

## FCC Part 15C Compliance Test Report

|                                                         |                                                                                                                                                                                                                                                                                                                                      |                                   |                                                                                                               |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Test Report no.:</b>                                 | FCC15C_RM-658_02.doc                                                                                                                                                                                                                                                                                                                 | <b>Date of Report:</b>            | 09-Apr-2010                                                                                                   |
| <b>Number of pages:</b>                                 | 31                                                                                                                                                                                                                                                                                                                                   | <b>Customer's Contact person:</b> | Jan Rasmussen                                                                                                 |
| <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>Frederikskaj<br>1790 COPENHAGEN V<br>DENMARK<br>Tel. +45 33 292929<br>Fax. +45 33 292934 |
| <b>FCC listing no.:</b>                                 | 99059                                                                                                                                                                                                                                                                                                                                |                                   |                                                                                                               |
| <b>IC recognition no.:</b>                              | 661AL-1                                                                                                                                                                                                                                                                                                                              |                                   |                                                                                                               |
| <b>Tested devices/ accessories:</b>                     | <b>Phone RM-658 / Battery BP-4L / Headset WH-205 / AC Charger AC-10U</b>                                                                                                                                                                                                                                                             |                                   |                                                                                                               |
| <b>FCC ID:</b>                                          | QTKRM-658                                                                                                                                                                                                                                                                                                                            | <b>IC:</b>                        | 661AD-RM658                                                                                                   |
| <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               | 11-Mar-2010                                           |
| Testing completed             | 08-Apr-2010                                           |
| The customer's contact person | Jan Rasmussen                                         |
| Test Plan referred to         | T:\Projects\RM-658\TestPlan_RS\RS_testplan_RM-658.xls |
| Notes                         | None                                                  |
| Document name                 | FCC15C_RM-658_02.doc                                  |

### 1.1. EUT and Accessory Information

The EUT is a 7-band (GSM850/900/1800/1900) and WCDMA Band (I/IV(1700)/VIII) mobile phone with GPRS, EGPRS, HSDPA, HSUPA and WLAN and Bluetooth. Bluetooth and WLAN are tested with maximum rated TX power.

| Product    | Type   | SN                          | HW   | MV | SW        | DUT   |
|------------|--------|-----------------------------|------|----|-----------|-------|
| Phone      | RM-658 | 004402019812243             | 9011 | -  | -         | 24417 |
| Phone      | RM-658 | 004401019811187             | 9011 | -  | 041.003   | 24455 |
| Battery    | BP-4L  | 3932139463B61034038;0670519 | -    | -  | -         | 24444 |
| Battery    | BP-4L  | 3932139463B61034035;0670519 | -    | -  | -         | 24451 |
| AC Charger | AC-10  | 3997910035052200004;0675409 | -    | -  | -         | 24446 |
| AC Charger | AC-10  | 3997910035052200093;0675409 | -    | -  | -         | 24440 |
| Headset    | WH-205 | 06944219215D1R00130         | -    | -  | -         | 24880 |
| Headset    | WH-205 | 06944219485D1R68493         | -    | -  | -         | 24436 |
| Phone      | RM-658 | 004401019811062             | 9013 | -  | 041.003RD | 24357 |
| Battery    | BP-4L  | 3932139463B61034044;0670519 | -    | -  | -         | 24450 |
| Headset    | WH-205 | 06944219485D1R68372         | -    | -  | -         | 24443 |
| AC Charger | AC-10U | 3997910035052200095;0675409 | -    | -  | -         | 24447 |

### 1.2. Summary of Test Results

#### WLAN:

| Section in CFR 47 | Section in RSS-GEN or RSS-210 | Name of the test                     | Result |
|-------------------|-------------------------------|--------------------------------------|--------|
| 15.247(b)(1)      | A8.4 (4)                      | 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)(2)      | A8.2 (a)                      | 6 dB bandwidth                       | Passed |
| 15.247(e)         | A8.2 (b)                      | Power spectral density               | Passed |

PASSED  
FAILED  
NP

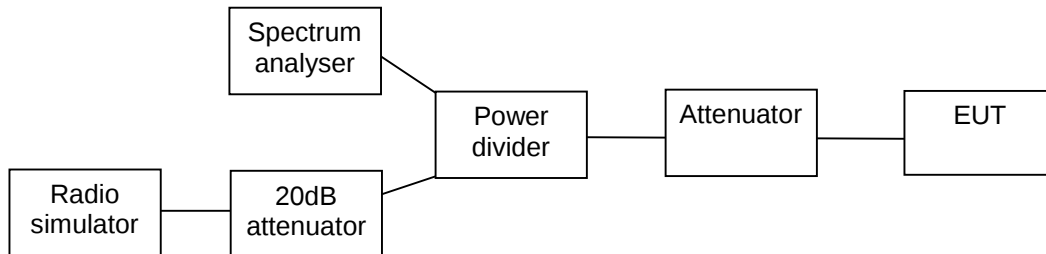
The EUT complies with the essential requirements in the standard.  
The EUT does not comply with the essential requirements in the standard.  
The test was not performed by the TCC Nokia Copenhagen Laboratory.

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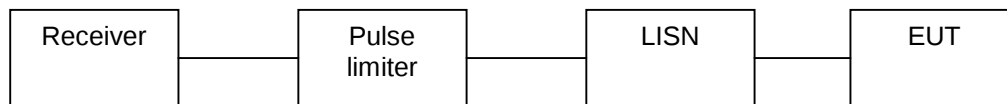
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## 2. Test setups

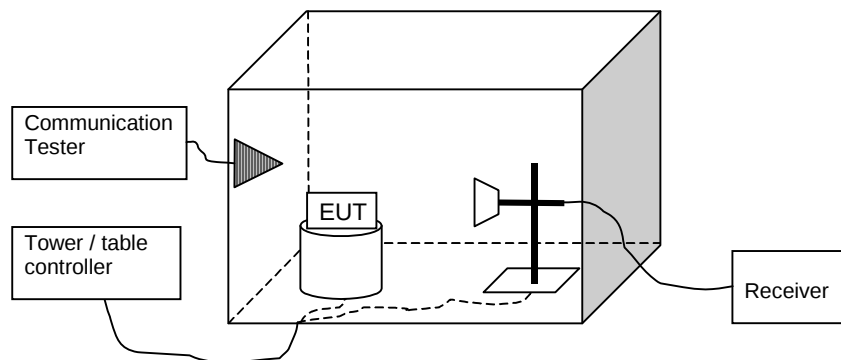
### 2.1. Conducted RF test setup



### 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 (4))

|                                                        |                                                    |
|--------------------------------------------------------|----------------------------------------------------|
| <b>EUT with DUT number</b>                             | RM-658 DUT 24417                                   |
| <b>Accessories with DUT numbers</b>                    | BP-4L DUT 24444, AC-10 DUT 24446, WH-205 DUT 24880 |
| <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 / 43 / 102.3                                    |
| <b>Date of measurements</b>                            | 12-Mar-2010                                        |
| <b>Measured by</b>                                     | Ruben Hansen                                       |

#### 3.1. Test method and limit

The measurement is made according to DTS procedures KDB 558074 and IC standard RSS-210.

Limits for conducted peak output power measurements

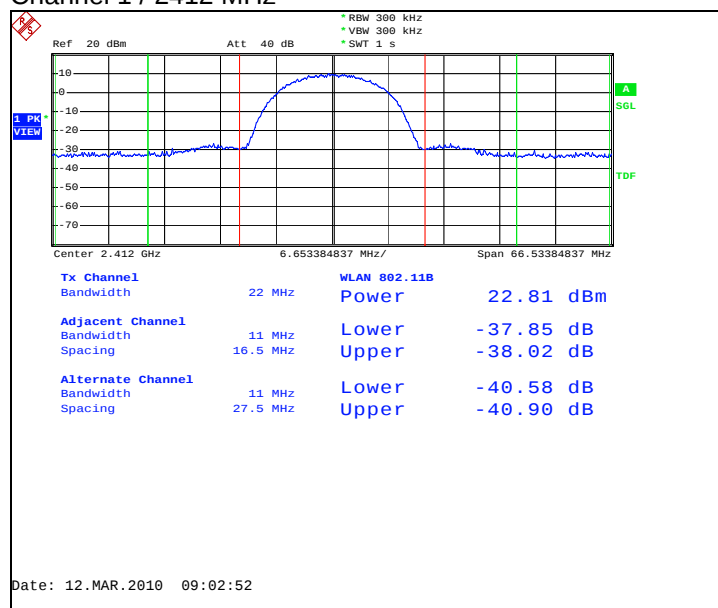
| <b>Frequency range [MHz]</b> | <b>Limit [W]</b> | <b>Limit [dBm]</b> |
|------------------------------|------------------|--------------------|
| 2400 – 2483.5                | ≤ 1              | ≤ 30               |

