

TEST REPORT

Applicant:

Address of Applicant:

Manufacturer:

**Address of
Manufacturer:**

Equipment Under Test (EUT)

Product Name: Air 5W wireless charging journal cover A5

Model: P774.06

Standards: ETSI EN 303 417 V1.1.1 (2017-09)

Date of Receipt: November 20, 2019

Date of Test: November 20-25, 2019

Date of Issue: November 25, 2019

Test Result : PASS *

* In the configuration tested, the EUT complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives. The protection requirements with respect to electromagnetic compatibility contained in Directive 2014/53/EU are considered.

A handwritten signature in black ink is written over a circular blue stamp. The stamp contains the text "GTS", "GLOBAL TESTING", and "GLOBAL UNITED TECHNOLOGY SERVICES CO., LTD." around the perimeter.

Robinson Lo

Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.



2 Version

Version No.	Date	Description
00	November 25, 2019	Original

Prepared By:



Date:

November 25, 2019

Project Engineer

Check By:



Date:

November 25, 2019

Reviewer

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4 Test Summary

Radio Spectrum Matter (RSM) Part of Tx/Rx			
Item	Test Requirement	Test method	Result
Operating Frequency Range	ETSI EN 303 417 V1.1.1	ETSI EN 303 417 V1.1.1 Cluase 4.3.3	Pass
Transmitter H-Field requirements	ETSI EN 303 417 V1.1.1	ETSI EN 303 417 V1.1.1 Cluase 4.3.4	Pass
WPT system unwanted radiated emissions	ETSI EN 303 417 V1.1.1	ETSI EN 303 417 V1.1.1 Cluase 4.3.5	Pass
Transmitter out of band(OOB) emissions	ETSI EN 303 417 V1.1.1	ETSI EN 303 417 V1.1.1 Cluase 4.3.6	Pass
Receiver Blocking	ETSI EN 303 417 V1.1.1	ETSI EN 303 417 V1.1.1 Cluase 4.4.2.1	Pass

Remark:N/A is not applicable.

5 General Information

5.1 General Description of E.U.T.

Product Name:	Air 5W wireless charging journal cover A5
Model No.	P774.06
Operation Frequency:	110-205kHz
Modulation type:	Backscatter modulation
Antenna Type:	Inductive loop coil Antenna
Antenna Gain:	0dBi
Power Supply:	Input: DC 5V 2A Output: DC 5V 1A

5.2 Test mode

Transmitting mode	Keep the EUT in transmitting mode
Receive mode	Keep the EUT in receive mode.
Standby mode	Keep the EUT in idle mode.

5.3 Test Facility

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

- **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen 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 files. Registration 381383.

- **IC —Registration No.: 9079A**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A

- **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). LAB CODE:600179-0

5.4 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel:86- 0755-27798480

Fax: 86-0755-27798960

5.5 Description of Support Units

Manufacturer	Description	Model	Serial Number
SAMSUNG	Mobile Phone	S7EDGE	R28H835BJ2B
APPLE	USB Charger	A1399	N/A

5.6 Deviation from Standards

Biconical and log periodic antennas were used instead of dipole antennas.

5.7 Abnormalities from Standard Conditions

None.

5.8 Other Information Requested by the Customer

None.

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 26 2019	June. 25 2020
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 26 2019	June. 25 2020
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 26 2019	June. 25 2020
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 26 2019	June. 25 2020
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 26 2019	June. 25 2020
9	Coaxial Cable	GTS	N/A	GTS211	June. 26 2019	June. 25 2020
10	Coaxial cable	GTS	N/A	GTS210	June. 26 2019	June. 25 2020
11	Coaxial Cable	GTS	N/A	GTS212	June. 26 2019	June. 25 2020
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 26 2019	June. 25 2020
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 26 2019	June. 25 2020
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 26 2019	June. 25 2020
15	Band filter	Amindeon	82346	GTS219	June. 26 2019	June. 25 2020
16	Power Meter	Anritsu	ML2495A	GTS540	June. 26 2019	June. 25 2020
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 26 2019	June. 25 2020
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 26 2019	June. 25 2020
19	Splitter	Agilent	11636B	GTS237	June. 26 2019	June. 25 2020
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 26 2019	June. 25 2020
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 19 2019	Oct. 18 2020
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 19 2019	Oct. 18 2020
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 19 2019	Oct. 18 2020
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 26 2019	June. 25 2020

