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Report No.: SHEM180700553902

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TEST REPORT

Application No.: SHEM1807005539CR
Applicant: ZIMI CORPORATION
Address of Applicant: Room A913, No.159 Chengjiang Road, Jiangyin City, Jiangsu Province, 214431, P.R.C
Manufacturer: ZIMI CORPORATION
Address of Manufacturer: Room A913, No.159 Chengjiang Road, Jiangyin City, Jiangsu Province, 214431, P.R.C
Factory:
 1.Dongguan DBK Energy Technology Co.,Ltd.
 2.Suzhou Lineprinting Wireless Communication Co.,Ltd.
 3.Shenzhen DBK Electronics Co.,Ltd.
Address of Factory:
 1.No.51 Zhangshen Middle Road,Xuzhen Community,Zhangmutou Town,Dongguan,Guangdong,P.R.China.
 2.Floor 6,Building 40 and Floor 8,Building 39,No.18,Dongchang Road,SIP,Suzhou,China.
 3.Room No.208-1,308,404-408 in Building Five,2-4 Floor in Building Three,No.8 Qinghua Road,Zhu Village,518109,Fucheng New Community,Guanlan Street,Longhua District,Shenzhen City,Guangdong Province,P.R.China.

Equipment Under Test (EUT):

EUT Name: Mi Wireless Charging Pad
Model No.: WPC01ZM
Trade mark: MI
Standard(s) : EN 303 417 V1.1.1
Date of Receipt: 2018-07-10
Date of Test: 2018-07-19 to 2018-07-23
Date of Issue: 2018-08-17

Test Result:	Pass *
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* 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 EU Declaration of Conformity and compliance with all relevant EU Directives.



Parlam Zhan
E&E Section Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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Revision Record			
Version	Description	Date	Remark
00	Original	2018-08-17	/

Authorized for issue by:			
		<i>Vincent Zhu</i>	
		_____ Vincent Zhu /Project Engineer	
		<i>Parlam zhan</i>	
		_____ Parlam Zhan / Reviewer	

2 Test Summary

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Operating frequency range(s) (OFR)	EN 303 417 V1.1.1	EN 303 417 V1.1.1 Clause 6.2.1	EN 303 417 V1.1.1 Clause 4.3.3	Pass
H-field	EN 303 417 V1.1.1	EN 303 417 V1.1.1 Clause 6.2.1	EN 303 417 V1.1.1 Clause 4.3.4	Pass
Transmitter spurious emissions	EN 303 417 V1.1.1	EN 303 417 V1.1.1 Clause 6.2.1	EN 303 417 V1.1.1 Clause 4.3.5	Pass
Transmitter out of band (OOB) emissions	EN 303 417 V1.1.1	EN 303 417 V1.1.1 Clause 6.2.1	EN 303 417 V1.1.1 Clause 4.3.6	Pass
Receiver blocking	EN 303 417 V1.1.1	EN 303 417 V1.1.1 Clause 6.3.2	EN 303 417 V1.1.1 Clause 4.4.2	Pass



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 5V 2A/9V 1.6A by USB Type-C
Test voltage:	AC 230V 50Hz
Cable:	DC Cable 1m for USB Port
Wireless Output:	DC 5V, 5W or 9V, 10W
Operation frequency:	115-148 kHz
Antenna type:	Inductive Loop Coil Antenna

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Load	Client	Full Load (5Ω) Half Load (10Ω) Low Load (200Ω)	/

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25 x 10 ⁻⁸
2	Timeout	2s
3	Duty cycle	0.37%
4	Occupied Bandwidth	3%
5	RF conducted power	0.75dB
6	RF power density	2.84dB
7	Conducted Spurious emissions	0.75dB
8	RF Radiated power	4.5dB (Below 1GHz)
		4.8dB (Above 1GHz)
9	Radiated Spurious emission test	4.2dB (Below 30MHz)
		4.4dB (30MHz-1GHz)
		4.6dB (1GHz-18GHz)
		5.2dB (Above 18GHz)
10	Temperature test	1 °C
11	Humidity test	3%
12	Supply voltages	1.5%
13	Time	3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.