## 3.2. WLAN Test results

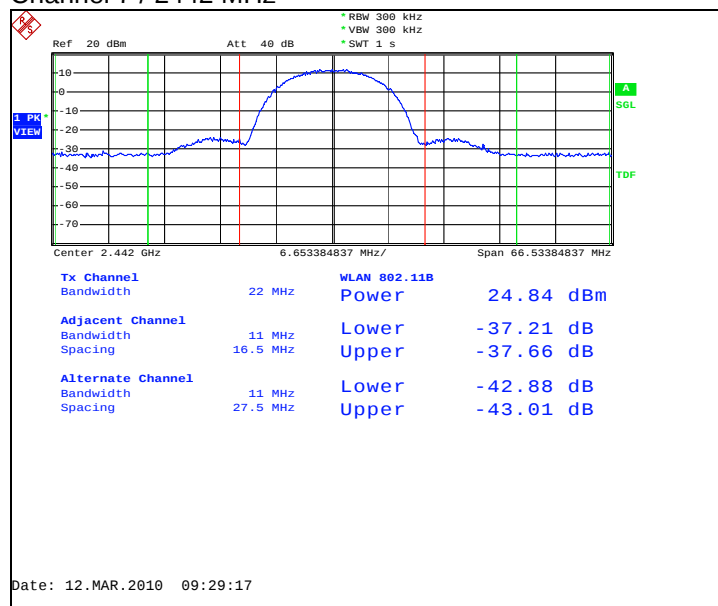
### 3.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

| Channel / $f_c$ [MHz] | P [dBm] | P [W] | Result |
|-----------------------|---------|-------|--------|
| 1 / 2412              | 22.81   | 0.191 | Passed |
| 7 / 2442              | 24.84   | 0.305 | Passed |
| 11 / 2462             | 23.78   | 0.239 | Passed |

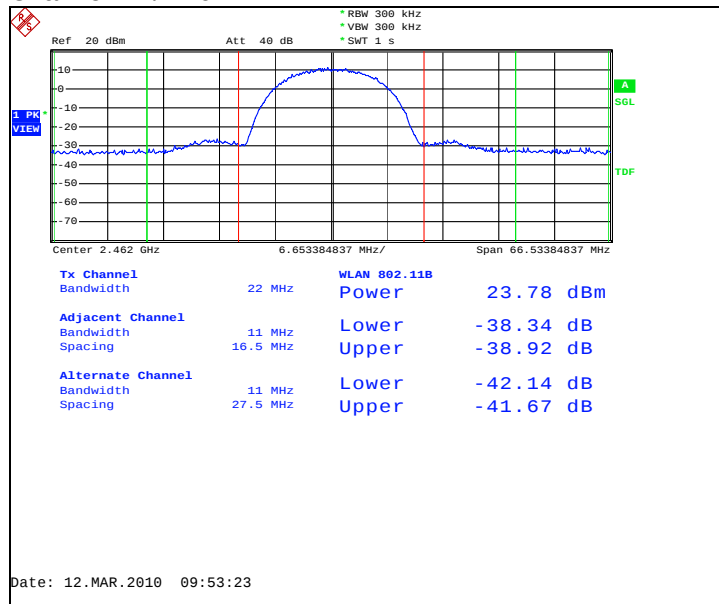
#### Channel 1 / 2412 MHz



#### Channel 7 / 2442 MHz



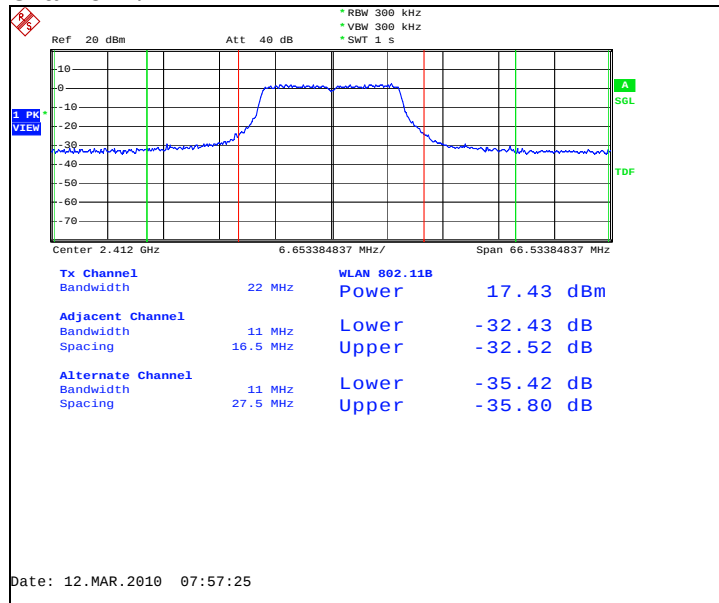
### Channel 11 / 2462 MHz



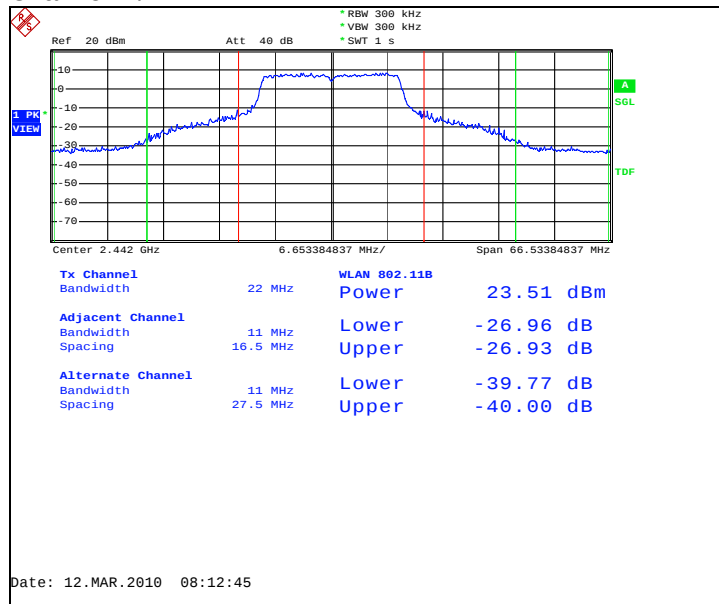
### 3.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

| Channel / f <sub>c</sub> [MHz] | P [dBm] | P [W] | Result |
|--------------------------------|---------|-------|--------|
| 1 / 2412                       | 17.43   | 0.055 | Passed |
| 7 / 2442                       | 23.51   | 0.224 | Passed |
| 11 / 2462                      | 18.34   | 0.068 | Passed |

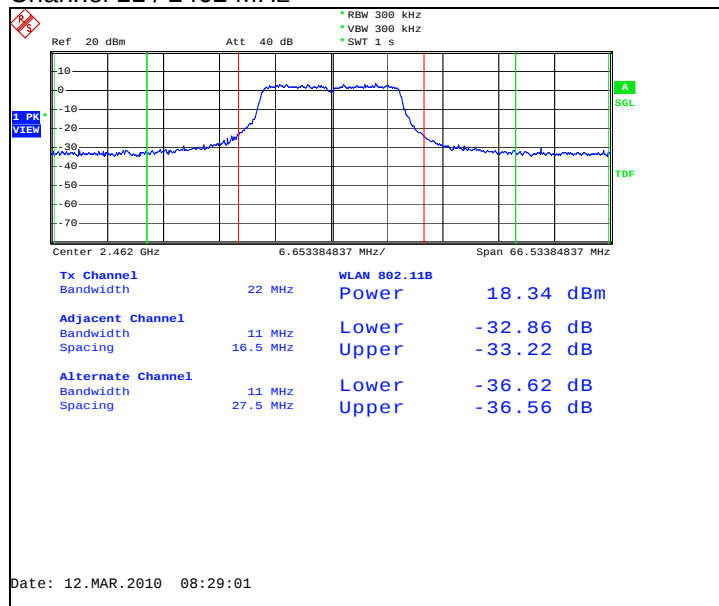
### Channel 1 / 2412 MHz



## Channel 7 / 2442 MHz



## Channel 11 / 2462 MHz



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

|                                                        |                                                          |
|--------------------------------------------------------|----------------------------------------------------------|
| <b>EUT with DUT number</b>                             | RM-658, DUT 24357                                        |
| <b>Accessories with DUT numbers</b>                    | BP-4L, DUT 24450 ; WH-205, DUT 24443 ; AC-10U, DUT 24447 |
| <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> | 22 / 38 / 100.2                                          |
| <b>Date of measurements</b>                            | 08-Apr-2010                                              |
| <b>Measured by</b>                                     | Christian Andersen                                       |

##### 4.1. Test method and limit

The measurement is made according to DTS procedures KDB 558074 and IC standard RSS-210.

