Test Report

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

Client Information:

Applicant:	SHENZHEN NITO POWER SOURCE TECHNOLOGY CO.,LTD.
Applicant add.:	201, No.8 Building, JinfanghuaElectricity Industrial park, Bantian St., Longgang Dist., Shenzhen, China

EUT Information:

EUT Name:	Magnetic Wireless Car Charger Holder
Model No.:	JR-ZS295, JR-ZS331,JR-ZS332
Brand Name:	JOYROOM

Prepared By:

Dongguan Yaxu (AiT) Technology Limited
Add. : No.22, Jinqianling Third Street, Jitigang, Huangjiang, Dongguan, Guangdong, China

Date of Receipt:	May 19, 2022	Date of Test:	May 19~ May 25, 2022
Date of Issue:	May 26, 2022	Test Result:	Pass

This device has been tested and found to comply with the stated standard(s) which is compliance with the RED directive 2014/53/EU and indicated in the test report. And the report is applicable only to the tested sample.

Reviewed by: Simba Huang
Simba huang

Approved by: Seal chen
Seal.chen

1 Contents

2 Test Summary

RADIO SPECTRUM MATTER (RSM) PART OF TX					
Test	**Test Requirement**	**Test method**	**Limit/Severity**	**Uncertainty**	**Result**
Permitted range of operating frequencies	EN 303 417: Clause 4.3.2	EN 300 330	EN 303 417: Clause 4.3.2.3	$\pm 0.5\times10^{-7}$	PASS
Operating frequency range(s) (OFR)	EN 303 417: Clause 4.3.3	EN 300 330	EN 303 417: Clause 4.3.3.3	$\pm 0.5\times10^{-7}$	PASS
Radiated H-field	EN 303 417: Clause 4.3.4	EN 300 330	EN 303 417: Clause 4.3.4.3	± 4 dB	PASS
Transmitter spurious emissions	EN 303 417: Clause 4.3.5	EN 300 330	EN 303 417: Clause 4.3.5.3	± 4 dB	PASS
Transmitter out of band (OOB) emissions	EN 303 417: Clause 4.3.6	EN 300 330	EN 303 417: Clause 4.3.6.3	± 4 dB	PASS
WPT system unwanted conducted emissions	EN 303 417: Clause 4.3.7	EN 300 330	EN 303 417: Clause 4.3.7.3	± 2 dB	N/A
Radio Spectrum Matter (RSM) Part of Rx					
Test	**Test Requirement**	**Test method**	**Limit/Severity**	**Uncertainty**	**Result**
Receiver blocking	EN 303 417: Clause 4.4	EN 300 330	EN 303 417: Clause 4.4.2.3	± 2 dB	PASS

Remark:

N/A: not applicable. Refer to the relative section for the details.

For the test methods, according to the present document the uncertainty figures is calculated according to the methods described in TR 100 028 and correspond to an expansion factor (coverage factor) k=2 (which provide confidence levels of respectively 95 %).

EN 303 417 in this report means ETSI EN 303 417 V1.1.1 (2017-09)

EN 300 330 in this report means ETSI EN 300 330 V2.1.1 (2017-02)

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radio Frequency.

Temperature (Uncertainty): ±1℃;Humidity (Uncertainty): ±10%

3 General Information

3.1 General Description of EUT

Manufacturer:	Xiaozhi (Dongguan) Technology Co., Ltd
Manufacturer Address:	RM 502, No. 4 Building, No. 302 TanglongXi Road, Tangxia Town, Dongguan, Guangdong
EUT Name:	Magnetic Wireless Car Charger Holder
Model No:	JR-ZS295
Brand Name:	JOYROOM
Derivative model No.:	JR-ZS331,JR-ZS332
Operation frequency:	110-205KHz
AntennaType:	loop coil Antenna
Antenna Gain:	maximum 0dBi
Power Supply Range:	Input: 5V/2A,9V/2A,12V/2A Output:5V/1A,7.5V/1A,9V/1.1A,12V/1.25A
Power Supply:	Input: 5V/2A,9V/2A,12V/2A Output:5V/1A,7.5V/1A,9V/1.1A,12V/1.25A
Signal Cable:	N/A

3.2 Description of Support Units

The EUT has been tested as an independent unit.

3.3 Deviation from Standards

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

3.4 Abnormalities from Standard Conditions

None.

3.5 Other Information Requested by the Customer

None.

4 Equipment Used during Test

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Spectrum Analyzer	R&S	FSV40	101470	2021.08.30	2022.08.29
2	EMI Measuring Receiver	R&S	ESR	101660	2021.08.30	2022.08.29
3	Low Noise Pre Amplifier	HP	HP8447E	1205323	2021.08.30	2022.08.29
4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2021.08.30	2022.08.29
5	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9160	9160-3207	2021.08.29	2024.08.28
6	Broadband Horn Antenna	SCHWARZBECK	BBHA9120D	452	2021.08.29	2024.08.28
7	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2021.08.30	2022.08.29
8	EMI Test Receiver	R&S	ESCI	100124	2021.08.30	2022.08.29
9	LISN	Kyoritsu	KNW-242	8-837-4	2021.08.30	2022.08.29
10	LISN	Kyoritsu	KNW-407	8-1789-3	2021.08.30	2022.08.29
11	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2021.08.30	2022.08.29
12	Pro.Temp&Humi.chamber	MENTEK	MHP-150-1C	MAA08112501	2021.08.30	2022.08.29
13	Multimeter	UNI-T	UT52	3080008236	2021.08.30	2022.08.29
14	DC power supply	ZHAOXIN	RXN-305D-2	28070002559	N/A	N/A
15	SMA Antenna connector	Dosin	Dosin-SMA	N/A	N/A	N/A
Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.						

