

## FCC Part 22/24 Compliance Test Report

|                                                  |                                                                                                                                                                                                                                                                                                                      |                            |                                                                                                                                                                                    |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Report no.:                                 | FCC22&24_RM-852_03.docx                                                                                                                                                                                                                                                                                              | Date of Report:            | 13-Jun-2012                                                                                                                                                                        |
| Number of pages:                                 | 9                                                                                                                                                                                                                                                                                                                    | Customer's Contact person: | Zhang Wei                                                                                                                                                                          |
| Testing laboratory:                              | TCC Nokia Beijing Laboratory<br>Beijing Economic and Technological Development Area<br>No.5 Donghuan Zhonglu<br>Beijing<br>PRC China 100176<br>Tel. +86 10 8711 8888<br>Fax. +86 10 8711 4550                                                                                                                        | Customer:                  | Nokia Corporation<br>Beijing Economic and Technological Development Area<br>No.5 Donghuan Zhonglu<br>Beijing<br>PRC China 100176<br>Tel. +86 10 8711 8888<br>Fax. +86 10 8711 4550 |
| FCC listing no.:                                 | 975940                                                                                                                                                                                                                                                                                                               |                            |                                                                                                                                                                                    |
| IC recognition no.:                              | 661AH-1                                                                                                                                                                                                                                                                                                              |                            |                                                                                                                                                                                    |
| Tested devices/ accessories:                     | Phone RM-852 / Battery BL-4U                                                                                                                                                                                                                                                                                         |                            |                                                                                                                                                                                    |
| FCC ID:                                          | QTLRM-852                                                                                                                                                                                                                                                                                                            | IC:                        | 661AB-RM852                                                                                                                                                                        |
| Supplement reports:                              | -                                                                                                                                                                                                                                                                                                                    |                            |                                                                                                                                                                                    |
| Testing has been carried out in accordance with: | CFR 47, FCC rules Parts 22/24 , TIA-603-C-2004 and IC standards, RSS-GEN (Issue 3, December 2010), RSS-132 (Issue 2, September 2005), RSS-133 (Issue 5, February 2009). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit". |                            |                                                                                                                                                                                    |
| Documentation:                                   | The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.                                                                 |                            |                                                                                                                                                                                    |
| Test Results:                                    | <b>The EUT complies with the requirements in respect of all parameters subject to the test.</b><br>The test results relate only to devices specified in this document                                                                                                                                                |                            |                                                                                                                                                                                    |
| Date and signature for the contents:             |                                                                                                                                                                                                                                                                                                                      |                            |                                                                                                                                                                                    |

Zou Ming, Engineer, EMC

## 1. Summary for FCC Part 22/24 Compliance Test Report

|                               |                                                    |
|-------------------------------|----------------------------------------------------|
| Date of receipt               | 23-May-2012                                        |
| Testing completed             | 07-Jun-2012                                        |
| The customer's contact person | Zhang Wei                                          |
| Test Plan referred to         | T:\Projects\RM-852\TestPlan\RS_testplan_RM-852.xls |
| Notes                         | -                                                  |
| Document name                 | FCC22&24_RM-852_03.docx                            |

### 1.1. EUT and Accessory Information

The EUT is a mobile phone with following features:

GSM/Bluetooth

The EUT is tested with maximum rated TX power, modulated with pseudo random bit sequence (PRBS9).

Devices under tests

| Product | Type   | SN                                                 | HW   | MV | SW       | DUT   |
|---------|--------|----------------------------------------------------|------|----|----------|-------|
| Phone   | RM-852 | SIM1:004402/13/921604/2<br>SIM2:004402/13/921605/9 | 0202 | -  | tnd12w19 | 52588 |
| Battery | BL-4U  | 4955401233021102291;0670560                        | -    | -  | -        | 52582 |

