FCC Test Report (Part 1)

RF Exposure (EMF)

Test Report no.:	EMC_BO_002028(v1.0)	**Date of Report:**	31-Mar-2016
Number of pages:	9	**Project support engineer:**	Frank Wittmann
Test period:	03/04-Mar-2016		

Applicant:	Novero Dabendorf GmbH, Märkische Straße 72, 15806 Zossen, Mr. Krzysztof Ruchala		
Manufacturer:	Novero Dabendorf GmbH, Märkische Straße 72, 15806 Zossen, Germany		
EUT ident.:	Novero, WCH-180		
FCC ID:	RK7180-00	**IC ID:**	4774A-18000

Referred documents:	CFR 47, FCC rules Part 1, KDB 680106 D01 RF Exposure Wireless Charging Apps v02, IC standards 216 Issue 1, Safety Code 6 (2015). Deviations or clarifications to these standards are noted in the related test result under “test method and limit”.

Testing Laboratory:	novero Test Center, Meesmannstr.103, 44807 Bochum, Germany			
	Tel.:	+49 234/51668-0	e-mail:	product-validation@novero.com
	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.

Approver:	Ines Baufeld	Author:	Robert Müller
Title:	Laboratory Quality Manager	Title:	Product Certification Manager
Signature:		Signature:	

1. Summary for FCC Part 1 EMF Test Report

Date of receipt	01-Mar-2016
Testing completed	04-Mar-2016
The customer's contact person	Krzysztof Ruchala
Notes	none

1.1. EUT and Accessory Information

The EUT is an inductive wireless power transfer device (wireless charger) with load management operating at 111kHz. EUT is tested with a self designed and shielded receiver simulator which requests and consumes always maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Wireless charger unit	WCH-180	0000027AAF6A	1/1	--	31.1.5.0	DAB16047U
Artificial load	WCH Rec.	0001	1.0	--	--	DAB15155E
Power cable	--	--	--	--	--	DAB15161U
RF cable with BiasT	--	--	--	--	--	DAB16018E
Rubber mat	--	--	--	--	--	DAB16029E

1.2. Summary of Test Results

Section	Section in CFR 47	Section in RSS-102 / SC6	Name of the test	Result
3	1.307(b), 1.1310	4 / 2.2.1	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.

1.3. Measurement Uncertainties

Parameter	Worst Case Uncertainty	Max. Uncertainty
H-field probe 100cm^2	3.33%	<30%
H-field probe 3cm^2	4.17%	
H-field level tester	12.60%	
E-field probe+level tester	20%	

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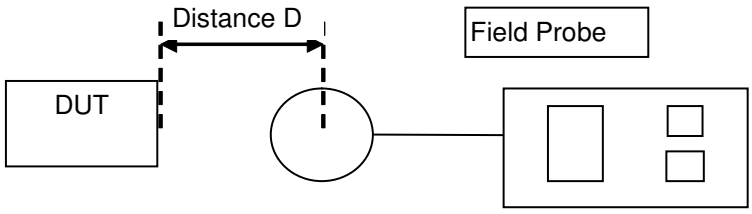
2. EMF Test setup



3. E and H-field strength

(FCC §1.307(b), §1.1310, RSS-102, Safety Code 6)

EUT with DUT number	DAB16047U
Accessories with DUT numbers	DAB16024E (Novero WCH Receiver), DAB15164E (power cable), DAB16029E (rubber mat)
Operation Voltage [V] / [Hz]	12 / DC
Result	PASS
Remarks	OP1 (5Ω/5W load, Primary Coil 1)
Temp [°C] / Humidity [%RH]	22.2 / 40.5
Date of measurements	03/04-Mar-2016
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 and 5cm 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

FCC 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	$0.158 f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$		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 E-field Strength

