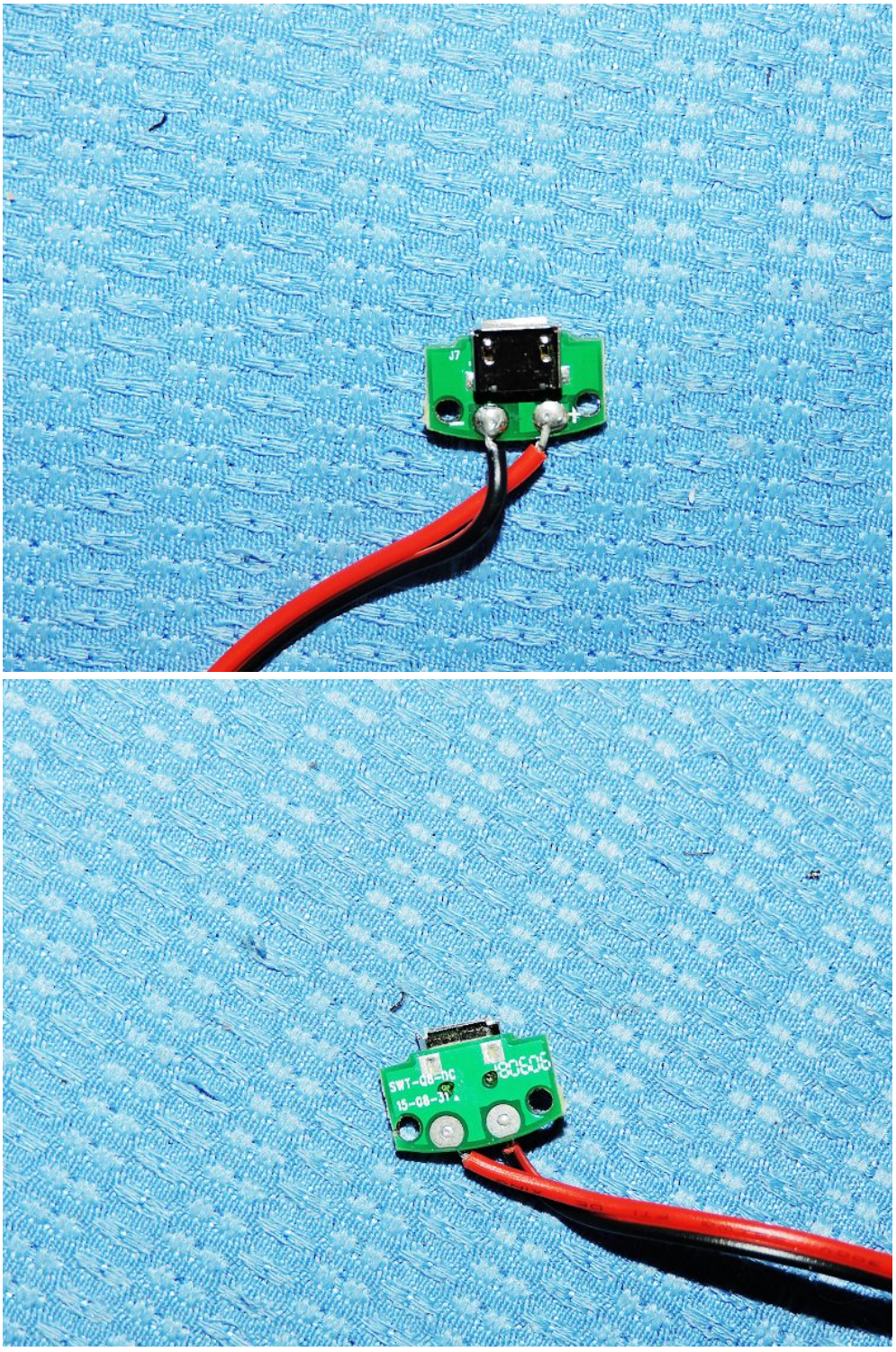


Internal View

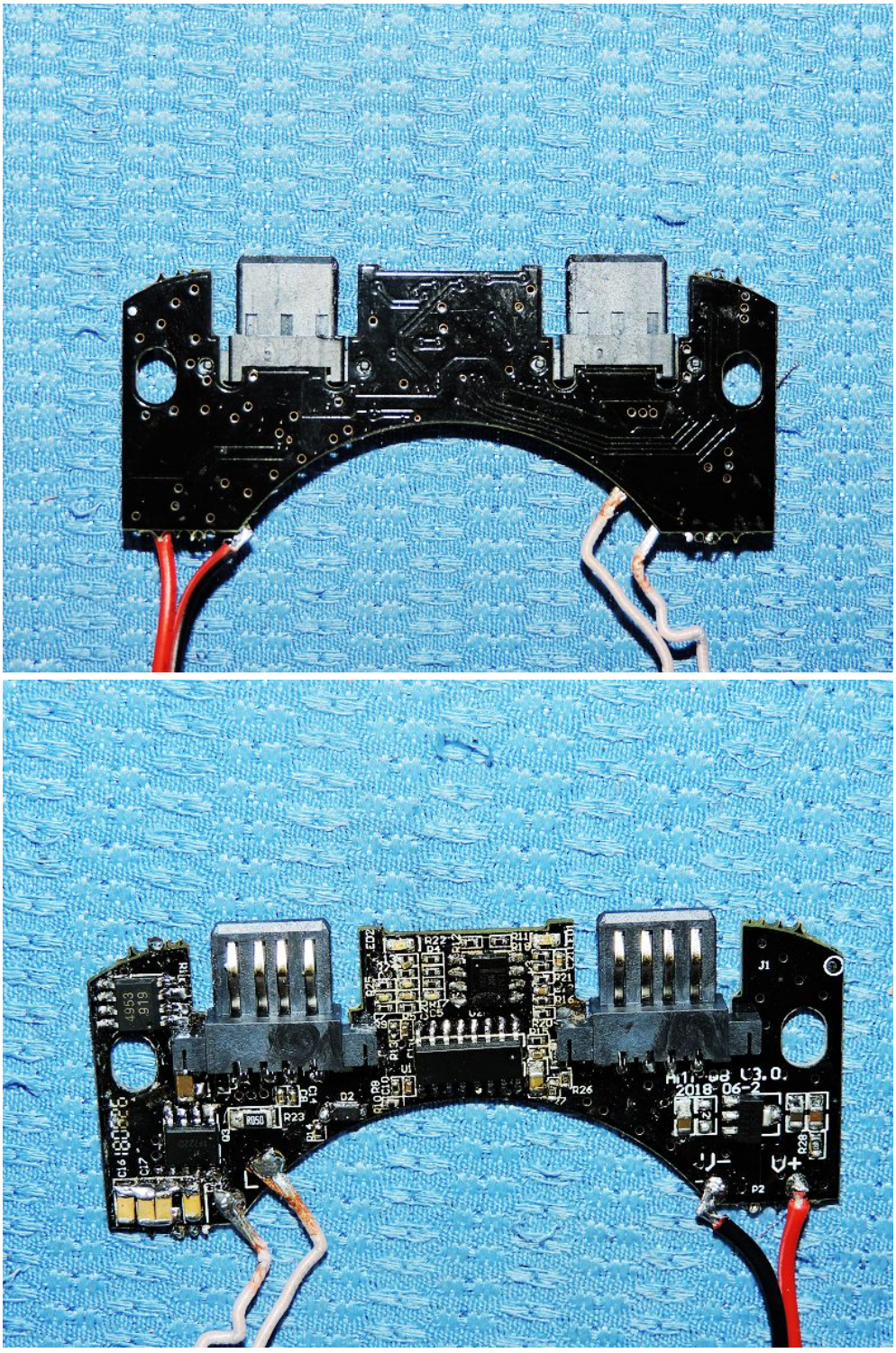
Internal View



Internal View



Internal View



6.0 Test Equipment

Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2018-06-02	2019-06-01
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100294	2018-06-02	2019-06-01
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100253	2018-06-02	2019-06-01
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2018-06-02	2019-06-01
ESDV Test Receiver	ROHDE&SCHWARZ	ESDV	100008	2018-06-02	2019-06-01
Impuls-Begrenzer	ROHDE&SCHWARZ	ESH3-Z2	100281	2018-06-02	2019-06-01
System Controller	CT	SC100	-	2017-08-22	2018-08-21
Oscillator	KENWOOD	AG-203D	3070002	2017-08-22	2018-08-21
Spectrum Analyzer	HAMEG	HM5012	-	2017-08-22	2018-08-21
Power Supply	LW	APS1502	-	2017-08-22	2018-08-21
5K VA AC Power Source	California Instruments	5001iX	56060	2018-06-02	2019-06-01
CDN	EM TEST	CDN M2/M3	-	2018-06-02	2019-06-01
Attenuation	EM TEST	ATT6/75	-	2018-06-02	2019-06-01
Resistance	EM TEST	R100	-	2018-06-02	2019-06-01
Electromagnetic Injection Clamp	LITTHI	EM101	35708	2018-06-02	2019-06-01
Inductive Components	EM TEST	MC2630	-	2018-06-02	2019-06-01
