

## FCC Part 15C Compliance Test Report

|                                                         |                                                                                                                                                                                                                                                      |                                   |                                                                                                                                            |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test Report no.:</b>                                 | Salo_FCC_0639_05.doc                                                                                                                                                                                                                                 | <b>Date of Report:</b>            | 27.09.2006                                                                                                                                 |
| <b>Number of pages:</b>                                 | 11                                                                                                                                                                                                                                                   | <b>Customer's Contact person:</b> | Sonja Perälä                                                                                                                               |
| <b>Testing laboratory:</b>                              | TCC Nokia Salo Laboratory<br>P.O. Box 86<br>Joensuunkatu 7H / Kiila 1B<br>FIN-24101 SALO, FINLAND<br>Tel. +358 (0) 7180 08000<br>Fax. +358 (0) 7180 45220                                                                                            | <b>Customer:</b>                  | Nokia Corporation<br>P.O. Box 50<br>Elektroniikkatie 10<br>FIN-90571 OULU, FINLAND<br>Tel. +358 (0) 7180 08000<br>Fax. +358 (0) 7180 47222 |
| <b>FCC listing no.:</b>                                 | 533467                                                                                                                                                                                                                                               |                                   |                                                                                                                                            |
| <b>IC recognition no.:</b>                              | 5385                                                                                                                                                                                                                                                 |                                   |                                                                                                                                            |
| <b>Tested devices/ accessories:</b>                     | <b>Phone RM-198 / Battery BL-5C, Headset HS-5 and AC- Charger AC-3</b>                                                                                                                                                                               |                                   |                                                                                                                                            |
| <b>FCC ID:</b>                                          | LJPRM-198H                                                                                                                                                                                                                                           | <b>IC:</b>                        | 661E-RM198                                                                                                                                 |
| <b>Supplement reports:</b>                              | -                                                                                                                                                                                                                                                    |                                   |                                                                                                                                            |
| <b>Testing has been carried out in accordance with:</b> | CFR 47, FCC rules Part 15 Subpart C, ANSI C63.4 (2003), IC standards RSS-GEN and RSS-210. Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".               |                                   |                                                                                                                                            |
| <b>Documentation:</b>                                   | 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. |                                   |                                                                                                                                            |
| <b>Test Results:</b>                                    | <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.                                                                               |                                   |                                                                                                                                            |
| <b>Date and signature for the contents:</b>             |                                                                                                                                                                                                                                                      |                                   |                                                                                                                                            |

**Sami Lehtonen, System Manager**

## 1. Summary for FCC Part 15C Compliance Test Report

|                               |                                                         |
|-------------------------------|---------------------------------------------------------|
| Date of receipt               | 20.07.2006                                              |
| Testing completed             | 26.09.2006                                              |
| The customer's contact person | Sonja Perälä                                            |
| Test Plan referred to         | T:\Projects\RM-198\TestPlan_RS\RS_Testplan_RM-198.xls   |
| Notes                         | -                                                       |
| Document name                 | T:\Projects\RM-198\EMC\Results\FCC\Salo_FCC_0639_05.doc |

### 1.1. EUT and Accessory Information

The EUT is a quadri band (GSM850/900/1800/1900) mobile phone with GPRS, EGPRS and Bluetooth. Bluetooth is tested with maximum rated TX power.

| Product     | Type   | SN                          | HW   | MV | SW    | DUT   |
|-------------|--------|-----------------------------|------|----|-------|-------|
| Phone       | RM-198 | 004400/87/166979/0          | 1101 | -  | 03.11 | 11375 |
| Battery     | BL-5C  | 0670400363563M442121810338  | -    | -  | -     | 11188 |
| Headset     | HS-5   | -                           | -    | -  | -     | 10174 |
| AC- Charger | AC-3E  | 1103336112151306640;0675370 | -    | -  | -     | 11436 |

