

## FCC Part 15C Compliance Test Report

|                                                         |                                                                                                                                                                                                                                                                                                                                      |                                   |                                                                                                                       |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Test Report no.:</b>                                 | FCC15C_RM-640_18                                                                                                                                                                                                                                                                                                                     | <b>Date of Report:</b>            | 14-July-2010                                                                                                          |
| <b>Number of pages:</b>                                 | 40                                                                                                                                                                                                                                                                                                                                   | <b>Customer's Contact person:</b> | Vivian Kill-Tollnek                                                                                                   |
| <b>Testing laboratory:</b>                              | TCC Nokia Copenhagen Laboratory<br>Frederikskaj<br>1790 COPENHAGEN V<br>DENMARK<br>Tel. +45 33 292929<br>Fax. +45 33 292934                                                                                                                                                                                                          | <b>Customer:</b>                  | Nokia Corporation<br>Lise Meitner Strasse 10<br>89081 ULM<br>GERMANY<br>Tel. +49 731 1754 0<br>Fax. +49 731 1754 6800 |
| <b>FCC listing no.:</b>                                 | 99059                                                                                                                                                                                                                                                                                                                                |                                   |                                                                                                                       |
| <b>IC recognition no.:</b>                              | 661AL-1                                                                                                                                                                                                                                                                                                                              |                                   |                                                                                                                       |
| <b>Tested devices/ accessories:</b>                     | <b>Phone RM-640 / Battery BL-5CT / Charger AC-8 / Headset WH-102</b>                                                                                                                                                                                                                                                                 |                                   |                                                                                                                       |
| <b>FCC ID:</b>                                          | PPIRM-640                                                                                                                                                                                                                                                                                                                            | <b>IC:</b>                        | 661U-RM640                                                                                                            |
| <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), Public Notice DA 00-705, DTS procedures KDB 558074, IC standards RSS-GEN (Issue 2, June 2007) and RSS-210 (Issue 7, June 2007). 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>             |                                                                                                                                                                                                                                                                                                                                      |                                   |                                                                                                                       |

Christian Andersen, System Specialist, EMC

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

|                               |                                                    |
|-------------------------------|----------------------------------------------------|
| Date of receipt               | 03-June-2010                                       |
| Testing completed             | 09-July-2010                                       |
| The customer's contact person | Vivian Kill-Tollnek                                |
| Test Plan referred to         | T:\Projects\RM-640\TestPlan\RS_testplan_RM-640.xls |
| Notes                         | None                                               |
| Document name                 | FCC15C_RM-640_18                                   |

### 1.1. EUT and Accessory Information

The EUT is a Bluetooth device. Bluetooth is tested with maximum rated TX power.

| Product | Type   | SN                          | HW   | MV | SW      | DUT   |
|---------|--------|-----------------------------|------|----|---------|-------|
| Phone   | RM-640 | 004402/13/036951/9          | 0210 | -  | re 5.04 | 24275 |
| Phone   | RM-640 | 004402/13/036968/1          | 0210 | -  | re 5.04 | 24274 |
| Battery | BL-5CT | 3820669492155081010;0670555 | -    | -  | -       | 24257 |
| Battery | BL-5CT | 3820669492155081047;0670555 | -    | -  | -       | 24263 |
| Charger | AC-8   | 4090499301040501808;0675387 | -    | -  | -       | 24255 |
| Charger | AC-8   | 4090499301040501804;0675387 | -    | -  | -       | 24250 |
| Headset | WH-102 | 06943239431A4102158         | -    | -  | -       | 24240 |
| Headset | WH-102 | 06943239431A4102160         | -    | -  | -       | 24247 |

### 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)                      | Conducted peak output power          | PASSED |
| 15.247(d)         | A8.5                          | Band edge compliance of RF emissions | PASSED |
| 15.247(d)         | A8.5                          | Spurious RF conducted emissions      | PASSED |
| 15.247(d), 15.209 | A8.5                          | Spurious radiated emissions          | PASSED |
| 15.207            | 7.2.2                         | AC powerline conducted emissions     | PASSED |
| 15.247(a)(1)      | A8.1 (a)                      | 20 dB bandwidth                      | PASSED |
| 15.247(a)(1)      | A8.1 (b)                      | Carrier frequency separation         | PASSED |
| 15.247(a)(1)(iii) | A8.1 (d)                      | Number of hopping frequencies        | PASSED |
| 15.247(a)(1)(iii) | A8.1 (d)                      | Time of occupancy                    | PASSED |

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 Copenhagen Laboratory.

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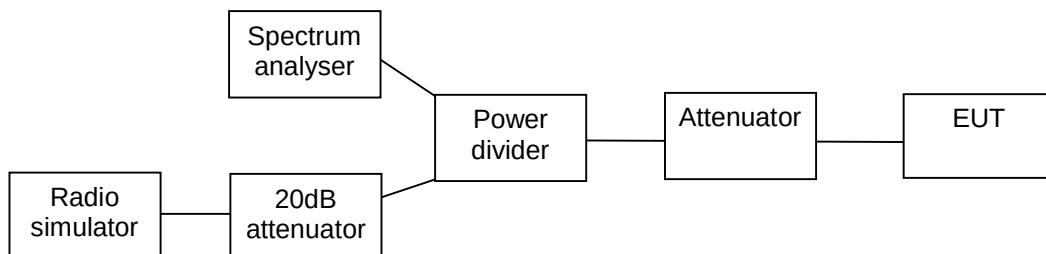
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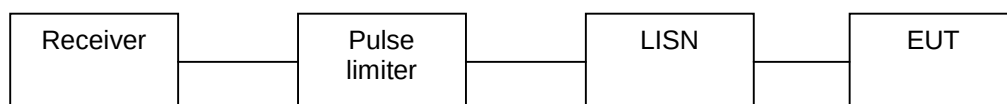
|            |                                                                           |           |
|------------|---------------------------------------------------------------------------|-----------|
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## 2. Test setups

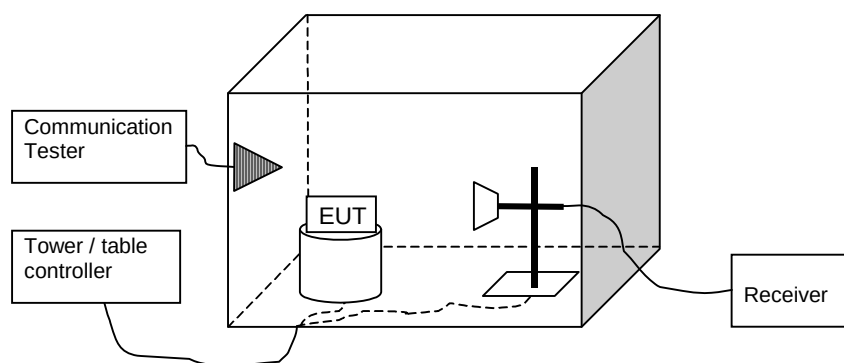
### 2.1. Conducted RF test setup



### 2.2. AC powerline conducted emissions test setup



### 2.3. Radiated test setup



### 3. Conducted peak output power (FCC §15.247(b)(1), RSS-210 A8.4 (2))

|                                                        |                                                          |
|--------------------------------------------------------|----------------------------------------------------------|
| <b>EUT with DUT number</b>                             | RM-640, DUT 24274                                        |
| <b>Accessories with DUT numbers</b>                    | BL-5CT, DUT 24263 ; AC-8E, DUT 24250 ; WH-102, DUT 24247 |
| <b>Operation Voltage [V] / [Hz]</b>                    | 115 V / 60 Hz                                            |
| <b>Result</b>                                          | PASSED                                                   |
| <b>Remarks</b>                                         | None                                                     |
| <b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b> | 23 / 44 / 1013                                           |
| <b>Date of measurements</b>                            | 28-June-2010                                             |
| <b>Measured by</b>                                     | Ruben Hansen                                             |

#### 3.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

Limits for conducted peak output power measurements

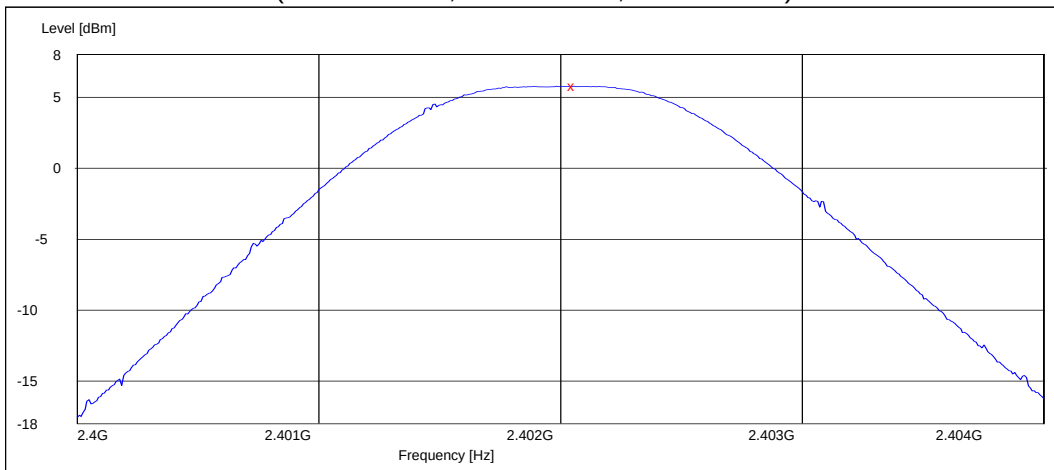
| <b>Frequency range [MHz]</b> | <b>Limit [W]</b> | <b>Limit [dBm]</b> |
|------------------------------|------------------|--------------------|
| 2400 – 2483.5                | ≤ 1              | ≤ 30               |

## 3.2. Bluetooth Test results

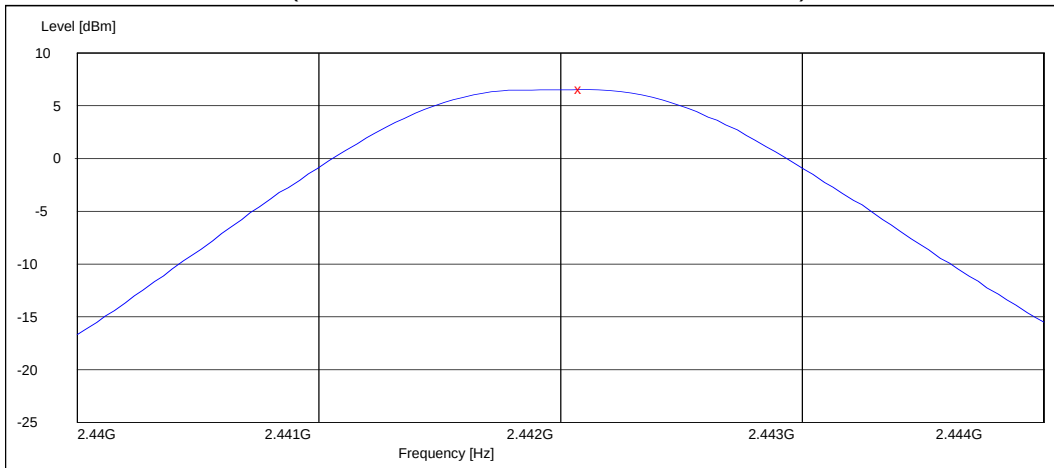
### 3.2.1 GFSK modulation, PRBS packet type

| Channel / $f_c$ [MHz] | P [dBm] | P [mW] | Result |
|-----------------------|---------|--------|--------|
| 0 / 2402              | 5.80    | 3.802  | Passed |
| 40 / 2442             | 6.60    | 4.571  | Passed |
| 78 / 2480             | 6.90    | 4.898  | Passed |

