

RADIO REPORT FCC 47 CFR Part 18 Wireless Power Transfer Devices	
Report Reference No	G0M-1908-8402-TFC106WP-V01
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	 DAkkS - Registration number : D-PL-12092-01-04 FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	eResearchTechnology GmbH
Address	Sieboldstrasse 3 97230 Estenfeld GERMANY
Test Specification	47 CFR Part 18 FCC MP-5:1986
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Electrical System (Charging Station)
Model(s)	WSCS
Additional Model(s)	None
Brand Name(s)	MasterScope
Hardware Version(s)	WSCS 0101
Software Version(s)	N/A
FCC-ID	2AAUFWSCS01
IC	n/a
Test Result	PASSED

Possible test case verdicts:		
Required by standard but not tested	N/T	
Not required by standard	N/R	
Not applicable to EUT	N/A	
Test object does meet the requirement	P(PASS)	
Test object does not meet the requirement	F(FAIL)	
Testing:		
Test Lab Temperature	20 - 23 °C	
Test Lab Humidity	32 – 38 %	
Date of receipt of test item	2020-01-10	
Report:		
Compiled by	Abdullah Al Jamal	
Tested by (+ signature) (Responsible for Test)	Abdullah Al Jamal	
Approved by (+ signature) (Head of Lab)	Christian Weber	
Date of Issue	2020-02-11	
Total number of pages	21	
General Remarks:		
The test results presented in this report relate only to the object tested. The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.		
Additional Comments:		
None.		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2020-02-11	Initial Release	

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EUT	Equipment Under Test
FCC	Federal Communications Commission
ISED	Innovation, Science and Economic Development Canada
RBW	Resolution bandwidth
RMS	Root mean square
VBW	Video bandwidth
V _{NOM}	Nominal supply voltage

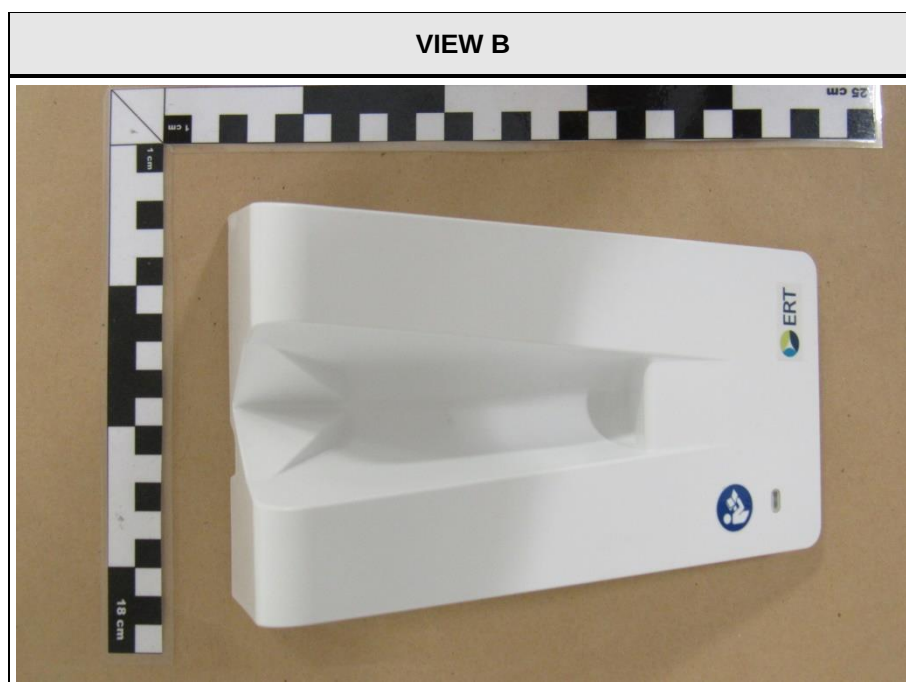
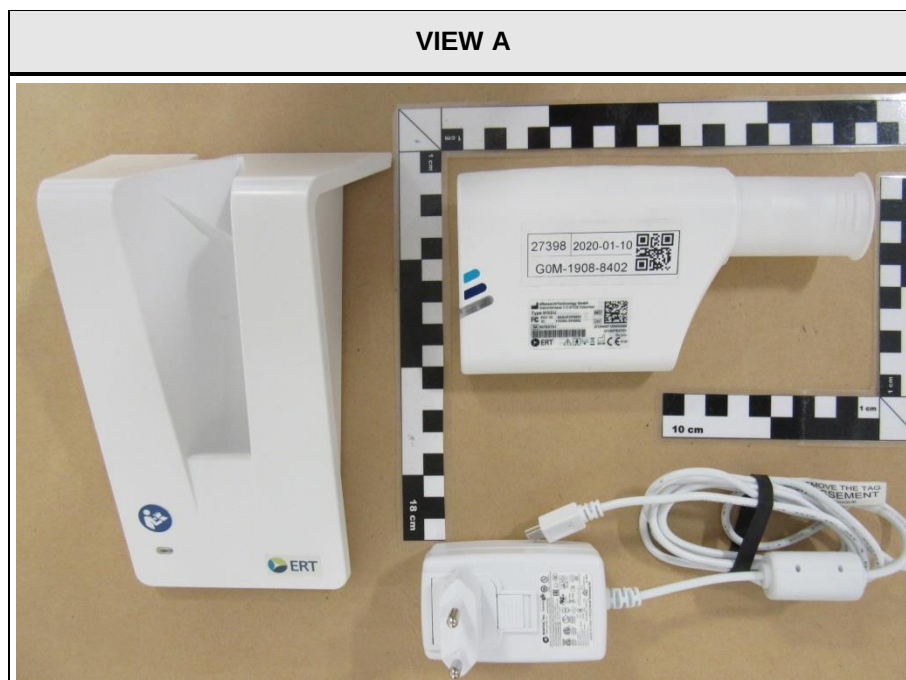
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1 Equipment (Test Item) Under Test

