

Test report No:

4361206.54-RF

TEST REPORT**FCC Rules&Regulations 47 CFR Chapter I - Part 15**

Identification of item tested	WIRELESS CHARGER
Trademark	TISSOT SA
Model and /or type reference	T229
Features	Input: 5Vdc, 1A Output Power: 2W max
Derived model(s)	N/A
Applicant's name / address	TISSOT SA CHEMIN DES TOURELLES 17 - CH-2400 LE LOCLE, SWITZERLAND
Test method requested, standard	FCC Rules and Regulations 47 CFR Chapter I Part 15 Subpart C; ANSI C63.10:2013
Verdict Summary	IN COMPLIANCE
Documented By (name / position & signature)	Kitty Li/Project Assistant 
Tested by (name / position & signature)	Frank He/ Technical Supervisor 
Approved by (name / position & signature)	Jack Zhang/ Supervisor 
Date of issue	2020-03-20
Report template No	TRF_EMG 2017-06

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COMPETENCES AND GUARANTEES

The DEKRA Certification B.V. EMC laboratory has been designated by the “Radio communications Agency of the Netherlands” as a Conformity Assessment Body for all products addressed by Parts 15 and Part 18 of the FCC rules per designation AT-EZ/EU-USA/MRA002 since December 1, 2005.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA.

GENERAL CONDITIONS

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.
5. This report will not be used for social proof function in China market.

UNCERTAINTY

For all measurements where guidance for the calculation of the instrumentation uncertainty of a measurement is specified in EN 55016-4-2 (CISPR 16-4-2), EN/IEC 61000-4 series or a product standard, the measurement instrumentation uncertainty has been calculated and applied in accordance with these standards.

Uncertainties have been calculated according to the DEKRA internal document. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%. Refer to the Annex 1 for further information.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%
Atmospheric pressure	86 kPa – 106 kPa

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

DEFINITION OF SYMBOLS USED IN THIS TEST REPORT

<input checked="" type="checkbox"/> Indicates that the listed condition, standard or equipment is applicable for this report/test/EUT.			
<input type="checkbox"/> Indicates that the listed condition, standard or equipment is not applicable for this report/test/EUT.			
Decimal separator used in this report	<input checked="" type="checkbox"/>	Comma (,)	<input type="checkbox"/> Point (.)

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	: Equipment Under Test
DUT	: Device Under Test
QP	: Quasi-Peak
CAV	: CISPR Average
AV	: Average
CDN	: Coupling Decoupling Network
SAC	: Semi-Anechoic Chamber
OATS	: Open Area Test Site
BW	: Bandwidth
U_N	: Nominal voltage
T_x	: Transmitter
R_x	: Receiver
N/A	: Not Applicable
N/M	: Not Measured
RGP	: Reference Ground Plane

DOCUMENT HISTORY

Report nr.	Date	Description
4361206.54	2020-03-20	First release.

REMARKS AND COMMENTS

1. The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with FCC Rules and Regulations 47 CFR Chapter I; Part 15 Subpart C; ANSI C63.10:2013.
3. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result, unless the specification, standard or customer have special requirements.
4. The test results presented in this report relate only to the object tested.
5. The test results relate only to the samples tested.
6. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification (Suzhou) Co., Ltd.
7. This report will not be used for social proof function in China market.

USED EQUIPMENT

Conducted Emission / TR-1

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI	100906	2019.03.04	2020.03.04
Two-Line V-Network	R&S	ENV216	101190	2019.06.09	2020.06.09
Two-Line V-Network	R&S	ENV216	101044	2019.06.09	2020.06.09
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	N/A	N/A
50ohm Termination	SHX	TF2	07081402	2019.09.08	2020.09.08
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2019.10.24	2020.10.24

Radiated Emission / AC3

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100176	2019.09.08	2020.09.08
Bilog Antenna	Teseq GmbH	CBL6112D	27613	2019.06.09	2020.06.09
Coaxial Cable	Huber+Suhner	RG 214	AC3-C	2019.02.28	2020.02.28
Temperature/Humidity Meter	Ruitesi	RTS-8S	AC3-TH	2019.10.24	2020.10.24
Software	Quietek	EMI_V3	V3.0.0	N/A	N/A

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Description of the item	WIRELESS CHARGER
Model / Type number.....	T229
Serial number	T-201
Trademark.....	TISSOT SA
Ratings	Input: 5Vdc, 1A Output Power: 2W max
Manufacturer.....	Shenzhen XPGTECH, Co, Ltd F2, Building A, #282, HuanGuan Middle Road, Guanlan, Longhua, Shenzhen, China.
Address.....	Shenzhen XPGTECH, Co, Ltd F2, Building A, #282, HuanGuan Middle Road, Guanlan, Longhua, Shenzhen, China.

Declared by manufacturer:

Operating frequency range	110-205kHz
Operating Temperature Range.....	-5-45°C
Max. communicate distance D.....	6mm

Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input checked="" type="checkbox"/>	DC: 5V					
	<input type="checkbox"/>	Battery:					
Mounting position.....	<input checked="" type="checkbox"/>	Table top equipment					
	<input type="checkbox"/>	Wall/Ceiling mounted equipment					
	<input type="checkbox"/>	Floor standing equipment					
	<input type="checkbox"/>	Hand-held equipment					
	<input type="checkbox"/>	Other:					

Intended use of the Equipment Under Test (EUT)

The apparatus as supplied for the test is WPT system intended for residential use and the product contains electronic control circuitry.

No	Module/parts of test item	Type	Manufacturer

No	Documents as provided by the applicant - Description	File name	Issue date

Modifications to the test item during testing	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>	
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Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

1.2 The environment(s) in which the EUT is intended to be used

The equipment under test (EUT) is intended to be used in the following environment(s):

<input checked="" type="checkbox"/>	Residential (domestic) environment.
<input checked="" type="checkbox"/>	Commercial and light-industrial environment.
<input type="checkbox"/>	Industrial environment.

