T E S T R E P O R T
No.: 19-1-0066701T10a

According to:
FCC Regulations
§1.1310
§ 2.1091 & 2.1093

for
Continental Automotive GmbH

D-WMI2020A

FCC-ID: KR5DWMI2020A

Laboratory Accreditation
ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-12047-01-01 D-PL-12047-01-03 D-PL-12047-01-04
accredited according to DIN EN ISO/IEC 17025

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The listed attachments are an integral part of this report.

1. Summary of test results

The test results apply exclusively to the test samples as presented in this Report. The CETECOM GmbH does not assume responsibility for any conclusions and generalizations taken in conjunction with other specimens or samples of the type of the item presented to tests.

The Equipment Under Test (in this report, hereinafter referred as EUT) is a wireless charger with external and internal NFC function. The charger is operated at Carrier Frequency 127.7 kHz

TEST OVERVIEW

No. of Diagram group	Test Cases	Port	References, Standards & Limits		EUT set-up	EUT op-mode	Result
			FCC	Limits			
1.1	Electric field strength	6.2 cm distance to EUT (surround the edge of Device)	§1.1310 §2.1091 §2.1093	614 (V/m)	1	1 + 2 + 3	passed
1.1	Electric field strength	9.7 cm distance to EUT (top side of Device)	§1.1310 §2.1091 §2.1093	614 (V/m)	1	1 + 2 + 3	passed
1.1	Electric field strength	6.2 cm distance to EUT (surround the edge of Device)	§1.1310 §2.1091 §2.1093	614 (V/m)	2	1 + 2 + 3	passed
1.1	Electric field strength	9.7 cm distance to EUT (top side of Device)	§1.1310 §2.1091 §2.1093	614 (V/m)	2	1 + 2 + 3	passed
1.1	Electric field strength	9.7 cm distance to EUT (top side of Device)	§1.1310 §2.1091 §2.1093	614 (V/m)	3	1 + 2 + 3	passed
1.1	Electric field strength	9.7 cm distance to EUT (top side of Device)	§1.1310 §2.1091 §2.1093	614 (V/m)	3	1 + 2 + 3	passed
1.2	Magnetic field strength	6.2 cm distance to EUT (surround the edge of Device)	§1.1310 §2.1091 §2.1093	1.63 (A/m)	1	1 + 2 + 3	Passed
1.2	Magnetic field strength	9.7 cm distance to EUT (top side of Device)	§1.1310 §2.1091 §2.1093	1.63 (A/m)	1	1 + 2 + 3	Passed
1.2	Magnetic field strength	6.2 cm distance to EUT (surround the edge of Device)	§1.1310 §2.1091 §2.1093	1.63 (A/m)	2	1 + 2 + 3	Passed
1.2	Magnetic field strength	9.7 cm distance to EUT (top side of Device)	§1.1310 §2.1091 §2.1093	1.63 (A/m)	2	1 + 2 + 3	Passed
1.2	Magnetic field strength	6.2 cm distance to EUT (surround the edge of Device)	§1.1310 §2.1091 §2.1093	1.63 (A/m)	3	1 + 2 + 3	Passed
1.2	Magnetic field strength	9.7 cm distance to EUT (top side of Device)	§1.1310 §2.1091 §2.1093	1.63 (A/m)	3	1 + 2 + 3	Passed

Remark:
Following tests have been performed to show compliance with applicable Standards:
FCC §1.1310, §2.1091 §2.1093,
OET Bulletin 65 Supplement C,
KDB 680106 D01 V03.

Deviating to KDB 680106 D01 V03 tests were performed due to customer declaration with 6.2 cm distance between edge of EUT and probe and 9.7 cm between top of EUT and probe.

markus.ridder@cetecom.com 2019.09.17 16:33:48 +02'00'

Dipl.-Ing. Markus Ridder
Responsible for test section

Wolfgang Markus 2019.09.17 14:01:19 +02'00'

W. Markus
Responsible for test report

2. Administrative Data

2.1. Identification of the testing laboratory

Company name:	CETECOM GmbH
Address:	Im Teelbruch 116 45219 Essen - Kettwig Germany
Responsible for testing laboratory:	Volker Wittmann
Deputy for testing laboratory:	Dipl.-Ing. Niels Jeß

2.2. Test location

2.2.1. Test laboratory "CTC"

Company name:	see chapter 2.1. Identification of the testing laboratory

2.3. Organizational items

Responsible for test report:	W. Markus
Receipt of EUT:	2019-05-09
Date(s) of test:	2019-07-31
Date of report:	2019-09-16
Version of template: 12.11	

2.4. Applicant's details

Applicant's name:	Continental Automotive GmbH
Address:	Siemensstrasse 12 93055, Regensburg Germany
Contact person:	Ms. Qian Liu

2.5. Manufacturer's details

Manufacturer's name:	Continental Automotive Lithuania UAB
Address:	Davalgonių g. 12 LT-54462 Sergeičikai I, Kaunas region Lithuania
2nd Plant: Manufacturer's name:	Continental Automotive Systems (Tianjin) Co. Ltd.
Address:	No. 2 Bohai Road 300457 TEDA Tianjin P.R. China

2.6. Customer's details

Customer's name:	IB-Lenhardt AG
Address:	Heinrich-Hertz-Allee 7 66386, St. Ingbert Germany
Contact person:	Philipp Gräf

3. Equipment under test (EUT)

3.1. Technical data of main EUT declared by applicant

Main function	Wireless power Charger		
Type	D-WMI2020A (high and low version)		
Carrier Frequency	127.7 kHz		
Max. nominal power	15 W		
Antenna Type	Single coil according to Qi standard		
Power supply	☒ 13.5 V DC		
Special EMI components	--		
EUT sample type	☒ Production	☐ Pre-Production	☐ Engineering
FCC-ID:	KR5DWMI2020A		
FCC label attached	☐ yes	☒ no	

3.2. EUT: Type, S/N etc. and short descriptions used in this test report

Short descrip-tion*)	EUT	Type	S/N serial number	HW hardware status	SW software status
EUT A (S19)	D-WMI2020A	Wireless power Charger (high Version)	A3C01728002 00 19 04 01 0041	C2	19.09.30
EUT B (S26)	D-WMI2020A	Wireless power Charger (high version)	A3C01728002 00 19 04 01 0047	C2	19.09.30
EUT C (S42)	D-WMI2020A	Wireless power Charger (low version)	A3C01727702 00 19 04 10 0028	C2	19.09.30

*) EUT short description is used to simplify the identification of the EUT in this test report.