Description	Electrical System (Charging Station)	
Model	WSCS	
Additional Model(s)	None	
Brand Name(s)	MasterScope	
Serial Number(s)	51TEST03	
Hardware Version(s)	WSCS 0101	
Software Version(s)	N/A	
FCC-ID	2AAUFWSCS01	
WPT Source Subassembly	Type 3	
WPT Client Subassembly	No	
Wireless Module	No	
Radio technology	Wireless Power Transfer	
Modulation	ASK	
Highest internal frequency [MHz]	84	
Antenna	Type	Coil
	Model	Not specified
	Manufacturer	Not specified
	Gain	N/A
Supply Voltage	V_{NOM}	5.0 VDC
Operating Temperature	T_{NOM}	25 °C
AC/DC-Adaptor	Model	GTM41134-0606-1.0
	Vendor	GlobTek
	Input	100 VAC – 240 VAC
	Output	5.0 VDC
Manufacturer	eResearchTechnology GmbH Sieboldstrasse 3 97230 Estenfeld GERMANY	

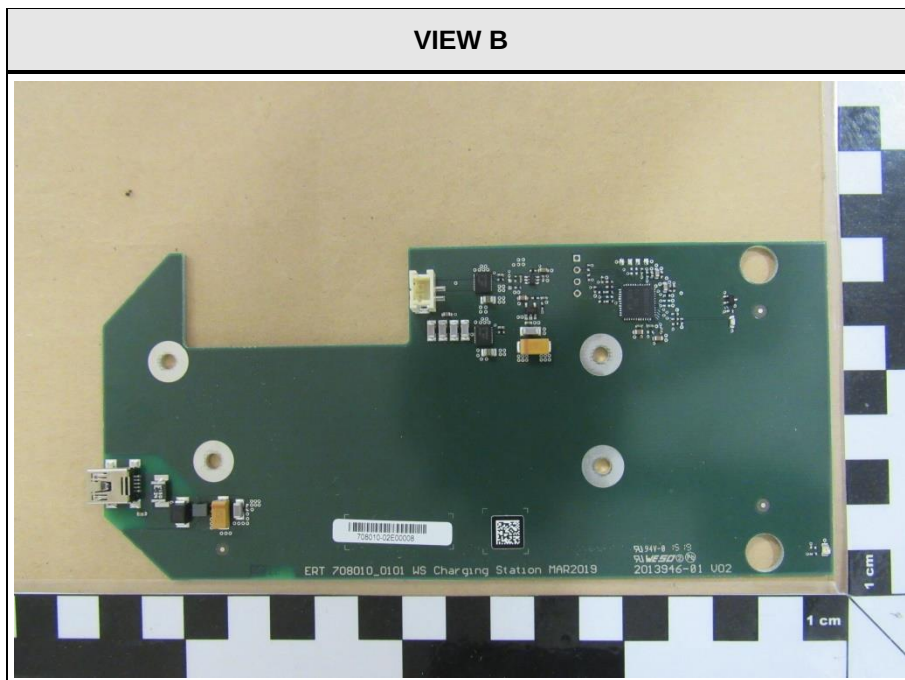
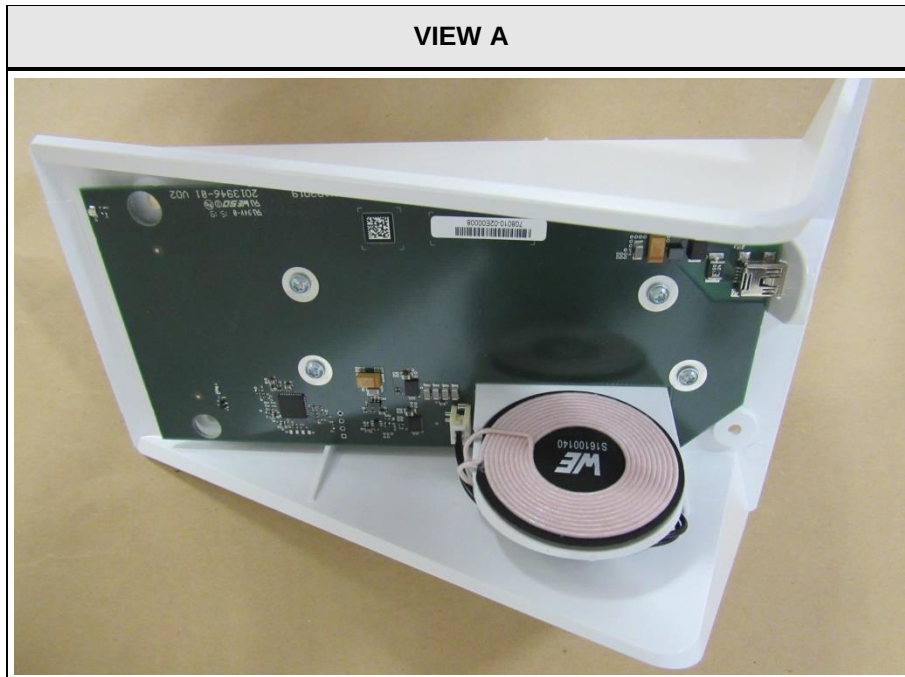
1.1 Photos – Equipment External



