

TEST REPORT
of the accredited test laboratory

TÜV Nr.:INE-AT/FG-18/149

Applicant: SES-imagotag GmbH
St. Peter Gürtel 10b
A – 8042 Graz

Tested Product: Networking transceiver "EDG1-0600-A"

FCC-ID: 2ACQM-EDG1-0600-A

IC-ID: 12154A-EDG1-0600-A

Manufacturer: SES-imagotag GmbH
St. Peter Gürtel 10b
A – 8042 Graz

Output power / field strength: 1,66 mV/m average @ 3m distance **power supply:** 3V DC internal battery

Frequency range: 2404 - 2479,25 MHz **Channel separation:** 0,35 MHz

Standard: FCC: 47 CFR Part 15 (15. June 2018 edition)
RSS-210 Issue 9, August 2016

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Certification Body,
Calibration Laboratory,
VerifizierungsstelleNotified Body 0408
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Test laboratory for EMC

Supervisor of EMC-laboratory:

Ing. Wilhelm Seier



01.08.2018

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checked by:

Ing. Michael Emminger

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The results of this test report only refer to the provided equipment.

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1. Applicant

Company: SES-imagotag GmbH
Department: Product & Project Manager
Address: A – 8042 Graz; St. Peter Gürtel 10b
Contact person: Mr. Philipp Jauck

EUT received on: 30.07.2018

Tests were performed on: 30.07. and 31.07.2018

2. Description of EUT

| | |
|---|--|
| EUT: | Networking transceiver "EDG1-0600-A" |
| Serial Number: | Prototype |
| Manufacturer: | SES-imagotag GmbH A – 8042 Graz; St. Peter Gürtel 10b |
| Description: | SES-imagotag GmbH provided the following configuration for the measurements: Prototype with special test-firmware for continuous transmission |
| Operating mode: | The measurements were carried out at the following running states: test-firmware running, transmitting continuously |
| Technical data EUT: | Rated voltage: 3VDC Rated current: <1A Rated frequency: DC Mains voltage during the tests: 3VDC internal battery |
| Climatic conditions in the emc laboratory: | Relative humidity: 51% Temperature: 28°C |

3. Standards / Final result

| Name | Title | Deviation | Result |
|---|---|-----------|--------|
| Title 47 CFR Part 15 15. June 2018 edition | RADIO FREQUENCY DEVICES | none | OK |
| RSS-210 Issue 9, August 2016 | Licence-Exempt Radio Apparatus: Category I Equipment | none | OK |
| <p>Result: Opinions and interpretation of testing laboratory OK: EUT passed NOK: EUT failed</p> | | | |

4.1 TEST OBJECT DATA

General EUT Description

This transceiver module is working in a network consisting of a controller station, so called Accesspoint, and various displays. The Accesspoint transmits information to the displays and receives acknowledgements. This device is a module to be used in displays operating in the network system. The device is equipped with a passive NFC chip onboard which does not have its own rf generation. It works as tag and can also receive information from the NFC reader station.

2.1033 (c) Technical description

2.1033 (4) Type of emission: Minimum shift keying – declared channel bandwidth 250 kHz – ‘virtual’ channel spacing 0,35 MHz. Only 11 channels from the channel plan are used, therefore the channel spacing in reality is much higher and varies from 2,45 MHz minimum up to 17,15 MHz.

2.1033 (5) Frequency range: 2404 – 2479,25 MHz (channel center frequencies of channel 0 up to ch. 10)

2.1033 (6) Power range and Controls: The maximum field strength measured is 1,66 mV/m average @ 3m distance. There is no power control or regulation.

2.1033 (7) Maximum output power rating: 1,66 mV/m average @ 3m distance.

2.1033 (8) DC Voltage and Current: 3 VDC (internal battery)
maximum current consumption: 28,0mA during continuous transmission

RSS-135 This standard does not apply to:

- 1.1.(a) a receiver that scans radio frequencies for the purpose of enabling its associated transmitter to avoid transmitting in an occupied frequency but which does not have the capability of decoding the message (e.g. converting it to audio voice) contained in the radio signal

Tests were performed on: July 30th and 31st 2018.

4.2 Number of channels and channel spacing

§ 2.1033

Channel plan:

| Channel Number | Center frequency (MHz) | Channel spacing (MHz) |
|----------------|------------------------|-----------------------|
| 0 | 2404 | |
| 1 | 2409,95 | 5,95 |
| 2 | 2421,85 | 11,9 |
| 3 | 2424,65 | 2,8 |
| 4 | 2441,8 | 17,15 |
| 5 | 2449,15 | 7,35 |
| 6 | 2461,75 | 12,6 |
| 7 | 2469,45 | 7,7 |
| 8 | 2474,35 | 4,9 |
| 9 | 2476,8 | 2,45 |
| 10 | 2479,25 | 2,45 |

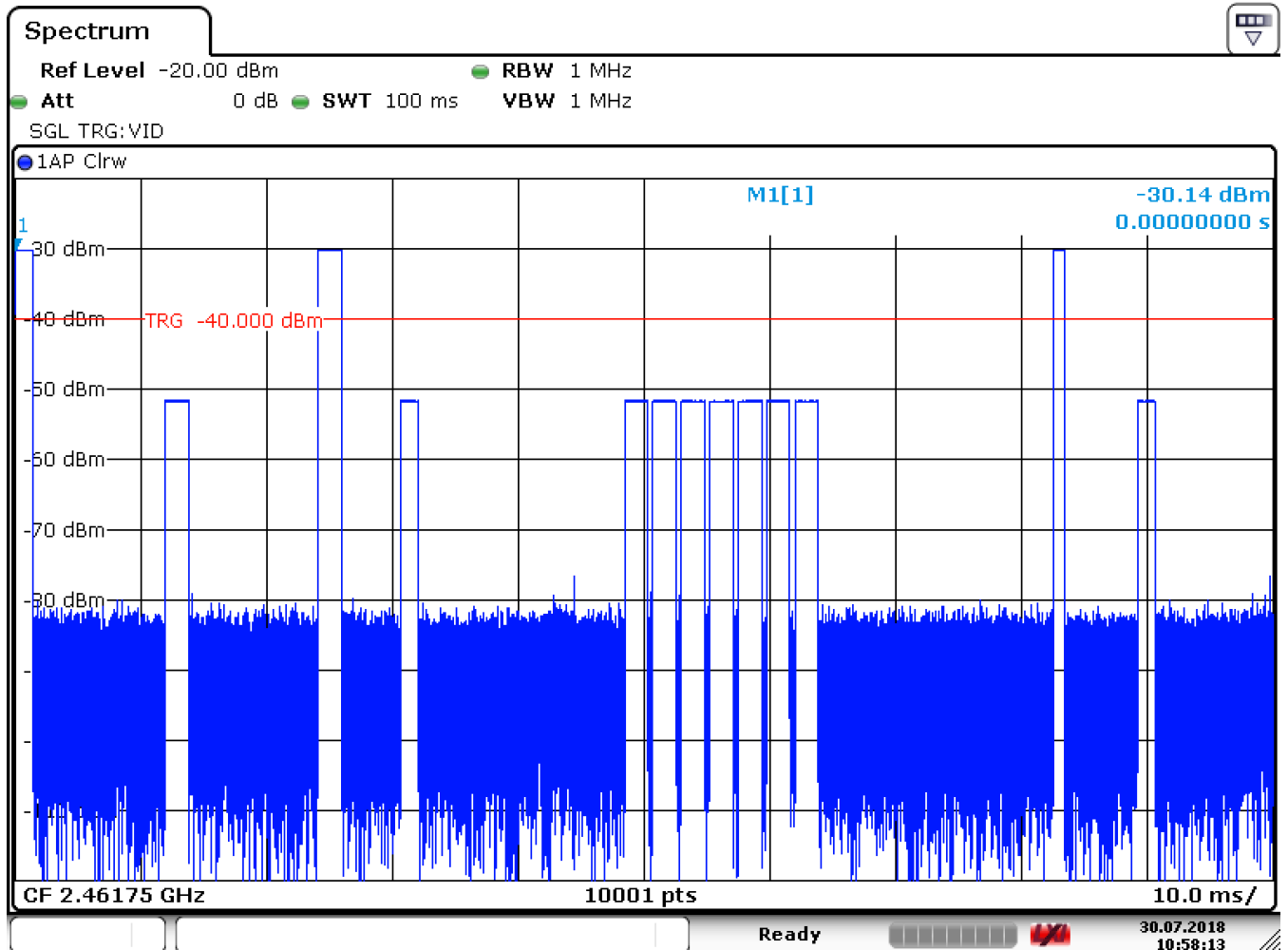
Tests were performed on channels 0, 4 and 10.

Test Equipment used: N/A

4.3 Duty Cycle measurements for averaging

§ 15.249 (e)

Mode: data transmission (worst case in 100ms)



Date: 30.JUL.2018 10:58:13

According to the timing protocol description provided by the manufacturer and attached as technical description to the application for certification, the transmission burst time was checked to not exceed the declared value. The declared value was taken for calculation, as that gives the worst case. Transmission bursts of 1,48ms length occurring twice in 100ms with another handshaking burst of 1,97ms length give a duty cycle of 4,93% or an average factor of -26,1 dB.

LIMIT SUBCLAUSE 15.249(e)

(e) As shown in §15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

Test Equipment used: EMV-205

4.4 Field strength of emissions at 2400 – 2483,5 MHz

§ 15.249 (a) (c)

Operating on CH 0 (2404 MHz)

The maximum peak value measured was 90,5 dB μ V/m = 33,50 mV/m at 3m distance.