5 Radio Technical Requirements Specification in EN 303 417

5.1 Test conditions

5.1.1 Normal conditions

Ambient:	Temperature:	+15°C to +35°C
	Relative humidity:	20% to 75%
Power supply:	AC:	230V AC, 49Hz to 51Hz
	Battery:	-

5.1.2 Extreme conditions

Ambient:	Temperature:	- Category I (General): -20 °C to +55 °C; - Category II (Portable): -10 °C to +55 °C; - Category III (Equipment for normal indoor use): 0°C to +35 °C.
Power supply:	AC:	230V AC ±10%,49Hz to 51Hz
	Battery:	**Regulated lead-acid battery power sources** 1,3 and 0,9 multiplied by the nominal voltage for regulated lead-acid battery power sources. 0.85 and 1.15 multiplied by the nominal for "gel-cell" type batteries. **Power sources using other types of batteries** The lower extreme test voltages for equipment with power sources using batteries shall be as follows: ● for equipment with a battery indicator, the end point voltage as indicated; ● for equipment without a battery indicator the following end point voltages shall be used: —0.85 multiplied by the nominal for the Leclanché or the lithium type of battery. —0.9 multiplied by the nominal for nickel-cadmium type of battery. ● for other types of battery or equipment, the lower extreme test. voltage for the discharged condition shall be declared by the equipment provider. The nominal voltage is considered to be the upper extreme test voltage in this case. **Other power sources** For equipment using other power sources, or capable of being operated from a variety of power sources, the extreme test voltages shall be those agreed between the equipment provider and the test laboratory.

5.2 WPT operational modes

The operation mode of the WPT system as below:

a) charging mode/power transmission/system in resonance;

b) communication mode (data transmission from and to the mobile device);

c) determination of the charging action

The manufacturer declared the EUT belongs to Class a.

Overview of operational modes within a WPT system

Operational Mode	**Set-up**	**Function of base station**	**Function of mobile device**	**Test scenario**
Mode 1: base station in stand-by, idle mode	Single device	Transmitter	Not applicable	Single radiation test (TX) with the base station/charging pad. The test set-up as described in clause 6.1.2 shall be used.
Mode 2: Communication before charging, adjustment charging mode / position	In combination	TX and RX	TX and RX	Specific test setup, declared by the manufacturer. Manufacturer shall declare the maximal distance between base station and mobile device the WPT system is able to communicate (distance D). The test setup- up shall be performed with the largest communication distance. The test set-up as described in clause 6.1.3 shall be used.
Mode 3: Communication	WPT system alignment	TX and RX	TX and RX	Worst case alignment Both tests can be performed within one set-up, worst-case alignment. The test set-up as described in clause 6.1.4 shall be used.
Mode 4: energy transmission	WPT system alignment	TX and RX	TX and RX	

Operational Mode	**Conformance Requirements**
Mode 1: base station in stand-by, idle mode	• Operating frequency range (clause 4.3.3) • H-Field emission (clause 4.3.4) • TX spurious (clauses 4.3.5, 4.3.6 and 4.3.7) • Performance criteria test (RX test) (clause 4.4)
Mode 2: Communication before charging, adjustment charging mode / position	• Operating frequency range (clause 4.3.3) • H-Field emission (clause 4.3.4) • TX spurious (clauses 4.3.5, 4.3.6 and 4.3.7) • Wanted performance criteria test (RX test) (clause 4.4)
Mode 3: Communication	• Operating frequency range (clause 4.3.3) • H-Field emission (clause 4.3.4) • TX spurious (clauses 4.3.5, 4.3.6 and 4.3.7) • Wanted Performance criteria test (RX test) (clause 4.4)
Mode 4: energy transmission	

The EUT belongs to Mode 2.

5.3 Transmitter Requirements

5.3.1 Permitted range of operating frequencies

Test Requirement: EN 303 417:Clause 4.3.2

Limit: EN 303 417:Clause 4.3.2.3

The permitted range of operating frequency range(s) for intentional emissions shall be within 100 - 300 kHz.

5.3.1.1 Measurement Record

The manufacturer declared the WPT system to operate from 110KHz to 205KHz.

It is within the permitted frequency rang 100 kHz to 300 kHz. Outside the permitted range the unintentional emissions was reduced to the spurious emission limits. Refer to RSE test data for further details.

5.3.2 Operating frequency range(s) (OFR)

Test Requirement: EN 303 417:Clause 4.3.3

Limit: EN 303 417:Clause 4.3.3.3

The operating frequency range for emissions shall be within 100 - 300 kHz.

EUT Operation:

Status: Test Tx in operating mode.

Test procedure:

1. The operating frequency range(s) of the WPT system are determined by the lowest (fL) and highest frequency (fH) as occupied by the 99% power envelope.
2. The measuring receiver was a spectrum analyser which was appropriate to perform the intended measurement of the EUT.

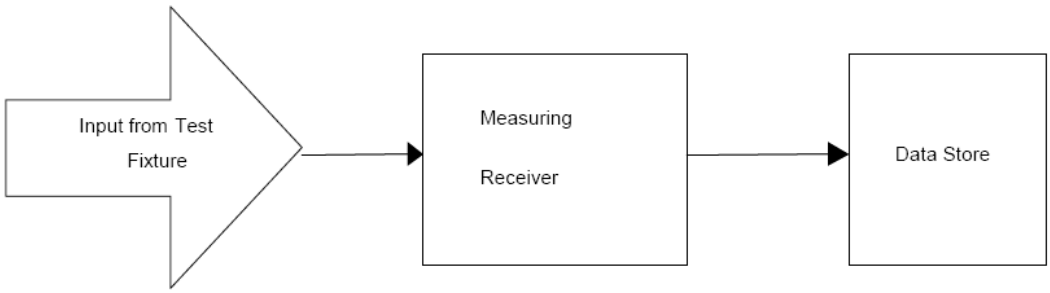


Figure: Test set-up for measuring the operating frequency range.