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 26 2019	June. 25 2020

2	Barometer	ChangChun	DYM3	GTS255	June. 26 2019	June. 25 2020
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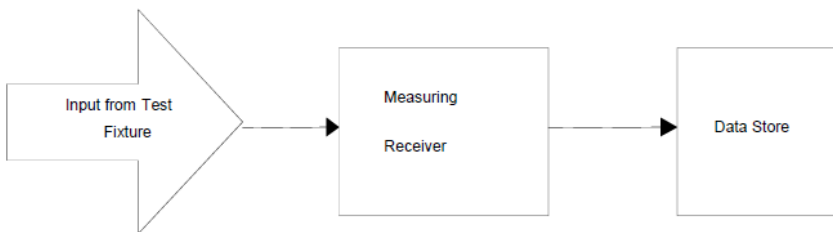
7 Radio Technical Specification in ETSI EN 303 417

7.1 Test environment

Item	Normal Environment	Extreme Environment
Temperature:	24.0 °C	0°C to +50 °C
Voltage 1:	DC 5V	DC 4.5V, DC 5.5V
Humidity:	52 % RH	
Atmospheric Pressure:	1008 mbar	

7.2 Transmitter Requirement

7.2.1 Operating Frequency Ranges

Test Requirement:	ETSI EN303 417 Clause 4.3.3
Test Method:	ETSI EN303 417 Clause 6.2
Receiver setup:	• Start frequency: lower than the lower edge of the permitted frequency range / requested by the essential requirements in clause 4.3.3. • Stop frequency: higher than the upper edge of the permitted frequency range / requested by the essential requirements in clause 4.3.3. • Resolution Bandwidth: see ETSI EN 300 330 [1], clause 5.12, Table 11. • Video Bandwidth: > Resolution bandwidth. • Detector mode: see ETSI EN 300 330 [1], clause 5.12, Table 11. • Display mode: Max. hold. • Sweep time: the sweep time shall be chosen in such a way that the time of each sub-operational mode / operational mode (WPT system operation cycle) is taken into account.
Limit:	ETSI EN303 417 Clause 4.3.3.3
Test Setup:	 <pre> graph LR A[Input from Test Fixture] --> B[Measuring Receiver] B --> C[Data Store] </pre>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Measurement Record:	Uncertainty: $\pm 10^{-7}$ dB

Measurement Data:

Measurement Conditions		f_L (kHz)	f_H (kHz)	Limit (kHz)	Result
Tnormal (24°C)	Vnor: 5.0V dc	111.55	205.18	100-300	PASS