### 1.2. Summary of Test Results

#### Bluetooth:

| Section in CFR 47 | Section in RSS-GEN or RSS-210 | Name of the test                     | Result |
|-------------------|-------------------------------|--------------------------------------|--------|
| 15.247(b)(1)      | A8.4 (2)                      | Peak output power                    | NP     |
| 15.247(c)         | A8.5                          | Band edge compliance of RF emissions | PASSED |
| 15.247(c)         | A8.5                          | Spurious RF conducted emissions      | NP     |
| 15.247(c), 15.209 | A8.5                          | Spurious radiated emissions          | NP     |
| 15.207            | 7.2.2                         | AC powerline conducted emissions     | NP     |
| 15.247(a)(1)      | A8.1 (1)                      | 20 dB bandwidth                      | NP     |
| 15.247(a)(1)      | A8.1 (2)                      | Carrier frequency separation         | NP     |
| 15.247(a)(1)(iii) | A8.1 (4)                      | Number of hopping frequencies        | NP     |
| 15.247(a)(1)(iii) | A8.1 (4)                      | Time of occupancy                    | 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.

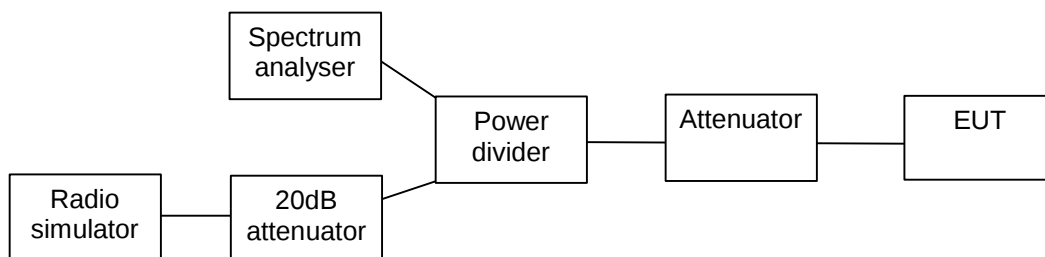
The test was not performed by the TCC Nokia Salo Laboratory.

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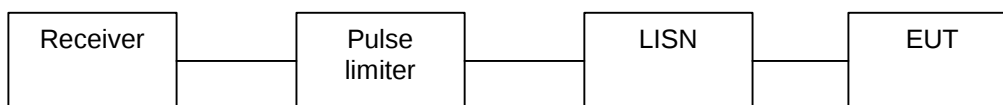
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## 2. Test setups

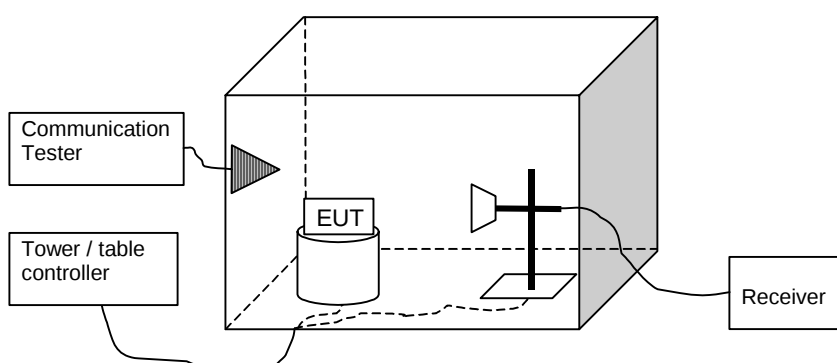
### 2.1. Conducted RF test setup



### 2.2. AC powerline conducted emissions test setup



### 2.3. Spurious radiated emissions test setup



### 3. Band edge compliance of RF emissions (FCC §15.247(c), RSS-210 A8.5)

|                                                            |                                                        |
|------------------------------------------------------------|--------------------------------------------------------|
| <b>EUT with DUT number</b>                                 | RM-198, DUT 11375                                      |
| <b>Accessories with DUT numbers</b>                        | BL-5C, DUT 11188; HS-5, DUT 10174;<br>AC-3E, DUT 11436 |
| <b>Operation Voltage [V] / [Hz]</b>                        | 115 / 60                                               |
| <b>Result</b>                                              | PASSED                                                 |
| <b>Remarks</b>                                             | Phone tested flip open mode.                           |
| <b>Temp [°C] / Humidity [%RH] /<br/>Air Pressure [kPa]</b> | 23 / 52 / 102.2                                        |
| <b>Date of measurements</b>                                | 25.09.2006 – 26.09.2006                                |
| <b>Measured by</b>                                         | Sami Lehtonen                                          |

