

# **RF Test Report**

Report No.: AGC04094181102EE17

**PRODUCT DESIGNATION**: USB and 10W wireless charger

BRAND NAME : N/A

**MODEL NAME** : P308.60

CLIENT : Xindao B.V.

**DATE OF ISSUE** : Nov. 20, 2018

**STANDARD(S)** : ETSI EN 303 417 V1.1.1(2017-09)

**REPORT VERSION** : V1.0

## Attestation of Global Compliance (Shenzhen) Co., Ltd.

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Tel: +86-755 2908 1955 Fax: +86-755 2600 8484 E-mail: agc@agc-cert.com @ 400 089 2118 Add: 2/F. , Building 2, No.1-4,Chaxi Sanwei Technical Industrial Park,Gushu, Xixiang, Baoan District, Shenzhen, Guangdong China



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## **Report Revise Record**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0		Nov. 20, 2018	Valid	Initial Release

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## 1. TEST RESULT CERTIFICATION

Applicant	Xindao B.V.
Address	P.O. Box 3082, 2280 GB, Rijswijk, The Netherlands
manufacturer	Xindao B.V.
Address	P.O. Box 3082, 2280 GB, Rijswijk, The Netherlands
Factory	Xindao B.V.
Address	P.O. Box 3082, 2280 GB, Rijswijk, The Netherlands
Product Designation	USB and 10W wireless charger
Brand Name	N/A
Test Model	P308.60
Date of test	Nov. 15, 2018 to Nov. 20, 2018
Deviation	None
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-EC-RF

The above equipment was tested by SHENZHEN ATTESTATION OF GLOBAL COMPLIANCE (SHENZHEN) CO., LTD. for compliance with the requirements set forth in the European Standard ETSI EN 303 417 V1.1.1. The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By	Max 2 lang	
C to ill	Max Zhang(Zhang Yi)	Nov. 20, 2018
Reviewed By	Bore xie	
	Bart Xie(Xie Xiaobin)	Nov. 20, 2018
Approved By	Foresto ce	
30 " >C	Forrest Lei(Lei Yonggang)  Authorized Officer	Nov. 20, 2018

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## 2. EUT DESCRIPTION

Details of technical specification refer to the description in follows:

V1.0
V1.0
118KHz
1kHz
1 Channel(a single frequency systems)
Integral antenna
Mode 3: communication  Mode 4: energy transmission
AC 100-240V, 50-60Hz, 0.8A
10W(Max)

NOTE: For more information, please refer to User's Manual.

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## 3. DESCRIPTION OF TEST ITEMS

	Harmonised Standard ETSI EN 303 417						
	Requirement	Requirement Conditionality					
No	Description						
1	Permitted range of operating frequencies	Applicable Not Applicable					
2	Operating frequency ranges						
3	H-field requirements						
4	Transmitter spurious emissions	Applicable  Not Applicable					
5	Transmitter out of band (OOB) emissions						
6	WPT system unwanted conducted emissions	☐ Applicable ☑ Not Applicable					
7	Receiver blocking						
	36 10 10 10 10 10 10 10 10 10 10 10 10 10						

## 4. TEST FACILITY

4	Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
	Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

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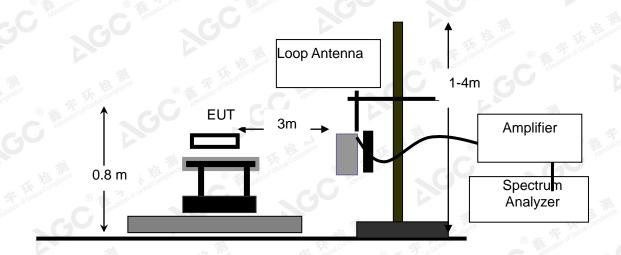
## 5. ETSI EN 303 417 REQUIREMENT

## 5.1 TRANSMITTER H-FIELD REQUIREMENTS

#### **MEASUREMENT EQUIPMENT USED:**

NAME OF EQUIPMENT	MANUFACTURER	MODEL	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	100096	Jun.12, 2018	Jun.11, 2019
Amplifier	EM S	EM30180	060552	Jun.12, 2018	Jun.11, 2019
LOOP ANTENNA	A.H.	SAS-526B	C	Mar. 01, 2018	Feb. 28, 2020

