

TEST REPORT
No.: 18-1-0070201T07b-C1

According to:
FCC Regulations
§1.1310, §1.1307 (b)
§ 2.1091 & 2.1093

for
Laird Technologies, Inc.

Wireless Charging Unit WCH-209

FCC ID: 2APE3WCH-209

| Laboratory Accreditation and Listings | | |
|--|---|--|
|   Deutsche Akkreditierungsstelle D-PL-00000-00-00 |  Industry Canada Reg. No.: 3462D-1 Reg. No.: 3462D-2 Reg. No.: 3462D-3 |  Voluntary Controls for Electromagnetic Emissions Reg. No.: R-4452, C-20009, T-20006, G-20013 |
|  |  Lab Code: 20011130-00 |  MRA US-EU 0003 |
| accredited according to DIN EN ISO/IEC 17025 | | |
| <p>CETECOM GmbH Laboratory Radio Communications & Electromagnetic Compatibility Im Teelbruch 116 • 45219 Essen • Germany Registered in Essen, Germany, Reg. No.: HRB Essen 8984 Tel.: + 49 (0) 20 54 / 95 19-954 • Fax: + 49 (0) 20 54 / 95 19-964 E-mail: info@cetecom.com • Internet: www.cetecom.com</p> | | |

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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 Mobile charger.
The wireless charger is operated at Frequency 111kHz.

TEST OVERVIEW

| No. of Diagram group | Test Cases | Port | References, Standards & Limits | | EUT set-up | EUT op-mode | Measured values | Result |
|----------------------|-------------------------|-----------------------------|--|------------|------------|-------------|--|--------|
| | | | FCC | Limits | | | | |
| 1.1 | Electric field strength | 4cm – 15cm distance to EUT | §1.1310 §1.1307 (b) §2.1091 §2.1093 | 614 (V/m) | 1 | 1 | all values are below the regulatory limits | passed |
| 1.2 | Magnetic field strength | 1,6cm -20cm distance to EUT | §1.1310 §1.1307 (b) §2.1091 §2.1093 | 1.63 (A/m) | 1 | 1 | all values are below the regulatory limits | passed |

Remark:

Following tests have been performed to show compliance with applicable Standards:

FCC §1.1310, §1.1307 (b), §2.1091 §2.1093

OET Bulletin 65 Supplement C

KDB 680106 D01 V03.

Test report 18-1-0070201T07b-C1, dated 2018-10-18 is replacing original test report 18-1-0070201T07b, dated 2018-10-01. The replaced test report is invalid herewith.

Dipl.-Ing. Niels Jeß
Responsible for test section

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: | 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: | 2018-08-31 |
| Date(s) of test: | 2018-09-23 |
| Date of report: | 2018-10-01 |
| <hr/> | |
| Version of template: | 12.11 |

2.4. Applicant's details

| | |
|-------------------|--|
| Applicant's name: | Laird Technologies, Inc. |
| Address: | 8100 Industrial Park Dr. Grand Blanc, MI, 48439 |
| | USA |
| Contact person: | Ms. Rhonda Turner |

2.5. Manufacturer's details

| | |
|----------------------|--|
| Manufacturer's name: | Laird Wireless Shanghai Ltd. |
| Address: | 398 Lane 3088 Hua'ning Road Shanghai 201108 |
| | China |

3. Equipment under test (EUT)

3.1. Technical data of main EUT declared by applicant

| | | | |
|------------------------|---|---|--------------------------------------|
| Main function | <input checked="" type="checkbox"/> Wireless Power Transfer | | |
| Type | WCH-209b | | |
| Frequency range | Fixed frequency 111kHz for wireless charging | | |
| Antenna Type | <input checked="" type="checkbox"/> Integrated (coil type) <input type="checkbox"/> External, no RF- connector <input type="checkbox"/> External, separate RF-connector | | |
| Power supply | <input checked="" type="checkbox"/> 12V DC | | |
| Special EMI components | -- | | |
| EUT sample type | <input checked="" type="checkbox"/> Production | <input type="checkbox"/> Pre-Production | <input type="checkbox"/> Engineering |
| FCC label attached | <input type="checkbox"/> yes | <input checked="" type="checkbox"/> no | |

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

| Short description*) | EUT | Type | S/N serial number | HW hardware status | SW software status |
|---------------------|------------------------|---|-------------------|--------------------|--------------------|
| EUT A | Wireless Charging Unit | Wireless Power Transfer Device WCH-209b | 711822802000 0003 | 4.0 | RC11 |

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

Remark: The type WCH-209 has two variants, WCH-209a and WCH-209b. All tests are performed with only one variant, WCH-209b. The customer has declared a "Declaration of Similarity" for it.