5.3.2.1 Measurement Record

Test Channel	FL (MHz) or FH (MHz)	Lower Limit (KHz)	Higher Limit (KHz)
Lowest	110.25	> 100	N/A
Highest	205.32	N/A	< 300

5.3.3 Radiated H-field

Test Requirement: EN 303 417:Clause 4.3.4

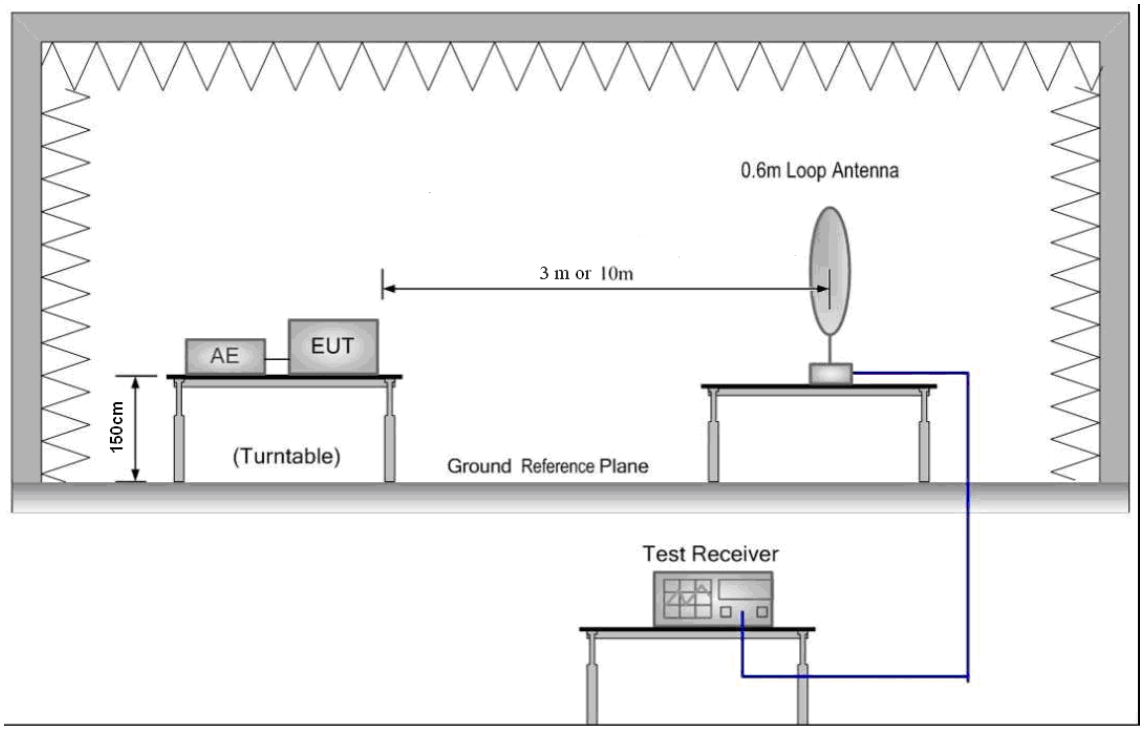
Limit: EN 303 417:Clause 4.3.4.3

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.		

EUT Operation:

Status: Test Tx in operating and standby mode.

Test setup:



Test procedure:

1. The measurements of the transmitter radiated H-field was made on an semi-anechoic chamber. Any measured values were at least 6 dB above the ambient noise level.
2. The H-field produced by the equipment was measured at standard distance of 10 m.
3. The H-field was measured with a shielded loop antenna connected to a measurement receiver. The measuring bandwidth and detector type of the measurement receiver was in accordance with below table.

Frequency: (f)	Detector type	Measurement receiver bandwidth	Spectrum analyser bandwidth
9 kHz ≤ f < 150 kHz	Quasi Peak	200 Hz	300 Hz
150 kHz ≤ f < 30 MHz	Quasi Peak	9 kHz	10 KHz
30 MHz ≤ f ≤ 1 000 MHz	Quasi Peak	120 kHz	100 kHz
NOTE: For the measurement of the ranges 6,765 MHz ≤ f ≤ 6,795 MHz and 13,553 MHz ≤ f ≤ 13,567 MHz, the measurement bandwidth has to be 200 Hz respectively 300 Hz.			

4. The equipment under test operated with normal modulation
5. The measurements were made under normal and extreme conditions.
6. For measuring equipment calibrated in dBµV/m, the reading should be reduced by 51,5 dB to be converted to dBµA/m.

5.3.3.1 Measurement Record

Operating Mode with Modulation			
Frequency	**Measuring Bandwidth**	**H-field Level**	**Limit in Table 5**
190 KHz	9 kHz	-1.59	26.2
Standby Mode			
Frequency	**Measuring Bandwidth**	**H-field Level**	**Limit in Table 5**
190 KHz	9 kHz	N/A	26.2
N/A, Not applicable, for the ERP level of the EUT was too weak to be detected.			

Remark:
The H-field limit in dBµA/m at 3 m (H3m) is determined by the following equation:
H3m = H10m + C3 , where:
C3 is a conversion factor in dB determined from ETSI EN 300 330 figure H.2,
the value is 31.2 dB.

5.3.4 Transmitter spurious emissions

Test Requirement: EN 303 417:Clause 4.3.5

Limit: EN 303 417:Clause 4.3.5.3

The radiated field strength of spurious emissions below 30 MHz shall not exceed the generated H-field given as follow:

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 as follow:

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.		

EUT Operation:

Status: Test Tx in operating and standby mode.

Test Frequency Range: 9 kHz to 1 GHz

Test Setup:

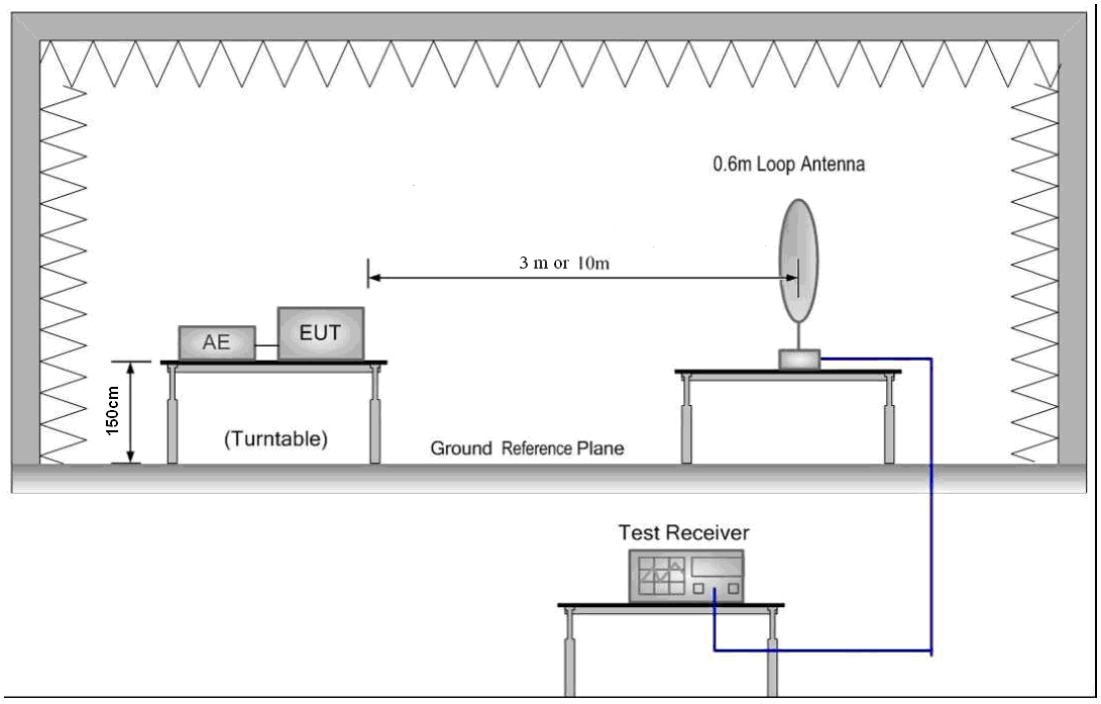


Figure: 9 kHz to 30 MHz

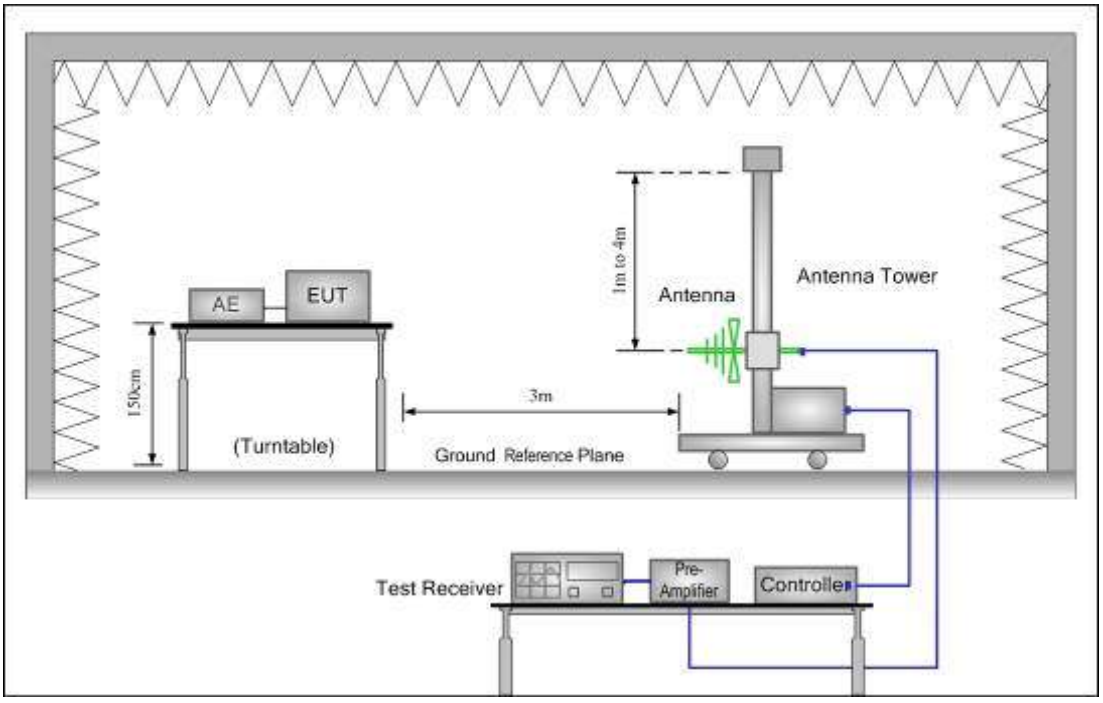


Figure: 30 MHz to 1 GHz

Test procedure:

Substitution method was performed to determine the actual spurious emission levels of the EUT. The following test procedure as below:

1) 9 kHz to 30MHz test procedure:

1. The field strength was measured for frequencies below 30 MHz. The equipment under test was measured at a distance of 10 m on a semi-anechoic. The test antenna was a calibrated shielded magnetic field antenna.
2. The equipment under test was switched on with normal modulation. The characteristics of the modulation signal used was stated on the test report. The measuring receiver was tuned over the frequency range 9 kHz to 30 MHz, except for the frequency band on which the transmitter was intended to operate.
3. At each frequency at which a relevant spurious signal was detected the equipment under test and the test antenna was rotated until maximum field strength was indicated on the measuring receiver. This level was noted.
4. The measurements were repeated in the standby mode.
5. For measuring equipment calibrated in dBμV/m, the reading should was reduced by 51,5 dB to be converted to dBμA/m.

2) 30 MHz to 1GHz test procedure:

6. On the test site as test setup graph above, the EUT shall be placed at the 1.5m support on the turntable and in the position closest to normal use as declared by the provider.
7. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the test frequency of the transmitter. The output of the test antenna shall be connected to the measuring receiver.
8. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the test frequency of the transmitter under test.
9. The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
10. Repeat step 4 for test frequency with the test antenna polarized horizontally.
11. Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At the lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.
12. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output

until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

13. Repeat step 7 with both antennas horizontally polarized for each test frequency.
14. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:

ERP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBd)

where:

Pg is the generator output power into the substitution antenna.