3.3. Auxiliary Equipment (AE): Type, S/N etc. and short descriptions

AE short descrip-tion *)	Auxiliary Equipment	Type	S/N serial number	HW hardware status	SW software status	Comment
AE 1	Power Cable	--	--	--	--	--
AE 2	Qi Receiver Simulator	AVID 15 W, 102-03	--	V1.2	--	--
AE 3	NFC External Antenna	NFC Ext.1	A2139053805	2718	-	--
AE 4	NFC External Antenna	NFC Ext.2	A2139052312	2718	-	Not tested
AE 5	NFC External Antenna	NFC Ext.3	A2139052412	2718	-	Not tested

*) AE short description is used to simplify the identification of the auxiliary equipment in this test report.

3.4. EUT set-ups

EUT set-up no.*)	Combination of EUT and AE	Remarks
Set. 1	EUT A + AE 1 + AE 2	--
Set. 2	EUT B + AE 1 + AE 2 + AE 3	for testing with connected external NFC antenna
Set. 3	EUT C + AE 1 + AE 2 + AE 3	The results of measurements with connected NFC card or without are not different. For this reason only one set-up (worst case) was selected for EUT.

*) EUT set-up no. is used to simplify the identification of the EUT set-up in this test report.

3.5. EUT operating modes

EUT operating mode no.*)	Description of operating modes	Additional information
op. 1	Wireless charging	Wireless charging was activated. The EUT is transferring power to AE2 With 900 mA LOAD (5% charging level)
op. 2	Wireless charging	Wireless charging was activated. The EUT is transferring power to AE2 with 500 mA LOAD (50% charging level)
op. 3	Wireless charging	Wireless charging was activated. The EUT is transferring power to AE2 with 100 mA LOAD (90% charging level)

*) EUT operating mode no. is used to simplify the test report.
Less than 5% charging level is not possible due to technical reasons with the Qi Receiver Simulator

3.6. Additional declaration and description of EUT

Set up 1 + 2 + 3	☐ table-top ☐ floor-standing ☐ wall-mounted ☒ not defined	typical use ☐ portable use ☐ fixed use ☒ vehicular use	
Place of use	☐ Residential, commercial and light industry ☐ Industrial environment ☒ vehicular use		
typical operating cycle of EUT	☐ < 0.5 sec. ☐ :		
Power line: ☐ AC ☐ 120 V, ☐ 230 V, ☐ 400 V ☐ PE, ☐ N, ☐ L1, ☐ L2 ☐ L3 ☐ __ Hz ☒ DC ☒ 13.5V	EUT-grounding: ☒ none ☐ with power supply ☐ additional: (in case of deviation during tests the single details are described on chapter 4)		
Other Ports (description of interconnecting cables) Description	possible total cable length	shielding	connected during test
1. Power Line	☒ < 3 m ☐ > 3 m	☐ screened ☒ unscreened	☒ yes ☐ no
2. Antenna Line	☒ < 3 m ☐ > 3 m	☐ screened ☒ unscreened	☒ yes ☐ no
Does EUT contain devices susceptible to magnetic fields, e.g. Hall elements, electrodynamics microphones, etc.?			☐ yes ☒ no
Is mounting position / usual operating position defined?			☒ yes ☐ no

4. DESCRIPTION OF TEST SET-UP's

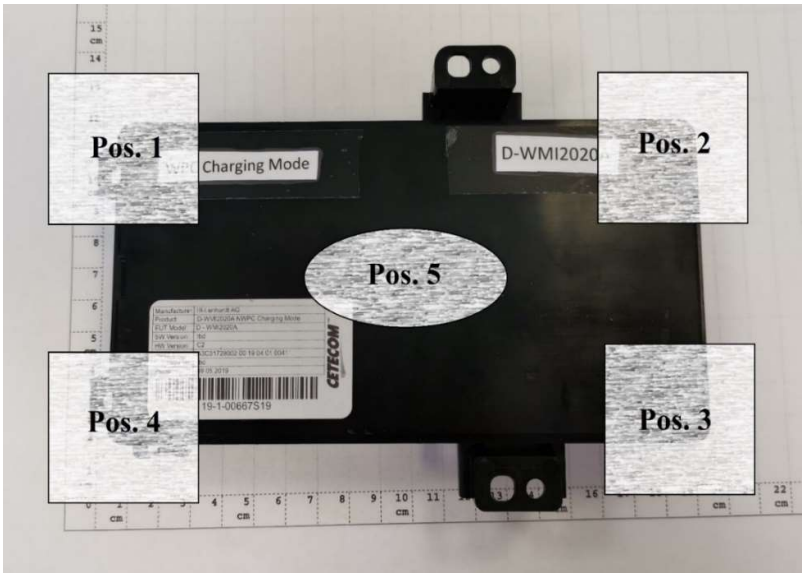
4.1. Test Set-up for configuration

The RF exposure test is performed in shielded room.
The EUT was placed on a table.

The measurement probe was surrounding point 1 to point 4 at a distance of 6.2 cm from the EUT and 9.7 cm above the top surface (point 5) for H-field and E-filed strength.

