

TEST REPORT

Application No.: SZEM1901010781CR
Applicant: acv GmbH
Address of Applicant: Strassburger Allee 10-12, Erkelenz, Germany 41812
Manufacturer: acv GmbH
Address of Manufacturer: Strassburger Allee 10-12, Erkelenz, Germany 41812
Factory: DeSun / NERA TECH (HK) LIMITED
Address of Factory: Huameiju Business Centre, xihu Road, Bao'an District, Floor 7, Zone A, Shenzhen, China

Equipment Under Test (EUT):

EUT Name: Wireless Charging System
Model No.: 241170-53-1, 241170-53-5, 240000-01-033, 240000-01-035 ♣
 ♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.

Trade mark: Inbay 2.0
FCC ID: 2AQWT24000001030
Standard(s) : 47 CFR Part 18
Date of Receipt: 2019-01-28
Date of Test: 2019-01-30 to 2019-02-15
Date of Issue: 2019-02-20

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu

Keny Xu
EMC Laboratory Manager





Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2019-02-20		Original

Authorized for issue by:			
			
		Vincent Chen /Project Engineer	
			
		Eric Fu /Reviewer	



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2 Test Summary

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Radiated emission	47 CFR Part 18	FCC MP-5	Part 18.305	Pass

Declaration of EUT Family Grouping:

Model No.: 241170-53-1, 241170-53-5, 240000-01-033, 240000-01-035

All models had been tested, only show the worst model 241170-53-5 in this report, since the electrical circuit design, layout, components used, internal wiring and functions were identical for the above models.

240000-01-030 and 240000-01-031 are the same PCBs(same BOM), just different on software in regards of illumination of the status LED and beep signal.

240000-01-033 (with aluminum housing) and 240000-01-035 (with plastic housing) are the subsystems based on the PCB 240000-01-030 or 240000-01-031.

241170-53-1 (with plastic house subsystem 240000-01-035) and 241170-53-5 (with aluminum housed subsystem 240000-01-033) are the application specific solutions.



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4 General Information

4.1 Details of E.U.T.

Power supply:	Input: DC 12V
Cable:	DC power cable: 60cm
Antenna Type:	Inductive Loop Coil Antenna
Modulation Type:	Load Modulation
Operation Frequency:	113.08kHz to 204.04kHz
Remark:	Tests were conducted in three load modes (5W/7.5W/10W) and the worst case (10W) is reported only.

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
DC power	ZHAOXIN	RXN-305D	REF. No.SEA2700
Load receiver	SUPPLIED BY CLIENT	10W	NA
Mobile Phone	SAMSUNG	SM-G9500	R28J9140LPB

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 7.25 \times 10^{-8}$
2	Duty cycle	$\pm 0.37\%$
3	Occupied Bandwidth	$\pm 3\%$
4	RF conducted power	$\pm 0.75\text{dB}$
5	RF power density	$\pm 2.84\text{dB}$
6	Conducted Spurious emissions	$\pm 0.75\text{dB}$
7	RF Radiated power	$\pm 4.5\text{dB}$ (below 1GHz)
		$\pm 4.8\text{dB}$ (above 1GHz)
8	Radiated Spurious emission test	$\pm 4.5\text{dB}$ (Below 1GHz)
		$\pm 4.8\text{dB}$ (Above 1GHz)
9	Temperature test	$\pm 1^\circ\text{C}$
10	Humidity test	$\pm 3\%$
11	Supply voltages	$\pm 1.5\%$
12	Time	$\pm 3\%$

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

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

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab 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.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



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5 Equipment List

Radiated emission					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2018-03-31	2021-03-30
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM029-01	2018-07-12	2019-07-11
EMI Test Receiver (9kHz-7GHz)	Rohde & Schwarz	ESR	SEM004-03	2018-04-02	2019-04-01
Trilog-Broadband Antenna (30MHz-1GHz)	Schwarzbeck	VULB9168	SEM003-18	2016-06-29	2019-06-28
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-04	2018-04-13	2019-04-12
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2018-09-27	2019-09-26
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2018-09-27	2019-09-26
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2018-09-27	2019-09-26
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2018-04-08	2019-04-07

6 Radio Spectrum Matter Test Results

6.1 Radiated emission

Test Requirement Part 18.305

Test Method: FCC MP-5

Measurement Distance: 3m

Limit:

(b) The field strength levels of emissions which lie outside the bands specified in §18.301, unless otherwise indicated, shall not exceed the following:

Equipment	Operating frequency	RF Power generated by equipment (watts)	Field strength limit (uV/m)	Distance (meters)
Any type unless otherwise specified (miscellaneous)	Any ISM frequency	Below 500 500 or more	25 $25 \times \text{SQRT}(\text{power}/500)$	300 ¹ 300
	Any non-ISM frequency	Below 500 500 or more	15 $15 \times \text{SQRT}(\text{power}/500)$	300 ¹ 300
Industrial heaters and RF stabilized arc welders	On or below 5,725 MHz Above 5,725 MHz	Any Any	10 (²)	1,600 (²)
Medical diathermy	Any ISM frequency	Any	25	300
	Any non-ISM frequency	Any	15	300
Ultrasonic	Below 490 kHz	Below 500 500 or more	2,400/F(kHz) $2,400/\text{F}(\text{kHz}) \times \text{SQRT}(\text{power}/500)$	300 ³ 300
	490 to 1,600 kHz	Any	24,000/F(kHz)	30
	Above 1,600 kHz	Any	15	30
Induction cooking ranges	Below 90 kHz	Any	1,500	⁴ 30
	On or above 90 kHz	Any	300	⁴ 30

¹Field strength may not exceed 10 µV/m at 1600 meters. Consumer equipment operating below 1000 MHz is not permitted the increase in field strength otherwise permitted here for power over 500 watts.