Antenna	EM TEST	MS100	-	2018-06-02	2019-06-01
Signal Generator	ROHDE&SCHWARZ	SMT03	100029	2017-08-23	2018-08-22
Power Amplifier	AR	150W1000	300999	2017-08-23	2018-08-22
Field probe	Holaday	HI-6005	105152	2017-08-23	2018-08-22
Bilog Antenna	Chase	CBL6111C	2576	2017-08-23	2018-08-22
Loop Antenna	EMCO	6502	00042960	2017-08-23	2018-08-22
ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2017-08-22	2018-08-21
3m OATS	--	--	N/A	2017-08-24	2018-08-23

Vector Signal Generator	AGILENT	E4438C	MY49070163	2018.01.20	2019.01.19
Splitter	Mini-Circuits	ZAP-50W	NN256400424	2018.01.20	2019.01.19
Directional Coupler	AGILENT	87300C	MY44300299	2018.01.20	2019.01.19
vector Signal Generator	AGILENT	E4438C	US44271917	2018.01.20	2019.01.19
4 Ch.Simultaneous Sampling 14 Bits 2 MS/s	AGILENT	U2531A	TW54063507	2018.01.20	2019.01.19
4 Ch.Simultaneous Sampling 14 Bits 2 MS/s	AGILENT	U2531A	TW54063513	2018.01.20	2019.01.19
Splitter	Mini	PS3-7	4463	2018.01.20	2019.01.19
Spectrum Analyzer	AGILENT	E7405A	US44210471	2018.01.20	2019.01.19
Attenuator	Resnet	20dB	(n.a)	2018.01.20	2019.01.19
Signal Analyzer	AGILENT	N9010A	MY48030494	2018.01.20	2019.01.19
Horn Antenna	ROHDE&SCHWARZ	BBHA 9120D	9120D-631	2017-08-24	2018-08-23

End of the Report