TECHNICAL REPORT

Report No.:	EMC 2003151-02
File Reference No.:	2020-03-31
Applicant:	
Product:	wireless chargers
Model No.:	
Trademark:	N/A
Test Standards:	ETSI EN 303 417 v1.1.1 (2017-09)
Test Result:	The RF 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: March 31, 2020

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 meet 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.

FCC-Registration No.: 744189

The 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 No.: 744189.

Industry Canada (IC) —Registration No.:5205A

The EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5205A.

A2LA (Certification Number:5013.01)

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (A2LA). Certification Number:5013.01

Test Report Conclusion

Content

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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Tel: +86 755 83448688 Fax :+86 755 83442996

Internet: www.timeway-lab.com

1.3 Details of Applicant

1. 4 Application Details

Date of Receipt of Test Item: March 18, 2020

Date of Receipt of Test Item: March 18, 2020

Date of Test: March 18, 2020~ March 31, 2020

1.5 Test Item

Brand Name: N/A

Model No.:

Additional Model: N/A

Description: wireless chargers

Additional Information

Frequency: 111.5-205 kHz

Modulation Type: MSK

Power Supply: DC5V from USB Port

Operation Distance: N/A

Resolution: N/A

Extreme Temp. Tolerance: -20℃ to 55℃

1.6 Test Standards

ETSI EN 303 417 v 1.1.1 (2017-09)

Wireless power transmission systems, using technologies other than radio frequency beam in the 19 - 21 kHz, 59 - 61 kHz, 79 - 90 kHz, 100 - 300 kHz, 6 765 - 6 795 kHz ranges;

Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

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

1.7 Configuration of the EUT

The EUT was configured according to **CISPR16.** All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A. EUT

Device	Manufacturer	Model
wireless chargers	**Leader Premiums Limited**	**AB0196**

B. Internal Devices

Device	Manufacturer	Model
N/A		

C. Peripherals

Device	Manufacturer	Model	Cable
N/A			

1.8 EUT Modifications

No modification by Shenzhen Timeway Testing Laboratories

1.9 Tests 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

Test Report Reference

List of Measurements		
Parameter to be measured	**Clause**	**Result**
Transmitter Parameters		
Permitted range of operating frequencies	Clause4.3.2	Pass
Operating frequency ranges	Clause4.3.3	Pass
H-field requirements	Clause4.3.4	Pass
Transmitter spurious emissions	Clause4.3.5	Pass
Transmitter out of band (OOB) emissions	Clause4.3.6	Pass
WPT system unwanted conducted emissions	Clause4.3.7	N/A
Receiver Parameters		
Receiver Blocking	Clause4.4.2	N/A

Note: The clause numbers are referenced to ETSI EN 303 417 v 1.1.1 (2017-09).

Clause 4.3 Transmitter Conformance Requirements

For Transmitter

Clause4.3.2 Permitted range of operating frequencies

For Transmitter

The permitted range of operating frequencies denotes the frequency ranges set out in Table 1. It likewise denotes the respective frequency range for accommodation of the fundamental WPT frequency of the EUT within its operating frequency range (OFR).

The measuring receiver may be a spectrum analyser, oscilloscope, selective power meter or any measuring receiver which is appropriate to perform the intended measurement of the EUT.

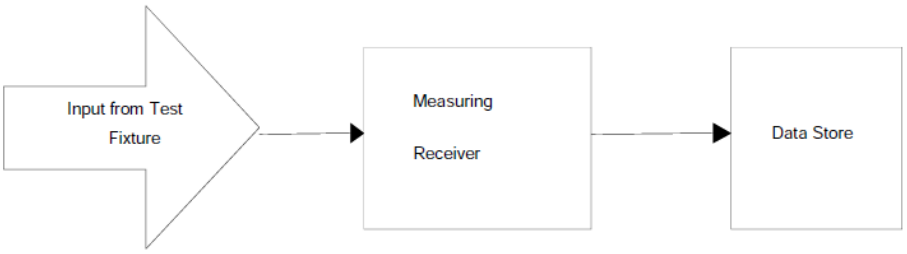


Figure 1: Test set-up for measurement of the operating frequencies

EUT	Wireless chargers	Model	AB0196
Mode	Normal operation	Input Voltage	DC5V
Subclause	EN303 417 Clause 4.3.2	Test Equipments	Refer to Section 6
Temperature	24 deg. C,	Humidity	56% RH

Result: the operation frequency range is 111.5-205 kHz. It is fall in the frequency range of 100-300 kHz.