With the averaging factor calculated on page 5 of this test report of -26,1 dB the maximum average value is then 64,4 dB μ V/m = 1,66 mV/m at 3m distance.

LIMIT SUBCLAUSE 15.249(a) (c)

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Fundamental frequency | Field strength of fundamental (millivolts/meter) | Field strength of harmonics (microvolts/meter) |
|-----------------------|--|--|
| 902–928 MHz | 50 | 500 |
| 2400–2483.5 MHz | 50 | 500 |
| 5725–5875 MHz | 50 | 500 |
| 24.0–24.25 GHz | 250 | 2500 |

(c) Field strength limits are specified at a distance of 3 meters.

Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-200

Field strength of emissions at 2400 – 2483,5 MHz

§ 15.249 (a) (c)

Operating on CH 4 (2441,8 MHz)

The maximum peak value measured was 89,7 dB μ V/m = 30,55 mV/m at 3m distance.

With the averaging factor calculated on page 5 of this test report of -26,1 dB the maximum average value is then 63,6 dB μ V/m = 1,51 mV/m at 3m distance.

LIMIT SUBCLAUSE 15.249(a) (c)

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Fundamental frequency | Field strength of fundamental (millivolts/meter) | Field strength of harmonics (microvolts/meter) |
|------------------------------|---|---|
| 902–928 MHz | 50 | 500 |
| 2400–2483.5 MHz | 50 | 500 |
| 5725–5875 MHz | 50 | 500 |
| 24.0–24.25 GHz | 250 | 2500 |

(c) Field strength limits are specified at a distance of 3 meters.

Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-200

Field strength of emissions at 2400 – 2483,5 MHz

§ 15.249 (a) (c)

Operating on CH 10 (2479,25 MHz)

The maximum peak value measured was 90,3 dB μ V/m = 32,73 mV/m at 3m distance.

With the averaging factor calculated on page 5 of this test report of -26,1 dB the maximum average value is then 64,2 dB μ V/m = 1,62 mV/m at 3m distance.

LIMIT SUBCLAUSE 15.249(a) (c)

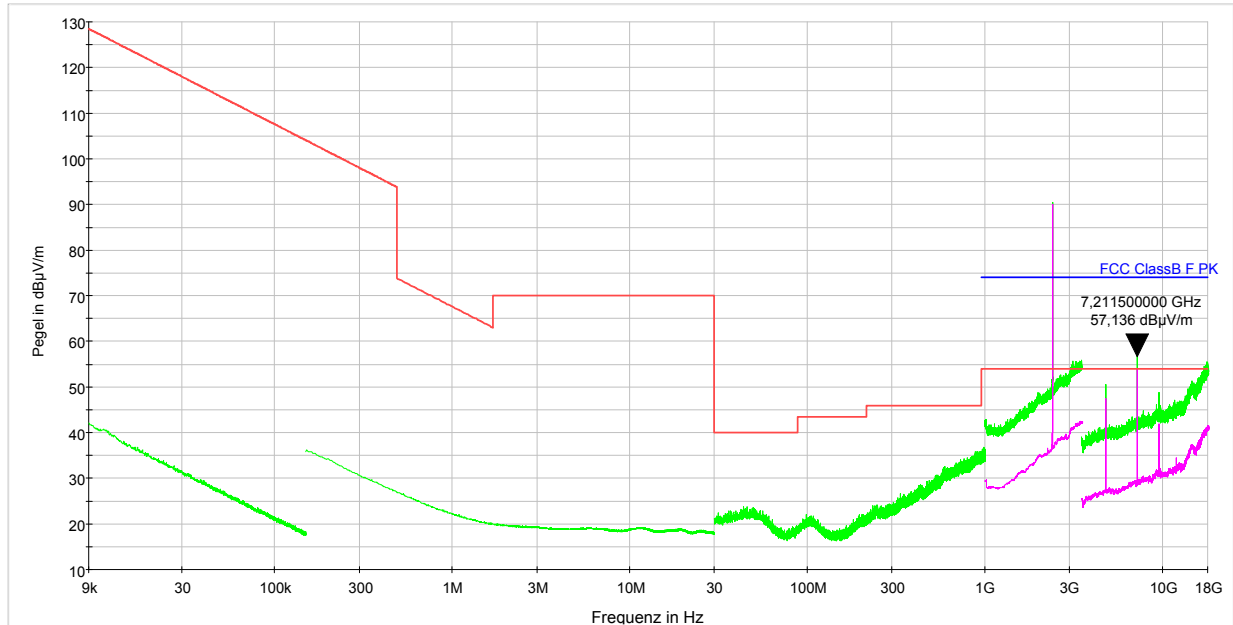
(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Fundamental frequency | Field strength of fundamental (millivolts/meter) | Field strength of harmonics (microvolts/meter) |
|------------------------------|---|---|
| 902–928 MHz | 50 | 500 |
| 2400–2483.5 MHz | 50 | 500 |
| 5725–5875 MHz | 50 | 500 |
| 24.0–24.25 GHz | 250 | 2500 |

(c) Field strength limits are specified at a distance of 3 meters.

Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-200

4.5 Emissions outside 2400 – 2483,5 MHz § 15.249 (d) (e)
Channel 0 (2404 MHz) – average values above 1 GHz are shown in magenta – green = peak



- PK+ CLRWR(1);EDG1-0600-A_CH0_F3 [EDG1-0600-A_CH0_F3.Result:1]
- PK+ MAXH(1);EDG1-0600-A_CH0_F4 [EDG1-0600-A_CH0_F4.Result:2]
- FCC ClassB F QP 40dB [..EMI radiated]
- QPK CLRWR:Preview Result 1 [Preview Result 1.Result:1]
- PK+ CLRWR [Ergebnistabelle.Result:1]
- AVG CLRWR [Ergebnistabelle.Result:3]
- AVG CLRWR(1);EDG1-0600-A_CH0_F3 [EDG1-0600-A_CH0_F3.Result:2]
- AVG MAXH(1);EDG1-0600-A_CH0_F4 [EDG1-0600-A_CH0_F4.Result:4]
- FCC ClassB F PK [..EMI radiated]
- PK+ MAXH(1);EDG1-0600-A_CH0_F2 [EDG1-0600-A_CH0_F2.Result:2]
- PK+ MAXH [Ergebnistabelle.Result:2]
- AVG MAXH [Ergebnistabelle.Result:4]

LIMIT SUBCLAUSE 15.249(d) (e) (15.209)

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

(e) As shown in §15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

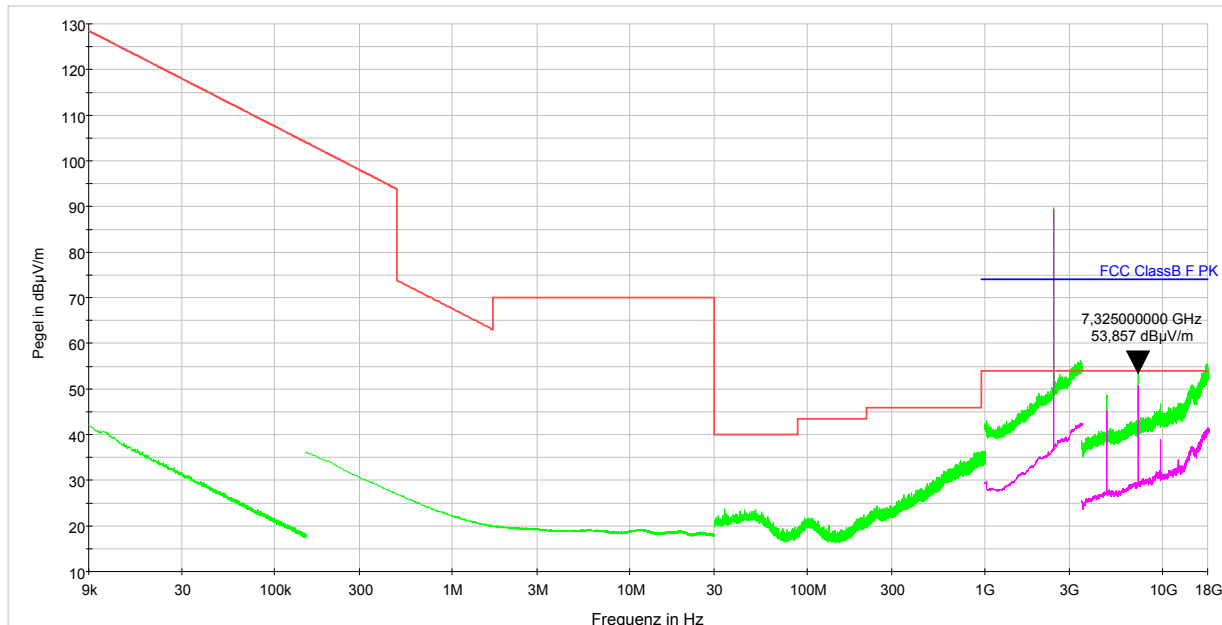
| Frequency (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|-----------------|-----------------------------------|-------------------------------|
| 0.009–0.490 | 2400/F(kHz) | 300 |
| 0.490–1.705 | 24000/F(kHz) | 30 |
| 1.705–30.0 | 30 | 30 |
| 30–88 | 100** | 3 |
| 88–216 | 150** | 3 |
| 216–960 | 200** | 3 |
| Above 960 | 500 | 3 |

Test Equipment used:

EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-111; EMV-112; EMV-200; NT-416

Remark: Although the measurements were made up to the 10th harmonic (25 GHz) the frequency range above 18 GHz is not automatized, so no graphs are available. Nevertheless no emissions above noise level were found in the frequency range above 18 GHz.