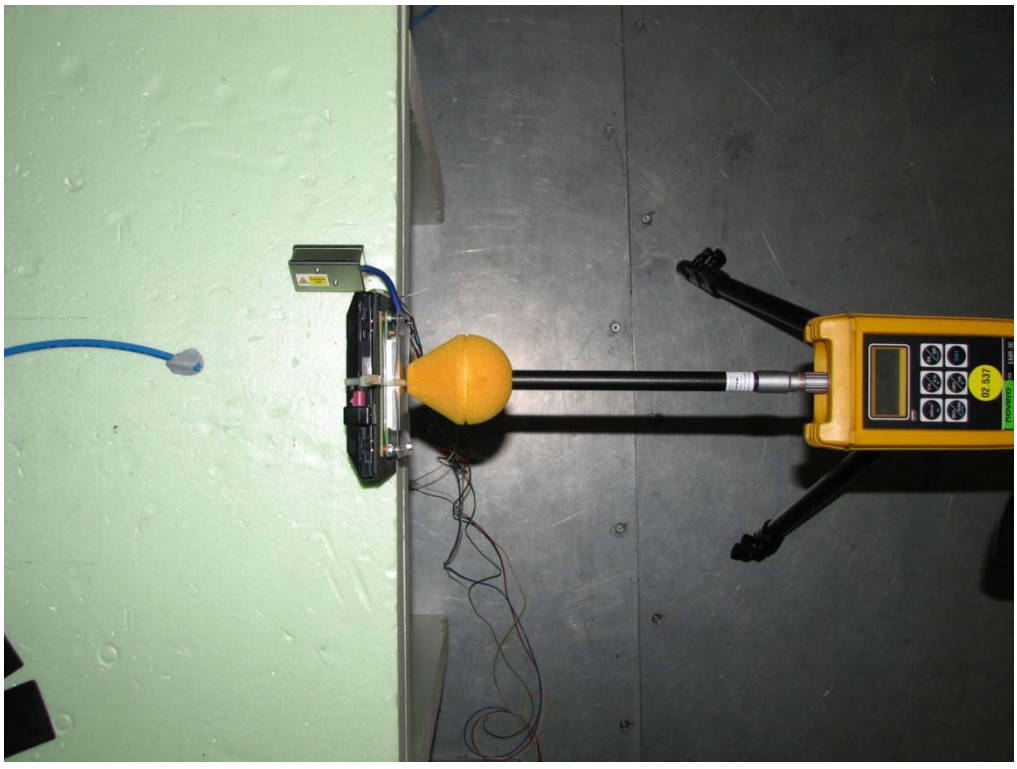
Detector: RMS, Trace: Average

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 Top [V/m]	FCC Limit [V/m]	IC Limit [V/m]	Result
1	111	10	0.36	2)	2)	2)	0.34	614	83	PASS
1	111	9	0.43	2)	2)	2)	0.40	614	83	PASS
1	111	8	0.49	2)	2)	2)	0.46	614	83	PASS
1	111	7	0.66	0.32	2)	0.29	0.56	614	83	PASS
1	111	6	0.70	0.45	2)	0.45	0.70	614	83	PASS
1	111	5	1.04	0.51	0.31	0.50	1)	614	83	PASS

1) not possible due to artificial load dimension

2) noise floor level

3.2.2 Worst case position setup photo



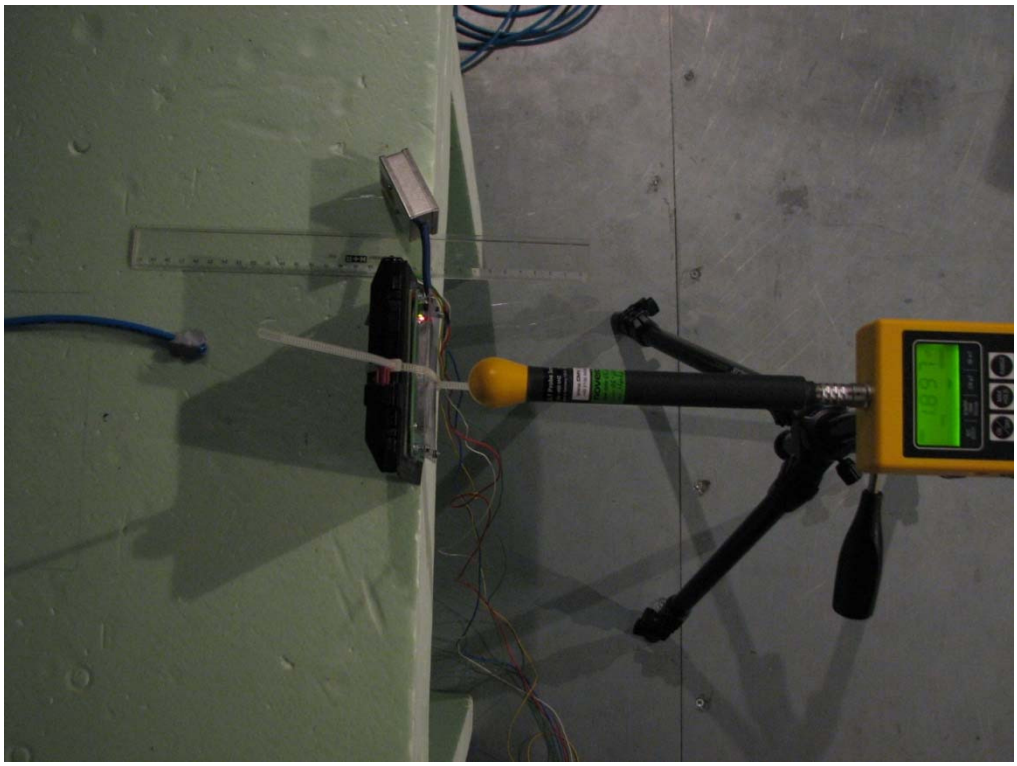
3.2.3 H-field Strength

Detector: RMS, Mode: 320µT; Range: normal; Low Cut: 10Hz

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 TOP [A/m]	FCC Limit [A/m]	IC Limit [A/m]	Result
1	111	10	0.143	0.100	0.100	0.084	0.382	1.63	90/6.57	PASS
1	111	9	0.175	0.119	0.114	0.106	0.535	1.63	90/6.57	PASS
1	111	8	0.214	0.141	0.131	0.117	0.785	1.63	90/6.57	PASS
1	111	7	0.236	0.172	0.149	0.135	0.915	1.63	90/6.57	PASS
1	111	6	0.383	0.217	0.182	0.196	1.139	1.63	90/6.57	PASS
1	111	5	0.471	0.495	0.471	0.389	**1.510**	1.63	90/6.57	PASS

Note1: Measurement values were transformed from µT to A/m, where 1 A/m = 1.256 µT
Note2: Measurements for distances 10, 9, 8, 7cm were done with 100cm^2 probe

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 100cm^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