### 1.2. Summary of Test Results

**GSM850:**

| Section in CFR 47     | Section in RSS-GEN or RSS-132 | Name of the test                           | Result |
|-----------------------|-------------------------------|--------------------------------------------|--------|
| §2.1046(a), 22.913(a) | 4.4                           | Conducted RF output power                  | NP     |
| §22.913(a)            | 4.4                           | Radiated RF output power                   | PASSED |
| §2.1049(h)            | 4.6.1                         | 99 % occupied bandwidth                    | NP     |
| §22.917(a)            | 4.5                           | Band edge compliance                       | PASSED |
| §22.917(a), §2.1051   | 4.5                           | Spurious emissions at antenna terminals    | NP     |
| §22.917(a), §2.1053   | 4.5                           | Spurious radiated emissions                | NP     |
| §2.1055(a)            | 4.3                           | Frequency stability, temperature variation | NP     |
| §2.1055(d)            | 4.3                           | Frequency stability, voltage variation     | NP     |

**GSM1900:**

| Section in CFR 47   | Section in RSS-GEN or RSS-133 | Name of the test                           | Result |
|---------------------|-------------------------------|--------------------------------------------|--------|
| §2.1046(a)          | 6.4                           | Conducted RF output power                  | NP     |
| §24.232(b)          | 6.4                           | Radiated RF output power                   | PASSED |
| §2.1049(h)          | 4.6.1                         | 99 % occupied bandwidth                    | NP     |
| §24.238(a)          | 6.5                           | Band edge compliance                       | PASSED |
| §24.238(a), §2.1051 | 6.5                           | Spurious emissions at antenna terminals    | NP     |
| §24.238(a), §2.1053 | 6.5                           | Spurious radiated emissions                | NP     |
| §2.1055(a)          | 6.3                           | Frequency stability, temperature variation | NP     |
| §2.1055(d)          | 6.3                           | Frequency stability, voltage variation     | NP     |

PASSED

FAILED

NP

The EUT complies with the essential requirements in the standard.

The EUT does not comply with the essential requirements in the standard.

The test was not performed by the TCC Nokia Laboratory.

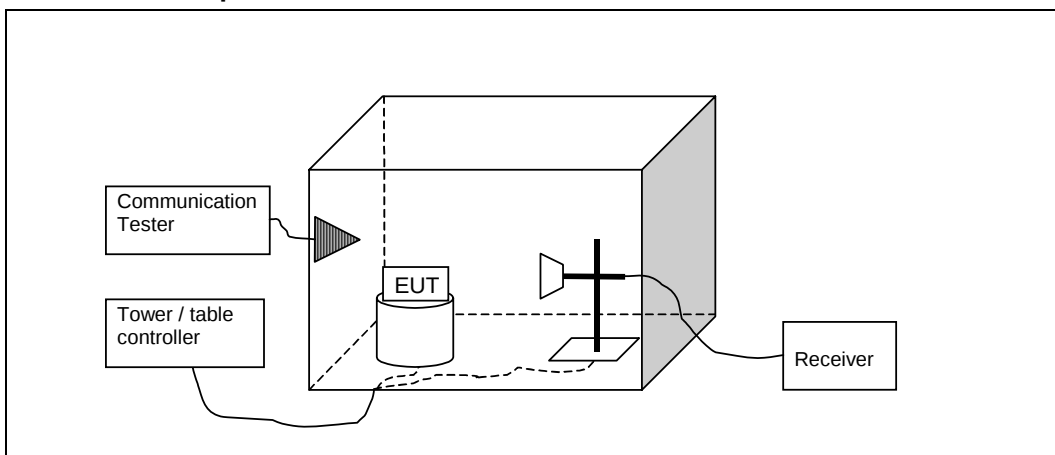
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## 2. Radiated RF output power (FCC §22.913(a), §24.232(b), RSS-132 4.4, RSS-133 6.4)

|                                                 |                                                                            |
|-------------------------------------------------|----------------------------------------------------------------------------|
| EUT with DUT number                             | RM-852, DUT 52588                                                          |
| Accessories with DUT numbers                    | BL-4U, DUT 52582                                                           |
| Operation Voltage [V] / [Hz]                    | Nominal                                                                    |
| Results                                         | PASSED                                                                     |
| Remarks                                         | Test was done in SIM1 call mode, both SIMs were installed during the test. |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 25/53/99.6                                                                 |
| Date of measurements                            | 07-Jun-2012                                                                |
| Measured by                                     | Zou Ming                                                                   |

### 2.1.1 Test Setup



### 2.2. Test method and limit

The measurement is made according to TIA-603-C-2004 as follows:

The measurement is performed in the Anechoic Chamber with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system. The turntable is rotated 360 degrees and this is repeated for both horizontal and vertical receive antenna polarizations.