Limits: EN 303 417, subclause 4.3.2.3

The permitted range of operating frequency range(s) for intentional emissions shall be within 19 - 21 kHz, 59 - 61 kHz, 79 - 90 kHz, 100 - 300 kHz, 6 765 - 6 795 kHz, see Table 2.

Clause4.3.3 operating frequency range(s) (OFR)

For Transmitter

The operating frequency range is the frequency range over which the WPT system is intentionally transmitting (all operational modes, see clause 4.2.3, Table 2).

The operating frequency range(s) of the WPT system are determined by the lowest (fL) and highest frequency (fH) as occupied by the power envelope.

The WPT system could have more than one operating frequency range.

For a single frequency systems the OFR is equal to the occupied bandwidth (OBW) of the WPT system.

For multi-frequency systems the OFR is described in Figures 2 and 3.

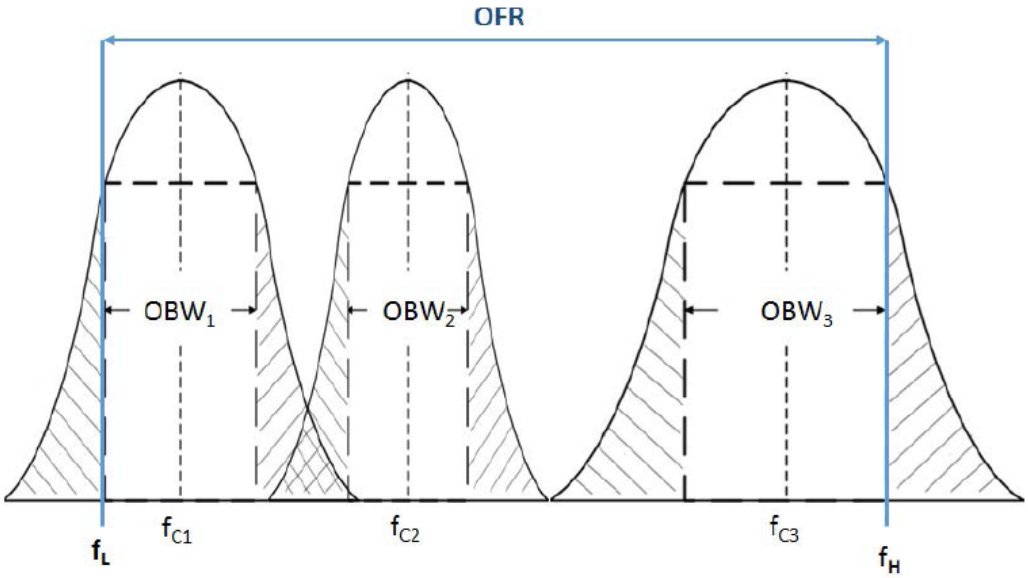


Figure 2: OFR of a multi - frequency WPT system within one frequency range of Table 2 and within one WPT system cycle time

