

FCC Test Report (Part 1)

RF Exposure (EMF)

Test Report no.:	EMC_BO_001966(v2.0)	Date of Report:	29-May-2015
Number of pages:	9	Project support engineer:	Robert Müller
Test period:	30-Apr-2015		

Applicant:	Novero Dabendorf GmbH, Märkische Straße 72, 15806 Zossen, Mr. Bodo Nickel		
Manufacturer:	Novero Dabendorf GmbH, Märkische Straße 72, 15806 Zossen, Germany		
EUT ident.:	Novero, WCH-177		
FCC ID:	RK7177-00	IC ID:	4774A-17700

Referred documents:	CFR 47, FCC rules Part 1, KDB 680106 D01 RF Exposure Wireless Charging Apps v02, IC standards 216 Issue 1. Deviations or clarifications to these standards are noted in the related test result under "test method and limit".
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Testing Laboratory:	novero Test Center, Meesmannstr.103, 44807 Bochum, Germany		
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	FCC listing no.:	881111	IC recognition no.: 7847A-1
	Laboratory manager:	Jürgen Mitterer	

Test result	The EUT complies with the requirements made in the referred test documents.
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Approver:	Ines Baufeld	Author:	Robert Müller
Title:	Laboratory Quality Manager	Title:	Product Certification Manager
Signature:		Signature:	

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1. Summary for FCC Part 1 EMF Test Report

Date of receipt	30-Apr-2015
Testing completed	30-Apr-2015
The customer's contact person	Bodo Nickel
Notes	none

1.1. EUT and Accessory Information

The EUT is an inductive wireless charger device operating at 125kHz. Tests were done with a self designed and shielded receiver simulator which requests and consumes always 5W (with 5Ω at 5V).

Product	Type	SN	HW	MV	SW	DUT
Wireless charger unit	WCH-177	000002682805	0007	--	1468	DAB15077E
Artificial load	--	--	--	--	--	DAB15004E
Power cable	--	--	--	--	--	DAB14030

1.2. Summary of Test Results

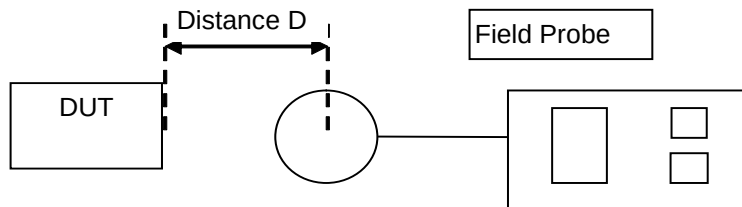
Section	Section in CFR 47	Section in RSS-GEN or RSS-216	Name of the test	Result
3	1.307(b), 1.1310	Code 6	RF Exposure	PASS

PASS: The EUT complies with the essential requirements in the standard.
 FAIL: The EUT does not comply with the essential requirements in the standard.
 NP: The test was not performed.
 NA: The test was not applicable.

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2. EMF Test setup



3. E and H-field strength (FCC §1.307(b), §1.1310)

EUT with DUT number	DAB15077E
Accessories with DUT numbers	DAB15004E (Receiver Simulator), DAB14030 (Power Cable)
Operation Voltage [V] / [Hz]	12 / DC
Result	PASS
Remarks	OP1 (5Ω/5W load, Primary Coil 1)
Temp [°C] / Humidity [%RH]	23.4 / 40.5
Date of measurements	30-Apr-2015
Measured by	Robert Müller

3.1. Test method and limit

Measurement was made from all sides of the DUT in 10, 9, 8, 7, 6, 5, 4, 3.5 cm distance (DUT edge to the center of probe)

Different probes were used to measure E and H-field separately

The highest emission level was recorded

EUT was cooled during measurements to avoid overheating and therefore power shut down

Limits for maximum permissible exposure

Frequency range [MHz]	Electric Field Strength Limit [V/m]	Magnetic Field Strength Limit [A/m]	Power Density [mW/cm ²]	Average Time [minutes]
(A) Limits for Occupational/Control Exposures				
0.3 – 3.0	614	1.63	*(100)	6
3.0 – 30	1842/f(MHz)	4.89/f(MHz)	*(900/f(MHz) ²)	6
30 – 300	61.4	0.163	1.0	6
300 – 1500			f(MHz)/300	6
1500 - 100000			5	6
(B) Limits for General Population/Uncontrol Exposures				
0.3 – 1.34	614	1.63	*(100)	30
1.34 – 30	824/f(MHz)	2.19/f(MHz)	*(180/f(MHz) ²)	30
30 – 300	27.5	0.073	0.2	30
300 – 1500			F(MHz)/1500	30
1500 - 100000			1.0	30