The EUT is placed on a nonconductive plate at 170 cm height.

The substitution method is used. The measurement results are obtained as described below:

$$P[\text{dBm}] = P_{\text{SUBST TX}} + P_{\text{MEAS}} - P_{\text{SUBST RX}} - L_{\text{SUBST CABLES}} + G_{\text{SUBST TX ANT}}$$

Where  $P_{\text{SUBST TX}}$  is signal generator level.  $P_{\text{MEAS}}$  is measured power level from the EUT.  $P_{\text{SUBST RX}}$  is measured power level in substitute measurement.  $L_{\text{SUBST CABLE}}$  is the loss of the cable between the signal generator and the substitution antenna and  $G_{\text{SUBST TX ANT}}$  is substitution antenna gain.

Limits for radiated RF output power measurements

| Frequency range [MHz] | Limit [W] | Limit [dBm] |
|-----------------------|-----------|-------------|
| 824 - 849             | 7 ERP     | 38.5        |
| 1850 - 1910           | 2 EIRP    | 33          |

### 2.3. GSM850 TX Test results

GSM mode

| Channel /<br>f <sub>c</sub><br>[MHz] | ERP<br>[dBm] | ERP<br>[W] | P <sub>MEAS</sub><br>[dBm] | P <sub>SUBST TX</sub><br>[dBm] | P <sub>SUBST RX</sub><br>[dBm] | G <sub>SUBST TX</sub><br>ANT<br>[dBd] | L <sub>SUBST CABLE</sub><br>[dB] | Polarisation | Result |
|--------------------------------------|--------------|------------|----------------------------|--------------------------------|--------------------------------|---------------------------------------|----------------------------------|--------------|--------|
| 128 / 824.2                          | 29.14        | 0.820      | -2.9                       | +10                            | -28.18                         | -2.85                                 | 3.29                             | VERTICAL     | PASSED |
| 190 / 836.6                          | 30.04        | 1.009      | -3.77                      | +10                            | -29.97                         | -2.73                                 | 3.43                             | HORIZONTAL   | PASSED |
| 251 / 848.8                          | 30.03        | 1.007      | -3.17                      | +10                            | -29.16                         | -2.56                                 | 3.4                              | VERTICAL     | PASSED |