5.3.4.1 Measurement Record

9 kHz to 30 MHz

Tx in operation mode				
Maximum Frequency	**Spurious Emission polarization and Level**		**Limit of Table 1**	**Over Limit**
MHz	**polarization**	**dBμA/m**	**dBμA/m**	**dB**
0.0337	Vertical	5.90	52.42	-46.52
0.1307	V	4.45	46.56	-42.11
0.3462	V	-4.35	42.29	-46.64
0.8659	V	3.14	38.27	-35.13
3.5531	V	-9.95	29.09	-39.04
8.1271	V	-27.82	23.67	-51.49
0.0165	Horizontal	3.00	55.50	-52.50
0.0466	H	6.35	51.03	-44.68
0.1226	H	6.05	46.84	-40.79
0.2691	H	-3.10	43.39	-46.49
0.7983	H	1.85	38.63	-36.78
12.6965	H	-19.65	19.07	-38.72
Tx in standby mode				
N/A: Not applicable, since the spurious emission of the EUT is too weak to be detected.(≤-50 dBμA/m)				

Remark:

1. －40 dBμA/m was the minimum level which could be detected by measuring facility when below 30 MHz.

30 MHz to 1 GHz

Tx in operation mode				
Maximum Frequency	**Spurious Emission polarization and Level**		**Limit of Table 2**	**Over Limit**
MHz	**polarization**	**dBm**	**dBm**	**dB**
96.1612	Vertical	-61.72	-54.00	-7.72
346.9995	Vertical	-63.40	-36.00	-27.40
406.0346	Vertical	-61.44	-36.00	-25.44
95.1754	Horizontal	-63.20	-54.00	-9.20
215.1258	Horizontal	-68.39	-54.00	-14.39
450.0316	Horizontal	-60.56	-36.00	-24.56
Tx in standby Mode				
N/A: Not applicable, since the spurious emission of the EUT is too weak to be detected.(≤-70dBm)				

Remark:

1. **–**70dBm was the minimum level which could be detected by measuring facility when below 1GHz, -60dBm at over 1GHz.
2. There were not any spurious emissions could be detected above 1 GHz.(≤-60dBm).

5.3.5 Transmitter out of band (OOB) emissions

Test Requirement: EN 303 417:Clause 4.3.6

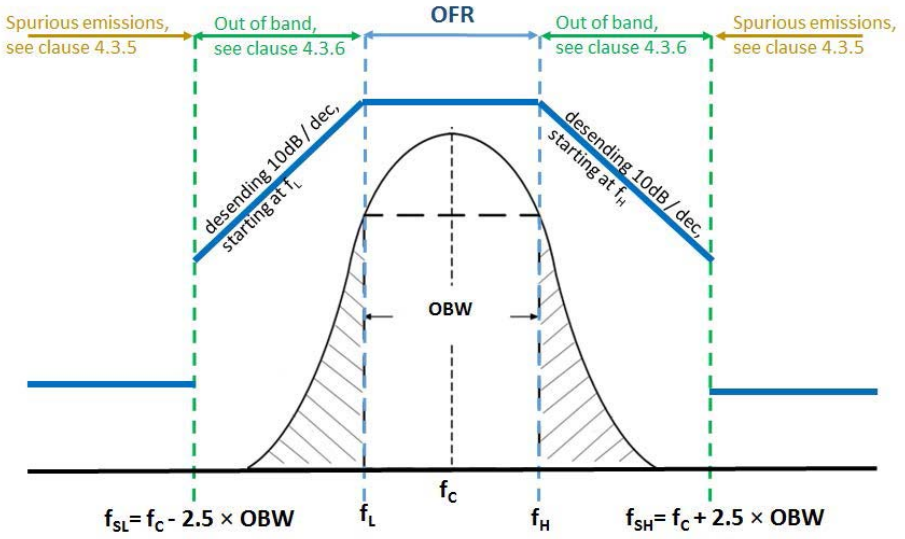
Limit: EN 303 417:Clause 4.3.6.3

The OOB limits are visualized in figures 4 and 5; they are descending from the intentional limits from the table which as below at fH/fL with 10 dB/decade.

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.

Frequency Rang:



EUT Operation:

Status: Test Tx in operating mode.

Test Setup:

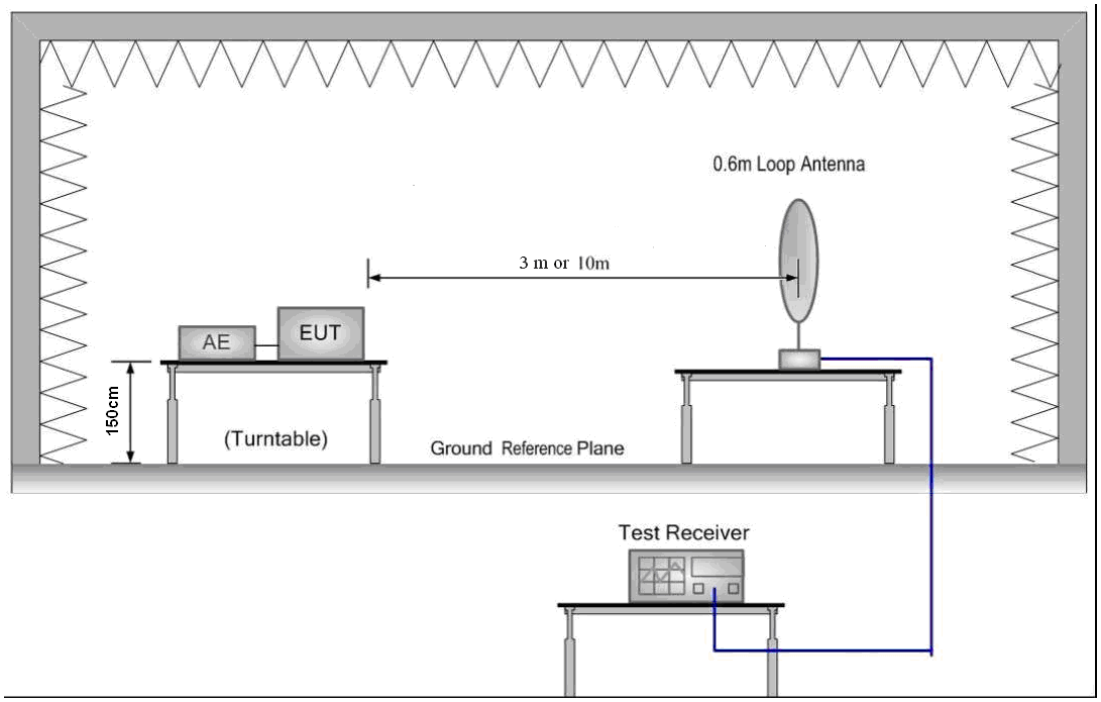


Figure: 9 kHz to 30 MHz

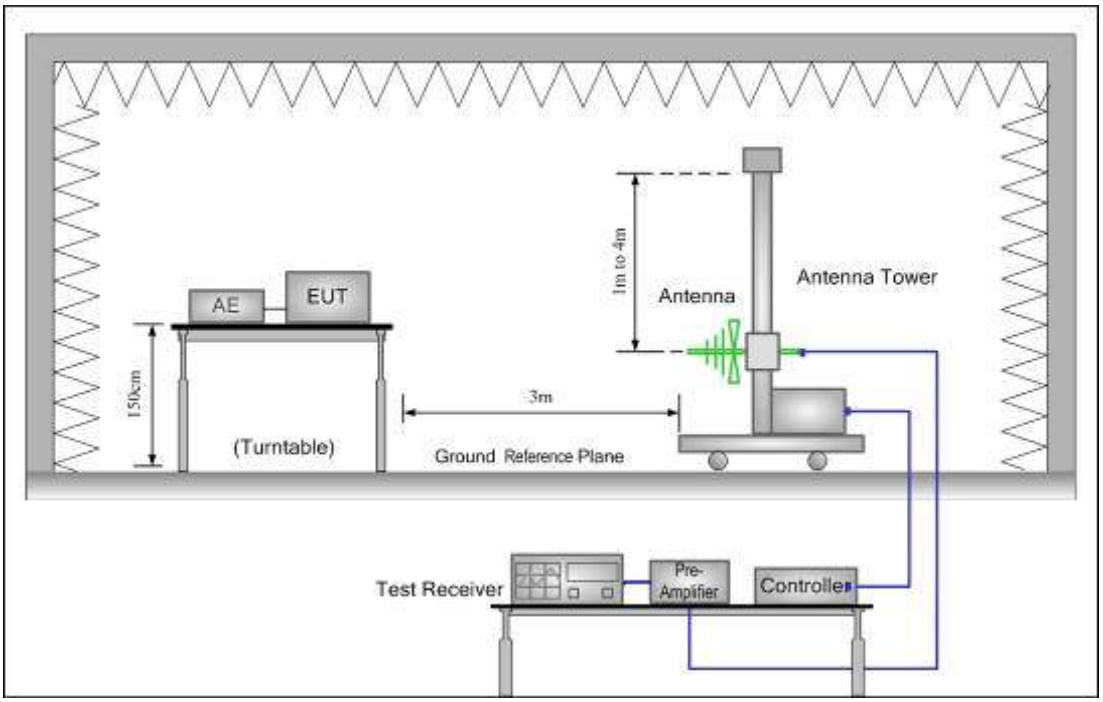


Figure: 30 MHz to 1 GHz

Test procedure:

Substitution method was performed to determine the actual spurious emission levels of the EUT. The following test procedure as below:

1) 9 kHz to 30MHz test procedure:

1. The field strength was measured for frequencies below 30 MHz. The equipment under test was measured at a distance of 10 m on a semi-anechoic. The test antenna was a calibrated shielded magnetic field antenna.
2. The equipment under test was switched on with normal modulation. The characteristics of the modulation signal used was stated on the test report. The measuring receiver was tuned over the frequency range 9 kHz to 30 MHz, except for the frequency band on which the transmitter was intended to operate.
3. At each frequency at which a relevant spurious signal was detected the equipment under test and the test antenna was rotated until maximum field strength was indicated on the measuring receiver. This level was noted.
4. The measurements were repeated in the standby mode.
5. For measuring equipment calibrated in dBμV/m, the reading should was reduced by 51,5 dB to be converted to dBμA/m.

2) 30 MHz to 1GHz test procedure:

6. On the test site as test setup graph above, the EUT shall be placed at the 1.5m support on the turntable and in the position closest to normal use as declared by the provider.
7. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the test frequency of the transmitter. The output of the test antenna shall be connected to the measuring receiver.
8. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the test frequency of the transmitter under test.
9. The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
10. Repeat step 4 for test frequency with the test antenna polarized horizontally.
11. Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At the lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.
12. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output

until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

13. Repeat step 7 with both antennas horizontally polarized for each test frequency.
14. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:

ERP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBd)

where:

Pg is the generator output power into the substitution antenna.

5.3.5.1 Measurement Record

The result of the transmitter out of band (OOB) emissions as below.

Test Conditions		Transmitter Frequency (KHz)		Max. Reading (dBμA/m)	Limit (dBμA/m)	Pass /Fail
Temp (℃)	Volt (VDC)					
25.0	12	FL	110	-14.69	73.2	Pass
		FH	205	-13.52	26.2	Pass

Remark:

The H-field limit in dBμA/m at 3 m (H3m) is determined by the following equation:
H3m = H10m + C3 , where:
C3 is a conversion factor in dB determined from ETSI EN 300 330 figure H.2,
the value is 31.2 dB.