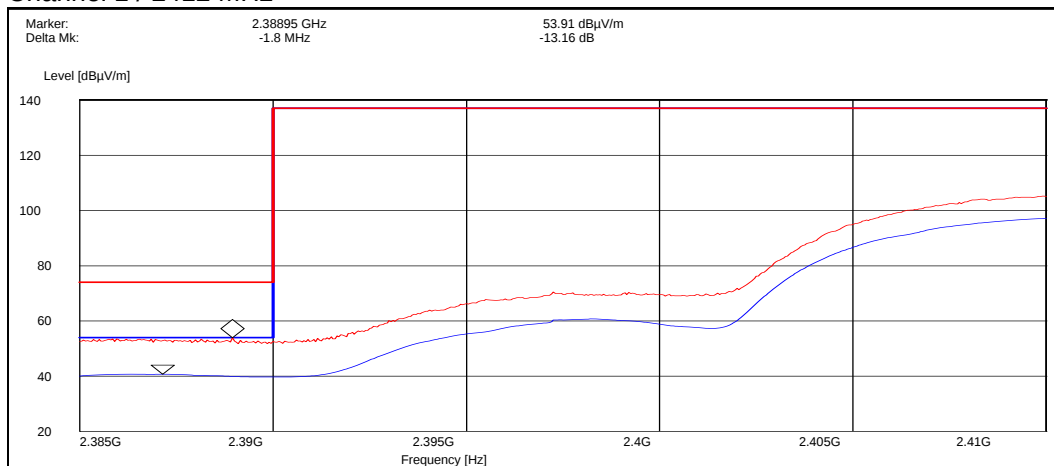
Limits for band edge compliance of RF emissions measurements (3 m measurement distance)

| <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                       |

## 4.2. WLAN Test results

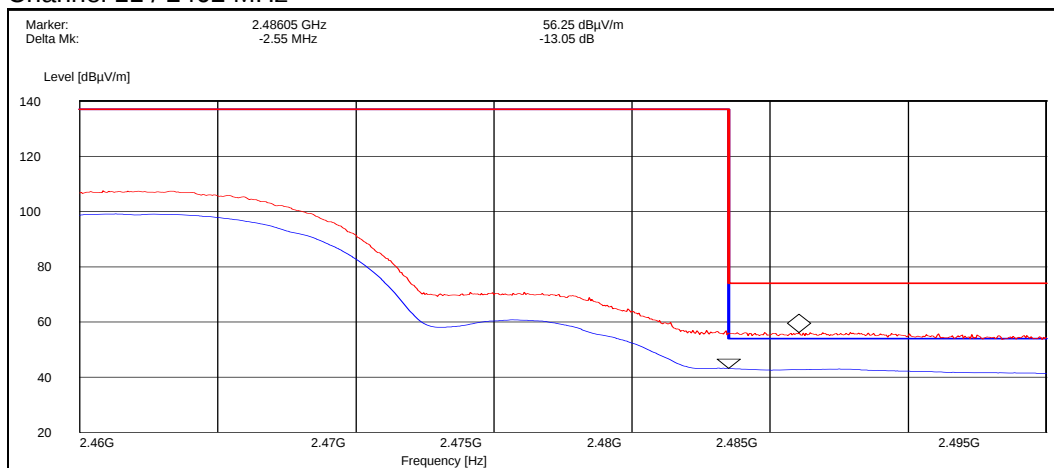
### 4.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

#### Channel 1 / 2412 MHz



| Detector (RBW: 1 MHz) | E [dB $\mu$ V/m] | Result |
|-----------------------|------------------|--------|
| Peak                  | 53.90            | Passed |
| Average               | 40.70            | Passed |

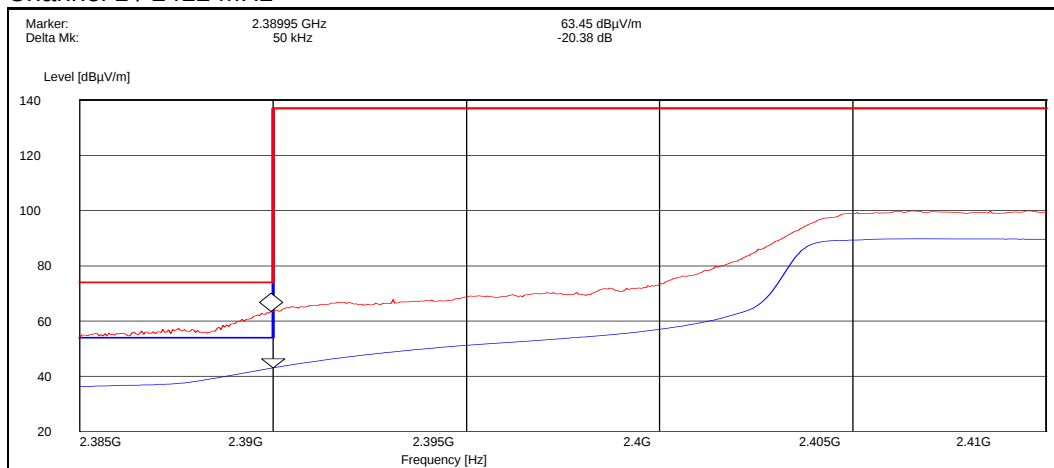
#### Channel 11 / 2462 MHz



| Detector (RBW: 1 MHz) | E [dB $\mu$ V/m] | Result |
|-----------------------|------------------|--------|
| Peak                  | 56.20            | Passed |
| Average               | 43.20            | Passed |

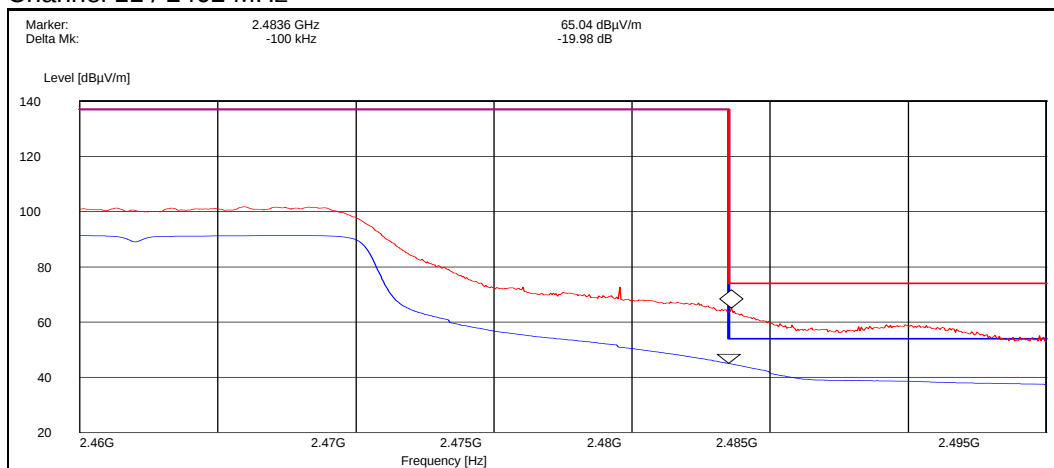
## 4.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

### Channel 1 / 2412 MHz



| Detector (RBW: 1 MHz) | E [dB $\mu$ V/m] | Result |
|-----------------------|------------------|--------|
| Peak                  | 63.50            | Passed |
| Average               | 43.10            | Passed |

### Channel 11 / 2462 MHz



| Detector (RBW: 1 MHz) | E [dB $\mu$ V/m] | Result |
|-----------------------|------------------|--------|
| Peak                  | 65.00            | Passed |
| Average               | 45.10            | Passed |

## 5. Spurious RF conducted emissions (FCC §15.247(d), RSS-210 A8.5)

|                                                        |                                                    |
|--------------------------------------------------------|----------------------------------------------------|
| <b>EUT with DUT number</b>                             | RM-658 DUT 24417                                   |
| <b>Accessories with DUT numbers</b>                    | BP-4L DUT 24444, AC-10 DUT 24446, WH-205 DUT 24880 |
| <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 / 43 / 102.3                                    |
| <b>Date of measurements</b>                            | 12-Mar-2010                                        |
| <b>Measured by</b>                                     | Ruben Hansen                                       |

### 5.1. Test method and limit

The measurement is made according to DTS procedures KDB 558074 and IC standard RSS-210.