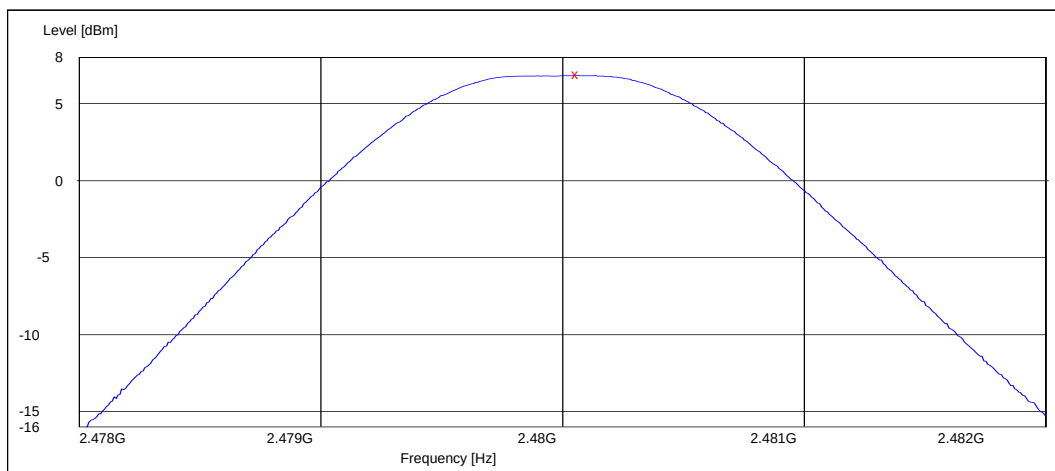
Channel 0 / 2402 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



Channel 40 / 2442 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



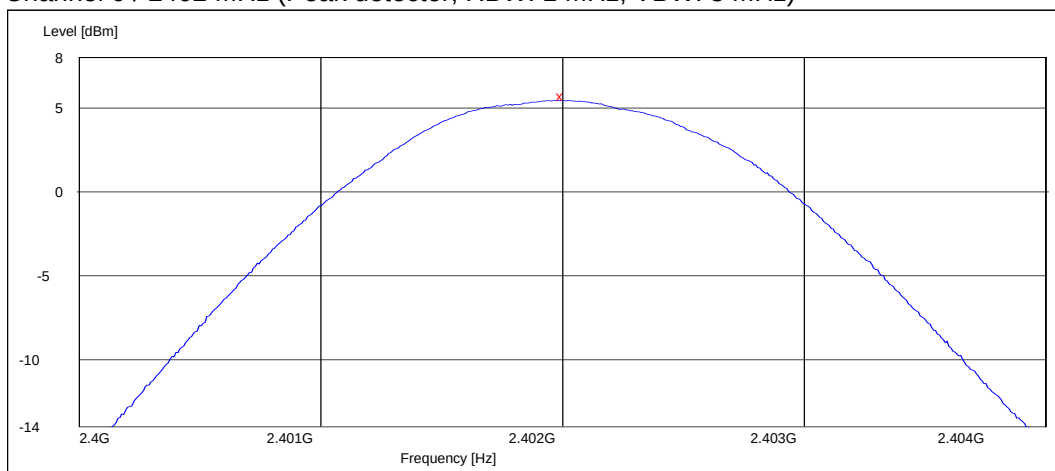
Channel 78 / 2480 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



### 3.2.2 8DPSK modulation, PRBS packet type

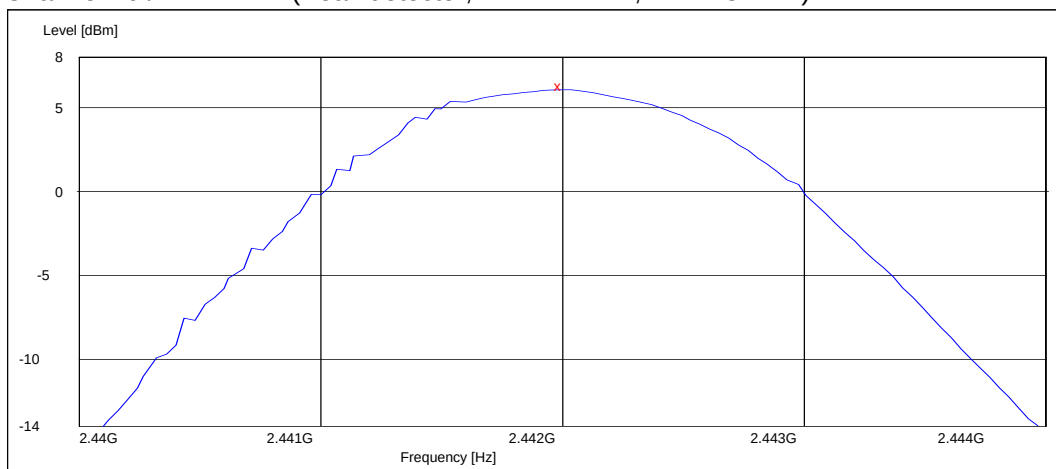
| Channel / $f_c$ [MHz] | P [dBm] | P [mW] | Result |
|-----------------------|---------|--------|--------|
| 0 / 2402              | 5.70    | 3.715  | Passed |
| 40 / 2442             | 6.30    | 4.266  | Passed |
| 78 / 2480             | 6.70    | 4.677  | Passed |

Channel 0 / 2402 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)

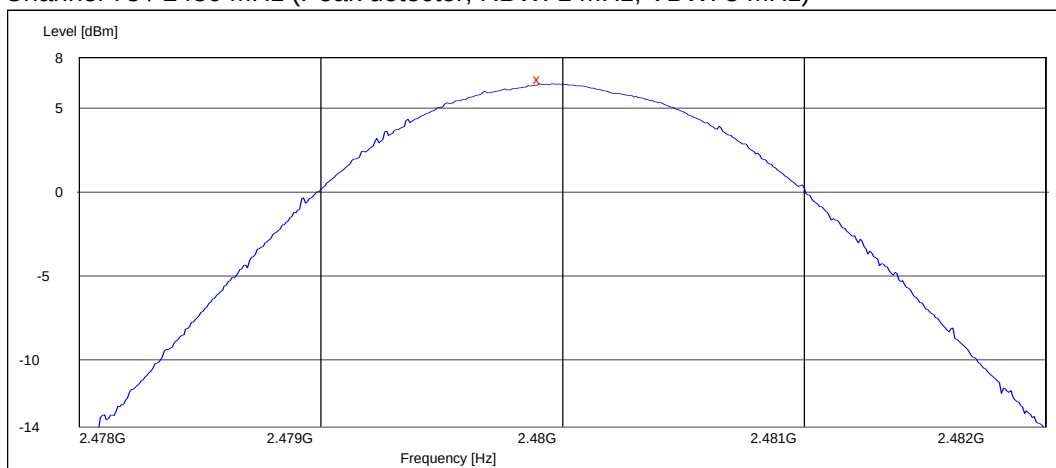




Channel 40 / 2442 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



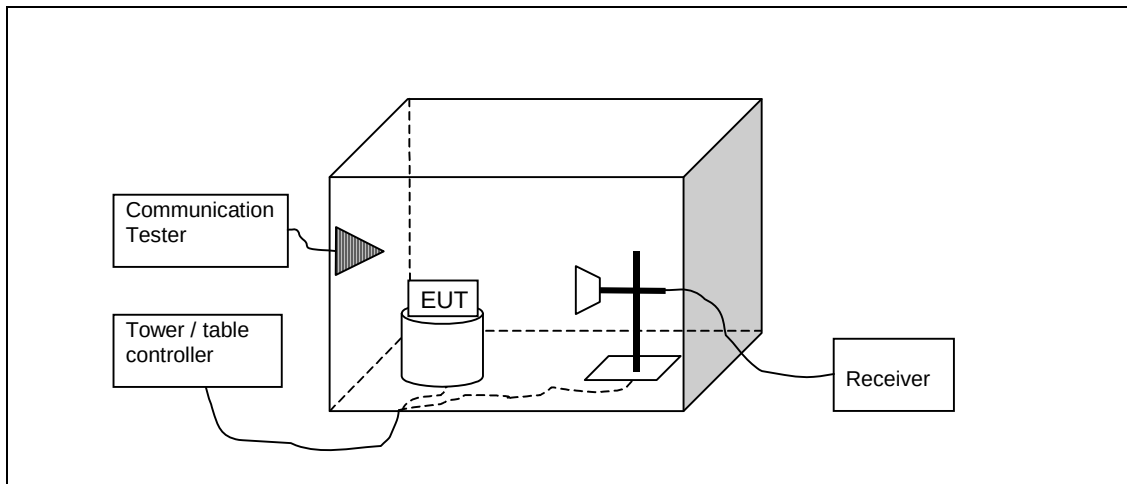
Channel 78 / 2480 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



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

|                              |                                                          |
|------------------------------|----------------------------------------------------------|
| EUT with DUT number          | RM-640, DUT 24275                                        |
| Accessories with DUT numbers | BL-5CT, DUT 24257 ; AC-8E, DUT 24255 ; WH-102, DUT 24240 |
| Operation Voltage [V] / [Hz] | 115 V / 60 Hz                                            |
| Results                      | PASSED                                                   |
| Remarks                      | None                                                     |
| Temp [°C] / Humidity [%RH] / | 23 / 45                                                  |
| Date of measurements         | 23-Jun-2010                                              |
| Measured by                  | Ruben Hansen                                             |

##### 4.1. Test Setup



##### 4.2. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

The measurement results are obtained as described below:

$$E [\mu V/m] = U_{RX} + A_{TOT}$$

Where  $U_{RX}$  is receiver reading and  $A_{TOT}$  is total correction factor including cable loss, antenna factor and preamplifier gain ( $A_{TOT} = L_{CABLES} + A_F - G_{PREAMP}$ ).

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

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

### 4.3. Bluetooth Test results

#### 4.3.1 8DPSK modulation, PRBS packet type

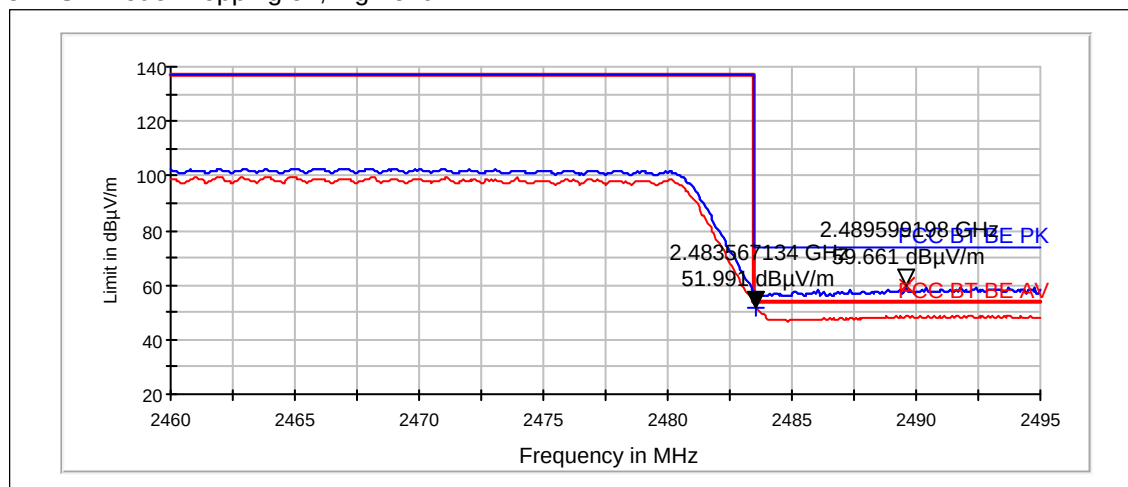
Average (RBW: 1 MHz, VBW: 1 MHz)

| Channel / $f_c$ [MHz] | E [dB $\mu$ V/m] | E [ $\mu$ V/m] | $U_{RX}$ [dB $\mu$ V] | $A_{TOT}$ [dB] | Result |
|-----------------------|------------------|----------------|-----------------------|----------------|--------|
| 0 / 2402              | 46.48            | 210.874        | 48.1                  | -1.62          | Passed |
| Hopping on, low end   | 47.41            | 234.725        | 49.03                 | -1.62          | Passed |
| 78 / 2480             | 51.72            | 385.473        | 52.96                 | -1.24          | Passed |
| Hopping on, high end  | 51.99            | 397.71         | 53.23                 | -1.24          | Passed |