#### 3.1. Test method and limit

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210.

Limits for band edge compliance of RF emissions measurements (3 m measurement distance)

| <b>Frequency range [MHz]</b> | <b>Limit Average [dBμV/m]</b> | <b>Limit Peak [dBμV/m]</b> |
|------------------------------|-------------------------------|----------------------------|
| Below 2390 and above 2483.5  | ≤ 54                          | ≤ 74                       |

## 3.2. Bluetooth Test results

### 3.2.1 GFSK modulation, PRBS packet type

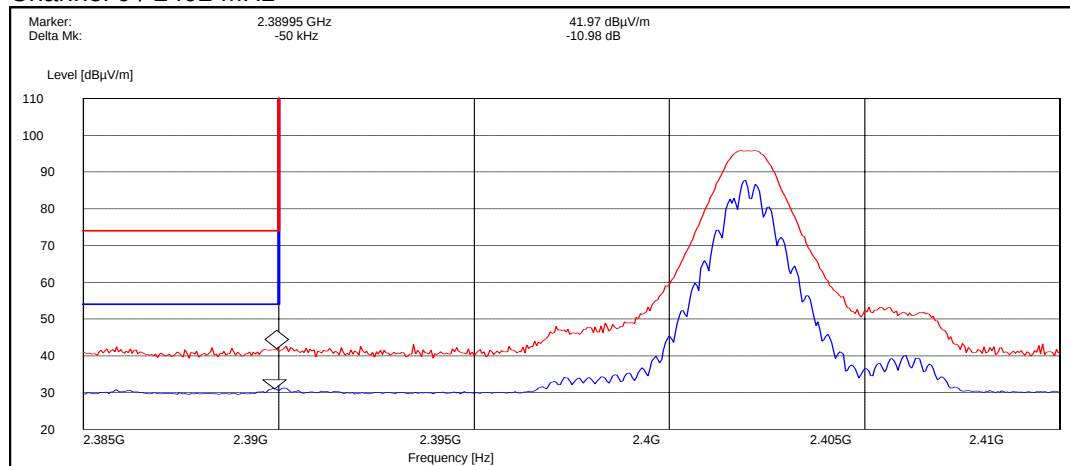
Average (RBW: 1 MHz)

| Channel / $f_c$ [MHz] | E [dB $\mu$ V/m] | Result |
|-----------------------|------------------|--------|
| 0 / 2402              | 30.99            | PASSED |
| 78 / 2480             | 39.41            | PASSED |
| Hopping on, low end   | 35.09            | PASSED |
| Hopping on, high end  | 47.51            | PASSED |