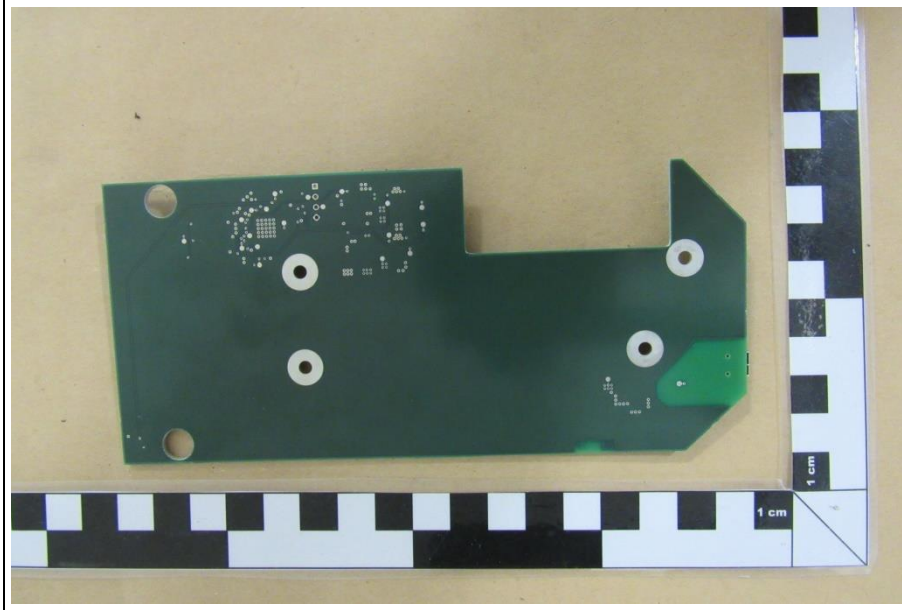
VIEW C



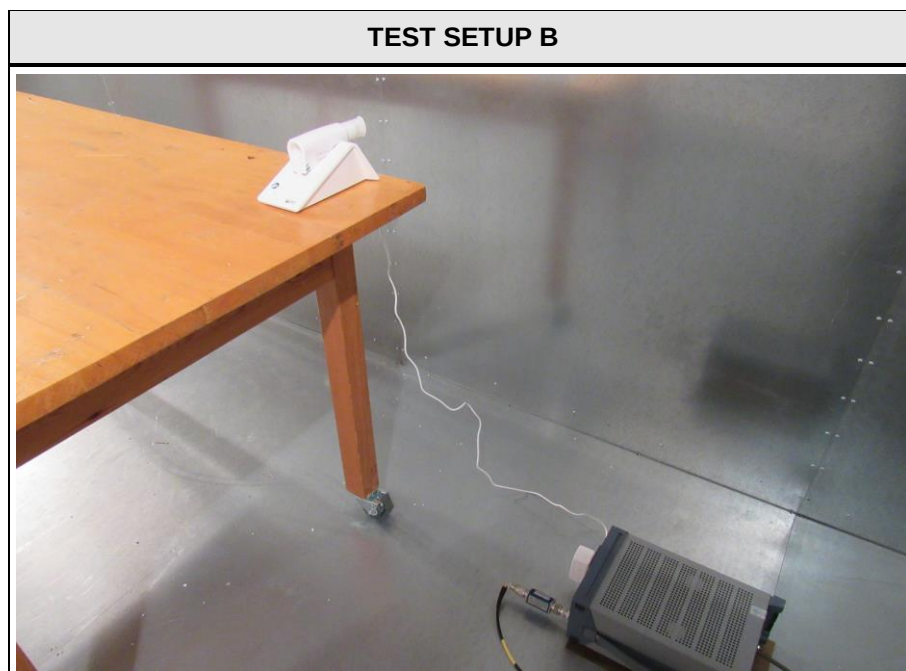
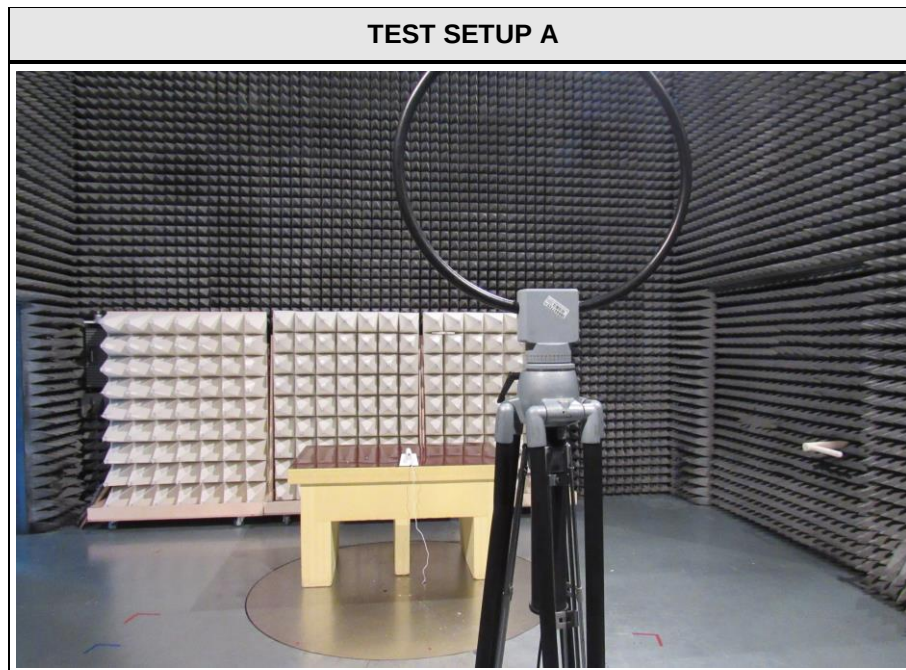
1.2 Photos – Equipment Internal



