

PARTIAL TEST REPORT No.: 2-20842790-15-10c

According to: FCC Regulations Part15.247, Part 15.207

> IC-Regulations RSS-Gen, Issue 4 RSS-247, Issue 1

> > for

Datalogic ADC S.r.l.

JOYA TOUCH Type : P00AN04HL0GT0W7-GRR

IC: 3862E-JNGWB PMN: JOYA TOUCH HVIN: JNG P GUN

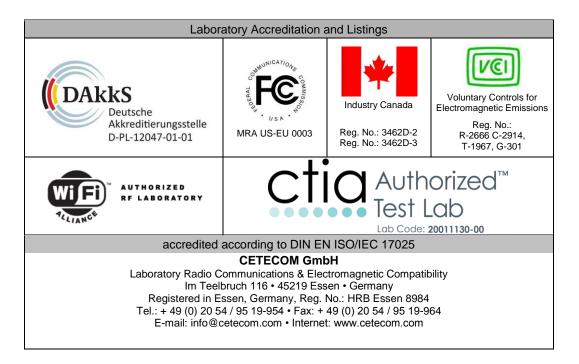




Table of contents

| 1. SUMMARY OF TEST RESULTS | 3 |
|---|----------------------|
| 1.1. Tests overview of US (FCC) and Canada IC (RSS) Standards | 3 |
| 2. ADMINISTRATIVE DATA | 5 |
| 2.1. Identification of the testing laboratory 2.2. Test location 2.3. Organizational items | 5 5 5 |
| 3. EQUIPMENT UNDER TEST (EUT) | 6 |
| 3.1. Technical data of main EUT declared by applicant | 6 6 7 7 |
| 4. DESCRIPTION OF TEST SYSTEM SET-UP'S | |
| 4.1. Test system set-up for conducted measurements on antenna port | |
| 5. MEASUREMENTS | 13 |
| 5.1. RF-Parameter – RF Power conducted | 15 17 19 21 |
| 6. ABBREVIATIONS USED IN THIS REPORT | 24 |
| 7. ACCREDITATION DETAILS OF CETECOM'S LABORATORIES AND TEST SITES | 24 |
| 8. INSTRUMENTS AND ANCILLARY | |
| 9. VERSIONS OF TEST REPORTS (CHANGE HISTORY) | |

| Table of annex The listed attachments are an integral part of this report | Total pages |
|--|-------------|
| Annex 1: Test result diagrams (separate document) TR2-20842790-15-10c-A1 | 27 |
| Annex 2: External photographs of EUT (separate document) TR2-20842790-15-10c-A2 | 6 |
| Annex 3: Internal photographs of EUT (separate document) TR2-20842790-15-10c-A3 | 13 |
| Annex 4: Test set-up photographs (separate document) TR2-20842790-15-10c-A4 | 9 |
| Tune-up procedure for SSD45_JOYA TOUCH Plus_rev20160621(supplied by applicant) | 3 |
| JOYANG_TEST-TOOLS_QUICK_START_INSTRUCTIONS_REV20160530 (supplied by applicant) | 41 |
| BlueTest3 User Guide(CS-102736-AN-6) Issue 6 (supplied by applicant) | 44 |
| Operational Description_JOYA TOUCH_20160530_rev05 (supplied by applicant) | 10 |



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 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. Also we refer on special conditions which the applicant should fulfill according §2.927 to §2.948, special focus regarding modification of the equipment and availability of sample equipment for market surveillance tests.

The presented <u>Equipment Under Test</u> (in this report, hereinafter referred as EUT) integrates a Bluetooth[©] transmitter. Other implemented wireless technologies are not considered within this test report. **The build-in Bluetooth module is already approved with FCC ID: SQGBT900 and IC:3147A-BT900.**

Following test cases have been performed to show compliance with applicable FCC Part 2 and Part 15 rules of the FCC CFR Title 47 Rules, Edition 4th November 2015 and IC RSS-247 Issue 1/RSS-Gen Issue 4 standards

| | | References and Limits | | | | EUT | |
|--|------------------------------------|--------------------------|----------------------------------|---|---------------|-------------|------------|
| Test cases | Port | FCC Standard | RSS Section | Test limit | EUT set-up | op. mode | Result |
| | | | | | | | |
| 20 dB bandwidth | Antenna terminal | §15.247 | RSS-247, Issue 1: 5.1 (1) | At least 25 kHz or 2/3 | | | Remark 1.) |
| Channel carrier frequency separation | (conducted) | (a)(1) | RSS-247, Issue 1: 5.1 (2) | of 20 dB bandwith | | | Remark 1.) |
| 99% occupied bandwidth | Antenna terminal (conducted) | 2.1049(h) | RSS-Gen, Issue 4: Chapter 6.6 | 99% Power bandwidth | | | Remark 1.) |
| Channel use, average channel use, input band- width and synchronization between signals | | \$15.247 (a)(1) | RSS-210, Issue 8: 5.1 | See specification | | | Remark 1.) |
| Channel average Occupancy time and number of channels | Antenna terminal (conducted) | \$15.247 (a)(1) (iii) | RSS-247, Issue 1: 5.1 (3) | 0.4 seconds | | | Remark 1.) |
| Transmitter Peak output power | Antenna terminal (conducted) | §15.247 (b)(1) | RSS-247, Issue 1: 5.1 (2) | < 125 mW | 2 | 1 | Pass |
| Transmitter frequency stability | Antenna terminal (conducted) | | RSS-Gen, Chapter 4.7 | Operation within designated operational band | | | Not tested |
| Transmitter Peak output power radiated | Enclosure (radiated) | \$15.247 (b)(4) | RSS-247, Issue 1: 5.1 (2) | < 125 mW (EIRP) for antenna with directional gain less 6 dBi | | | Remark 1.) |
| Out-Of-Band RF- emissions Band-Edge emissions | Antenna terminal (conducted) | §15.247 (d) | RSS-247, Issue 1, Chapter 5.5 | 20 dBc and Emissions in restricted bands must meet the general field strength radiated limits | | | Remark 1.) |

1.1. Tests overview of US (FCC) and Canada IC (RSS) Standards



| General field strength emissions + restricted bands | Enclosure + Interconnecting cables (radiated) | \$15.247 (d) \$15.205 \$15.209 | RSS-247, Issue 1, Chapter 5.5 RSS-Gen: Issue 4: §8.9 Table 4+5+6 | Emissions in restricted bands must meet the general field-strength radiated limits | 1 | 1 | Pass |
|---|--|--------------------------------------|---|---|---|---|------------|
| AC-Power Lines Conducted Emissions | AC-Power lines | §15.207 | RSS-Gen, Issue 4: Chapter 8.8 Table 3 | FCC §15.107 class B limits §15.207 limits IC: Table 3, Chapter 8.8 | | | Remark 2.) |

Remark: 1.) Please refer integrated BT900-SA Module's reports

FCC ID: SQGBT900 Reports FR442807AD & FR442807AE Version Rev.01, issued May 28, 2014

IC: 3147A-BT900 Reports CR442807-02AD & CR442807-02AE Version Rev.01, issued Oct. 23, 2015

2.) Please refer separate test report TR2-20842790-15-10d and corresponding annexes

Attestation:

I declare that all measurements were performed by me or under my supervision and that all measurements have been performed and are correct to my best knowledge and belief to Industry Canada standards. All requirements as shown in above table are met in accordance with enumerated standards.

.

Dipl.-Ing. Rachid Acharkaoui Responsible for test section

.....

Dipl.-Ing. Christian Lorenz Responsible for test report



2. Administrative Data

| adoratory | |
|----------------------------|--|
| CETECOM GmbH | |
| Im Teelbruch 116 | |
| 45219 Essen - Kettwig | |
| Germany | |
| DiplIng. Rachid Acharkaoui | |
| DiplIng. Niels Jeß | |
| | CETECOM GmbH Im Teelbruch 116 45219 Essen - Kettwig Germany DiplIng. Rachid Acharkaoui |

2.1. Identification of the testing laboratory

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

| DiplIng. Christian Lorenz |
|---------------------------|
| DiplIng. V. Krueger |
| 2016-02-29 |
| 2016-03-03 to 2016-10-10 |
| 2016-10-12 |
| |

2.4. Applicant's details

| Applicant's name: | Datalogic ADC S.r.l. | |
|-------------------|---|--|
| Address: | Via S. Vitalino, 13 40012, Lippo di Calderara di Reno (BO) | |
| | ITALY | |
| Contact person: | Mr. Eucarpio Guarisco | |

2.5. Manufacturer's details

| Manufacturer's name: | please see Applicant's details | | |
|----------------------|--------------------------------|--|--|
| Address: | please see Applicant's details | | |
| | | | |
| | | | |



3. Equipment under test (EUT)

3.1. Technical data of main EUT declared by applicant

| Main function | Shopping application | ation & general purp | oose mobile computer | | | |
|--|--|---------------------------------------|---------------------------------------|--|--|--|
| Туре | Portable equipment | | | | | |
| Frequency range and channels (US/Canada -bands) | 2402 MHz to 2480 MHz | | | | | |
| Type of modulation (packet types) | | E BT 1.0 / BT 1.1: DH1/DH3/DH5 – GFSK | | | | |
| | | 2.1: DH1/2DH3/2D | - | | | |
| | E BT 3.0: | | | | | |
| | E BT 4.0: | | 5 – GFSK | | | |
| Number of channels | 🗷 0 to 78 (BR & | | | | | |
| (USA/Canada -bands) | 🗷 0 to 40 (LE M | lode) | | | | |
| Antenna Type | Integrated | | | | | |
| | □ External, no F | | | | | |
| | □ External, sepa | rate RF-connector | | | | |
| Antenna Gain | Maximum 0.50 d | Bi gain according a | pplicants information in 2.4 GHz band | | | |
| MAX Field strength (radiated): | 99.80 dBµV/m@3m distance on nominal 2480 MHz | | | | | |
| FCC-ID | U4GJNGWB | | | | | |
| IC-ID | 3862E-JNGWB | | | | | |
| Installed options | 🗷 W-LAN 2.4 C | Hz (not tested with | in this test report) | | | |
| | 🗷 W-LAN 5 GH | Iz (not tested within | this test report) | | | |
| | NFC (not test | ed within this test re | port) | | | |
| | 🗷 battery chargi | ng option (WPC) (n | ot tested within this test report) | | | |
| Power supply | Internal battery Li-Io 3.41V DC to 4.35 V DC (nominal 3.75 V DC) | | | | | |
| Special EMI components | | | | | | |
| EUT sample type | □ Production | Pre-Production | □ Engineering | | | |
| Firmware | | \Box for normal use | Special version for test execution | | | |
| FCC label attached | ¥ yes □ no | | | | | |

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

| Short descrip- tion*) | EUT | Туре | S/N serial number | HW hardware status | SW software status |
|-----------------------------|------------|-----------------------------------|----------------------|-------------------------------------|---|
| EUT A | JOYA TOUCH | Type : P00AN04HL0GT0W7 -GRR | Z16P00014 | Beta HW Version P/N:911350013 | SW Version:WEC7 Firmware Version: 2.16 |

*) 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 | Туре | S/N serial number | HW hardware status | SW software status |
|------------------------------------|---------------------|---------------|----------------------|-----------------------|-----------------------|
| AE 1 | Laptop | DELL Inspiron | | | Windows 7 |

*) 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 | Radiated measurements Set-up (AE 1 & Cable 1 were used only to activate Bluetooth mode was placed outside measurement chambers) |
| set. 2 | EUT A + Cable 2 | Conducted measurements Set-up (AE 1 & Cable 1 were used only to activate Bluetooth mode was placed outside measurement chambers) |

*) 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 | TX-HFSS Mode Bluetooth BR/EDR | A continuous Bluetooth TX modes BR(Basic Rate) Mode GFSK- Modulation / EDR (Enhanced Data Rate (Vers. 2.1)) Mode can be established on with help of Datalogic test firmware version 2.16 & below mentioned softwares - USB to BT900 bridge using Windows-XP 32bit Virtual Machine - Bluetooth driver installation using BT900 firmware - Serial connection using Uw Teminal command window - Configuration of test mode, channels, modulation, Power in Blue Test3 |
| op. 2 | RX-HFSS Mode Bluetooth BR/EDR | A continuous Bluetooth-RX Mode BR(Basic Rate) Mode GFSK- Modulation / EDR (Enhanced Data Rate (Vers. 2.1)) can be established on with help of Datalogic test firmware version 2.16 & below mentioned softwares USB to BT900 bridge using Windows-XP 32bit Virtual Machine Bluetooth driver installation using BT900 firmware Serial connection using Uw Teminal command window Configuration of test mode, channels, modulation, Power in Blue Test3. |
| op. 3 | TX-DSSS Mode Bluetooth LE | A continuous Bluetooth- LE (Low Energy) TX Mode can be established on with help of Datalogic test firmware version 2.16 & below mentioned softwares USB to BT900 bridge using Windows-XP 32bit Virtual Machine Bluetooth driver installation using BT900 firmware Serial connection using Uw Teminal command window Configuration of test mode, channels, modulation, Power in Blue Test3 |
| op. 4 | RX-DSSS Mode Bluetooth LE | A continuous Bluetooth- LE (Low Energy) -RX Mode can be established on with help of Datalogic test firmware version 2.16 & below mentioned softwares USB to BT900 bridge using Windows-XP 32bit Virtual Machine Bluetooth driver installation using BT900 firmware Serial connection using Uw Teminal command window Configuration of test mode, channels, modulation, Power in Blue Test3. |

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



3.6. Configuration of cables used for testing

| Cable number | Item | Туре | S/N serial number | HW hardware status | Cable length |
|-----------------|-------------------------|------------------------|----------------------|-------------------------|--------------|
| Cable 1 | CABLETECH TECHNOLOGY | High-speed revision2.0 | | AWM 2725 FT2 E237114 | 1.2 m |
| Cable 2 | RF –SMA Cable | | | | 0.133 m |



4. Description of test system set-up's

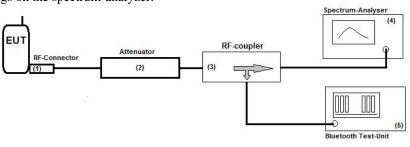
4.1. Test system set-up for conducted measurements on antenna port

Bluetooth conducted RF-Setup 1 (BT1 Set-up)

The EUT's RF-signal is coupled out by a suitable antenna coupling connector (1). The signal is first attenuated (2) then on the RF-coupler the coupled RF-path is connected to a Bluetooth test unit communication tester (5). The direct RF-path is connected to the spectrum – analyzer (4) for specific RF-measurements. The specific attenuation losses for both signal paths/branches are determined prior to the measurement within a set-up calibration. These are then taken into account by correcting the measurement readings on the spectrum-analyzer.

Schematic:

General description:



| Testing method: | ANSI C63.10:2013, KDB 558074 D01 DTS Meas.Guidance v03r05 | | |
|-------------------------|---|--|---|
| Used Equipment | Passive Elements | Test Equipment | Remark: |
| | ☑ 10 dB Attenuator | ☑ CBT32 Communication Test- Unit for Bluetooth | See List of equipment under each test case and chapter 8 for calibration info |
| | Low loss RF- cables | ☑ DC-Power Supply | |
| | ☑ RF-Coupler | Spectrum-Analyser | |
| Measurement uncertainty | See chapter 5.6 | | |



4.2. Test system set-up for radiated magnetic field measurements below 30 MHz

Specification: ANSI C63.10-2013 chapter 6.4 (§6.4.4.2)

General Description: Evaluating the radiated field emissions are done first by an exploratory emission measurement and a final measurement for most critical frequencies determined.

> The loop antenna was placed at 1 m height above ground plane and 3 m measurement distance from set-up for investigations. Because of reduced measurement distance, correction data were applied, as stated in chapter "General Limit - Radiated field strength emissions below 30 MHz". The tests are performed in the semi anechoic room recognized by the regulatory commission.

Schemat

Testing

| atic: | < arr 3 m distance € | Receiver |
|-----------|---|--|
| | Anechoic Room | m magnetic antenna PC with measurement software Positioning Controller |
| | Power supply (if needed) | unit (if needed) |
| g method: | Exploratory, preliminary measurement The EUT and it's associated accessories are placed on a non-conductive position manipulator (tipping device) of 0.8 m height which is placed on the turntable. By rotating the turntable (step 90°, range 0°to 360°) and the EUT itself either | Final measurement on critical frequencies Based on the exploratory measurements, the most critical frequencies are re-measured by main- taining the EUT's worst-case operation mode, cable position, etc. |
| | on 3-orthogonal axis (portable equipment) or 2- orthogonal axis (defined operational position of EUT), the emission spectrum was recorded. The | First a frequency zoom around the critical frequency is done to locate the frequency more precisely. After this step, for all identified critical |

ıl ely. After this step, for all identifie frequencies, the maximum peak was determined.