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

| AE short description*) | Auxiliary Equipment | Type | S/N serial number | HW hardware status | SW software status |
|------------------------|----------------------|-------------------|-------------------|--------------------|--------------------|
| AE 1 | Samsung Mobile Phone | Samsung Galaxy S7 | R58J46PML VK | -- | -- |

*) 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 | -- |

*) 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 AE1 |

*) EUT operating mode no. is used to simplify the test report.

3.6. Additional declaration and description of EUT

| | | | | |
|---|--|--|---|--|
| Set up 1 | <input type="checkbox"/> table-top <input type="checkbox"/> floor-standing <input type="checkbox"/> wall-mounted <input checked="" type="checkbox"/> not defined | <input type="checkbox"/> typical use <input type="checkbox"/> portable use <input type="checkbox"/> fixed use <input checked="" type="checkbox"/> vehicular use | | |
| Place of use | <input type="checkbox"/> Residential, commercial and light industry <input type="checkbox"/> Industrial environment <input checked="" type="checkbox"/> vehicular use | | | |
| Highest internal frequency generated by EUT | <input checked="" type="checkbox"/> 111kHz | | | |
| typical operating cycle of EUT | <input checked="" type="checkbox"/> < 0,5 sec. <input type="checkbox"/> : | | | |
| Power line: | EUT-grounding: <input type="checkbox"/> none <input type="checkbox"/> with power supply <input type="checkbox"/> additional: (in case of deviation during tests the single details are described on chapter 4) | | | |
| AC <input type="checkbox"/> 120V, <input type="checkbox"/> 230V, <input type="checkbox"/> 400V PE, <input type="checkbox"/> N, <input type="checkbox"/> L1, <input type="checkbox"/> L2 <input type="checkbox"/> L3 <input type="checkbox"/> Hz <input checked="" type="checkbox"/> DC <input type="checkbox"/> 5V, <input checked="" type="checkbox"/> 12.0V <input type="checkbox"/> 24V | | | | |
| Other Ports (description of interconnecting cables) | possible total cable length | shielding | connected during test | |
| Description | Connector | | | |
| 1. Main | Multi pin | <input checked="" type="checkbox"/> < 3m <input type="checkbox"/> > 3m <input type="checkbox"/> : other | <input type="checkbox"/> screened <input checked="" type="checkbox"/> unscreened | <input checked="" type="checkbox"/> yes <input type="checkbox"/> no |
| Does EUT contain devices susceptible to magnetic fields, e.g. Hall elements, electrodynamics microphones, etc.? | | | | <input type="checkbox"/> yes <input checked="" type="checkbox"/> no |
| Is mounting position / usual operating position defined? | | | | <input type="checkbox"/> yes <input checked="" type="checkbox"/> no |