VIEW C



1.3 Photos – Test Setup



1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE1	Mobile Device – WSSU	eResearch Technology GmbH		Mobile Device – Companion device – Serial number 50TEST01 – Test sample ID 27397
AE2	ERT PT Set	eResearch Technology GmbH		ERT only to be used with AE1 – Test sample ID 27400
AE3	Power Supply	GlobTek	GTM41134-0606- 1.0	AC/DC-adapter – Part number WR9QA- 1200MUNMRVW31 90 – Test sample ID 27399
AE4	Fujitsu Lifebook	Fujitsu Limited	LEFEBOOK E Series, E756	Serial number DSET093317 – Test sample ID 25146
AE5	Power Supply	Fujitsu Limited	A12-065N2A	Used with AE4 – Part number CP500624-01 – Test sample ID 25153
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
Comment: None.				

1.5 Test Modes

Mode	Description
Transmit	Mode = Energy Transmission Modulation = OOK Duty cycle = 100 %
Comment: None.	

1.6 Test Frequencies

Designator	Mode	Channel	Frequency [kHz]
F1	Energy Transmission	N/A	112
F2	Energy Transmission	N/A	205

1.7 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum analyzer in dBμV. Any external preamplifiers used are taken into account through internal analyzer settings.

A.F.:

This is the antenna factor for the receiving antenna. It is a conversion factor, which converts electric fields strengths to voltages, which can be measured directly on the spectrum analyzer. It is treated as a loss in dB. Cable losses have been included with the A.F. to simplify the calculations. The antenna factor is used in calculations as follows:

$$\text{Reading on Analyzer (dB}\mu\text{V)} + \text{A.F. (dB/m)} = \text{Net field strength (dB}\mu\text{V/m)}$$

Net:

This is the net field strength measurement (as shown above).

Limit:

This is the FCC Class B radiated emission limit (in units of dBμV/m). The FCC limits are given in units of μV/m. The following formula is used to convert the units of μV/m to dBμV/m:

$$\text{Limit (dB}\mu\text{V/m)} = 20 \cdot \log(\mu\text{V/m})$$

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Example only:

Reading + AF	= Net Reading	:	Net reading - FCC limit	= Margin
+21.5 dBμV + 26 dB/m	= 47.5 dBμV/m	:	47.5 dBμV/m - 57.0 dBμV/m	= -9.5 dB

2 Result Summary

FCC KDB 680106 D01, 47 CFR Part 15/18				
Product Standard Reference	Requirement	Reference Method	Result	Remarks
FCC KDB 680106 FCC 18.305	ISM field strength emissions	MP-5:1986	PASS	
FCC KDB 680106 FCC 18.307	ISM conducted emissions	MP-5:1986	PASS	
Comment: None.				

Possible Test Case Verdicts	
PASS	Test object does meet the requirements
FAIL	Test object does not meet the requirements
N/T	Required by standard but not tested
N/R	Not required by standard for the test object