Following parameters were varied: the turntable angle continuously in the range 0 to 360 degree, the EUT itself either over 3-orthogonal axis (not defined usage position) or 2-orthogonal axis (defined usage position).

On the determined worst-case position, a final measurement with necessary bandwidth and detector according standard has been carried out.

| Formula: | $E_C = E_R + AF + C_L + D_F - G_A$ | AF =Antenna factor |
|----------|---|---|
| | | $C_L = Cable loss$ |
| | $M = L_T - E_C$ | D _F = Distance correction factor |
| | | E_C = Electrical field – corrected value |
| | | $E_R = Receiver reading$ |
| | | G_A = Gain of pre-amplifier (if used) |
| | | $L_{T} = Limit$ |
| | | M = Margin |
| | All units are dB-units, positive margin m | eans value is below limit. |

loop antenna was moved at least to 2-perpendicular axes (antenna vector in direction of EUT and parallel to EUT) in order to

maximize the emissions. The results are

documented in a diagram. Critical frequencies

(low margin to limit) are saved within a data

reduction table for further investigations. If

various operating modes are supported, further investigations are made to find the worst-case.

Also the interconnection cables and equipment

position were varied in order to maximize the

emissions.

Distance correction:

Reference for applied correction (extrapolating) factors due to reduced measurement distance: ANSI C63.10:2013, §6.4.4.2 - Equations (2) + (3) + (4)



4.3. Test system set-up for radiated electric field measurement 30 MHz to 1 GHz

Specification:

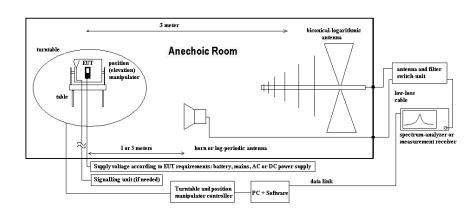
ANSI C63.4-2014 chapter 8.2.3, ANSI C63.10-2013 chapter 6.5

General Description:

Evaluating the field emissions have to be done first by an exploratory emissions measurement and a final measurement for most critical frequencies. The tests are performed in a NSA-compliant semi anechoic room (SAR) recognized by the regulatory commissions.

Schematic:

Testing method:



Exploratory, preliminary measurements

The EUT and its associated accessories are placed on a non-conductive position manipulator (tipping device) of 0.8 m height which is placed on the turntable. By rotating the turntable (range 0° to 360°, step 90°) and the EUT itself either on 3-orthogonal axis (portable equipment) or 2-orthogonal axis (defined operational position of EUT) the emission spectrum and it's characteristics was recorded with an EMI-receiver, broadband antenna and software.

Measurement antenna: horizontal and vertical, heights: 1,0 m and 1,82 m as worst-case determined by an exploratory emission measurements. The results are documented in a diagram. Critical frequencies (low margin to limit) are saved within a table for further investigations. If various operating modes are supported, further investigations are made to find the worst-case of them. Also the interconnection cables and equipment position were varied in order to maximize the emissions. Final measurement on critical frequencies

Based on the exploratory measurements, the most critical frequencies are re-measured by maintaining the EUT's worst-case operation mode, cable position, etc. either on 10m OATS or 3m semi-anechoic room.

First a frequency zoom around the critical frequency is done to locate the frequency more precisely. After this step, for all identified critical frequencies, the maximum peak was determined.

Following parameters were varied: the turntable angle continuously in the range 0 to 360 degree, the EUT itself either over 3-orthogonal axis (not defined usage position) or 2-orthogonal axis (defined usage position). The measurement antenna height between 1 m and 4 m.

On the determined worst-case position, a final measurement with necessary bandwidth and detector according standard has been carried out.

| $E_C = E_R + AF + C_L + D_F - G_A (1)$ | AF = Antenna factor |
|--|--|
| | $C_L = Cable loss$ |
| $\mathbf{M} = \mathbf{L}_{\mathrm{T}} - \mathbf{E}_{\mathrm{C}} \tag{2}$ | D_F = Distance correction factor (if used) |
| | E_C = Electrical field – corrected value |
| | $E_R = Receiver reading$ |
| | $G_A = Gain of pre-amplifier (if used)$ |
| | $L_{T} = Limit$ |
| | M = Margin |

All units are dB-units, positive margin means value is below limit.

Formula:



٦

4.4. Test system set-up for radiated electric field measurement above 1 GHz

Specification:

ANSI C63.4-2014 chapter 8.3, ANSI C63.10-2013 chapter 6.6.3.3 & 6.6.4

General Description: Evaluating the emissions have to be done first by an exploratory emissions measurement and a final measurement for most critical frequencies. The tests are performed in a CISPR 16-1-4:2010 compliant fully anechoic room (FAR) recognized by the regulatory commission. The measurement distance was set to 3 meter for frequencies up to 18 GHz and 2 meter above 18 GHz. A logarithmic periodic antenna is used for the frequency range 30 MHz to 1 GHz. Horn antennas are used for frequency range 1 GHz to 40 GHz. The EUT is aligned within 3 dB beam width of the measurement antenna with three orthogonal axis measurements on the EUT.

Schematic:

| 3 m | eter | ~ | |
|---|--|--|---|
| turntable position (elevation) table 1 or 3 meters Supply voltage according to E | Anechoic Room | | antisuma and filter owritch-unit low-loss cable spectrum-analyzer or measurement receiver |
| Exploratory, preliminary mease The EUT and its associated placed on a non-conductive positi (tipping device) of 1.55 m height on the turntable. By rotating the to 0° to 360°, step 15°) and the EUT 3-orthogonal axis (portable equ orthogonal axis (defined operation EUT) the emission spectric characteristics was recorded of receiver, broadband antenna and so The measurements are performed and vertical polarization of th antennas. The results are doo diagram. Critical frequencies (limit) are saved within a tal investigations. If various opera supported, further investigations at the worst-case of them. Also the cables and equipment position order to maximize the emissions. | accessories are bassion manipulator criti which is placed tain urntable (range cabl f itself either on uipment) or 2- firs preconstruction of freq um and it's preconstruction with an EMI- goftware. Foll and in horizontal angle e measurement the cumented in a heig low margin to ble for further On ting modes are mea are made to find dete interconnection On were varied in measurement the | al measurement on critic ed on the exploratory mea cal frequencies are re-r ing the EUT's worst-ca le position, etc. t a frequency zoom a uency is done to locate cisely. After this step, for uencies, the maximum pe owing parameters were v le continuously in the rar EUT itself over 3-ortho the for EUT with large dir the determined worst-ca surement with necessa actor according standard h the determined worst-ca surement with necessa | asurements, the most measured by main- se operation mode, around the critical the frequency more all identified critical tak was determined. varied: the turntable nge 0 to 360 degree, ogonal axis and the mensions. use position, a final ry bandwidth and as been carried out. use position, a final ry bandwidth and |
| $E_{\rm C} = E_{\rm R} + AF + C_{\rm L} + D_{\rm F} - 0$ $M = L_{\rm T} - E_{\rm C} \qquad (2)$ | E _R M = L _T | = Electrical field – c = Receiver reading = Margin = Limit ' = Antenna factor | corrected value |

 $G_A = Gain \text{ of pre-amplifier (if used)}$ All units are dB-units, positive margin means value is below limit.

 $C_L = Cable loss$

 D_F = Distance correction factor (if used)



5. Measurements

5.1. RF-Parameter – RF Power conducted

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

| test location | ☑ CETECOM Essen (Chapter. 2.2.1) □ 4 | | 443 System CTC-FAR-EMI- | | □ Please see Chapter. 2.2.3 | |
|-----------------|--|-------------|--------------------------------|--|-----------------------------|-----|
| test site | □ 441 EMISAR | 487 SAR NSA | □ 337 OATS | 🗷 347 Radio.lab. | | |
| receiver | □ 377 ESCS30 | □ 001 ESS | 🗷 489 ESU | | | |
| spectr. analys. | □ 489 ESU | □ 120 FSEM | □ 264 FSEK | | | |
| power supply | □ 456 EA 3013A □ 457 EA 3013A □ 459 EA 2032-50 | | □ 459 EA 2032-50 | 0 🗷 4.35 V DC (fully charged internal battery) | | ry) |
| otherwise | ☑ 613 20dB Attenuator | | □ Directional Coupler 1539R-10 | | | |
| Power meter | ☑ 600 NRVD Power meter | | | 🗷 266 NRV-Z31 Pea | k Power Sensor | |

5.1.2. Requirements:

| FCC | §15.247 (b) (1) for FHSS | |
|------|--|--|
| IC | RSS-247, Issue 1. Chapter 5.1, Point 2 | |
| ANSI | C63.10-2013 (chapter 6.101) | |

5.1.3. Reference: EUT antenna characteristics:

☑ Directional Gain < 6 dBi (measured: difference between measured conducted and radiated eirp. power) □ Directional Gain > 6 dBi (measured / applicant's declaration) -> conducted power reduction necessary

5.1.4. EUT settings:

For FHHS-systems hopping mode was switched-off so fixed three different channels could be measured. The EUT was instructed to send with maximum power (if adjustable) according applicants instructions. Different modulation characteristics have been checked, e.g. data rates which EUT can operate.

5.1.5. Measurement method:

The measurement was performed in non-hopping transmission mode with the carrier set to lowest/middle and highest channel. The power was also checked for different data rates, modulation scheme or packet types if applicable.

Set of RBW

RBW > 20 dB bandwith of the emission (for FHSS)

| 5.1.0. Settings on Speetrum-Analyzer. | | |
|--|--|--|
| Center Frequency Nominal channel frequency | | |
| Span | 8 MHz | |
| Resolution Bandwidth (RBW) | 3 MHz > 20 dB-Bandwidth of the signal | |
| Video Bandwidth (VBW) | 3 times the resolution bandwidth = $10MHz$ | |
| Sweep time | coupled | |
| Detector | Peak, Max hold mode | |
| Sweep Mode | Repetitive mode | |

5.1.6. Settings on Spectrum-Analyzer:



5.1.7. Conducted measurement: Max. Peak Power

• Maximum declared antenna gain [isotropical]: 0.50 dBi

| MAX PEAK POWER (conducted) [dBm] | | | | | |
|----------------------------------|-------------------------------|---------------------------------|------|--|--|
| Set-up no.: 2 Op-Mode: 1 | Low channel = 0 (2402 MHz) | High channel = 78 (2480 MHz) | | | |
| BR Mode-1Mbps -GFSK | 4.59 | 7.17 | 8.25 | | |
| EDR Mode-3Mbps-8 DPSK | -2.45 1.21 2.48 | | | | |
| Maximum Conducted value | 8.25 dBm (6.68 mW) | | | | |
| Maximum antenna gain: | 0.50 dBi | | | | |
| Maximum e.i.r.p. value | 8.75 dBm (7.50 mW) | | | | |
| Limit | 21dBm (125 mW) | | | | |

| MAX PEAK POWER (conducted) [dBm] | | | | | | | | |
|----------------------------------|-------------------------------|------|------|--|--|--|--|--|
| Set-up no.:2Op-Mode:3 | Low channel =37 (2402 MHz) | | | | | | | |
| LE Mode-1Mbps -GFSK | 5.92 | 5.39 | 5.98 | | | | | |
| Maximum Conducted value | 5.98 dBm (3.96 mW) | | | | | | | |
| Maximum antenna gain: | 0.50 dBi | | | | | | | |
| Maximum e.i.r.p. value | 6.48 dBm (4.44 mW) | | | | | | | |
| Limit | 21dBm (125 mW) | | | | | | | |

Remarks:

1.) For further details please refer diagrams in separate annex A1

Maximum Conducted value among all Modes: 8.25 dBm (6.68 mW)

TEST RESULT: Pass



5.2. General Limit - Radiated field strength emissions below 30 MHz

5.2.1. Test location and equipment

| 5.2.1. Test location and equipment | | | | | | | | | |
|------------------------------------|---------------------|--------------------|--------------------|------------------------|------------------|---------------|--|--|--|
| test location | CETECOM Esser | n (Chapter. 2.2.1) | Please see Chapte | er. 2.2.2 | Please see Chapt | er. 2.2.3 | | | |
| test site | 🗷 441 EMISAR | □ 487 SAR NSA | □ 347 Radio.lab. | | | | | | |
| receiver | □ 377 ESCS30 | 🗷 001 ESS | | | | | | | |
| spectr. analys. | □ 584 FSU | □ 120 FSEM | □ 264 FSEK | | | | | | |
| antenna | 🗆 574 BTA-L | □ 133 EMCO3115 | □ 302 BBHA9170 | 289 CBL 6141 | 🗷 030 HFH-Z2 | □ 477 GPS | | | |
| signaling | □ 392 MT8820A | □ 371 CBT32 | □ 547 CMU | □ 594 CMW | | | | | |
| otherwise | □ 400 FTC40x15E | □ 401 FTC40x15E | □110 USB LWL | □ 482 Filter Matrix | □ 378 RadiSense | | | | |
| DC power | 🗆 456 EA 3013A | 🗆 457 EA 3013A | □ 459 EA 2032-50 | 268 EA- 3050 | □ 494 AG6632A | □ 498 NGPE 40 | | | |
| line voltage | 🗆 230 V 50 Hz via p | oublic mains | 🗷 4.35 V DC (fully | charged internal batte | ry) | | | | |

5.2.2. Requirements

| 1212 Requirements | | | | | | | | | |
|--------------------------|---|--------------------------------------|-----------------|---|--|--|--|--|--|
| FCC | Part 15, Subpart 0 | art 15, Subpart C, §15.205 & §15.209 | | | | | | | |
| IC | RSS-Gen: Issue 4 | SS-Gen: Issue 4: §8.9 Table 5 | | | | | | | |
| ANSI | C63.10-2013 | .10-2013 | | | | | | | |
| Frequency [MHz] | Field strength limit [µV/m] [dBµV/m] | | Distance [m] | Remarks | | | | | |
| 0.009 - 0.490 | 2400/f (kHz) 67.6 – 20Log(f) (kHz) | | 300 | Correction factor used due to measurement distance of 3 m | | | | | |
| 0.490 - 1.705 | 24000/f (kHz) 87.6 – 20Log(f) (kHz) | | 30 | Correction factor used due to measurement distance of 3 m | | | | | |
| 1.705 - 30 | 30 | 29.5 | 30 | Correction factor used due to measurement distance of 3 m | | | | | |

5.2.3. Test condition and test set-up

| eraler rest cond | and test set- | ap | | | | | |
|------------------------|--------------------------------|---|---|--|--|--|--|
| Signal link to test sy | ystem (if used): | 🗆 air link | □ cable connection | 🗵 none | | | |
| EUT-grounding | | 🗷 none | □ with power supply | □ additional connection | | | |
| Equipment set up | | 🗷 table top | | □ floor standing | | | |
| Climatic conditions | | Temperature: | (22±3°C) | Rel. humidity: (40±20)% | | | |
| | Scan data | | \blacksquare 9 - 150 kHzRBW/VBW = 200 HzScan step = 80 Hz \blacksquare 150 kHz - 30 MHzRBW/VBW = 9 kHzScan step = 4 kHz \Box other: | | | | |
| EMI-Receiver or | Scan-Mode | 🗷 6 dB EMI-I | 🗷 6 dB EMI-Receiver Mode 🗆 3dB Spectrum analyser Mode | | | | |
| Analyzer Settings | Detector | Peak (pre-measurement) and Quasi-PK/Average (final if applicable) | | | | | |
| | Mode: | Repetitive-Sca | ın, max-hold | | | | |
| | Sweep-Time | | | ous signal otherwise adapted to EUT's individual | | | |
| | | transmission duty-cycle | | | | | |
| General measurement | General measurement procedures | | Please see chapter "Test system set-up radiated magnetic field measurements below 30 MHz" | | | | |

5.2.4. Measurement Results

The results are presented below in summary form only. For more information please consult the diagrams included in annex 1.