Note: According to DUT operating frequency and installation definition, the limit in bold letters (300kHz) was applied

IC Limits for maximum permissible exposure for general public and uncontrolled environment

Frequency range [MHz]	Electric Field Strength Limit [V/m]	Magnetic Field Strength Limit [A/m]	Power Density [mW/cm ²]	Average Time [minutes]
0.003 – 10	83	90	-	Instantaneous*
0.1 – 10	-	0.73 / f	-	6
1.1 – 10	87 / f ^{0.5}	-	-	6
10 – 20	27.46	0.0728	-2	6
20 – 48	58.07 / f ^{0.25}	0.1540 / f ^{0.25}	8.944 / f ^{0.5}	6
48 -300	22.06	0.05852	1.291	6
300 – 6000	3.142 f ^{0.3417}	0.008335 f ^{0.3417}	0.02619 f ^{0.6834}	6
6000 – 15000	61.4	0.163	10	6
15000 – 150000	61.4	0.163	10	616000/f
150000 - 300000	0.158 f ^{0.5}	4.21 x 10 ⁻⁴ f ^{0.5}		616000/f

Note: According to DUT operating frequency and installation definition, the limit in bold letters was applied

3.2. EMF Test Results

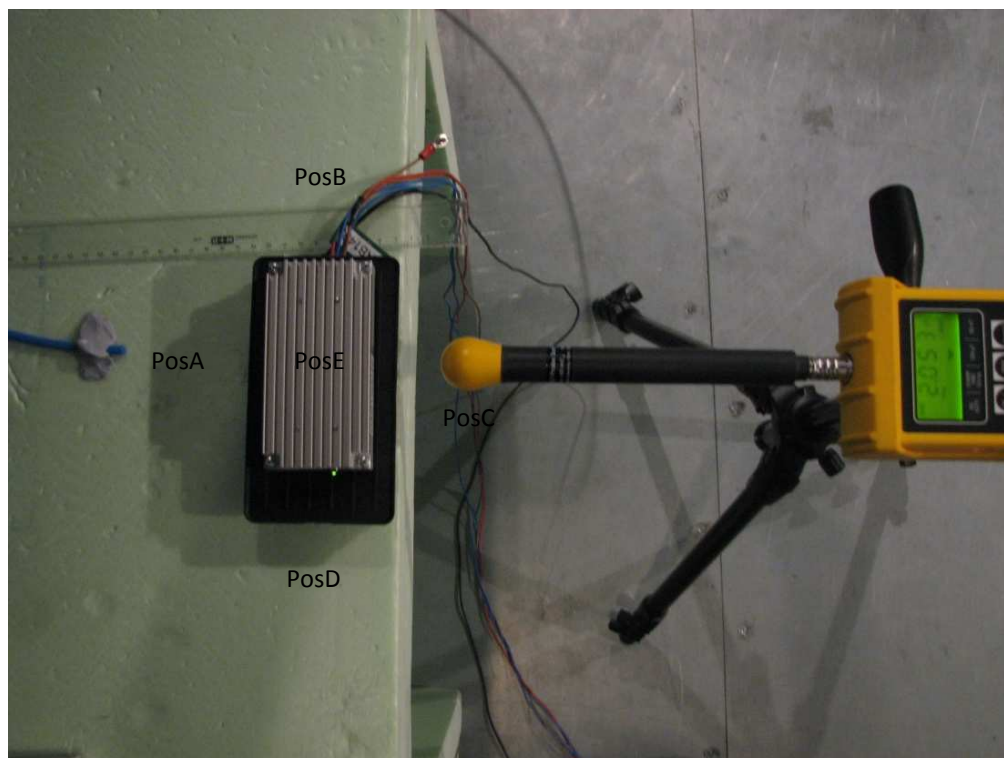
3.2.1 H-field Strength

Detector: RMS, Mode: 320 μ T; Range: normal; Low Cut: 10Hz; Average time: 6 minutes

Operation Mode	Frequency [kHz]	Distance [cm]	Level Pos A [A/m]	Level Pos B [A/m]	Level Pos C [A/m]	Level Pos D [A/m]	Level Pos E [A/m]	FCC Limit [A/m]	IC Limit [A/m]	Result
1	125	10	0.326	0.296	0.365	0.303	0.357	1.63	90	PASS
1	125	9	0.348	0.309	0.407	0.311	0.397	1.63	90	PASS
1	125	8	0.390	0.311	0.483	0.296	0.440	1.63	90	PASS
1	125	7	0.484	0.317	0.569	0.326	0.504	1.63	90	PASS
1	125	6	0.592	0.338	0.766	0.341	0.600	1.63	90	PASS
1	125	5	0.851	0.373	1.081	0.353	0.717	1.63	90	PASS
1	125	4	1.318	0.447	1.509	0.377	0.872	1.63	90	PASS
1	125	3.5	1.618	0.854	1.633	0.391	0.773	1.63	90	PASS

