

FCC Test Report (Part 15C)

WPT

Test Report no.:	EMC_BO_001976(v1.0)	Date of Report:	29-May-2015
Number of pages:	11	Project support engineer:	Robert Müller
Test period:	10-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:	--

Referred documents:	CFR 47, FCC rules Part 15 Subpart C, ANSI C63.4 (2009). 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 15C Test Report

Date of receipt	30-Apr-2015
Testing completed	28-May-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
RF cable	--	--	--	--	--	DAB14035

1.2. Summary of Test Results

Section	Section in CFR 47	Name of the test	Result
3&4	15.209	Spurious radiated emissions	PASS
-	15.207	AC powerline conducted emissions	NA

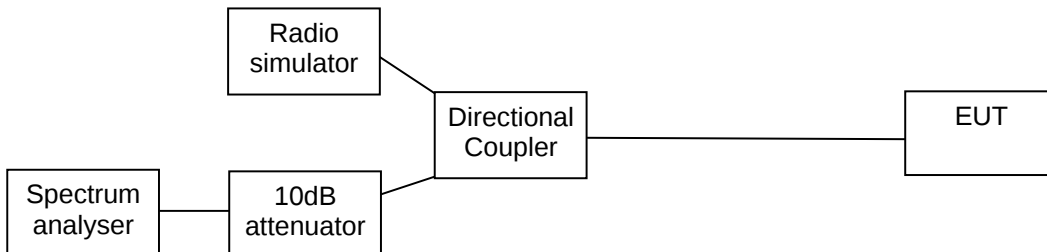
PASS: The EUT complies with the essential requirements in the standard.
 FAIL: The EUT does not comply with the essential requirements in the standard.
 NP: The test was not performed.
 NA: The test was not applicable.

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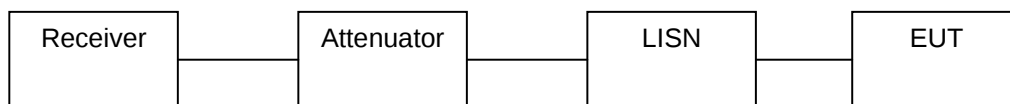
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2. Test setups

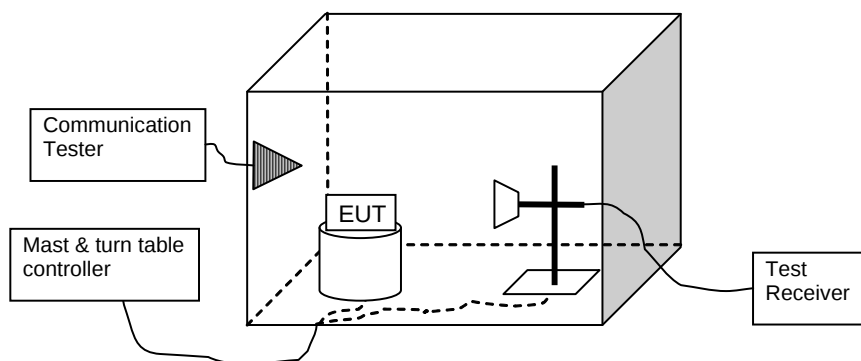
2.1. Conducted RF test setup



2.2. AC power line conducted emissions test setup



2.3. Radiated emissions test setup



3. Radiated emissions below 30MHz (FCC §15.209)

EUT with DUT number	DAB15077E
Accessories with DUT numbers	DAB15069E (Receiver Simulator), DAB14030 (power cable), DAB14035 (RF cable)
Operation Voltage [V] / [Hz]	12 / DC
Result	PASS
Remarks	OP1 (5Ω/5W load, Primary Coil 1)
Temp [°C] / Humidity [%RH]	24.2 / 38.5
Date of measurements	16-Apr-2015
Measured by	Robert Müller

3.1. Test method and limit

The measurement is made according to ANSI C63.4:2009 as follows:

The measurement distance is 3m with a shielded loop antenna

The Limit has been adjusted with the distance correction factor (+40dB for 30m distance and +80dB for 300m distance)

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with measuring antenna at fixed height using 2-axis EUT position system, set on the turntable, which is rotated 360 degrees.

The emissions less than 20 dB below the permissible value are reported.