Table of measurement results:

| Diagram No. | Channel | | Frequency range | Set- OP- up mode | | Remark | Used detector | | | Result |
|----------------|---------|-----|--------------------|---------------------|---|------------------------|---------------|----|----|--------|
| | Range | No. | | no. no. | | | | AV | QP | |
| 2.04 | High | 78 | 9 kHz-30 MHz | 1 | 1 | BR Mode (GFSK-1Mbps) | × | | | Pass |
| 2.05 | High | 78 | 9 kHz-30 MHz | 1 | 1 | EDR Mode (8DPSK-3Mbps) | × | | | Pass |
| 2.06 | High | 39 | 9 kHz-30 MHz | 1 | 3 | LE Mode (GFSK-1Mbps) | X | | | Pass |

Remark: 1.) For further details please refer diagrams in separate annex A1

2.) Tests performed only on Worst-Case Channels of Conducted measurements



5.2.5. Correction factors due to reduced meas. distance (f< 30 MHz)

The used correction factors when the measurement distance is reduced compared to regulatory measurement distance, are calculated according Extrapolation formulas valid for EUT's with maximum dimension of 0.625xLambda. Formula 2+3+4 as presented in ANSI C63.10, Chapter 6.4.4 are used for the calculations of proper extrapolation factors.

| Frequency -Range | f [kHz/MHz] | Lambda [m] | Far-Field Point [m] | Distance Limit accord. 15.209 [m] | 1st Condition (dmeas< D _{near-field}) | 2'te Condition (Limit distance bigger d _{near-field}) | Distance Correction accord. Formula |
|---------------------|-------------|------------|------------------------|--------------------------------------|---|---|--|
| | | | | | | | |
| | 9,00E+03 | 33333, 33 | 5305,17 | | fullfilled | not fullfilled | -80,00 |
| | 1,00E+04 | 30000,00 | 4774,65 | | fullfilled | not fullfilled | -80,00 |
| | 2,00E+04 | 15000,00 | 2387,33 | | fullfilled | not fullfilled | -80,00 |
| | 3,00E+04 | 10000,00 | 1591,55 | | fullfilled | not fullfilled | -80,00 |
| | 4,00E+04 | 7500,00 | 1193,66 | | fullfilled | not fullfilled | -80,00 |
| | 5,00E+04 | 6000,00 | 954, 93 | | fullfilled | not fullfilled | -80,00 |
| | 6,00E+04 | 5000,00 | 795, 78 | | fullfilled | not fullfilled | -80,00 |
| | 7,00E+04 | 4285,71 | 682,09 | 300 | fullfilled | not fullfilled | -80,00 |
| | 8,00E+04 | 3750,00 | 596,83 | 000 | fullfilled | not fullfilled | -80,00 |
| | 9,00E+04 | 3333,33 | 530, 52 | | fullfilled | not fullfilled | -80,00 |
| kHz | 1,00E+05 | 3000,00 | 477,47 | | fullfilled | not fullfilled | -80,00 |
| | 1,25E+05 | 2400,00 | 381,97 | | fullfilled | not fullfilled | -80,00 |
| | 2,00E+05 | 1500,00 | 238,73 | | fullfilled | fulfilled | -78,02 |
| | 3,00E+05 | 1000,00 | 159, 16 | | fullfilled | fulfilled | -74, 49 |
| | 4,00E+05 | 750,00 | 119, 37 | | fullfilled | fullfilled | -72,00 |
| | 4,90E+05 | 612,24 | 97,44 | | fullfilled | fulfilled | -70,23 |
| | 5,00E+05 | 600,00 | 95,49 | | fullfilled | not fullfilled | -40,00 |
| | 6,00E+05 | 500,00 | 79,58 | | fullfilled | not fullfilled | -40,00 |
| | 7,00E+05 | 428,57 | 68,21 | | fullfilled | not fullfilled | -40,00 |
| | 8,00E+05 | 375,00 | 59,68 | | fullfilled | not fullfilled | -40,00 |
| | 9,00E+05 | 333, 33 | 53,05 | | fullfilled | not fullfilled | -40,00 |
| | 1,00 | 300,00 | 47,75 | | fullfilled | not fullfilled | -40,00 |
| | 1,59 | 188,50 | 30,00 | | fullfilled | not fullfilled | -40,00 |
| | 2,00 | 150,00 | 23,87 | | fullfilled | fullfilled | -38, 02 |
| | 3,00 | 100,00 | 15,92 | | fullfilled | fulfilled | -34, 49 |
| | 4,00 | 75,00 | 11,94 | | fullfilled | fullfilled | -32,00 |
| | 5,00 | 60,00 | 9,55 | | fullfilled | fullfilled | -30,06 |
| | 6,00 | 50,00 | 7,96 | | fullfilled | fulfilled | -28,47 |
| | 7,00 | 42,86 | 6,82 | | fullfilled | fullfilled | -27, 13 |
| | 8,00 | 37,50 | 5,97 | | fullfilled | fullfilled | -25,97 |
| | 9,00 | 33, 33 | 5,31 | | fullfilled | fullfilled | -24,95 |
| | 10,00 | 30,00 | 4,77 | 30 | fullfilled | fullfilled | -24,04 |
| | 10,60 | 28, 30 | 4,50 | | fullfilled | fulfilled | -23, 53 |
| MHz | 11,00 | 27,27 | 4,34 | | fullfilled | fullfilled | -23,21 |
| | 12,00 | 25,00 | 3,98 | | fullfilled | fullfilled | -22, 45 |
| 1 | 13,56 | 22, 12 | 3,52 | | fullfilled | fullfilled | -21, 39 |
| | 15,00 | 20,00 | 3, 18 | | fullfilled | fullfilled | -20,51 |
| | 15,92 | 18,85 | 3,00 | | fullfilled | fulfilled | -20,00 |
| | 17,00 | 17,65 | 2,81 | | not fullfilled | fulfilled | -20,00 |
| | 18,00 | 16,67 | 2,65 | | not fullfilled | fulfilled | -20,00 |
| | 20,00 | 15,00 | 2,39 | | not fullfilled | fulfilled | -20,00 |
| | 21,00 | 14,29 | 2,27 | | not fullfilled | fulfilled | -20,00 |
| | 23,00 | 13,04 | 2,08 | | not fullfilled | fulfilled | -20,00 |
| 1 | 25,00 | 12,00 | 1,91 | | not fullfilled | fullfilled | -20,00 |
| | 27,00 | 11, 11 | 1,77 | | not fullfilled | fulfilled | -20,00 |
| | 29,00 | 10,34 | 1,65 | | not fullfilled | fulfilled | -20,00 |
| | 30,00 | 10,00 | 1,59 | | not fullfilled | fullfilled | -20,00 |



5.3. General Limit - Radiated field strength emissions, 30 MHz - 1 GHz

5.3.1. Test location and equipment

| 5.5.1. Test location and equipment | | | | | | | | | |
|------------------------------------|--------------------------------|-----------------|--------------------|------------------------|-----------------------------|------------|--|--|--|
| test location | CETECOM Essen (Chapter. 2.2.1) | | Please see Chapte | er. 2.2.2 | □ Please see Chapter. 2.2.3 | | | | |
| test site | 🗷 441 EMI SAR | 🗷 487 SAR NSA | | | | | | | |
| receiver | □ 377 ESCS30 | 🗷 001 ESS | □ 489 ESU 40 | □ 620 ESU 26 | | | | | |
| spectr. analys. | □ 584 FSU | □ 120 FSEM | □ 264 FSEK | | | | | | |
| antenna | 🗷 574 BTA-L | □ 133 EMCO3115 | □ 302 BBHA9170 | 289 CBL 6141 | □ 030 HFH-Z2 | □ 477 GPS | | | |
| signaling | □ 392 MT8820A | □ 371 CBT32 | □ 547 CMU | □ 594 CMW | | | | | |
| otherwise | □ 400 FTC40x15E | □ 401 FTC40x15E | □ 110 USB LWL | 🗷 482 Filter Matrix | | | | | |
| DC power | 🗆 456 EA 3013A | 🗆 457 EA 3013A | □ 459 EA 2032-50 | 268 EA- 3050 | □ 494 AG6632A | □ 498 NGPE | | | |
| line voltage | 🗆 230 V 50 Hz via | public mains | 🗷 4.35 V DC (fully | charged internal batte | ry) | | | | |

5.3.2. Requirements/Limits

| | FCC | Part 15 Subpart B, §15.109, class B Part 15 Subpart C, §15.209 @ frequencies defined in §15.205 | | | | |
|-------|-----------------|---|---------------------|--|--|--|
| | IC | RSS-Gen., Issue 4, Chapter 8.9, Table 4+6 (licence-exempt radio apparatus) RSS-Gen., Issue 4, Chapter 7.1.2, Table 2 (receiver) ICES-003, Issue 6, Table 5 (Class B) RSS-247, Issue 1, Chapter 5 | | | | |
| | ANSI | □ C63.4-2014 ☑ C63.10-2013 | | | | |
| | Engine av [MII] | Radiated emission | ns limits, 3 meters | | | |
| | Frequency [MHz] | QUASI Peak [µV/m] | QUASI-Peak [dBµV/m] | | | |
| Limit | 30 - 88 | 100 | 40.0 | | | |
| Linnt | 88 - 216 | 150 | 43.5 | | | |
| | 216 - 960 | 200 46.0 | | | | |
| | above 960 | 500 | 54.0 | | | |

5.3.3. Restricted bands of operation (FCC §15.205/ RSS-Gen, Issue 4 Chapter 8.9, Table 4)

| MHz | MHz | MHz | GHz |
|----------------------------|---------------------------------------|-------------------------------------|-------------|
| 0.090-0.110 | 16.42-16.423 | 399.9-410 | 4.5-5.15 |
| 0.495-0.505 | 16.69475-16.69525 | 608-614 | 5.35-5.46 |
| 2.1735-2.1905 | 16.80425-16.80475 | 960-1240 | 7.25-7.75 |
| 4.125-4.128 | 25.5-25.67 | 1300-1427 | 8.025-8.5 |
| 4.20725-4.20775 | 37.5-38.25 | 1645.5-1646.5 | 9.3-9.5 |
| 6.215-6.218 | 73-74.6 | 1660-1710 | 10.6-12.7 |
| 6.26775-6.26825 | 74.8-75.2 | 1718.8-1722.2 | 13.25-13.4 |
| 6.31175-6.31225 | 108-121.94 | 2200-2300 | 14.47-14.5 |
| 8.291-8.294 | 123-138 | 2310-2390 | 15.35-16.2 |
| 8.362-8.366 | 149.9-150.05 | 2483.5-2500 | 17.7-21.4 |
| 8.37625-8.38675 | 156.52475-156.52525 | 2690-2900 | 22.01-23.12 |
| 8.41425-8.41475 | 156.7-156.9 | 3260-3267 | 23.6-24.0 |
| 12.29-12.293 | 162.0125-167.17 | 3332-3339 | 31.2-31.8 |
| 12.51975-12.52025 | 167.72-173.2 | 3345.8-3358 | 36.43-36.5 |
| 12.57675-12.57725 | 240-285 | 3600-4400 | |
| 13.36-13.41 | 322-335.4 | | |
| Remark: only spurious emis | sions are allowed within these freque | ency bands not exceeding the limits | per §15.209 |

| Signal link to test sy | /stem (if used): | 🗆 air link | □ cable connection | 🗵 none | | | |
|------------------------|-----------------------|---|--|---|--|--|--|
| EUT-grounding | | 🗷 none | □ with power supply | □ additional connection | | | |
| Equipment set up | | ☑ table top 0.8 | 8m height | □ floor standing | | | |
| Climatic conditions | | Temperature: (| (22±3°C) | Rel. humidity: (40±20)% | | | |
| EMI-Receiver | Scan frequency range: | ¥ 30−1000 M | 1Hz 🗆 other: | | | | |
| (Analyzer) Settings | Scan-Mode | 🗷 6 dB EMI-R | 6 dB EMI-Receiver Mode 3 dB spectrum analyser mode | | | | |
| | Detector | Peak / Quasi-peak | | | | | |
| | RBW/VBW | 100 kHz/300 k | Hz | | | | |
| | Mode: | Repetitive-Sca | ın, max-hold | | | | |
| | Scan step | 80 kHz | | | | | |
| | Sweep-Time | Coupled - cali | brated display if continue | ous tx-signal otherwise adapted to EUT's individual | | | |
| | | duty-cycle | | | | | |
| General measureme | ent procedures | Please see chapter "Test system set-up for electric field measurement in the range 30 MHz | | | | | |
| | | to 1 GHz" | | | | | |

5.3.4. Test condition and measurement test set-up

5.3.5. MEASUREMENT RESULTS

The results are presented below in summary form only. For more information please consult the diagrams included in annex 1.

Table of measurement results:

| Dia- gram | Carrier C | Channel | Frequency range | Set- up | OP- mode | Remark | Use | d detec | ctor | Result |
|--------------|-----------|---------|--------------------|------------|-------------|------------------------|-----|---------|------|--------|
| no. | Range | No. | 0 | no. | no. | | PK | AV | QP | |
| 3.04 | High | 78 | 30 MHz – 1 GHz | 1 | 1 | BR Mode (GFSK-1Mbps) | X | | X | Pass |
| 3.05 | High | 78 | 30 MHz – 1 GHz | 1 | 1 | EDR Mode (8DPSK-3Mbps) | X | | × | Pass |
| 3.06 | High | 39 | 30 MHz – 1 GHz | 1 | 3 | LE Mode (GFSK-1Mbps) | X | | × | Pass |

Remark: 1.) For further details please refer diagrams in separate annex A1

2.) Tests performed only on Worst-Case Channels of Conducted measurements



GP 477 S

5.4. General Limit - Radiated emissions, above 1 GHz

| 5.4.1. Test lo | ocation and equ | ipment FAR | | | | | | |
|-----------------|-------------------|-----------------|--------------------|------------------------|------|-----|-------------|--|
| test site | □441 EMISAR | □ 348 EMI cond. | 🗷 443 EMI FAR | □ 347 Radio.lab. | | 337 | OATS | |
| spectr. analys. | □584 FSU | □ 120 FSEM | □ 264 FSEK | 🗷 489 ESU 40 | | | | |
| antenna meas | □574 BTA-L | □ 289 CBL 6141 | □ 608 HL 562 | ⊠ 549 HL025 | × | 302 | BBHA9170 | |
| antenna meas | □123 HUF-Z2 | □ 132 HUF-Z3 | □ 030 HFH-Z2 | □ 376 BBHA9120E | 1 | | | |
| antenna subst | □071 HUF-Z2 | □ 020 EMCO3115 | 🗆 063 LP 3146 | □ 303 BBHA9170 | | | | |
| multimeter | □341 Fluke 112 | | | | | | | |
| signaling | □392 MT8820A | □ 371 CBT32 | □ 547 CMU | □ 594 CMW | | | | |
| DCpower | □086 LNG50-10 | 087 EA3013 | □ 354 NGPE 40 | □ 349 car battery | | 350 | Car battery | |
| line voltage | 🗆 230 V 50 Hz via | public mains | A 4.35 V DC (fully | charged internal batte | ery) | | | |

5.4.2. Requirements/Limits (CLASS B equipment)

| FCC | □ Part 15 Subpart B, §15.109 class B ☑ Part 15 Subpart C, §15.209 for frequencies defined in §15.205 □ Part 15 Subpart C, §15.407(b)(1)(2)(3) 9 | | | | | | | |
|---|--|----------|--------|--------------------------|--|--|--|--|
| IC | RSS-Gen., Issue 4, Chapter 8.9, Table 4+6 (transmitter licence excempt) RSS-Gen., Issue 4, Chapter 8.9, Table 2 (receiver) ICES-003, Issue 6, Chapter 6.2.2, Table 7 (class B) | | | | | | | |
| ANSI | □ C63.4-2014 ☑ C63.10-2013 | | | | | | | |
| | | Limits | 8 | | | | | |
| Frequency | AV | AV | Peak | Peak | | | | |
| [MHz] | [µV/m] | [dBµV/m] | [µV/m] | [dBµV/m] or [dBm/MHz] | | | | |
| above 1 GHz for frequencies as defined in §15.205 or RSS-Gen., Issue 4, §8.10 - Table 6 | 500 | 54.0 | 5000 | 74.0 dBµV/m | | | | |