1.3 Classification

The following procedure has been selected to confirm the compliance of the equipment/device under test:

Procedure		Description
<input checked="" type="checkbox"/>	Verification	The DUT is subjected to the Verification procedure. The Verification procedure is defined in 47CFR Part 2 section 2.902 and described in section 2.951 through 2.957 of the FCC rules.
<input type="checkbox"/>	Declaration of Conformity (DoC)	The Device under Test (DUT) is subjected to the Declaration of Conformity procedure. The DoC procedure is defined in 47CFR Part 2 section 2.906 and described in section 2.1071 through 2.1077 of the FCC rules.

2 DESCRIPTION OF TEST SETUP

2.1 Operating mode(s) used for tests

During the tests the following operating mode(s) has(have) been used.

Operating mode	Description of the operating mode	Used for testing
1	Base station in stand-by, idle mode	<input checked="" type="checkbox"/>
2	Charging mode with full load	<input checked="" type="checkbox"/>
3	Charging mode with half load	<input checked="" type="checkbox"/>
Supplemental information:		

2.2 Port(s) of the EUT

Port name and description	Connected to / Termination	Cable		
		Length used during test [m]	Attached during test	Shielded
DC input port	AC / DC adaptor	0.8	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
Supplemental information:				

2.3 Support / Auxiliary equipment / unit / software for the EUT

The EUT has been tested with the following auxiliary equipment / unit / software:

Auxiliary equipment / unit / software	Type / Version	Manufacturer	Supplied by
AC / DC adaptor	-	-	DEKRA
Supplemental information:			

2.4 Test Configuration / Block diagram used for tests

The following test setup / configuration / block diagram has been used during the tests: N/A

3 VERDICT SUMMARY SECTION

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

3.1 Overview of results

Radio Spectrum Technical Requirement				
Section	Requirement – Test case	Basic standard	Verdict	Remark
15.203	Antenna Requirement	47 CFR Part 15, Subpart C 15.203	PASS	---
<u>Supplementary information: N/A</u>				

Radio Spectrum Matter Part					
Section	Requirement – Test case	Basic standard	Method	Verdict	Remark
15.207	Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.207	ANSI C63.10 (2013) Section 6.2	PASS	---
15.209	Radiated Emissions (9kHz-30MHz)	47 CFR Part 15, Subpart C 15.209	ANSI C63.10 (2013) Section 6.4	PASS	---
15.209	Radiated Emissions (30MHz-80MHz)	47 CFR Part 15, Subpart C 15.209	ANSI C63.10 (2013) Section 6.5	PASS	---
15.215	20dB Bandwidth	47 CFR Part 15, Subpart C 15.215	ANSI C63.10 (2013) Section 6.9	PASS	---
<u>Supplementary information: N/A</u>					

4 TEST RESULTS

4.1	Antenna Requirement	VERDICT: PASS
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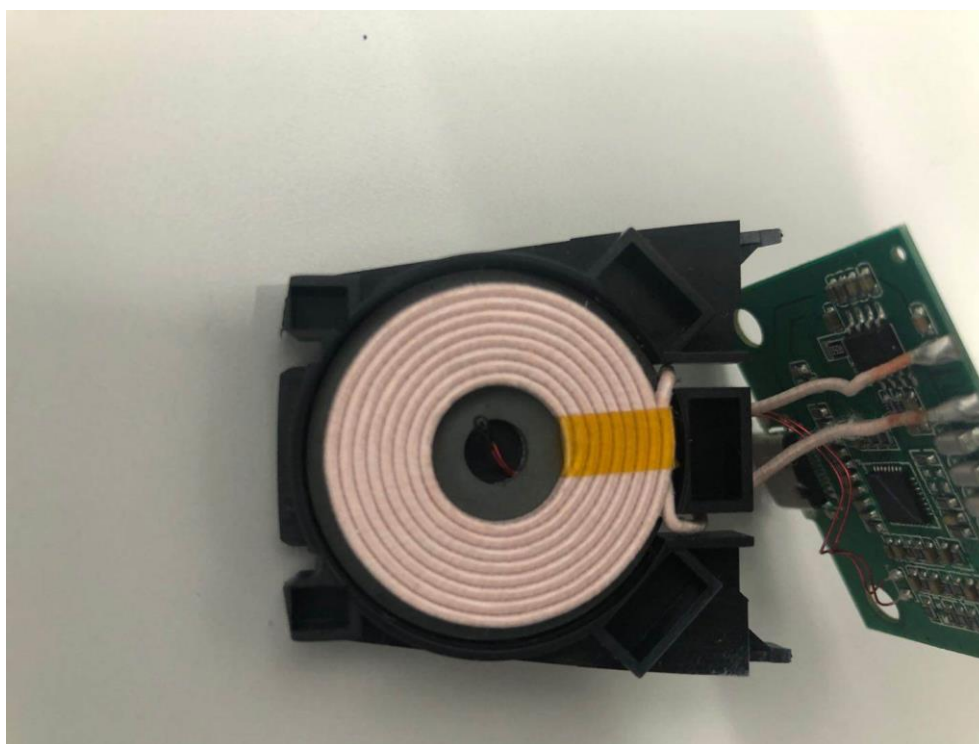
Standard	47 CFR Part 15, Subpart C 15.203
Basic standard	-

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0 dBi.