#### **TEST SETUP:**



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#### **TEST LIMITS:**

The H-field limit in dBµA/m at 3 m, H<sub>3m</sub>, is determined by the following equation:

$$H_{3m} = H_{10m} + C_3 (F.2)$$

Where: H<sub>10m</sub> is the H-field limit in dBμA/m at 10 m distance according to the present document; and C<sub>3</sub> is a conversion factor in dB determined from figure F.2.

According to EN 303 417 Tablet 3,

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	

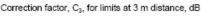
NOTE 1: Limit is 42 dBµA/m for the following spot frequencies: 60 kHz ± 250 Hz and 129,1 kHz ± 500 Hz.

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.

The limit at 10 m( $H_{10m}$ ) is 42dBµA/m.

Owing to the frequency EUT is 118kHz, so the C<sub>3</sub> approach to 31.5dB.

So the H3m = 73.5dBuA/m.



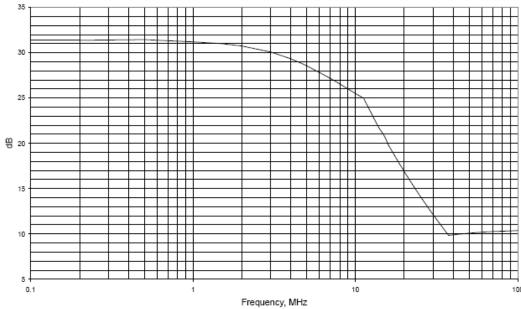


Figure F.2: Conversion factor C<sub>3</sub> versus frequency

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#### **TEST PROCEDURE:**

The EUT was placed on the top of an insulating table 0.8 meters above the ground at a semi-anechoic chamber.

The table was rotated 360 degrees to determine the position of the highest radiation.

The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

The H-field is measured with a shielded loop antenna connected to a measurement receiver.

The measuring bandwidth and detector type of the measurement receiver shall be in accordance with EN 300 330 V2.1.1 Table 11.

The EUT operate with modulation under normal and extreme conditions.

## **TEST RESULTS:**

Test Mode: Mode 4(worst case)

#### Extreme conditions state

conditions	Test Temp	Test Volt.(V)	Note Note
TN/VN	25℃	230	Worst case
TL/VL	-10°C	207	100
TH/VL	45℃	207	in the second
TL/VH	-10℃	230	K Brajane
TH/VH	<b>45</b> ℃	230	(Clarent Carrier Carri

## Test results tested at 3m test sites:

Freq.	Antenna Factor	Reading Level	Corrected Level	Limit
(MHz)	(dB/m)	(dBuA)	(dBuA/m)	(dBuA/m)
0.118	23.54	12.12	35.66	73.5

#### Test results calculated to 10m test sites:

Freq.	Antenna Factor	Reading Level	Corrected Level	Limit
(MHz)	(dB/m)	(dBuA)	(dBuA/m)	(dBuA/m)
0.118	23.54	-19.38	4.16	42.0

#### Remark:

- (1) Corrected Level (dBuA/m) = Reading Level + Antenna Factor
- (2) For the calculated method, please refer to Annex F at EN 300330.
- (3) All extreme conditions were considered for test, but only record the worst case

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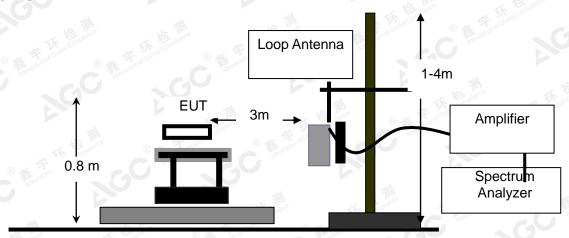
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## **5.2 OPERATING FREQUENCY RANGES**