Emissions outside 2400 – 2483,5 MHz § 15.249 (d) (e)
Channel 4 (2441,8 MHz) – average values above 1 GHz are shown in magenta – green = peak



- PK+ CLRWR(1);EDG1-0600-A_CH4_F3 [EDG1-0600-A_CH4_F3.Result:1]
- PK+ MAXH(1);EDG1-0600-A_CH4_F4 [EDG1-0600-A_CH4_F4.Result:2]
- FCC ClassB F QP 40dB [..EMI radiated]
- QPK CLRWR:Preview Result 1 [Preview Result 1.Result:1]
- PK+ CLRWR [Ergebnistabelle.Result:1]
- AVG CLRWR [Ergebnistabelle.Result:3]
- AVG CLRWR(1);EDG1-0600-A_CH4_F3 [EDG1-0600-A_CH4_F3.Result:2]
- AVG MAXH(1);EDG1-0600-A_CH4_F4 [EDG1-0600-A_CH4_F4.Result:4]
- FCC ClassB F PK [..EMI radiated]
- PK+ MAXH(1);EDG1-0600-A_CH4_F2 [EDG1-0600-A_CH4_F2.Result:2]
- PK+ MAXH [Ergebnistabelle.Result:2]
- AVG MAXH [Ergebnistabelle.Result:4]

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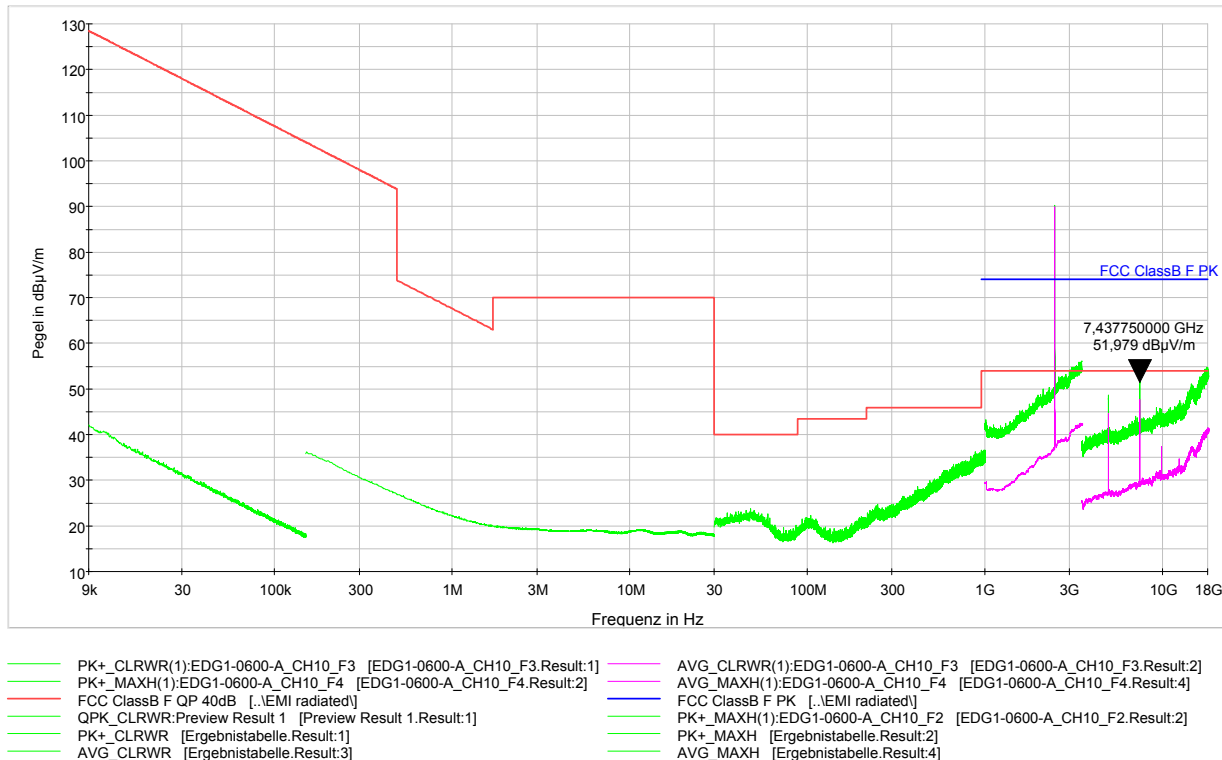
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| 0.490–1.705 | 24000/F(kHz) | 30 |
| 1.705–30.0 | 30 | 30 |
| 30–88 | 100** | 3 |
| 88–216 | 150** | 3 |
| 216–960 | 200** | 3 |
| Above 960 | 500 | 3 |

Test Equipment used:

EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-111; EMV-112; EMV-200; NT-416

Remark: Although the measurements were made up to the 10th harmonic (25 GHz) the frequency range above 18 GHz is not automatized, so no graphs are available. Nevertheless no emissions above noise level were found in the frequency range above 18 GHz.

Emissions outside 2400 – 2483,5 MHz § 15.249 (d) (e)
Channel 10 (2479,25 MHz) – average values above 1 GHz are shown in magenta – green = peak



LIMIT SUBCLAUSE 15.249(d) (e) (15.209)

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

(e) As shown in §15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

| Frequency (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|-----------------|-----------------------------------|-------------------------------|
| 0.009–0.490 | 2400/F(kHz) | 300 |
| 0.490–1.705 | 24000/F(kHz) | 30 |
| 1.705–30.0 | 30 | 30 |
| 30–88 | 100** | 3 |
| 88–216 | 150** | 3 |
| 216–960 | 200** | 3 |
| Above 960 | 500 | 3 |

Test Equipment used:

EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-111; EMV-112; EMV-200; NT-416

Remark: Although the measurements were made up to the 10th harmonic (25 GHz) the frequency range above 18 GHz is not automatized, so no graphs are available. Nevertheless no emissions above noise level were found in the frequency range above 18 GHz.

Appendix 1

Test equipment used

| | | | | | |
|--------------------------|---|--------------------|--------------------------|--|-----------|
| <input type="checkbox"/> | Anechoic Chamber with 3m measurement distance | NT-100 | <input type="checkbox"/> | Spectrum analyzer – FSP7 9 kHz – 7 GHz | NT-200 |
| <input type="checkbox"/> | Stripline according to ISO 11452-5 | NT-108 | <input type="checkbox"/> | ESCI - Test receiver 9 kHz - 7 GHz | NT-203/1 |
| <input type="checkbox"/> | MA4000 - Antenna mast 1 - 4 m height | NT-110/1 | <input type="checkbox"/> | ESI26 – Test receiver 20 Hz – 26,5 GHz | NT-207 |
| <input type="checkbox"/> | DS - Turntable 0 - 400 ° Azimuth | NT-111/1 | <input type="checkbox"/> | Digital Radio Tester CTS55 | NT-208 |
| <input type="checkbox"/> | CO3000 Controller Mast+Turntable | NT-112/1 | <input type="checkbox"/> | Noise-gen., ITU-R 559-2 20 Hz – 20 kHz | NT-209 |
| <input type="checkbox"/> | HUF-Z3 - Log. Per. Antenna 200 - 1000 MHz | NT-121 | <input type="checkbox"/> | CMTA - Radiocommunication analyzer ; 0,1 - 1000 MHz | NT-210 |
| <input type="checkbox"/> | FMZB1513 - Loop Antenna 9 kHz - 30 MHz | NT-122/1 | <input type="checkbox"/> | 3271 - Spectrum analyzer 100 Hz - 26,5 GHz | NT-211 |
| <input type="checkbox"/> | HFH-Z6 - Rod Antenna 9 kHz - 30 MHz | NT-123 | <input type="checkbox"/> | Digital Radio Tester Aeroflex 3920 | NT-212/1 |
| <input type="checkbox"/> | 3121C - Dipole Antenna 28 - 1000 MHz | NT-124 | <input type="checkbox"/> | Mixer M28HW 26,5 GHz - 40 GHz | NT-214 |
| <input type="checkbox"/> | 3115 - Horn Antenna 1 - 18 GHz (immunity) | NT-125 | <input type="checkbox"/> | RubiSource T&M Timing reference | NT-216 |
| <input type="checkbox"/> | 3116 - Horn Antenna 18 - 40 GHz | NT-126 | <input type="checkbox"/> | Radiocommunication analyzer SWR 1180 MD | NT-217 |
| <input type="checkbox"/> | SAS-200/543 - Bicon. Antenna 20 MHz - 300 MHz | NT-127 | <input type="checkbox"/> | Mixer M19HWD 40 GHz – 60 GHz | NT-218 |
| <input type="checkbox"/> | AT-1080 - Log. Per. Antenna 80 - 1000 MHz | NT-128 | <input type="checkbox"/> | Mixer M12HWD 60 GHz – 90 GHz | NT-219 |
| <input type="checkbox"/> | HK-116 - bicon. Antenna 20 MHz - 300 MHz | NT-129 | <input type="checkbox"/> | DSO9104 Digital scope | NT-220/1 |
| <input type="checkbox"/> | HK-116 - bicon. Antenna 20 MHz - 300 MHz | NT-130 | <input type="checkbox"/> | TPS 2014 Digital scope | NT-222 |
| <input type="checkbox"/> | 3146 - Log. Per. Antenna 200 – 1000 MHz | NT-131 | <input type="checkbox"/> | Artificial Ear according to IEC 60318 | NT-224 |
| <input type="checkbox"/> | VULB 9163 Trilog Antenna 30 – 3000 MHz | NT-131/1 | <input type="checkbox"/> | 1 kHz Sound calibrator | NT-225 |
| <input type="checkbox"/> | Loop Antenna H-Field | NT-132 | <input type="checkbox"/> | B10 - Harmonics and flicker analyzer | NT-232 |
| <input type="checkbox"/> | Horn Antenna 500 MHz - 2900 MHz | NT-133 | <input type="checkbox"/> | SRM-3006 Spectrum analyzer | NT-233/1a |
| <input type="checkbox"/> | Horn Antenna 500 MHz - 6000 MHz | NT-133/1 | <input type="checkbox"/> | E-field probe SRM 75 MHz – 3 GHz | NT-234 |
| <input type="checkbox"/> | Log. per. Antenna 800 MHz - 2500 MHz | NT-134 | <input type="checkbox"/> | Field Meter NBM-500 incl. E- and H-Field probes | NT-240a-e |
| <input type="checkbox"/> | Log. per. Antenna 800 MHz - 2500 MHz | NT-135 | <input type="checkbox"/> | Hall-Teslameter ETM-1 | NT-241 |
| <input type="checkbox"/> | BiConiLog Antenna 26 MHz – 2000 MHz | NT-137 | <input type="checkbox"/> | EFA-3 H-field- / E-field probe | NT-243 |
| <input type="checkbox"/> | Conical Dipol Antenna PCD8250 | NT-138 | <input type="checkbox"/> | EHP-50F H-field- / E-field probe | NT-243/1 |
| <input type="checkbox"/> | HF 906 - Horn Antenna 1 - 18 GHz (emission) | NT-139 | <input type="checkbox"/> | Field Meter EMR-200 100 kHz – 3 GHz | NT-244 |
| <input type="checkbox"/> | HZ-1 Antenna tripod | NT-150 | <input type="checkbox"/> | E-field probe 100 kHz – 3 GHz | NT-245 |
| <input type="checkbox"/> | BN 1500 Antenna tripod | NT-151 | <input type="checkbox"/> | H-field probe 300 kHz – 30 MHz | NT-246 |
| <input type="checkbox"/> | Ant. tripod for EN61000-4-3 Model TP1000A | NT-156 | | | |
| <input type="checkbox"/> | Power quality analyzer Fluke 1760 (complete set) | NT-160 - NT-173 | | | |