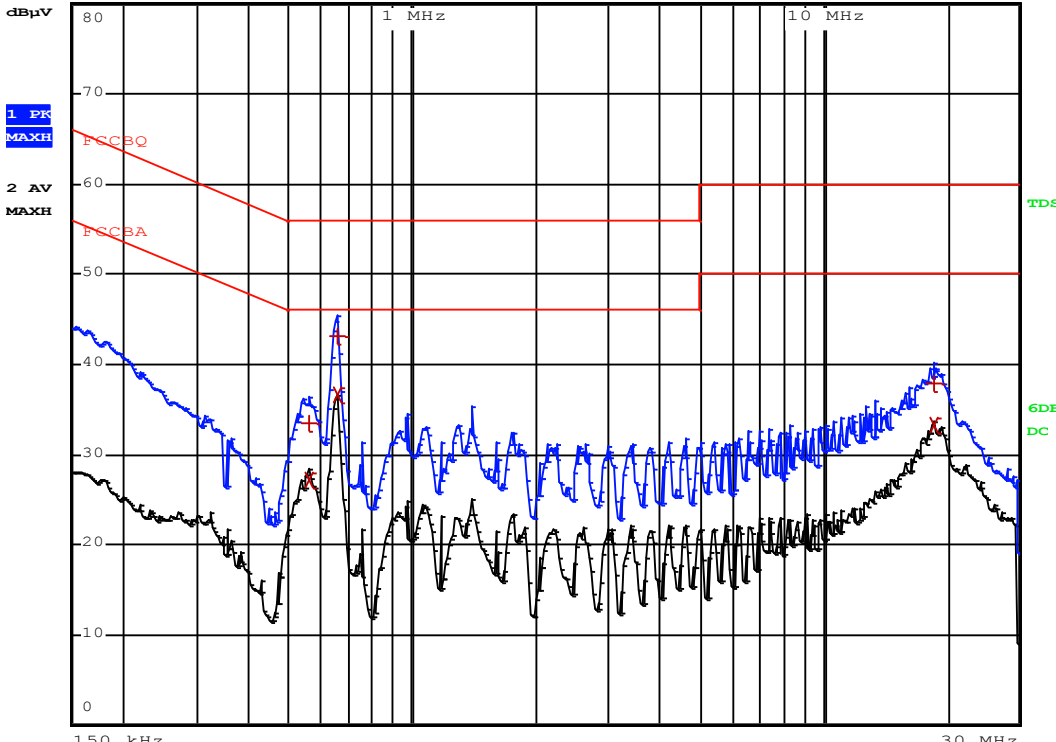
Antenna

Test result: The unit does meet the FCC requirements.

Measurement data

Port under test		Terminal							
<input checked="" type="checkbox"/>	AC mains input power	<input checked="" type="checkbox"/>	N	<input checked="" type="checkbox"/>	L1	<input type="checkbox"/>	L2	<input type="checkbox"/>	L3
<input type="checkbox"/>	DC input power	<input type="checkbox"/>	Positive (+)		<input type="checkbox"/>	Negative (-)			
Voltage – Mains [V]		120							
Frequency – Mains [Hz]		60							
Test method applied	<input checked="" type="checkbox"/>	Artificial mains network (50 μ H / 50 Ω)							
	<input type="checkbox"/>	Voltage probe							
	<input type="checkbox"/>	Artificial mains network (5 μ H / 50 Ω), high power devices							
Test setup	<input checked="" type="checkbox"/>	Table top	<input type="checkbox"/>	Artificial hand applied					
	<input type="checkbox"/>	Floor standing	<input type="checkbox"/>	Other:					
	Refer to the Annex 2 for test setup photo(s).								
Operating mode(s) used		Mode 2(pre-test mode 1&2&3, mode 2 was the worst case which was recorded)							
Remark		-							

See next page.

Measurement data		Port under test	AC mains input power																																																							
Operating mode / voltage / frequency used during the test			Mode 2 / 120 Vac / 60 Hz																																																							
Neutral																																																										
<div><div><div></div><div>RBW 9 kHz MT 1 s PREAMP OFF</div><div>Att 10 dB</div></div><div></div></div>																																																										
<table><tr><th colspan="5">EDIT PEAK LIST (Final Measurement Results)</th></tr><tr><td colspan="2">Trace1:</td><td colspan="3">FCCBQ</td></tr><tr><td colspan="2">Trace2:</td><td colspan="3">FCCBA</td></tr><tr><td colspan="2">Trace3:</td><td colspan="3">---</td></tr><tr><td></td><td>TRACE</td><td>FREQUENCY</td><td>LEVEL dBμV</td><td>DELTA LIMIT dB</td></tr><tr><td>2</td><td>Average</td><td>654 kHz</td><td>36.59</td><td>-9.40</td></tr><tr><td>1</td><td>Quasi Peak</td><td>654 kHz</td><td>43.17</td><td>-12.82</td></tr><tr><td>2</td><td>Average</td><td>18.614 MHz</td><td>33.36</td><td>-16.63</td></tr><tr><td>2</td><td>Average</td><td>562 kHz</td><td>27.29</td><td>-18.70</td></tr><tr><td>1</td><td>Quasi Peak</td><td>18.614 MHz</td><td>37.88</td><td>-22.11</td></tr><tr><td>1</td><td>Quasi Peak</td><td>558 kHz</td><td>33.59</td><td>-22.41</td></tr></table>				EDIT PEAK LIST (Final Measurement Results)					Trace1:		FCCBQ			Trace2:		FCCBA			Trace3:		---				TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB	2	Average	654 kHz	36.59	-9.40	1	Quasi Peak	654 kHz	43.17	-12.82	2	Average	18.614 MHz	33.36	-16.63	2	Average	562 kHz	27.29	-18.70	1	Quasi Peak	18.614 MHz	37.88	-22.11	1	Quasi Peak	558 kHz	33.59	-22.41
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No other significant emissions were recorded employing the QP detector at the frequency range of interest.																																																										
Remark	The given graph is the combination of max-hold function of each line.																																																									

4.3 Radiated emissions	VERDICT: PASS
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Standard	FCC Rules & Regulations 47 CFR Chapter I - Part 15 Subpart B Clause 15.209
Basic standard(s)	ANSI C63.10 Section 6.4

Measurement procedure

The field strength levels of spurious radiated emissions from this non-ISM device have been determined according to the section 18.305 of 47 CFR.

Measurements have been performed in a semi anechoic chamber at 3 meter measurement distance using the test setup described at chapter 2. The resulting field strength was calculated using the correction factors for cable loss and antenna.