#### **MEASUREMENT EQUIPMENT USED:**

NAME OF EQUIPMENT	MANUFACTURER	MODEL	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	100096	Jun.12, 2018	Jun.11, 2019
Amplifier	EM	EM30180	060552	Jun.12, 2018	Jun.11, 2019
LOOP ANTENNA	A.H.	SAS-526B	® Antes	Mar. 01, 2018	Feb. 28, 2020

#### **TEST SETUP:**



## **TEST PROCEDURE:**

- 1). The EUT was placed on a turn table which is 0.8m above ground plane.
- 2). The EUT was modulated by normal signal,
- 3).Set SPA Center Frequency = fundamental frequency, RBW=VBW=200Hz, Span=5kHz, Detector=RMS. The 99 % OBW function shall be used to determine the operating frequency range, fH is the frequency of the upper marker resulting from the OFR, fL is the frequency of the lower marker resulting from the OFR.
- 4), Both normal test condition and extreme test condition applied

## **LIMITS**

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.

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## **TEST RESULT**

Test Mode: Mode 4(worst case)

## Frequency Range Test Result

Test Temperature	Test Voltage (V DC)	Upper Frequency (kHZ)	Lower Frequency (kHZ)	Limit
-10℃	230	117.528	118.434	100kHz≤&≤300kHz
station of Circle - 10 C	207	117.527	118.437	100kHz≤&≤300kHz
<b>25</b> ℃	230	117.531	118.434	100kHz≤&≤300kHz
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	230	117.531	118.432	100kHz≤&≤300kHz
<b>45</b> ℃	207	117.530	118.434	100kHz≤&≤300kHz
OF	R AME	1	C	).906kHz
Res	ults	THE THE	The Allerton	PASS

NOTE: All the modes had been tested, but only the worst data recorded in the report.

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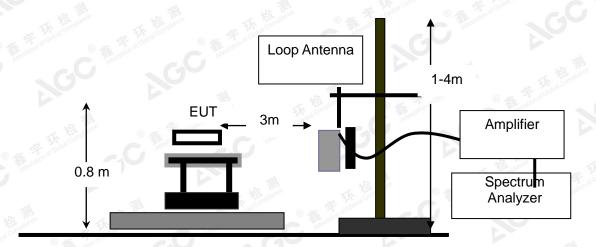
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## 5.3 TRANSMITTER OUT OF BAND (OOB) EMISSIONS

## **MEASUREMENT EQUIPMENT USED:**

NAME OF EQUIPMENT	MANUFACTURER	MODEL	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	100096	Jun.12, 2018	Jun.11, 2019
Amplifier	EM	EM30180	060552	Jun.12, 2018	Jun.11, 2019
LOOP ANTENNA	A.H.	SAS-526B	- G	Mar. 01, 2018	Feb. 28, 2020

#### TEST SETUP:



## TEST PROCEDURE:

- 1). The EUT was placed on a turn table which is 0.8m above ground plane.
- 2). The EUT was modulated by normal signal,
- 3).Set SPA Center Frequency = fundamental frequency, RBW=VBW=200Hz, Span=5KHz, Detector=RMS. The 99 % OBW function shall be used to determine the operating frequency range, fH is the frequency of the upper marker resulting from the OFR, fL is the frequency of the lower marker resulting from the OFR.
- 4), Both normal test condition and extreme test condition applied

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## **LIMITS**

The OOB limits are visualized in figures; they are descending from the intentional limits from Table 3 at fH/fL with 10 dB/decade.

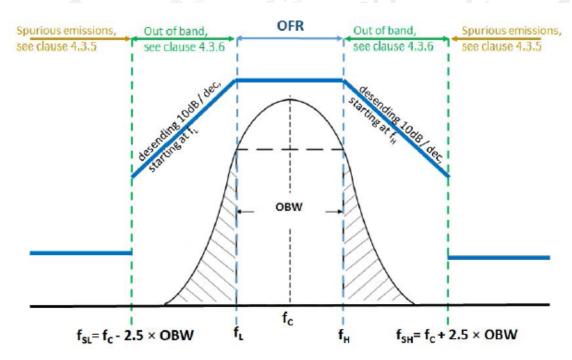


Figure 4: Out of band and spurious domain of a single frequency WPT system

## **TEST RESULT**

Test Mode: Mode 4(worst case)