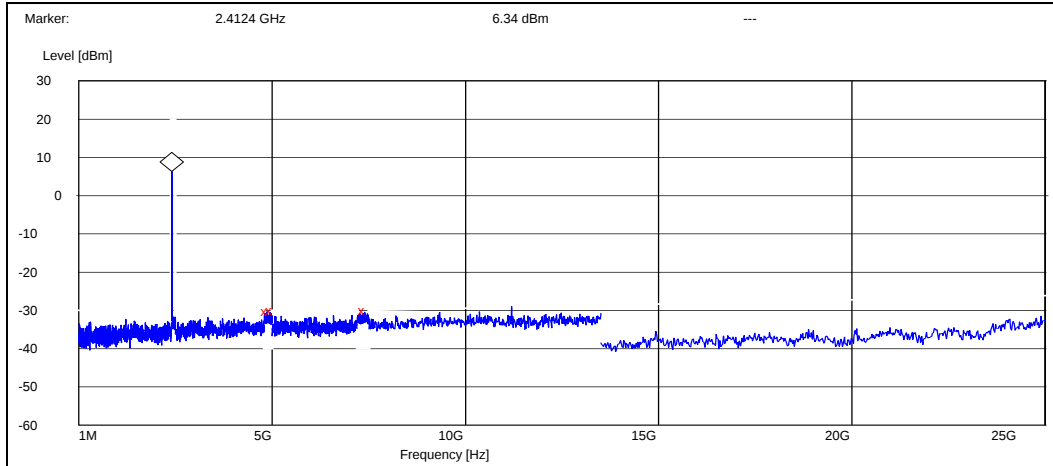
Limits for spurious RF conducted emissions measurements

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

## 5.2. WLAN Test results

### 5.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

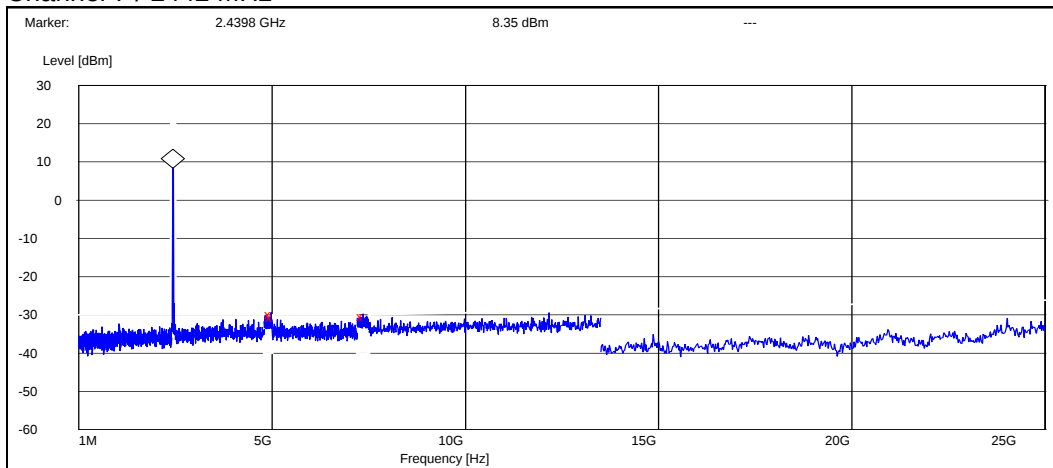
Channel 1 / 2412 MHz



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

| Frequency [MHz] | P [dBc]    | Result |
|-----------------|------------|--------|
| 4878.800000     | -36.543033 | Passed |
| 5000.000000     | -36.343033 | Passed |
| 7389.600000     | -36.343033 | Passed |

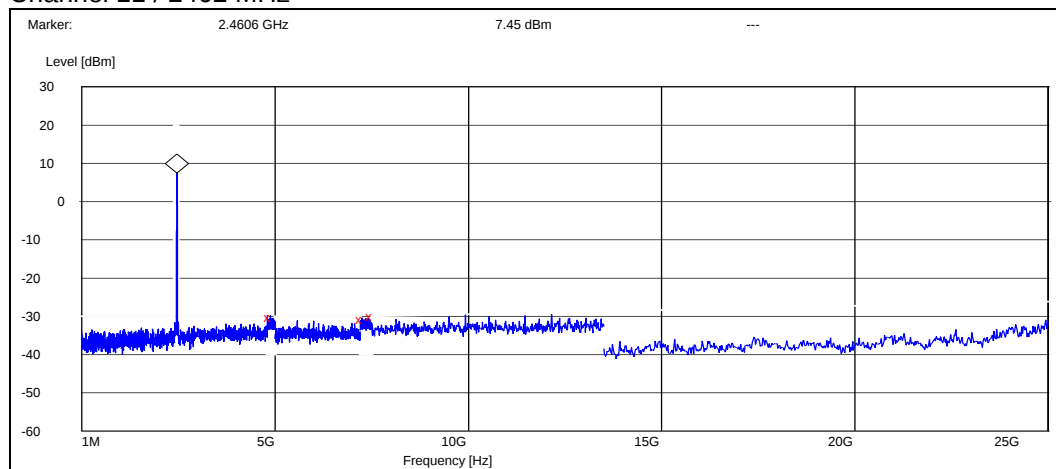
Channel 7 / 2442 MHz



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

| Frequency [MHz] | P [dBc]    | Result |
|-----------------|------------|--------|
| 4978.000000     | -38.348518 | Passed |
| 5000.000000     | -38.948518 | Passed |
| 7360.200000     | -38.648518 | Passed |

## Channel 11 / 2462 MHz

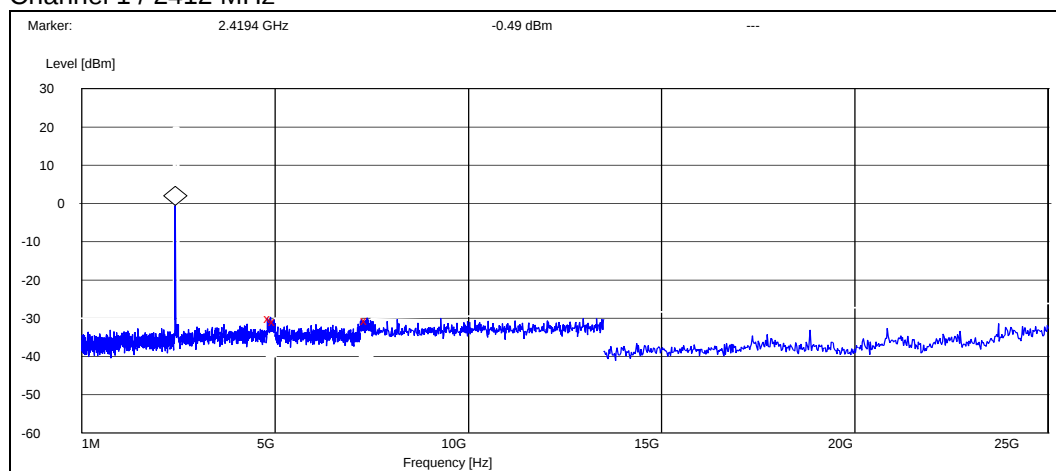


Peak (RBW: 100 kHz, VBW: 100 kHz)

| Frequency [MHz] | P [dBc]    | Result |
|-----------------|------------|--------|
| 4880.400000     | -37.753781 | Passed |
| 7249.200000     | -38.253781 | Passed |
| 7500.000000     | -37.553781 | Passed |

## 5.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

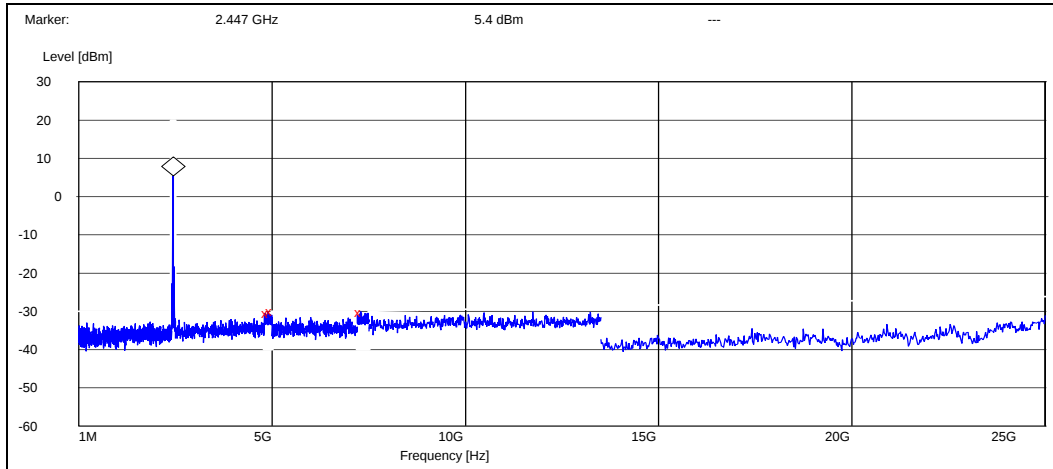
### Channel 1 / 2412 MHz



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

| Frequency [MHz] | P [dBc]    | Result |
|-----------------|------------|--------|
| 4885.200000     | -29.609911 | Passed |
| 5000.000000     | -30.309911 | Passed |
| 7378.200000     | -30.009911 | Passed |