### 2.4. GSM1900 TX Test results

GSM mode

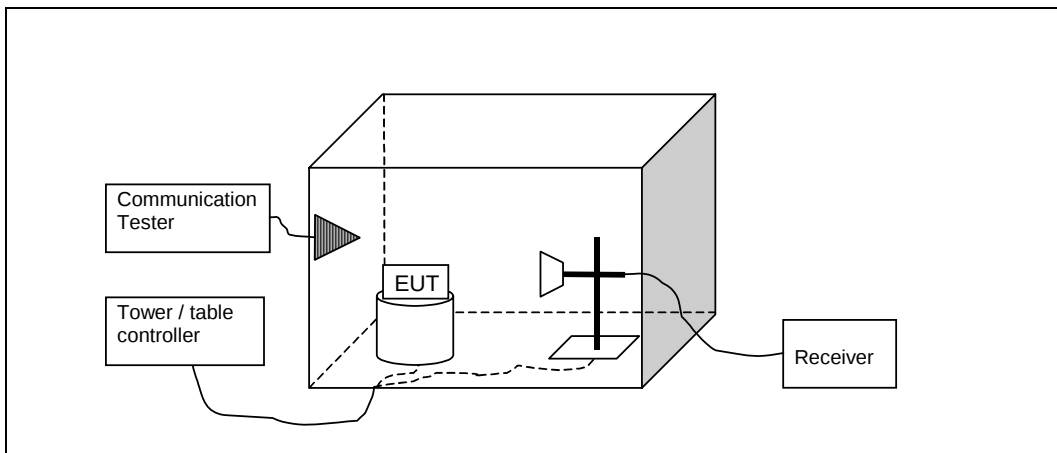
| Channel /<br>f <sub>c</sub><br>[MHz] | EIRP<br>[dBm] | EIRP<br>[W] | P <sub>MEAS</sub><br>[dBm] | P <sub>SUBST TX</sub><br>[dBm] | P <sub>SUBST RX</sub><br>[dBm] | G <sub>SUBST TX</sub><br>ANT<br>[dBi] | L <sub>SUBST CABLE</sub><br>[dB] | Polarisation | Result |
|--------------------------------------|---------------|-------------|----------------------------|--------------------------------|--------------------------------|---------------------------------------|----------------------------------|--------------|--------|
| 512 / 1850.2                         | 30.72         | 1.180       | -13.21                     | +10                            | -13.21                         | 8.14                                  | 5.04                             | VERTICAL     | PASSED |
| 661 / 1880                           | 29.3          | 0.851       | -14.76                     | +10                            | -14.76                         | 8.27                                  | 5.06                             | VERTICAL     | PASSED |
| 810 / 1909.8                         | 30.99         | 1.256       | -13.43                     | +10                            | -13.43                         | 8.43                                  | 5.11                             | VERTICAL     | PASSED |

### 3. Band edge compliance

(FCC §22.917(a), §24.238(a), RSS-132 4.5, RSS-133 6.5)

|                                                        |                                                                            |
|--------------------------------------------------------|----------------------------------------------------------------------------|
| <b>EUT with DUT number</b>                             | RM-852, DUT 52588                                                          |
| <b>Accessories with DUT numbers</b>                    | BL-4U, DUT 52582                                                           |
| <b>Operation Voltage [V] / [Hz]</b>                    | Nominal                                                                    |
| <b>Results</b>                                         | PASSED                                                                     |
| <b>Remarks</b>                                         | Test was done in SIM1 call mode, both SIMs were installed during the test. |
| <b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b> | 25/53/99.6                                                                 |
| <b>Date of measurements</b>                            | 07-Jun-2012                                                                |
| <b>Measured by</b>                                     | Zou Ming                                                                   |

#### 3.1.1 Test Setup



#### 3.2. Test method and limit

The measurement is made according to FCC rules parts 22, 24 and IC standards , RSS-132, RSS-133.

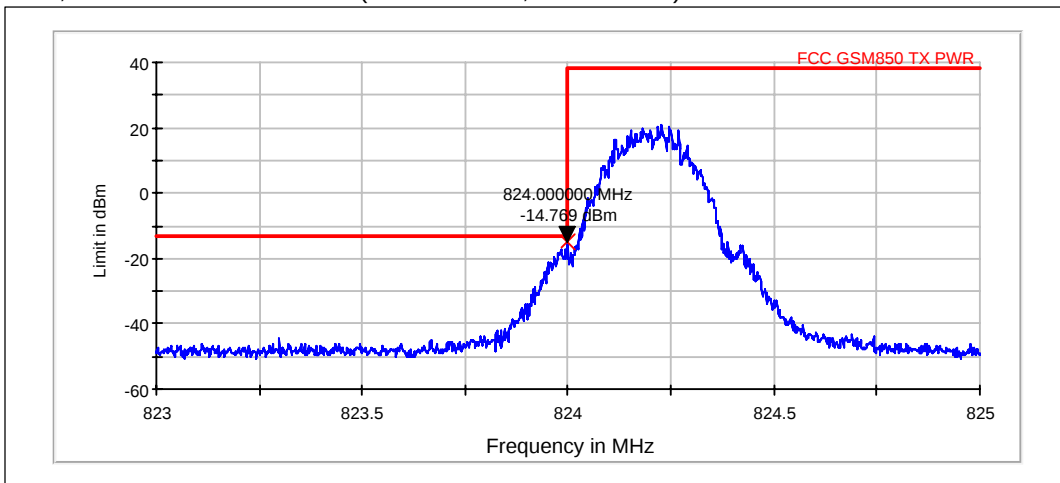
Limits for band edge compliance measurements

| Operation band        | Frequency range [MHz]     | Limit [dBm] |
|-----------------------|---------------------------|-------------|
| GSM 850 / WCDMA 850   | Below 824 and above 849   | -13         |
| GSM 1900 / WCDMA 1900 | Below 1850 and above 1910 | -13         |