4.5 Test Facility

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

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **NVLAP (Certificate No. 201034-0)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). Certificate No. 201034-0.

- **FCC –Designation Number: CN5033**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN5033. Test Firm Registration Number: 479755.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A-1.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868,C-4336,T-12221,G-10830 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Conducted Emission at AC Power Line					
EMI test receiver	R&S	ESR7	SHEM162-1	2017-12-20	2018-12-19
LISN	Schwarzbeck	NSLK8127	SHEM061-1	2017-12-20	2018-12-19
LISN	EMCO	3816/2	SHEM019-1	2017-12-20	2018-12-19
Pulse limiter	R&S	ESH3-Z2	SHEM029-1	2017-12-20	2018-12-19
CE test Cable	/	CE01	/	2017-12-26	2018-12-25
Conducted Test					
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2017-12-20	2018-12-19
Spectrum Analyzer	Agilent	N9020A	SHEM181-1	2017-09-26	2018-09-25
Power meter	R&S	NRP	SHEM057-1	2017-12-26	2018-12-25
Power Sensor	R&S	NRP-Z22	SHEM136-1	2018-07-22	2019-07-21
Power Sensor	R&S	NRP-Z91	SHEM057-2	2017-12-26	2018-12-25
Signal Generator	R&S	SMR40	SHEM058-1	2018-07-03	2019-07-02
Signal Generator	Agilent	N5182A	SHEM182-1	2017-09-26	2018-09-25
Communication Tester	R&S	CMW270	SHEM183-1	2017-10-22	2018-10-21
Switcher	Tonscend	JS0806	SHEM184-1	2017-09-26	2018-09-25
Splitter	Anritsu	MA1612A	SHEM185-1	/	/
Coupler	e-meca	803-S-1	SHEM186-1	/	/
High-low Temp Cabinet	Suzhou Zhihe	TL-40	SHEM087-1	2017-09-26	2018-09-25
AC Power Stabilizer	WOCEN	6100	SHEM045-1	2017-12-26	2018-12-25
DC Power Supply	QJE	QJ30003SII	SHEM046-1	2017-12-26	2018-12-25
Conducted test Cable	/	RF01, RF 02	/	2017-12-26	2018-12-25
Radiated Test					
EMI test receiver	R&S	ESU40	SHEM051-1	2017-12-20	2018-12-19
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2017-12-20	2018-12-19
Loop Antenna (9kHz-30MHz)	Schwarzbeck	FMZB1519	SHEM135-1	2017-04-10	2020-04-09
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM048-1	2017-02-28	2020-02-27
Antenna (25MHz-3GHz)	Schwarzbeck	HL562	SHEM010-1	2017-02-28	2020-02-27
Horn Antenna (1-8GHz)	Schwarzbeck	HF906	SHEM009-1	2017-10-24	2020-10-23
Horn Antenna (1-18GHz)	Schwarzbeck	BBHA9120D	SHEM050-1	2017-01-14	2020-01-13
Horn Antenna (14-40GHz)	Schwarzbeck	BBHA 9170	SHEM049-1	2017-12-03	2020-12-02
Pre-amplifier (9KHz-2GHz)	CLAVIIO	LNA-0001-412010	SHEM164-1	2017-08-22	2018-08-21
Pre-amplifier (1-18GHz)	CLAVIIO	BDLNA-0118-352810	SHEM050-2	2017-08-22	2018-08-21
High-amplifier (14-40GHz)	Schwarzbeck	10001	SHEM049-2	2017-12-20	2018-12-19
Band filter	LORCH	9BRX-875/X150-SR	SHEM156-1	/	/
Band filter	LORCH	13BRX-1950/X500-SR	SHEM083-2	/	/
Band filter	LORCH	5BRX-2400/X200-SR	SHEM155-1	/	/
Band filter	LORCH	5BRX-5500/X1000-SR	SHEM157-2	/	/
High pass Filter	Wainwright	WHK3.0/18G-100SS	SHEM157-1	/	/
High pass Filter	Wainwright	WHKS1700-3SS	SHEM157-3	/	/
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2017-07-22	2020-07-21
RE test Cable	/	RE01, RE02, RE06	/	2017-12-26	2018-12-25