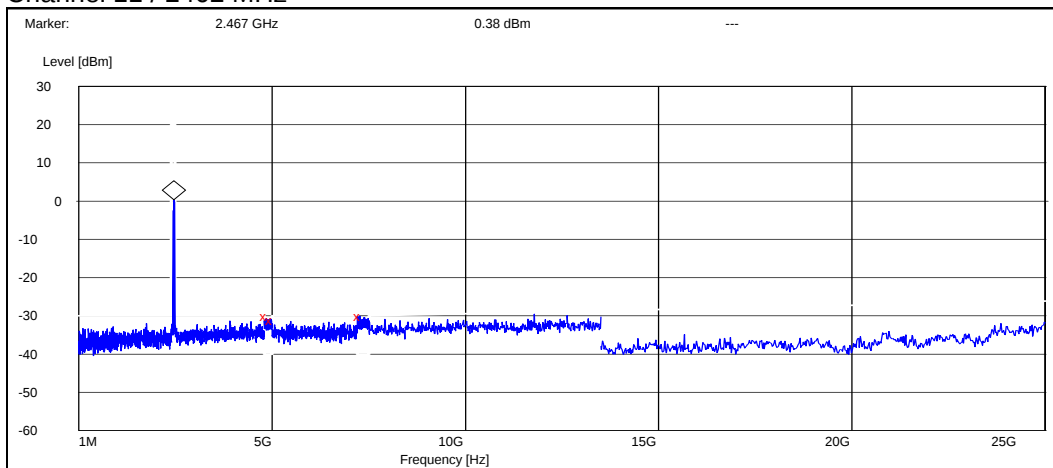
### Channel 7 / 2442 MHz



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

| Frequency [MHz] | P [dBc]    | Result |
|-----------------|------------|--------|
| 4896.800000     | -35.895966 | Passed |
| 5000.000000     | -35.495966 | Passed |
| 7294.200000     | -35.595966 | Passed |

### Channel 11 / 2462 MHz



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

| Frequency [MHz] | P [dBc]    | Result |
|-----------------|------------|--------|
| 4860.000000     | -30.575000 | Passed |
| 5000.000000     | -31.475000 | Passed |
| 7274.400000     | -30.575000 | Passed |

## 6. Spurious radiated emissions (FCC §15.247(d), §15.209, RSS-210 A8.5)

|                                                 |                                                          |
|-------------------------------------------------|----------------------------------------------------------|
| EUT with DUT number                             | RM-658, DUT 24357                                        |
| Accessories with DUT numbers                    | BP-4L, DUT 24450 ; WH-205, DUT 24443 ; AC-10U, DUT 24447 |
| Operation Voltage [V] / [Hz]                    | 115 / 60                                                 |
| Result                                          | Passed                                                   |
| Remarks                                         | None                                                     |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 22 / 38 / 100.2                                          |
| Date of measurements                            | 08-Apr-2010                                              |
| Measured by                                     | Christian Andersen                                       |

### 6.1. Test method and limit

The measurement is made according to DTS procedures KDB 558074 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 ( $A_{TOT} = L_{CABLES} + AF - G_{PREAMP}$ ).

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

| Frequency range [MHz] | Limit [ $\mu\text{V/m}$ ] | Limit [dB $\mu\text{V/m}$ ] | 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       |

## 6.2. WLAN Test results

### 6.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

TX mode, channel 1 / 2412 MHz

Peak (RBW: 1 MHz)

| Frequency [MHz] | E [dB $\mu\text{V/m}$ ] | E [ $\mu\text{V/m}$ ] | U <sub>RX</sub> [dB $\mu\text{V}$ ] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|-------------------------|-----------------------|-------------------------------------|-----------------------|--------------|--------|
| 4824.000000     | 55.00                   | 562.34                | 55.60                               | -0.6                  | HORIZONTAL   | Passed |
| 7236.000000     | 41.70                   | 121.62                | 33.40                               | 8.3                   | HORIZONTAL   | Passed |

Average (RBW: 1 MHz)

| Frequency [MHz] | E [dB $\mu\text{V/m}$ ] | E [ $\mu\text{V/m}$ ] | U <sub>RX</sub> [dB $\mu\text{V}$ ] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|-------------------------|-----------------------|-------------------------------------|-----------------------|--------------|--------|
| 4824.000000     | 38.20                   | 81.28                 | 38.80                               | -0.6                  | HORIZONTAL   | Passed |
| 7236.000000     | 28.70                   | 27.23                 | 20.40                               | 8.3                   | HORIZONTAL   | Passed |

TX mode, channel 7 / 2442 MHz

Quasi peak (RBW: 120 kHz)

| Frequency [MHz] | E [dB $\mu\text{V/m}$ ] | E [ $\mu\text{V/m}$ ] | U <sub>RX</sub> [dB $\mu\text{V}$ ] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|-------------------------|-----------------------|-------------------------------------|-----------------------|--------------|--------|
| 37.835872       | 15.70                   | 6.10                  | 32.00                               | -16.3                 | VERTICAL     | Passed |
| 74.269940       | 29.60                   | 30.20                 | 55.20                               | -25.6                 | HORIZONTAL   | Passed |
| 74.588978       | 29.10                   | 28.51                 | 54.60                               | -25.5                 | HORIZONTAL   | Passed |
| 111.663527      | 27.90                   | 24.83                 | 51.50                               | -23.6                 | HORIZONTAL   | Passed |
| 245.792986      | 16.90                   | 7.00                  | 40.90                               | -24.0                 | VERTICAL     | Passed |

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

| Frequency [MHz] | E [dB $\mu\text{V/m}$ ] | E [ $\mu\text{V/m}$ ] | U <sub>RX</sub> [dB $\mu\text{V}$ ] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|-------------------------|-----------------------|-------------------------------------|-----------------------|--------------|--------|
| 2494.536072     | 51.70                   | 384.59                | 49.20                               | 2.5                   | VERTICAL     | Passed |
| 2502.500000     | 57.20                   | 724.44                | 56.20                               | 1.0                   | VERTICAL     | Passed |
| 4883.767535     | 49.20                   | 288.40                | 49.40                               | -0.2                  | HORIZONTAL   | Passed |
| 7342.181363     | 42.60                   | 134.90                | 33.00                               | 9.6                   | VERTICAL     | Passed |
| 7425.355711     | 43.20                   | 144.54                | 33.90                               | 9.3                   | VERTICAL     | Passed |
| 17493.489980    | 52.50                   | 421.70                | 28.90                               | 23.6                  | HORIZONTAL   | Passed |
| 17887.269539    | 58.70                   | 860.99                | 30.40                               | 28.3                  | VERTICAL     | Passed |

Average (RBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------|----------|------------------------|-----------------------|--------------|--------|
| 2494.536072     | 38.70      | 86.10    | 36.20                  | 2.5                   | VERTICAL     | Passed |
| 2505.500000     | 36.90      | 69.98    | 36.30                  | 0.6                   | VERTICAL     | Passed |
| 4883.767535     | 35.00      | 56.23    | 35.20                  | -0.2                  | HORIZONTAL   | Passed |
| 7337.681363     | 29.50      | 29.85    | 20.10                  | 9.4                   | VERTICAL     | Passed |
| 7427.355711     | 29.90      | 31.26    | 20.50                  | 9.4                   | VERTICAL     | Passed |
| 17494.489980    | 39.60      | 95.50    | 16.00                  | 23.6                  | HORIZONTAL   | Passed |
| 17888.269539    | 45.40      | 186.21   | 17.00                  | 28.4                  | VERTICAL     | Passed |

TX mode, channel 11 / 2462 MHz

Peak (RBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------|----------|------------------------|-----------------------|--------------|--------|
| 4924.000000     | 54.00      | 501.19   | 54.00                  | 0.0                   | HORIZONTAL   | Passed |
| 7386.000000     | 43.20      | 144.54   | 33.00                  | 10.2                  | VERTICAL     | Passed |

Average (RBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------|----------|------------------------|-----------------------|--------------|--------|
| 4924.000000     | 36.90      | 69.98    | 36.90                  | 0.0                   | HORIZONTAL   | Passed |
| 7386.000000     | 31.80      | 38.90    | 21.60                  | 10.2                  | HORIZONTAL   | Passed |

## 6.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

TX mode, channel 1 / 2412 MHz

Peak (RBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------|----------|------------------------|-----------------------|--------------|--------|
| 4824.000000     | 49.00      | 281.84   | 49.60                  | -0.6                  | HORIZONTAL   | Passed |
| 7236.000000     | 41.40      | 117.49   | 33.10                  | 8.3                   | VERTICAL     | Passed |