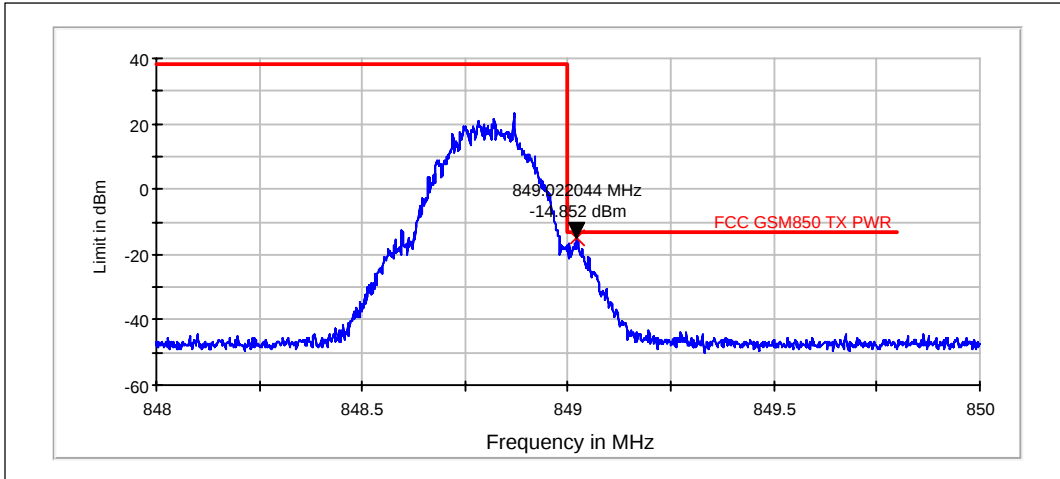
### 3.3. GSM850 Test results

| Operation mode (TX on) | Channel / $f_c$ [MHz] | Level [dBm] | Result |
|------------------------|-----------------------|-------------|--------|
| GSM                    | 128 / 824.2           | -14.77      | PASSED |
| GSM                    | 251 / 848.8           | -14.85      | PASSED |

GSM, channel 128 / 824.2 MHz (Peak detector, RBW: 3 kHz)



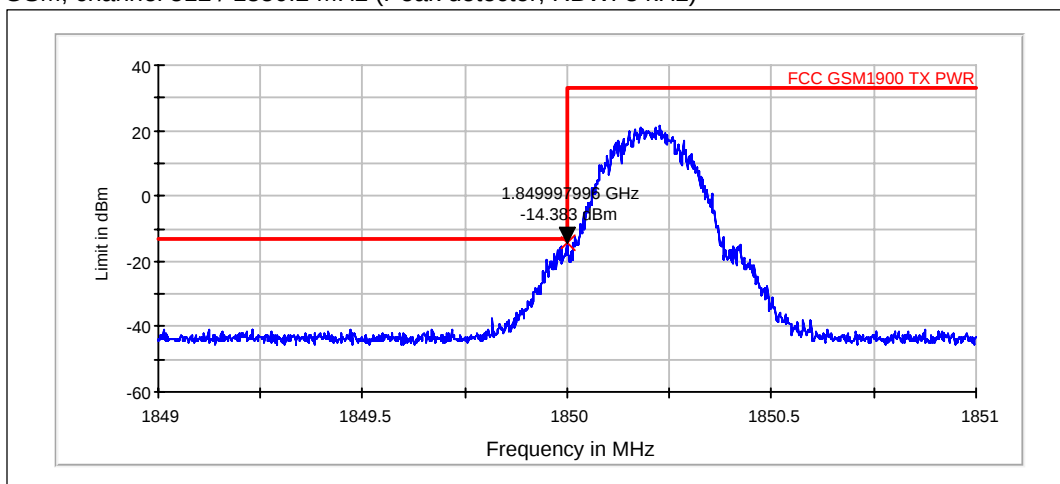
GSM, channel 251 / 848.8 MHz (Peak detector, RBW: 3 kHz)