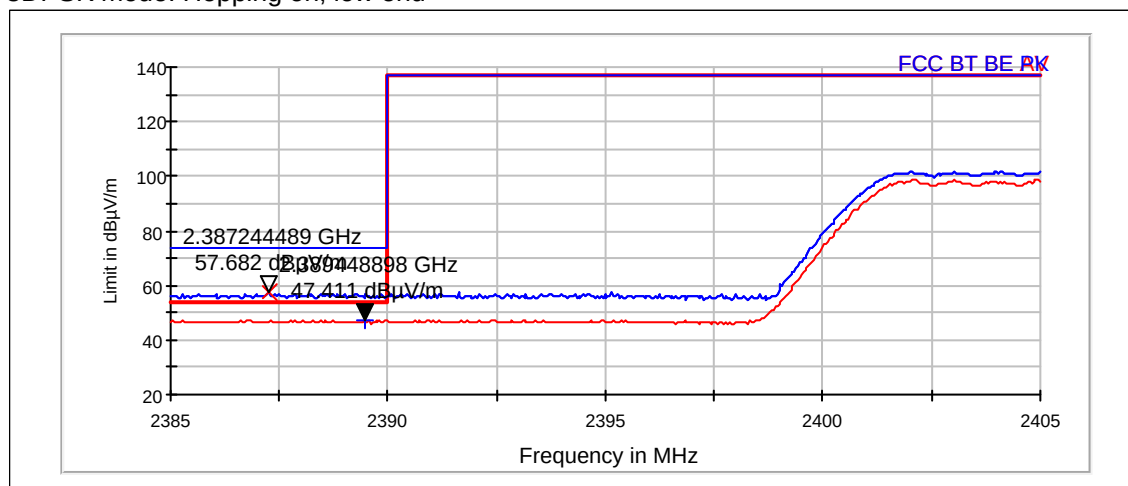
Peak (RBW: 1 MHz, VBW: 1 MHz)

| Channel / $f_c$ [MHz] | E [dB $\mu$ V/m] | E [ $\mu$ V/m] | $U_{RX}$ [dB $\mu$ V] | $A_{TOT}$ [dB] | Result |
|-----------------------|------------------|----------------|-----------------------|----------------|--------|
| 0 / 2402              | 57.75            | 771.766        | 59.37                 | -1.62          | Passed |
| Hopping on, low end   | 57.68            | 765.74         | 59.3                  | -1.62          | Passed |
| 78 / 2480             | 59.55            | 949.228        | 60.79                 | -1.24          | Passed |
| Hopping on, high end  | 59.66            | 961.73         | 60.9                  | -1.24          | Passed |

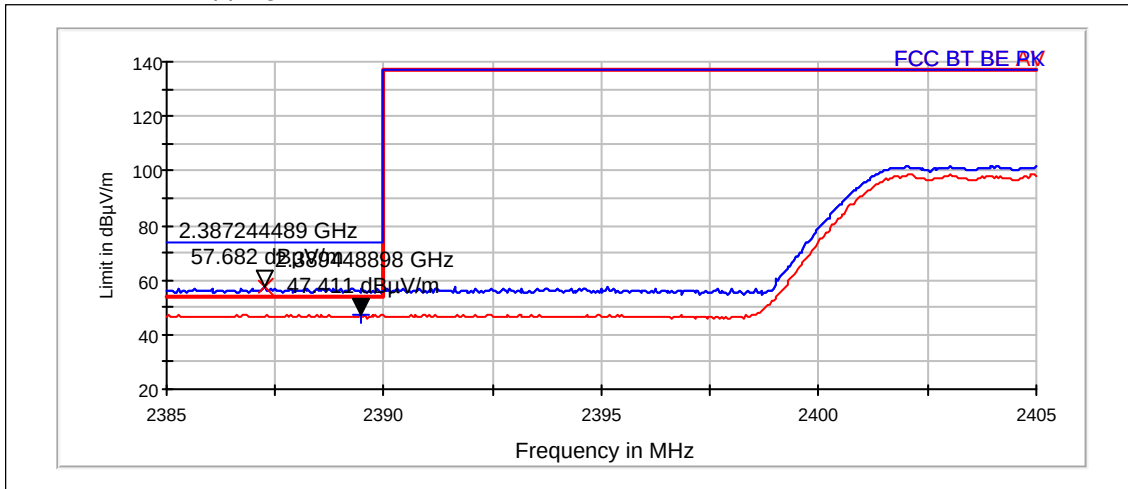
8DPSK mode. Hopping on, high end



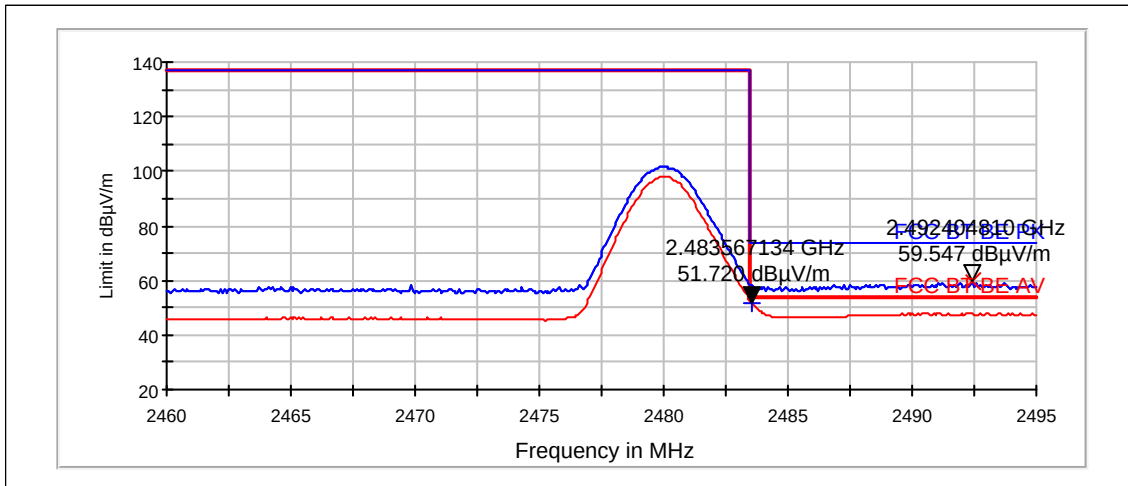
8DPSK mode. Hopping on, low end



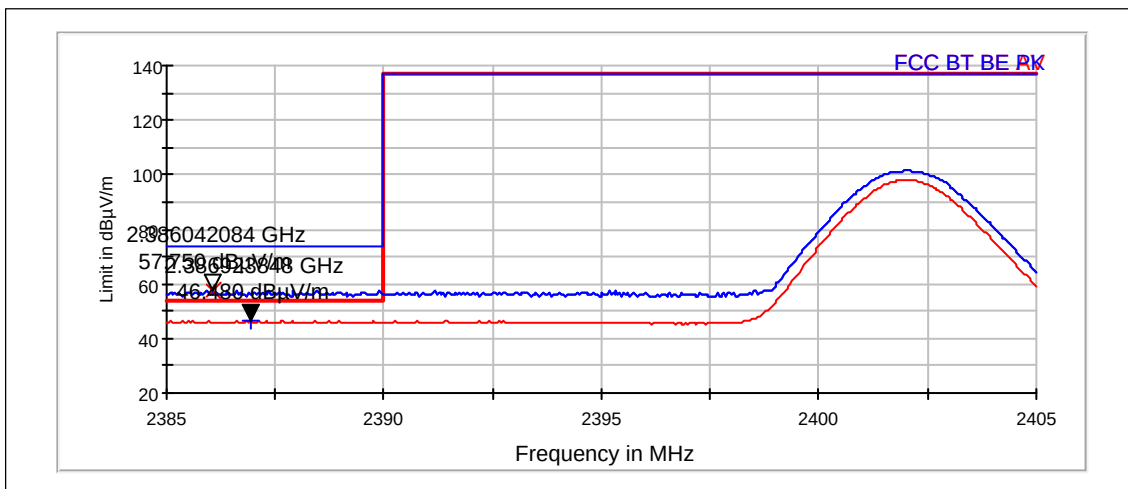
8DPSK mode. Hopping on, low end



8DPSK mode. Channel 78 / 2480 MHz



8DPSK mode. Channel 0 / 2402 MHz



#### 4.3.2 GFSK modulation, PRBS packet type

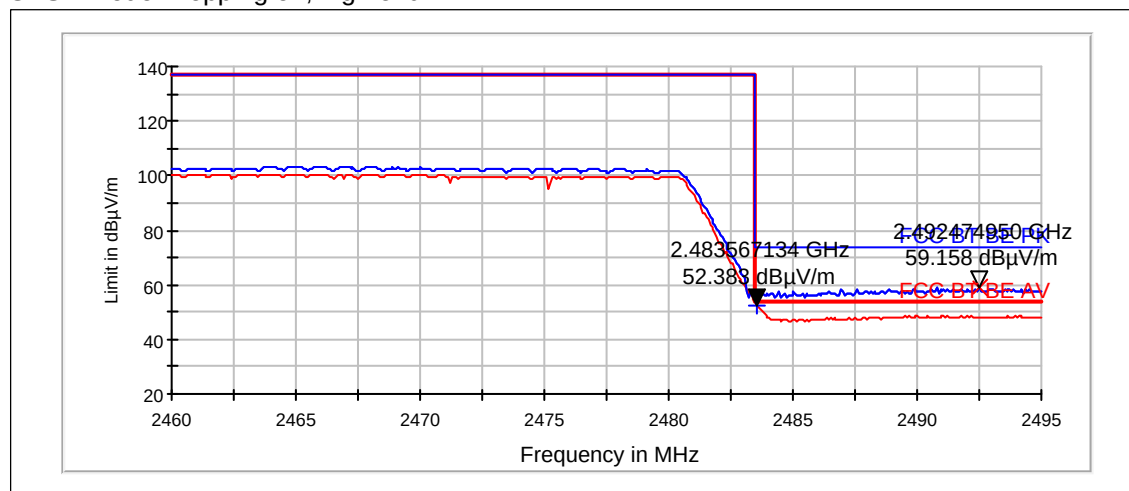
Average (RBW: 1 MHz, VBW: 1 MHz)

| Channel / $f_c$ [MHz] | E [dB $\mu$ V/m] | E [ $\mu$ V/m] | U <sub>RX</sub> [dB $\mu$ V] | A <sub>TOT</sub> [dB] | Result |
|-----------------------|------------------|----------------|------------------------------|-----------------------|--------|
| 0 / 2402              | 46.23            | 204.956        | 47.85                        | -1.62                 | Passed |
| Hopping on, low end   | 47.37            | 233.683        | 48.99                        | -1.62                 | Passed |
| 78 / 2480             | 52.09            | 402.299        | 53.33                        | -1.24                 | Passed |
| Hopping on, high end  | 52.38            | 416.066        | 53.62                        | -1.24                 | Passed |

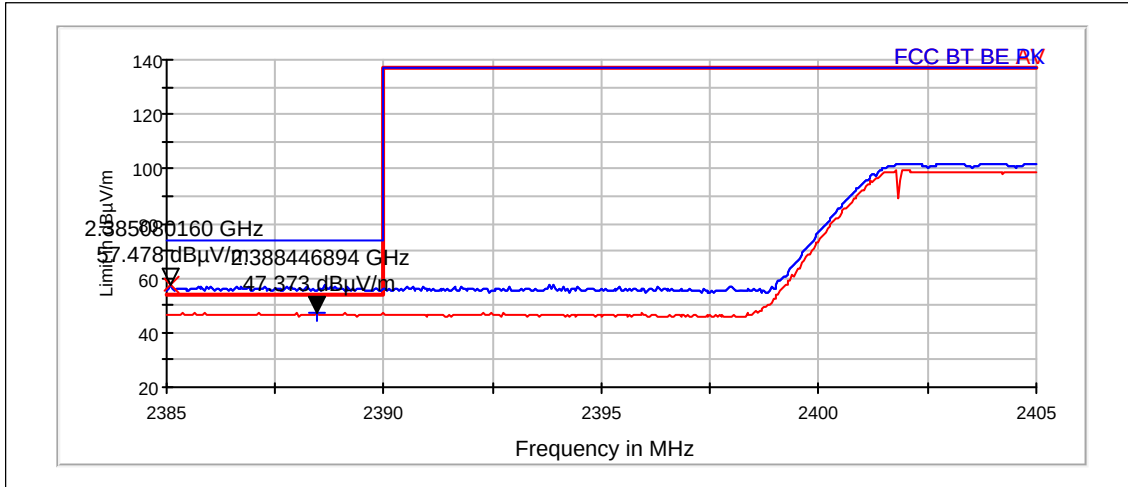
Peak (RBW: 1 MHz, VBW: 1 MHz)

| Channel / $f_c$ [MHz] | E [dB $\mu$ V/m] | E [ $\mu$ V/m] | U <sub>RX</sub> [dB $\mu$ V] | A <sub>TOT</sub> [dB] | Result |
|-----------------------|------------------|----------------|------------------------------|-----------------------|--------|
| 0 / 2402              | 57.49            | 748.849        | 59.11                        | -1.62                 | Passed |
| Hopping on, low end   | 57.48            | 747.958        | 59.1                         | -1.62                 | Passed |
| 78 / 2480             | 59.23            | 915.421        | 60.47                        | -1.24                 | Passed |
| Hopping on, high end  | 59.16            | 907.601        | 60.4                         | -1.24                 | Passed |