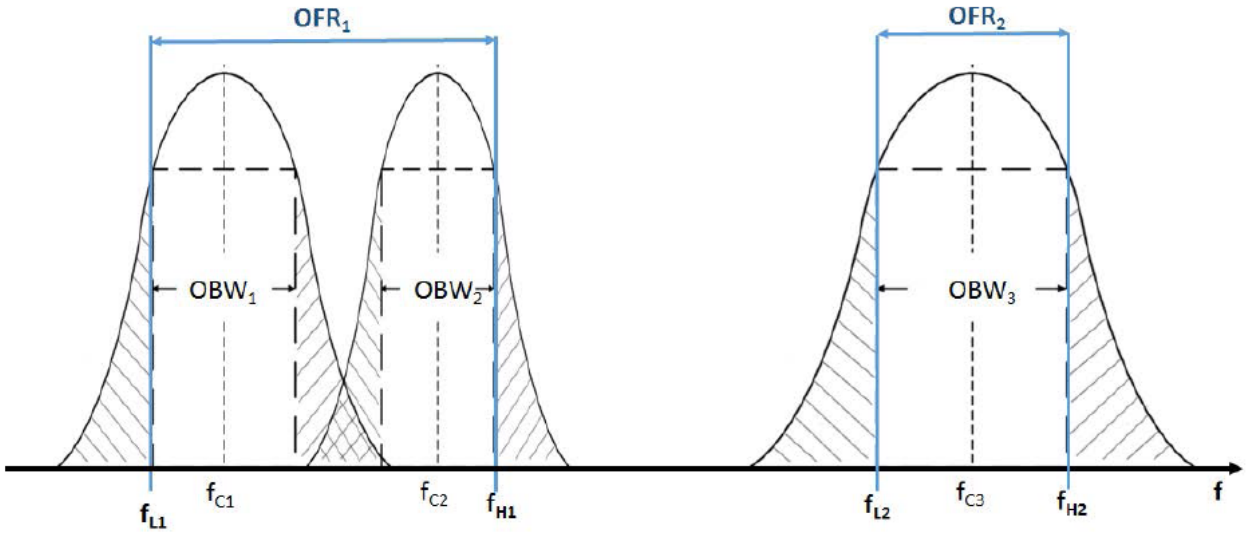


Figure 3: OFR of a multi - frequency WPT system within two frequency ranges of Table 2 and within one WPT system cycle time

EUT	Wireless chargers	Model	AB0196
Mode	Normal operation	Input Voltage	DC5V
Subclause	EN303 417 Clause 4.3.3	Test Equipments	Refer to Section 6
Temperature	24 deg. C,	Humidity	56% RH

Test Data:

F_L (kHz)	F_H (kHz)	Limit	Result
111.18	205.31	$F_L \geqslant 100$kHz; $F_H \leqslant 300$kHz	Pass

Limits: EN 303 417-1, subclause 4.3.3.3

The operating frequency range for emissions shall be within one of the following limits: 19 - 21 kHz, 59 - 61 kHz, 79 - 90 kHz, 100 - 300 kHz, 6 765 - 6 795 kHz.

Clause4.3.4 Transmitter H-field requirements

For Transmitter

The radiated H-field is defined in the direction of maximum field strength under specified conditions of measurement.

EUT	Wireless chargers	Model	AB0196
Mode	Normal operation	Input Power	DC5V
Subclause	EN303 417 Clause 4.3.4	Test Equipments	Refer to Section 6
Temperature	24 deg. C,	Humidity	56% RH

Frequency (kHz)	Value (dBuA/m@3m)	Value (dBuA/m@10m)	Limit (dBuA/m@10m)	Result
175	19.89	-11.51	-5.00	Pass

Remark:

The H-field limit in dBµA/m at 3 m, H_{3m}, is determined by the following equation:

$$H_{3m} = H_{10m} + C_3 \qquad \text{(H.2)}$$

where:

H_{10m} is the H-field limit in dBµA/m at 10 m distance according to the present document; and

C_3 is a conversion factor in dB determined from figure H.2.

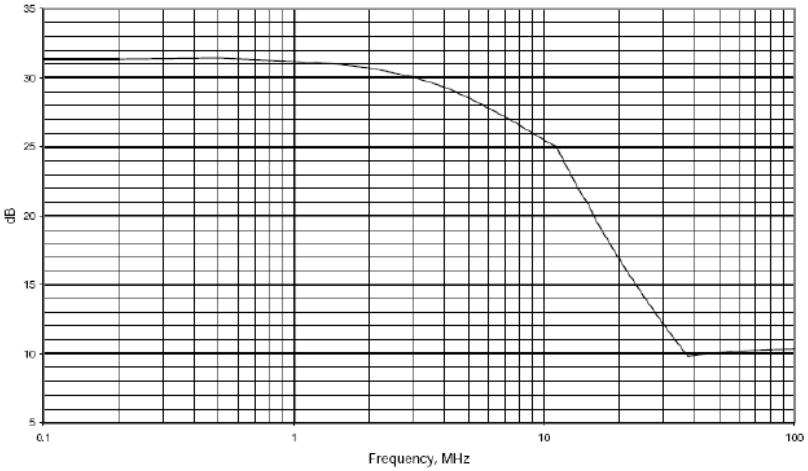


Figure H.2: Conversion factor C_3 versus frequency

Limits: EN 303 417-1, subclause 4.3.4.3

The H-field limits are provided in Table 3.