3 Test Conditions and Results

3.1 Test Conditions and Results - ISM radiated field strength emissions

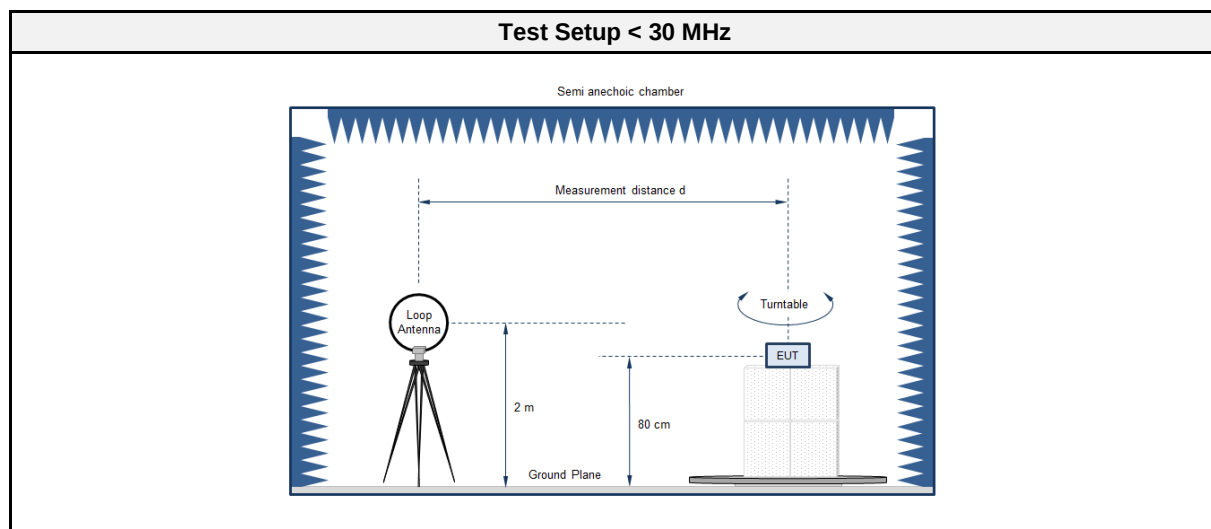
3.1.1 Information

Test Information	
Product Standard Reference	FCC KDB 680106, FCC Part 18
Measurement Method	FCC MP-5
Operator	Abdullah Al Jamal
Date	2020-02-10

3.1.2 Limits

Limits - Any non-ISM frequency - Up to 30 MHz				
Frequency range [MHz]	Detector	Limit [$\mu\text{V/m}$]	Limit [$\text{dB}\mu\text{V/m}$]	Limit Distance [m]
0.009 - 30	Average	15	23.52	300

3.1.3 Setup



3.1.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2016.1.10