5.4.3. Test condition and measurement test set-up

| Signal link | Signal link to test system (if used): | | □ cable connection | x none | | |
|-------------|---------------------------------------|--|--------------------|----------------------------------|--|--|
| 0 | | | | | | |
| EUT-groun | ding | 🗷 none | with power supply | □ additional connection | | |
| Equipment | set up | ☑ table top 1.5 | 5m height | □ floor standing | | |
| Climatic co | nditions | Temperature: (| (22±3°C) | Rel. humidity: (40±20)% | | |
| Spectrum- | Scan frequency range: | ⊠ 1 – 18 GHz | ⊠ 18 – 25 GHz □ 18 | $-40 \text{ GHz} \square$ other: | | |
| Analyzer | Scan-Mode | 🗷 6 dB EMI-Receiver Mode 🗆 3 dB Spectrum analyser Mode | | | | |
| settings | Detector | Peak and Average | | | | |
| | RBW/VBW | 1 MHz / 3 MHz | | | | |
| | Mode: | Repetitive-Scan, max-hold | | | | |
| | Scan step | 400 kHz | | | | |
| | Sweep-Time | nal otherwise adapted to EUT's individual duty-cycle | | | | |
| General mea | surement procedures | Please see chapter "Test system set-up for radiated electric field measurements above 1 GHz" | | | | |



5.4.4. Measurement Results

The results are presented below in summary form only. For more information please consult the diagrams included in annex 1.

| Dia- gram | Carrier (| Channel | Frequency range | Set- up | OP- mode | Remark | Use | d detec | ctor | Result |
|--------------|-----------|---------|--------------------|------------|-------------|------------------------|-----|---------|------|--------|
| no. | Range | No. | runge | no. | no. | | РК | AV | QP | |
| 4.04 | High | 78 | 1-18 GHz | 1 | 1 | BR Mode (GFSK-1Mbps) | X | × | | Pass |
| 4.04a | High | 78 | 18-25 GHz | 1 | 1 | BR Mode (GFSK-1Mbps) | × | × | | Pass |
| 4.05 | High | 78 | 1-18 GHz | 1 | 1 | EDR Mode (8DPSK-3Mbps) | × | × | | Pass |
| 4.05a | High | 78 | 18-25 GHz | 1 | 1 | EDR Mode (8DPSK-3Mbps) | × | × | | Pass |
| 4.06 | High | 39 | 1-18 GHz | 1 | 3 | LE Mode (GFSK-1Mbps) | × | × | | Pass |
| 4.06a | High | 39 | 18-25 GHz | 1 | 3 | LE Mode (GFSK-1Mbps) | × | × | | Pass |

Remark: 1.) For further details please refer diagrams in separate annex A1

2.) Tests performed only on Worst-Case Channels of Conducted measurements

3.) Carrier on diagram wanted TX-channel, not relevant for results

5.5. RF-Parameter - Radiated Band Edge compliance measurements

5.5.1. Test location and equipment FAR

| te | st site | □441 EMISAR | □ 348 EMI cond. | 🗷 443 EMI FAR | □ 347 Radio.lab. | □ 337 OATS | | | | |
|-----|----------------|--------------------|------------------------|---------------|--------------------------------|-------------------|-----------|--|--|--|
| sp | bectr. analys. | □584 FSU | □ 120 FSEM | □ 264 FSEK | 🗷 489 ESU 40 | | | | | |
| an | ntenna meas | □574 BTA-L | □ 289 CBL 6141 | 🗆 608 HL 562 | 🗷 549 HL025 | □ 302 BBHA9170 | □ 477 GPS | | | |
| an | ntenna meas | □123 HUF-Z2 | □ 132 HUF-Z3 | □ 030 HFH-Z2 | | | | | | |
| an | ntenna subst | □071 HUF-Z2 | □ 020 EMCO3115 | 🗆 063 LP 3146 | □ 303 BBHA9170 | | | | | |
| m | ultimeter | □341 Fluke 112 | | | | | | | | |
| si | gnaling | □392 MT8820A | □ 371 CBT32 | □ 547 CMU | □ 594 CMW | | | | | |
| D | C power | □086 LNG50-10 | 🗷 087 EA3013 | □ 354 NGPE 40 | □ 349 car battery | □ 350 Car battery | | | | |
| lir | ne voltage | 🗷 4.35 V DC (fully | charged internal batte | ery) | □ 060 120 V 60 Hz via PAS 5000 | | | | | |

5.5.2. Requirements/Limits

| FCC | □ Part 15 Subpart B, §15.109 class B ☑ Part 15 subpart C, §15.209 @ frequencies defined in §15.205 | | | | |
|---|---|--|--|--|--|
| IC \square RSS-210, Issue 8, Annex 8 \blacksquare RSS-Gen: Issue 4: §8.9 Table 4+5+6 | | | | | |
| ANSI | □ C63.4-2009 □ C63.4-2014 □ C63.10-2009 ⊠ C63.10-2013, Chapter 6.10.6 | | | | |

5.5.3. Test condition and measurement test set-up

| | cist rest condition and measurement test set up | | | | | | | | | |
|--------------|---|--|----------------------|--------------------------------|--|--|--|--|--|--|
| Signal ink t | o test system (if used): | 🗆 air link | □ cable connection | 🗷 none | | | | | | |
| EUT-groun | EUT-grounding | | □ with power supply | □ additional connection | | | | | | |
| Equipment | set up | ☑ table top 1.5 | 5m height | □ floor standing | | | | | | |
| Climatic co | nditions | Temperature: (| (22±3°C) | Rel. humidity: (40±20)% | | | | | | |
| Spectrum- | Scan frequency range: | □ 1 – 18 GHz | □ 18 – 25 GHz □ 18 - | – 40 GHz 🗷 other: see diagrams | | | | | | |
| Analyzer | Scan-Mode | □ 6 dB EMI-Receiver Mode 🗵 3 dB Spectrum analyser Mode | | | | | | | | |
| settings | Detector | Peak and Aver | age | | | | | | | |
| | RBW/VBW | Left band-edge: 100kHz/300kHz | | | | | | | | |
| | | Right band-edge: 1 MHz / 3 MHz | | | | | | | | |
| | Mode: | Repetitive-Scan, max-hold | | | | | | | | |
| | Scan step | 40kHz or 400 | kHz | | | | | | | |
| | Sweep-Time | Coupled – calibrated display if CW signal otherwise adapted to EUT's individual duty-cycle | | | | | | | | |
| General mea | surement procedures | Please see chapter "Test system set-up for radiated electric field measurements above 1 GHz" | | | | | | | | |
| | | for general measurements procedures in anechoic chamber. | | | | | | | | |

5.5.4. Measurement Method

For <u>uncritical results</u> where a measurement resolution bandwidth of 1MHz can clearly show the compliance without influencing the results, a field strength measurement was performed to show compliance.

For <u>critical results</u> a Marker-Delta marker method was used for showing compliance to restricted bands. The method is according ANSI C63.10:2013, Chapter 6.10.6 "Marker-Delta method", The method consists of three independent steps:

- **1. Step:** Prior to the measurement the fundamental radiated In-Band field strength was performed. The determined value is used as reference value.
- **2. Step**: Second step consist of finding the relative attenuation between the fundamental emission and the maximum local out-of-band emission (within 2 MHz range around the band edge either on the band-edge directly or some modulation product if the level is greater than that on the band-edge) when measured with lower resolution bandwidth.
- **3. Step:** The delta value recorded in step 2 will be subtracted from value recorded in step 1, thus giving the required field strength at the band-edge. This value must fulfil the requirements for radiated spurious emissions in restricted bands in FCC §15.205 or RSS-Gen, Issue 4, Chapter 8.10, Table 6 with the general limits of FCC §15.209 or RSS-Gen, Issue 4 Chapter 8.9, Table 4.

5.5.5. EUT settings

The EUT was instructed to send with maximum power (if adjustable) according to applicants instructions.



5.5.6. Results: for non-restricted bands near-by

5.5.6.1. Non-restricted bands near-by - limits according FCC §15.407 and RSS-247, Issue 1, Chapter 5.5

| Diagram No. | Channel Restricte | | icted IOBUV/MI | | Peak-Value at Band-Edge | Difference | Limit | Margin | Verdict | Remark: | |
|-------------|-------------------|--------|----------------|-------|----------------------------|------------|-------|--------|---------|--|--|
| Diagram No. | no. | band ? | Peak-Value | | | [dB] [dBc] | | [dB] | verdict | | |
| | | | | | | | | | | | |
| 9.07 | 0 | no | 94,6 | 90,3 | 50,1 | 44,5 | 20 | 24,5 | PASS | TX_BR_GFSK(1Mbps)-mode_CH0 Power Value= Maximum Power | |
| 9.09 | 0 | no | 89,63 | 79,7 | 50,3 | 39,33 | 20 | 19,33 | PASS | TX_EDR_8DPSK(3Mbps)-mode_CH0 Power Value= Maximum Power | |
| 9.11 | 0 | no | 92,26 | 83,57 | 50,2 | 42,06 | 20 | 22,06 | PASS | TX_LE_GFSK(1Mbps)-mode_CH0 Power Value= Maximum Power | |

Remark: 1.) For further details please refer diagrams in separate annex A1

5.5.6.2. Restricted bands near-by (§15.205 with limits accord. FCC §15.209) and (RSS-Gen, Issue4, Chapter 8.10)

| Diagram No. | Channel | | | | , , , , , , , , , , , , , , , , , , , | | Ŭ | | | | | | • | Verdict | Remark: | |
|-------------|---------|--------|------------|---------------|---------------------------------------|-------------------|----------------|-------------------|-------|---------|------|---|---|---------|---------|--|
| | no. | band ? | Peak-Value | Average-Value | Peak -Value | Average -Value | Peak -Value | Average -Value | Peak | Average | | | | | | |
| 9.08 | 78 | yes | 98,33 | 98,26 | 57,29 | 45,86 | 74 | 54 | 16,71 | 8,14 | PASS | TX_BR(GFSK 1Mbps)_CH78 Power Value= Maximum Power | | | | |
| 9.10 | 78 | yes | 96,20 | 93,17 | 57,49 | 46,01 | 74 | 54 | 16,51 | 7,99 | PASS | TX_EDR(8DPSK 3Mbps)-mode_CH78 Power Value= Maximum Power | | | | |
| 9.12 | 39 | yes | 99,80 | 96,62 | 63,77 | 53,23 | 74 | 54 | 10,23 | 0,77 | PASS | TX_LE(GFSK 1Mbps)-mode_CH39 Power Value= Maximum Power | | | | |

Remark: 1.) For further details please refer diagrams in separate annex A1

5.5.7. Verdict: Pass



5.6. Measurement uncertainties

The reported uncertainties are calculated based on the standard uncertainty multiplied with the appropriate coverage factor \mathbf{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 | Reference | Frequency range | Ca | | | tainty b level of | based or 95% | ı a | Remarks | |
|--|--------------|--|----------------------------|---|---------|----------------------|-----------------|-----------------------------|--|--|
| Conducted emissions (U _{CISPR}) | CISPR 16-2-1 | 9 kHz - 150 kHz 150 kHz - 30 MHz | | 4.0 dB 3.6 dB | | | - | | | |
| Radiated emissions Enclosure | CISPR 16-2-3 | 30 MHz - 1 GHz 1 GHz - 18 GHz | | 4.2 dB 5.1 dB | | E-Field | | | | |
| Disturbance power | CISPR 16-2-2 | 30 MHz - 300 MHz | - | | | | | | - | |
| Power Output radiated | - | 30 MHz - 4 GHz | 3.17 d | В | | | | | Substitution method | |
| Power Output conducted | | Set-up No. | Cel- C1 | Cel- C2 | BT1 | W1 | W2 | | | |
| Power Output conducted | - | 9 kHz - 12.75 GHz | N/A | 0.60 | 0.7 | 0.25 | N/A | | | |
| | | 12.75 - 26.5GHz | N/A | 0.82 | | N/A | N/A | | | |
| Conducted emissions | - | 9 kHz - 2.8 GHz | 0.70 | N/A | 0.70 | N/A | 0.69 | | N/A - not | |
| on RF-port | | 2.8 GHz - 12.75GHz | 1.48 | N/A | 1.51 | N/A | 1.43 | | applicable | |
| | | 12.75 GHz - 18GHz | 1.81 | N/A | 1.83 | N/A | 1.77 | | | |
| | | 18 GHz - 26.5GHz | 1.83 | N/A | 1.85 | N/A | 1.79 | | | |
| Occupied bandwidth | - | 9 kHz - 4 GHz | 0.1272 | | Delta N | Marker) |) | | Frequency error Power | |
| Emission bandwidth | - | 9 kHz - 4 GHz | 0.1272 | 0.1272 ppm (Delta Marker) See above: 0.70 dB | | | | Frequency error Power | | |
| Frequency stability | - | 9 kHz - 20 GHz | 0.063 | 6 ppm | | | | | - | |
| Radiated emissions Enclosure | - | 150 kHz - 30 MHz 30 MHz - 1 GHz 1 GHz - 20 GHz | 5.0 dE 4.2 dE 3.17 d | 3 | | | | | Magnetic field E-field Substitution | |

Table: measurement uncertainties, valid for conducted/radiated measurements



| The abbreviation | S |
|------------------|---|
| ANSI | American National Standards Institute |
| AV, AVG, CAV | Average detector |
| EIRP | Equivalent isotropically radiated power, determined within a separate measurement |
| EGPRS | Enhanced General Packet Radio Service |
| EUT | Equipment Under Test |
| FCC | Federal Communications Commission, USA |
| IC | Industry Canada |
| n.a. | not applicable |
| Op-Mode | Operating mode of the equipment |
| РК | Peak |
| RBW | resolution bandwidth |
| RF | Radio frequency |
| RSS | Radio Standards Specification, Dokuments from Industry Canada |
| Rx | Receiver |
| TCH | Traffic channel |
| Tx | Transmitter |
| QP | Quasi peak detector |
| VBW | Video bandwidth |
| ERP | Effective radiated power |

6. Abbreviations used in this report

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 | |
| 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 | |
| 487 550 348 348 OATS | R-2666Radiated Measurements 30 MHz to 1 GHz, 3 m (SAR)G-301Radiated Measurements 1 GHz to 6 GHz, 3 m (SAR)C-2914Mains Ports Conducted Interference Measurements | | VCCI, Voluntary Control Council for Interference by Information Technology Equipment, Japan | |