6 Radio Spectrum Matter Test Results

6.1 Operating frequency range(s) (OFR)

Test Requirement EN 303 417 V1.1.1 Clause 4.3.3

Test Method: EN 303 417 V1.1.1 Clause 6.2.1

Limit:

6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 23.0 °C Humidity: 56 % RH Atmospheric Pressure: 1020 mbar

Test mode b: mode 1_Keep the WPT system in idle mode.

c: mode 2_Keep the WPT system in charging adjustment mode.

d: mode 3_Keep the WPT system in power transmission arrangement mode.

6.1.2 Measurement Procedure and Data

Measurement Condition		f _L (kHz)	f _H (kHz)	Limit (kHz)	Result
T Normal 25°C	V _{norm} :230V	115.188	147.508	100-300	PASS
-20°C	V _{min} : 207V	115.189	147.509	100-300	PASS
-20°C	V _{max} : 253V	115.187	147.507	100-300	PASS
55°C	V _{min} : 207V	115.186	147.506	100-300	PASS
55°C	V _{max} : 253V	115.120	147.510	100-300	PASS

6.2 H-field

Test Requirement EN 303 417 V1.1.1 Clause 4.3.4

Test Method: EN 303 417 V1.1.1 Clause 6.2.1

Limit:

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 [1.4] 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.

6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.0 °C Humidity: 56 % RH Atmospheric Pressure: 1020 mbar

Test mode b: mode 1_Keep the WPT system in idle mode.

c: mode 2_Keep the WPT system in charging adjustment mode.

d: mode 3_Keep the WPT system in power transmission arrangement mode.

6.2.2 Measurement Procedure and Data

Test Conditions		Frequency (kHz)	H-field value (dBµA/m)	Limit (dBµA/m)	Result
Temp (°C)	Volt (V AC)				
25	Vnorm:230	115	15.32	47.40	Pass
-20	V _{min} : 207	115	15.42	47.40	Pass
-20	V _{max} : 253	115	15.41	47.40	Pass
55	V _{min} : 207	115	15.42	47.40	Pass
55	V _{max} : 253	115	15.50	47.40	Pass
25	Vnorm:230	132	15.49	47.40	Pass
-20	V _{min} : 207	132	15.50	47.40	Pass
-20	V _{max} : 253	132	15.48	47.40	Pass
55	V _{min} : 207	132	15.47	47.40	Pass
55	V _{max} : 253	132	15.51	47.40	Pass
25	Vnorm:230	148	15.67	47.40	Pass
-20	V _{min} : 207	148	15.74	47.40	Pass
-20	V _{max} : 253	148	15.42	47.40	Pass
55	V _{min} : 207	148	15.19	47.40	Pass
55	V _{max} : 253	148	15.36	47.40	Pass

6.3 Transmitter spurious emissions

Test Requirement EN 303 417 V1.1.1 Clause 4.3.5

Test Method: EN 303 417 V1.1.1 Clause 6.2.1

Limit:

Table 4

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

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.		

6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23.0 °C Humidity: 56 % RH Atmospheric Pressure: 1020 mbar

Test mode b: mode 1_Keep the WPT system in idle mode.

c: mode 2_Keep the WPT system in charging adjustment mode.

d: mode 3_Keep the WPT system in power transmission arrangement mode.