Average (RBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------|----------|------------------------|-----------------------|--------------|--------|
| 4824.000000     | 30.90      | 35.08    | 31.50                  | -0.6                  | HORIZONTAL   | Passed |
| 7236.000000     | 28.30      | 26.00    | 20.00                  | 8.3                   | VERTICAL     | Passed |

TX mode, channel 7 / 2442 MHz

Quasi peak (RBW: 120 kHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------|----------|------------------------|-----------------------|--------------|--------|
| 73.948497       | 29.50      | 29.85    | 55.10                  | -25.6                 | HORIZONTAL   | Passed |
| 74.569940       | 27.70      | 24.27    | 53.30                  | -25.6                 | HORIZONTAL   | Passed |
| 111.782565      | 27.00      | 22.39    | 50.60                  | -23.6                 | HORIZONTAL   | Passed |

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

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------|----------|------------------------|-----------------------|--------------|--------|
| 2378.513026     | 53.20      | 457.09   | 53.50                  | -0.3                  | VERTICAL     | Passed |
| 2386.228457     | 66.80      | 2187.76  | 66.60                  | 0.2                   | VERTICAL     | Passed |
| 2492.512024     | 62.60      | 1348.96  | 57.80                  | 4.8                   | HORIZONTAL   | Passed |
| 2497.548096     | 62.00      | 1258.93  | 60.40                  | 1.6                   | HORIZONTAL   | Passed |
| 2500.000000     | 60.00      | 1000.00  | 58.80                  | 1.2                   | HORIZONTAL   | Passed |
| 4884.769539     | 45.90      | 197.24   | 46.10                  | -0.2                  | HORIZONTAL   | Passed |
| 4886.267535     | 44.20      | 162.18   | 44.40                  | -0.2                  | HORIZONTAL   | Passed |
| 7331.157315     | 42.50      | 133.35   | 33.40                  | 9.1                   | HORIZONTAL   | Passed |
| 7387.271543     | 42.70      | 136.46   | 32.50                  | 10.2                  | VERTICAL     | Passed |
| 17451.903808    | 52.50      | 421.70   | 29.00                  | 23.5                  | VERTICAL     | Passed |
| 17915.823647    | 59.30      | 922.57   | 30.30                  | 29.0                  | VERTICAL     | Passed |

Average (RBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------|----------|------------------------|-----------------------|--------------|--------|
| 2384.228457     | 38.70      | 86.10    | 38.60                  | 0.1                   | VERTICAL     | Passed |
| 2496.048096     | 40.90      | 110.92   | 39.10                  | 1.8                   | HORIZONTAL   | Passed |
| 2498.012024     | 40.10      | 101.16   | 38.60                  | 1.5                   | HORIZONTAL   | Passed |
| 2503.000000     | 38.00      | 79.43    | 37.10                  | 0.9                   | HORIZONTAL   | Passed |
| 4882.769539     | 31.60      | 38.02    | 31.80                  | -0.2                  | HORIZONTAL   | Passed |
| 4886.767535     | 31.30      | 36.73    | 31.50                  | -0.2                  | HORIZONTAL   | Passed |
| 7330.657315     | 29.30      | 29.17    | 20.30                  | 9.0                   | HORIZONTAL   | Passed |
| 7389.271543     | 29.80      | 30.90    | 19.60                  | 10.2                  | VERTICAL     | Passed |
| 17448.903808    | 39.70      | 96.61    | 16.20                  | 23.5                  | VERTICAL     | Passed |
| 17908.823647    | 45.60      | 190.55   | 16.70                  | 28.9                  | VERTICAL     | Passed |

TX mode, channel 11 / 2462 MHz

Peak (RBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------|----------|------------------------|-----------------------|--------------|--------|
| 4924.000000     | 41.60      | 120.23   | 41.60                  | 0.0                   | HORIZONTAL   | Passed |
| 7386.000000     | 42.80      | 138.04   | 32.60                  | 10.2                  | VERTICAL     | Passed |

Average (RBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------|----------|------------------------|-----------------------|--------------|--------|
| 4924.000000     | 28.30      | 26.00    | 28.30                  | 0.0                   | HORIZONTAL   | Passed |
| 7386.000000     | 30.00      | 31.62    | 19.80                  | 10.2                  | VERTICAL     | Passed |

## 7. AC powerline conducted emissions (FCC §15.207, RSS-GEN 7.2.2)

|                                                        |                                                    |
|--------------------------------------------------------|----------------------------------------------------|
| <b>EUT with DUT number</b>                             | RM-658 DUT 24455                                   |
| <b>Accessories with DUT numbers</b>                    | BP-4L DUT 24451, AC10U DUT 24440, WH-205 DUT 24436 |
| <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> | 23 / 38 / 101                                      |
| <b>Date of measurements</b>                            | 12-March-2010                                      |
| <b>Measured by</b>                                     | Bo Moltved Christiansen                            |

### 7.1. Test method and limit

The measurement is made according to DTS procedures KDB 558074 and IC standard RSS-GEN 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.

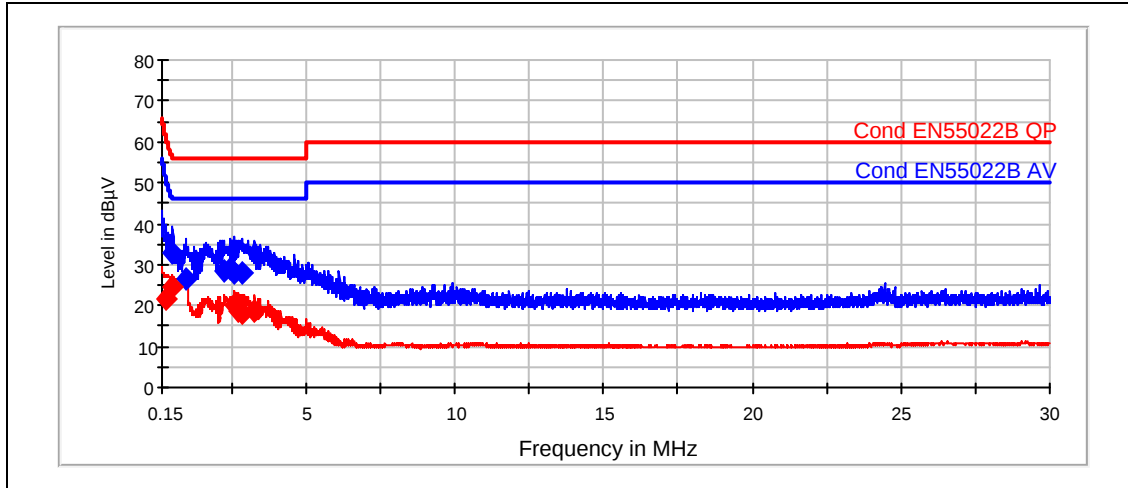
CISPR 22 Class B limits

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

## 7.2. WLAN Test results

### 7.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel 7 / 2442 MHz



Quasi peak

| Frequency[MHz] | Level [dBμV] | Line | Result |
|----------------|--------------|------|--------|
| 0.505          | 32.93        | N    | Passed |
| 0.955          | 26.35        | N    | Passed |
| 2.225          | 28.59        | N    | Passed |
| 2.435          | 29.06        | N    | Passed |
| 2.595          | 27.89        | N    | Passed |
| 2.85           | 27.98        | N    | Passed |

Average

| Frequency[MHz] | Level [dBμV] | Line | Result |
|----------------|--------------|------|--------|
| 0.29           | 21.82        | N    | Passed |
| 0.505          | 24.37        | N    | Passed |
| 2.595          | 20.11        | N    | Passed |
| 2.695          | 18.88        | N    | Passed |
| 2.85           | 18.15        | N    | Passed |
| 3.28           | 18.81        | N    | Passed |

## 8. 6 dB bandwidth (FCC §15.247(a)(2), RSS-210 A8.2 (a))

|                                                        |                                                     |
|--------------------------------------------------------|-----------------------------------------------------|
| <b>EUT with DUT number</b>                             | RM-658 DUT 24417                                    |
| <b>Accessories with DUT numbers</b>                    | BP-4L DUT 24444, AC-10U DUT 24446, WH-205 DUT 24880 |
| <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 / 43 / 102.3                                     |
| <b>Date of measurements</b>                            | 12-Mar-2010                                         |
| <b>Measured by</b>                                     | Ruben Hansen                                        |

### 8.1. Test method and limit

The measurement is made according to DTS procedures KDB 558074 and IC standard RSS-210.