The distances were declared as the worst case by the customer

Set 1:



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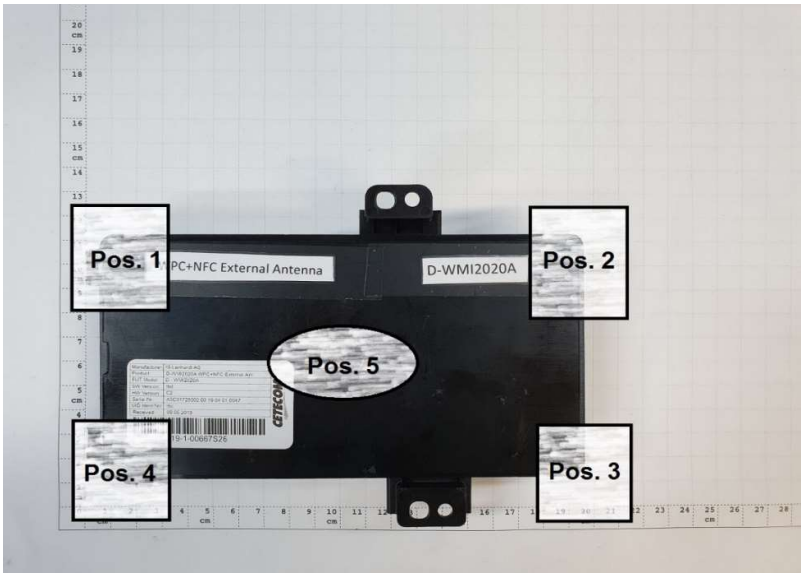

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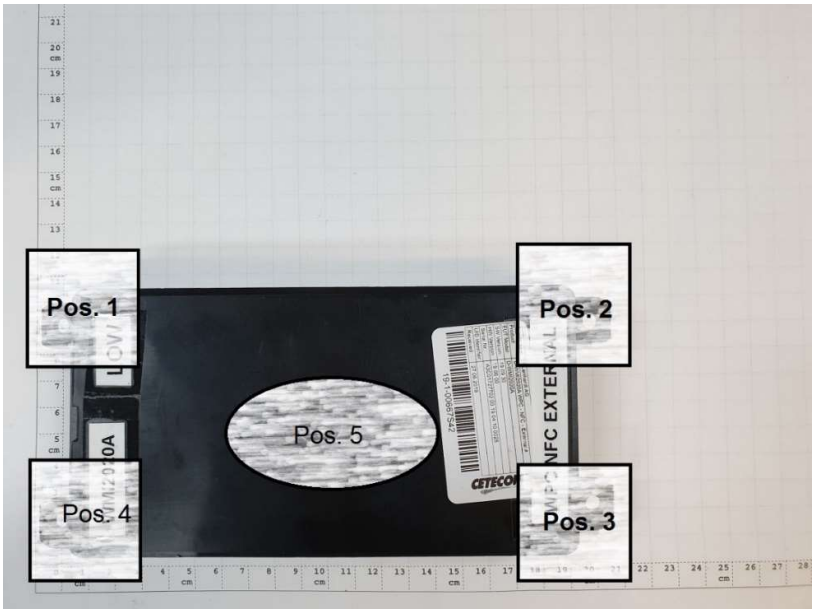
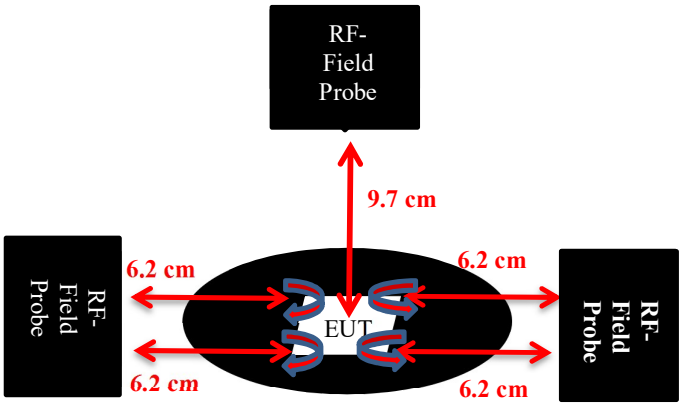




Schematic: Test set-up for RF exposure measurements

Measurement for E-Field with NBM550 + EF 0391 probe
Measurement for H-Field with ELT 400 + ELT probe 100 cm²

5. Maximum Permissible RF Exposure

5.1.FCC References & Limits

FCC Rules: §1.1310, § 2.1093

The criteria used for the evaluation of human exposure to radio frequency radiation is listed in table 1 according FCC §1.1307(b, except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this.

Note 1 to table 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provide those persons are fully aware for a exposure and can control over their exposure. Limits for occupational/controlled exposures also apply in situations when an individual is transient through a location where occupational/controlled apply provided he or she is made aware of the potential for exposure.

Note 2 to table 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*($180/f^2$)	30
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

f = frequency in MHz

So applicable limits in this case are as follows:

§1.1310 LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)
Table 1(B) Limits for General Population/Uncontrolled Exposure

0.3–1,34 MHz: Electric field: 614 V/m

0.3–1,34 MHz: Magnetic field: 1.63 A/m

5.2. E-Field Results

5.2.1. Test location and equipment (for reference numbers please see chapter 'List of test equipment')

test location	☒ CETECOM Essen (Chapter 2.2.1)		☐ Please see Chapter 2.2.2		☐ Please see Chapter 2.2.3	
equipment	☒ NBM 550	☒ EF 0391	☐	☐	☐	☐
signaling	☐ 017 CMD 65	☐ 323 CMD 55	☐ 340 CMD 55			
signaling	☐ 298 CMU	☐ 460 CMU	☐ 295 RACAL	☐ 392 MT8820A		
line voltage	☒ 13.5 V DC					

5.2.2. Test condition and test set-up

link to test system (if used):	☐ air link	☐ cable connection	
EUT-grounding (if different to chapter 3.5)	☐ none	☐ with power supply	☐ additional connection
Equipment set up	-		-
Climatic conditions	Temperature: 24 °C		Rel. humidity: 31 % rH

5.2.3. Results

Table 1:
The aggregate E-Field strengths at 6.2 cm surrounding the device:

EUT Type and S/N or EUT set-up no.			Set- up 1	
EUT operating mode or operating mode no.			EUT operating mode 1 (5% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	1	0.062	7.71	614
127.5	2	0.062	8.52	614
127.5	3	0.062	8.73	614
127.5	4	0.062	9.0	614

Remarks:

EUT Type and S/N or EUT set-up no.			Set- up 1	
EUT operating mode or operating mode no.			EUT operating mode 2 (50% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	1	0.062	2.48	614
127.5	2	0.062	2.59	614
127.5	3	0.062	2.62	614
127.5	4	0.062	2.66	614

Remarks:

EUT Type and S/N or EUT set-up no.			Set- up 1	
EUT operating mode or operating mode no.			EUT operating mode 3 (90% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	1	0.062	0.49	614
127.5	2	0.062	0.52	614
127.5	3	0.062	0.57	614
127.5	4	0.062	0.58	614

Remarks:

EUT Type and S/N or EUT set-up no.			Set- up 2	
EUT operating mode or operating mode no.			EUT operating mode 1 (5% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	1	0.062	7.50	614
127.5	2	0.062	8.0	614
127.5	3	0.062	8.33	614
127.5	4	0.062	8.71	614

Remarks:

EUT Type and S/N or EUT set-up no.			Set- up 2	
EUT operating mode or operating mode no.			EUT operating mode 2 (50% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	1	0.062	2.45	614
127.5	2	0.062	2.53	614
127.5	3	0.062	2.59	614
127.5	4	0.062	2.61	614

Remarks:

EUT Type and S/N or EUT set-up no.			Set- up 2	
EUT operating mode or operating mode no.			EUT operating mode 3 (90% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	1	0.062	0.47	614
127.5	2	0.062	0.53	614
127.5	3	0.062	0.55	614
127.5	4	0.062	0.60	614

Remarks:

EUT Type and S/N or EUT set-up no.			Set- up 3	
EUT operating mode or operating mode no.			EUT operating mode 1 (5% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	1	0.062	7.13	614
127.5	2	0.062	7.81	614
127.5	3	0.062	8.12	614
127.5	4	0.062	8.53	614

Remarks:

EUT Type and S/N or EUT set-up no.			Set- up 3	
EUT operating mode or operating mode no.			EUT operating mode 2 (50% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	1	0.062	2.48	614
127.5	2	0.062	2.59	614
127.5	3	0.062	2.62	614
127.5	4	0.062	2.66	614

Remarks:

EUT Type and S/N or EUT set-up no.			Set- up 3	
EUT operating mode or operating mode no.			EUT operating mode 3 (90% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	1	0.062	0.41	614
127.5	2	0.062	0.47	614
127.5	3	0.062	0.50	614
127.5	4	0.062	0.51	614

Remarks:

Table 2:
The aggregate E-Field strengths at 9.7 cm above the top of the device:

EUT Type and S/N or EUT set-up no.			Set- up 1	
EUT operating mode or operating mode no.			EUT operating mode 1 (5% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	5	0.097	**9.55**	614

Remarks:

EUT Type and S/N or EUT set-up no.			Set- up 1	
EUT operating mode or operating mode no.			EUT operating mode 1 (50% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	5	0.097	5.12	614

Remarks:

EUT Type and S/N or EUT set-up no.			Set- up 1	
EUT operating mode or operating mode no.			EUT operating mode 1 (90% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	5	0.097	0.55	614

Remarks:

EUT Type and S/N or EUT set-up no.			Set- up 2	
EUT operating mode or operating mode no.			EUT operating mode 1 (5% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	5	0.097	**9.26**	614

Remarks:

EUT Type and S/N or EUT set-up no.			Set- up 2	
EUT operating mode or operating mode no.			EUT operating mode 1 (50% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	5	0.097	5.14	614

Remarks:

EUT Type and S/N or EUT set-up no.			Set- up 2	
EUT operating mode or operating mode no.			EUT operating mode 1 (90% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	5	0.097	0.78	614

Remarks:

EUT Type and S/N or EUT set-up no.			Set- up 3	
EUT operating mode or operating mode no.			EUT operating mode 1 (5% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	5	0.097	**8.47**	614

Remarks:

EUT Type and S/N or EUT set-up no.			Set- up 3	
EUT operating mode or operating mode no.			EUT operating mode 1 (50% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	5	0.097	5.10	614

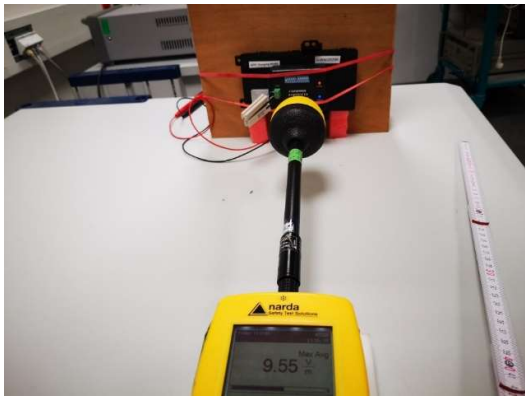
Remarks:

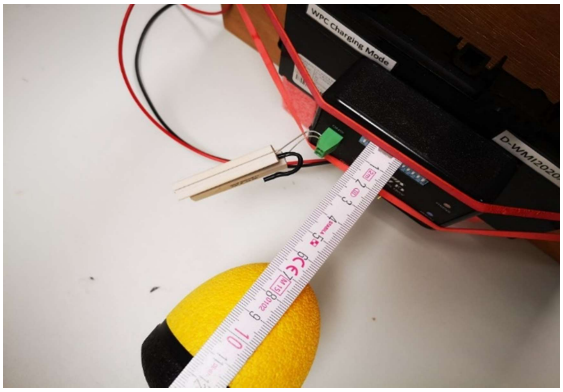
EUT Type and S/N or EUT set-up no.			Set- up 3	
EUT operating mode or operating mode no.			EUT operating mode 1 (90% charging level)	
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	E-field (V/m)	E-field Limit (V/m)
127.5	5	0.097	0.84	614

Remarks:

Max E-Field, 9.7 cm distance between EUT and probe (top side)

Set 1:





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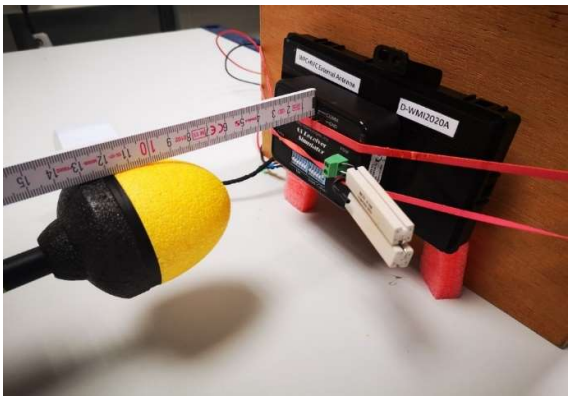

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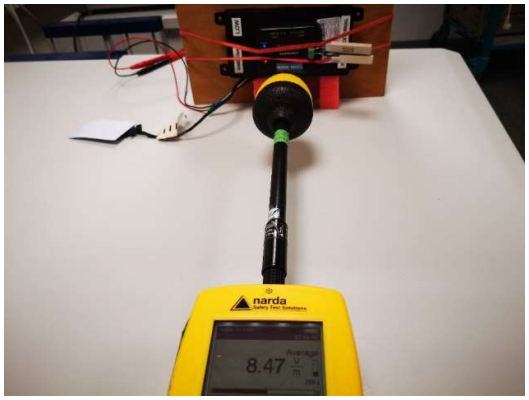
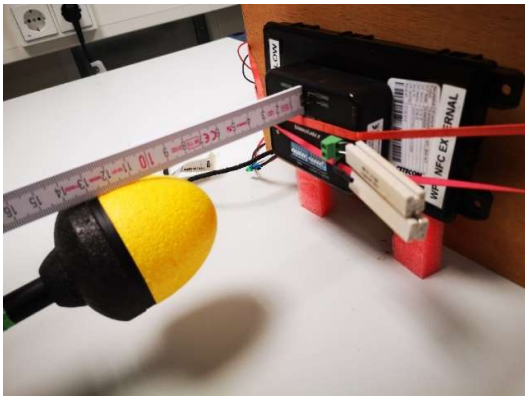




5.3. H-Field Results

5.3.1. Test location and equipment (for reference numbers please see chapter 'List of test equipment')

test location	☒ CETECOM Essen (Chapter 2.2.1)		☐ Please see Chapter 2.2.2		☐ Please see Chapter 2.2.3	
equipment	☒ 802 ELT400	☒ 803 ELT probe 3cm²	☐	☐	☐	☐
signaling	☐ 017 CMD 65	☐ 323 CMD 55	☐ 340 CMD 55			
signaling	☐ 298 CMU	☐ 460 CMU	☐ 295 RACAL	☐ 392 MT8820A		
line voltage	☒ 13.5 V DC					

5.3.2. Test condition and test set-up

link to test system (if used):	☐ air link	☐ cable connection	
EUT-grounding (if different to chapter 3.5)	☐ none	☐ with power supply	☐ additional connection
Equipment set up	-		-
Climatic conditions	Temperature: 24 °C		Rel. humidity: 31 % rH

Table 4:
The aggregate H-Field strengths at 6,2cm surrounding the device:

EUT Type and S/N or EUT set-up no			Set-up 1		
EUT operating mode or operating mode no.			EUT operating mode 1 (5% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	1	0.062	0.84	1.63	passed
127.5	2	0.062	0.85	1.63	passed
127.5	3	0.062	0.91	1.63	passed
127.5	4	0.062	0.95	1.63	passed

Remarks: Measurement values were transformed from µT to A/m, where 1 A/m = 1.256 µT

EUT Type and S/N or EUT set-up no.			Set-up 1		
EUT operating mode or operating mode no.			EUT operating mode 2 (50% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	1	0.062	0.65	1.63	passed
127.5	2	0.062	0.68	1.63	passed
127.5	3	0.062	0.71	1.63	passed
127.5	4	0.062	0.75	1.63	passed

Remarks: Measurement values were transformed from µT to A/m, where 1 A/m = 1.256 µT

EUT Type and S/N or EUT set-up no.			Set-up 1		
EUT operating mode or operating mode no.			EUT operating mode 3 (90% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	1	0.062	0.41	1.63	passed
127.5	2	0.062	0.47	1.63	passed
127.5	3	0.062	0.54	1.63	passed
127.5	4	0.062	0.51	1.63	passed

Remarks: Measurement values were transformed from µT to A/m, where 1 A/m = 1.256 µT

EUT Type and S/N or EUT set-up no			Set-up 2		
EUT operating mode or operating mode no.			EUT operating mode 1 (5% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	1	0.062	0.82	1.63	passed
127.5	2	0.062	0.83	1.63	passed
127.5	3	0.062	0.89	1.63	passed
127.5	4	0.062	0.91	1.63	passed

Remarks: Measurement values were transformed from µT to A/m, where 1 A/m = 1.256 µT

EUT Type and S/N or EUT set-up no.			Set-up 2		
EUT operating mode or operating mode no.			EUT operating mode 2 (50% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	1	0.062	0.60	1.63	passed
127.5	2	0.062	0.62	1.63	passed
127.5	3	0.062	0.68	1.63	passed
127.5	4	0.062	0.70	1.63	passed

Remarks: Measurement values were transformed from µT to A/m, where 1 A/m = 1.256 µT

EUT Type and S/N or EUT set-up no.			Set-up 2		
EUT operating mode or operating mode no.			EUT operating mode 3 (90% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	1	0.062	0.40	1.63	passed
127.5	2	0.062	0.45	1.63	passed
127.5	3	0.062	0.50	1.63	passed
127.5	4	0.062	0.52	1.63	passed

Remarks: Measurement values were transformed from µT to A/m, where 1 A/m = 1.256 µT

EUT Type and S/N or EUT set-up no			Set-up 3		
EUT operating mode or operating mode no.			EUT operating mode 1 (5% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	1	0.062	0.80	1.63	passed
127.5	2	0.062	0.82	1.63	passed
127.5	3	0.062	0.86	1.63	passed
127.5	4	0.062	0.90	1.63	passed

Remarks: Measurement values were transformed from µT to A/m, where 1 A/m = 1.256 µT