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

| RefNo. | Equipment | Туре | 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 |
| 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 |
| 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 |
| 528 546 | Load Dump Simulator Univ. Radio Communication Tester | LD 200B CMU 200 | 0496-06 106436 | Software-Nr. 000031 Version V2.35a01 R&S Test Firmware Base=5.14, GSM=5.14 |
| 547 | Univ. Radio Communication Tester | CMU 200 | 835390/014 | WCDMA=5.14 (current Testsoftw.,f. all band to be used 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 |
| | | | | R&S Test Firmware Base=5.01, GSM=5.02 WCDMA= |
| 597 598 | Univ. Radio Communication Tester Spectrum Analyzer | CMU 200 FSEM 30 (Reserve) | 100347 831259/013 | not installed, Mainboard= μP1=V.850 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 | 4.45_SF5 Setup V03.26, Test programm component V03.02.20 |
| 670 | Univ. Radio Communication Tester | CMU 200 | 120089 | μ P1 =V8.50, Firmware = V.20 |
| 689 | Vector Signal Generator | SMU200 | 100833 | 02.20.360.142 |
| 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

| RefNo. | Equipment | Туре | Serial-No. | Manufacturer | Interval of calibration | Remark | Cal due |
|--------|---|--------------------------------|-------------|--------------------------------|----------------------------|--------|------------|
| 001 | EMI Test Receiver | ESS | 825132/017 | Rohde & Schwarz | 12 M | - | 30.05.2017 |
| 005 | AC - LISN (50 Ohm/50µH, test site 1) | ESH2-Z5 | 861741/005 | Rohde & Schwarz | 12 M | - | 30.05.2017 |
| 007 | Single-Line V-Network (50 Ohm/5µH) | ESH3-Z6 | 892563/002 | Rohde & Schwarz | 12 M | - | 30.05.2017 |
| 009 | Power Meter (EMS-radiated) | NRV | 863056/017 | Rohde & Schwarz | 24 M | - | 30.04.2017 |
| | Line Impedance Simulating Network | Op. 24-D | B6366 | Spitzenberger+Spies | 36 M | - | 30.05.2019 |
| | Horn Antenna 18 GHz (Subst 1) | 3115 | 9107-3699 | EMCO | 36/12 M | - | 31.03.2017 |
| 021 | Loop Antenna (H-Field) | 6502 | 9206-2770 | EMCO | 36 M | - | 30.04.2018 |
| | Loop Antenna (H-field) | HFH-Z2 | 879604/026 | Rohde & Schwarz | 36 M | - | 30.04.2018 |
| | RF-current probe (100kHz-30MHz) | ESH2-Z1 | 879581/18 | Rohde & Schwarz | 24 M | - | 30.04.2017 |
| 057 | relay-switch-unit (EMS system) | RSU | 494440/002 | Rohde & Schwarz | pre-m | 1a | |
| 060 | power amplifier (DC-2kHz) | PAS 5000 | B6363 | Spitzenberger+Spies | - | 3 | |
| 066 | notch filter (WCDMA; FDD1) | WRCT 1900/2200-5/40- 10EEK | 5 | Wainwright GmbH | 12 M | 1g | 30.06.2016 |
| 086 | DC - power supply, 0 -10 A | LNG 50-10 | - | Heinzinger Electronic | pre-m | 2 | |
| 087 | DC - power supply, 0 -5 A | EA-3013 S | - | Elektro Automatik | pre-m | 2 | |
| 091 | USB-LWL-Converter | OLS-1 | 007/2006 | Ing. Büro Scheiba | - | 4 | |
| 099 | passive voltage probe | ESH2-Z3 | 299.7810.52 | Rohde & Schwarz | 36 M | - | 30.04.2018 |
| 100 | passive voltage probe | Probe TK 9416 | without | Schwarzbeck | 36 M | - | 30.04.2018 |
| 110 | USB-LWL-Converter | OLS-1 | - | Ing. Büro Scheiba | - | 4 | |
| 119 | RT Harmonics Analyzer dig. Flickermeter | B10 | G60547 | BOCONSULT | 36 M | - | 30.05.2019 |
| 136 | adjustable dipole antenna (Dipole 1) | 3121C-DB4 | 9105-0697 | EMCO | 36 M | - | 30.04.2018 |
| 140 | Signal Generator | SMHU | 831314/006 | Rohde & Schwarz | 24 M | - | 30.05.2018 |
| 248 | attenuator | SMA 6dB 2W | - | Radiall | pre-m | 2 | |
| 249 | attenuator | SMA 10dB 10W | - | Radiall | pre-m | 2 | |
| 252 | attenuator | N 6dB 12W | - | Radiall | • | 2 | |
| - | | | - | | pre-m | | |
| 256 | attenuator | SMA 3dB 2W | - | Radiall | pre-m | 2 | |
| 257 | hybrid | 4031C | 04491 | Narda | pre-m | 2 | |
| 260 | hybrid coupler | 4032C | 11342 | Narda | pre-m | 2 | |
| 261 | Thermal Power Sensor | NRV-Z55 | 825083/0008 | Rohde & Schwarz | 24 M | - | 30.05.2018 |
| 262 | Power Meter | NRV-S | 825770/0010 | Rohde & Schwarz | 24 M | - | 30.05.2018 |
| 263 | Signal Generator | SMP 04 | 826190/0007 | Rohde & Schwarz | 36 M | - | 30.05.2019 |
| 265 | peak power sensor | NRV-Z33, Model 04 | 840414/009 | Rohde & Schwarz | 24 M | - | 30.05.2018 |
| 266 | Peak Power Sensor | NRV-Z31, Model 04 | 843383/016 | Rohde & Schwarz | 24 M | - | 30.05.2018 |
| 267 | notch filter GSM 850 | WRCA 800/960-6EEK | 9 | Wainwright GmbH | pre-m | 2 | |
| 270 | termination | 1418 N | BB6935 | Weinschel | pre-m | 2 | |
| 271 | termination | 1418 N | BE6384 | Weinschel | pre-m | 2 | |
| 272 | attenuator (20 dB) 50 W | Model 47 | BF6239 | Weinschel | pre-m | 2 | |
| 273 | attenuator (10 dB) 100 W | Model 48 | BF9229 | Weinschel | pre-m | 2 | |
| 274 | attenuator (10 dB) 50 W | Model 47 (10 dB) 50 W | BG0321 | Weinschel | pre-m | 2 | |
| 275 | DC-Block | Model 7003 (N) | C5129 | Weinschel | pre-m | 2 | |
| | | | | | • | 2 | |
| 276 | DC-Block | Model 7006 (SMA) | C7061 | Weinschel | pre-m | | |
| 279 | power divider | 1515 (SMA) | LH855 | Weinschel | pre-m | 2 | |
| 287 | pre-amplifier 25MHz - 4GHz | AMF-2D-100M4G-35-10P | 379418 | Miteq | 12 M | 1c | 30.06.2017 |
| | high pass filter GSM 850/900 | WHJ 2200-4EE | 14 | Wainwright GmbH | 12 M | 1c | 30.06.2017 |
| | Univ. Radio Communication Tester | CMU 200 | 832221/091 | Rohde & Schwarz | pre-m | 3 | |
| 300 | AC LISN (50 Ohm/50µH, 1-phase) | ESH3-Z5 | 892 239/020 | Rohde & Schwarz | 12 M | - | 30.05.2017 |
| 301 | attenuator (20 dB) 50W, 18GHz | 47-20-33 | AW0272 | Lucas Weinschel | pre-m | 2 | I |
| 302 | horn antenna 40 GHz (Meas 1) | BBHA9170 | 155 | Schwarzbeck | 36 M | - | 31.03.2017 |
| | horn antenna 40 GHz (Subst 1) | BBHA9170 | 156 | Schwarzbeck | 36 M | - | 31.03.2017 |
| 331 | Climatic Test Chamber -40/+80 Grad | HC 4055 | 43146 | Heraeus Vötsch | Pre-m | 2 | |
| 341 | Digital Multimeter | Fluke 112 | 81650455 | Fluke | 24 M | - | 30.05.2018 |
| - | Digital Multimeter | Voltcraft M-4660A | IB 255466 | Voltcraft | 24 M | - | 30.04.2017 |
| 347 | laboratory site | radio lab. | - | - | - | 5 | |
| 348 | laboratory site | EMI conducted | - | - | - | 5 | |
| - | DC - Power Supply 40A | NGPE 40/40 | 448 | Rohde & Schwarz | pre-m | 2 | |
| 355 | Power Meter | URV 5 | 891310/027 | Rohde & Schwarz | 24 M | - | 30.05.2018 |
| 357 | power sensor | NRV-Z1 | 861761/002 | Rohde & Schwarz | 24 M | - | 30.04.2017 |
| 371 | Bluetooth Tester | CBT32 | 100153 | R&S | 36 M | - | 30.05.2019 |
| 373 | Single-Line V-Network (50 Ohm/5µH) | ESH3-Z6 | 100535 | Rohde & Schwarz | 12 M | - | 30.05.2017 |
| 377 | EMI Test Receiver | ESCS 30 | 100160 | Rohde & Schwarz | 12 M | - | 30.05.2017 |
| 389 | Digital Multimeter | Keithley 2000 | 0583926 | Keithley | 24 M | - | 30.04.2017 |
| 392 | Radio Communication Tester | MT8820A | 6K00000788 | Anritsu | 12 M | - | 30.05.2017 |
| 431 | Model 7405 | Near-Field Probe Set | 9305-2457 | EMCO | - | 4 | [] |
| 436 | Univ. Radio Communication Tester | CMU 200 | 103083 | Rohde & Schwarz | 12 M | - | 30.04.2017 |
| 439 | UltraLog-Antenna | HL 562 | 100248 | Rohde & Schwarz | 36 M | - | 31.03.2017 |
| 443 | CTC-FAR-EMI-RSE | System CTC-FAR-EMI- RSE | - | ETS-Lindgren / CETECOM | 12 M | 5 | 30.06.2017 |
| 448 | notch filter WCDMA_FDD II | WRCT 1850.0/2170.0- 5/40- | 5 | Wainwright Instruments GmbH | 12 M | 1c | 30.06.2017 |
| 449 | notch filter WCDMA FDD V | WRCT 824.0/894.0-5/40- 8SSK | 1 | Wainwright | 12 M | 1c | 30.06.2017 |