Limits for 6 dB bandwidth measurements

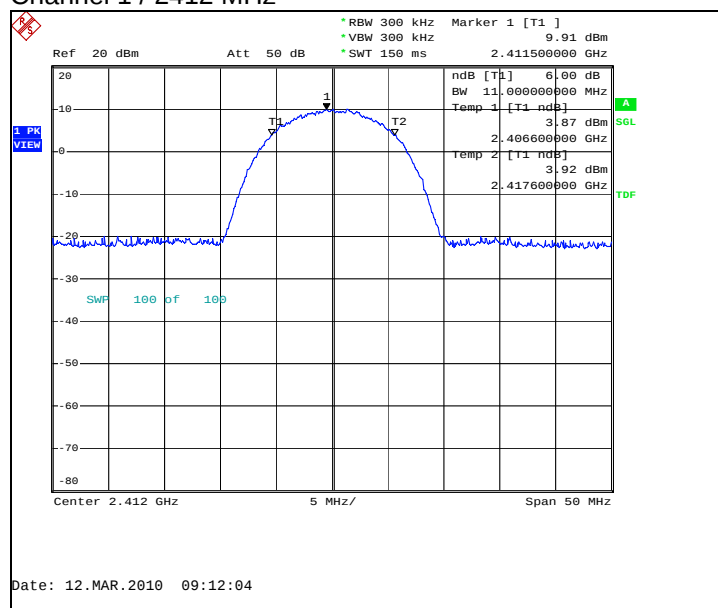
| <b>Limit [kHz]</b> |
|--------------------|
| ≥ 500              |

## 8.2. WLAN test results

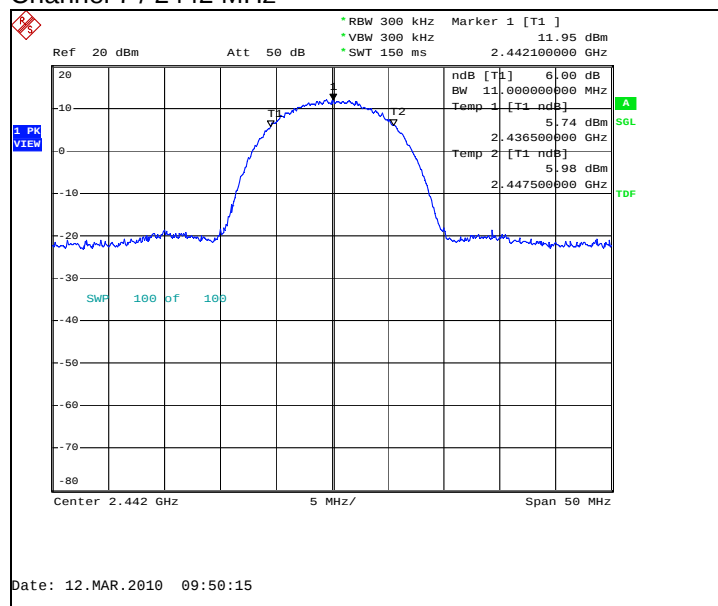
### 8.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

| Channel / $f_c$ [MHz] | 6 dB bandwidth [kHz] | Result |
|-----------------------|----------------------|--------|
| 1                     | 11000.000            | Passed |
| 7                     | 11000.000            | Passed |
| 11                    | 10900.000            | Passed |

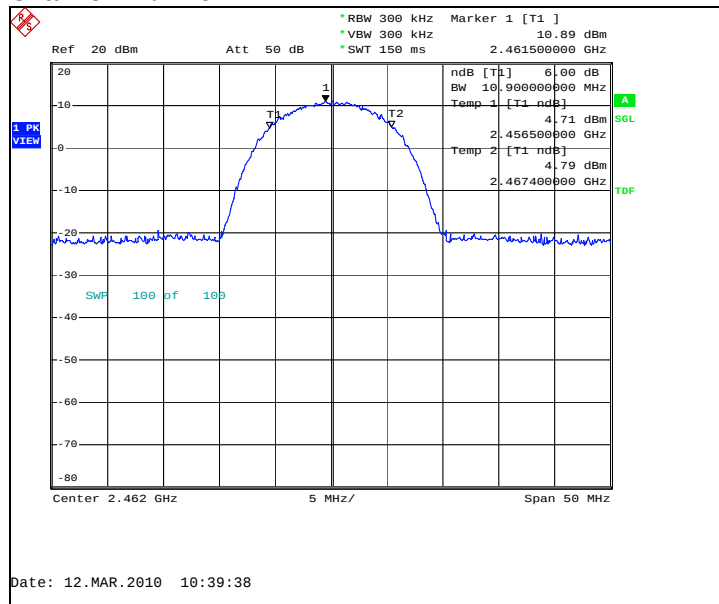
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



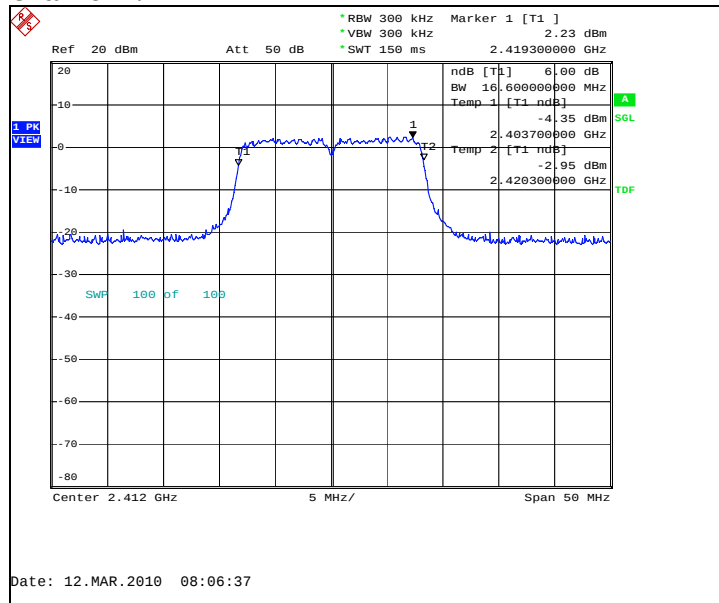
## Channel 11 / 2462 MHz



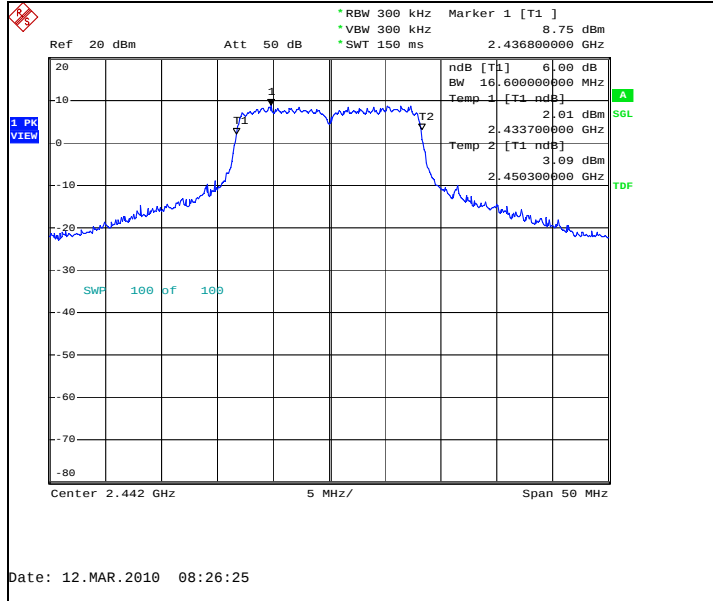
## 8.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

| Channel / f <sub>c</sub> [MHz] | 6 dB bandwidth [kHz] | Result |
|--------------------------------|----------------------|--------|
| 1                              | 16600.000            | Passed |
| 7                              | 16600.000            | Passed |
| 11                             | 16600.000            | Passed |

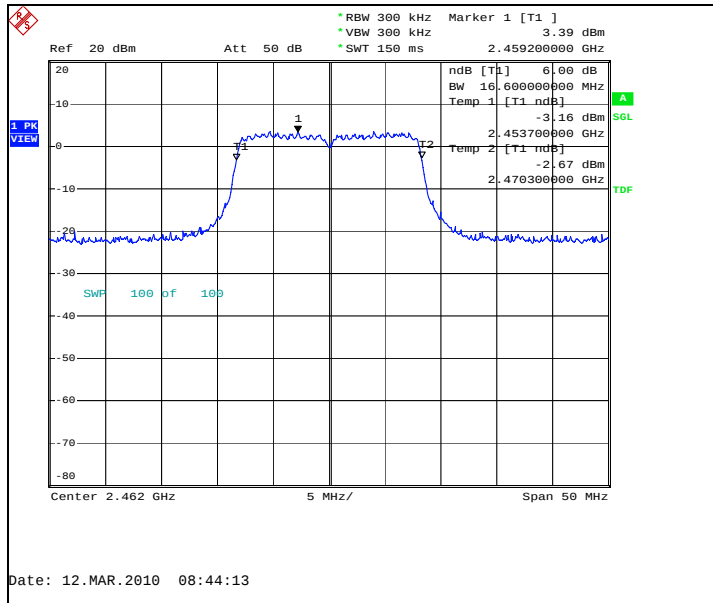
## Channel 1 / 2412 MHz



### Channel 7 / 2442 MHz



### Channel 11 / 2462 MHz



## 9. Power spectral density (FCC §15.247(e), RSS-210 A8.2 (b))

|                                                 |                                                    |
|-------------------------------------------------|----------------------------------------------------|
| EUT with DUT number                             | RM-658 DUT 24417                                   |
| Accessories with DUT numbers                    | BP-4L DUT 24444, AC-10 DUT 24446, WH-205 DUT 24880 |
| Operation Voltage [V] / [Hz]                    | 115 / 60                                           |
| Result                                          | Passed                                             |
| Remarks                                         | None                                               |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 24 / 43 / 102.3                                    |
| Date of measurements                            | 12-Mar-2010                                        |
| Measured by                                     | Ruben Hansen                                       |

### 9.1. Test method and limit

The measurement is made according to DTS procedures KDB 558074 and IC standard RSS-210.