EUT Type and S/N or EUT set-up no.			Set-up 3		
EUT operating mode or operating mode no.			EUT operating mode 2 (50% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	1	0.062	0.56	1.63	passed
127.5	2	0.062	0.59	1.63	passed
127.5	3	0.062	0.64	1.63	passed
127.5	4	0.062	0.70	1.63	passed

Remarks: Measurement values were transformed from µT to A/m, where 1 A/m = 1.256 µT

EUT Type and S/N or EUT set-up no.			Set-up 3		
EUT operating mode or operating mode no.			EUT operating mode 3 (90% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	1	0.062	0.39	1.63	passed
127.5	2	0.062	0.42	1.63	passed
127.5	3	0.062	0.48	1.63	passed
127.5	4	0.062	0.50	1.63	passed

Remarks: Measurement values were transformed from µT to A/m, where 1 A/m = 1.256 µT

Table 5:
The aggregate H-Field strengths at 9.7 cm above the top of the device:

EUT Type and S/N or EUT set-up no.			Set-up 1		
EUT operating mode or operating mode no.			EUT operating mode 1 (5% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	5	0.097	**0.98**	1.63	passed

Remarks: Measurement values were transformed from µT to A/m, where 1 A/m = 1.256 µT

EUT Type and S/N or EUT set-up no.			Set-up 1		
EUT operating mode or operating mode no.			EUT operating mode 2 (50% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	5	0.097	0.78	1.63	passed

Remarks: Measurement values were transformed from µT to A/m, where 1 A/m = 1.256 µT

EUT Type and S/N or EUT set-up no.			Set-up 1		
EUT operating mode or operating mode no.			EUT operating mode 3 (90% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	5	0.097	0.71	1.63	passed

Remarks: Measurement values were transformed from µT to A/m, where 1 A/m = 1.256 µT

EUT Type and S/N or EUT set-up no.			Set-up 2		
EUT operating mode or operating mode no.			EUT operating mode 1 (5% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	5	0.097	**0.79**	1.63	passed

Remarks: Measurement values were transformed from µT to A/m, where 1 A/m = 1.256 µT

EUT Type and S/N or EUT set-up no.			Set-up 2		
EUT operating mode or operating mode no.			EUT operating mode 2 (50% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	5	0.097	0.78	1.63	passed

Remarks: Measurement values were transformed from µT to A/m, where 1 A/m = 1.256 µT

EUT Type and S/N or EUT set-up no.			Set-up 2		
EUT operating mode or operating mode no.			EUT operating mode 3 (90% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	5	0.097	0.77	1.63	passed

Remarks: Measurement values were transformed from µT to A/m, where 1 A/m = 1.256 µT

EUT Type and S/N or EUT set-up no.			Set-up 3		
EUT operating mode or operating mode no.			EUT operating mode 1 (5% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	5	0.097	**0.82**	1.63	passed

Remarks: Measurement values were transformed from µT to A/m. where 1 A/m = 1.256 µT

EUT Type and S/N or EUT set-up no.			Set-up 3		
EUT operating mode or operating mode no.			EUT operating mode 2 (50% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	5	0.097	0.72	1.63	passed

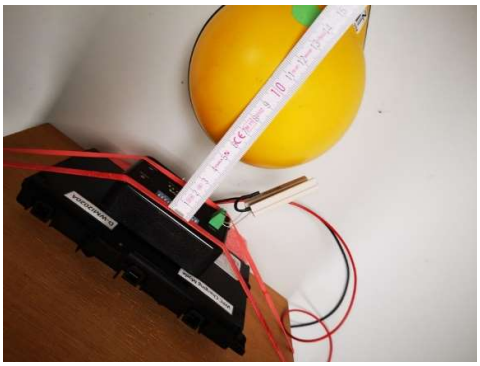
Remarks: Measurement values were transformed from µT to A/m. where 1 A/m = 1.256 µT

EUT Type and S/N or EUT set-up no.			Set-up 3		
EUT operating mode or operating mode no.			EUT operating mode 3 (90% charging level)		
Frequency Range (kHz)	Position	Distance between EUT and Field probe (m)	H-field (A/m)	H-field Limit (A/m)	Result
127.5	5	0.097	0.66	1.63	passed

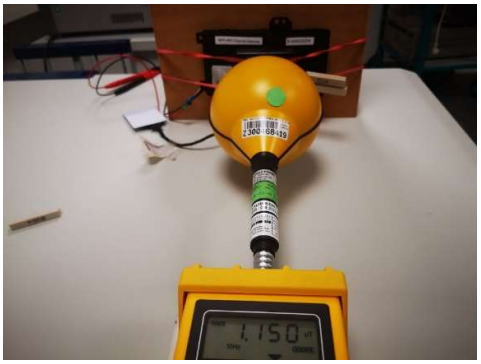
Remarks: Measurement values were transformed from µT to A/m, where 1 A/m = 1.256 µT

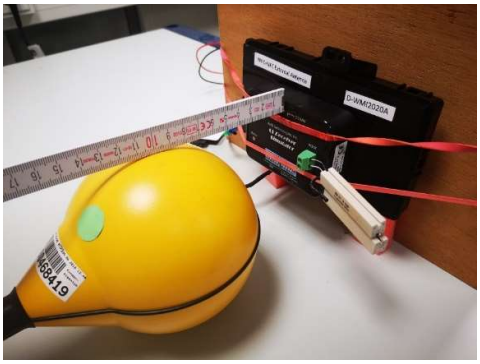
Max H-Field, 9.7 cm Distance between EUT and probe (top side)

Set 1:

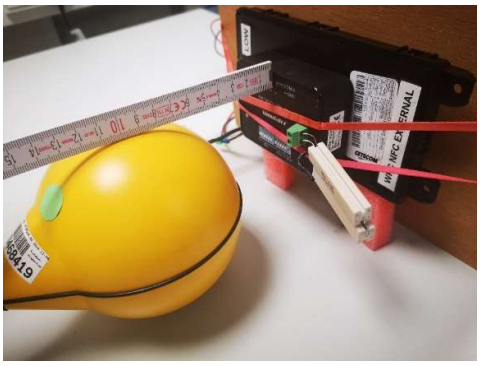


Set 2:



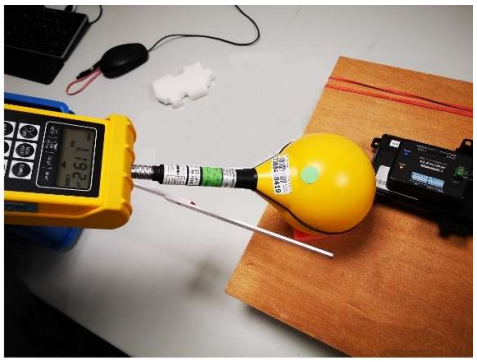


Set 3:



Max H-Field, 6.2 cm Distance between EUT and probe (edge of the device, Point 4)

Set 1:




Set 2:


Set 3:


6. Measurement uncertainties

The reported uncertainties are calculated based on the standard uncertainty multiplied with the appropriate coverage factor **k**, such that a confidence level of approximately 95% is achieved.
For uncertainty determination, each component used in the concrete measurement set-up was taken in account and its contribution to the overall uncertainty according it's statistical distribution calculated.

Following table shows expectable uncertainties for each measurement type performed.

RF-Measurement	Frequency range	Calculated uncertainty based on a confidence level of 95%	Remarks:
Power Output conducted	9 kHz .. 20 GHz	1.0 dB	--
Power Output radiated	30 MHz .. 4 GHz	3.17 dB	Substitution method
Conducted emissions on antenna ports	9 kHz .. 20 GHz	1.0 dB	--
Radiated emissions enclosure	9 kHz .. 30 MHz	5.0 dB	Magnetic field
	9 MHz .. 1 GHz	5.0 dB	E-Field
	30 MHz .. 1 GHz	4.2 dB	E-Field
	1 GHz .. 20 GHz	3.17 dB	Substitution method
Occupied bandwidth	9 kHz .. 4 GHz	0.1272 ppm (Delta Marker)	Frequency error
		1.0 dB	Power
Emission bandwidth	9 kHz .. 4 GHz	0.1272 ppm (Delta Marker)	Frequency error
		1.0 dB	Power
Frequency stability	9 kHz .. 20 GHz	0.0636 ppm	--
Conducted emissions on AC-mains port (U_{CISPR})	9 kHz .. 150 kHz	4.0 dB	--
	150 kHz .. 30 MHz	3.6 dB	

Table: measurement uncertainties, valid for conducted/radiated measurements

7. Accreditation details of CETECOM's laboratories and test sites

Ref.-No.	Accreditation Certificate	Valid for laboratory area or test site	Accreditation Body
-	D-PL-12047-01-01	All laboratories and test sites of CETECOM GmbH, Essen	DAkkS, Deutsche Akkreditierungsstelle GmbH
337 487 558 348 348	MRA US-EU 0003	Radiated Measurements 30 MHz to 1 GHz, 3 m / 10 m (OATS) Radiated Measurements 30 MHz to 1 GHz, 3 m (SAR) Radiated Measurements above 1 GHz, 3 m (FAR) Mains Ports Conducted Interference Measurements Telecommunication Ports Conducted Interference Measurem.	FCC, Federal Communications Commission Laboratory Division, USA (MRA US-EU 0003)
337 487 550 558	3462D-1 3462D-2 3462D-2 3462D-3	Radiated Measurements 30 MHz to 1 GHz, 3 m / 10 m (OATS) Radiated Measurements 30 MHz to 1 GHz, 3 m (SAR) Radiated Measurements 1 GHz to 6 GHz, 3 m (SAR) Radiated Measurements above 1 GHz, 3 m (FAR)	IC, Industry Canada Certification and Engineering Bureau
337 487 550 348	R-20013 G-20013 C-20009 T-20006	Radiated Measurements 30 MHz to 1 GHz, 3 m (SAR) Radiated Measurements 1 GHz to 6 GHz, 3 m (SAR) Mains Ports Conducted Interference Measurements Telecommunication Ports Conducted Interference Measurem.	VCCI, Voluntary Control Council for Interference by Information Technology Equipment, Japan
OATS = Open Area Test Site, SAR = Semi Anechoic Room, FAR = Fully Anechoic Room			

8. Instruments and Ancillary

8.1. Used equipment "CTC"

The "Ref.-No" in the left column of the following tables allows the clear identification of the laboratory equipment.