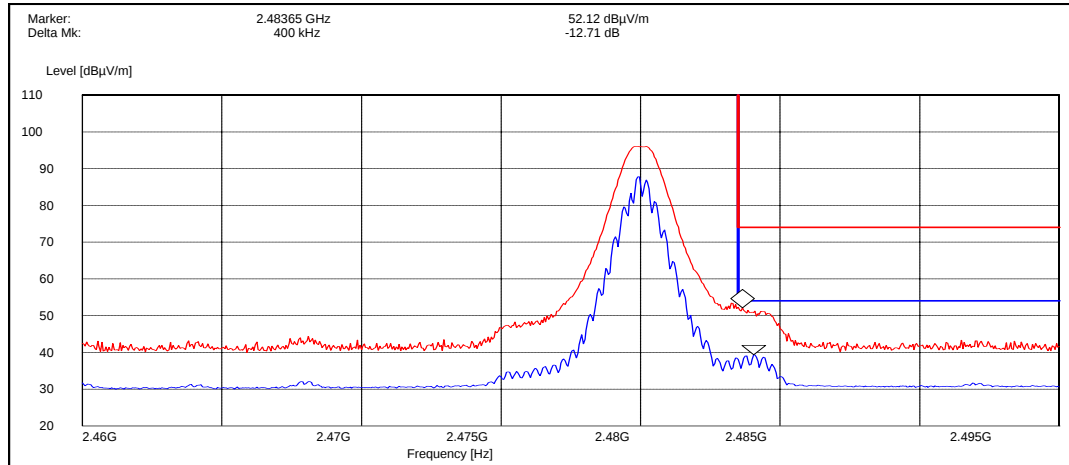
Peak (RBW: 1 MHz)

| Channel / $f_c$ [MHz] | E [dB $\mu$ V/m] | Result |
|-----------------------|------------------|--------|
| 0 / 2402              | 41.97            | PASSED |
| 78 / 2480             | 52.12            | PASSED |
| Hopping on, low end   | 46.60            | PASSED |
| Hopping on, high end  | 54.42            | PASSED |