Division:
Industry & Energy

Department: FG

Test report number:
INE-AT/FG-18/149

Page: 1 of 4

Date: 01.08.2018

Checked by: 

Appendix 1 (continued)

Test equipment used

| | | | | | |
|--------------------------|---|-------------|--------------------------|--|----------|
| <input type="checkbox"/> | E-field probe 3 MHz – 18 GHz | NT-247 | <input type="checkbox"/> | 500W1000M7 - RF-Amplifier 80 - 1000 MHz / 500 W | NT-332 |
| <input type="checkbox"/> | H-field probe 27 MHz – 1 GHz | NT-248 | <input type="checkbox"/> | AS0102-65R - RF-Amplifier 1 GHz - 2 GHz | NT-333 |
| <input type="checkbox"/> | ELT-400 1 Hz – 400 kHz | NT-249 | <input type="checkbox"/> | APA01 – RF-Amplifier 0,5 GHz – 2,5 GHz | NT-334 |
| <input type="checkbox"/> | MDS 21 - Absorbing clamp 30 - 1000 MHz | NT-250 | <input type="checkbox"/> | Preamplifier 1 GHz - 4 GHz | NT-335 |
| <input type="checkbox"/> | FCC-203I EM Injection clamp | NT-251 | <input type="checkbox"/> | Preamplifier for GPS MKU 152 A | NT-336 |
| <input type="checkbox"/> | FCC-203I-DCN Ferrite decoupling network | NT-252 | <input type="checkbox"/> | Preamplifier 100 MHz – 23 GHz | NT-337 |
| <input type="checkbox"/> | PR50 Current Probe | NT-253 | <input type="checkbox"/> | DC Block 10 MHz – 18 GHz Model 8048 | NT-338 |
| <input type="checkbox"/> | i310s Current Probe | NT-254/1 | <input type="checkbox"/> | 2-97201 Electronic load | NT-341 |
| <input type="checkbox"/> | Fluke 87 V True RMS Multimeter | NT-260 | <input type="checkbox"/> | TSX3510P - Power supply 0-30 V / 0 - 10 A | NT-344 |
| <input type="checkbox"/> | Model 2000 Digital Multimeter | NT-261 | <input type="checkbox"/> | TSX3510P - Power supply 0-30 V / 0 - 10 A | NT-345 |
| <input type="checkbox"/> | Fluke 87 V Digital Multimeter | NT-262/1 | <input type="checkbox"/> | VDS 200 Mobil-impuls-generator | NT-350 |
| <input type="checkbox"/> | ESH2-Z5-U1 Artificial mains network 4x25A | NT-300 | <input type="checkbox"/> | LD 200 Mobil-impuls-generator | NT-351 |
| <input type="checkbox"/> | ESH3-Z5-U1 Artificial mains network 2x10A | NT-301 | <input type="checkbox"/> | MPG 200 Mobil-Impuls-Generators | NT-352 |
| <input type="checkbox"/> | ESH3-Z6-U1 Artificial mains network 1x100A | NT-302 | <input type="checkbox"/> | EFT 200 Mobil-impuls-generator | NT-353 |
| <input type="checkbox"/> | ESH3-Z6-U1 Artificial mains network 1x100A | NT-302a | <input type="checkbox"/> | AN 200 S1 Artificial Network | NT-354 |
| <input type="checkbox"/> | PHE 4500/B Power amplifier | NT-304 | <input type="checkbox"/> | FP-EFT 32M 3 ph. Coupling filter (Burst) | NT-400/1 |
| <input type="checkbox"/> | EZ10 T-Artificial Network | NT-305 | <input type="checkbox"/> | PHE 4500 - Mains impedance network | NT-401 |
| <input type="checkbox"/> | SMG - Signal generator 0,1 - 1000 MHz | NT-310 | <input type="checkbox"/> | IP 6.2 Coupling filter for data lines (Surge) | NT-403 |
| <input type="checkbox"/> | SMA100A - Signal generator 9 kHz - 6 GHz | NT-310/1 | <input type="checkbox"/> | TK 9421 High Power Volt. Probe 150 kHz - 30 MHz | NT-409 |
| <input type="checkbox"/> | RefRad Reference generator | NT-312 | <input type="checkbox"/> | ESH2-Z3 - Probe 9 kHz - 30 MHz | NT-410 |
| <input type="checkbox"/> | SMP 02 Signal generator 10 MHz - 20 GHz | NT-313 | <input type="checkbox"/> | IP 4 - Capacitive clamp (Burst) | NT-411 |
| <input type="checkbox"/> | 40 MHz Arbitrary Generator TGA1241 | NT-315 | <input type="checkbox"/> | Highpass-Filter 100 MHz – 3 GHz | NT-412 |
| <input type="checkbox"/> | Artificial mains network NSLK 8127-PLC | NT-316 | <input type="checkbox"/> | Highpass-Filter 600 MHz – 4 GHz | NT-413 |
| <input type="checkbox"/> | ESD 30 System up to 25 kV | NT-321 | <input type="checkbox"/> | Highpass-Filter 1250 MHz – 4 GHz | NT-414 |
| <input type="checkbox"/> | PSURGE 4.1 Surge generator | NT-324 | <input type="checkbox"/> | Highpass-Filter 1800 MHz – 16 GHz | NT-415 |
| <input type="checkbox"/> | IMU4000 Immunity test system | NT-325/1 | | | |
| <input type="checkbox"/> | VCS 500-M6 Surge-Generator | NT-326 | | | |
| <input type="checkbox"/> | Oscillatory Wave Simulator incl. Coupling networks | NT-328a+b+c | | | |
| <input type="checkbox"/> | BTA-250 - RF-Amplifier 9 kHz - 220 MHz / 250 W | NT-330 | | | |
| <input type="checkbox"/> | T82-50 RF-Amplifier 2 GHz – 8 GHz | NT-331 | | | |