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2018-07	2021-07
Loop Antenna	R&S	HFH2-Z2	EF00184	2017-12	2020-12
Measurement Receiver	R&S	ESU 26	EF00887	2019-07	2020-07

3.1.5 Procedure

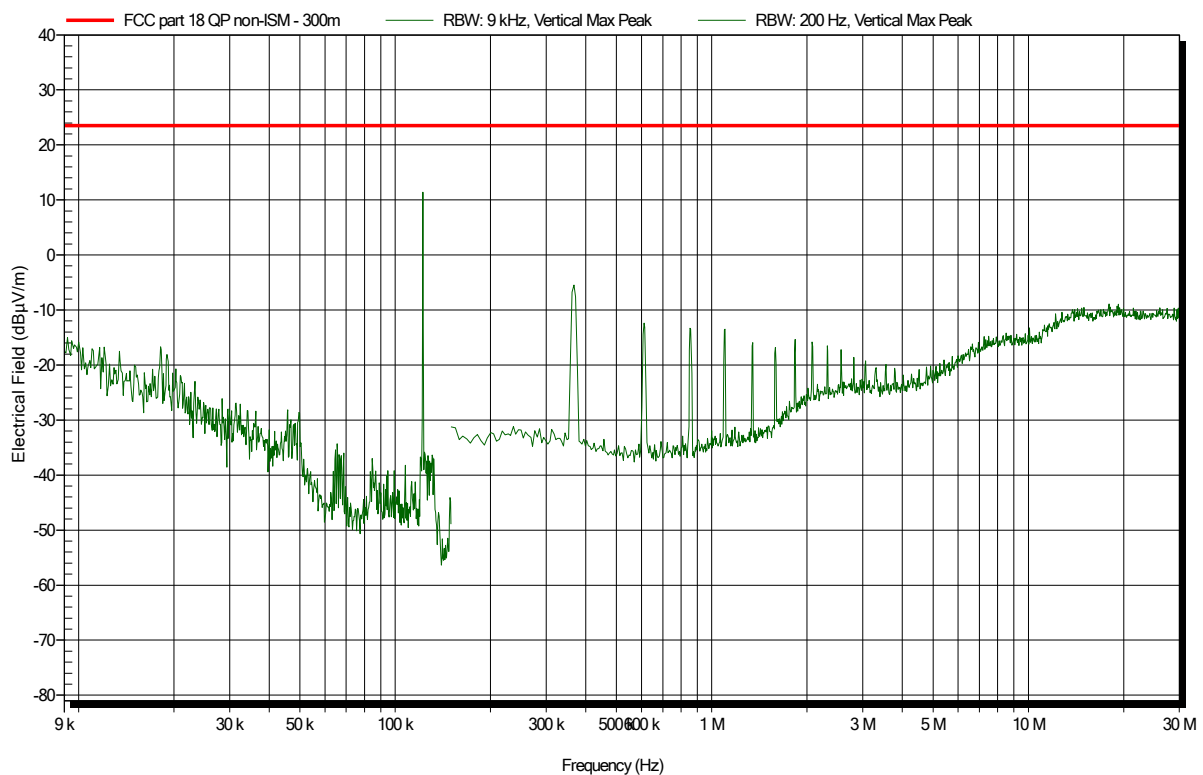
Test Procedure	
1.	EUT set to test mode
2.	Span it set according to measurement range
3.	Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1 MHz with peak/average detector is used above 1 GHz
4.	Below 30MHz an extrapolation according ANSI 63.10; 6.4.4.2 is used.
5.	Markers are set to maximum emission levels