Remark

4. DESCRIPTION OF TEST SET-UP's

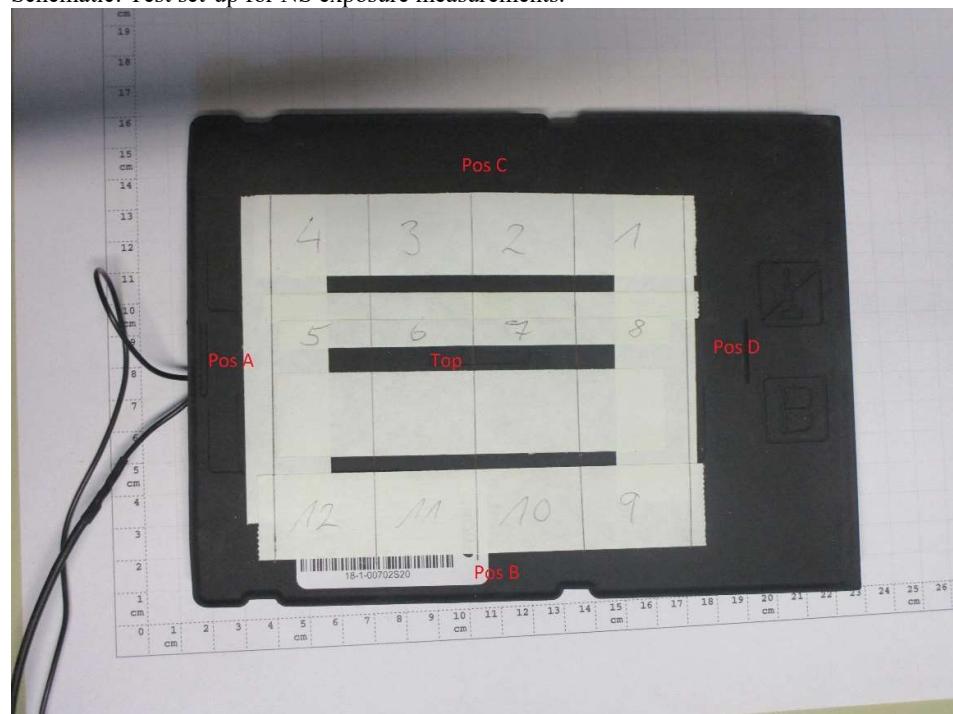
4.1. Test Set-up for configuration

The RF exposure test is performed in shielded room.

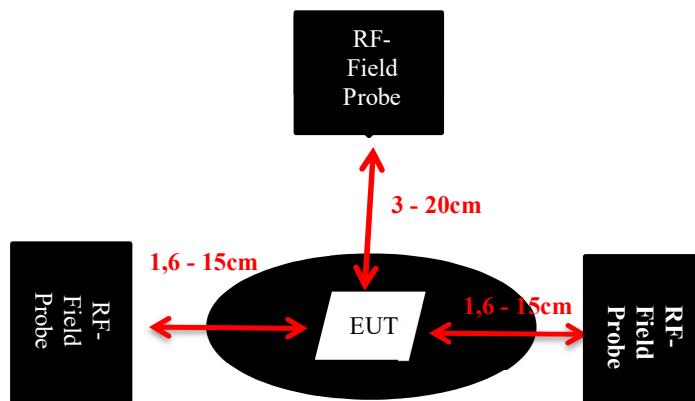
The EUT was placed on a table.

The measurement probe was moved at a distance of 1,6-20cm (H-Field) and 4-15cm (E-Field) from the EUT at 12 different points

Schematic: Test set-up for NS exposure measurements:



Position of E-Field and H-Field probe



Schematic: Test set-up for Rf exposure measurements

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 | <input checked="" type="checkbox"/> CETECOM Essen (Chapter 2.2.1) | <input type="checkbox"/> Please see Chapter 2.2.2 | <input type="checkbox"/> Please see Chapter 2.2.3 |
| equipment | <input checked="" type="checkbox"/> 686 EHP-200A | <input checked="" type="checkbox"/> ELT 400 NARDA | <input type="checkbox"/> |
| signaling | <input type="checkbox"/> 017 CMD 65 | <input type="checkbox"/> 323 CMD 55 | <input type="checkbox"/> 340 CMD 55 |
| signaling | <input type="checkbox"/> 298 CMU | <input type="checkbox"/> 460 CMU | <input type="checkbox"/> 295 RACAL |
| line voltage | <input checked="" type="checkbox"/> 12V DC | | <input type="checkbox"/> |

5.2.2. Test condition and test set-up

| | | | |
|---|-----------------------------------|--|--|
| link to test system (if used): | <input type="checkbox"/> air link | <input type="checkbox"/> cable connection | |
| EUT-grounding (if different to chapter 3.5) | <input type="checkbox"/> none | <input type="checkbox"/> with power supply | <input type="checkbox"/> additional connection |
| Equipment set up | - | - | |
| Climatic conditions | Temperature: 24 °C | Rel. humidity: 31 % | |

5.2.3. Results

Left coil

| EUT Type and S/N or EUT set-up no. | | EUT set-up 1 | | | | | | | |
|--|--|----------------------|------|------|------|-------------|---------------------|--------|--|
| EUT operating mode or operating mode no. | | EUT operating mode 1 | | | | | | | |
| Frequency Range (kHz) | Distance between EUT and Field probe (m) | E-field (V/m) | | | | | E-field Limit (V/m) | Result | |
| | | A | B | C | D | Top | | | |
| 111 | 0.02 | NP | NP | NP | NP | NP | 614 | passed | |
| 111 | 0.03 | NP | NP | NP | NP | NP | 614 | passed | |
| 111 | 0.04 | 0,79 | 1,22 | 2,01 | 0,59 | 3,69 | 614 | passed | |
| 111 | 0.05 | 0,71 | 1,12 | 1,69 | 0,51 | 2,39 | 614 | passed | |
| 111 | 0.06 | 0,61 | 1,01 | 1,42 | 0,45 | 1,84 | 614 | passed | |
| 111 | 0.07 | 0,55 | 0,81 | 1,20 | 0,40 | 1,63 | 614 | passed | |
| 111 | 0.08 | 0,41 | 0,69 | 1,07 | 0,38 | 1,54 | 614 | passed | |
| 111 | 0.09 | 0,38 | 0,52 | 0,90 | 0,35 | 1,41 | 614 | passed | |
| 111 | 0.10 | 0,30 | 0,41 | 0,69 | 0,30 | 1,12 | 614 | passed | |
| 111 | 0.15 | 0,21 | 0,31 | 0,48 | 0,22 | 0,93 | 614 | passed | |
| 111 | 0.20 | 0,12 | 0,20 | 0,31 | 0,10 | 0,78 | 614 | passed | |
| 111 | 0.30 | 0,07 | 0,13 | 0,14 | 0,02 | 0,57 | 614 | passed | |
| 111 | 0.50 | -- | -- | -- | -- | 0,12 | 614 | passed | |