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| | | | | | |
|--------------------------|--|--------|--------------------------|---|--------------------|
| <input type="checkbox"/> | Highpass-Filter 3500 MHz – 18 GHz | NT-416 | <input type="checkbox"/> | FCC-801-AF10 Coupling decoupling network | NT-461 |
| <input type="checkbox"/> | RF-Attenuator 10 dB DC – 18 GHz / 50 W | NT-417 | <input type="checkbox"/> | FCC-801-S25 Coupling decoupling network | NT-462 |
| <input type="checkbox"/> | RF-Attenuator 6 dB DC – 18 GHz / 50 W | NT-418 | <input type="checkbox"/> | FCC-801-T4 Coupling decoupling network | NT-463 |
| <input type="checkbox"/> | RF-Attenuator 3 dB DC – 18 GHz / 50 W | NT-419 | <input type="checkbox"/> | FCC-801-C1 Coupling decoupling network | NT-464 |
| <input type="checkbox"/> | RF-Attenuator 20 dB DC - 1000 MHz / 25 W | NT-421 | <input type="checkbox"/> | SW 9605 - Current probe 150 kHz – 30 MHz | NT-465/1 |
| <input type="checkbox"/> | RF-Attenuator 30 dB DC - 1000 MHz / 1 W | NT-423 | <input type="checkbox"/> | 95242-1 – Current probe 1 MHz – 400 MHz | NT-468 |
| <input type="checkbox"/> | RF-Attenuator 30 dB | NT-424 | <input type="checkbox"/> | 94106-1L-1 – Current probe 100 kHz – 450 MHz | NT-471 |
| <input type="checkbox"/> | RF-Attenuator 6 dB DC - 1000 MHz / 1 W | NT-425 | <input type="checkbox"/> | GA 1240 Power amplifier according to EN 61000-4-16 | NT-480 |
| <input type="checkbox"/> | RF-Attenuator 6 dB DC - 1000 MHz / 1 W | NT-426 | <input type="checkbox"/> | Coupling networks according to EN 61000-4-16 | NT-481 - NT-483 |
| <input type="checkbox"/> | RF-Attenuator 6 dB | NT-428 | <input type="checkbox"/> | Van der Hoofden Test Head | NT-484 |
| <input type="checkbox"/> | RF-Attenuator 0 dB - 81 dB | NT-429 | <input type="checkbox"/> | EMC Video/Audiosystem | NT-511/1 |
| <input type="checkbox"/> | WRU 27 - Band blocking 27 MHz | NT-430 | <input type="checkbox"/> | ES-K1 Version 1.71 SP2 Test software | NT-520 |
| <input type="checkbox"/> | WHJ450C9 AA - High pass 450 MHz | NT-431 | <input type="checkbox"/> | EMC32 Version 10.40.00 Test software | NT-520/1 |
| <input type="checkbox"/> | WHJ250C9 AA - High pass 250 MHz | NT-432 | <input type="checkbox"/> | SRM-TS Version 1.3 software for SRM-3000 | NT-522 |
| <input type="checkbox"/> | RF-Load 150 W | NT-433 | <input type="checkbox"/> | SRM-TS Version 1.3.1 software for SRM-3006 | NT-522/1 |
| <input type="checkbox"/> | Impedance transducer 1:4 ; 1:9 ; 1:16 | NT-435 | <input type="checkbox"/> | Spitzenberger und Spies Test software V4.1 | NT-525 |
| <input type="checkbox"/> | RF-Attenuator DC – 18 GHz 6 dB | NT-436 | <input type="checkbox"/> | Noise power test apparatus according to EN 55014 | NT-530 |
| <input type="checkbox"/> | RF-Attenuator DC – 18 GHz 6 dB | NT-437 | <input type="checkbox"/> | Vertical coupling plane (ESD) | NT-531 |
| <input type="checkbox"/> | RF-Attenuator DC – 18 GHz 10 dB | NT-438 | <input type="checkbox"/> | Test cable #4 for EN 61000-4-6 | NT-553 |
| <input type="checkbox"/> | RF-Attenuator DC – 18 GHz 20 dB | NT-439 | <input type="checkbox"/> | Test cable #3 for conducted emission | NT-554 |
| <input type="checkbox"/> | I+P 7780 Directional coupler 100 - 2000 MHz | NT-440 | <input type="checkbox"/> | Test cable #5+#6 ESD-cable (2x470k) | NT-555 + NT-556 |
| <input type="checkbox"/> | ESH3-Z2 - Pulse limiter 9 kHz - 30 MHz | NT-441 | <input type="checkbox"/> | Test cable #8 Sucoflex 104EA | NT-559 |
| <input type="checkbox"/> | Power Divider 6 dB/1 W/50 Ohm | NT-443 | <input type="checkbox"/> | Test cable #9 (for outdoor measurements) | NT-580 |
| <input type="checkbox"/> | Directional coupler 0,1 MHz – 70 MHz | NT-444 | <input type="checkbox"/> | Test cable #10 (for outdoor measurements) | NT-581 |
| <input type="checkbox"/> | Directional coupler 0,1 MHz – 70 MHz | NT-445 | <input type="checkbox"/> | Test cable #13 Sucoflex 104PE | NT-584 |
| <input type="checkbox"/> | Tube imitations according to EN 55015 | NT-450 | <input type="checkbox"/> | Test cable #21 for SRM-3000 | NT-592 |
| <input type="checkbox"/> | FCC-801-M3-16A Coupling decoupling network | NT-458 | <input type="checkbox"/> | Shield chamber | NT-600 |
| <input type="checkbox"/> | FCC-801-M2-50A Coupling decoupling network | NT-459 | <input type="checkbox"/> | Climatic chamber | M-1200 |
| <input type="checkbox"/> | FCC-801-M5-25 Coupling decoupling network | NT-460 | | | |


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Appendix 1 (continued) Test equipment used

| | | | | | |
|--------------------------|---|-------------|--------------------------|--|-------------|
| <input type="checkbox"/> | Anechoic Chamber 3 m / 5 m measuring distance | EMV-100 | <input type="checkbox"/> | Log.per Antenna 0,7 – 9 GHz STLP9149 | EMV-305 |
| <input type="checkbox"/> | Turntabel 6 m diameter | EMV-101 | <input type="checkbox"/> | HF- Ampflifier 9 kHz-250 MHz BBA150 (low noise) | EMV-306 |
| <input type="checkbox"/> | Antenna mast 1 – 4 m | EMV-102 | <input type="checkbox"/> | Load Dump Generator LD 200N | EMV-350 |
| <input type="checkbox"/> | Mast and Turntable controller FC-06 | EMV-103 | <input type="checkbox"/> | Ultra Compact Symulator UCS 200N100 | EMV-351 |
| <input type="checkbox"/> | EMC Video/Audiosystem | EMV-104 | <input type="checkbox"/> | Automotive Power fail module PFM 200N100.1 | EMV-352 |
| <input type="checkbox"/> | EMC Software EMC32 Version 10.40.00 | EMV-105 | <input type="checkbox"/> | Voltage Drop Symulator VDS 200Q100 | EMV-353 |
| <input type="checkbox"/> | Hornantenna 1 – 18 GHz HF 907 | EMV-110 | <input type="checkbox"/> | Arb. Generator AutoWave | EMV-354 |
| <input type="checkbox"/> | Antennapre.amp. 1 – 18 GHz ERZ-LNA0200-1800-30-2 | EMV-111 | <input type="checkbox"/> | Ultra Compact Symulator UCS 500N7 | EMV-355 |
| <input type="checkbox"/> | Trilog Antenna 30-3000 MHz VULB9163 | EMV-112 | <input type="checkbox"/> | Coupling decoupling network CNI 503B7 / 32 A | EMV-356 |
| <input type="checkbox"/> | Monopol 9 kHz – 30 MHz VAMP 9243 | EMV-113 | <input type="checkbox"/> | Coupling decoupling network CNI 503B7 / 63 A | EMV-357 |
| <input type="checkbox"/> | Antennapre.amp 18 – 40 GHz BBV 9721 | EMV-114 | <input type="checkbox"/> | Telecom Surge Generator TSurge 7 | EMV-358 |
| <input type="checkbox"/> | Hornantenna 200 – 2000 MHz AH-220 | EMV-110 | <input type="checkbox"/> | Coupling decoupling network CNI 508N2 | EMV-359 |
| <input type="checkbox"/> | DC Artificial Network PVDC 8300 | EMV-150 | <input type="checkbox"/> | Coupling decoupling network CNV 504N2.2 | EMV-360 |
| <input type="checkbox"/> | AC Artificial Network NNLK 8121 RC | EMV-151 | <input type="checkbox"/> | Immunity generator NSG4060/NSG4060-1 | EMV-361 |
| <input type="checkbox"/> | EMI Receiver ESR26 | EMV-200 | <input type="checkbox"/> | Coupling network CDND M316-2 | EMV-362 |
| <input type="checkbox"/> | Signalgenerator 9 kHz – 40 GHz N5173B | EMV-201 | <input type="checkbox"/> | Coupling network CT419-5 | EMV-363 |
| <input type="checkbox"/> | GPS Frequency normal B-88 | EMV-202 | <input type="checkbox"/> | ESD Generator NSG 437 | EMV-364 |
| <input type="checkbox"/> | DC Power supply N5745A | EMV-203 | <input type="checkbox"/> | Pulse Limiter VTSD 9561-F BNC | EMV-405 |
| <input type="checkbox"/> | Spektrum Analyzator FSV40 | EMV-205 | <input type="checkbox"/> | Transient emission BSM200N40+BS200N100 | EMV-450+451 |
| <input type="checkbox"/> | Thd Multimeter Model 2015 | EMV-206 | <input type="checkbox"/> | Cap. Coupling Clamp HFK | EMV-455 |
| <input type="checkbox"/> | Poweramplifier PAS15000 | EMV-207/abc | <input type="checkbox"/> | Mag. Field System MS100N+MC26100+MC2630 | EMV-456-458 |
| <input type="checkbox"/> | Inrush Current Source | EMV-208/abc | <input type="checkbox"/> | Coupling network CDN M2-100A | EMV-459 |
| <input type="checkbox"/> | Arb.-generator Sycore | EMV-209 | <input type="checkbox"/> | Coupling network CDN M3-32A | EMV-460 |
| <input type="checkbox"/> | Harmonics/Flicker analyzer ARS 16/3 | EMV-210 | <input type="checkbox"/> | Coupling network CDN M5-100A | EMV-461 |
| <input type="checkbox"/> | HF- Ampflifier 9 kHz-250 MHz BBA150 | EMV-300 | <input type="checkbox"/> | Current Clamp CIP 9136A | EMV-462 |
| <input type="checkbox"/> | HF- Amplifier 80 -1000 MHz BBA150 | EMV-301 | <input type="checkbox"/> | DC Artificial Network HV-AN 150 | EMV-464+465 |
| <input type="checkbox"/> | HF- Amplifier 0,8 - 6 GHz BBA150 | EMV-302 | <input type="checkbox"/> | Coupling Clamp EM 101 | EMV-466 |
| <input type="checkbox"/> | High Power Ant. 20-200 MHz VHBD 9134 | EMV-303 | <input type="checkbox"/> | Decoupling Clamp FTC 101 | EMV-467 |
| <input type="checkbox"/> | Log.per Antenna 80-2700 MHz STLP 9128 E special | EMV-304 | <input type="checkbox"/> | Power attenuator 10 dB / 250 Watt | EMV-469/2 |