| 163 Universal source HP3215A 281A03472 Aglent - 4 4 165 Digital Multimeter Fluke 112 \$9001955 Fluke USA 36 M - 30.05.27 167 Digital Multimeter Fluke 112 \$9001955 Fluke USA 36 M - 30.04.27 168 Digital Multimeter Fluke 112 \$9001955 Fluke USA 36 M - 30.04.27 169 Power ander Ghala NKVS Rassover and the state of the | RefNo. | Equipment | Туре | Serial-No. | Manufacturer | Interval of calibration | Remark | Cal due |
|---|--------|--------------------------------------|---------------------------|--------------|-----------------------|----------------------------|--------|-------------|
| 199 DC - Power supply -0.5. do -2.1 Elstic Automatik power 2 300.12 640 Liveral source HP3345A 2831.03127 Aglem - 4 647 Digital Multimeter Fluke 112 39501037 Puke USA 36.04 - 300.12 647 Digital Multimeter Fluke 112 39500306 Fluke USA 36.04 - 300.12 647 Redutating CPS System A4.4 - 2000405 Fluke USA 36.04 - 300.12 648 Presentifies 25 - 18 GHz 100 Nor Rold & Schunger 124 - 300.02 649 presentifies 25 - 18 GHz 100 100.00 Rold & Schunger 124 - 300.22 702 Inder schuler System CTC NSA-Verification SAR-EMI System SMI feld SAR - S00.24 - 300.24 - 300.24 - 300.24 - 300.24 - 300.24 - 300.24 - 300.24 - 300.24 | 454 | Oscilloscope | HM 205-3 | 9210 P 29661 | Hameg | - | 4 | |
| 160 Univ. Radio Communication Toter CMU 200 100901 Rouke & Schwarz 12.1 - Adjust 166 Digital Multimeter Flake 112 98710177 Flake USA 3.60 - 3.00.12 168 Digital Multimeter Flake 112 9960106 Flake USA 3.60 - 3.00.12 168 Digital Multimeter Flake 112 9960106 Flake USA 3.00.12 - 3.00.12 168 Digital Multimeter Flake 112 9960106 Flake USA 3.00.12 - 3.00.12 169 Intermarks Particital State Advert Sto DO21000-25: 1.244554 Milling CTS Schwart 1.2 - 1.00.23 160 Intermarks Ra Film Store DO21000-25: 1.244554 Milling CTS Milling CTS Schwart 1.2 - 1.00.23 170 Diadi Schwart ISA Milling CTS Schwart 1.00.13 Nond Schwart 1.0 1.00.23 180 Diadi Schwart ISA Milling CTS Schwart 1.0 1.00.23 Nond S | 456 | DC-Power supply 0-5 A | EA 3013 S | 207810 | Elektro Automatik | pre-m | 2 | |
| Inst. Universal source HP325A 28714372 Agkent - 4 - 1 500.55 46 Digula Multimeter Fluke 112 9800306 Fluke USA 30.45X 30.45X< | 459 | DC -Power supply 0-5 A, 0-32 V | EA-PS 2032-50 | 910722 | Elektro Automatik | pre-m | 2 | |
| 166 Epidal Multimeter Flake 112 992(16)7 Flake USA 20 M | 460 | Univ. Radio Communication Tester | CMU 200 | 108901 | Rohde & Schwarz | 12 M | - | 30.04.2017 |
| 197 Digital Multimeter Plake 112 990000455 Plake USA 35 M - 300.42 288 Digital Multimeter Name Allorentity Cons. Fink - 3 | 463 | Universal source | HP3245A | 2831A03472 | Agilent | - | 4 | |
| 168 Diginal Multimeter Fluke 112 90009435 Fluke USA 0.440 <th0< td=""><td>466</td><td>Digital Multimeter</td><td>Fluke 112</td><td>89210157</td><td>Fluke USA</td><td>24 M</td><td>-</td><td>30.05.2018</td></th0<> | 466 | Digital Multimeter | Fluke 112 | 89210157 | Fluke USA | 24 M | - | 30.05.2018 |
| 177 Rekatiating GPS System A5-17 - Automative Cons. Fink - 3 - 304 22 488 Provements (Tubu) NRVS Si3372/03 Robbe & Schwarz 14 M - 304 24 482 Inter marits AN I - CTTCCOM (0hr) - 14 - 300 24 483 Inter marits AN I - CTTCCOM (0hr) 24 M - 300 24 483 Inter marits AN I - CTTCTSA-Verification SAR-EMI System EMI field (SAR) - CTT The Solution of the Schwarz 12 M - 200 52 512 Indan rights Filter WKCG 1709/1786 SN 9 Wainwright Pre-m 2 512 Inda Rights Filter WKCA 800/040/240° SN 24 Wainwright 12 M - 300.24 513 India Bondmiterio power diviter Model 1515 L11 8S Weinhele Pre-m 2 514 India Bondmiterio power diviter Model 1510 L11 8S Application 21 M - 300.24 <td>467</td> <td>Digital Multimeter</td> <td>Fluke 112</td> <td>89680306</td> <td>Fluke USA</td> <td>36 M</td> <td>-</td> <td>30.04.2018</td> | 467 | Digital Multimeter | Fluke 112 | 89680306 | Fluke USA | 36 M | - | 30.04.2018 |
| 180 prover metri (Pui) NRVS 878/92/01 Robe & Schwarz 24 M - 100-22 26 filter marix SAR 1 - CETECOM (#b) - 10 487 Filter marix SAR 1 - CETECOM (#b) - 10 487 System CTC NSA-Verification SAR-EM NAM System EM field (\$AR) - CETECOM 12 M - 300.52 489 EMI Test Receiver ISMO 1000-50 Robe & Schwarz 12 M - 300.52 512 hord spicet filter 1000/1796- SN 9 Wainweight re-m 2 512 hords filter GSM 850 WECG 82/49/814/859- SN 5 Wainweight re-m 2 512 hords filter marix Iff Reds Rob Kettley SN 24 Wainweight re-m 2 526 of BB coadbard resistive power divider Red 1515 L14 85 Weinschell re-m 2 300.52 530 Id dB Roadbard resistive power divider Red 1515 L14 85 4 30 | 468 | Digital Multimeter | Fluke 112 | 90090455 | Fluke USA | 36 M | - | 30.04.2018 |
| 192 Ider matrix Filter matrix SAR I. - CETECOM (Brb) I.d. 484 pre-amplifier 2.5 - 18 GHz MIRC DO 2030 100-72 1244554 Mincq 12 M. - 30.06.27 487 System CTC NSA-Verification SAR-PMM System FMI field (SAR) . CETECOM 24 M. - 31.07.27 502 Inand reject fiber WEQI (779/1786- SN 9 Wainwright Pre-m 2 512 noch fiber GM S00 GFEK SN 9 Wainwright Pre-m 2 512 noch fiber GM S00 GFEK SN 14 Wainwright Pre-m 2 512 noch fiber GM S00 GFEK SN 14 Wainwright Pre-m 2 513 relas solich natrix HF Reias Rox Keinley SN 14 Kainbley Pre-m 2 50.01 Additionator SM 14 Rokin Additionator Sixies power divider 14.11.0 NV 44000154 Agita 30.01.22 10.01 Bita Grant Additionator Sixies power divider 14.01.00 10.01.23 10.01.23 10.0 | 477 | ReRadiating GPS-System | AS-47 | - | Automotive Cons. Fink | - | 3 | |
| 484 pre-amplifier 2.5 - 18 GHz AHF-SD 0250090-25: 100-0 1244554 Macq 12 M 3 30.06.20 487 System CTC NSA-Verification SAR-EMI System EMI field (SAR) ETS Lindgren / CETECOMI 24 M - 31.07.20 489 EMI Test Receiver ISL40 1000-30 Rohé & Schwarz 12 M - 30.06.20 481 EMI Test Receiver ISL40 1000-30 Rohé & Schwarz 12 M - 30.06.20 482 Indar reject filter WRCG 82.3459.814.859. SN 5 Wainweight re-m 2 512 note: filter GSM 850 GFK SN 24 Wainweight re-m 2 512 filter Bonaband resistive power divider Med 1515 LH 85 Weinschell gres-m 2 513 Iold Broadband resistive power divider Rel 151 LH 85 Weinschell 12 M 3 30.05.22 52 Iolg Broadband resistive power divider Rel 151 LH 85 Weinschell 12 M 3 30.05.22 53 <td>480</td> <td>power meter (Fula)</td> <td>NRVS</td> <td>838392/031</td> <td>Rohde & Schwarz</td> <td>24 M</td> <td>-</td> <td>30.04.2017</td> | 480 | power meter (Fula) | NRVS | 838392/031 | Rohde & Schwarz | 24 M | - | 30.04.2017 |
| 161 Hos-anguner L2 is Ord? 110 2 300.8.2 147 System CTC NSA Verification SAR EMI SAK System EMI field (SAR) - ETS Lindgren / CFTECOM 24 M - 31.07.20 305 band reject filter WRC (1707)786. N9 Wainwright pre-m 2 305 band reject filter WRC (20090-02-00. SN 5 Wainwright pre-m 2 305 band reject filter WRC (20090-02-00. SN 24 Wainwright 12 M 16 30.06.20 305 outs filter GSM 850 GEE K SN 24 Wainwright 12 M 16 30.06.20 305 JOBE Mandband resistive power divider HFI Relais Sock Estildy SN 24 Wainwright 12 M 30.02 | 482 | filter matrix | Filter matrix SAR 1 | - | CETECOM (Brl) | - | 1d | |
| 18/1 System CLE NSA-Vertification SARC-SM NSA | 484 | pre-amplifier 2,5 - 18 GHz | | 1244554 | Miteq | 12 M | - | 30.06.2017 |
| 502 band reject filter (WECC 1799/1786- 1600 SN 9 Wainwright pre-m 2 503 hand reject filter WRCC 824849-814.859- 04EEK SN 5 Wainwright 12 M 12 512 tookh filter GSM 850 WRCC 824849-814.859- 04EEK SN 5 Wainwright 12 M 12 M 523 Digital Multimeter HF Rekais Rot Keithely SE 04 Keithely perem 2 524 Oth Roadband resistive power divider Kold 1515 LH 855 Weinschel perem 2 547 Oth Roadband resistive power divider Kold 1515 LH 855 Weinschel 12 M 30.04.20 549 Log Per-Antenna Feator CMU 200 835390014 Robde & Schwarz 12 M 30.07.20 550 System CTC 5-VSWR Verification SAE System SUT 2.8-186(Hz) VSWR 28 H 86(1085 12 M 30.107.20 551 Bidg puse filter 2.8-186(Hz) Weit 2.8-186(1085 4 Wainwright 12 M 5 30.09.21 553 System CTC | 487 | System CTC NSA-Verification SAR-EMI | | - | | 24 M | - | 31.07.2017 |
| 502 band reject filter [1690] 736,- NS 9 Watnwrigh pre-m 2 503 band reject filter WRCG 824-893-814-859. SN 5 Wainwrigh pre-m 2 512 noch filter GSM 850 GEEK SN 24 Wainwrigh pre-m 2 512 relais switch matrix HF Relais BOX Keithley SE 04 Keithley pre-m 2 520 Jogtal Multimeter L411/A MY4000154 Agleten 2.4 M > 30.04.27 530 10.03. Broadband essitive power divider Alod 11515 L11.855 Weinschell pre-m 2 2 540 Univ. Rudio Communication Tester CMU 200 1053390014 Rohde & Schwarz 30.04.27 30.04.27 550 System CTC -OTA-2 R&S TS891 - ETG TECCOM 24 4 31.07.27 551 System CTC -FAR S- VSWR 31.03.22 553 System CTC -FAR S- VSWR System CTC | 489 | EMI Test Receiver | ESU40 | 1000-30 | Rohde & Schwarz | 12 M | - | 30.05.2017 |
| 50 band reject filter 10091 / 0m 2m 2m 2mm | 502 | band reject filter | | SN 9 | Wainwright | pre-m | 2 | |
| 512 noch filer GSM 850 WRCA 800/960/0240- GEK SN 24 Wainwrgh 12 M 1e 30.06.20 517 relais switch matrix HF Relais Box Keitbley SE 0.4 Keitbley pre-m 2 523 Digtal Multimeter L4411.A MY44000154 Agalent 72.4 M z 30.04.2 530 10.0B Roadband residue power divider R 416110000 LOT 9828 - pre-m 2 30.04.2 547 Urin: Radio Communication Tester CMU 200 106456 R&S 12.4 M - 30.04.2 540 Lin: Neadio Communication Tester CMU 200 1064576 R&S 12.4 M - 30.07.2 551 Spite Provention SWR SWR SWR SWR - Lindgreen/ETECOM 24.M - 30.07.2 551 Spite DTC FA 8- SWR SWR VSWR - Rohde & Schwarz 12.M 16.300.62 551 Spite CTC FA 8- SWR VSWR - CTC 2.4 M - 10.07.2 | | | | | U | - | | |
| 171 celais switch matrix HF Relais Box Keitbley SE 0.4 Keitbley prem 2 223 Digital Multimeter L411A MY 48000154 Agilen 2.4 7.3 30.04.27 320 Digital Multimeter L411A MY 4800154 Weinschel prem 2 331 10.08 prem Z and 2 and 2 347 Univ. Radio Communication Tester CMU 200 106436 Re.8 12.M - 30.04.27 347 Univ. Radio Communication Tester CMU 200 106436 Re.8 30.12.2 - 30.10.21 - 30.04.21 - 30.04.27 350 Synth CTC S-NWR Verification SAR Synth CTC FAR S- - Lindgreen/CTETCOM 24 M - 30.09.27 351 System CTC FAR S - VSWR VSWR - CTC 24 M - 10.04.27 365 System CTC FAR S - VSWR VSWR - CTC 24 M - 10.04.27 374 Bioptime Radio | | | WRCA 800/960-02/40- | | e | | | 30.06.2017 |
| 123 Digital Multimeter L411A MV4000154 Agilem 21 300.1 250 6.B. Broadband resistive power divider R.41610000 L07.9828 - pre-m 2 540 Univ. Radio Communication Tester CMU 200 106436 R&S 12 M - 30.04.23 540 Log Per-Antenna HL020 835300104 Rohde & Schwarz 12 M - 30.04.23 541 Log Per-Antenna HL020 RAST SS900104 Rohde & Schwarz 12 M 1 31.07.22 552 System CTC FAR S-VSWR Verification SAR System CTC FAR S-VSWR VSWR - Rohde & Schwarz 12 M 1 30.05.21 553 System CTC FAR S-VSWR VSWR - CTC 2 4 M 31.03.22 544 Bioonling Hybrid Antenna BTA-L 980026L Frankonia 36(12 M 2 31.03.22 545 Spectrum Analyzer FSLM 30 (Reserve) 812250013 Rohde & Schwarz 12 M - 30.04.22 546 Univ, Ra | | | | | - | | | |
| 529 6.dB Broadband resistive power divider Model 1515 L1I 855 Weinschel pre-m 2 530 10.dB Broadband resistive power divider R.410110000 L07 9828 i pre-m 2 30 547 Univ. Radio Communication Tester CMU 200 106436 R&S 12 M - 30.04.2 547 Univ. Radio Communication Tester CMU 200 835390/014 Rolade & Schwarz 26/12 M - 30.04.2 540 System CTC - S-VSWR Verification SAR- ELMI System CTC FAR S-VSWR Verification SAR- System CTC CATA-2 R&S TS8971 - Rolade & Schwarz 12 M 16 30.09.27 573 System CTC CATA-2 R&S TS8971 - Rolade & Schwarz 12 M 16 30.09.27 574 Biconitog Hybrid Antenna BTA- 9800261 Frankonia 3612 M 10.31.27 574 Biconitog Hybrid Antenna BTA- 9800261 Frankonia 3612 M 30.09.27 574 Biconitog Hybrid Antenna BTA- 9800261 Frankonia 361 | _ | | , | | | | - | 30.04.2017 |
| 130 10 dB. Broadbad resistive power divider R 416110000 LOT 9828 - pre-m 2 154 Uuix, Radio Communication Tester CMU 200 1853500014 Rohde & Schwarz 12 M - 3005 27 159 Log Per-Aneman 11025 1000060 Rohde & Schwarz 12 M - 3005 27 159 Log Per-Aneman System CTC FAVENR Verification SAR System CTC FAVENR Verification SAR System CTC FAR S-18GHz WHKX 28/18G-108S 4 Wainweight 12 M 16 3006.27 157 System CTC FAR S-VSWR VSWR - Rohde & Schwarz 12 M 5 3009.27 158 System CTC FAR S-VSWR VSWR - CTC 2 M 3 3107.21 154 Spectrum Analyzer FSU 8 100248 Rohde & Schwarz 12 M 3 3009.27 158 Spectrum Analyzer FSU 80 00 (Reserve) 831250013 Rohde & Schwarz 2 M 3 304.27 159 Univ. Radio Communication Tester CMV 20 1003477< | - | | | | e e | | 2 | 2010 112017 |
| 546 Univ. Radio Communication Tester CMU 200 106436 Reks 12 M - 3 00 5.2 547 Univ. Radio Communication Tester CMU 200 853590014 Rohde & Schwarz 12 M - 3 00 5.2 549 Log Per-Anterna HL025 1000060 Rohde & Schwarz 3 612 M - 3 10.7 2C 550 EMI System EMI Field SAR S- - LindgreeCTEFCOM 2 M - 3 10.7 2C 551 System ETC -OTA-2 R&S TS8991 - Rohde & Schwarz 12 M - 3 10.9 2C 553 System CTC -OTA-2 R&S TS8991 - CTC 2 M - 3 10.9 2C 554 System CTC FAR S- - CTC 2 M - 3 10.9 2C 554 Wadeband Radio Communication Tester CMU 300 100347 Rohde & Schwarz 12 M - 3 0.0 42C 579 Waik And Radio Communication Tester CMU 200 100347 Rohde & Schwarz 24 M - 3 0.0 42C 579 <td></td> <td>*</td> <td></td> <td></td> <td>weinseher</td> <td>•</td> <td></td> <td></td> | | * | | | weinseher | • | | |
| 547 Univ. Radio Communication Tester CMU 200 853390.014 Rohe & Schwarz 12 M - 3 0.04.27 549 Log Per Antenna HL025 1000060 Rohe & Schwarz 3612 M - 31.07.27 557 Bystem CTC S-VSWR Verification SAR- VSWR VSWR - LindgrewCETECOM 24 M - 31.07.20 557 System CTC A-2 R&S TS8991 - Rohe & Schwarz 12 M 5 30.06.21 558 System CTC FAR S-VSWR System CTC FAR S-VSWR - CTC 24 M - 19.04.22 584 Spectrum Analyzer FSU 8 100248 Rohde & Schwarz 12 M - 31.03.20 594 Wideband Radio Communication Tester CMU 200 100347 Rohde & Schwarz 12 M - 30.04.20 595 Spectrum Analyzer FSEM 30 (Reserve) 835323.003 Rohde & Schwarz 24 M - 30.04.20 595 Spectrum Analyzer NRV26 (Reserve) 835323.003 Rohde & Schwarz 24 M -< | _ | 1 | | | - D&C | | 2 | 20.05.2017 |