NP = not performed

Remark: measured on all 12 positions shown in the schematic picture. Only the max value was recorded and noted

middle coil

| EUT Type and S/N or EUT set-up no. | | EUT set-up 1 | | | | | | |
|---|--|----------------------|------|------|---------------------|-------------|-----|--------|
| EUT operating mode or operating mode no. | | EUT operating mode 1 | | | | | | |
| Frequency Range (kHz) | Distance between EUT and Field probe (m) | E-field (V/m) | | | E-field Limit (V/m) | Result | | |
| | | A | B | C | D | Top | | |
| 111 | 0.02 | NP | NP | NP | NP | NP | 614 | passed |
| 111 | 0.03 | NP | NP | NP | NP | NP | 614 | passed |
| 111 | 0.04 | 0,72 | 0,95 | 1,71 | 0,55 | 2,12 | 614 | passed |
| 111 | 0.05 | 0,61 | 0,81 | 1,21 | 0,51 | 1,78 | 614 | passed |
| 111 | 0.06 | 0,52 | 0,72 | 1,03 | 0,48 | 1,52 | 614 | passed |
| 111 | 0.07 | 0,46 | 0,60 | 0,95 | 0,40 | 1,31 | 614 | passed |
| 111 | 0.08 | 0,31 | 0,51 | 0,69 | 0,36 | 1,22 | 614 | passed |
| 111 | 0.09 | 0,30 | 0,42 | 0,59 | 0,30 | 0,95 | 614 | passed |
| 111 | 0.10 | 0,27 | 0,36 | 0,45 | 0,28 | 0,79 | 614 | passed |
| 111 | 0.15 | 0,20 | 0,31 | 0,38 | 0,19 | 0,68 | 614 | passed |
| 111 | 0.20 | 0,13 | 0,19 | 0,22 | 0,11 | 0,53 | 614 | passed |
| 111 | 0.30 | 0,02 | 0,11 | 0,13 | 0,02 | 0,42 | 614 | passed |
| 111 | 0.50 | -- | -- | -- | -- | 0,19 | 614 | passed |

NP = not performed

Remark: measured on all 12 positions shown in the schematic picture. Only the max value was recorded and noted

right coil

| EUT | Type and S/N or EUT set-up no. | EUT set-up 1 | | | | | | |
|-----------------------|--|----------------------|------|------|------|-------------|---------------------|--------|
| EUT | operating mode or operating mode no. | EUT operating mode 1 | | | | | | |
| Frequency Range (kHz) | Distance between EUT and Field probe (m) | E-field (V/m) | | | | | E-field Limit (V/m) | Result |
| | | A | B | C | D | Top | | |
| 111 | 0.02 | NP | NP | NP | NP | NP | 614 | passed |
| 111 | 0.03 | NP | NP | NP | NP | NP | 614 | passed |
| 111 | 0.04 | 0,71 | 0,96 | 2,23 | 0,80 | 3,30 | 614 | passed |
| 111 | 0.05 | 0,65 | 0,82 | 2,02 | 0,69 | 2,97 | 614 | passed |
| 111 | 0.06 | 0,50 | 0,71 | 1,73 | 0,52 | 2,52 | 614 | passed |
| 111 | 0.07 | 0,42 | 0,59 | 1,55 | 0,41 | 2,21 | 614 | passed |
| 111 | 0.08 | 0,36 | 0,43 | 1,32 | 0,35 | 2,01 | 614 | passed |
| 111 | 0.09 | 0,35 | 0,39 | 1,01 | 0,31 | 1,63 | 614 | passed |
| 111 | 0.10 | 0,33 | 0,37 | 0,83 | 0,30 | 1,41 | 614 | passed |
| 111 | 0.15 | 0,21 | 0,29 | 0,68 | 0,21 | 1,28 | 614 | passed |
| 111 | 0.20 | 0,13 | 0,21 | 0,49 | 0,14 | 1,03 | 614 | passed |
| 111 | 0.30 | 0,04 | 0,12 | 0,17 | 0,03 | 0,85 | 614 | passed |
| 111 | 0.50 | -- | -- | -- | -- | 0,48 | 614 | passed |