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Appendix 2 Photodocumentation

Description: Front view


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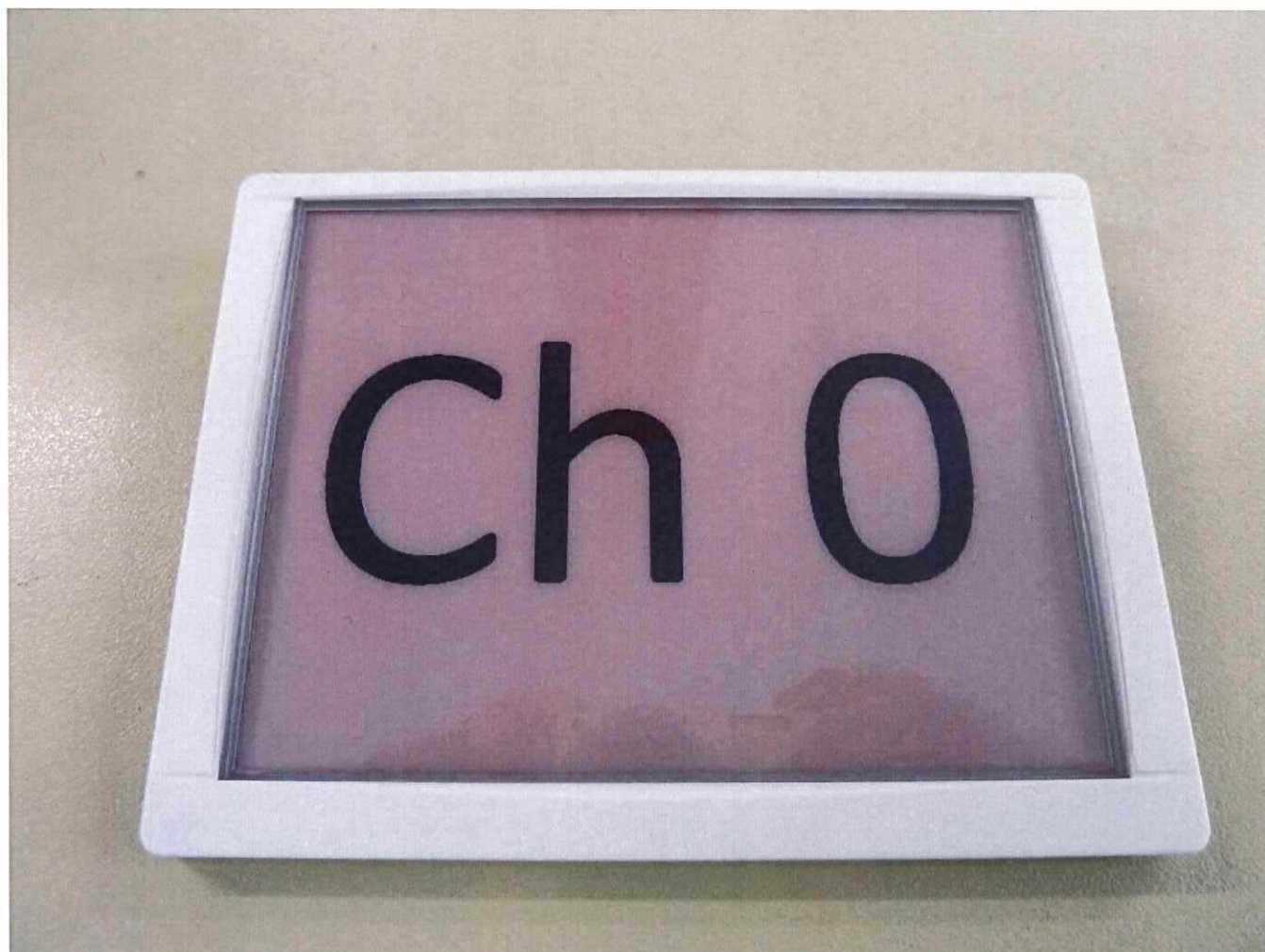
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Appendix 2 Photodocumentation

Description: Backside view

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Appendix 2 Photodocumentation

Description: Battery compartment opened

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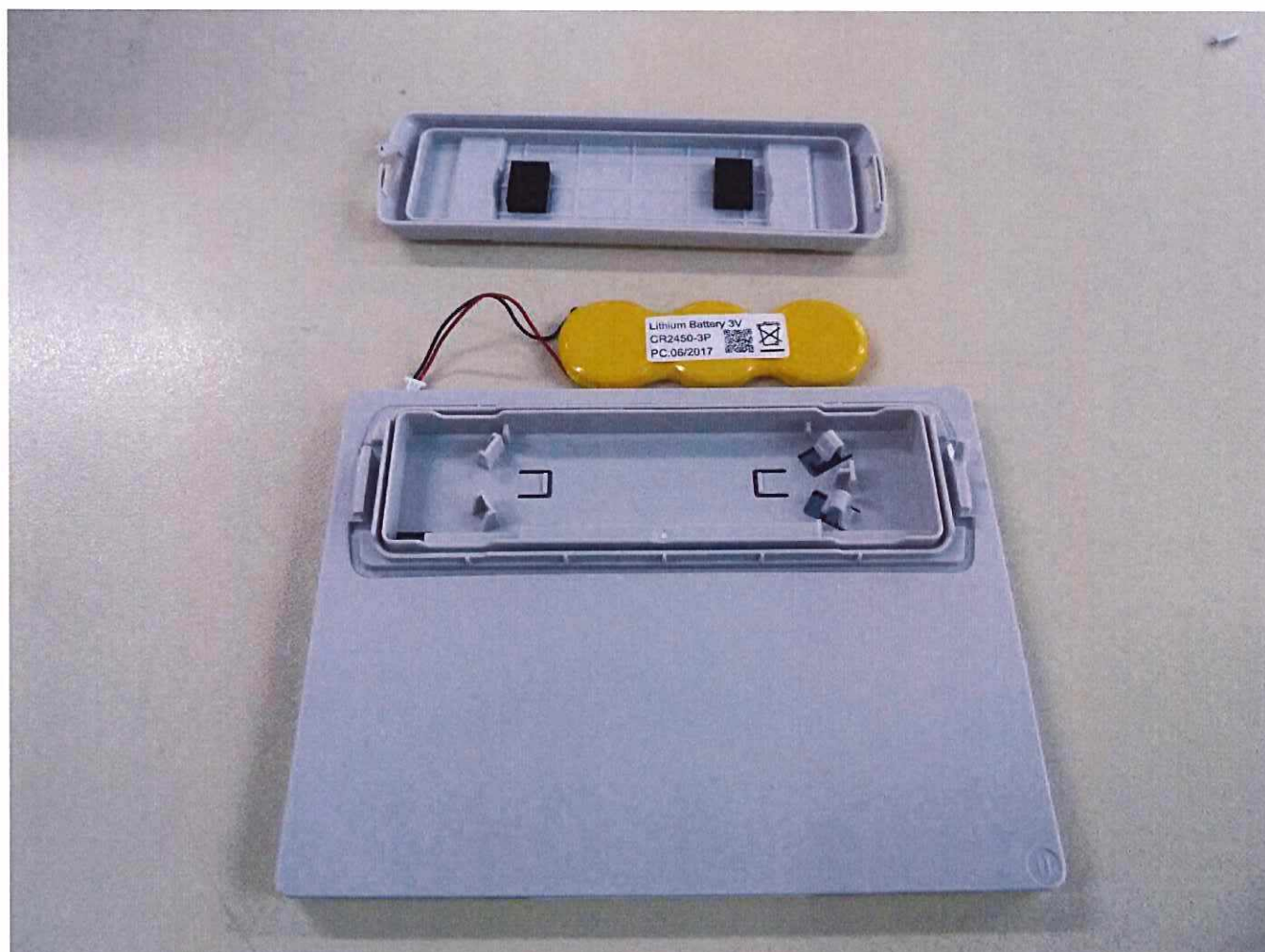
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Appendix 2 Photodocumentation