They have been specified for control of any radiated emissions within the OFR originating from the WPT system (power transmission and accompanying data communication).

The H-field limits in Table 3 are EU wide harmonised according to EC Decision 2013/752/EU [i.2]. Further information is available in CEPT/ERC/REC 70-03 [i.1].

Table 3: H-field limits

Frequency range [MHz]	H-field strength limit [dBµA/m at 10 m]	Comments
0,019 ≤ f < 0,021	72	
0,059 ≤ f < 0,061	69,1 descending 10 dB/dec above 0,059 MHz	See note 1
0,079 ≤ f < 0,090	67,8 descending 10 dB/dec above 0,079 MHz	See note 2
0,100 ≤ f < 0,119	42	
0,119 ≤ f < 0,135	66 descending 10 dB/dec above 0,119 MHz	See note 1
0,135 ≤ f < 0,140	42	
0,140 ≤ f < 0,1485	37,7	
0,1485 ≤ f < 0,30	-5	
6,765 ≤ f < 6,795	42	

NOTE 1: Limit is 42 dBµA/m for the following spot frequencies: 60 kHz ± 250 Hz and 129,1 kHz ± 500 Hz.
NOTE 2: At the time of preparation of the present document the feasibility of increased limits for high power wireless power transmission systems to charge vehicles [i.4] was prepared. New specific requirements for such systems (e.g. higher H-field emission limits in the 79 - 90 kHz band) will be reflected within a future revision of the present document.

Clause 4.3.5 Transmitter spurious emissions

For Transmitter

The transmitter spurious emissions for a single frequency system are to be considered in frequency ranges defined in Figure 4 ($f < f_{SL}$ and $f > f_{SH}$).

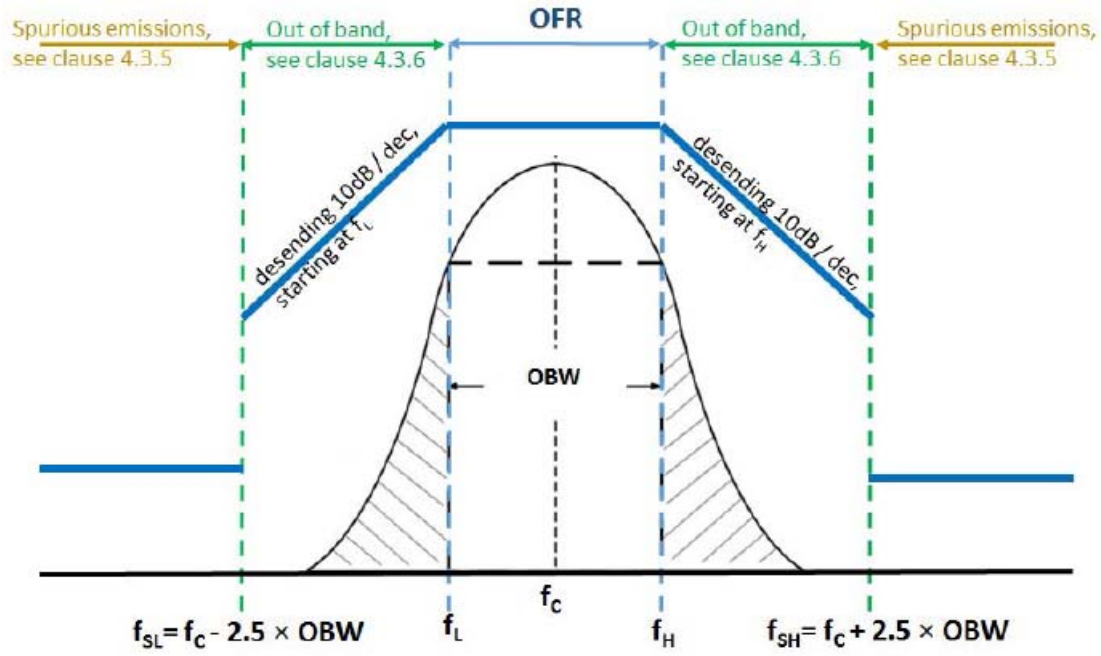


Figure 4: Out of band and spurious domain of a single frequency WPT system

The transmitter spurious emissions for a multi frequency system (within one WPT frequency range from Table 2) are to be considered in frequency ranges defined in Figure 5 ($f < f_{SL}$ and $f > f_{SH}$).