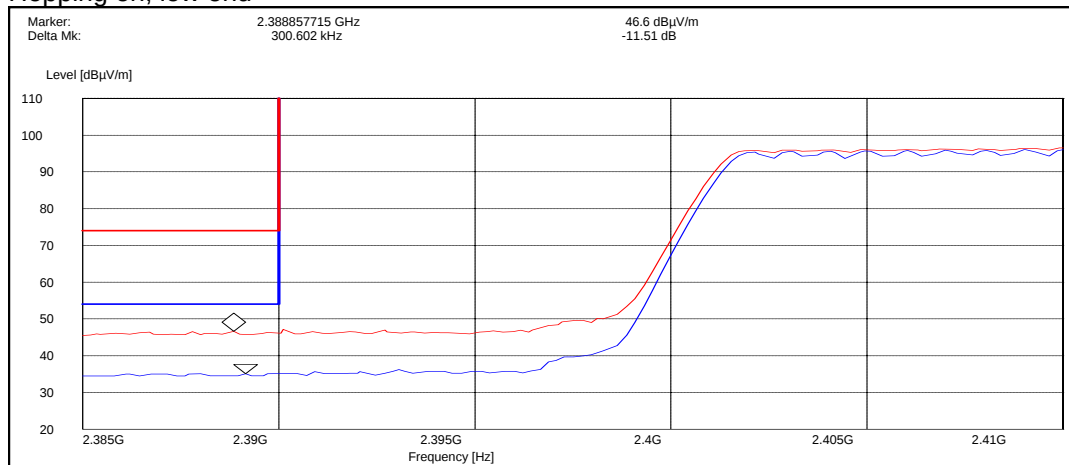
Channel 0 / 2402 MHz



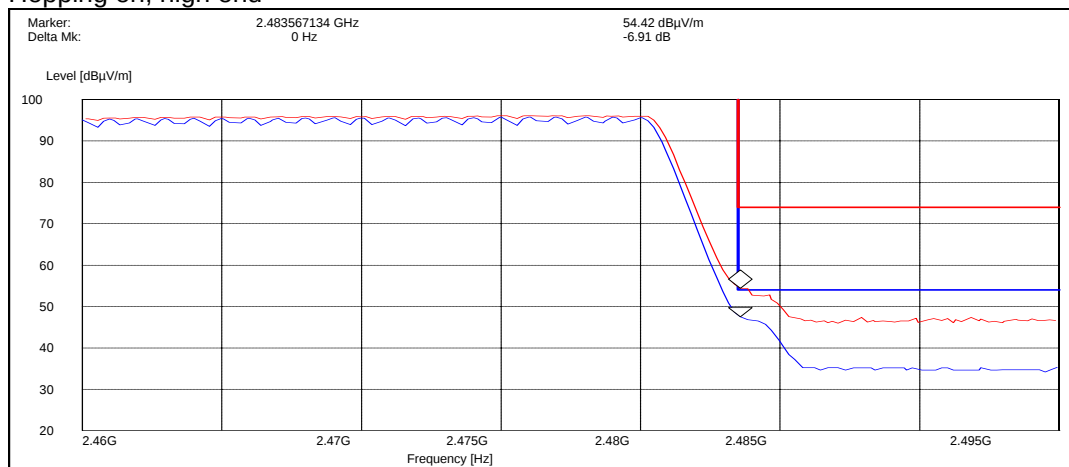
### Channel 78 / 2480 MHz



### Hopping on, low end



### Hopping on, high end



### 3.2.2 8DPSK modulation, PRBS packet type

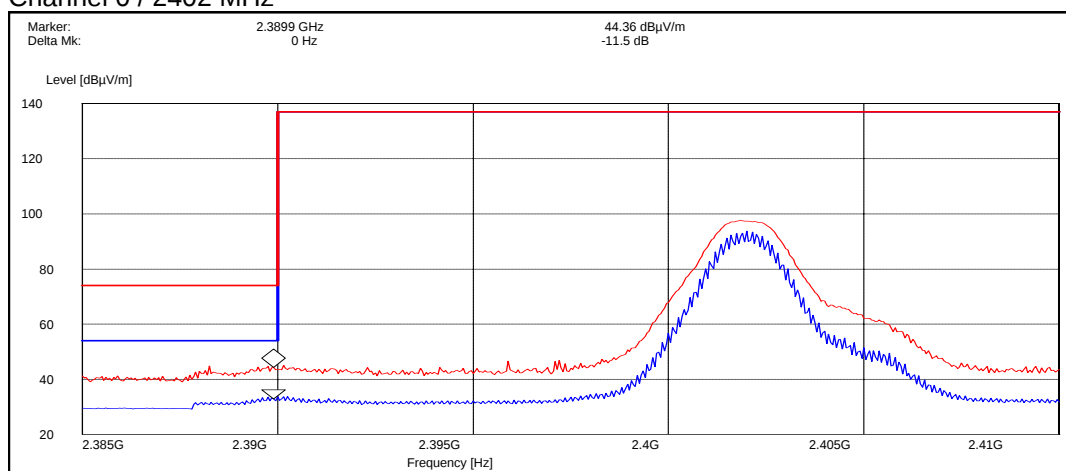
Average (RBW: 1 MHz)

| Channel / $f_c$ [MHz] | E [dB $\mu$ V/m] | Result |
|-----------------------|------------------|--------|
| 0 / 2402              | 32.86            | PASSED |
| 78 / 2480             | 40.23            | PASSED |
| Hopping on, low end   | 36.91            | PASSED |
| Hopping on, high end  | 50.90            | PASSED |

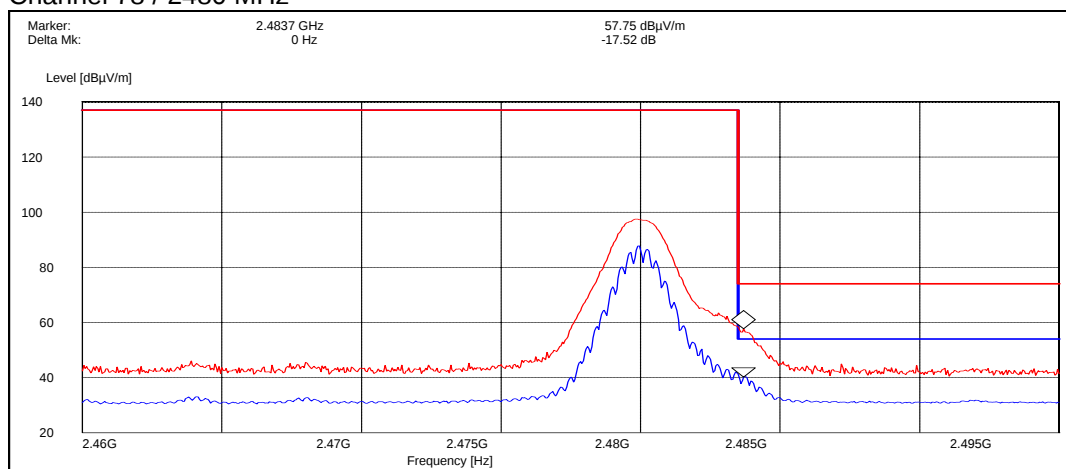
Peak (RBW: 1 MHz)