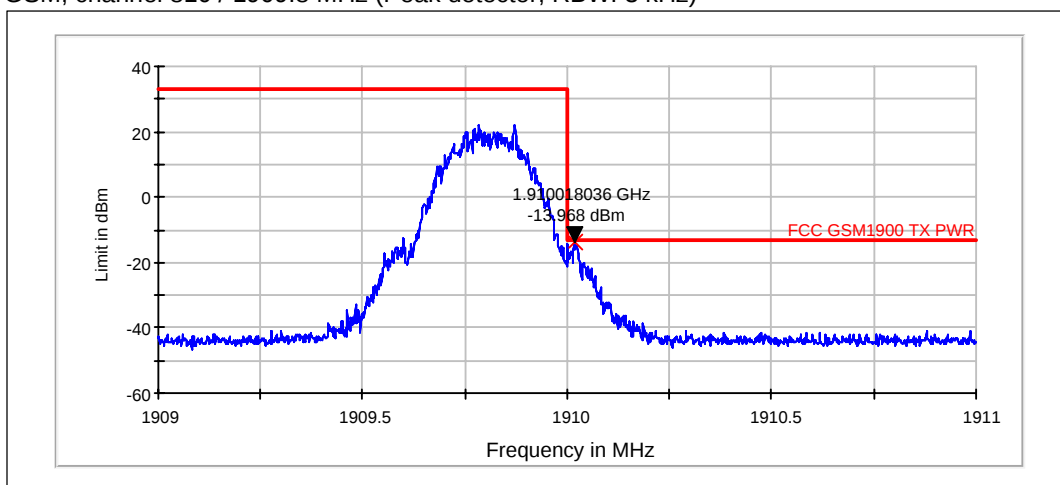
### 3.4. GSM1900 Test results

| Operation mode (TX on) | Channel / $f_c$ [MHz] | Level [dBm] | Result |
|------------------------|-----------------------|-------------|--------|
| GSM                    | 512 / 1850.2          | -14.38      | PASSED |
| GSM                    | 810 / 1909.8          | -13.97      | PASSED |

GSM, channel 512 / 1850.2 MHz (Peak detector, RBW: 3 kHz)



GSM, channel 810 / 1909.8 MHz (Peak detector, RBW: 3 kHz)



## 4. Test Equipment

### 4.1. Conducted measurements

| Eq. No     | Equipment                | Type                | Manufacturer               | Used in            |
|------------|--------------------------|---------------------|----------------------------|--------------------|
| -          | RF Emission Software     | EMC32 Test Software | R&S                        | 22/24/27, 15C, 15B |
| BJPCHW0020 | DC Power supply          | HP6632B             | HP                         | 22/24/27, 15C      |
| BJPCPT0040 | Receiver                 | ESCS30              | R&S                        | 15C, 15B           |
| BJPCPT0069 | LISN 50 $\mu$ H          | ESH3-Z5             | R&S                        | 15C, 15B           |
| BJPCPT0073 | Signal Generator         | SMR 20              | R&S                        | 22/24/27, 15C, 15B |
| BJPCPT0191 | Pulse Limiter            | ESH3-Z2             | R&S                        | 15C, 15B           |
| BJPCTC0017 | Communication Tester     | CMU200              | R&S                        | 22/24/27, 15C, 15B |
| BJPCTC0067 | Bluetooth Tester         | CBT                 | R&S                        | 22/24/27, 15C      |
| BJPCTC0089 | Temperature Test chamber | VT4002              | Votsch<br>industrietechnik | 22/24/27, 15C      |
| BJPCTC0090 | FSP spectrum analyzer    | FSP30               | R&S                        | 22/24/27, 15C      |
| BJPCTC0094 | GPIO-RS232 convertor     | GPIO-RS232          | NI                         | 22/24/27, 15C      |
| BJPCTC0112 | Power Splitter           | 11667B              | Agilent                    | 22/24/27, 15C      |
| BJPCTC0114 | Signal Generator         | E8257C              | Agilent                    | 22/24/27, 15C      |
| BJPCTC0115 | Communication Tester     | CMU200              | R&S                        | 22/24/27, 15B, 15C |