The measurement results are obtained as described below:

$$E [\mu V/m] = U_{RX} + A_{CF}$$

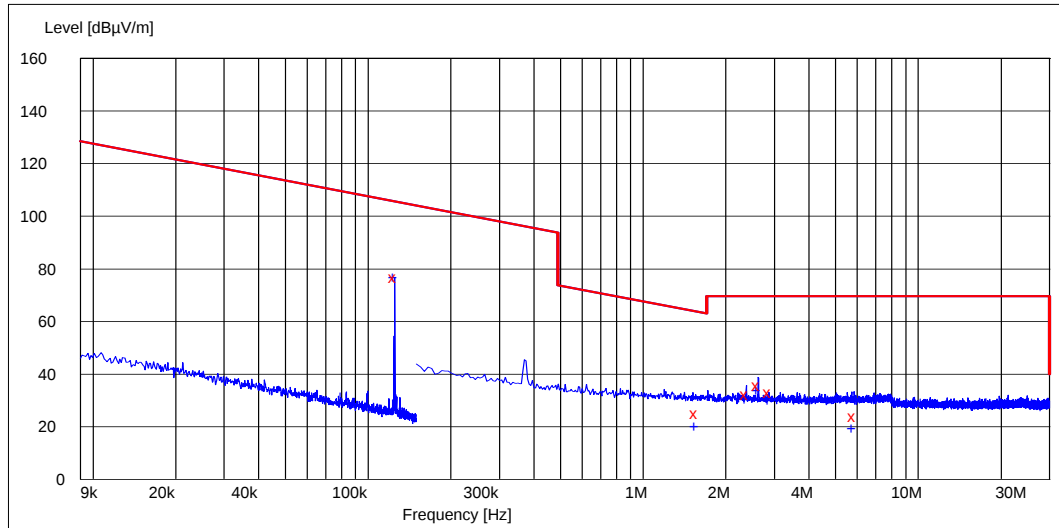
Where U_{RX} is receiver reading and A_{CF} is total correction factor including cable loss, antenna factor and preamplifier gain ($A_{CF} = L_{CABLES} + AF - G_{PREAMP}$).

Limits for spurious radiated emissions measurements (3 m measurement distance)

Frequency range [MHz]	Limit [$\mu V/m$]	Limit [dB $\mu V/m$]	Detector
0.009 – 0.09	10000 * 2400/f(kHz)	128.5 – 93.8	AV
0.09 – 0.11			QP
0.11 – 0.19			AV
0.19 - 0.49			AV
0.490 – 1.705	100 * 24000/f(kHz)	73.8 – 63.0	QP
1.705 – 30.0	100 * 30	69.5	QP

3.2. Test results

Peak (<150kHz: RBW: 200Hz, >150kHz: RBW: 10kHz)



QuasiPeak (<150kHz: RBW: 200Hz, >150kHz: RBW: 9kHz)

Frequency [MHz]	Level [dBμV/m]	Transducer [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Polarisation	Azimuth [Deg]	Result
0.125	76.80	23.30	105.70	28.90	170	VERTICAL	0	PASS
1.556	25.20	23.20	63.80	38.60	170	VERTICAL	90	PASS
2.370	32.50	23.10	69.50	37.00	170	VERTICAL	90	PASS
2.618	35.70	23.10	69.50	33.80	170	VERTICAL	0	PASS
2.968	33.00	23.10	69.50	36.50	170	VERTICAL	0	PASS
5.853	23.90	23.40	69.50	45.60	170	VERTICAL	0	PASS

No further emissions found less than 20dB to the regulatory limit

Average (<150kHz: RBW: 200Hz, >150kHz: RBW: 9kHz)

Frequency [MHz]	Level [dBμV/m]	Transducer [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Polarisation	Azimuth [Deg]	Result
0.125	76.80	23.30	105.70	28.90	170	VERTICAL	0	PASS
1.559	20.10	23.20	63.70	43.60	170	VERTICAL	90	PASS
2.369	30.20	23.10	69.50	39.30	170	VERTICAL	90	PASS
2.619	33.70	23.10	69.50	35.80	170	VERTICAL	0	PASS
2.867	29.90	23.10	69.50	39.60	170	VERTICAL	0	PASS
5.818	19.20	23.40	69.50	50.30	170	VERTICAL	0	PASS