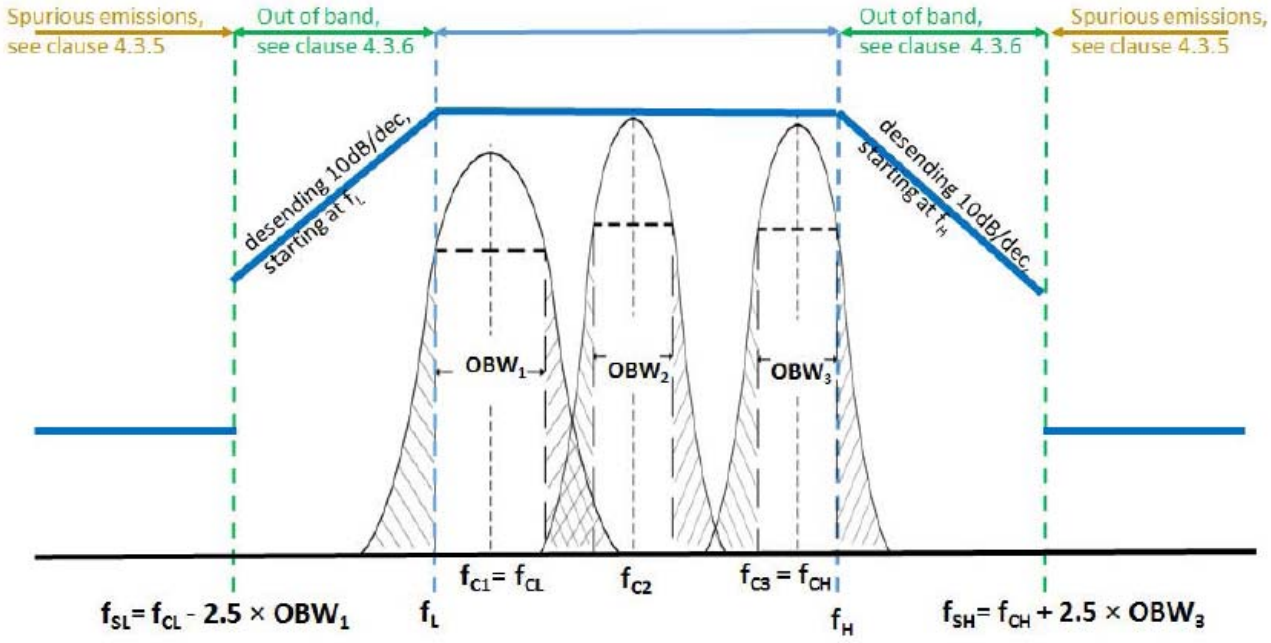


Figure 5: Out of band and spurious domain of a multi - frequency system (during one WPT system cycle time)

EUT	Wireless chargers	Model	AB0196
Mode	Operation and Standby	Input Voltage	230V~
Subclause	EN303 417 Clause 4.3.5	Test Equipments	Refer to Section 6
Temperature	24 deg. C,	Humidity	56% RH

Operation Mode:

Frequency (MHz)	Polarity	Level (dBm)	Limit (dBm)	Result
141.037	Horizontal	-65.22	-54.00	Pass
46.174	Vertical	-59.83	-54.00	Pass
143.704	Vertical	-59.28	-54.00	Pass

Standby Mode:

Frequency (MHz)	Polarity	Level (dBm)	Limit (dBm)	Result
NF	Horizontal	--	-57.00	Pass
NF	Vertical	--	-57.00	Pass

Note: NF=No significant peak noise was found

Limits: EN 303 417, subclause 4.3.5.3

The radiated field strength of spurious emissions below 30 MHz shall not exceed the generated H-field given in Table 4.

Table 4

State (see note)	Frequency 9 kHz ≤ f < 10 MHz	Frequency 10 MHz ≤ f < 30 MHz
Operating	27 dBµA/m at 9 kHz descending 10 dB/dec	-3,5 dBµA/m
Standby	5,5 dBµA/m at 9 kHz descending 10 dB/dec	-25 dBµA/m
NOTE: "Operating" means mode 2, 3 and 4 according to Table 2; "standby" means mode 1 according to Table 2.		