| 1540 Log. Per-Anterna HL025 1000060 Rohde & Schwarz 36/12 M - 3107.22 550 System CC CS -VSWR Verification SAR- VSWR System CTC FARS - LindgroctETECOM 24 M - 3107.22 551 System CTC -OTA-2 R&S TS8991 - Rohde & Schwarz 12 M 5 3006.22 558 System CTC FAR S-VSWR System CTC FAR S- VSWR - CTC 24 M - 310.3.20 574 Biconilog Hybrid Antenna BTA-L 980026L Frankonia 3612.M - 310.4.20 584 Spectrum Analyzer PSU 8 100248 Rohde & Schwarz pre-m - 594 Widehand Radio Communication Tester CMU 300 (Bostary) 831259013 Rohde & Schwarz 24 M - 300.4.21 591 Unix, Radio Communication Tester CMU 300 (Bostary) 831259013 Rohde & Schwarz 24 M - 300.4.21 592 Unix, Radio Communication Tester CMU 251 (Reserve) 831259013 Rohde & Schwarz 24 M< | | | | | | | - | |
| System CTC S-VSWR Verification SAR- bigh pass filter 2.8+RGHz System EMI Field SAR S- VSWR EITS VSWR ETS Lindgren/CETECOM 24 M - 31.07.20 557 Bystem CTC S-VSWR WHKX 2.8/18G-10SS 4 Winwright 12 M 15 300.927 557 System CTC FAR S- VSWR WHKX 2.8/18G-10SS 4 Winwright 12 M 5 300.927 558 System CTC FAR S- VSWR Rohde & Schwarz 12 M - 310.3.20 574 Biconilog Hybrid Antenna BTA-L 980026L Frankonia 36/12 M - 310.4.2 584 Spectrum Analyzer FSLM 30 (Reserve) 831259/013 Rohde & Schwarz 12 M - 30.04.2 597 Univ. Radio Communication Tester CMV 200 100347 Rohde & Schwarz 12 M - 30.04.2 598 Spectrum Analyzer FSEM 30 (Reserve) 831259/013 Rohde & Schwarz 12 M - 30.04.2 600 medium-sensitivity diode sensor NRV-23 (Reserve) 83523/003 Rohde & Schwarz 24 M | _ | | | | | | | |
| 552 high pass filter 2.8+18GHz WHKX 28/18G-10SS 4 Winiwright 12 M 16 300.62 557 System CTC-OTA-2 R&5 TS8991 - Rohde & Schwarz 12 M 5 30.90.20 558 System CTC FAR S-VSWR System CTC FAR S-VSWR - CTC 24 M - 19.04.20 574 Biconilog Hybrid Amenna BTA-L 980026L Frankonia 36/12 M - 31.03.20 584 Spectrum Analyzer FSU 8 100248 Rohde & Schwarz Pre-m - 597 Univ. Radio Communication Tester CMV 200 100347 Rohde & Schwarz Pre-m - 30.04.21 598 Spectrum Analyzer PSEM 30 (Reserve) 831529/013 Rohde & Schwarz 24 M - 30.04.22 601 mediam-sensitivity diode sensor NRV-Z3 (Reserve) 8435532/003 Rohde & Schwarz 24 M - 30.04.22 610 Dc power supply E3632A MY 4000131 Agilent pre-m 2 6 | | System CTC S-VSWR Verification SAR- | System EMI Field SAR S- | - | ETS | | | 31.07.2018 |
| 557 System CTC 7A-2 R&S TS8991 - Rohde & Schwarz 12 M 5 30.09.20 558 System CTC FAR S-VSWR System CTC FAR S- VSWR - CTC 2 M - 19.04.20 574 Biconilog Hybrid Antenna BTA-L 980026L Frankonia 36/12 M - 31.03.20 584 Spectrum Analyzer FSU 8 100248 Rohde & Schwarz 12 M - 30.04.20 594 Wideband Radio Communication Tester CMU 3000 100347 Rohde & Schwarz 24 M - 30.04.20 600 power meter NRVD (Reserve) 834501/018 Rohde & Schwarz 24 M - 30.04.20 601 modum-sensitivity diode sensor NRV-Z3 (Reserve) 8350300 Rohde & Schwarz 24 M - 30.04.20 612 DC power supply E3632A MY 40001321 Agilent pre-m 2 612 DC power supply E3632A MY 40001321 Agilent pre-m 2 613 Pow | 552 | | | 4 | | 12 M | 1c | 30.06.2017 |
| 258 System CTC PAR S-VSWR $\sqrt{y}WR$ - CTC 24 M - 19.04.2. 574 Bisconig Hybrid Antenna BTA-L 980026L Frankonia 36712 M - 31.03.27 584 Spectrum Analyzer FSU 8 100248 Rohde & Schwarz 12 M - 30.04.27 594 Wideband Radio Communication Tester CMU 200 100347 Rohde & Schwarz 24 M - 30.04.27 600 power meter NRVD (Reserve) 834501018 Rohde & Schwarz 24 M - 30.04.27 601 medium-sensitivity diode sensor NRV-Z5 (Reserve) 834501018 Rohde & Schwarz 24 M - 30.04.27 602 peak power sensor NRV-Z5 (Reserve) 8345023003 Rohde & Schwarz 24 M - 30.04.27 601 DC power supply E3632.A MY 40001321 Agilent pre-m 2 612 Attennator R416120000 20dB 10W Lot 9828 Radiall pre-m 2 616 613 Attennator Z4 H6120000 20dB 10W Lot 9828 Rohdia & Schwarz | | U 1 | | | | | | 30.09.2016 |
| 584 Spectrum Analyzer FSU 8 100248 Rohde & Schwarz pre-m - 594 Wideband Radio Communication Tester CMW 500 101757 Rohde & Schwarz 12 M - 304.20 591 Univ. Radio Communication Tester CMU 200 1003477 Rohde & Schwarz 24 M - 30.04.20 598 Spectrum Analyzer FSEM 30 (Reserve) 834301.018 Rohde & Schwarz 24 M - 30.04.20 601 medium-sensitivity diode sensor NRV-Z5 (Reserve) 834351.018 Rohde & Schwarz 24 M - 30.04.20 601 DC power supply E3632.A KR 75305854 Agilent pre-m 2 612 DC power supply E3632.A MY 40001321 Agilent pre-m 2 613 Attenuator R416120000 20dB 10W Lot. 9828 Radiall pre-m 2 2 614 Dogitalanultimeter Fluke 177 88900339 Fluke 12 M - 30.05.20 619 Power Spli | 558 | System CTC FAR S-VSWR | | - | CTC | 24 M | - | 19.04.2017 |
| 594 Wideband Radio Communication Tester CMW 500 101757 Rohde & Schwarz 12 M - 30.04.20 597 Univ. Radio Communication Tester CMU 200 100347 Rohde & Schwarz pre-m - 598 Spectrum Analyzer FSEM 30 (Reserve) 831259/013 Rohde & Schwarz 24 M - 30.04.20 600 power meter NRVD (Reserve) 834501/018 Rohde & Schwarz 24 M - 30.04.20 610 medium-sensitivity diode sensor NRV-Z32 (Reserve) 83532003 Rohde & Schwarz 24 M - 30.04.20 611 DC power supply E3632A KR 75305854 Agilent pre-m 2 613 Attenuator R416120000 20dB 10W Lot, 9828 Radial1 pre-m 2 2 616 Digitalmultimeter Fluke 177 8900339 Fluke 24 M - 30.05.20 617 Power Splitter/Combiner SOPD-634 600995 JFW Industries USA - 2 2 <t< td=""><td>574</td><td>Biconilog Hybrid Antenna</td><td></td><td></td><td>Frankonia</td><td>36/12 M</td><td>-</td><td>31.03.2019</td></t<> | 574 | Biconilog Hybrid Antenna | | | Frankonia | 36/12 M | - | 31.03.2019 |
| 597 Univ. Radio Communication Tester CMU 200 100347 Rohde & Schwarz pre-m i. 598 Spectrum Analyzer FSEM 30 (Reserve) 831259/013 Rohde & Schwarz 24 M - 30.04.27 601 medium-sensitivity diode sensor NRV-Z5 (Reserve) 83435323003 Rohde & Schwarz 24 M - 30.04.27 601 medium-sensitivity diode sensor NRV-Z3 (Reserve) 835080 Rohde & Schwarz 24 M - 30.04.27 612 Dc power supply E3632A KR 75305854 Agilent pre-m 2 613 Attenuator R416120000 20dB 10W Lot, 9828 Radiall pre-m 2 616 Digitalmultimeter Fluke 177 88900339 Fluke 24 M - 30.05.27 618 Power Splitter/Combiner SDPD-634 600995 JFW Industries USA - 2 2 620 EMT est Receiver ESU 26 100362 Rohde & Schwarz pre-m 2 2 621 | 584 | 1 5 | | | Rohde & Schwarz | 1 | - | |
| 598 Spectrum Analyzer FSEM 30 (Reserve) 831259/013 Rohde & Schwarz 24 M - 30.04.27 600 power meter NRVD (Reserve) 834301/018 Rohde & Schwarz 24 M - 30.04.27 601 medium-sensitivity diode sensor NRV-Z32 (Reserve) 8335323003 Rohde & Schwarz 24 M - 30.04.27 602 peak power sensor NRV-Z32 (Reserve) 835080 Rohde & Schwarz 24 M - 30.04.27 611 DC power supply E3632A MY 40001321 Agilent pre-m 2 613 Attenuator R 416120000 20dB 10W Lot, 9828 Radiall pre-m 2 616 Digitalmultimeter Fluke 177 88900339 Fluke 24 M - 30.05.27 618 Power Splitter/Combiner 50PD-634 600995 JFW Industries USA - 2 620 EMT Est Receiver ESU 26 100362 Rohde-Schwarz 12 M - 30.05.27 625 | _ | | | | | | - | 30.04.2017 |
| 600 power meter NRVD (Reserve) 834501/018 Rohde & Schwarz 24 M - 30.04.20 601 medium-sensitivity diode sensor NRV-Z5 (Reserve) 83503/003 Rohde & Schwarz 24 M - 30.04.20 601 DC power supply E3632A KR 75305854 Agilent pre-m 2 611 DC power supply E3632A KR 75305854 Agilent pre-m 2 612 DC power supply E3632A MY 4001321 Agilent pre-m 2 613 Attenuator R416120000 20dB 10W Lot. 9828 Radiall pre-m 2 616 Digitalmultimeter Fluke 177 88900339 Fluke 24 M - 30.05.20 617 Power Splitter/Combiner SOPD-634 600995 JFW Industries USA - 2 620 EMI Test Receiver ESU 26 10017 Rohde & Schwarz Pre-m 2 625 Generic Test Load USB Generic Test Load USB - | 597 | Univ. Radio Communication Tester | CMU 200 | 100347 | Rohde & Schwarz | | - | |
| 601 medium-sensitivity diode sensor NRV-Z5 (Reserve) 8435323/003 Rohde & Schwarz 24 M - 30.04.20 602 peak power sensor NRV-Z5 (Reserve) 835080 Rohde & Schwarz 24 M - 611 DC power supply E3632A KR 75305854 Agilent pre-m 2 612 DC power supply E3632A MY 40001321 Agilent pre-m 2 613 Attenuator R416120000 20dB 10W Lot. 9828 Radiall pre-m 2 616 Digitalmultimeter Fluke 177 88900339 Fluke 24 M - 30.05.20 618 Power Splitter/Combiner 50PD-634 600995 JFW Industries USA - 2 620 EMI Test Receiver ESU 26 100362 Rohde-Schwarz 12 M - 30.05.20 621 Step Attenuator 0.139 dB RSP 100017 Rohde & Schwarz pre-m 2 62 625 Generic Test Load USB - CETECOM - | | 1 2 | | | | | - | 30.04.2017 |
| 602 peak power sensor NRV-Z32 (Reserve) 835080 Rohde & Schwarz 24 M - 611 DC power supply E3632A KR 75305854 Agilent pre-m 2 612 DC power supply E3632A MY 40001321 Agilent pre-m 2 613 Attenuator R416120000 20dB 10W Lot. 9828 Radiall pre-m 2 616 Digitalmultimeter Fluke 177 88900339 Fluke 24 M - 30.05.20 617 Power Splitter/Combiner SDPD-634 600994 JFW Industries USA - 2 619 Power Splitter/Combiner 50PD-634 600995 JFW Industries USA - 3 620 EMITest Receiver ESU 26 100362 Rohde & Schwarz 12 M - 30.05.20 621 step Attenuator 0-139 dB RSP 100017 Rohde & Schwarz pre-m 2 - 623 Generic Test Load USB Generic Test Load USB - CETECOM - < | | 1 | | | | | - | 30.04.2017 |
| 611 DC power supply E3632A KR 75305854 Agilent pre-m 2 612 DC power supply E3632A MY 40001321 Agilent pre-m 2 613 Attenuator R416120000 20dB 10W Lot. 9828 Radial pre-m 2 616 Digitalmultimeter Fluke 177 88900339 Fluke 24 M 30.05 20 617 Power Splitter/Combiner ZFSC-2-2-S+ S P987001108 Mini Circuits - 2 618 Power Splitter/Combiner 50PD-634 600995 JFW Industries USA - 3 620 EMI Test Receiver ESU 26 100362 Rohde-Schwarz 12 M - 30.05 .20 621 Step Attenuator 0-139 dB RSP 100017 Rohde & Schwarz 12 M - 30.04 .20 625 Generic Test Load USB Generic Test Load USB 2 2 - 30.04 .20 634 Spectrum Analyzer FSM (HF-Unit) 826188/010 Rohde & Schwarz pre-m 2 2 640 HDMI table with Ethernet 1.5 HDMI cable with Ethe | _ | | | | | | - | 30.04.2017 |
| 612 DC power supply E3632A MY 40001321 Agilent pre-m 2 613 Attenuator R416120000 20dB 10W Lot. 9828 Radiall pre-m 2 616 Digitalmultimeter Fluke 177 88900339 Fluke 24 M - 30.05 20 617 Power Splitter/Combiner ZFSC-2-28+ S P987001108 Mini Circuits - 2 618 Power Splitter/Combiner SOPD-634 600995 JFW Industries, USA - 2 619 Power Splitter/Combiner SOPD-634 600995 JFW Industries, USA - 3 620 EMI Test Receiver ESU 26 100362 Rohde-Schwarz 12 M - 30.05.20 621 Step Attenuator 0-139 dB RSP 100017 Rohde & Schwarz pre-m 2 623 Generic Test Load USB Generic Test Load USB - CETECOM - 2 634 Spectrum Analyzer FSM (HF-Unit) 826188/010 Rohde & Schwarz pre-m <td< td=""><td></td><td>* *</td><td></td><td></td><td></td><td>24 M</td><td></td><td></td></td<> | | * * | | | | 24 M | | |
| 613 Attenuator R416120000 20dB 10W Lot. 9828 Radiall pre-m 2 616 Digitalmultimeter Fluke 177 88900339 Fluke 24 M - 30.05.20 617 Power Splitter/Combiner ZFSC-2-2-S+ S F9R701108 Mini Circuits - 2 618 Power Splitter/Combiner 50PD-634 600995 JFW Industries USA - 2 619 Power Splitter/Combiner 50PD-634 600995 JFW Industries USA - 3 620 EMI Test Receiver ESU 26 100362 Rohde-Schwarz 12 M - 30.05.20 621 Step Attenuator 0-139 dB RSP 100017 Rohde & Schwarz pre-m 2 6 623 Generic Test Load USB - CETECOM - 2 6 633 Spectrum Analyzer FSM (HF-Unit) 826188/010 Rohde & Schwarz pre-m 2 6 634 HDMI cable with Ethernet 1 m HDMI cable with Ethernet 1 - 2 | 611 | DC power supply | E3632A | KR 75305854 | Agilent | pre-m | | |
| 616 Digitalmultimeter Fluke 177 88900339 Fluke 24 M - 30.05.20 617 Power Splitter/Combiner ZFSC-2-S+ S F987001108 Mini Circuits - 2 618 Power Splitter/Combiner 50PD-634 600994 JFW Industries USA - 2 619 Power Splitter/Combiner 50PD-634 600995 JFW Industries, USA - 3 620 EMI Test Receiver ESU 26 100362 Rohde-Schwarz 12 M - 30.05.20 621 Step Attenuator 0-139 dB RSP 100017 Rohde & Schwarz pre-m 2 627 data logger OPUS 1 201.0999.9302.6.4.1.4 G. Lufft GmbH 24 M - 30.04.20 634 Spectrum Analyzer FSM (HF-Unit) 826188/010 Rohde & Schwarz pre-m 2 637 High Speed HDMI with Ethernet 1 m HDMI cable with Ethernet - KogiLink - 2 640 HDMI cable 2m rund - Reichelt - | 612 | DC power supply | E3632A | MY 40001321 | Agilent | pre-m | 2 | |
| 617 Power Splitter/Combiner ZFSC-2-2-S+ S F987001108 Mini Circuits - 2 618 Power Splitter/Combiner 50PD-634 600994 JFW Industries USA - 2 619 Power Splitter/Combiner 50PD-634 600995 JFW Industries USA - 3 620 EMI Test Receiver ESU 26 100362 Rohde-Schwarz 12 M - 30.05.20 621 Step Attenuator 0-139 dB RSP 100017 Rohde & Schwarz pre-m 2 625 Generic Test Load USB Generic Test Load USB - CETECOM - 2 634 Spectrum Analyzer ESM (HF-Unit) 826188/010 Rohde & Schwarz pre-m 2 637 High Speed HDMI with Ethernet 1m HDMI cable with Ethernet - KogiLink - 2 640 HDMI cable 2m rund HDMI cable with Ethernet - Reichelt - 2 641 HDMI cable 2m rund HDMI cable 2m rund - - - | | | R416120000 20dB 10W | | Radiall | pre-m | 2 | |
| 618 Power Splitter/Combiner 50PD-634 600994 JFW Industries USA - 2 619 Power Splitter/Combiner 50PD-634 600995 JFW Industries, USA - 3 620 EMI Test Receiver ESU 26 100362 Rohde-Schwarz 12 M - 30.05.20 621 Step Attenuator 0-139 dB RSP 100017 Rohde & Schwarz pre-m 2 625 Generic Test Load USB Generic Test Load USB - CETECOM - 2 627 data logger OPUS 1 201.0999.9302.6.4.1.4 G. Lufft GmbH 24 M - 30.04.20 634 Spectrum Analyzer FSM (HF-Unit) 826188/010 Rohde & Schwarz pre-m 2 637 High Speed HDMI with Ethernet 1n HDMI cable with Ethernet - KogiLink - 2 640 HDMI cable 2m rund - Reichelt - 2 - 644 Amplifierer ZX60-2534M+ SN865701299 Mini-Circuits - <td< td=""><td>616</td><td>Digitalmultimeter</td><td>Fluke 177</td><td>88900339</td><td>Fluke</td><td>24 M</td><td>-</td><td>30.05.2018</td></td<> | 616 | Digitalmultimeter | Fluke 177 | 88900339 | Fluke | 24 M | - | 30.05.2018 |