| Channel / $f_c$ [MHz] | E [dB $\mu$ V/m] | Result |
|-----------------------|------------------|--------|
| 0 / 2402              | 44.36            | PASSED |
| 78 / 2480             | 57.75            | PASSED |
| Hopping on, low end   | 48.31            | PASSED |
| Hopping on, high end  | 60.26            | PASSED |

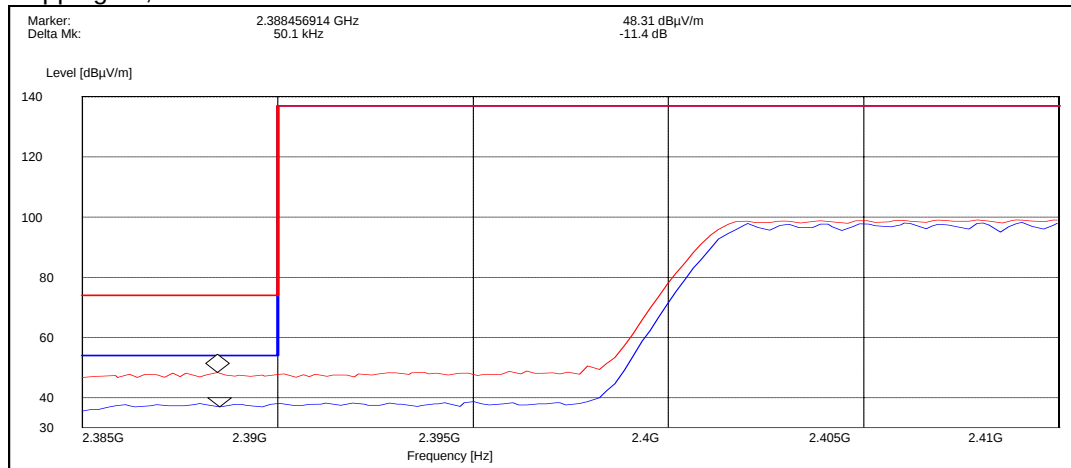
Channel 0 / 2402 MHz



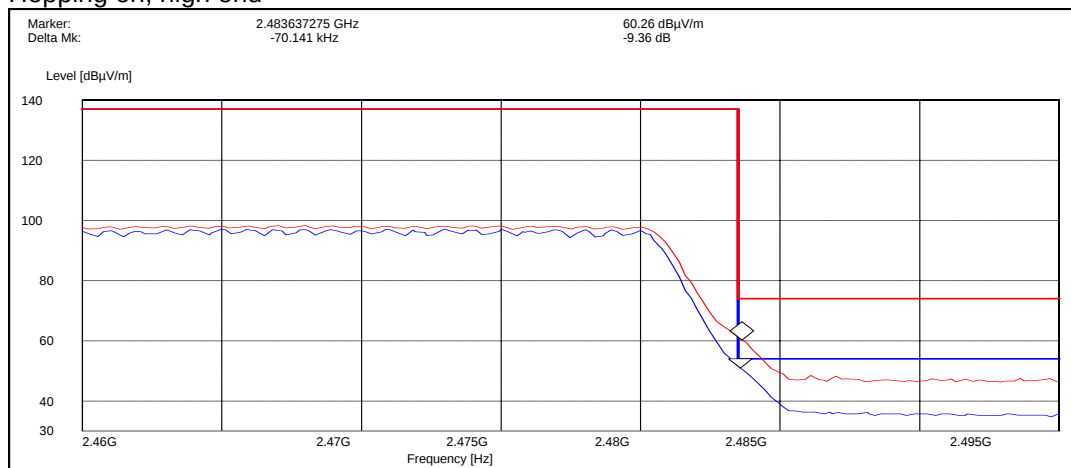
Channel 78 / 2480 MHz



### Hopping on, low end



### Hopping on, high end



## 4. Test Equipment

### 4.1. Conducted measurements

| Eq. No | Equipment                          | Type            | Manufacturer            | Used in         |
|--------|------------------------------------|-----------------|-------------------------|-----------------|
| 1742   | EMI Test Receiver                  | ESMI            | R&S                     | 15C, 15B        |
| 1759   | LISN 50 µH                         | ESH3-Z5         | R&S                     | 15C, 15B        |
| 1872   | Thermo- Hygrograph                 | 00.02520.150700 | Lambrecht               | 15C, 15B        |
| 1916   | Radio Communication tester         | CMTA84          | R&S                     | 15C, 15B        |
| 2039   | Power Supply                       | PL330QMD        | THURLBY                 | 15C, 15B        |
| 2060   | LISN 50 µH                         | ESH3-Z5         | R&S                     | 15C, 15B        |
| 2068   | CDN-Antenna line                   | S1              | NMP                     | 15C, 15B        |
| 2097   | Pulse Limiter                      | ESH3-Z2         | R&S                     | 15C, 15B        |
| 2111   | Multimeter                         | TX3             | Tektronix               | 15C, 15B        |
| 2156   | Digital Radio Communication Tester | CMU200          | R&S                     | 15C, 15B        |
| 2206   | Signal generator                   | SMX             | R&S                     | 15C, 15B        |
| 2335   | GPIB Switch 2 to 1                 | -               | National Instruments    | 15C, 15B        |
| 2347   | Digital Radio Communication Tester | CMU200          | R&S                     | 22/24, 15C, 15B |
| 2352   | Spectrum Analyzer                  | FSP             | R&S                     | 22/24, 15C      |
| 2359   | Temperature Test system            | VT4002          | Vötsch Industrietechnik | 22/24           |