NP = not performed

Remark: measured on all 12 positions shown in the schematic picture. Only the max value was recorded and noted

5.3. H-Field Results

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

| | | | |
|---------------|---|---|---|
| test location | <input checked="" type="checkbox"/> CETECOM Essen (Chapter 2.2.1) | <input type="checkbox"/> Please see Chapter 2.2.2 | <input type="checkbox"/> Please see Chapter 2.2.3 |
| equipment | <input checked="" type="checkbox"/> 686 EHP-200A NARDA | <input type="checkbox"/> | <input type="checkbox"/> |
| signaling | <input type="checkbox"/> 017 CMD 65 | <input type="checkbox"/> 323 CMD 55 | <input type="checkbox"/> 340 CMD 55 |
| signaling | <input type="checkbox"/> 298 CMU | <input type="checkbox"/> 460 CMU | <input type="checkbox"/> 295 RACAL |
| line voltage | <input checked="" type="checkbox"/> 12V DC | <input type="checkbox"/> | <input type="checkbox"/> |

5.3.2. Test condition and test set-up

| | | | |
|---|-----------------------------------|--|--|
| link to test system (if used): | <input type="checkbox"/> air link | <input type="checkbox"/> cable connection | |
| EUT-grounding (if different to chapter 3.5) | <input type="checkbox"/> none | <input type="checkbox"/> with power supply | <input type="checkbox"/> additional connection |
| Equipment set up | - | - | |
| Climatic conditions | Temperature: 24 °C | Rel. humidity: 31 % | |

left coil

| EUT Type and S/N or EUT set-up no. | | EUT set-up 1 | | | | | |
|--|--|----------------------|------|------|------|---------------------|--------|
| EUT operating mode or operating mode no. | | EUT operating mode 1 | | | | | |
| Frequency Range (kHz) | Distance between EUT and Field probe (m) | H-field (A/m) | | | | H-field Limit (A/m) | Result |
| | | A | B | C | D | Top | |
| 111 | 0,016 | 0,72 | 0,70 | 1,57 | 0,56 | NP | 1,63 |
| 111 | 0,02 | 0,61 | 0,63 | 1,49 | 0,51 | NP | 1,63 |
| 111 | 0,03 | 0,46 | 0,47 | 1,11 | 0,44 | NP | 1,63 |
| 111 | 0,04 | 0,35 | 0,38 | 0,81 | 0,39 | 1,62 | 1,63 |
| 111 | 0,05 | 0,31 | 0,33 | 0,62 | 0,32 | 1,37 | 1,63 |
| 111 | 0,06 | 0,19 | 0,18 | 0,41 | 0,19 | 1,01 | 1,63 |
| 111 | 0,07 | 0,13 | 0,15 | 0,38 | 0,12 | 0,79 | 1,63 |
| 111 | 0,08 | 0,09 | 0,12 | 0,29 | 0,10 | 0,71 | 1,63 |
| 111 | 0,09 | 0,06 | 0,09 | 0,21 | 0,08 | 0,52 | 1,63 |
| 111 | 0,10 | 0,05 | 0,07 | 0,10 | 0,06 | 0,40 | 1,63 |
| 111 | 0,15 | 0,03 | 0,04 | 0,04 | 0,04 | 0,03 | 1,63 |
| 111 | 0,20 | -- | -- | -- | -- | 0,07 | 1,63 |
| 111 | 0,50 | -- | -- | -- | -- | -- | 1,63 |