Description: Case opened

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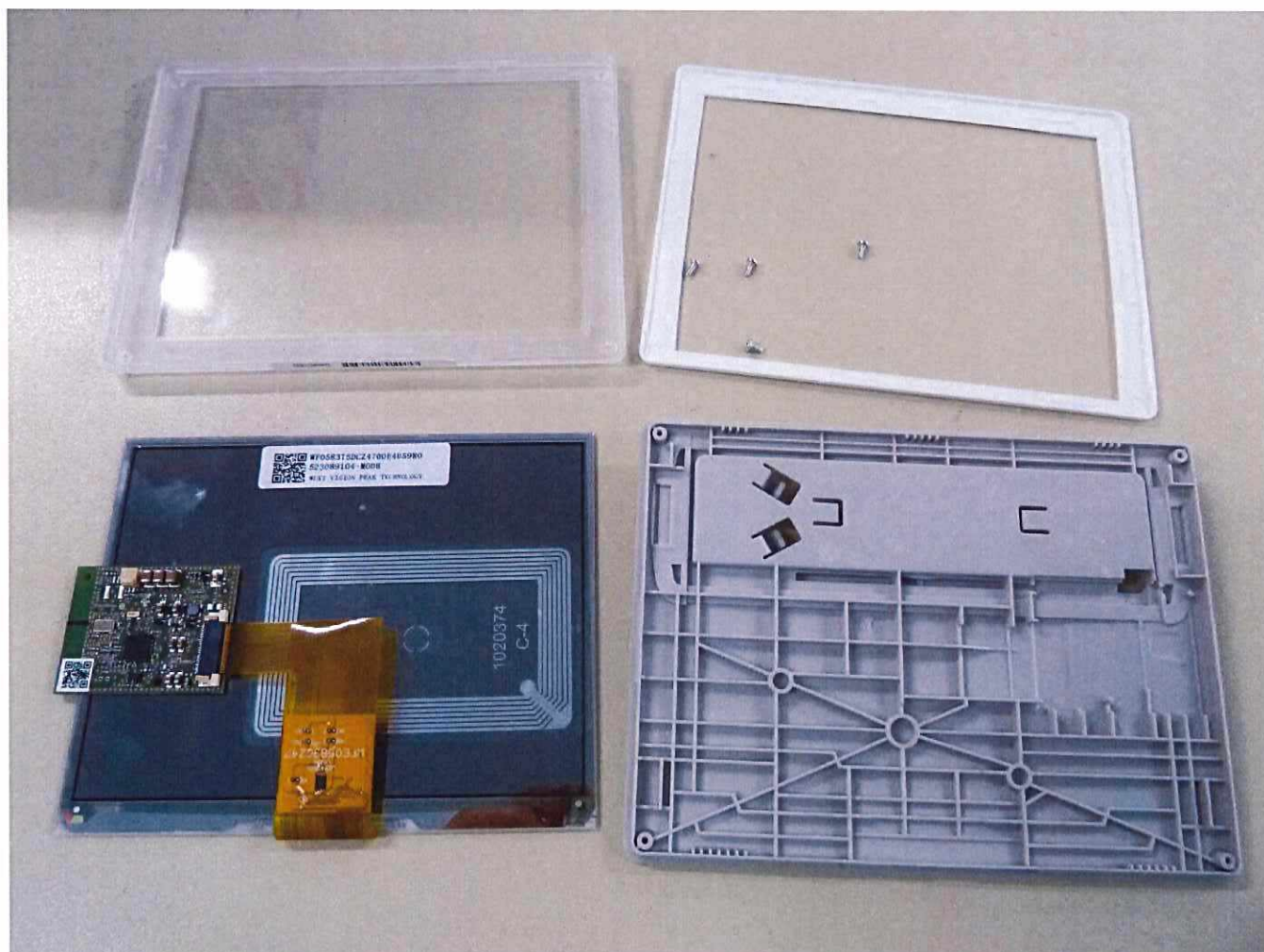
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Appendix 2 Photodocumentation

Description: Electronics view #1


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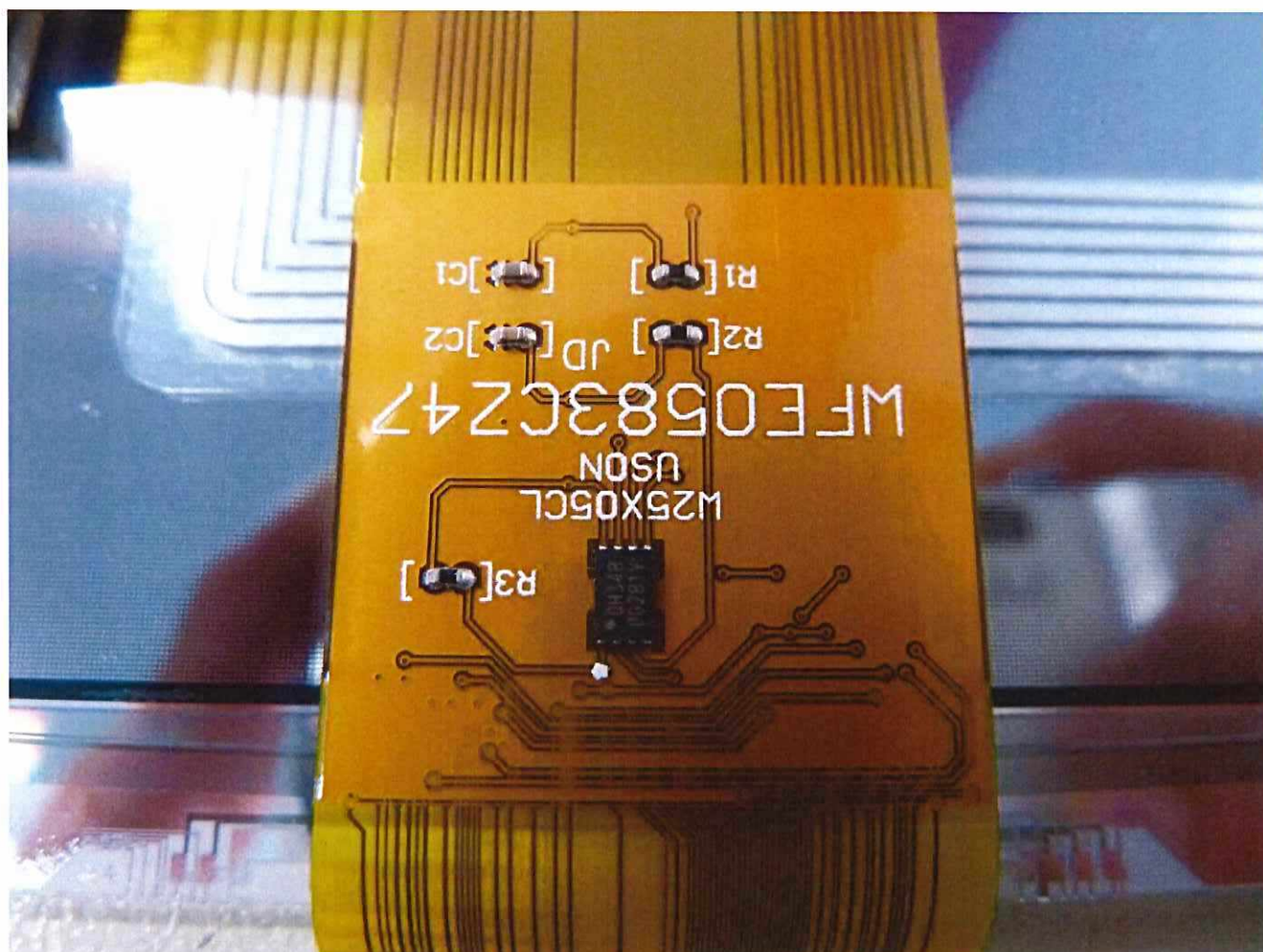
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Appendix 2 Photodocumentation

Description: Electronics view #2

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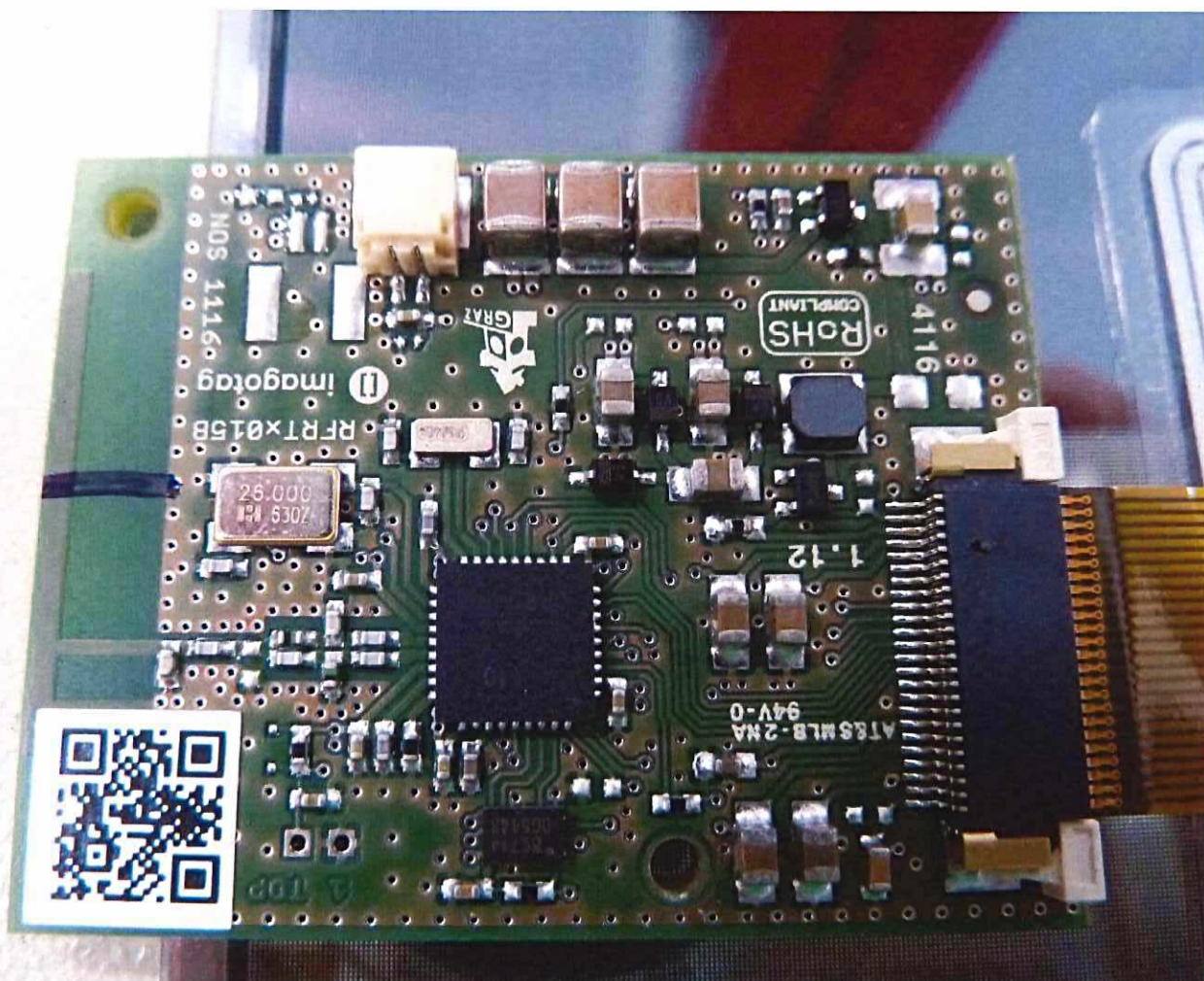
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Appendix 2 Photodocumentation