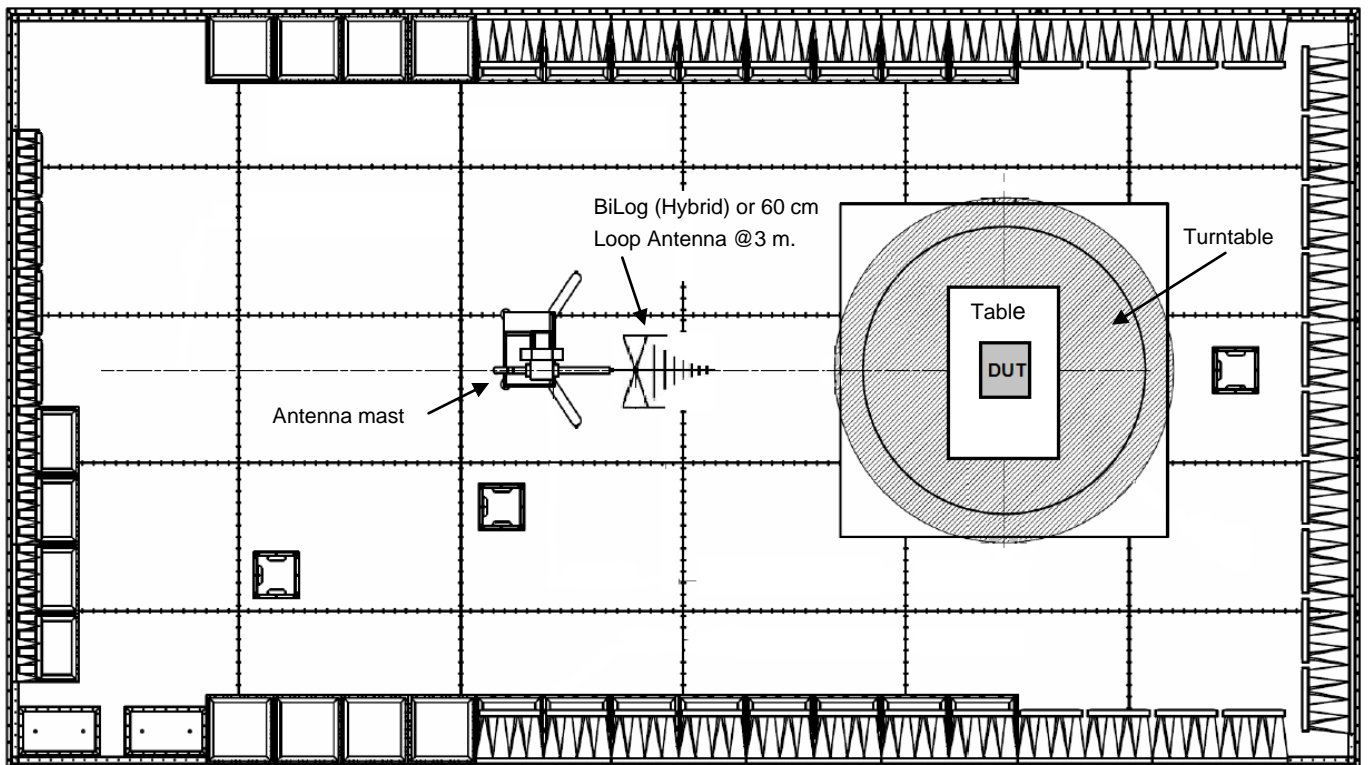
The frequency band in which the non-ISM device is operating is 110-205kHz. Thus, according to the table below, the frequency range of interest was Below 1,705.

Frequency band in which device operates (MHz)	Range of frequency measurements	
	Lowest frequency	Highest frequency
Below 1,705	Lowest frequency generated in the device, but not lower than 9 kHz.	30 MHz.
1,705 to 30	Lowest frequency generated in the device, but not lower than 9 kHz.	400 MHz.
30 to 500	Lowest frequency generated in the device or 25 MHz, whichever is lower.	Tenth harmonic or 1000 MHz, whichever is higher.
500 to 1000	Lowest frequency generated in the device or 100 MHz, whichever is lower.	Tenth harmonic.
Above 1000do	Tenth harmonic or highest detectable emission

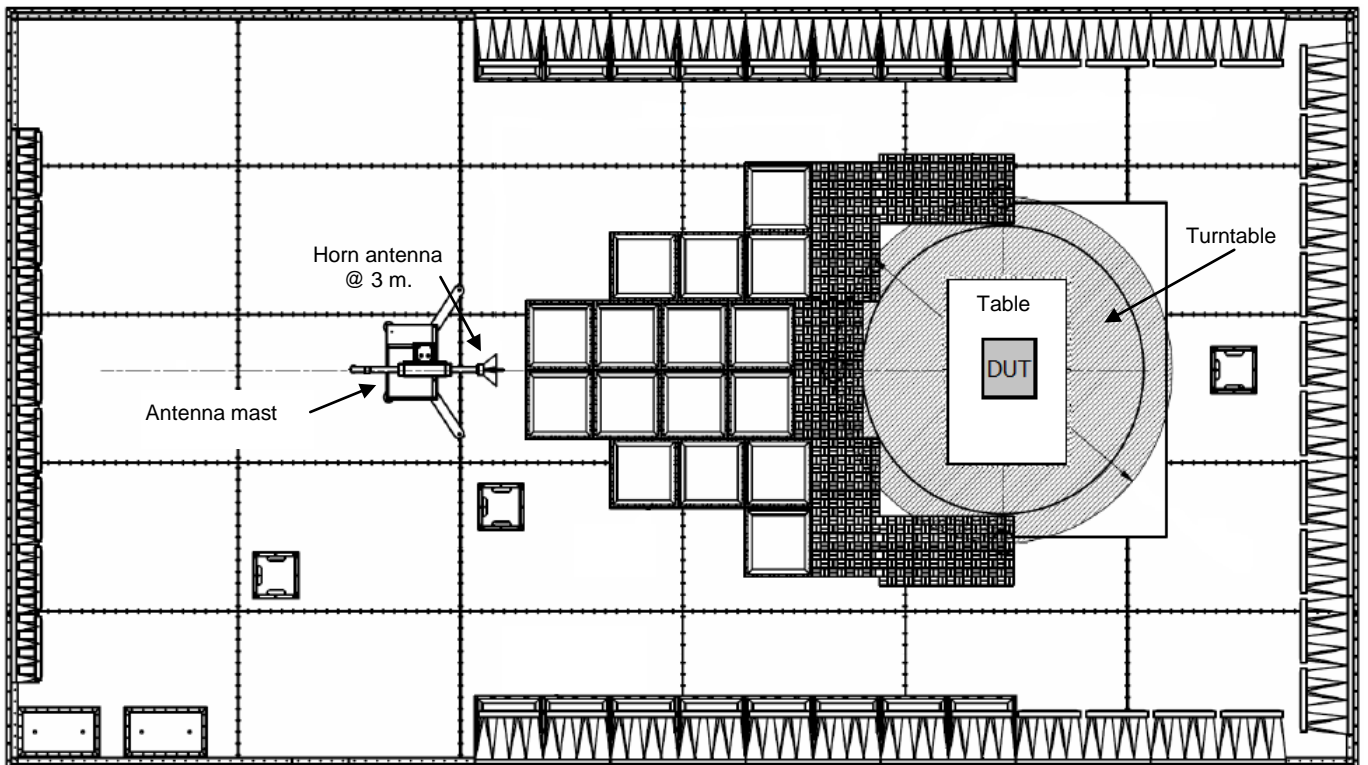
The following IF bandwidths have been used during the measurements:

- 200 Hz for measurements below 150 KHz,
- 9 KHz for measurements from 150 KHz to 30 MHz,
- 120 KHz for measurements from 30 to 1000 MHz,
- 1 MHz for measurements above 1000 MHz

Test setup for “Spurious radiated emission” measurements at frequency range 9 KHz-1000 MHz is shown below.



Test setup for “Spurious radiated emission” measurements above 1 GHz is shown below.



Field strength limits

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3
Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.		

Measurement data

Port under test	Enclosure	
Voltage – Mains [V]	120	
Frequency – Mains [Hz]	60	
Test method applied (below 1 GHz)	<input checked="" type="checkbox"/>	OATS or SAC with measurement distance [m]: 3 m.
	<input type="checkbox"/>	OATS or SAC with measurement distance [m]: 5 m.
	<input type="checkbox"/>	OATS or SAC with measurement distance [m]: 10 m.
Test method applied (above 1 GHz)	<input type="checkbox"/>	Absorber-lined OATS or SAC with measurement distance [m]: 3 m.
	<input type="checkbox"/>	Absorber-lined OATS or SAC with measurement distance [m]: 1 m.
Test setup	<input checked="" type="checkbox"/>	Equipment on a table of 80 cm height
	<input type="checkbox"/>	Equipment on the floor (insulated from ground plane)
	<input type="checkbox"/>	Other:
	Refer to the Annex 2 for test setup photo(s).	
Operating mode(s) used	Mode 2(pre-test mode 1&2&3, mode 2 was the worst case which was recorded)	
Remark	---	

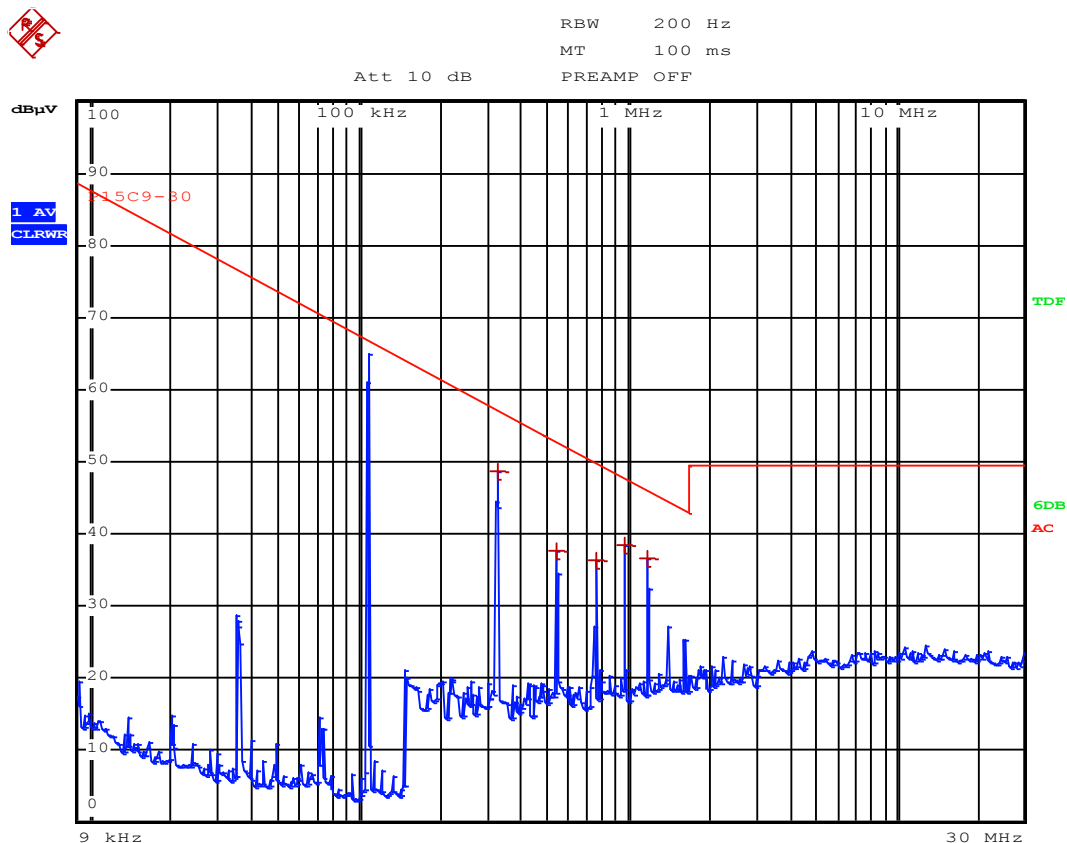
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Measurement data