### 4.2. Radiated measurements

| Eq. No     | Equipment               | Type                              | Manufacturer       | Used in            |
|------------|-------------------------|-----------------------------------|--------------------|--------------------|
| -          | BT / WLAN Antenna       | SPA 2400/75/9/0/V                 | Huber-Suhner       | 15C, 15B           |
| -          | BT / WLAN Antenna       | SPA 2400/75/9/0/V                 | Huber-Suhner       | 15C, 15B           |
| -          | RF Emission Software    | EMC32 Test Software               | R&S                | 22/24/27, 15C, 15B |
| BJPCPT0072 | Receiver                | ESI B26                           | R&S                | 22/24/27, 15C, 15B |
| BJPCPT0130 | Relay Switch Unit       | TS-RSP                            | R&S                | 22/24/27, 15C, 15B |
| BJPCPT0150 | High Pass Filter        | WHKS1200-10SS                     | Wainwright         | 22/24/27, 15C, 15B |
| BJPCPT0151 | Band Reject Filter      | WRCD1880/2000-0.2/40-5SSK         | Wainwright         | 24, 15B            |
| BJPCPT0154 | Band Reject Filter      | WRCT2402/2480-2400/2483.5-30-20SS | Wainwright         | 15C, 15B           |
| BJPCPT0162 | Antenna                 | HF906                             | R&S                | 22/24/27, 15C, 15B |
| BJPCTC0007 | Antenna                 | HL562                             | R&S                | 22/24/27, 15C, 15B |
| BJPCTC0029 | Antenna                 | HF906                             | R&S                | 22/24/27, 15C, 15B |
| BJPCTC0034 | Band Reject Filter      | WRCT 800/880-0.2/40-5SSK          | Wainwright         | 22, 15B            |
| BJPCTC0049 | Preamplifier            | Blma 0118-1A-Bt                   | Bonn               | 22/24/27, 15C, 15B |
| BJPCTC0055 | Communication Tester    | CMU200                            | R&S                | 22/24/27, 15C, 15B |
| BJPCTC0058 | Bluetooth Tester        | CBT                               | R&S                | 15C, 15B           |
| BJPCTC0064 | Band Reject Filter      | WRCG1877/1883-1870/1890-40/6SS    | Wainwright         | 24, 15B            |
| BJPCTC0065 | Band Reject Filter      | WRCG832/838-825/845-40/5SS        | Wainwright         | 27, 15B            |
| BJPCTC0071 | Multi-Device Controller | 2090                              | EMCO               | 22/24/27, 15C, 15B |
| BJPCTC0072 | Anechoic Chamber        | 3 m Semi / Full Anechoic Chamber  | ETS                | 22/24/27, 15C, 15B |
| BJPCTC0073 | MAST                    | Model-TR/POL                      | ETS                | 22/24/27, 15C, 15B |
| BJPCTC0074 | MAST                    | Model 2070-2                      | ETS                | 22/24/27, 15C, 15B |
| BJPCTC0075 | Turntable               | Model 2188                        | ETS-EMCO           | 22/24/27, 15C, 15B |
| BJPCTC0096 | Preamplifier            | AFS4-00100300-20-23P-6            | Miteq              | 22/24/27, 15C, 15B |
| BJPCTC0113 | Receiver                | ESI B26                           | R&S                | 22/24/27, 15B, 15C |
| BJPCTC0115 | Communication Tester    | CMU200                            | R&S                | 22/24/27, 15B, 15C |
| BJPCTC0124 | Attenuator              | SA18N200W-40                      | Fairview Microwave | -                  |