Description: Electronics view #3

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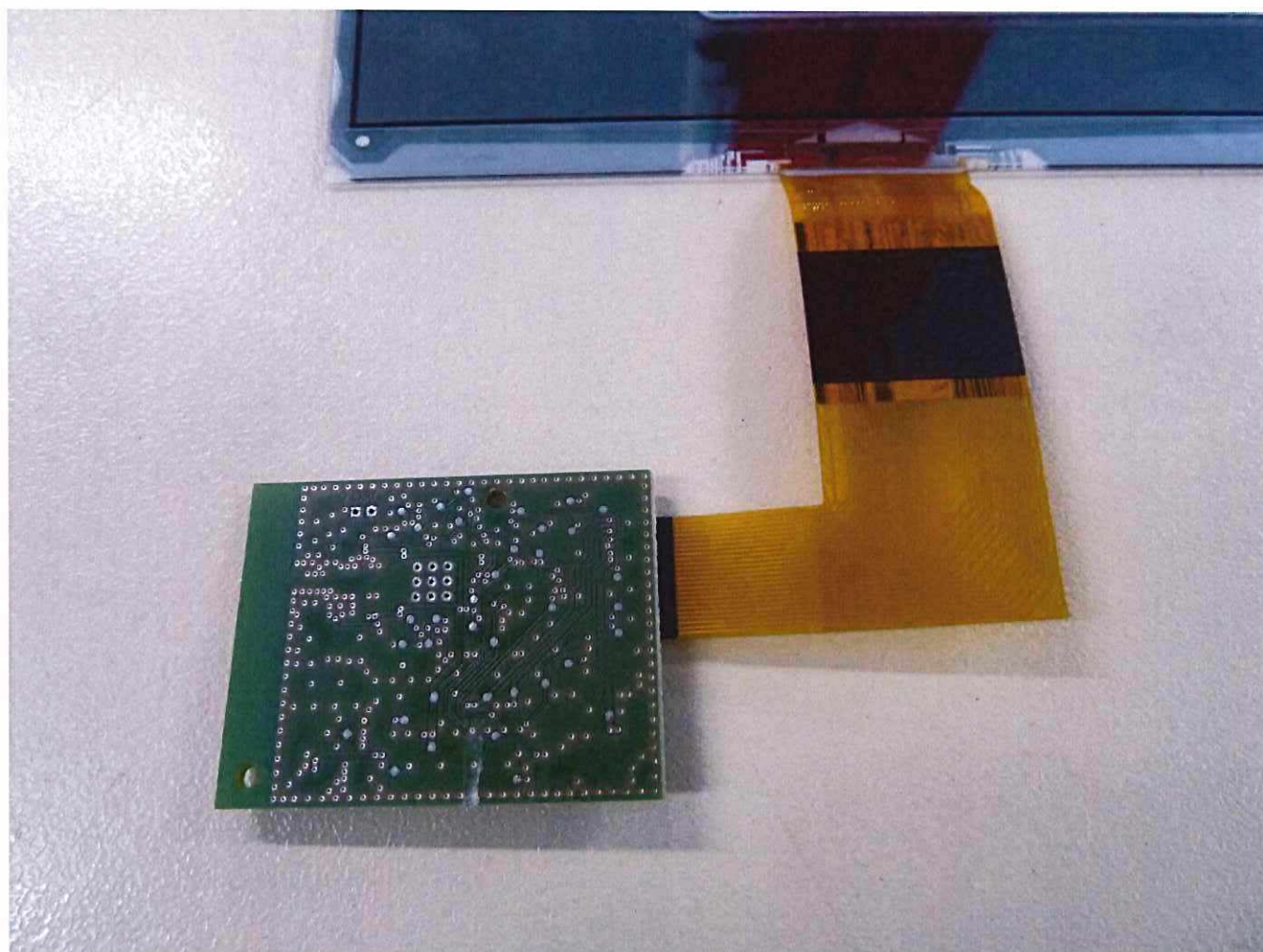
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Appendix 2 Photodocumentation

Description: Test setup view #1

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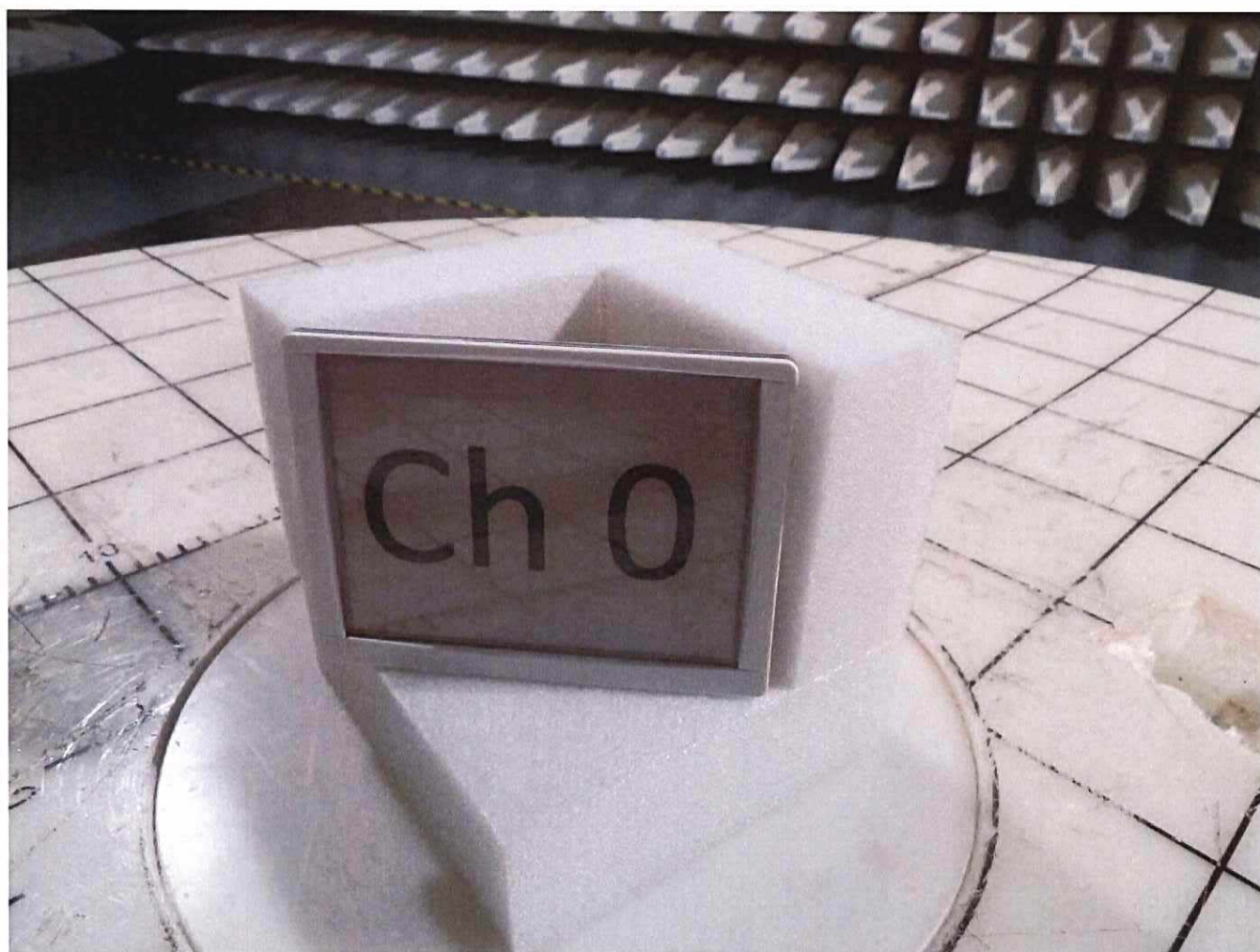
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Appendix 2 Photodocumentation

Description: Test setup view #2

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