Operating mode / voltage / frequency used during the test

Mode 2 / 120 Vac / 60 Hz

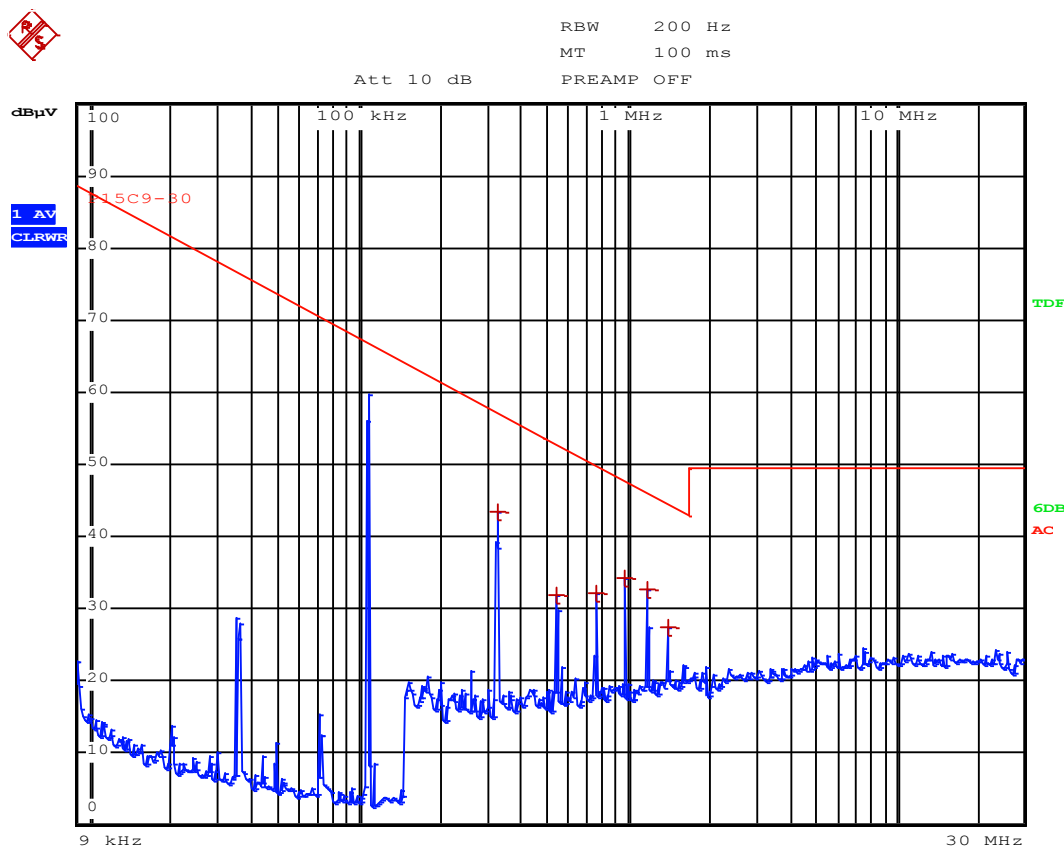
X - Axis



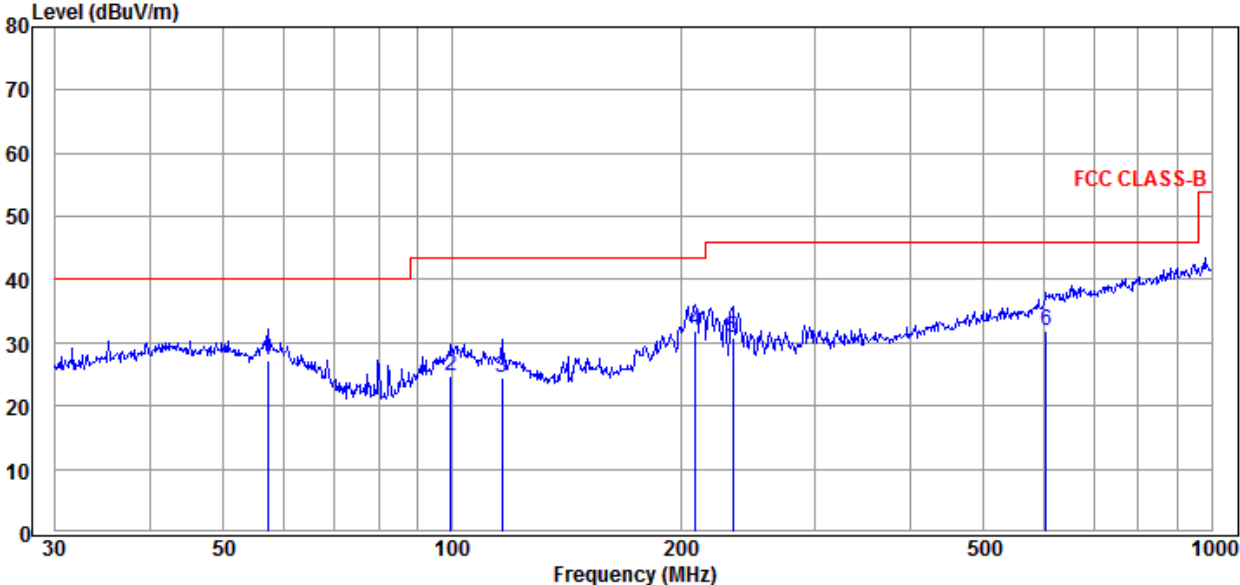
EDIT PEAK LIST (Prescan Results)			
Trace1:	P15C9-30		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Average	326 kHz	48.59	-8.74
1 Average	542 kHz	37.54	-15.37
1 Average	762 kHz	36.46	-13.49
1 Average	978 kHz	38.43	-9.35
1 Average	1.194 MHz	36.66	-9.40

No other significant emissions were recorded employing the QP detector at the frequency range of interest.