²Reduced to the greatest extent possible.

³Field strength may not exceed 10 µV/m at 1600 meters. Consumer equipment is not permitted the increase in field strength otherwise permitted here for over 500 watts.

⁴Induction cooking ranges manufactured prior to February 1, 1980, shall be subject to the field strength limits for miscellaneous ISM equipment.



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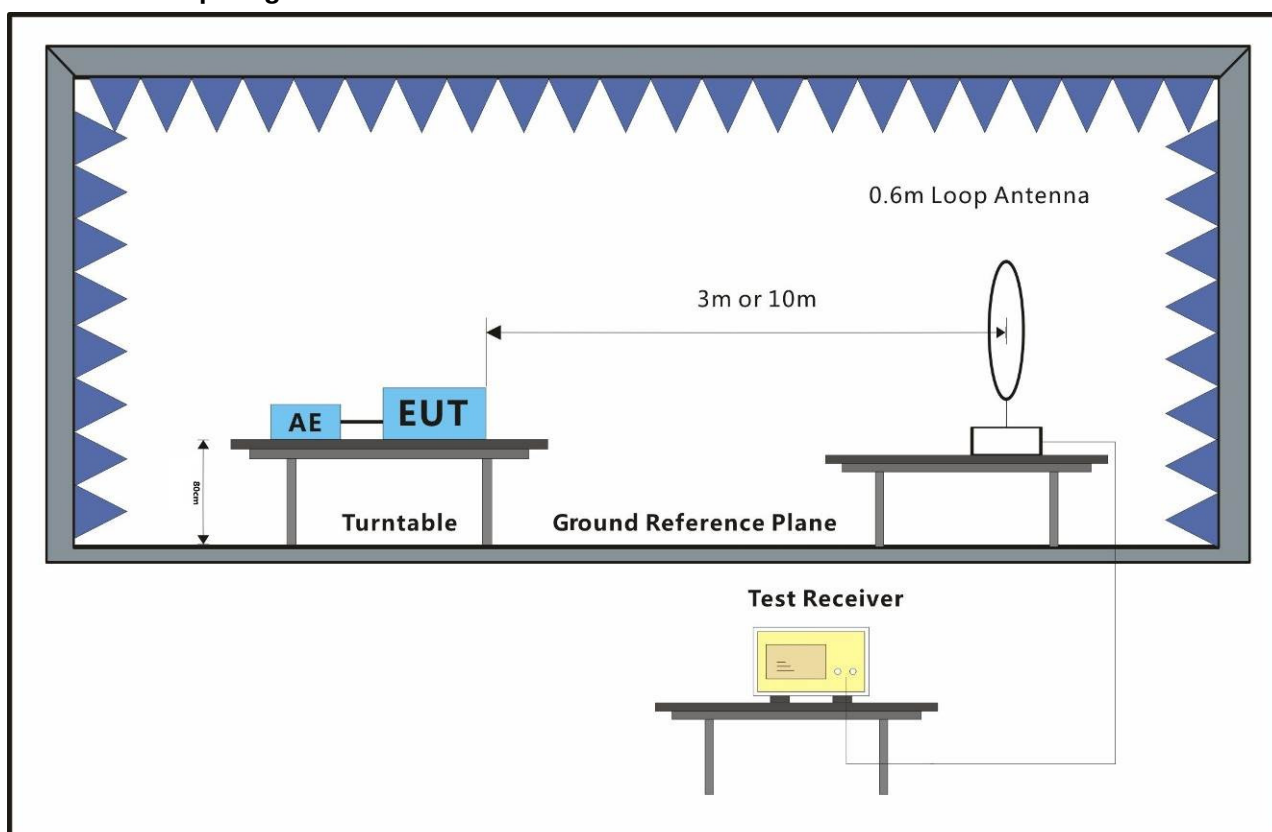
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 51 % RH Atmospheric Pressure: 1020 mbar