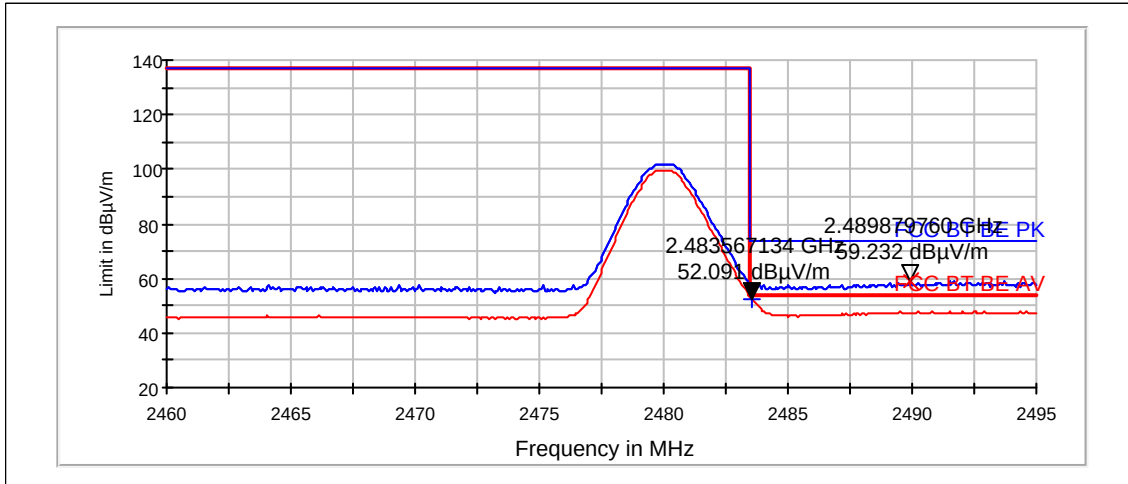
GFSK mode. Hopping on, high end



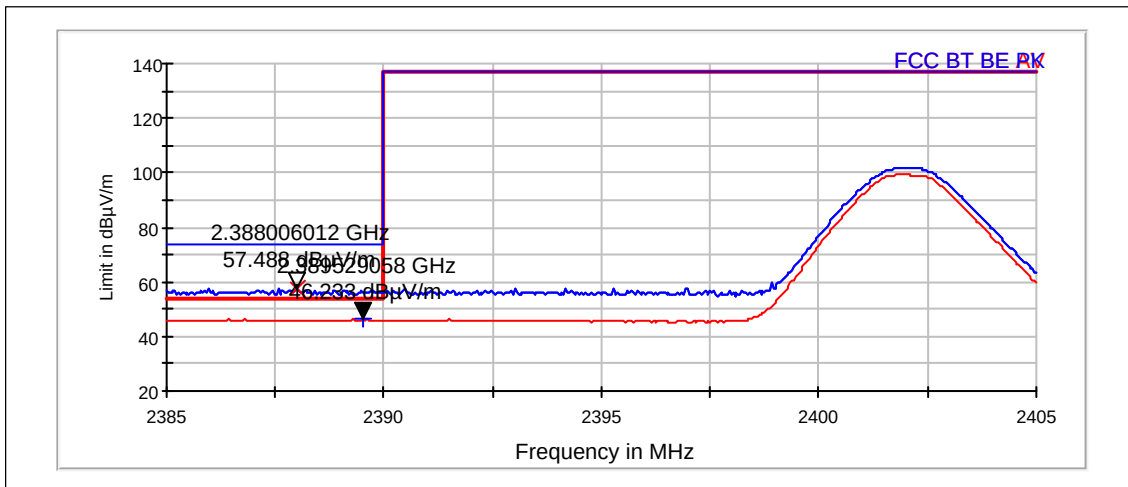
GFSK mode. Hopping on, low end



GFSK mode. Channel 78 / 2480 MHz



GFSK mode. Channel 0 / 2402 MHz



## 5. Spurious RF conducted emissions (FCC §15.247(d), RSS-A8.5)

|                                                        |                                                          |
|--------------------------------------------------------|----------------------------------------------------------|
| <b>EUT with DUT number</b>                             | RM-640, DUT 24274                                        |
| <b>Accessories with DUT numbers</b>                    | BL-5CT, DUT 24263 ; AC-8E, DUT 24250 ; WH-102, DUT 24247 |
| <b>Operation Voltage [V] / [Hz]</b>                    | 115 V / 60 Hz                                            |
| <b>Result</b>                                          | PASSED                                                   |
| <b>Remarks</b>                                         | None                                                     |
| <b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b> | 23 / 44 / 1013                                           |
| <b>Date of measurements</b>                            | 28-June-2010                                             |
| <b>Measured by</b>                                     | Ruben Hansen                                             |

### 5.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

Limits for spurious RF conducted emissions measurements

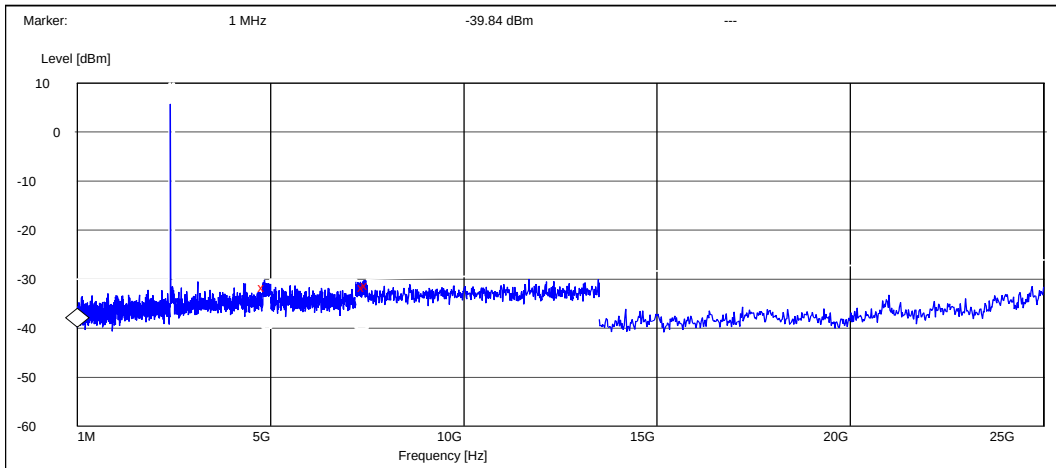
| <b>Frequency range [MHz]</b> | <b>Limit [dBc]</b> |
|------------------------------|--------------------|
| 1 – 25000                    | ≤ -20              |



## 5.2. Bluetooth Test results

### 5.2.1 GFSK modulation, PRBS packet type

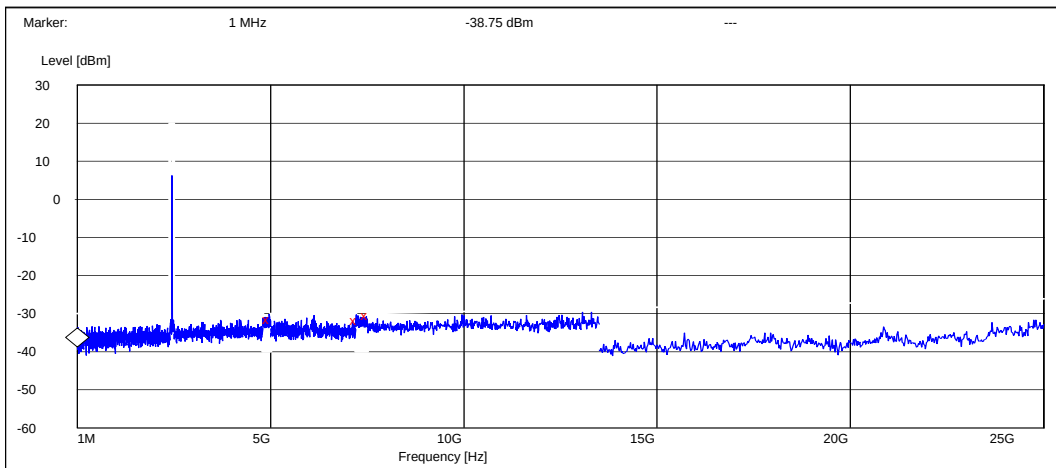
Channel 0 / 2402 MHz



Peak (RBW: 100 kHz, VBW: 100 kHz)

| Frequency [MHz] | P [dBc]    | Result |
|-----------------|------------|--------|
| 4841.200000     | -32.135964 | PASSED |
| 7428.600000     | -33.135964 | PASSED |
| 7500.000000     | -33.535964 | PASSED |

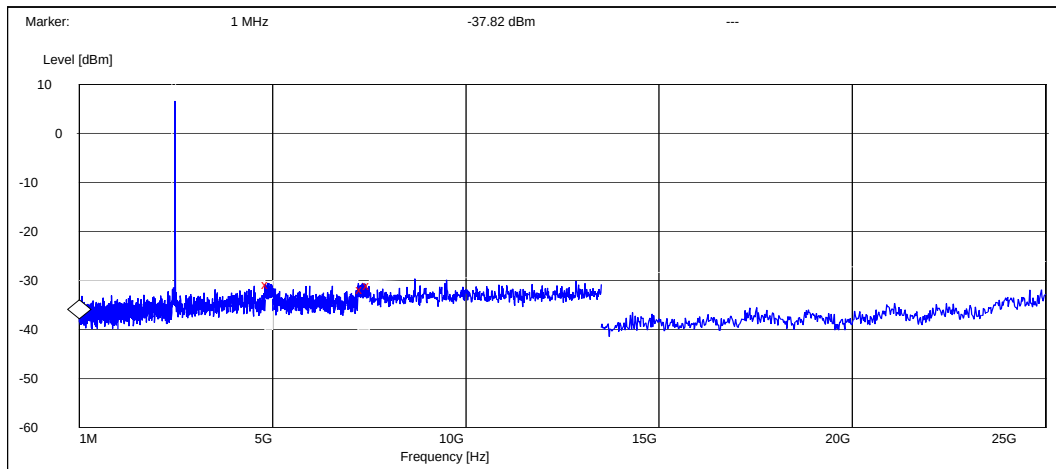
Channel 40 / 2442 MHz



Peak (RBW: 100 kHz, VBW: 100 kHz)

| Frequency [MHz] | P [dBc]    | Result |
|-----------------|------------|--------|
| 4958.000000     | -32.252174 | PASSED |
| 7223.400000     | -32.952174 | PASSED |
| 7500.000000     | -32.352174 | PASSED |

## Channel 78 / 2480 MHz

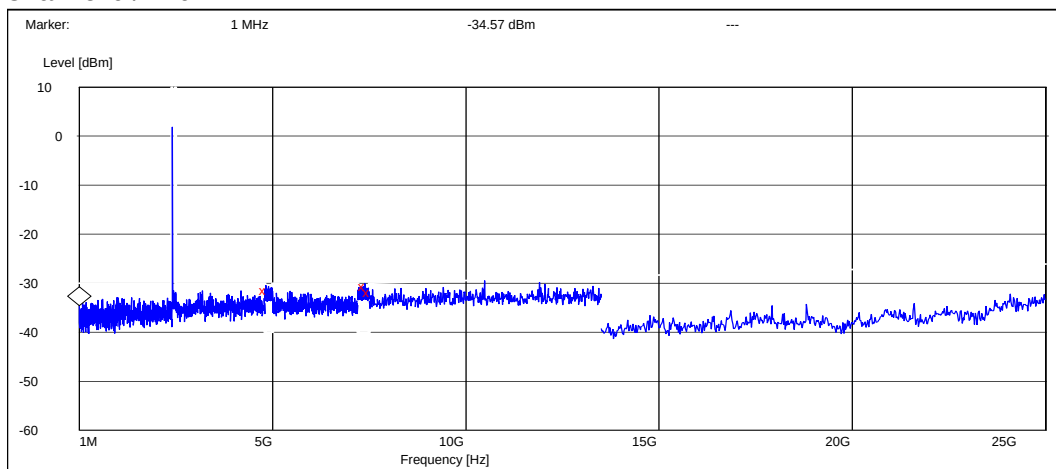


Peak (RBW: 100 kHz, VBW: 100 kHz)

| Frequency [MHz] | P [dBc]    | Result |
|-----------------|------------|--------|
| 4878.000000     | -32.015865 | PASSED |
| 7329.000000     | -33.115865 | PASSED |
| 7500.000000     | -33.915865 | PASSED |