Note: Measurement values were transformed from μ T to A/m, where 1 A/m = 1.256 μ T

3.2.2 Worst case position setup photo



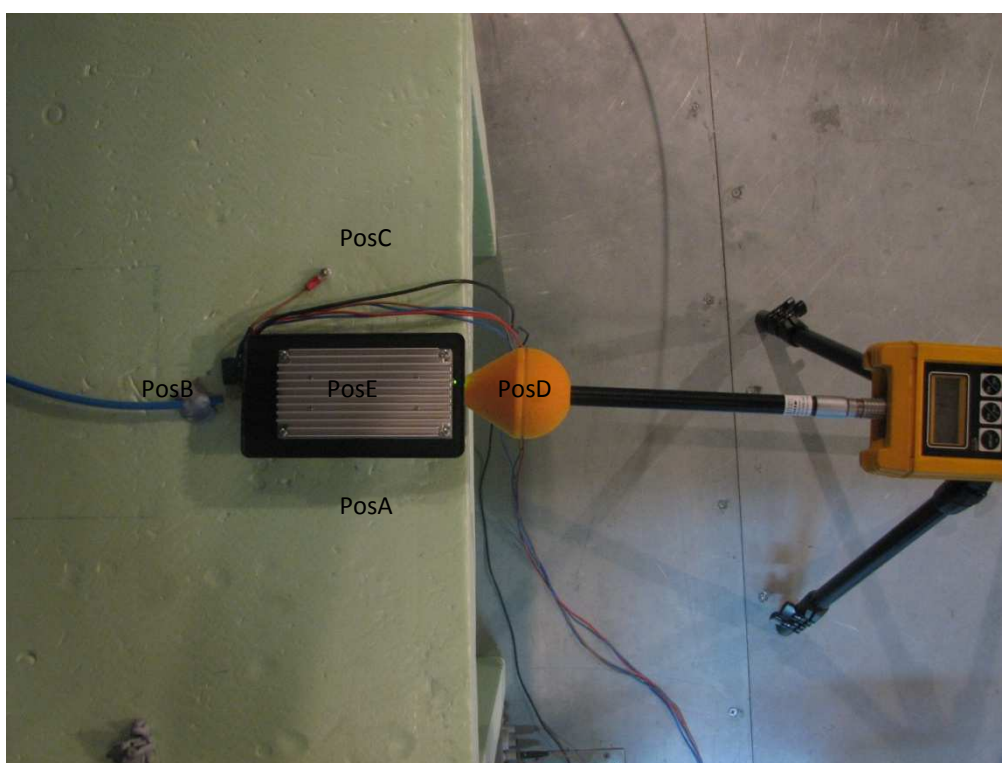
3.2.3 E-field Strength

Detector: RMS, Average time: 6 minutes

Operation Mode	Frequency [kHz]	Distance [cm]	Level Pos A [V/m]	Level Pos B [V/m]	Level Pos C [V/m]	Level Pos D [V/m]	Level Pos E [V/m]	FCC Limit [V/m]	IC Limit [V/m]	Result
1	125	10	0.36	0.28	0.36	0.20	1.37	614	83	PASS
1	125	9	0.37	0.30	0.41	0.39	1.51	614	83	PASS
1	125	8	0.39	0.35	0.49	0.46	1.59	614	83	PASS
1	125	7	0.51	0.36	0.61	0.58	1.90	614	83	PASS
1	125	6	0.66	0.37	0.73	0.64	2.24	614	83	PASS
1	125	5	0.86	0.38	0.91	0.80	Note1	614	83	PASS
1	125	4	1.02	0.53	1.06	1.13	Note1	614	83	PASS

Note 1: not possible due artificial load dimension

3.2.4 Worst case position setup photo



4. Test Equipment

Equipment	Manufacturer	Type	Serial No.	Calibration	Interval
H-field Level Meter	Narda	ELT-400	N-0385	01-Dec-14	3 years
H-field probe 3cm ²	Narda	2300/90.20	C-0111	02-Mar-14	3 years
H-field probe 10cm ²	Narda	2300/90.10	M-0823	02-Dec-14	3 years
E-field Level Meter	Wandel & Goltermann	EMR 20	P-0030	03-Dec-14	3 years
E-field probe	Wandel & Goltermann	Type8	M-0082	03-Dec-14	3 years