8.1.1. Test software and firmware of equipment

Ref.-No.	Equipment	Type	Serial-No.	Version of Firmware or Software during the test
001	EMI Test Receiver	ESS	825132/017	Firm.= 1.21 , OTP=2.0, GRA=2.0
012	Signal Generator (EMS-cond.)	SMY 01	839069/027	Firm.= V 2.02
013	Power Meter (EMS cond.)	NRVD	839111/003	Firm.= V 1.51
017	Digital Radiocommunication Tester	CMD 60 M	844365/014	Firmware = V 3.52 .22.01.99, DECT = D2.87 13.01.99
053	Audio Analyzer	UPA3	860612/022	Firm. V 4.3
119	RT Harmonics Analyzer dig. Flickermeter	B10	G60547	Firm.= V 3.1DHG
140	Signal Generator	SMHU	831314/006	Firm.= 3.21
261	Thermal Power Sensor	NRV-Z55	825083/0008	EPROM-Datum 02.12.04, SE EE 1 B
262	Power Meter	NRV-S	825770/0010	Firm.= 2.6
263	Signal Generator	SMP 04	826190/0007	Firm.=3.21
264	Spectrum Analyzer	FSEK 30	826939/005	Bios=2.1, Analyzer= 3.20
295	Racal Digital Radio Test Set	6103	1572	UNIT Firmware= 4.04, SW-Main=4.04, SW-BBP=1.04, SW-DSP=1.02, Hardboot=1.02, Softboot=2.02
298	Univ. Radio Communication Tester	CMU 200	832221/091	R&S Test Firmware =3.53 /3.54 (current Testsoftw. f. all band used
323	Digital Radiocommunication Tester	CMD 55	825878/0034	Firm.= 3.52 .22.01.99
331	Climatic Test Chamber -40/+80 Grad	HC 4055	43146	TSI 1.53
335	CTC-EMS-Conducted	System EMS Conducted	-	EMC 32 V 8.52
340	Digital Radiocommunication Tester	CMD 55	849709/037	Firm.= 3.52 .22.01.99
355	Power Meter	URV 5	891310/027	Firm.= 1.31
365	10V Insertion Unit 50 Ohm	URV5-Z2	100880	Eprom Data = 31.03.08
366	Ultra Compact Simulator	UCS 500 M4	V0531100594	Firm. UCS 500=001925/3.06a02, rc=ISMIEC 4.10
371	Bluetooth Tester	CBT32	100153	CBT V5,30+ SW-Option K55, K57
377	EMI Test Receiver	ESCS 30	100160	Firm.= 2.30, OTP= 02.01, GRA= 02.36
378	Broadband RF Field Monitor	RadiSense III	03D00013SNO-08	Firm.= V.03D13
389	Digital Multimeter	Keithley 2000	0583926	Firm. = A13 (Mainboard) A02 (Display)
392	Radio Communication Tester	MT8820A	6K00000788	Firm.= 4.50 #005, IPL=4.01#001,OS=4.02#001, GSM=4.41#013, W-CDMA= 4.54#004, scenario= 4.52#002
436	Univ. Radio Communication Tester	CMU 200	103083	R&S Test Firmware Base=5.14, Mess-Software= GSM:5.14 WCDMA:5.14 (current Testsoftw. F. all band
441	CTC-SAR-EMI Cable Loss	System EMI field (SAR)	-	EMC 32 Version 8.52
442	CTC-SAR-EMS	System EMS field (SAR)	-	EMC 32 Version 8.40
443	CTC-FAR-EMI-RSE	System CTC-FAR-EMI-RSE	-	Spuri 7.2.5 or EMC 32 Ver. 9.15.00
444	CTC-FAR-EMS field	System-EMS-Field (FAR)	-	EMC 32 Version 9.15.00
460	Univ. Radio Communication Tester	CMU 200	108901	R&S Test Firmware Base=5.14, GSM=5.14 WCDMA=5.14 (current Testsoftw.,f. all band to be used,
489	EMI Test Receiver	ESU40	1000-30	Firmware=4.43 SP3, Bios=V5.1-16-3, Spec. =01.00
491	ESD Simulator dito	ESD dito	dito307022	V 2.30
524	Voltage Drop Simulator	VDS 200	0196-16	Software Nr: 000037 Version V4.20a01
526	Burst Generator	EFT 200 A	0496-06	Software Nr. 000034 Version V2.32
527	Micro Pulse Generator	MPG 200 B	0496-05	Software-Nr. 000030 Version V2.43
528	Load Dump Simulator	LD 200B	0496-06	Software-Nr. 000031 Version V2.35a01
546	Univ. Radio Communication Tester	CMU 200	106436	R&S Test Firmware Base=5.14, GSM=5.14 WCDMA=5.14 (current Testsoftw.,f. all band to be used
547	Univ. Radio Communication Tester	CMU 200	835390/014	R&S Test Firmware Base=V5.1403 (current Testsoftw., f. all band used, GSM = 5.14 WCDMA: = 5.14
584	Spectrum Analyzer	FSU 8	100248	2.82_SP3
597	Univ. Radio Communication Tester	CMU 200	100347	R&S Test Firmware Base=5.01, GSM=5.02 WCDMA= not installed, Mainboard= µP1=V.850
598	Spectrum Analyzer	FSEM 30 (Reserve)	831259/013	Firmware Bios 3.40 , Analyzer 3.40 Sp 2
620	EMI Test Receiver	ESU 26	100362	4.43_SP3
642	Wideband Radio Communication Tester	CMW 500	126089	Setup V03.26, Test programm component V03.02.20
692	Bluetooth Tester	CBT 32	100236	CBT V 5.40, FW: V.2.41 (FPGA Digital, V. 3.09 FPGA RF)

8.1.2. Single instruments and test systems

Ref.-No.	Equipment	Type	Serial-No.	Manufacturer	Interval of calibration	Remark	Cal due
487	System CTC NSA-Verification SAR-EMI	System EMI field (SAR) NSA	-	ETS Lindgren / CETECOM	24 M	-	16.03.2021
468	Digital Multimeter	Fluke 112	90090455	Fluke USA	36 M	-	30.04.2021
802	Exposure Level Tester	ELT-400	O-0026	NARDA Safety Solutions	24 M	-	30.01.2021
803	Probe	ELT probe 3cm²	O-0026	Narda Safety Test Solution	24 M	-	30.01.2021
--	Broadband Field Meter	NBM 550	A-0150	Narda Safety Test Solution	24 M	-	30.11.2019
--	E-Field Probe	EF 0391	A-0124	Narda Safety Test Solution	24 M	-	30.11.2019

8.1.3. Legend

Note / remarks		Calibrated during system calibration:
	1a	System CTC-SAR-EMS (Ref.-No. 442)
	1b	System-CTC-EMS-Conducted (Ref.-No. 335)
	1c	System CTC-FAR-EMI-RSE (Ref.-No . 443)
	1d	System CTC-SAR-EMI (Ref.-No . 441)
	1e	System CTC-OATS (EMI radiated) (Ref.-No. 337)
	1 f	System CTC-CTIA-OTA (Ref.-No . 420)
	1 g	System CTC-FAR-EMS (Ref.-No . 444)
	2	Calibration or equipment check immediately before measurement
	3	Regulatory maintained equipment for functional check or support purpose
	4	Ancillary equipment without calibration e.g. mechanical equipment or monitoring equipment
	5	Test System

Interval of calibration	12 M	12 month
	24 M	24 month
	36 M	36 month
	24/12 M	Calibration every 24 months, between this every 12 months internal validation
	36/12 M	Calibration every 36 months, between this every 12 months internal validation
	Pre-m	Check before starting the measurement
	-	Without calibration

9. Versions of test reports (change history)

Version	Applied changes	Date of release
--	Initial release	2019-09-16

End of Test Report