5.3.6 WPT system unwanted conducted emissions

Test Requirement: EN 303 417:Clause 4.3.7

Limit: EN 303 417:Clause 4.3.7.3

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

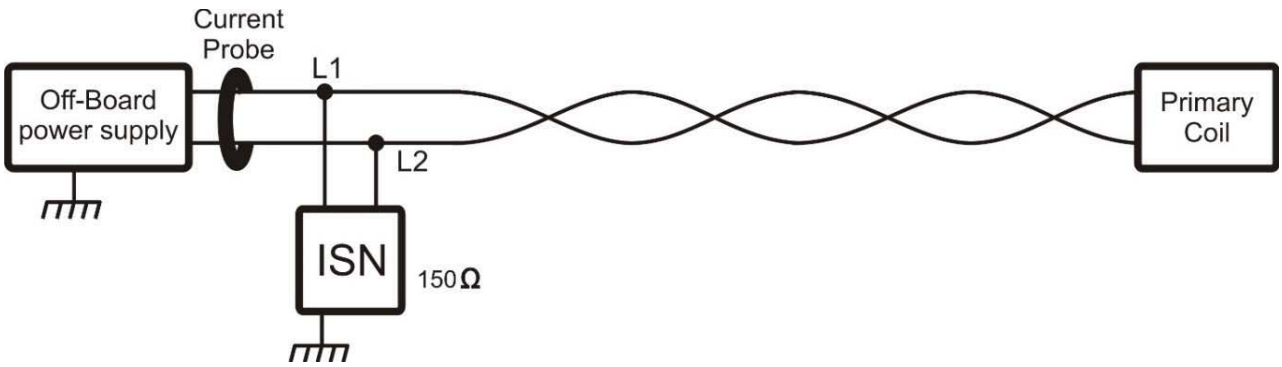
ICM = 47 – 8 × log(f) dBμA

NOTE: f is the frequency in MHz.

EUT Operation:

Status: Test Tx in operating mode.

Test Setup:



Test procedure:

1. According to the test setup, connect all equipments and cables.
2. Connect the Current Probe to receiver, then record the result of the receiver.

5.3.6.1 Measurement Record

N/A

Since the cable to the primary coil not exceeds a length of 3 m and not installed in the ground or any metallic structures, so this item is not applicable.

5.4 Receiver Requirements

5.4.1 Receiver blocking

Test Requirement: EN 303 417: Clause 4.4

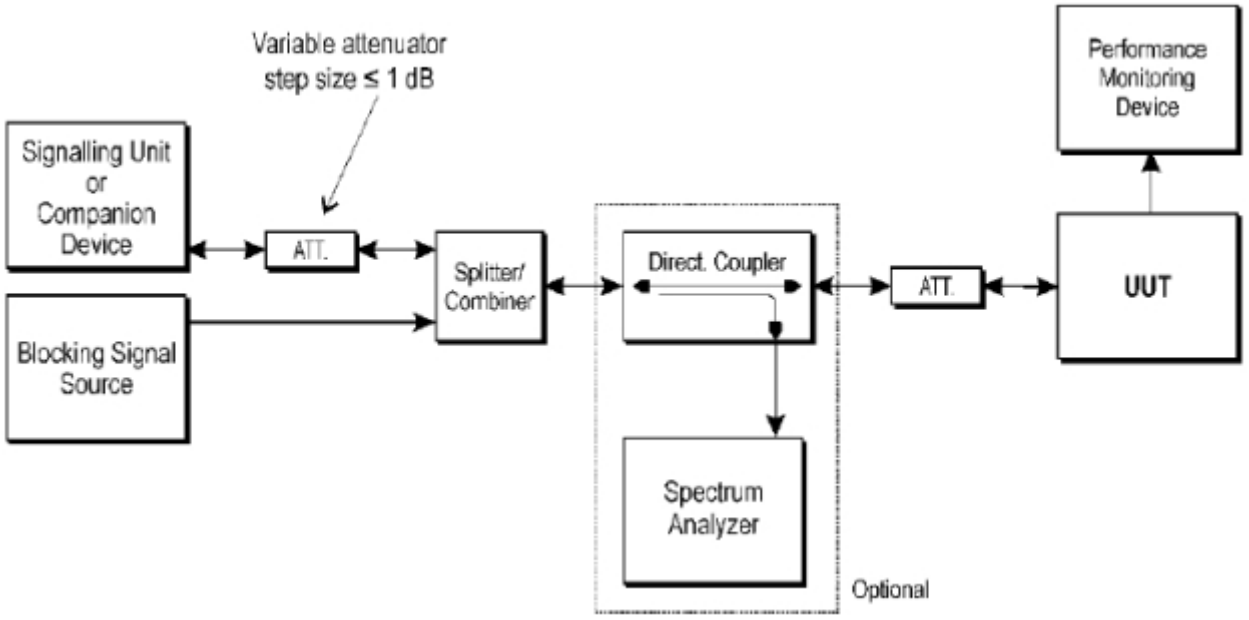
Limit: EN 303 417:Clause 4.4.2.3

	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
NOTE: F = OFR see clause 4.3.3.			

EUT Operation:

Status: Test Rx in receiving mode.

Test Setup:



Test procedure:

1. According to the test setup, connect all equipments and cables.
2. Transmit the in-band signal, OOB signal and Remote-band signal. Then record the result.

5.4.1.1 Measurement Record

The manufacturer declared the performance criteria used to determine the performance of the receiving parts inside the WPT system (related to the mode) as below:

Blocking signal frequency (KHz)	Frequency offset(MHz)	Test result (dBμA/m)	Limit (dBμA/m)	Result
160KHz	-0.1	81.4	72	PASS
	+0.1	81.8	72	PASS
	-1	81.9	72	PASS
	+1	81.7	72	PASS

Remark:
The H-field limit in dBμA/m at 3 m (H3m) is determined by the following equation:
H3m = H10m + C3 , where:
C3 is a conversion factor in dB determined from ETSI EN 300 330 figure H.2,
the value is 31.2 dB.