The power of any radiated spurious emission between 30 MHz and 1 GHz shall not exceed the values given in Table 5.

Table 5

State (see note)	47 MHz to 74 MHz 87,5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 790 MHz	Other frequencies between 30 MHz to 1 000 MHz
Operating	4 nW	250 nW
Standby	2 nW	2 nW
NOTE: "Operating" means mode 2, 3 and 4 according to Table 2; "standby" means mode 1 according to Table 2.		

Clause 4.3.6 Transmitter out of band (OOB) emissions
For Transmitter

The WPT system out of band emissions are to be considered in frequency ranges defined in Figure 4 and Figure 5 (between f_{SL} and f_L and between f_H and f_{SH}).

EUT	Wireless chargers	Model	AB0196
Mode	Operation and Standby	Input Voltage	230V~
Subclause	EN303 417 Clause 4.3.6	Test Equipments	Refer to Section 6
Temperature	24 deg. C,	Humidity	56% RH

Frequency (kHz)	Value (dBuA/m@3m)	Value (dBuA/m@10m)	Limit (dBuA/m@10m)	Result
106.39	7.85	-23.55	-15.00	Pass
210.02	8.12	-23.28		

Limits: EN 303 417, subclause 4.3.6.3

The OOB limits are visualized in Figures 4 and 5; they are descending from the intentional limits from Table 3 at f_H/f_L with 10 dB/decade.

Clause 4.3.7 WPT system unwanted conducted emissions
For Transmitter

This applies to all WPT systems where the cable to the primary coil exceeds a length of 3 m and where the cable is not installed in the ground or any metallic structures.

WPT system unwanted conducted emissions are based on the emissions of the unwanted common mode current on the cable between the off board power supply and the primary coil seen as a monopole radiator driven against the power supply.

EUT	Wireless chargers	Model	AB0196
Mode	Operation and Standby	Input Voltage	230V~
Subclause	EN303 417 Clause 4.3.7	Test Equipments	Refer to Section 6
Temperature	24 deg. C,	Humidity	56% RH
Test Result	N/A		

Note: the cable to the primary coil not exceeds a length of 3 m. This test item not applicable.

Limits: EN 303 417, subclause 4.3.7.3

The common mode current (ICM) between 1 MHz and 30 MHz shall not exceed the following limit:

$$I_{CM} = 47 - 8 \times \log(f)\ dB\mu A$$

NOTE: f is the frequency in MHz.

Clause4.4 Receiver Conformance requirements

Clause4.4.2 Receiver blocking

For receiver

This requirement applies to all WPT systems operation in Mode 1, Mode 2 and Mode 3.

Blocking is a measure of the capability of the receiver to receive a wanted signal without exceeding a given degradation due to the presence of an unwanted input signal at any frequencies other than those of the receiver spurious responses.

The test shall be performed in the relevant operational modes (see clause 4.2.3).

The wanted performance criteria from clause 4.2.2 shall be used as criterion for the receiver blocking tests.

EUT	Wireless chargers	Model	AB0196
Mode	Normal operation	Input Voltage	230V~
Subclause	EN303 417 Clause 6.3.1	Test Equipments	Refer to Section 6
Temperature	24 deg. C,	Humidity	56% RH
Test Result	N/A		

Limits: EN 303 417-1, subclause 4.4.2.3

The receiver blocking limits in Table 6 shall be fulfilled.

Table 6: Receiver blocking limits

	In-band signal	OOB signal	Remote-band signal
Frequency	Centre frequency (f_C) of the WPT system (see clause 4.3.3)	$f = f_C \pm F$ (see note)	$f = f_C \pm 10 \times F$ (see note)
Signal level field strength at the EUT	72 dBµA/m	72 dBµA/m	82 dBµA/m
NOTE: F = OFR see clause 4.3.3.			

The EUT shall achieve the wanted performance criterion, see clause 4.2.2, in the presence of the blocking signal.