NP = not performed

Remark: measured on all 12 positions shown in the schematic picture. Only the max value was recorded and noted
 Measurement values were transformed from μT to A/m, where 1 A/m = 1.256 μT

middle coil

| EUT Type and S/N or EUT set-up no. | | EUT set-up 1 | | | | | | |
|---|--|----------------------|------|------|---------------------|-------------|--------|--------|
| EUT operating mode or operating mode no. | | EUT operating mode 1 | | | | | | |
| Frequency Range (kHz) | Distance between EUT and Field probe (m) | H-field (A/m) | | | H-field Limit (A/m) | | Result | |
| | | A | B | C | D | Top | | |
| 111 | 0,016 | 0,75 | 0,59 | 0,84 | 0,41 | NP | 1,63 | passed |
| 111 | 0,02 | 0,68 | 0,51 | 0,76 | 0,36 | NP | 1,63 | passed |
| 111 | 0,03 | 0,53 | 0,43 | 0,61 | 0,35 | NP | 1,63 | passed |
| 111 | 0,04 | 0,38 | 0,31 | 0,41 | 0,30 | 1,68 | 1,63 | passed |
| 111 | 0,05 | 0,38 | 0,31 | 0,41 | 0,30 | 1,36 | 1,63 | passed |
| 111 | 0,06 | 0,31 | 0,28 | 0,39 | 0,21 | 1,21 | 1,63 | passed |
| 111 | 0,07 | 0,24 | 0,21 | 0,32 | 0,18 | 1,16 | 1,63 | passed |
| 111 | 0,08 | 0,18 | 0,16 | 0,21 | 0,16 | 1,12 | 1,63 | passed |
| 111 | 0,09 | 0,11 | 0,09 | 0,11 | 0,12 | 1,09 | 1,63 | passed |
| 111 | 0,10 | 0,09 | 0,07 | 0,07 | 0,10 | 0,82 | 1,63 | passed |
| 111 | 0,15 | 0,06 | 0,04 | 0,04 | 0,03 | 0,61 | 1,63 | passed |
| 111 | 0,20 | -- | -- | -- | -- | 0,22 | 1,63 | passed |
| 111 | 0,50 | -- | -- | -- | -- | -- | 1,63 | passed |

NP = not performed

Remark: measured on all 12 positions shown in the schematic picture. Only the max value was recorded and noted
 Measurement values were transformed from μT to A/m, where 1 A/m = 1.256 μT

right coil

| | | | | | | | | |
|-----------------------|--|----------------------|------|------|------|---------------------|--------|--------|
| EUT | Type and S/N or EUT set-up no. | EUT set-up 1 | | | | | | |
| EUT | operating mode or operating mode no. | EUT operating mode 1 | | | | | | |
| Frequency Range (kHz) | Distance between EUT and Field probe (m) | H-field (A/m) | | | | H-field Limit (A/m) | Result | |
| | | A | B | C | D | Top | | |
| 111 | 0,016 | 0,98 | 1,47 | 1,56 | 0,41 | NP | 1,63 | passed |
| 111 | 0,02 | 0,90 | 1,31 | 1,41 | 0,39 | NP | 1,63 | passed |
| 111 | 0,03 | 0,67 | 1,12 | 1,18 | 0,30 | 1,60 | 1,63 | passed |
| 111 | 0,04 | 0,41 | 0,86 | 0,62 | 0,28 | 1,55 | 1,63 | passed |
| 111 | 0,05 | 0,32 | 0,59 | 0,35 | 0,25 | 11,1 | 1,63 | passed |
| 111 | 0,06 | 0,26 | 0,42 | 0,23 | 0,13 | 0,98 | 1,63 | passed |
| 111 | 0,07 | 0,17 | 0,36 | 0,18 | 0,09 | 0,81 | 1,63 | passed |
| 111 | 0,08 | 0,15 | 0,25 | 0,15 | 0,08 | 0,69 | 1,63 | passed |
| 111 | 0,09 | 0,12 | 0,21 | 0,13 | 0,08 | 0,55 | 1,63 | passed |
| 111 | 0,10 | 0,10 | 0,18 | 0,10 | 0,07 | 0,26 | 1,63 | passed |
| 111 | 0,15 | 0,03 | 0,13 | 0,05 | 0,05 | 0,19 | 1,63 | passed |
| 111 | 0,20 | -- | -- | -- | -- | 0,09 | 1,63 | passed |
| 111 | 0,50 | -- | -- | -- | -- | -- | 1,63 | passed |
| NP = not performed | | | | | | | | |

Remark: measured on all 12 positions shown in the schematic picture. Only the max value was recorded and noted
Measurement values were transformed from μT to A/m, where $1 \text{ A/m} = 1.256 \mu\text{T}$

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 it's 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 (UCISPR) | 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