Frequency range (KHz)		Maximum level @10m (dBuA/m)	Limit @ 10m (dBuA/m)	Result
fSL -fL	115.5KHz-117.5KHz	Less than -15.74	See figure 4	Pass
fL fL	117.5KHz	-15.74	42.0	Pass
fH	118.5KHz	-16.68	42.0	Pass
fH - fSH	118.5KHz-120.5KHz	Less than -16.68	See figure 4	Pass

NOTE: The OCW is 1KHz.

NOTE: All the modes had been tested, but only the worst data recorded in the report.

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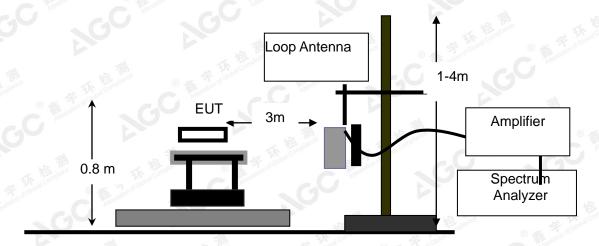
## **5.4 TRANSMITTER SPURIOUS EMISSIONS**

## **MEASUREMENT EQUIPMENT USED:**

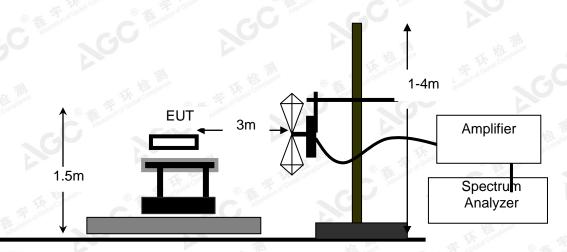
NAME OF EQUIPMENT	MANUFACTURER	MODEL	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	100096	Jun.12, 2018	Jun.11, 2019
Amplifier	EM	EM30180	060552	Jun.12, 2018	Jun.11, 2019
LOOP ANTENNA	A.H.	SAS-526B	O AMESTALI	Mar. 01, 2018	Feb. 28, 2020
ANTENNA	SCHWARZBECK	VULB9168	494	Mar. 01, 2018	Feb. 28, 2020

## **TEST SETUP:**

FREQUENCY RANGE (9KHZ-30MHZ)



FREQUENCY RANGE (ABOVE 30MHZ)



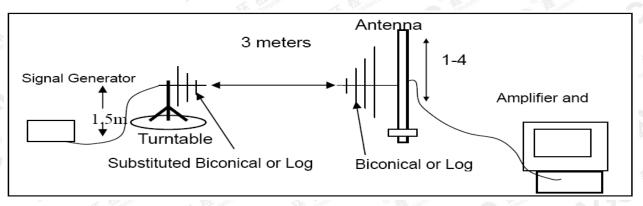
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#### SUBSTITUTION METHOD:

RADIATED BELOW 1GHZ



#### TEST PROCEDURE:

For test method of frequency range (9 kHz-30MHz)

The EUT was placed on the top of an insulating table 0.8 meters above the ground at a semi-anechoic chamber.

The table was rotated 360 degrees to determine the position of the highest radiation.

The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

The H-field is measured with a shielded loop antenna connected to a measurement receiver.

The measuring bandwidth and detector type of the measurement receiver shall be in accordance with EN 300 330 Table 1.

For test method of frequency range (30 MHz-1000MHz)

EUT was placed on a 1.5m height wooden table. The search antenna is placed at 3m distances from the EUT and search antenna height is from 1-4m. With the transmitter operating at continuously mode, the turntable was slowly rotated to locate the direction of maximum emission. Once maximum direction is determined, the search antenna was raised and lowered in both vertical and horizontal polarizations.