6.3.2 Measurement Procedure and Data

EUT operating with normal modulation

Below 30MHz

Item	Freq.	Read Level	Antenna Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμA)	(dB/m)	(dB)	(dBμA/m)	(dBμA/m)	(dB)	
1	0.04	32.72	-31.63	0.04	1.13	52.50	-51.37	QP
2	0.16	23.11	-31.60	0.05	-8.44	46.07	-54.51	QP
3	0.39	23.27	-31.63	0.06	-8.30	42.07	-50.37	QP
4	0.59	18.60	-31.55	0.07	-12.88	40.41	-53.29	QP
5	4.35	12.60	-31.19	0.09	-18.50	29.43	-47.93	QP
6	22.77	7.22	-31.32	0.16	-23.94	11.86	-35.80	QP

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - Preamp Factor

30MHz-1GHz

Freq (MHz)	Spurious Emission Level(dBm/m)	Limit_Line (dBm/m)	Over_Limit (dB)	Polaxis
145.35	-68.35	-36.00	-32.35	V
175.65	-69.77	-54.00	-15.77	V
341.98	-70.56	-36.00	-34.56	V
616.37	-64.76	-54.00	-10.76	V
842.13	-60.53	-36.00	-24.53	V
878.32	-60.03	-36.00	-24.03	V
47.83	-70.50	-54.00	-16.50	H
275.16	-68.26	-36.00	-32.26	H
475.50	-63.51	-54.00	-9.51	H
504.71	-64.83	-54.00	-10.83	H
711.67	-61.90	-54.00	-7.90	H
912.86	-57.02	-36.00	-21.02	H

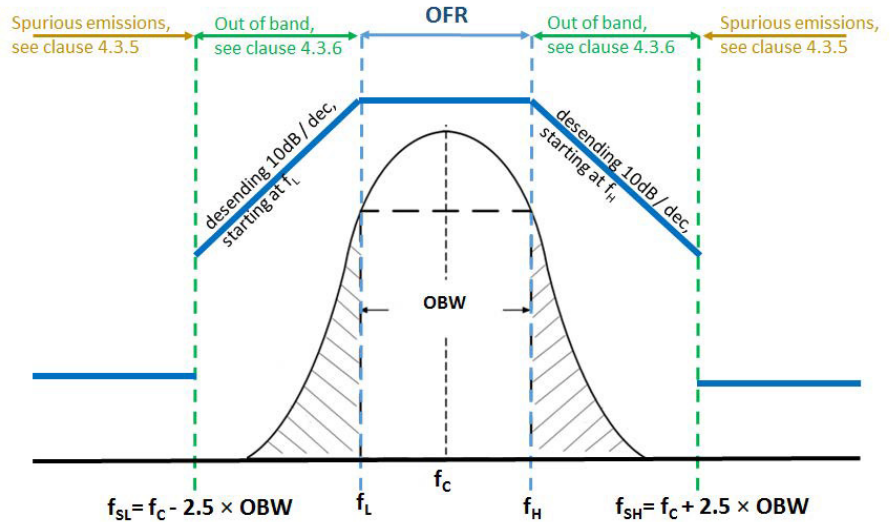
Note: All mode were rested, only the worst case has been record.

6.4 Transmitter out of band (OOB) emissions

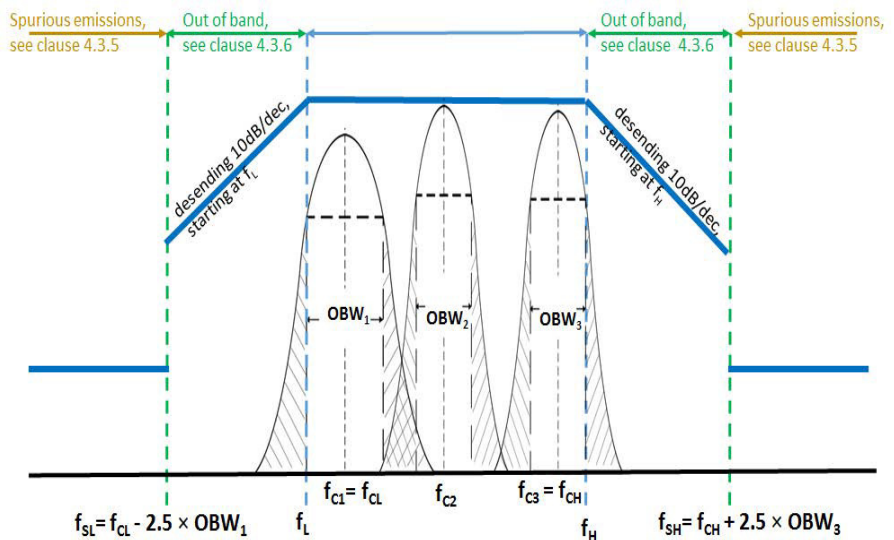
Test Requirement EN 303 417 V1.1.1 Clause 4.3.6