| 2360   | Serial Bus Converter               | Serial 488A     | IO Tech                 | 22/24           |
| 2362   | Power Supply                       | NGPX 70/5       | R&S                     | 22/24           |
| -      | RF Emission Software               | ES-K1 v.1.60    | R&S                     | 15C, 15B        |

### 4.2. Radiated measurements

| Eq. No | Equipment                           | Type                   | Manufacturer | Used in         |
|--------|-------------------------------------|------------------------|--------------|-----------------|
| 1748   | Log. per. Antenna                   | HL025                  | R&S          | 22/24, 15C      |
| 1749   | Log. per. Antenna                   | HL025                  | R&S          | 22/24, 15C      |
| 1875   | Thermo- Hygrograph                  | 00.02520.150700        | Lambrecht    | 22/24, 15C, 15B |
| 1917   | Radio Communication tester          | CMTA84                 | R&S          | 22/24, 15C, 15B |
| 1933   | Precision half-wave dipole antennas | HZ-13                  | R&S          | 22/24, 15C      |
| 1938   | Precision half-wave dipole antennas | HZ-12                  | R&S          | 22/24, 15C      |
| 2006   | Radiation Reference Source          | VSQ                    | MEB          | 22/24, 15C, 15B |
| 2009   | Signal generator                    | SMP 22                 | R&S          | 22/24, 15C, 15B |
| 2019   | Multimeter                          | 34401A                 | HP           | 22/24, 15C, 15B |
| 2027   | Coupling and Decoupling Network     | M2 (modified) DC1      | MEB          | 22/24, 15C, 15B |
| 2028   | Coupling and Decoupling Network     | M3 (modified) DC2      | MEB          | 22/24, 15C, 15B |
| 2029   | Power Supply                        | PL330                  | THURLBY      | 22/24, 15C      |
| 2043   | Band Reject Filter                  | WRCA824/849-0,2-6SS    | Wainwright   | 22/24, 15C, 15B |
| 2047   | Band Reject Filter                  | WRCC1800/2000-0.2-10SS | Wainwright   | 22/24, 15C, 15B |
| 2051   | High Pass Filter                    | 4HC1700-1-KK           | R&S          | 22/24, 15C      |
| 2057   | Log. per. Antenna                   | HL025                  | R&S          | 22/24, 15C      |
| 2109   | Power Supply                        | PL330QMD               | THURLBY      | 22/24, 15C, 15B |