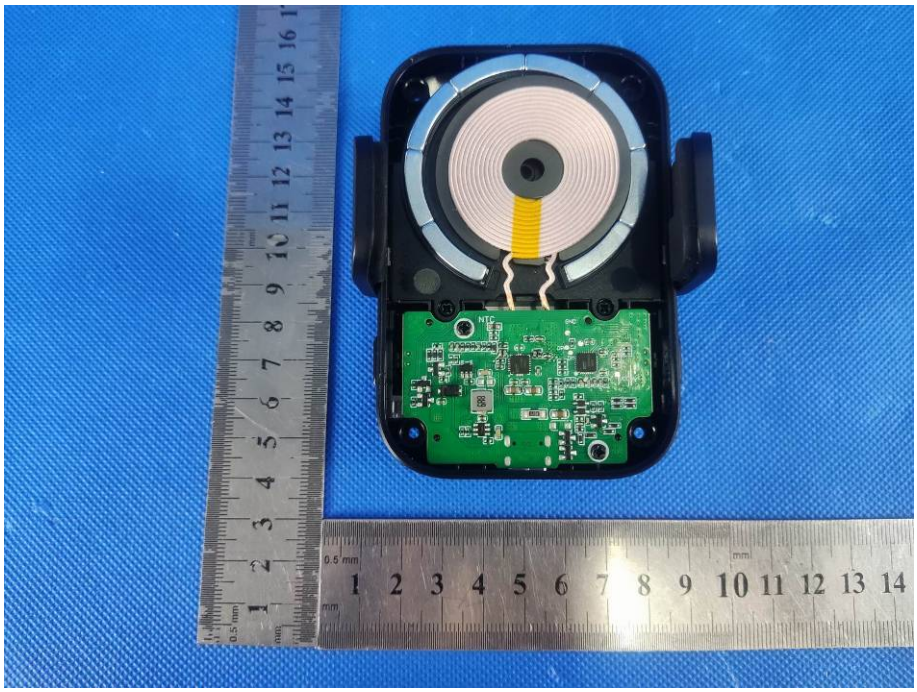
The EUT achieve the wanted performance criterion in the presence of the blocking signal.

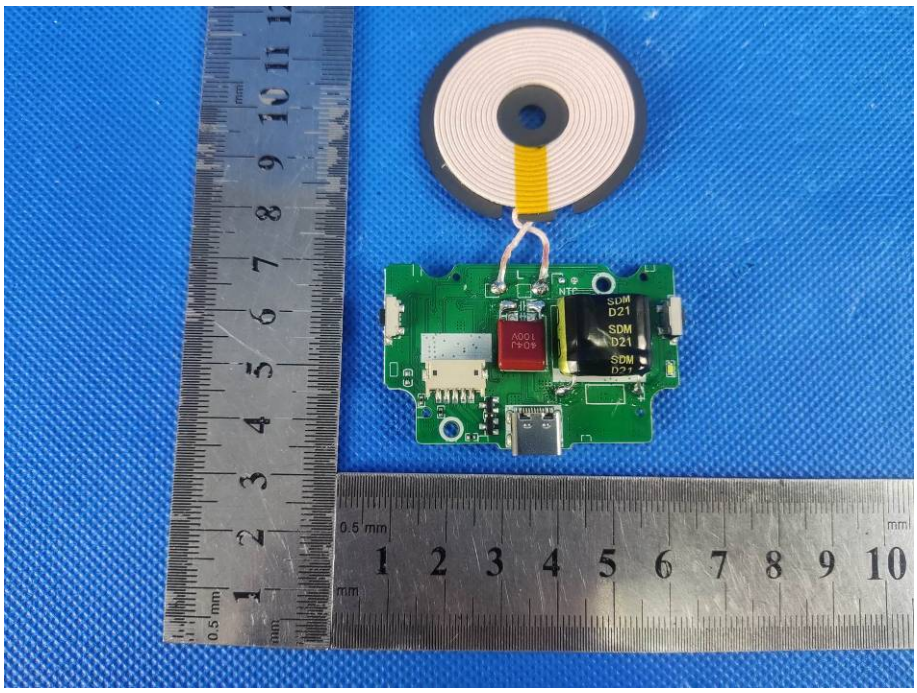
6 Photographs

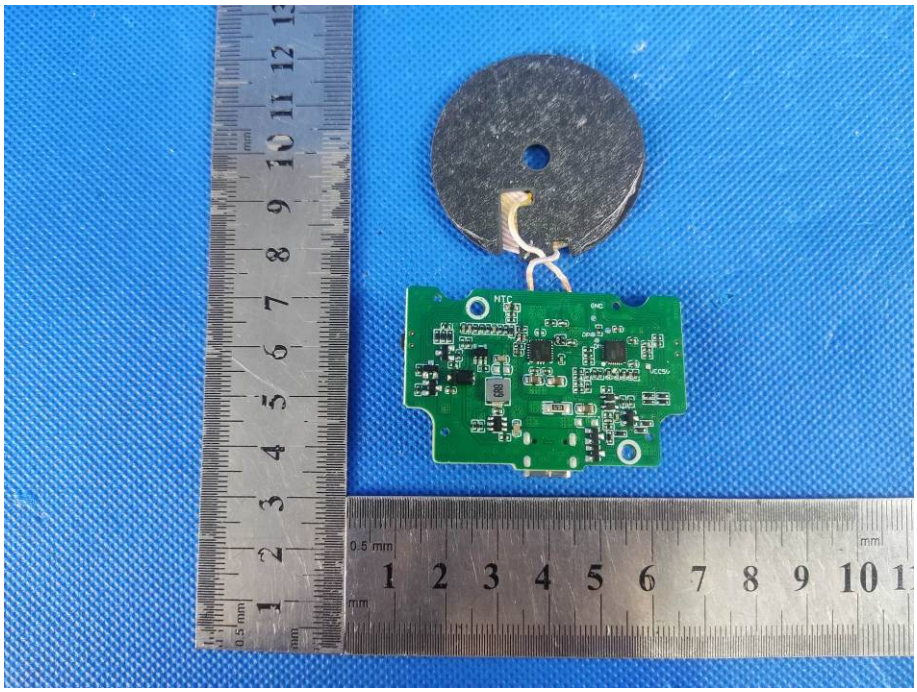
6.1 Radiated H-field & Spurious Emission Test Setup (below 30 MHz)

6.2 Spurious Emission Test Setup (above 30 MHz)

6.3 EUT Constructional Details


NTC
0.5 mm
1 2 3 4 5 6 7 8 9 10 11 12 13 14
mm


NTC
SDM
D21
SDM
D21
SDM
0.5 mm
1 2 3 4 5 6 7 8 9 10
mm



-End of Report--