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

8.0.1. Single instruments and test systems

| Ref .Nr | Equipment | Type | Serial Nr. | Manufacturer | Calibration | Next Calibration |
|------------|--------------------------------|----------|------------|-----------------------------|-------------|---------------------|
| 686 | Field Analyzer | EHP-200A | 160WX30702 | Narda Safety Test Solutions | 29.03.2017 | 29.03.2019 |
| -- | Exposure Level Tester | ELT 400 | N-0385 | Narda Safety Test Solutions | 07.12.2017 | 07.12.2020 |
| -- | H-Field Probe 3cm ² | Probe | M-0823 | Narda Safety Test Solutions | 20.05.2015 | 20.05.2018 |

9. Versions of test reports (change history)

| Version | Applied changes | Date of release |
|---------|---|-----------------|
| -- | Initial release | 2018-10-01 |
| C1 | Change of name of the measured field in chapter 5.4 | 2018-10-18 |
| | | |

10. External photographs

10.1. Device under test (EUT/DUT)



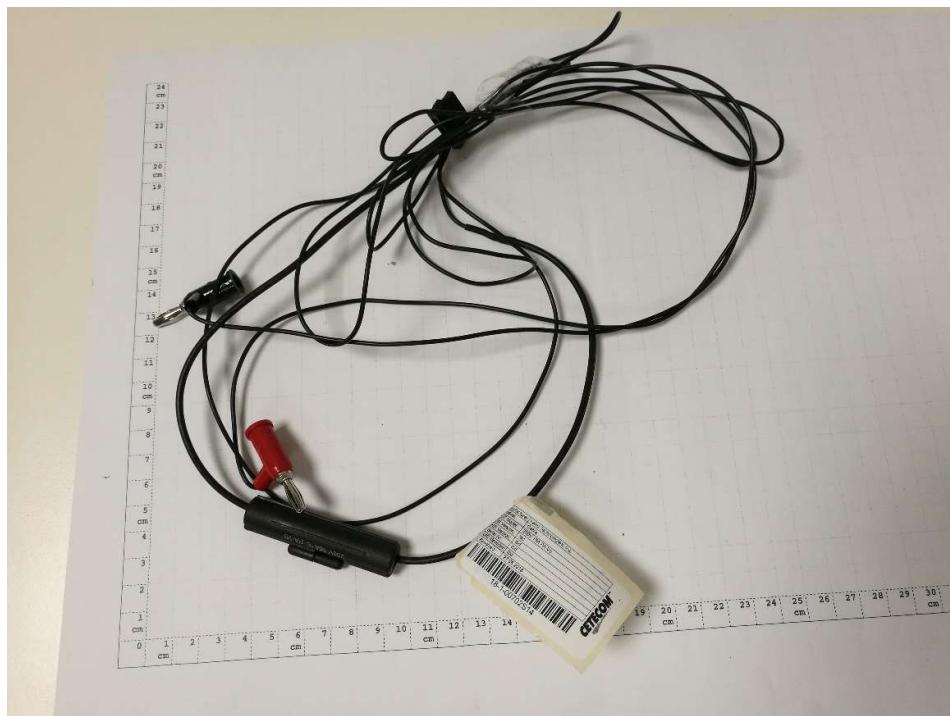
Photograph 1: EUT A – Top Side



Photograph 2: EUT A – Rear Side



Photograph 3: EUT A – right side



Photograph 4: EUT B

11. RF-exposure measurements



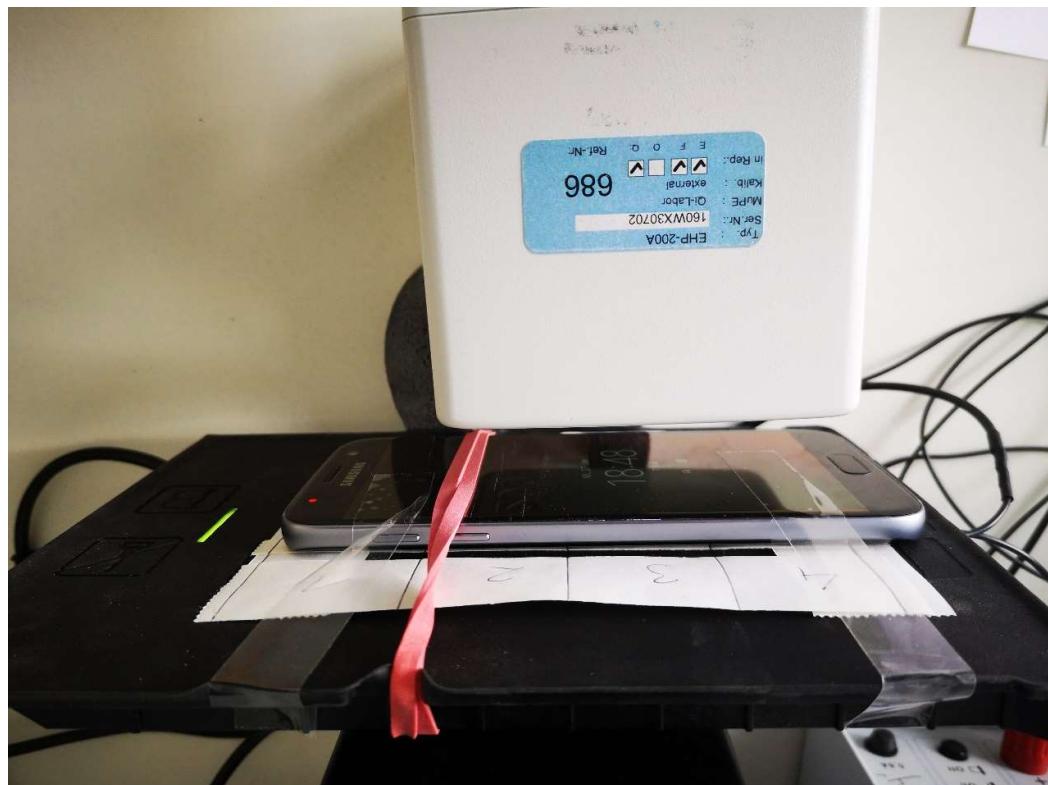
H-Field, worst case position, left coil, 4cm



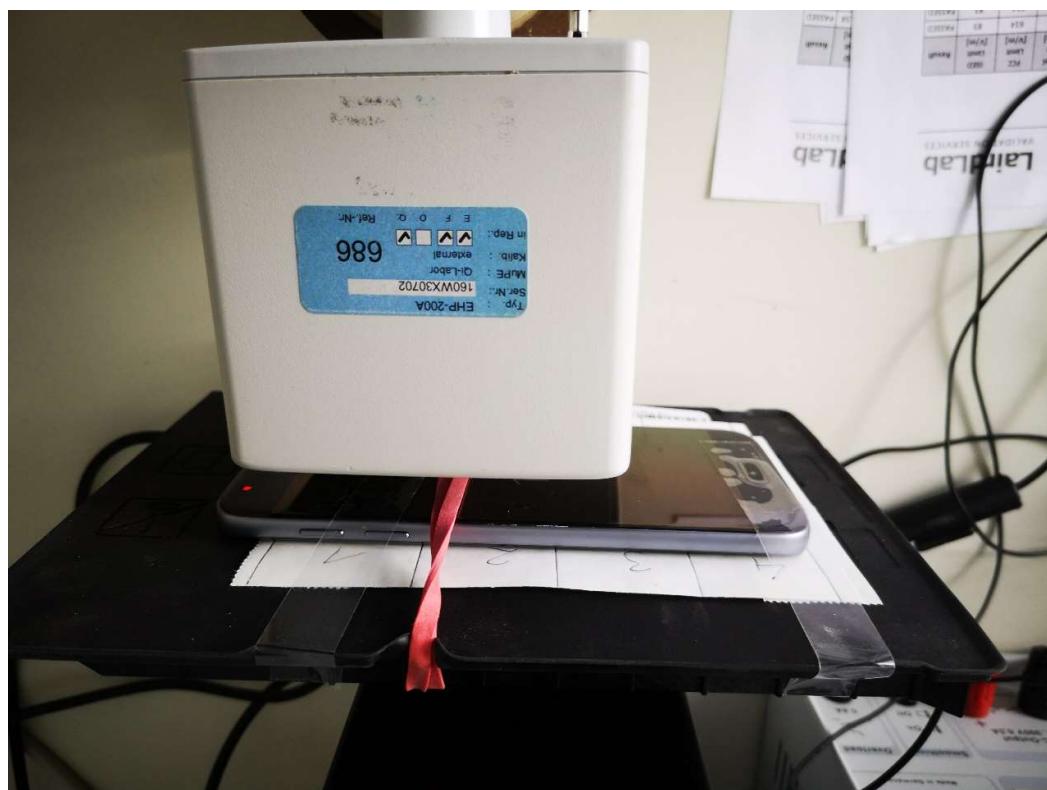
H-Field, worst case position, middle coil, 4cm



H-Field, worst case position, right coil, 4cm



E-Field, worst case position, left coil, 4cm



E-Field, worst case position, middle coil, 4cm



E-Field, worst case position, right coil, 4cm