| Eq. No | Equipment                          | Type                               | Manufacturer         | Used in         |
|--------|------------------------------------|------------------------------------|----------------------|-----------------|
| 2110   | Multimeter                         | 34401A                             | HP                   | 22/24, 15C, 15B |
| 2112   | Multimeter                         | TX3                                | Tektronix            | 22/24, 15C, 15B |
| 2116   | Controller                         | EMCO MODEL 2090                    | ETS                  | 22/24, 15C, 15B |
| 2133   | Power Meter                        | NRVS                               | R&S                  | 22/24, 15C      |
| 2134   | Power Sensor                       | NRV-Z32                            | R&S                  | 22/24, 15C      |
| 2135   | Coupling and Decoupling Network    | CDN 801-M3                         | LÜTHI                | 22/24, 15C, 15B |
| 2138   | Ultra Broadband Antenna            | HL562                              | R&S                  | 22/24, 15C, 15B |
| 2140   | Biconical Antenna                  | EMCO93110B                         | EMCO                 | 22/24, 15C      |
| 2142   | Log.-per.-dipol Antenna            | 3146                               | EMCO                 | 22/24, 15C      |
| 2144   | Attenuator                         | 6803.17B                           | Huber-Suhner         | 22/24, 15C, 15B |
| 2150   | High Pass Filter                   | F-15041                            | RLC ELECTRONICS      | 22/24, 15C      |
| 2176   | Coupling and Decoupling Network    | CDN 801-M3                         | LÜTHI                | 22/24, 15C, 15B |
| 2180   | Digital Radio Communication Tester | CMU200                             | R&S                  | 22/24, 15C, 15B |
| 2188   | Preamplifier                       | AFS4-00100300-20-23P-6             | MITEQ                | 22/24, 15C, 15B |
| 2330   | EMI Test receiver                  | ESIB26                             | R&S                  | 22/24, 15C, 15B |
| 2334   | GPB Switch 2 to 1                  | -                                  | National Instruments | 22/24, 15C, 15B |
| 2348   | Yaesu controller                   | G-1000DXC                          | YAESU                | 22/24, 15C, 15B |
| 2349   | Computer controller (Yaesu)        | GS-232B                            | YAESU                | 22/24, 15C, 15B |
| 2350   | Preamplifier                       | AMF-6D-020180-29-20P               | MITEQ                | 22/24, 15C      |
| 2361   | Anechoic chamber                   | 3 meter semi/full anechoic chamber | Euroshield           | 22/24, 15C, 15B |
| 2398   | Horn antenna                       | HF906                              | R&S                  | 22/24, 15C      |
| 2363   | Band Reject Filter                 | WRCG 832/838-825/845/5SS           | Wainwright           | 22/24           |
| 2364   | Band Reject Filter                 | WRCG1877/1883 - 1870/1890-40/6SS   | Wainwright           | 22/24           |
| 2365   | Relay Switch Unit                  | TS-RSP                             | R&S                  | 22/24, 15C, 15B |
| 2366   | Relay Switch Unit                  | TS-RSP                             | R&S                  | 22/24, 15C, 15B |
| -      | RF Emission Software               | ES-K1 v.1.71                       | R&S                  | 22/24, 15C, 15B |