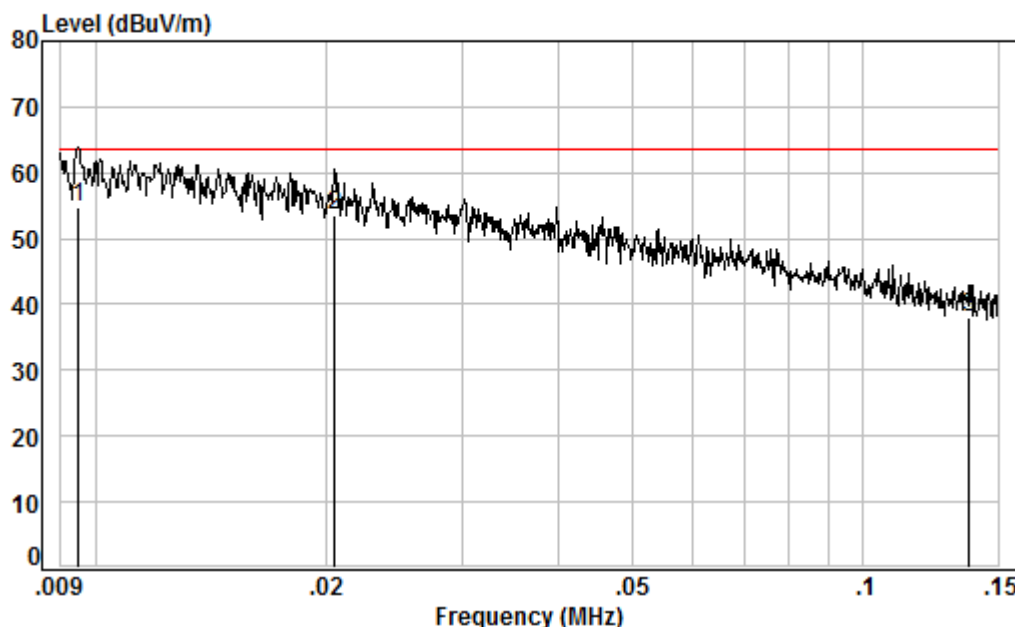
Test mode: a:DC 12V input_Keep the EUT charging. It is conducted in three load modes(low(1%), medium(50%) , high(99%) load and full load mode and only the worst case(full load mode) is submitted.

6.1.2 Test Setup Diagram



6.1.3 Measurement Procedure and Data

9kHz-150kHz



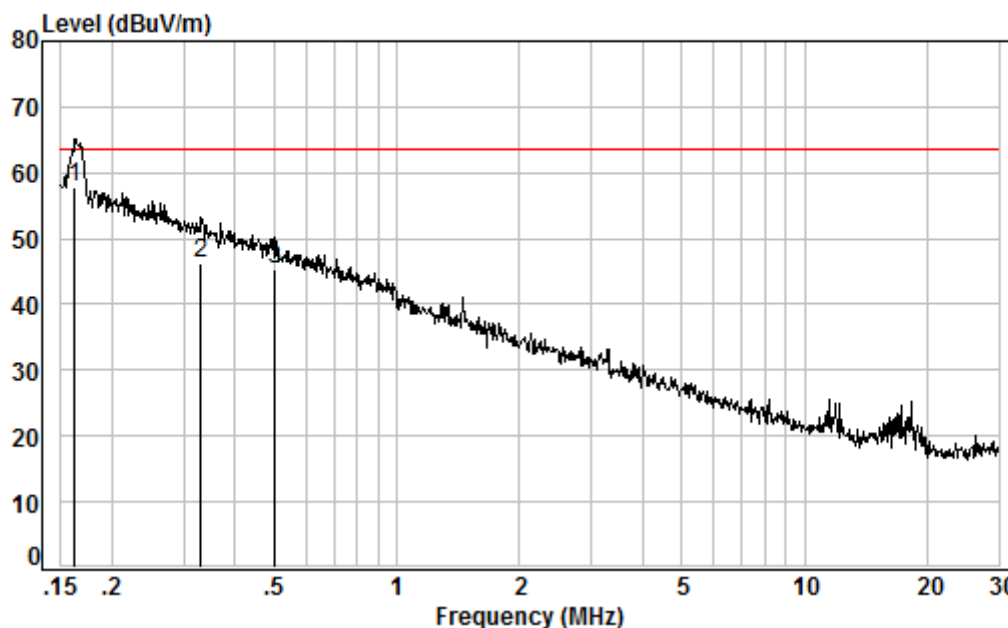
Condition: 3m

Job No. : 10781CR

Test Mode: a

	Freq	Cable	Ant	Preamp	Read	Limit	Over	
	MHz	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	0.01	0.29	19.64	31.23	66.17	54.87	63.52	-8.65 Average
2	0.02	0.21	14.93	31.79	70.24	53.59	63.52	-9.93 Average
3	0.14	0.06	11.76	32.67	58.76	37.91	63.52	-25.61 Average

150kHz-30MHz



Condition: 3m

Job No. : 10781CR

Test Mode: a

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	0.16	0.07	11.75	32.67	78.50	57.65	63.52	-5.87	Average
2	0.33	0.09	11.88	32.66	66.78	46.09	63.52	-17.43	Average
3	0.50	0.11	11.70	32.66	66.19	45.34	63.52	-18.18	Average



7 Photographs

7.1 Test Setup

Refer to Setup Photos

7.2 EUT Constructional Details (EUT Photos)

Refer to EUT external and internal photos

- End of the Report -



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