7.2.2 H-field

Test Requirement:	ETSI EN303 417 Clause 4.3.4																														
Test Method:	ETSI EN303 417 Clause 6.2																														
Test site:	Measurement Distance: 10m																														
Receiver setup:	RBW=9kHz, VBW=10kHz, Detector= peak																														
Limit:	Table 3: H-field limits <table><tr><th>Frequency range [MHz]</th><th>H-field strength limit [dBμA/m at 10 m]</th><th>Comments</th></tr><tr><td>$0,019 \leq f < 0,021$</td><td>72</td><td></td></tr><tr><td>$0,059 \leq f < 0,061$</td><td>69,1 descending 10 dB/dec above 0,059 MHz</td><td>See note 1</td></tr><tr><td>$0,079 \leq f < 0,090$</td><td>67,8 descending 10 dB/dec above 0,079 MHz</td><td>See note 2</td></tr><tr><td>$0,100 \leq f < 0,119$</td><td>42</td><td></td></tr><tr><td>$0,119 \leq f < 0,135$</td><td>66 descending 10 dB/dec above 0,119 MHz</td><td>See note 1</td></tr><tr><td>$0,135 \leq f < 0,140$</td><td>42</td><td></td></tr><tr><td>$0,140 \leq f < 0,1485$</td><td>37,7</td><td></td></tr><tr><td>$0,1485 \leq f < 0,30$</td><td>-5</td><td></td></tr><tr><td>$6,765 \leq f < 6,795$</td><td>42</td><td></td></tr></table> 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.	Frequency range [MHz]	H-field strength limit [dBμA/m at 10 m]	Comments	$0,019 \leq f < 0,021$	72		$0,059 \leq f < 0,061$	69,1 descending 10 dB/dec above 0,059 MHz	See note 1	$0,079 \leq f < 0,090$	67,8 descending 10 dB/dec above 0,079 MHz	See note 2	$0,100 \leq f < 0,119$	42		$0,119 \leq f < 0,135$	66 descending 10 dB/dec above 0,119 MHz	See note 1	$0,135 \leq f < 0,140$	42		$0,140 \leq f < 0,1485$	37,7		$0,1485 \leq f < 0,30$	-5		$6,765 \leq f < 6,795$	42	
Frequency range [MHz]	H-field strength limit [dBμA/m at 10 m]	Comments																													
$0,019 \leq f < 0,021$	72																														
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$0,135 \leq f < 0,140$	42																														
$0,140 \leq f < 0,1485$	37,7																														
$0,1485 \leq f < 0,30$	-5																														
$6,765 \leq f < 6,795$	42																														
Test Setup:	The diagram illustrates the test setup for H-field measurement. A green loop antenna is positioned at a measurement distance of 3m or 10m from a turntable. The turntable contains a metal plate with a primary coil and a secondary coil (just under the metal plate). The setup is connected to AC mains via an AMN and includes an off-board power component, resistive/electronic load, filters, and an on-board power component.																														
Test Instruments:	Refer to section 6.0 for details																														
Test mode:	Refer to section 5.2 for details																														
Measurement Record:	Uncertainty: ± 4.5dB																														

Measurement Data:

Frequency (kHz)	Value (dBuA/m@3m)	Value (dBuA/m@10m)	Limit (dBuA/m@10m)	Result
175.00	21.50	-9.90	-5.00	Pass

Remark:

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

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

where:

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

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

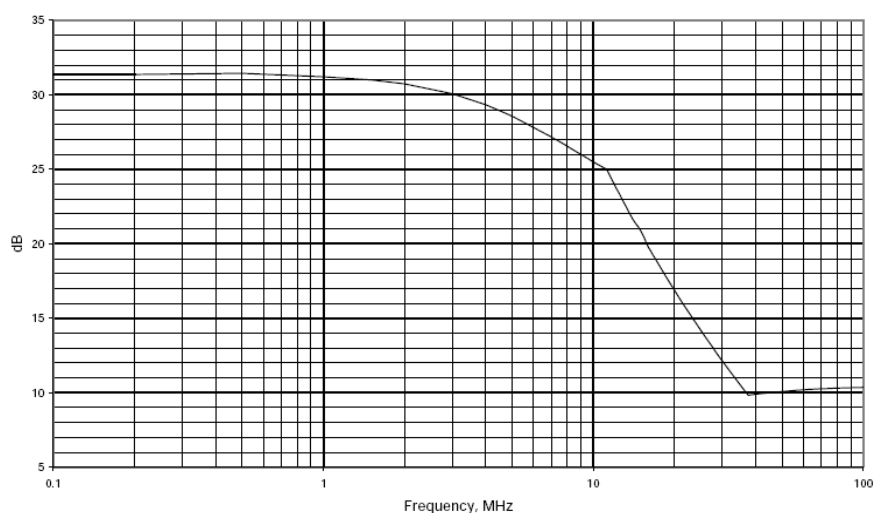
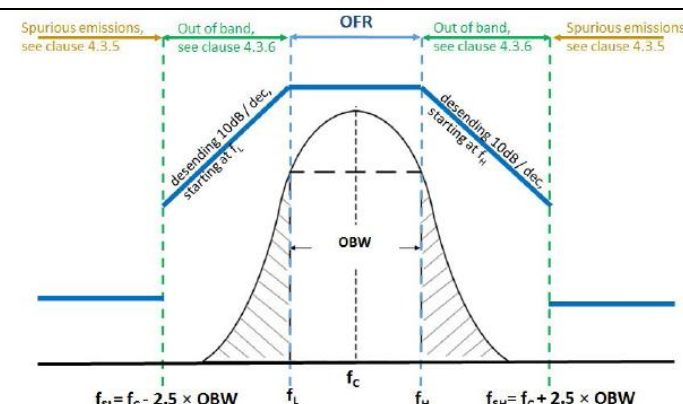
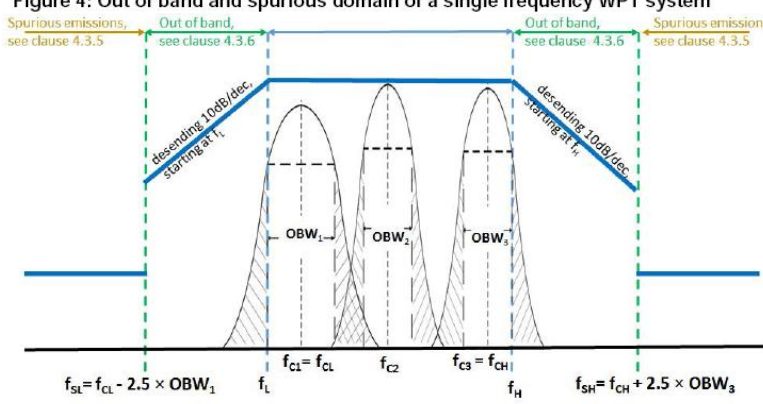
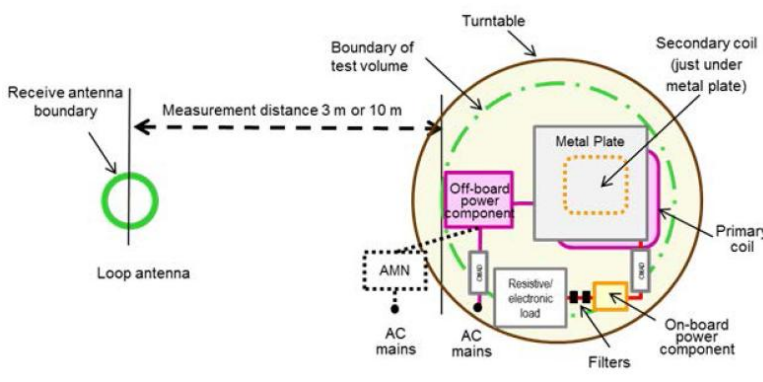


Figure H.2: Conversion factor C_3 versus frequency

7.2.3 Transmitter out of band(OOB) emissions

Test Requirement:	ETSI EN303 417 Clause 4.3.6
Test Method:	ETSI EN303 417 Clause 6.2
Limit:	 Figure 4: Out of band and spurious domain of a single frequency WPT system  Figure 5: Out of band and spurious domain of a multi-frequency system (during one WPT system cycle time)
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Measurement Record:	Uncertainty: $\pm 1 \times 10^{-7}$

Measurement Data:

For the H-Field emission is below the unwanted radiated emissions limit, the OOB test result complied with the OOB requirement.