The EUT was removed from the turntable and replaced with a linearly polarized antenna connected to a calibrated RF signal generator. The RF generator was set to a measured emission frequency and the search antenna was raised and lowered to produce a maximum received reading. The generator output was increased to match the radiated emission reading measured previously, and the result expressed in dB EIRP or ERP, correcting for substitution antenna gain at each frequency.

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## **LIMITS OF RADIATED DISTURBANCES**

Below 30MHz

## Table 4

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

30MHz-1000MHz

## 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" me	ans mode 2, 3 and 4 according to Table 2; "	standby" means mode 1 according to	
Table 2		-	

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#### **TEST LIMITS & RESULT**

Test Mode: Mode 4(worst case) FREQUENCY RANGE (9KHZ-30MHZ)

Operation Mode							
Frequency	Reading level	Total Factor	Emission level	Limit	Margin		
(MHz)	(dB µA)	(dB/m)	(dB µA/m)	(dBµA/m)	(dBµA/m)		
0.062	-7.52	-7.96	-15.48	18.62	34.10		
0.255	-11.47	-7.96	-19.43	12.48	31.91		
0.414	-13.38	-7.96	-21.34	10.37	31.71		
1.427	-13.21	-3.98	-17.19	5.00	22.19		
2.652	-17.14	-3.09	-20.23	2.31	22.54		
3.814	-14.62	-1.25	-15.87	0.73	16.60		

#### Remark:

- (1) Corrected Power (dBm) = Total Factor + Reading Level
- (2) Measuring frequencies from 9KHz to the 30MHz.

Data of measurement within this frequency range shown " -- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

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## FREQUENCY RANGE (ABOVE 30MHZ)

Transmitter Spurious Emission below 1GHz (30MHz-1GHz)

Frequency	Reading Level	Antenna	S.G.	Cable Loss	Ant.Gain	Emission Level	Limit	Margin
(MHz)	(dBuV)	Polarization	(dBm)	(dB)	(dBi)	(dBm)	(dBm)	(dB)
89.63	32.30	V	-62.67	0.04	1.26	-61.45	-54.00	7.45
160.61	28.25	adiance V ®	-66.32	0.06	1.20	-65.18	-36.00	29.18
353.61	31.87	V	-66.52	0.25	5.89	-60.88	-36.00	24.88
426.73	27.39	V	-73.31	0.33	6.98	-66.66	-36.00	30.66
630.48	28.48	V	-70.95	<sub>30</sub> 0.52	7.30	-64.17	-54.00	10.17
756.07	28.15	V	-71.64	0.61	6.40	-65.85	-54.00	11.85
8 Th 1800	(B) A	Final Global ®	震 station of Glob	CC				
97.06	30.31	H C	-63.91	0.04	1.60	-62.35	-54.00	8.35
154.19	26.55	Н	-66.74	0.06	0.70	-66.10	-36.00	30.10
348.09	28.32	H	-69.98	0.24	5.54	-64.68	-36.00	28.68
430.37	27.60	@ H F of Chobal	-72.57	0.34	6.90	-66.01	-36.00	30.01
633.42	28.55	H	-70.38	0.52	7.24	-63.66	-54.00	9.66
730.23	28.85	Н	-70.73	0.59	6.80	-64.52	-54.00	10.52

Note: 1.The margins of the other spectrum are not exceeding the minimum value of margin, and this part of the results without recording in the test report.

2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "--" remark, if no specific emission from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

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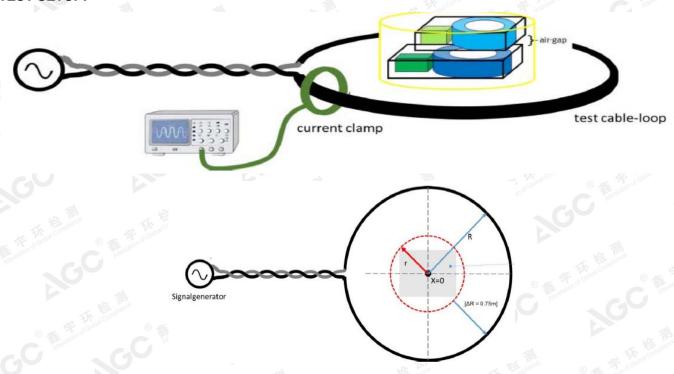
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#### 5.5 RECEIVER BLOCKING