Remark

Measurement data		<input type="checkbox"/>	<input type="checkbox"/>																																																				
Operating mode / voltage / frequency used during the test		Mode 2 / 120 Vac / 60 Hz																																																					
Y - Axis																																																							
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EDIT PEAK LIST (Prescan Results)																																																							
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Remark																																																							

Measurement data	<input checked="" type="checkbox"/>	Horizontal	<input type="checkbox"/>	
Operating mode / voltage / frequency used during the test		Mode 2 / 120 Vac / 60 Hz		



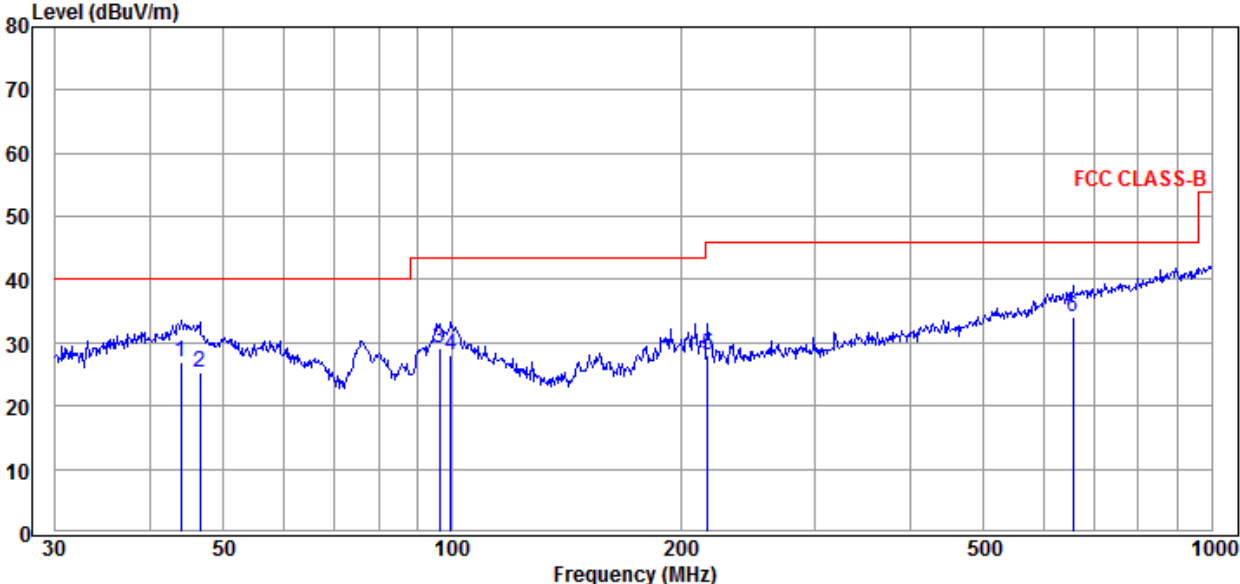
Freq MHz	Reading dBuV	C.F dB	Result dBuV/m	Limit dBuV/m	Margin dB
57.19	11.38	15.70	27.08	40.00	12.92
99.53	11.42	13.34	24.76	43.50	18.74
116.13	12.13	12.43	24.56	43.50	18.94
209.31	19.18	12.81	31.99	43.50	11.51
234.17	16.95	13.78	30.73	46.00	15.27
605.66	9.79	22.12	31.91	46.00	14.09

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

No other significant emissions were recorded employing the QP detector at the frequency range of interest.

Remark	
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Measurement data	<input checked="" type="checkbox"/>	Vertical	<input type="checkbox"/>	
Operating mode / voltage / frequency used during the test		Mode 2 / 120 Vac / 60 Hz		



Freq MHz	Reading dBuV	C.F dB	Result dBuV/m	Limit dBuV/m	Margin dB
43.97	11.40	15.45	26.85	40.00	13.15
46.50	9.97	15.35	25.32	40.00	14.68
96.10	16.44	12.61	29.05	43.50	14.45
99.53	14.82	13.34	28.16	43.50	15.34
216.78	14.83	13.12	27.95	46.00	18.05
656.53	10.95	23.02	33.97	46.00	12.03

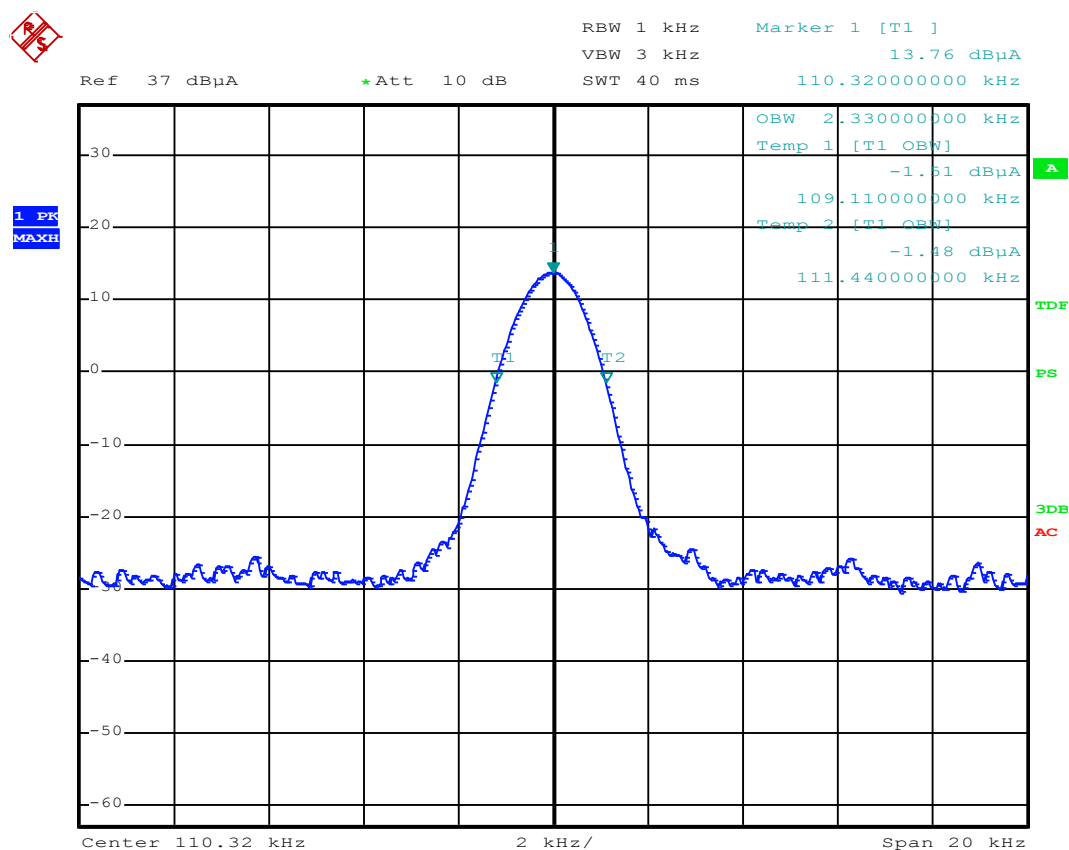
Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

No other significant emissions were recorded employing the QP detector at the frequency range of interest.