No further emissions found less than 20dB to the regulatory limit

4. Radiated emissions above 30MHz (FCC §15.209)

EUT with DUT number	DAB15077E
Accessories with DUT numbers	DAB15069E (Receiver Simulator), DAB14030 (power cable), DAB14035 (RF cable)
Operation Voltage [V] / [Hz]	12 / DC
Result	PASS
Remarks	OP1 (5Ω/5W load, Primary Coil 1)
Temp [°C] / Humidity [%RH]	24.2 / 38.5
Date of measurements	17-Apr-2015
Measured by	Robert Müller

4.1. Test method and limit

The measurement is made according to ANSI C63.4:2009 as follows:

Below 1GHz:

The Preliminary Measurement and the Final Measurement is performed in 3m distance by rotating the turntable of 360 degrees and moving the antenna height between 1-4m.

The Preliminary Measurement is performed with floor absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system.

The Final Measurement is performed without floor absorbers, if the Preliminary Measurement results are closer than 20 dB to the permissible limit.

Between 1-3GHz:

The Preliminary Measurement and the Final Measurement is performed in 3m distance by rotating the turntable of 360 degrees at fixed height.

The Preliminary Measurement and the Final Measurement with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system.

The Final Measurement is performed, if the Preliminary Measurement results are closer than 20 dB to the permissible limit.

Above 3GHz:

The Preliminary Measurement and the Final Measurement is performed in 1.5m distance by rotating the turntable of 360 degrees at fixed height.

The Preliminary Measurement and the Final Measurement with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system.

The Final Measurement is performed, if the Preliminary Measurement results are closer than 20 dB to the permissible limit.

General:

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The EUT is placed at nonconductive plate at the turntable center.

The emissions less than 20 dB below the permissible value are reported.

The measurement results are obtained as described below:

$$E [\mu\text{V/m}] = U_{RX} + A_{CF}$$

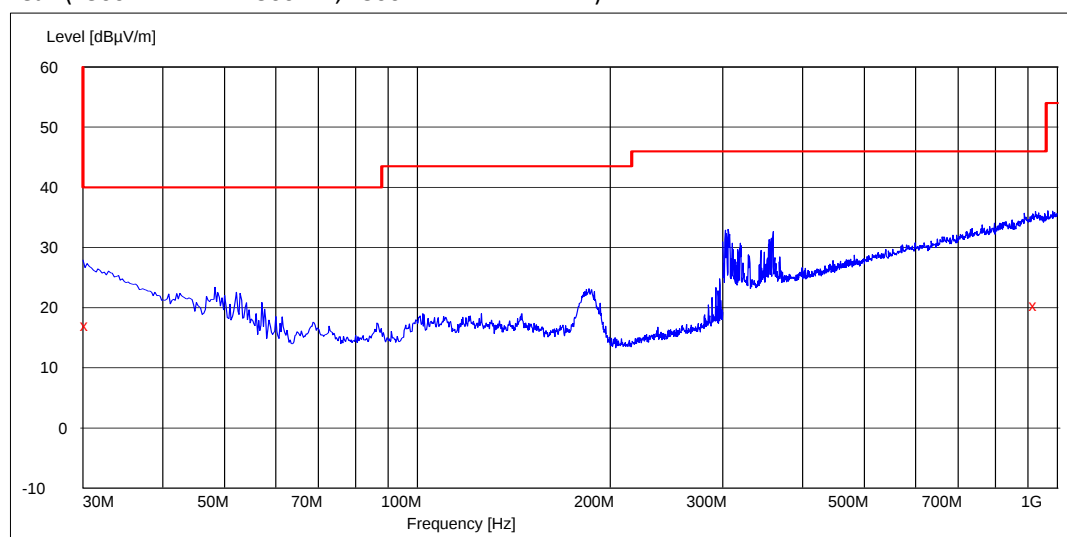
Where U_{RX} is receiver reading and A_{CF} is total correction factor including cable loss, antenna factor and preamplifier gain ($A_{CF} = L_{CABLES} + AF - G_{PREAMP}$).