Radiated H-field according to FCC 47 CFR Part 18

Project number: G0M-1908-8402

Applicant: eResearchTechnology GmbH
 EUT Name: Medical Electrical System (Spirometer)
 Model: WSCU
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 23°C, Vnom: 5.0 VDC (AC/DC-adapter, 100 VAC - 240 VAC)
 Antenna: Rohde & Schwarz HFH 2-Z2
 Measurement distance: 3 m
 Mode: WPT
 Test Date: 2020-02-10
 Note:

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3.2 Test Conditions and Results - ISM conducted emissions

3.2.1 Information

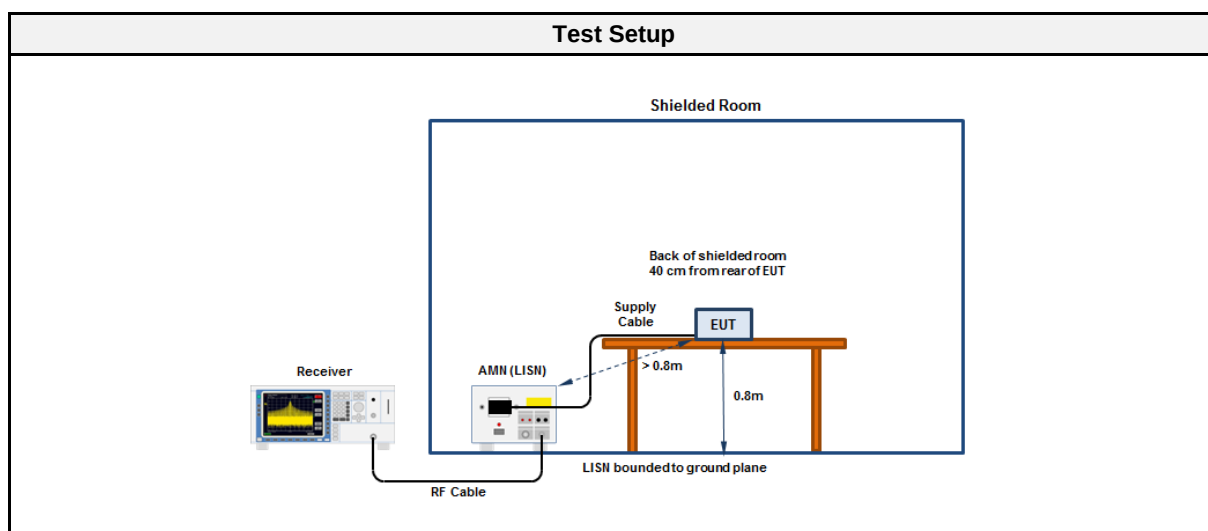
Test Information	
Product Standard Reference	FCC KDB 680106, FCC Part 18
Measurement Method	FCC MP-5
Operator	Abdullah Al Jamal
Date	2020-02-07

3.2.2 Limits

Limits		
Frequency [MHz]	Quasi-Peak [dBμV]	Average [dBμV]
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5	56	46
5 - 30	60	50

* Limit decreases linearly with the logarithm of the frequency

3.2.3 Setup



3.2.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2016.1.10

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Receiver	R&S	ESU 26	EF00241	2019-07	2021-07
LISN	R&S	ESH3-Z5	EF00036	2019-07	2021-07

Conducted emissions at the mains power port according to FCC Part 18

Project Number: G0M-1908-8402
 Applicant: eResearchTechnology GmbH
 Model Description: Medical Electrical System (Spirometer)
 Model: WSCU
 Test Sample ID: 27397
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Date: 2020-02-07
 Operating Conditions: ambient temperature: 23
 power input: 5.0 VDC (AC/DC-adapter, 100 VAC - 240 VAC)
 LISN: Rohde & Schwarz ESH3-Z5
 Mode: WPT

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