7.2.4 WPT system unwanted radiated emission

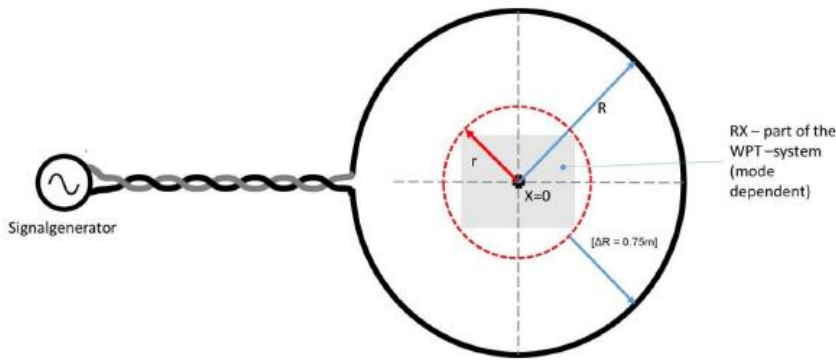
Test Requirement:	ETSI EN303 417 Clause 4.3.6																		
Test Method:	ETSI EN303 417 Clause 6.2																		
Limit:	Table 4 <table><tr><th>State (see note)</th><th>Frequency 9 kHz ≤ f < 10 MHz</th><th>Frequency 10 MHz ≤ f < 30 MHz</th></tr><tr><td>Operating</td><td>27 dBμA/m at 9 kHz descending 10 dB/dec</td><td>-3,5 dBμA/m</td></tr><tr><td>Standby</td><td>5,5 dBμA/m at 9 kHz descending 10 dB/dec</td><td>-25 dBμA/m</td></tr></table> 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 Table 5 <table><tr><th>State (see note)</th><th>47 MHz to 74 MHz 87,5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 790 MHz</th><th>Other frequencies between 30 MHz to 1 000 MHz</th></tr><tr><td>Operating</td><td>4 nW</td><td>250 nW</td></tr><tr><td>Standby</td><td>2 nW</td><td>2 nW</td></tr></table> NOTE: "Operating" means mode 2, 3 and 4 according to Table 2; "standby" means mode 1 according to Table 2.	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	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
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																	
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																	
Test setup:	Receiving part of the WPT system (charger or battery), incl. necessary electronic and coil Communication distance D Transmitting part of the WPT system (charger or battery), incl. necessary electronic and coil turntable Measurement antenna d = measurement distance Test volume (cylinder) covers complete WPT device d																		
Test Instruments:	Refer to section 6.0 for details																		
Test mode:	Refer to section 5.2 for details																		
Measurement Record:	Uncertainty: ± 1 × 10 ⁻⁷																		

Measurement Data:

EUT operating with normal modulation			
Freq (MHz)	Spurious Emission Level(dBμA/m)	Limit(dBμA/m)	Over limit
0.963	-12.82	6.78	-19.60
2.541	-14.57	2.58	-17.15
8.870	-13.15	-2.83	-10.32
10.559	-18.69	-3.50	-15.19
13.493	-21.24	-3.50	-17.74
21.284	-20.05	-3.50	-16.55

Freq (MHz)	Spurious Emission Level(dBm/m)	Limit Line (dBm/m)	Over Limit (dB)	Polarity
34.35	-76.79	-36	-40.79	V
44.66	-75.62	-36	-39.62	V
183.90	-79.54	-54	-25.54	V
195.85	-79.54	-54	-25.54	V
221.20	-78.14	-54	-24.14	V
225.30	-79.27	-54	-25.27	V
31.80	-82.77	-36	-46.77	H
40.55	-83.45	-36	-47.45	H
79.95	-85.86	-36	-49.86	H
109.34	-87.87	-54	-33.87	H
289.54	-86.73	-36	-50.73	H
311.73	-83.23	-36	-47.23	H

7.3 Receiver blocking

Test Requirement:	ETSI EN303 417 Clause 4.4.2												
Test Method:	ETSI EN303 417 Clause 6.3.2, Cluase 4.4.2.3												
Limit:	Table 6: Receiver blocking limits <table><tr><th></th><th>In-band signal</th><th>OOB signal</th><th>Remote-band signal</th></tr><tr><td>Frequency</td><td>Centre frequency (f_c) of the WPT system (see clause 4.3.3)</td><td>$f = f_c \pm F$ (see note)</td><td>$f = f_c \pm 10 \times F$ (see note)</td></tr><tr><td>Signal level field strength at the EUT</td><td>72 dBμA/m</td><td>72 dBμA/m</td><td>82 dBμA/m</td></tr></table> NOTE: F = OFR see clause 4.3.3.		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
	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										
Test setup:	Wanted performance criteria: For the purpose of the receiver performance tests, the WPT system shall produce an appropriate output under normal conditions as indicated below: • use as intended without degradation of performance; or • a degradation of the performance is indicated by the WPT system as described in the manual.  Figure 12: Schematic test set-up for the RX-blocking test												
Test Instruments:	Refer to section 6.0 for details												
Test mode:	Refer to section 5.2 for details												
Measurement Record:	Uncertainty: ± 4.5dB												

6.5.2 Measurement Data

For each test frequency the "reaction" of the device be recorded and checked against the performance criterion. The WPT system meets the wanted performance criterion at all times, So the test is passed.

:

8 Test setup photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

-----End-----