| 619 Power Splitter/Combiner 50PD-634 600995 JFW Industries, USA - 3 620 EMI Test Receiver ESU 26 100362 Rohde-Schwarz 12 M - 30.05.20 621 Step Attenuator 0-139 dB RSP 100017 Rohde & Schwarz pre-m 2 625 Generic Test Load USB Generic Test Load USB - CETECOM - 2 627 data logger OPUS 1 201.0999.9302.6.4.1.4 G. Lufft GmbH 24 M - 30.04.20 634 Spectrum Analyzer FSM (HF-Unit) 826188/010 Rohde & Schwarz pre-m 2 637 High Speed HDMI with Ethernet 1m HDMI cable with Ethernet 1m - KogiLink - 2 638 HDMI Kabel with Ethernet 1,5 m flach HDMI cable with Ethernet - Reichelt - 2 640 HDMI cable 2m rund - Reichelt - 2 - 640 HDMI cable 2m rund - PureLink - 2 | 617 | Power Splitter/Combiner | ZFSC-2-2-S+ | S F987001108 | Mini Circuits | - | 2 | |
| 620 EMI Test Receiver ESU 26 100362 Rohde-Schwarz 12 M - 30.05.20 621 Step Attenuator 0-139 dB RSP 100017 Rohde & Schwarz pre-m 2 625 Generic Test Load USB Generic Test Load USB - CETECOM - 2 627 data logger OPUS 1 201.0999.9302.6.4.1.4 G. Lufft GmbH 24 M - 30.04.20 634 Spectrum Analyzer FSM (HF-Unit) 826188/010 Rohde & Schwarz pre-m 2 637 High Speed HDMI with Ethernet 1 m HDMI cable with Ethernet 1 m - KogiLink - 2 640 HDMI cable with Ethernet - Reichelt - 2 - 644 Amplifierer ZX60-2534M+ SN865701299 Mini-Circuits - - - 670 Univ. Radio Communication Tester CMU 200 106833 Rohde & Schwarz 12 M - 30.04.20 671 DC-power supply 0-5 A EA-3013S - <t< td=""><td>618</td><td>Power Splitter/Combiner</td><td>50PD-634</td><td>600994</td><td>JFW Industries USA</td><td>-</td><td>2</td><td></td></t<> | 618 | Power Splitter/Combiner | 50PD-634 | 600994 | JFW Industries USA | - | 2 | |
| 621Step Attenuator 0-139 dBRSP100017Rohde & Schwarzpre-m2625Generic Test Load USBGeneric Test Load USB-CETECOM-2627data loggerOPUS 1 $2^{01.0999.9302.6.4.1.4}_{3}$ G. Lufft GmbH24 M-30.04.20634Spectrum AnalyzerFSM (HF-Unit)826188/010Rohde & Schwarzpre-m2637High Speed HDMI with Ethernet 1mHDMI cable with Ethernet 1m-Reichelt-2638HDMI Kabel with Ethernet 1,5 m flachHDMI cable with Ethernet 1m-Reichelt-2640HDMI cable 2m rund-Reichelt-2-644AmplifiererZX60-2534M+SN865701299Mini-Circuits670Univ. Radio Communication TesterCMU 200106833Rohde & Schwarz24 M-30.05.20671DC-power supply 0-5 AEA-3013S-Elektro Automatikpre-m2-678Spectrum AnalyzerFSU 26200571Rohde & Schwarz12 M-30.04.20686Field AnalyzerEHP-200A160WX30702Narda Safety Test Solutions24 M-30.04.20688Pre AmpJS-18004000-40-8P1750117Miteqpre-m690Spectrum AnalyzerFSU100302/026Rohde&Schwarz12 M-30.05.20692Bluetooth TesterCBT 32100236Rohde & Schwarz | 619 | Power Splitter/Combiner | 50PD-634 | 600995 | JFW Industries, USA | - | 3 | |
| 625Generic Test Load USBGeneric Test Load USB-CETECOM-2627data loggerOPUS 1 $201.0999.9302.6.4.1.4$ 3G. Lufft GmbH 24 M- $30.04.20$ 634Spectrum AnalyzerFSM (HF-Unit) $826188/010$ Rohde & Schwarzpre-m2637High Speed HDMI with Ethernet 1mHDMI cable with Ethernet 1m-KogiLink-2638HDMI Kabel with Ethernet 1.5 m flachHDMI cable with Ethernet 1m-Reichelt-2640HDMI cable 2m rund-Reichelt-2-641HDMI cable 2m rund-Reichelt-2-644AmplifiererZX60-2534M+SN865701299Mini-Circuits670Univ. Radio Communication TesterCMU 200106833Rohde & Schwarz24 M- $30.05.20$ 671DC-power supply 0-5 AEA-3013S-Elektro Automatikpre-m2683Spectrum AnalyzerFSU 26200571Rohde & Schwarz12 M- $30.05.20$ 686Field AnalyzerEHP-200A160WX30702Narda Safety Test Solutions24 M- $30.05.20$ 688Pre AmpJS-1800400-40-8P1750117Miteqpre-m-690Spectrum AnalyzerFSU100302/026Rohde&Schwarz12 M- $30.05.20$ 692Bluetooth TesterCBT 32100236Rohde&Schwarz36 M- $31.03.$ | 620 | EMI Test Receiver | ESU 26 | 100362 | Rohde-Schwarz | 12 M | - | 30.05.2017 |
| | 621 | Step Attenuator 0-139 dB | RSP | 100017 | Rohde & Schwarz | pre-m | 2 | |
| 627data loggerOPUS 13G. Luff GmbH 24 M- $30.04.20$ 634 Spectrum AnalyzerFSM (HF-Unit) $826188/010$ Rohde & Schwarzpre-m2 637 High Speed HDMI with Ethernet 1mHDMI cable with Ethernet 1m-KogiLink-2 638 HDMI Kabel with Ethernet 1,5 m flachHDMI cable with Ethernet HDMI cable 2m rund-Reichelt-2 640 HDMI cable 2m rundHDMI cable 2m rund-Reichelt-2 644 AmplifiererZX60-2534M+SN865701299Mini-Circuits 670 Univ. Radio Communication TesterCMU 200106833Rohde & Schwarz24 M-30.05.20 671 DC-power supply 0-5 AEA-3013S-Elektro Automatikpre-m2 678 Power MeterNRP101638Rohde & Schwarz12 M-30.05.20 686 Field AnalyzerFSU 26200571Rohde & Schwarz12 M-30.05.20 686 Field AnalyzerEHP-200A160WX30702Narda Safety Test Solutions24 M-30.05.20 688 Pre AmpJS-18004000-40-8P1750117Miteqpre-m-30.05.20 692 Bluetooth TesterCBT 32100236Rohde & Schwarz12 M-30.05.20 692 Bluetooth TesterCBT 32100236Rohde & Schwarz36 M-31.03.20 | 625 | Generic Test Load USB | Generic Test Load USB | - | CETECOM | - | 2 | |
| 637High Speed HDMI with Ethernet 1mHDMI cable with Ethernet 1m-KogiLink-2638HDMI Kabel with Ethernet 1,5 m flachHDMI cable with Ethernet-Reichelt-2640HDMI cable 2m rundHDMI cable 2m rund-Reichelt-2641HDMI cable with EthernetCertified HDMI cable with-PureLink-2644AmplifiererZX60-2534M+SN865701299Mini-Circuits670Univ. Radio Communication TesterCMU 200106833Rohde & Schwarz24 M-30.05.20671DC-power supply 0-5 AEA-3013S-Elektro Automatikpre-m2678Power MeterNRP101638Rohde & Schwarz12 M-30.05.20683Spectrum AnalyzerFSU 26200571Rohde & Schwarz12 M-30.05.20686Field AnalyzerEHP-200A160WX30702Narda Safety Test Solutions24 M-30.05.20688Pre AmpJS-18004000-40-8P1750117Miteqpre-m690Spectrum AnalyzerFSU100302/026Rohde & Schwarz12 M-30.05.20692Bluetooth TesterCBT 32100236Rohde & Schwarz12 M-30.05.20 | 627 | data logger | OPUS 1 | | G. Lufft GmbH | 24 M | - | 30.04.2017 |
| 637 High Speed HDMI with Ethernet In Im - Kögl.link - 2 638 HDMI Kabel with Ethernet 1,5 m flach HDMI cable with Ethernet - Reichelt - 2 640 HDMI cable 2m rund HDMI cable 2m rund - Reichelt - 2 641 HDMI cable with Ethernet Certified HDMI cable with - PureLink - 2 644 Amplifierer ZX60-2534M+ SN865701299 Mini-Circuits - - 670 Univ. Radio Communication Tester CMU 200 106833 Rohde & Schwarz 24 M - 30.05.20 671 DC-power supply 0-5 A EA-3013S - Elektro Automatik pre-m 2 678 Power Meter NRP 101638 Rohde & Schwarz 12 M - 30.05.20 686 Field Analyzer FSU 26 200571 Rohde & Schwarz 12 M - 30.05.20 687 Signal Generator SMF 100A 102073 Rohde & Schwarz 12 M - 30.05.20 688 Pre Amp JS-18004000 | 634 | Spectrum Analyzer | | 826188/010 | Rohde & Schwarz | pre-m | 2 | |
| 640 HDMI cable 2m rund HDMI cable 2m rund - Reichelt - 2 641 HDMI cable with Ethernet Certified HDMI cable with - PureLink - 2 644 Amplifierer ZX60-2534M+ SN865701299 Mini-Circuits - - 670 Univ. Radio Communication Tester CMU 200 106833 Rohde & Schwarz 24 M - 30.05.20 671 DC-power supply 0-5 A EA-3013S - Elektro Automatik pre-m 2 678 Power Meter NRP 101638 Rohde & Schwarz 12 M - 30.05.20 683 Spectrum Analyzer FSU 26 200571 Rohde & Schwarz 12 M - 30.04.20 686 Field Analyzer EHP-200A 160WX30702 Narda Safety Test Solutions 24 M - 30.05.20 688 Pre Amp JS-18004000-40-8P 1750117 Miteq pre-m - 690 Spectrum Analyzer FSU 100302/026 Rohde & Schwar | 637 | High Speed HDMI with Ethernet 1m | | - | KogiLink | - | 2 | |
| 641 HDMI cable with Ethernet Certified HDMI cable with - PureLink - 2 644 Amplifierer ZX60-2534M+ SN865701299 Mini-Circuits - - 670 Univ. Radio Communication Tester CMU 200 106833 Rohde & Schwarz 24 M - 30.05.20 671 DC-power supply 0-5 A EA-3013S - Elektro Automatik pre-m 2 678 Power Meter NRP 101638 Rohde & Schwarz 12 M - 30.05.20 683 Spectrum Analyzer FSU 26 200571 Rohde & Schwarz 12 M - 30.05.20 686 Field Analyzer EHP-200A 160WX30702 Narda Safety Test Solutions 24 M - 30.05.20 687 Signal Generator SMF 100A 102073 Rohde & Schwarz 12 M - 30.05.20 688 Pre Amp JS-18004000-40-8P 1750117 Miteq pre-m - 690 Spectrum Analyzer FSU 100302/026 Rohde & Schwarz 12 M - 30.05.20 692 | 638 | HDMI Kabel with Ethernet 1,5 m flach | HDMI cable with Ethernet | - | Reichelt | - | 2 | |
| 644 Amplifierer ZX60-2534M+ SN865701299 Mini-Circuits - - 670 Univ. Radio Communication Tester CMU 200 106833 Rohde & Schwarz 24 M - 30.05.20 671 DC-power supply 0-5 A EA-3013S - Elektro Automatik pre-m 2 678 Power Meter NRP 101638 Rohde & Schwarz pre-m - 683 Spectrum Analyzer FSU 26 200571 Rohde & Schwarz 12 M - 30.05.20 686 Field Analyzer EHP-200A 160WX30702 Narda Safety Test Solutions 24 M - 30.05.20 687 Signal Generator SMF 100A 102073 Rohde & Schwarz 12 M - 30.05.20 688 Pre Amp JS-18004000-40-8P 1750117 Miteq pre-m - 690 Spectrum Analyzer FSU 100302/026 Rohde & Schwarz 12 M - 30.05.20 692 Bluetooth Tester CBT 32 100236 Rohde & Schwarz 36 M - 31.03.20 | 640 | HDMI cable 2m rund | HDMI cable 2m rund | - | Reichelt | - | 2 | |
| 644 Amplifierer ZX60-2534M+ SN865701299 Mini-Circuits - - 670 Univ. Radio Communication Tester CMU 200 106833 Rohde & Schwarz 24 M - 30.05.20 671 DC-power supply 0-5 A EA-3013S - Elektro Automatik pre-m 2 678 Power Meter NRP 101638 Rohde & Schwarz pre-m - 683 Spectrum Analyzer FSU 26 200571 Rohde & Schwarz 12 M - 30.05.20 686 Field Analyzer EHP-200A 160WX30702 Narda Safety Test Solutions 24 M - 30.05.20 687 Signal Generator SMF 100A 102073 Rohde & Schwarz 12 M - 30.05.20 688 Pre Amp JS-18004000-40-8P 1750117 Miteq pre-m - 690 Spectrum Analyzer FSU 100302/026 Rohde & Schwarz 12 M - 30.05.20 692 Bluetooth Tester CBT 32 100236 Rohde & Schwarz 36 M - 31.03.20 | 641 | HDMI cable with Ethernet | Certified HDMI cable with | - | PureLink | - | 2 | |
| 670 Univ. Radio Communication Tester CMU 200 106833 Rohde & Schwarz 24 M - 30.05.20 671 DC-power supply 0-5 A EA-3013S - Elektro Automatik pre-m 2 678 Power Meter NRP 101638 Rohde & Schwarz pre-m - 683 Spectrum Analyzer FSU 26 200571 Rohde & Schwarz 12 M - 30.05.20 686 Field Analyzer EHP-200A 160WX30702 Narda Safety Test Solutions 24 M - 30.05.20 687 Signal Generator SMF 100A 102073 Rohde & Schwarz 12 M - 30.05.20 688 Pre Amp JS-18004000-40-8P 1750117 Miteq pre-m - 690 Spectrum Analyzer FSU 100302/026 Rohde & Schwarz 12 M - 30.05.20 692 Bluetooth Tester CBT 32 100236 Rohde & Schwarz 36 M - 31.03.20 | | | | SN865701299 | | - | - | |
| 671 DC-power supply 0-5 A EA-3013S - Elektro Automatik pre-m 2 678 Power Meter NRP 101638 Rohde&Schwarz pre-m - 683 Spectrum Analyzer FSU 26 200571 Rohde & Schwarz 12 M - 30.05.20 686 Field Analyzer EHP-200A 160WX30702 Narda Safety Test Solutions 24 M - 30.04.20 687 Signal Generator SMF 100A 102073 Rohde&Schwarz 12 M - 30.05.20 688 Pre Amp JS-18004000-40-8P 1750117 Miteq pre-m - 690 Spectrum Analyzer FSU 100302/026 Rohde&Schwarz 12 M - 30.05.20 692 Bluetooth Tester CBT 32 100236 Rohde & Schwarz 36 M - 31.03.20 | - | * | | | | 24 M | - | 30.05.2018 |
| 678 Power Meter NRP 101638 Rohde&Schwarz pre-m - 683 Spectrum Analyzer FSU 26 200571 Rohde & Schwarz 12 M - 30.05.20 686 Field Analyzer EHP-200A 160WX30702 Narda Safety Test Solutions 24 M - 30.04.20 687 Signal Generator SMF 100A 102073 Rohde&Schwarz 12 M - 30.05.20 688 Pre Amp JS-18004000-40-8P 1750117 Miteq pre-m - 690 Spectrum Analyzer FSU 100302/026 Rohde&Schwarz 12 M - 30.05.20 692 Bluetooth Tester CBT 32 100236 Rohde & Schwarz 36 M - 31.03.20 | | | | - | | | 2 | |
| 683 Spectrum Analyzer FSU 26 200571 Rohde & Schwarz 12 M - 30.05.20 686 Field Analyzer EHP-200A 160WX30702 Narda Safety Test Solutions 24 M - 30.04.20 687 Signal Generator SMF 100A 102073 Rohde&Schwarz 12 M - 30.05.20 688 Pre Amp JS-18004000-40-8P 1750117 Miteq pre-m - 690 Spectrum Analyzer FSU 100302/026 Rohde&Schwarz 12 M - 30.05.20 692 Bluetooth Tester CBT 32 100236 Rohde & Schwarz 36 M - 31.03.20 | | | | 101638 | | • | - | |
| 686 Field Analyzer EHP-200A 160WX30702 Narda Safety Test Solutions 24 M - 30.04.20 687 Signal Generator SMF 100A 102073 Rohde&Schwarz 12 M - 30.05.20 688 Pre Amp JS-18004000-40-8P 1750117 Miteq pre-m - 690 Spectrum Analyzer FSU 100302/026 Rohde&Schwarz 12 M - 30.05.20 692 Bluetooth Tester CBT 32 100236 Rohde & Schwarz 36 M - 31.03.20 | _ | | | | | • | - | 30.05.2017 |
| 687 Signal Generator SMF 100A 102073 Rohde&Schwarz 12 M - 30.05.20 688 Pre Amp JS-18004000-40-8P 1750117 Miteq pre-m - 30.05.20 - - 30.05.20 - 31.03.20 - 31.03.20 - 31.03.20 - 31.03.20 - 31.03.20 <td></td> <td></td> <td></td> <td></td> <td>Narda Safety Test</td> <td></td> <td>-</td> <td>30.04.2017</td> | | | | | Narda Safety Test | | - | 30.04.2017 |
| 688 Pre Amp JS-18004000-40-8P 1750117 Miteq pre-m - 690 Spectrum Analyzer FSU 100302/026 Rohde&Schwarz 12 M - 30.05.20 692 Bluetooth Tester CBT 32 100236 Rohde & Schwarz 36 M - 31.03.20 | 687 | Signal Generator | SMF 100A | 102073 | | 12 M | - | 30.05.2017 |
| 690 Spectrum Analyzer FSU 100302/026 Rohde&Schwarz 12 M - 30.05.20 692 Bluetooth Tester CBT 32 100236 Rohde & Schwarz 36 M - 31.03.20 | - | | | | | 1 | - | |
| 692 Bluetooth Tester CBT 32 100236 Rohde & Schwarz 36 M - 31.03.20 | _ | * | | | • | - | - | 30.05.2017 |
| | | * * | | | | | - | 31.03.2017 |
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8.1.3. Legend

| Note / remarks | | Calibrated during system calibration: |
|---|--|---|
| | 1a | System CTC-SAR-EMS (RefNo. 442) |
| | 1b System-CTC-EMS-Conducted (RefNo. 335) | |
| | 1c | System CTC-FAR-EMI-RSE (RefNo . 443) |
| | 1d | System CTC-SAR-EMI (RefNo . 441) |
| | 1e | System CTC-OATS (EMI radiated) (RefNo. 337) |
| | 1 f | System CTC-CTIA-OTA (RefNo . 420) |
| | 1 g | System CTC-FAR-EMS (RefNo . 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 |
| | 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 | | Calibration every 36 months, between this every 12 months internal validation |
| Pre-m Check before starting the measurement | | Check before starting the measurement |
| | - | Without calibration |

9. Versions of test reports (change history)

| Version | Applied changes | Date of release |
|---------|-----------------|-----------------|
| | Inital release | 2016-10-12 |
| | | |
| | | |