## 5.2.2 8DPSK modulation, PRBS packet type

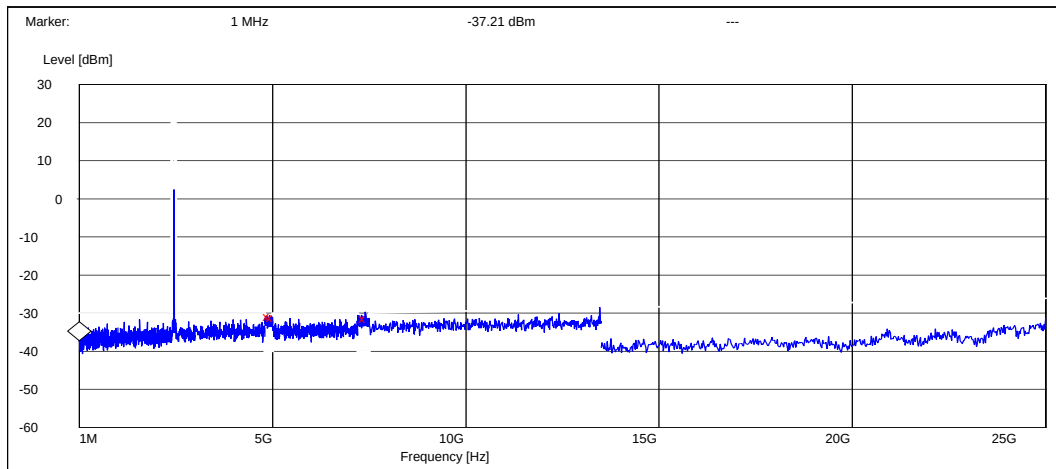
### Channel 0 / 2402 MHz



Peak (RBW: 100 kHz, VBW: 100 kHz)

| Frequency [MHz] | P [dBc]    | Result |
|-----------------|------------|--------|
| 4825.600000     | -33.166982 | PASSED |
| 7380.000000     | -33.966982 | PASSED |
| 7500.000000     | -32.766982 | PASSED |

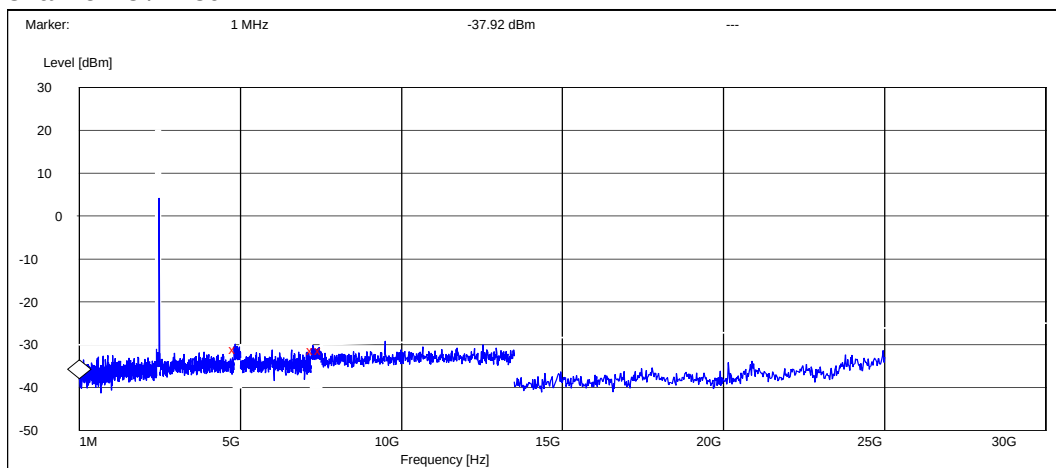
## Channel 40 / 2442 MHz



Peak (RBW: 100 kHz, VBW: 100 kHz)

| Frequency [MHz] | P [dBc]    | Result |
|-----------------|------------|--------|
| 4924.000000     | -33.412376 | PASSED |
| 5000.000000     | -32.012376 | PASSED |
| 7390.800000     | -31.912376 | PASSED |

## Channel 78 / 2480 MHz



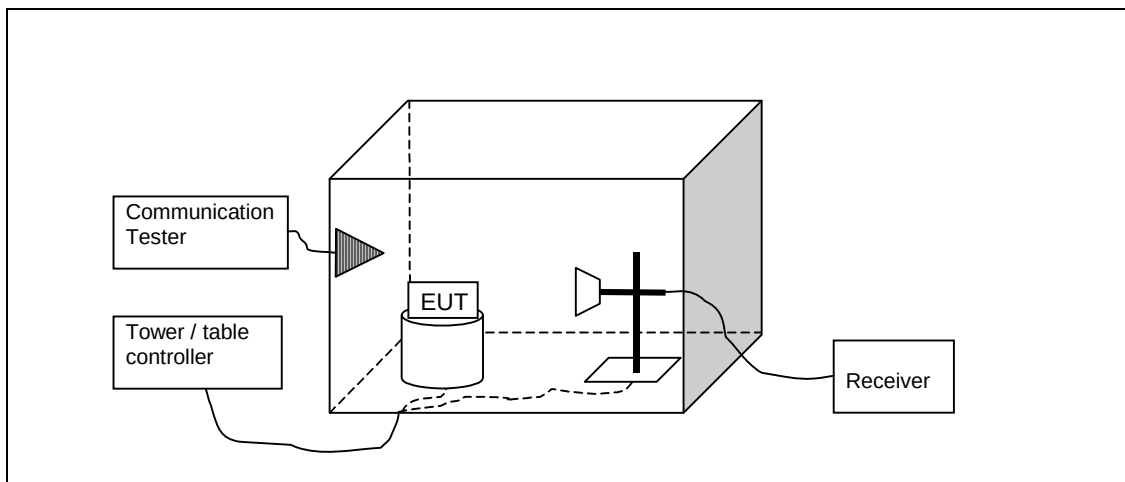
Peak (RBW: 100 kHz, VBW: 100 kHz)

| Frequency [MHz] | P [dBc]    | Result |
|-----------------|------------|--------|
| 4837.600000     | -31.916069 | PASSED |
| 7255.200000     | -32.616069 | PASSED |
| 7500.000000     | -32.716069 | PASSED |

## 6. Spurious radiated emissions (FCC §22.917(a), §24.238(a), §2.1053, RSS-132 4.5, RSS-133 6.5)

|                                     |                                                          |
|-------------------------------------|----------------------------------------------------------|
| <b>EUT with DUT number</b>          | RM-640, DUT 24275                                        |
| <b>Accessories with DUT numbers</b> | BL-5CT, DUT 24257 ; AC-8E, DUT 24255 ; WH-102, DUT 24240 |
| <b>Operation Voltage [V] / [Hz]</b> | 115 V / 60 Hz                                            |
| <b>Results</b>                      | PASSED                                                   |
| <b>Remarks</b>                      | None                                                     |
| <b>Temp [°C] / Humidity [%RH] /</b> | 23 / 46                                                  |
| <b>Date of measurements</b>         | 23-Jun-2010                                              |
| <b>Measured by</b>                  | Ruben Hansen                                             |

### 6.1. Test Setup



### 6.2. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210 as follows:

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system.

The Final Measurement is performed in the Semi-Anechoic Chamber with conducting metal floor, if the Preliminary Measurement results are closer than 20 dB to the permissible value.

The EUT is placed at nonconductive plate at the turntable center.

For each suspected frequency, the turntable is rotated 360 degrees and antenna is scanned from 1 to 4 m. This is repeated for both horizontal and vertical receive antenna polarizations.

The emissions less than 20 dB below the permissible value are reported.

The measurement results are obtained as described below:

$$E [\mu V/m] = U_{RX} + A_{TOT}$$

Where  $U_{RX}$  is receiver reading and  $A_{TOT}$  is total correction factor including cable loss, antenna factor and preamplifier gain ( $A_{TOT} = L_{CABLES} + A_F - G_{PREAMP}$ ).

Limits for spurious radiated emissions measurements (3 m measurement distance)

| Frequency range [MHz] | Limit [ $\mu V/m$ ] | Limit [dB $\mu V/m$ ] | Detector   |
|-----------------------|---------------------|-----------------------|------------|
| 30 - 88               | 100                 | 40                    | Quasi peak |
| 88 – 216              | 150                 | 43.5                  | Quasi peak |
| 216 – 960             | 200                 | 46                    | Quasi peak |
| 960 – 1000            | 500                 | 54                    | Quasi peak |
| Above 1000            | 500                 | 54                    | Average    |
| Above 1000            | 5000                | 74                    | Peak       |

## 6.3. Bluetooth Test results

### 6.3.1 GFSK modulation, PRBS packet type

Average(RBW: 1 MHz)

| Frequency [MHz] | E [dB $\mu$ V/m] | E [ $\mu$ V/m] | U <sub>RX</sub> [dB $\mu$ V] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------------|----------------|------------------------------|-----------------------|--------------|--------|
| 2339.919        | 30.29            | 32.681         | 30.37                        | -0.08                 | VERTICAL     | PASSED |
| 3915.231        | 24.56            | 16.91          | 25.65                        | -1.09                 | VERTICAL     | PASSED |
| 10631.863       | 41.88            | 124.222        | 24.31                        | 17.57                 | VERTICAL     | PASSED |

Peak (RBW: 1 MHz)

| Frequency [MHz] | E [dB $\mu$ V/m] | E [ $\mu$ V/m] | U <sub>RX</sub> [dB $\mu$ V] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------------|----------------|------------------------------|-----------------------|--------------|--------|
| 2339.919        | 43.71            | 153.303        | 43.79                        | -0.08                 | VERTICAL     | PASSED |
| 3915.231        | 37.77            | 77.339         | 38.86                        | -1.09                 | VERTICAL     | PASSED |
| 10631.863       | 55.4             | 588.573        | 37.83                        | 17.57                 | VERTICAL     | PASSED |

### 6.3.2 8DPSK modulation, PRBS packet type

Average(RBW: 1 MHz)

| Frequency [MHz] | E [dB $\mu$ V/m] | E [ $\mu$ V/m] | U <sub>RX</sub> [dB $\mu$ V] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------------|----------------|------------------------------|-----------------------|--------------|--------|
| 3906.714        | 24.7             | 17.181         | 25.78                        | -1.08                 | HORIZONTAL   | PASSED |

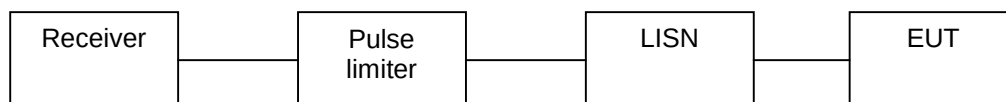
Peak (RBW: 1 MHz)

| Frequency [MHz] | E [dB $\mu$ V/m] | E [ $\mu$ V/m] | U <sub>RX</sub> [dB $\mu$ V] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------------|----------------|------------------------------|-----------------------|--------------|--------|
| 3906.714        | 37.91            | 78.596         | 38.99                        | -1.08                 | HORIZONTAL   | PASSED |

## 7. AC powerline conducted emissions (FCC §15.107, ICES-003 section 5.3)

|                                                        |                                                          |
|--------------------------------------------------------|----------------------------------------------------------|
| <b>EUT with DUT number</b>                             | RM-640, DUT 24276                                        |
| <b>Accessories with DUT numbers</b>                    | BL-5CT, DUT 24253 ; AC-8E, DUT 24254 ; WH-102, DUT 24241 |
| <b>Operation Voltage [V] / [Hz]</b>                    | 115 / 60                                                 |
| <b>Result</b>                                          | Passed                                                   |
| <b>Remarks</b>                                         | None                                                     |
| <b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b> | 24 / 42 / 1007                                           |
| <b>Date of measurements</b>                            | 22-Jun-2010                                              |
| <b>Measured by</b>                                     | Bo Moltved Christiansen                                  |

### 7.1. Test setup



### 7.2. Test method and limit

The measurement is made according to ANSI C63.4-2003 as follows:

The EUT is placed on a wooden table 80 cm above the reference groundplane.