3.0 Product Labelling

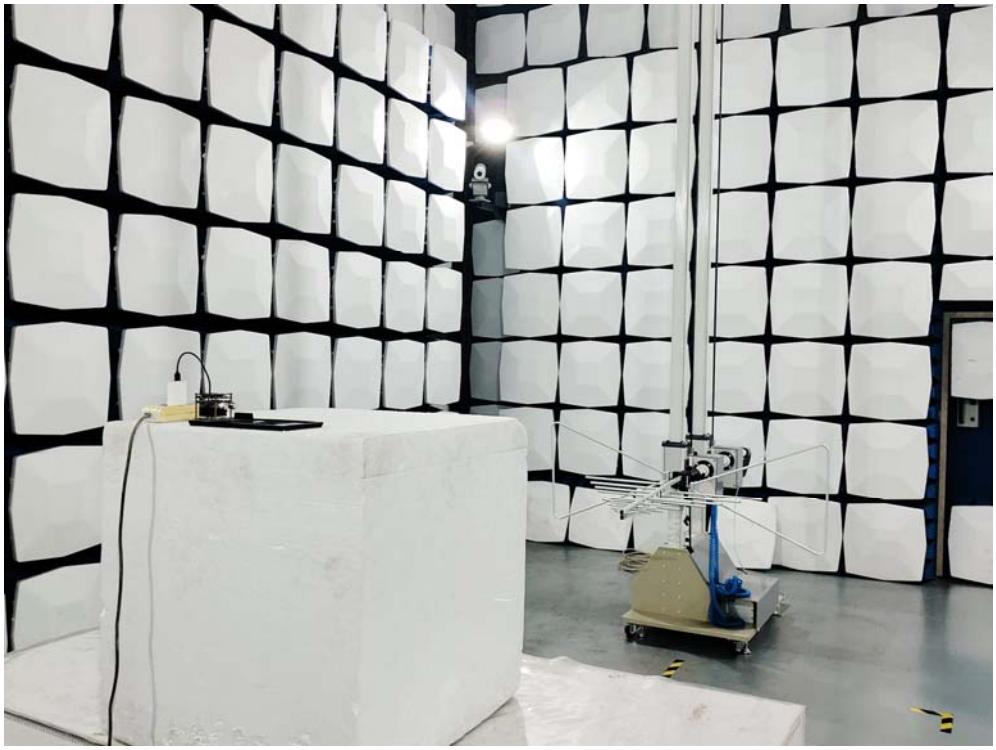
CE Mark label specification

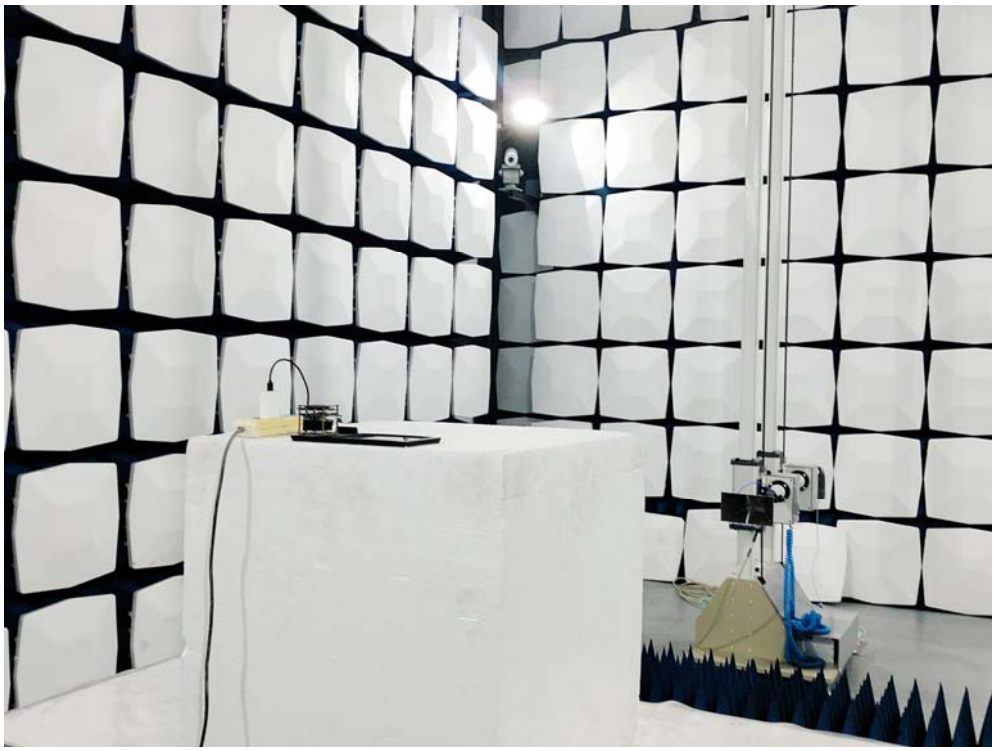
Text of the mark is black or white in color and is left justified. Labels are printed in indelible ink on permanent adhesive backing and shall be affixed at a conspicuous location on the EUT or silk-screened onto the EUT.