Limits for spurious radiated emissions measurements (3 m measurement distance)

Frequency range [MHz]	Limit [$\mu\text{V/m}$]	Limit [$\text{dB}\mu\text{V/m}$]	Detector
30 – 88	100	40	QP
88 – 216	150	43.5	QP
216 – 960	200	46	QP
960 – 1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

4.2. Test results

Peak (<300MHz: RBW: 300kHz, >300MHz: RBW: 1MHz)



QuasiPeak (RBW: 120kHz)

Frequency [MHz]	Level [$\text{dB}\mu\text{V/m}$]	Transducer [dB]	Limit [$\text{dB}\mu\text{V/m}$]	Margin [dB]	Height [cm]	Polarisation	Azimuth [Deg]	Result
30.400	17.00	-12.30	40.00	23.00	249	HORIZONTAL	88	PASS
925.050	20.40	-16.40	46.00	25.60	217	HORIZONTAL	305	PASS

No emissions found less than 20dB to the regulatory limit

5. Test Equipment

5.1. Conducted measurements

Equipment	Manufacturer	Type	Serial No.	Calibration	Interval
Communication tester	Agilent	N4010A	MY46320388	14-Jul-14	3 years
Communication tester	R&S	CMU200	101138	13-Aug-13	2 years
EMI Testreceiver	R&S	ESU 26	100077/026	12-Aug-13	2 years
Power Supply	Agilent	E3632A	KR75303332	4-Sep-14	2 years
Climatic Chamber	Vötsch	VT 4004	566031450010	9-Sep-14	2 years
Power Sensor	ETS Lindgren	7002-006	13I00030SNO83	7-Apr-14	3 years
Signal Generator	R&S	SMP02	828269 / 008	8-Jul-14	3 years
Vector Signal Generator	R&S	SMJ100A	100845	20-Aug-14	2 years
Directional Coupler	Tyco	0.5 - 18GHz	2026-6010-10	15-Mar-15	1 year
Cable	Huber+Suhner	Sucoflex 104 / 0.3m	199748/4	15-Mar-15	1 year
Cable	Huber+Suhner	Sucoflex 104 / 0.5m	123746/4	15-Mar-15	1 year
Cable	Huber+Suhner	Sucoflex 104 / 1.2m	143748/4	15-Mar-15	1 year
Cable	Huber+Suhner	Sucoflex 104 / 1.3m	143781/4	15-Mar-15	1 year
Splitter	Mini-Circuits	ZN2PD2-50	SF002300417	15-Mar-15	1 year
Directional Coupler	M/A-Com	2026-6003-20	001	15-Mar-15	1 year
Cable	Huber+Suhner	Sucoflex 104 / 1.3m	125434/4	15-Mar-15	1 year
Cable	Huber+Suhner	Sucoflex 104 / 1.3m	126838/4	15-Mar-15	1 year
Attenuator	Huber+Suhner	10dB	002	15-Mar-15	1 year

5.2. Radiated measurements

Equipment	Manufacturer	Type	Serial No.	Calibration	Interval
Chamber: Euroshield	ETS	RFD-F/ A-100	3069	30-Jun-14	3 years
Control Room	ETS	RFD-100	3070	-	-
Communication Tester	R&S	CMU200	101138	13-Aug-13	2 years
Signal Generator	R&S	SMP02	828269 / 008	8-Jul-14	3 years
Signal Generator	R&S	SML01	100651	23-Sep-14	3 years
Bluetooth Tester	Anritsu	MT 8850A	6k00001358	22-Aug-12	3 years
Power Supply	Agilent	E3632A	MY40011318	18-Aug-14	1 year
Antenna	R&S	HL562	100249	24-Jul-12	3 years
Antenna	Schwarzbeck	BBHA9120LF	1298	24-Oct-14	3 years
Antenna	EMCO	3160-09	001814-006	-	-
EMI Test Receiver	R&S	ESI 26	827769/010	25-Jul-13	2 years
Band Reject Filter	Wainwright	CH9750/1950 MHz	371133	15-Mar-15	1 year
Band Reject Filter	Wainwright	2.4-2.4835 GHz	1	15-Mar-15	1 year
Notch Filter GSM 1800	Wainwright	TCH700/1747,8 MHz	371136	15-Mar-15	1 year
Notch Filter GSM 1900	Wainwright	TCH661/1880 MHz	371137	15-Mar-15	1 year
Notch Filter GSM 900	Wainwright	TCH62/902,4 MHz	371135	15-Mar-15	1 year
Notch Filter GSM 850	Wainwright	TCH190/836,6 MHz	371134	15-Mar-15	1 year