The EUT is connected via LISN to a test power supply.

The measurement results are obtained as described below:

$$U [dB\mu V] = U_{RX} + A_{TOT}$$

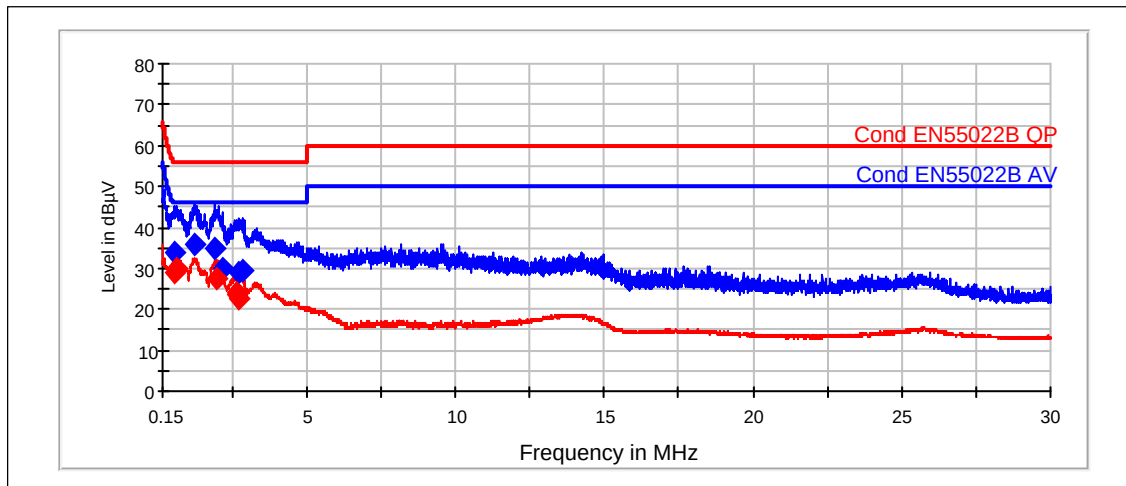
Where  $U_{RX}$  is receiver reading and  $A_{TOT}$  is total correction factor including cable and pulse limiter attenuations.

CISPR 22 Class B limits

| Frequency range [MHz] | Quasi peak limit [dBμV] | Average limit [dBμV] |
|-----------------------|-------------------------|----------------------|
| 0.15 - 0.5            | 66 - 56                 | 56 - 46              |
| 0.5 - 5               | 56                      | 46                   |
| 5 - 30                | 60                      | 50                   |



BT GFSK TX



Quasi peak

| Frequency [MHz] | Level [dBμV] | IF-BW[kHz] | Line | Margin | Result |
|-----------------|--------------|------------|------|--------|--------|
| 0.54            | 34.04        | 10         | L1   | 22     | PASSED |
| 1.24            | 35.79        | 10         | N    | 20.2   | PASSED |
| 1.925           | 34.99        | 10         | N    | 21     | PASSED |
| 2.15            | 30.09        | 10         | N    | 25.9   | PASSED |
| 2.74            | 28.87        | 10         | N    | 27.1   | PASSED |
| 2.855           | 29.57        | 10         | N    | 26.4   | PASSED |

Average

| Frequency [MHz] | Level [dBμV] | IF-BW[kHz] | Line | Margin | Result |
|-----------------|--------------|------------|------|--------|--------|
| 0.54            | 29.12        | 10         | N    | 16.9   | PASSED |
| 0.625           | 29.93        | 10         | N    | 16.1   | PASSED |
| 1.96            | 27.36        | 10         | N    | 18.6   | PASSED |
| 2.635           | 24           | 10         | N    | 22     | PASSED |
| 2.665           | 23.34        | 10         | N    | 22.7   | PASSED |
| 2.73            | 22.46        | 10         | N    | 23.5   | PASSED |

## 8. 20 dB bandwidth (FCC §15.247(a)(1), RSS-210 A8.1 (a))

|                                                 |                                                          |
|-------------------------------------------------|----------------------------------------------------------|
| EUT with DUT number                             | RM-640, DUT 24274                                        |
| Accessories with DUT numbers                    | BL-5CT, DUT 24263 ; AC-8E, DUT 24250 ; WH-102, DUT 24247 |
| Operation Voltage [V] / [Hz]                    | 115 V / 60 Hz                                            |
| Result                                          | PASSED                                                   |
| Remarks                                         | None                                                     |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 23 / 44 / 1013                                           |
| Date of measurements                            | 28-June-2010                                             |
| Measured by                                     | Ruben Hansen                                             |

### 8.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

Limits for 20 dB bandwidth measurements

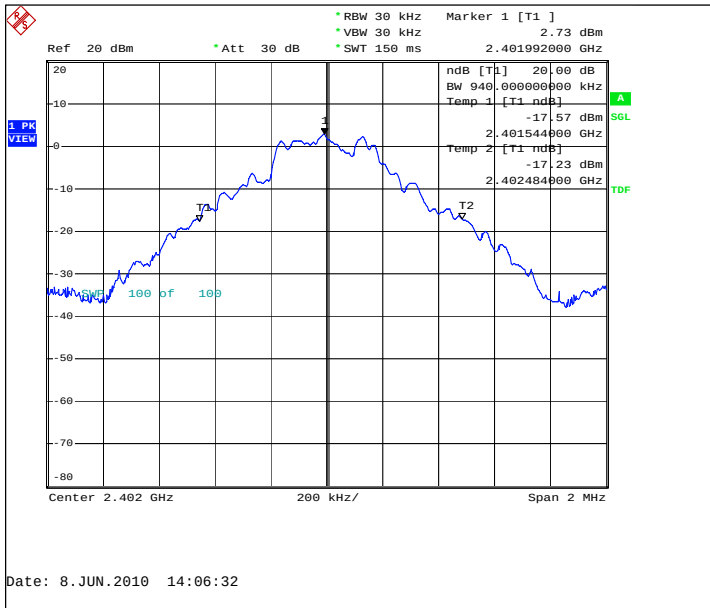
| Limit [MHz] |
|-------------|
| N/A         |

## 8.2. Bluetooth Test results

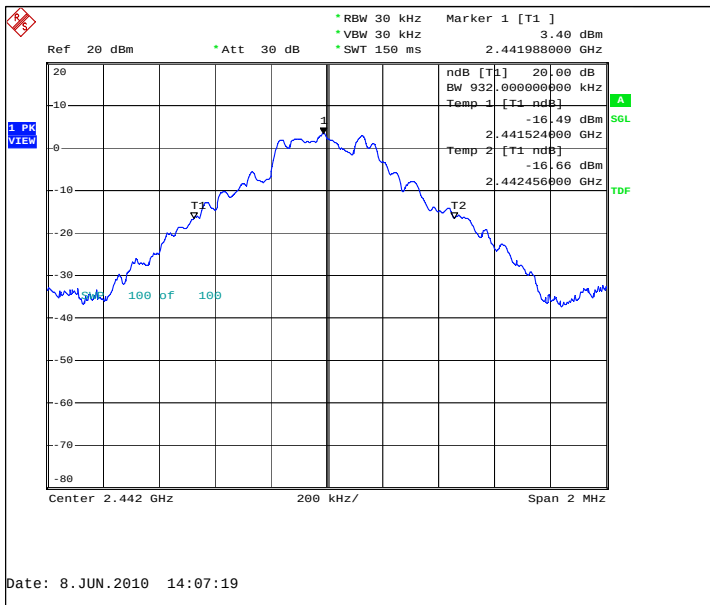
### 8.2.1 GFSK modulation, PRBS packet type

| Channel / f <sub>c</sub> [MHz] | 20 dB bandwidth [kHz] | Result |
|--------------------------------|-----------------------|--------|
| 0 / 2402                       | 940.000               | PASSED |
| 40 / 2442                      | 932.000               | PASSED |
| 78 / 2480                      | 940.000               | PASSED |

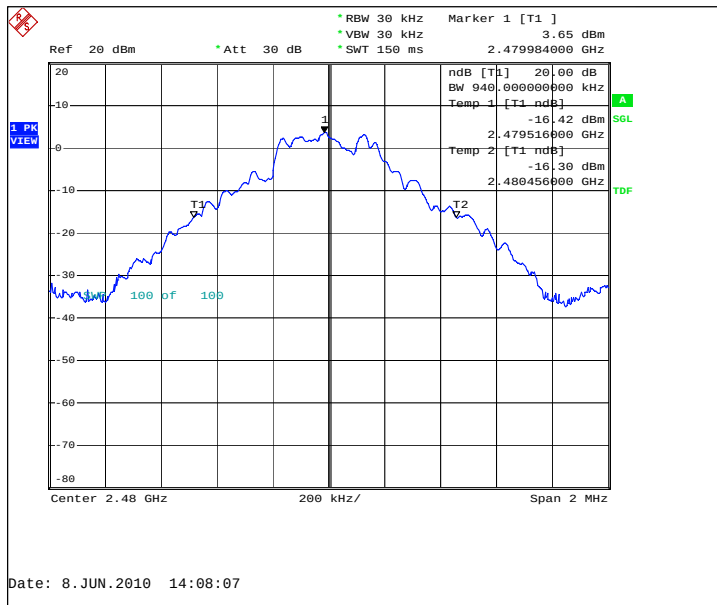
#### Channel 0 / 2402 MHz



#### Channel 40 / 2442 MHz



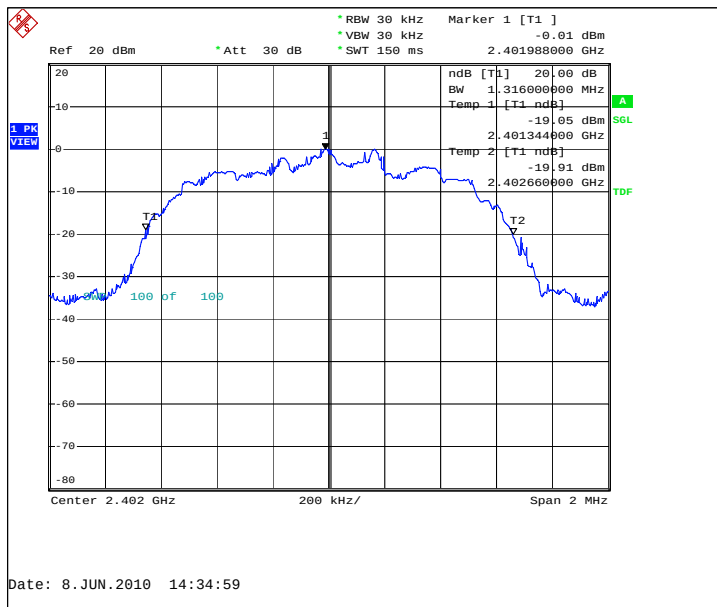
## Channel 78 / 2480 MHz



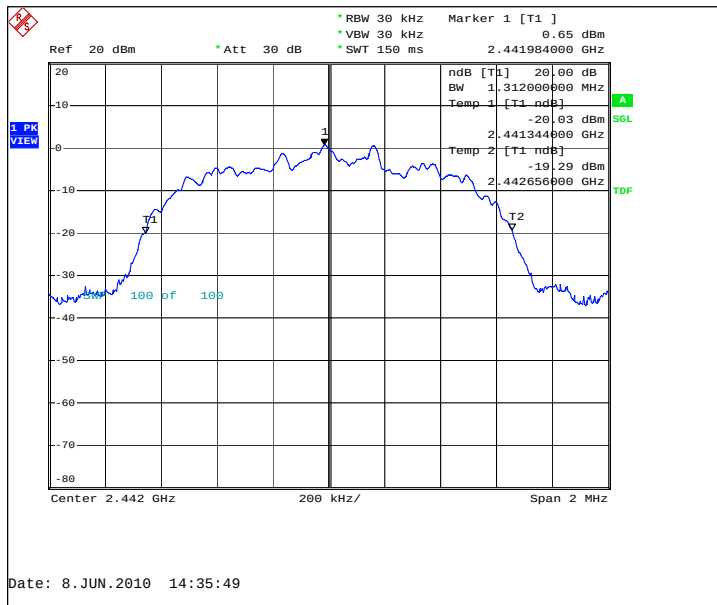
## 8.2.2 8DPSK modulation, PRBS packet type

| Channel / $f_c$ [MHz] | 20 dB bandwidth [kHz] | Result |
|-----------------------|-----------------------|--------|
| 0 / 2402              | 1316.000              | PASSED |
| 40 / 2442             | 1312.000              | PASSED |
| 78 / 2480             | 1312.000              | PASSED |