Remark	
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4.4	20dB Bandwidth	VERDICT: PASS
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Standard	FCC Rules & Regulations 47 CFR Chapter I - Part 15 Subpart C Clause 15.215
Basic standard(s)	ANSI C63.10 Section 6.9



Test result: The unit does meet the FCC requirements.

5 IDENTIFICATION OF THE EQUIPMENT UNDER TEST

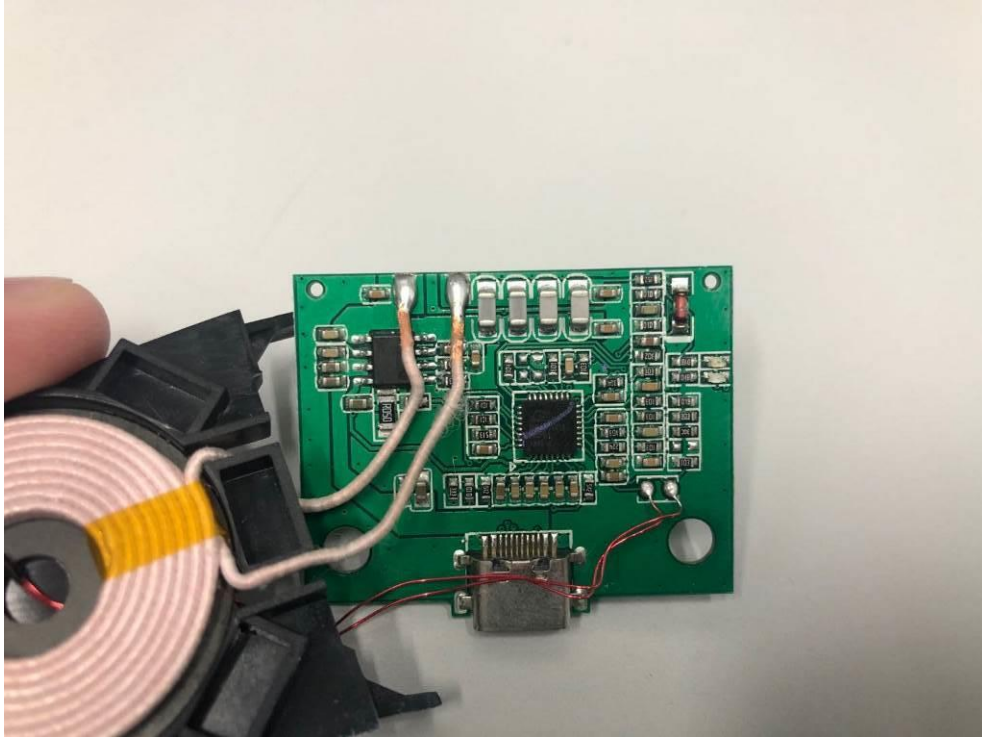
The photographs show the tested device.



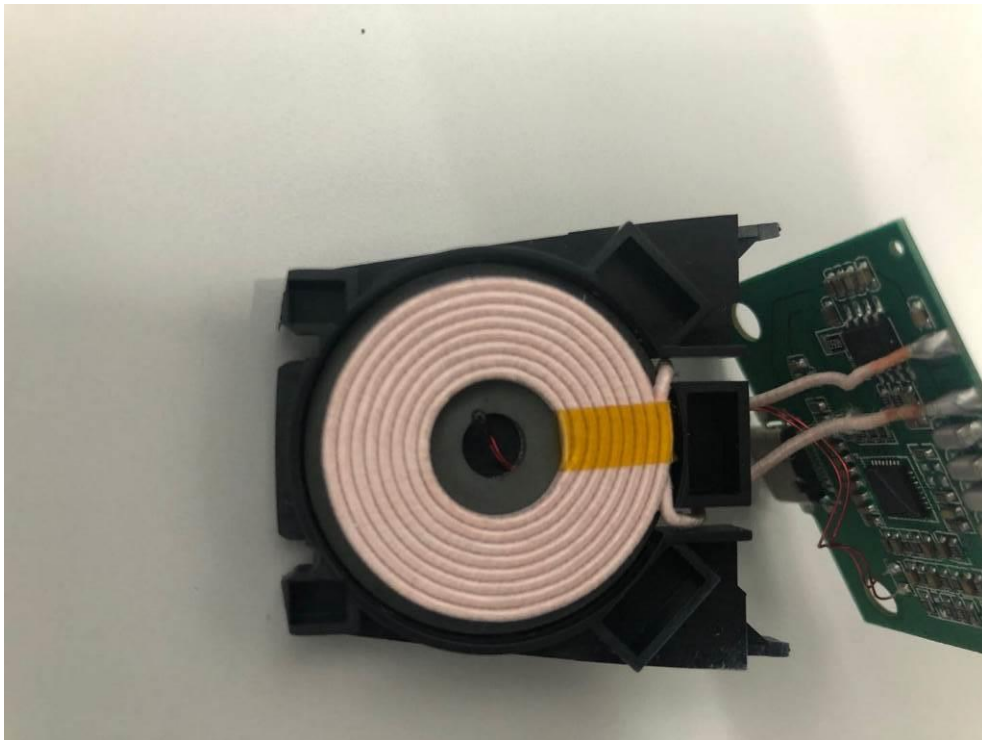
Model T229



PCB



PCB



Antenna

6 ANNEX 1 - MEASUREMENT UNCERTAINTIES

Measurement	Uncertainty
Unwanted Emissions, Radiated	3.32dB
Mains disturbance voltage (150 kHz – 30 MHz)	2,82 dB

Remark :

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

7 ANNEX 2 - TEST PHOTOS

Conducted disturbance voltage at AC mains terminals



Conducted disturbance voltage at AC mains terminals



Radiated emissions (30 - 1000 MHz)



Radiated emissions (below 30 MHz)



End of the report