Mark Location: Rear enclosure

4. Photographs – Test Setup

Spurious Radiated emission test view





5. Photographs - EUT

Please see test report EMC2003151-01

6.0 Test Equipment					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2019-06-21	2020-06-20
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100294	2019-06-21	2020-06-20
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100253	2019-06-21	2020-06-20
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2019-06-21	2020-06-20
ESVB Test Receiver	ROHDE&SCHWARZ	ESVB	826156/011	2019-06-21	2020-06-20
Impuls-Begrenzer	ROHDE&SCHWARZ	ESH3-Z2	100281	2019-06-21	2020-06-20
5K VA AC Power Source	California Instruments	5001iX	56060	2019-06-21	2020-06-20
CDN	EM TEST	CDN M2/M3	-	2019-06-21	2020-06-20
Attenuation	EM TEST	ATT6/75	-	2019-06-21	2020-06-20
Resistance	EM TEST	R100	-	2019-06-21	2020-06-20
Electromagnetic Injection Clamp	LITTHI	EM101	35708	2019-06-21	2020-06-20
Inductive Components	EM TEST	MC2630	-	2019-06-21	2020-06-20
Antenna	EM TEST	MS100	-	2019-06-21	2020-06-20
Signal Generator	ROHDE&SCHWARZ	SMT03	100029	2018-08-23	2019-08-22
Power Amplifier	AR	150W1000	300999	2018-08-23	2019-08-22
Field probe	Holaday	HI-6005	105152	2018-08-23	2019-08-22
Bilog Antenna	Chase	CBL6111C	2576	2018-08-23	2019-08-22
Loop Antenna	EMCO	6507	00078608	2020-06-20	2020-06-20
ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2020-06-20	2020-06-20
966 Chamber	YIHENG	--	N/A	2018-02-07	2021-02-06
Vector Signal Generator	AGILENT	E4438C	MY49070163	2020-01-16	2021-01-15
Splitter	Mini-Circuits	ZAP-50W	NN256400424	2020-01-16	2021-01-15

Directional Coupler	AGILENT	87300C	MY44300299	2020-01-16	2021-01-15
vector Signal Generator	AGILENT	E4438C	US44271917	2020-01-16	2021-01-15
4 Ch.Simultaneous Sampling 14 Bits 2 MS/s	AGILENT	U2531A	TW54063507	2020-01-16	2021-01-15
4 Ch.Simultaneous Sampling 14 Bits 2 MS/s	AGILENT	U2531A	TW54063513	2020-01-16	2021-01-15
Splitter	Mini	PS3-7	4463	2020-01-16	2021-01-15
Spectrum Analyzer	AGILENT	E7405A	US44210471	2020-01-16	2021-01-15
Attenuator	Resnet	20dB	(n.a)	2020-01-16	2021-01-15
Signal Analyzer	AGILENT	N9010A	MY48030494	2020-01-16	2021-01-15
ESD Simulator	NoiseKen	ESS-2002	ESS06Y6394	2019-06-21	2020-06-20
Continuous Wave Simulator	EM TEST	CWS 500N	0704-05	2019-06-21	2020-06-20
Ultra Compact Simulator	EM TEST	UCS 500 M4	0304-42	2019-06-21	2020-06-20
Pre-Amplifier	HP	8447B	--	2019-09-18	2020-09-17
Horn Antenna	SchwarzBeck	BBHA9120D	01919	2018-07-09	2021-07-08
BiConiLog Antenna	SchwarzBeck	9163	1139	2018-07-04	2021-07-03
Pre-Amplifier	SchwarzBeck	BBV 9743	#218	2019-06-21	2020-06-20

End of the Report