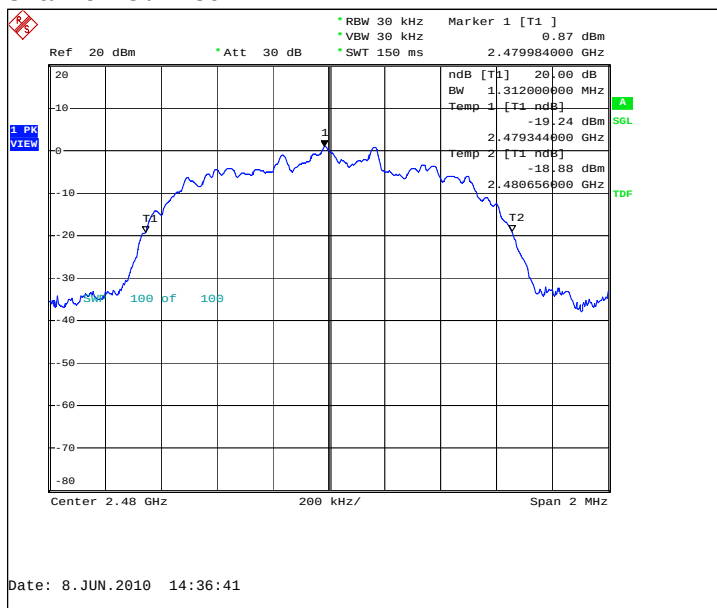
## Channel 0 / 2402 MHz



## Channel 40 / 2442 MHz



## Channel 78 / 2480 MHz



## 9. Carrier frequency separation (FCC §15.247(a)(1), RSS-210 A8.1 (b))

|                                                        |                                                          |
|--------------------------------------------------------|----------------------------------------------------------|
| <b>EUT with DUT number</b>                             | RM-640, DUT 24274                                        |
| <b>Accessories with DUT numbers</b>                    | BL-5CT, DUT 24263 ; AC-8E, DUT 24250 ; WH-102, DUT 24247 |
| <b>Operation Voltage [V] / [Hz]</b>                    | 115 V / 60 Hz                                            |
| <b>Result</b>                                          | PASSED                                                   |
| <b>Remarks</b>                                         | None                                                     |
| <b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b> | 23 / 44 / 1013                                           |
| <b>Date of measurements</b>                            | 28-June-2010                                             |
| <b>Measured by</b>                                     | Ruben Hansen                                             |

### 9.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

Limits for carrier frequency separation measurements

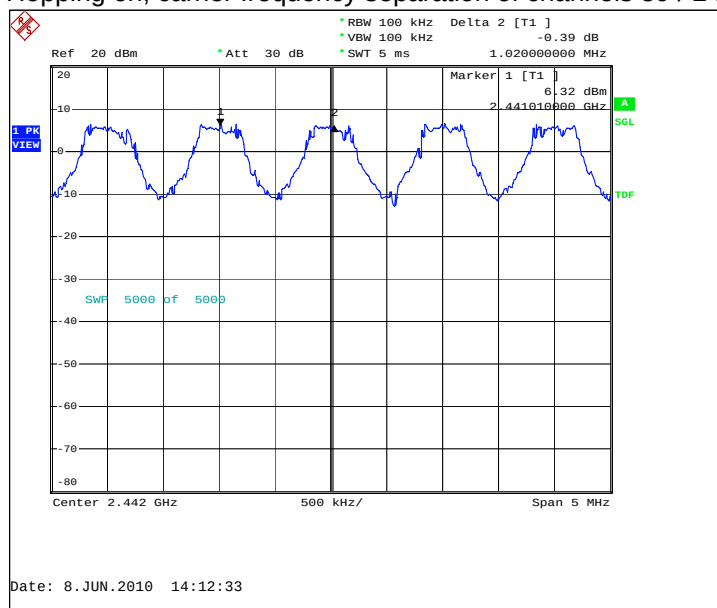
| <b>Limit [MHz]</b>                    |
|---------------------------------------|
| ≥ 0.025 or 2/3 of the 20 dB bandwidth |

## 9.2. Bluetooth Test results

### 9.2.1 GFSK modulation, PRBS packet type

| Carrier frequency separation [kHz] | Result |
|------------------------------------|--------|
| 1020                               | PASSED |

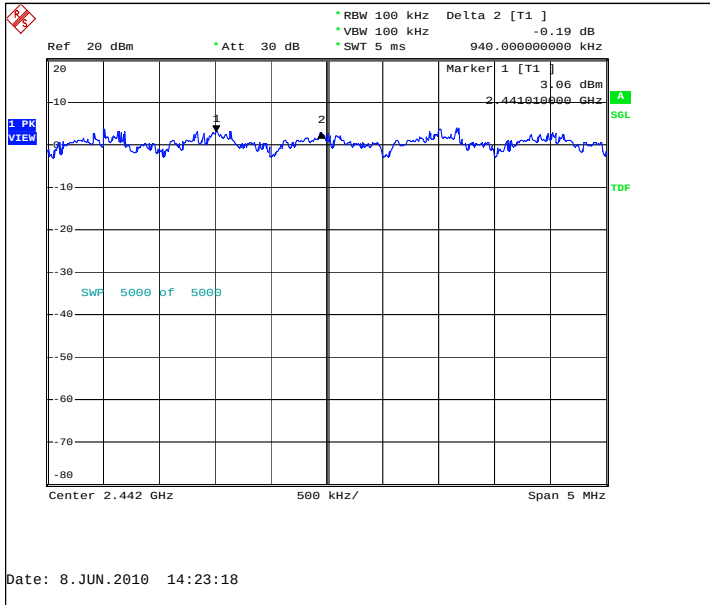
Hopping on, carrier frequency separation of channels 39 / 2441 MHz and 40 / 2442 MHz



## 9.2.2 8DPSK modulation, PRBS packet type

| Carrier frequency separation [kHz] | Result |
|------------------------------------|--------|
| 940                                | PASSED |

Hopping on, carrier frequency separation of channels 39 / 2441 MHz and 40 / 2442 MHz





## 10. Number of hopping frequencies (FCC §15.247(a)(1)(iii), RSS-210 A8.1 (d))

|                                                 |                                                          |
|-------------------------------------------------|----------------------------------------------------------|
| EUT with DUT number                             | RM-640, DUT 24274                                        |
| Accessories with DUT numbers                    | BL-5CT, DUT 24263 ; AC-8E, DUT 24250 ; WH-102, DUT 24247 |
| Operation Voltage [V] / [Hz]                    | 115 V / 60 Hz                                            |
| Result                                          | PASSED                                                   |
| Remarks                                         | None                                                     |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 23 / 44 / 1013                                           |
| Date of measurements                            | 28-June-2010                                             |
| Measured by                                     | Ruben Hansen                                             |

### 10.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

Limits for number of hopping frequencies measurements

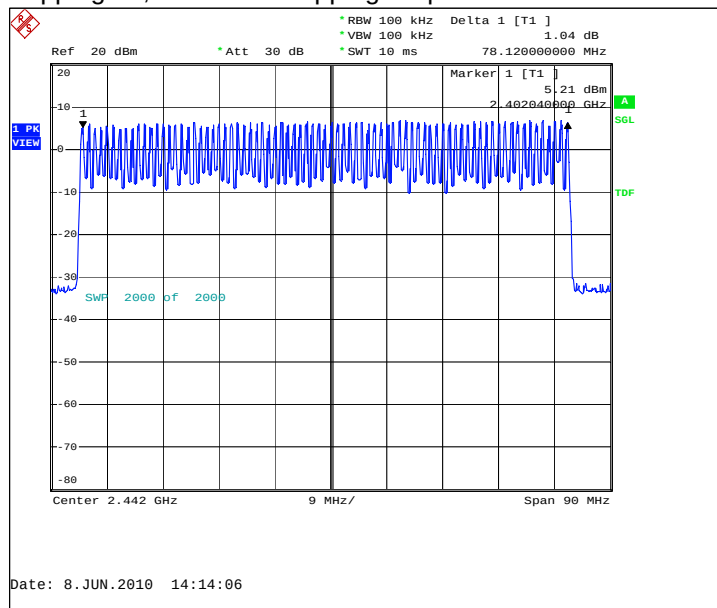
| Limit [number] |
|----------------|
| ≥ 15           |

## 10.2. Bluetooth Test results

### 10.2.1 GFSK modulation, PRBS packet type

| Measured number of hopping frequencies | Result |
|----------------------------------------|--------|
| 78                                     | PASSED |

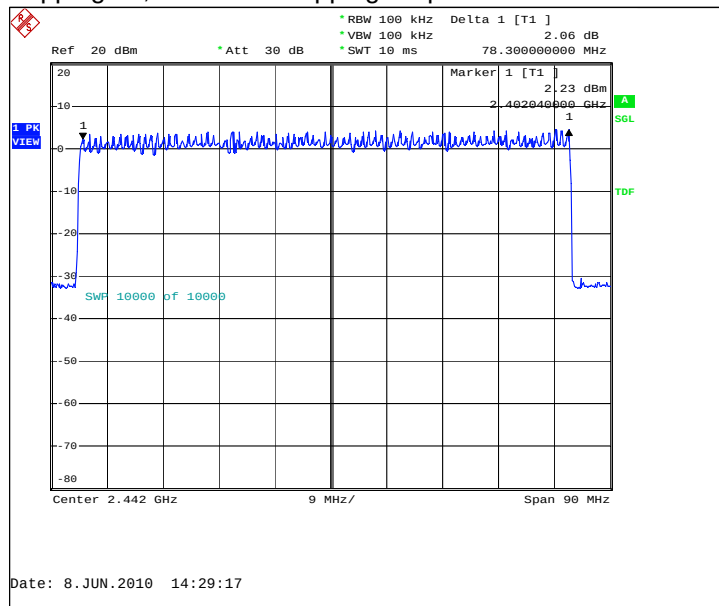
Hopping on, number of hopping frequencies



## 10.2.2 8DPSK modulation, PRBS packet type

| Measured number of hopping frequencies | Result |
|----------------------------------------|--------|
| 63                                     | PASSED |

Hopping on, number of hopping frequencies



## 11. Time of occupancy (FCC §15.247(a)(1)(iii), RSS-210 A8.1 (d))

|                                                 |                                                          |
|-------------------------------------------------|----------------------------------------------------------|
| EUT with DUT number                             | RM-640, DUT 24274                                        |
| Accessories with DUT numbers                    | BL-5CT, DUT 24263 ; AC-8E, DUT 24250 ; WH-102, DUT 24247 |
| Operation Voltage [V] / [Hz]                    | 115 V / 60 Hz                                            |
| Result                                          | PASSED                                                   |
| Remarks                                         | None                                                     |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 23 / 44 / 1013                                           |
| Date of measurements                            | 28-June-2010                                             |
| Measured by                                     | Ruben Hansen                                             |

### 11.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210 as follows:

The total time of occupancy is get by multiplying the measured number of transmissions occurred during 31.6 second period with the duration of one transmission.