#### **MEASUREMENT EQUIPMENT USED:**

NAME OF EQUIPMENT	MANUFACTURER	MODEL	S/N	Cal. Date	Cal. Due
MXG X-Series Vector Signal Generator	Agilent	N5182B	N/A	Sep. 20, 2018	Sep. 19, 2019
LOOP ANTENNA	LAPLACE	RF300	N/A	Mar. 01, 2018	Feb. 28, 2020
Clamp meter	PROVA	PROVA-11	17200101	Sep. 20, 2018	Sep. 19, 2019

#### **TEST SETUP:**



## **TEST PROCEDURE:**

- 1). The test shall be carried out inside a test chamber according to clauses C.1.1 and C.1.2 in ETSI EN 300 330
- 2). A test loop with a radius r shall be used to create the magnetic field; the test loop shall lie on a non-metallic ground and the minimum distance to metallic objects (e.g. ground plane) shall be 0,75 m. The EUT shall be placed to the centre of the test-loop
- 3). The test loop shall be sufficiently large so that the test loop itself does not influence the WPT system; The radius R of the test-loop shall be in minimum  $\Delta R = 0.75$  m larger than the maximum dimension r of the EUT.

$$R >= r + \Delta R$$
.

The maximum H-Field can be calculated from the loop current I (into the test-loop) with the following formula:

H=I/2R

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4) The required output current to achieve the required magnetic field at the WPT system shall be generated with a signal generator (unmodulated signal) at the test frequencies. For each test frequency the "reaction" of the device shall be recorded and checked against the performance criterion

#### **LIMITS**

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

Table 6: Receiver blocking limits

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

## **TEST RESULT**

Test Mode: Mode 3

TOOL WIDGE. WIDGE	July 100		HOTT BELLEVILLE		
Test Frequency(KHz)		Signal level @ EUT	Performance	Result	
In-band signal	118.0	72dBuA/m	No function loss	Pass	
OOB signal	117.0	72dBuA/m	No function loss	Pass	
OOD Signal	119.0	72dBuA/m	No function loss	Pass	
Remote-band	108.0	82dBuA/m	No function loss	Pass	
signal	128.0	82dBuA/m	No function loss	Pass	

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## 6. INTERPRETATION OF MEASUREMENT RESULTS

All the measurement equipments and accessories have been carefully selected to meet the maximum measurement uncertainty specified below:

RF Frequency	± 1 x 10 <sup>-7</sup>
RF Power, Conducted	± 0.75dB
Maximum Frequency Deviation: _ Within 300Hz and 6KHz of Audio Frequency _ Within 6KHz and 25KHz of Audio Frequency	± 5% ± 3dB
Adjacent channel power	± 3dB
Conducted Emission of Transmitter, Valid Up to 12.75GHz	± 4dB
Conducted Emissions of Receivers	± 3dB
Radiated Emission of Transmitter, Valid Up to 12.75GHz	± 6dB

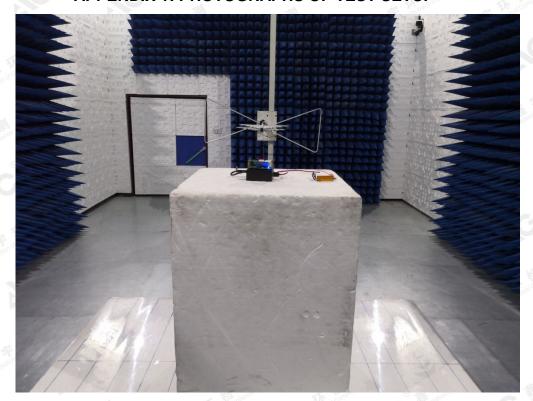
P.S. Uncertainty figures are valid to confidence level of 95% calculated according to the methods described in the ETSI TR 100 028.

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## **APPENDIX 1: PHOTOGRAPHS OF TEST SETUP**



----END OF REPORT----

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