Test Method: EN 303 417 V1.1.1 Clause 6.2.1

Limit:



Out of band and spurious domain of a single frequency WPT system



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



6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 23.0 °C Humidity: 56 % RH Atmospheric Pressure: 1020 mbar

Test mode b: mode 1_Keep the WPT system in idle mode.
 c: mode 2_Keep the WPT system in charging adjustment mode.
 d: mode 3_Keep the WPT system in power transmission arrangement mode.

6.4.2 Measurement Procedure and Data

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

6.5 Receiver blocking

Test Requirement EN 303 417 V1.1.1 Clause 4.4.2

Test Method: EN 303 417 V1.1.1 Clause 6.3.2

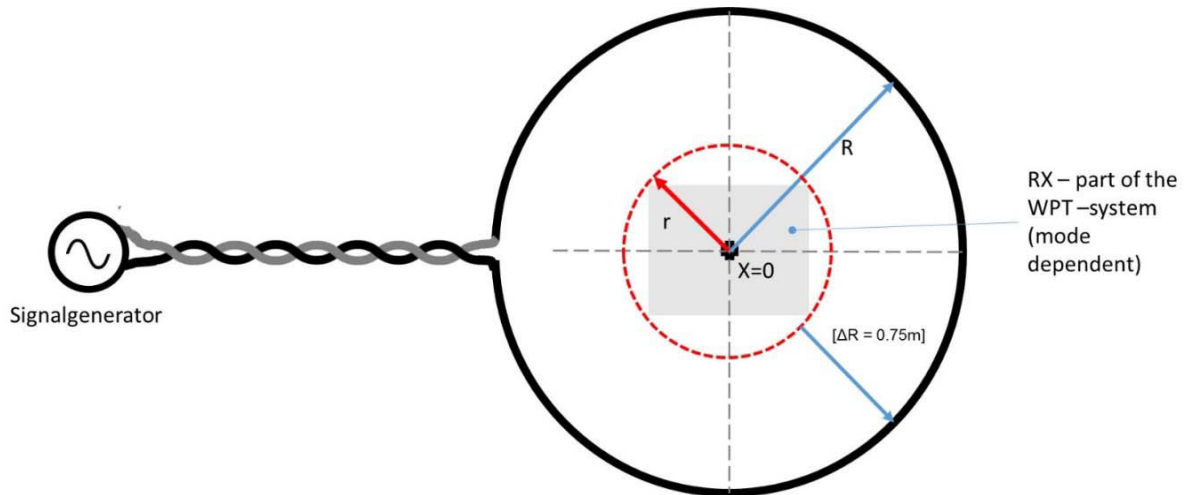
Limit:

	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 dB μ A/m	72 dB μ A/m	82 dB μ A/m
NOTE: F = OFR see clause 4.3.3.			

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.



6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 23.0 °C Humidity: 56 % RH Atmospheric Pressure: 1020 mbar

Test mode c: mode 2_Keep the WPT system in charging adjustment mode.

d: mode 3_Keep the WPT system in power transmission arrangement mode.

6.5.2 Measurement Procedure and 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.



7 Test Setup Photographs

Refer to the < Test Setup photos-EN>.

8 EUT Constructional Details

Refer to the < External Photos > & < Internal Photos >.

- End of the Report -