Limits for time of occupancy measurements

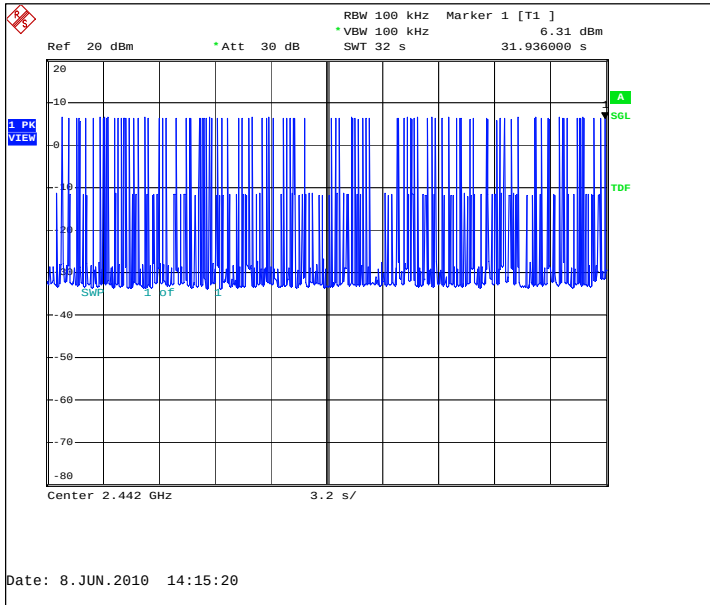
| Limit [s] |
|-----------|
| ≤ 0.4     |

## 11.2. Bluetooth test results

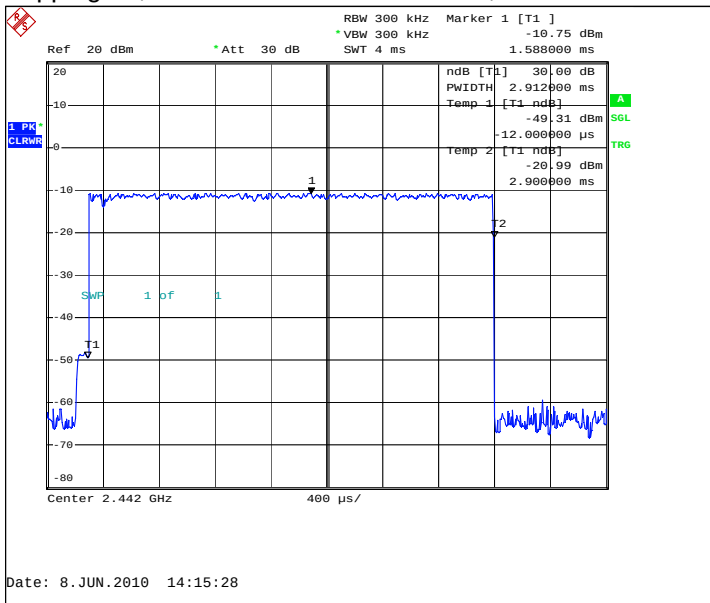
### 11.2.1 GFSK modulation, PRBS packet type

| Measured number of transmissions | Duration of one transmission [μs] | Time of occupancy [s] | Result |
|----------------------------------|-----------------------------------|-----------------------|--------|
| 88                               | 2,912                             | 0.256256              | PASSED |

Hopping on, number of transmissions, channel 40 / 2442 MHz



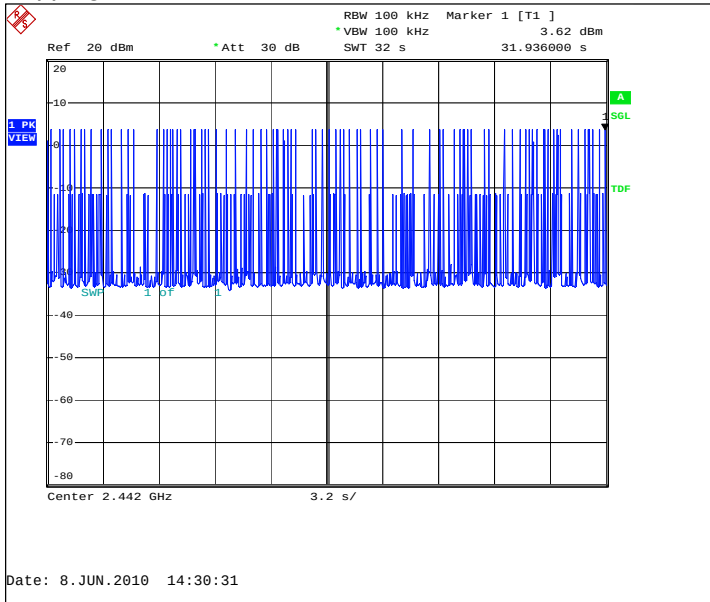
Hopping on, duration of one transmission, channel 40 / 2442 MHz



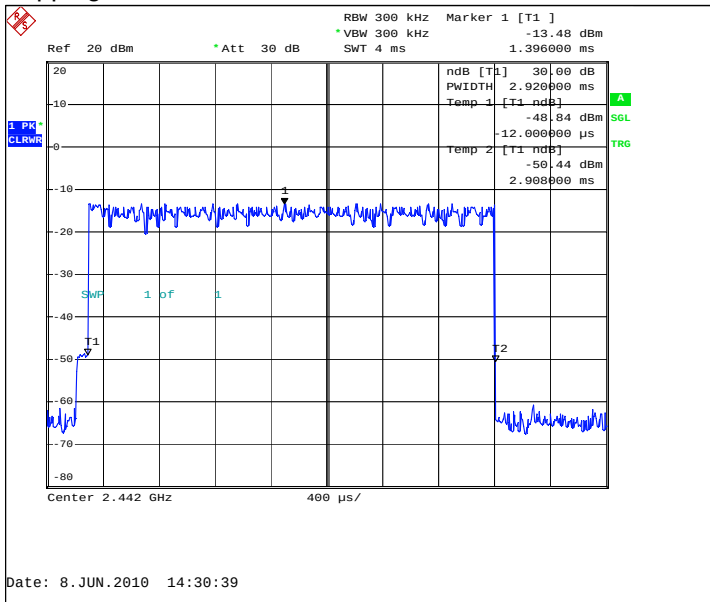
### 11.2.2 8DPSK modulation, PRBS packet type

| Measured number of transmissions | Duration of one transmission [μs] | Time of occupancy [s] | Result |
|----------------------------------|-----------------------------------|-----------------------|--------|
| 84                               | 2,920                             | 0.245280              | PASSED |

Hopping on, number of transmissions, channel 40 / 2442 MHz



Hopping on, duration of one transmission, channel 40 / 2442 MHz



## 13. Test Equipment

### 13.1. Conducted measurements

| Eq. No | Equipment                                      | Type         | Manufacturer    | Used in            |
|--------|------------------------------------------------|--------------|-----------------|--------------------|
| 20168  | Bluetooth Tester                               | CBT          | Rohde&Schwarz   | 22/24/27, 15C, 15B |
| 18772  | Shielded Chamber                               | RFD-100      | ETS-Lindgren    | 15C, 15B           |
| 13037  | Power Supply 0-15V 10A                         | EA3012       | LP Instruments  | 15C, 15B           |
| 13513  | Pulse Limiter                                  | ESH3Z2       | Rohde&Schwarz   | 15C, 15B           |
| 13666  | Receiver                                       | ESPC         | Rohde&Schwarz   | 15C, 15B           |
| 13935  | LISN                                           | ESH3-Z5      | Rohde&Schwarz   | 15C, 15B           |
| 16995  | Directional Coupler 20dB 0,5-2,0 GHz SMA Conn. | 1538RA-20    | Weinschel       | 15C, 15B           |
| 18772  | Shielded Chamber                               | RFD-100      | ETS-Lindgren    | 15C, 15B           |
| 19171  | Communication Tester                           | CMU200       | Rohde&Schwarz   | 15C, 15B           |
| 11386  | DC Power Supply                                | HP6632A      | Hewlett Packard | 22/24/27, 15C, 15B |
| 19678  | Spectrum Analyzer                              | FSP          | Rohde&Schwarz   | 22/24/27, 15C, 15B |
| 16601  | Communication Tester                           | CMU200       | Rohde&Schwarz   | 22/24/27, 15C, 15B |
| 19625  | Climatic Chamber                               | VT4002EMC    | Vötsch          | 22/24/27, 15C, 15B |
| 13357  | Signal Generator                               | SMP02        | Rohde&Schwarz   | 22/24/27, 15C, 15B |
| 19116  | Power splitter                                 | -            | various         | 22/24/27, 15C, 15B |
| 20544  | Transformer. 230/115V                          | -            | Nokia           | 22/24/27, 15C, 15B |
| 20543  | UPS. 700V/A 490W                               | PW 9120 700i | Powerware       | 22/24/27, 15C, 15B |

### 13.2. Radiated measurements

| Eq. No | Equipment                                     | Type                               | Manufacturer           | Used in            |
|--------|-----------------------------------------------|------------------------------------|------------------------|--------------------|
| 18792  | Mast/turntable controller                     | 2090                               | ETS-EMCO               | 22/24/27, 15C, 15B |
| 18416  | Communication Tester                          | CMU200                             | Rohde&Schwarz          | 22/24/27, 15C, 15B |
| 20168  | Bluetooth Tester                              | CBT                                | Rohde&Schwarz          | 22/24/27, 15C, 15B |
| 13077  | Power Supply                                  | EA-3016                            | -                      | 22/24/27, 15C, 15B |
| 15742  | Programmable Relay Switching System           | -----                              | Pickering              | 22/24/27, 15C, 15B |
| 20078  | Relay 2x6 Chnl $\mu$ Wave Mux                 | 10-785B-522                        | Pickering              | 22/24/27, 15C, 15B |
| 14021  | Relay Dual 6 Chnl $\mu$ Wave Mux              | 10-785-522                         | -                      | 22/24/27, 15C, 15B |
| -      | Relay Dual 6 Chnl $\mu$ Wave Mux              | 10-785-522                         | -                      | 22/24/27, 15C, 15B |
| 17644  | Dual 6 Channel MUX Microwave Relay SMA 50 Ohm | 10-785-522                         | Pickering              | 22/24/27, 15C, 15B |
| 16948  | Dual 6 Channel MUX Microwave Relay SMA 50 Ohm | 10-785-522                         | Pickering              | 22/24/27, 15C, 15B |
| 16949  | Dual 6 Channel MUX Microwave Relay SMA 50 Ohm | 10-785-522                         | Pickering              | 22/24/27, 15C, 15B |
| 18861  | Receiver                                      | EMI Test Receiver 20Hz-26,5GHz ESI | Rohde&Schwarz          | 22/24/27, 15C, 15B |
| 18860  | Antenna                                       | HL562                              | Rohde&Schwarz          | 22/24/27, 15C, 15B |
| 18773  | Anechoic chamber                              | RFD-100                            | ETS-Lindgren           | 22/24/27, 15C, 15B |
| 18774  | Anechoic chamber                              | RFSD-F/A-100                       | ETS-Lindgren           | 22/24/27, 15C, 15B |
| 19151  | High Pass Filter                              | WHJS3000-10SS                      | Wainwright             | 22/24/27, 15C, 15B |
| 13937  | Band reject filter                            | WRCA902.4-0.2/40-6SS               | Wainwright Instruments | 22/24/27, 15C, 15B |
| 13936  | Band reject filter                            | WRCD1747.5-0.2/40-10SS             | Wainwright Instruments | 22/24/27, 15C, 15B |
| 14114  | Highpass Filter                               | WHK1000-12SS                       | Wainwright Instruments | 22/24/27, 15C, 15B |
| 14188  | Band reject filter                            | WRCA902.4-0.2/40-6SS               | Wainwright             | 22/24/27, 15C, 15B |
| 14187  | Band reject filter                            | WRCD1747.5-0.2/40-10SS             | Wainwright             | 22/24/27, 15C, 15B |

| Eq. No | Equipment                | Type                            | Manufacturer  | Used in            |
|--------|--------------------------|---------------------------------|---------------|--------------------|
| 16633  | Band reject filter       | WRCD1880.0-0.2/40-10SS          | Wainwright    | 22/24/27, 15C, 15B |
| 19587  | Band reject filter       | WRCG2400/2483-2390/2493-35/10SS | Wainwright    | 22/24/27, 15C, 15B |
| 20115  | Band reject filter       | -                               | Wainwright    | 22/24/27, 15C, 15B |
| 20114  | Band reject filter       | WRCG1737/1743-1733/1747-40/6SS  | Wainwright    | 22/24/27, 15C, 15B |
| 20116  | Band reject filter       | WRCG832/83/-825/845-40/5SS      | Wainwright    | 22/24/27, 15C, 15B |
| 20698  | Antenna                  | BBHA 9120 D                     | SCHWARZBECK   | 22/24/27, 15C, 15B |
| 19966  | Antenna                  | HFH2-Z2                         | Rohde&Schwarz | 15C, 15B           |
| 13799  | Signal Generator         | SMP02                           | Rohde&Schwarz | 22/24/27, 15C, 15B |
| 15191  | Turntable Contoller Unit | G-800SDX                        | YAESU         | 22/24/27, 15C, 15B |
| 14900  | Antenna Controller       | HD100                           | HD GmbH       | 22/24/27, 15C, 15B |
| 20544  | Transformer. 230/115V    | -                               | Nokia         | 22/24/27, 15C, 15B |
| 20543  | UPS. 700V/A 490W         | PW 9120 700i                    | Powerware     | 22/24/27, 15C, 15B |