Limits for power spectral density measurements

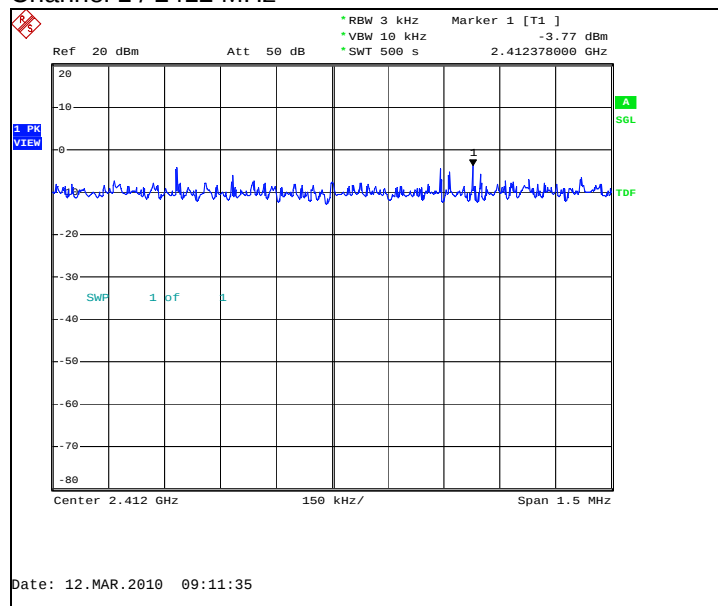
| Limit [dBm] @ 3 kHz |
|---------------------|
| ≤ 8                 |

## 9.2. WLAN test results

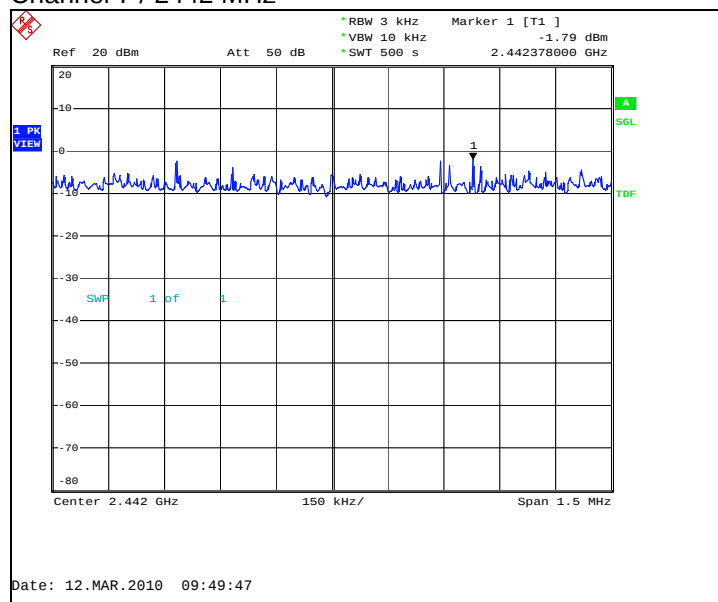
### 9.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

| Frequency   | Level | Transd | Spectr Density |
|-------------|-------|--------|----------------|
| 2412.000000 | -3.77 | 17.0   | Passed         |

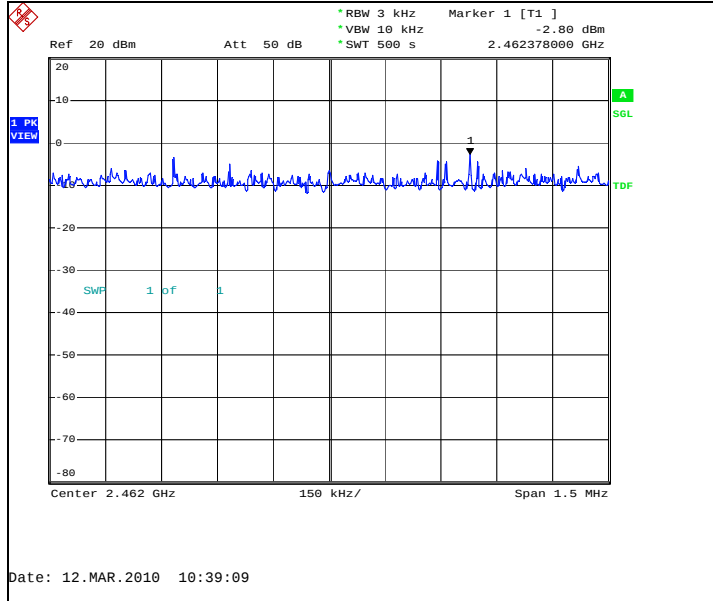
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



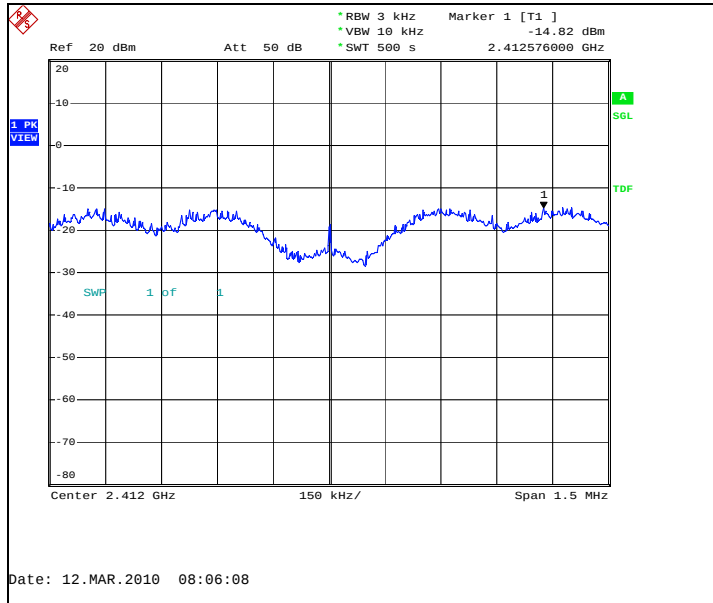
### Channel 11 / 2462 MHz



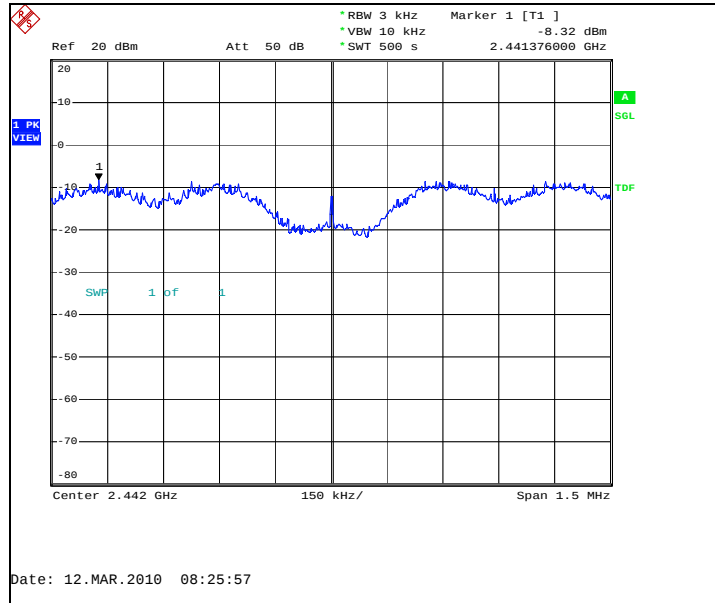
### 9.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

| Frequency   | Level  | Transd | Spectr Density |
|-------------|--------|--------|----------------|
| 2412.000000 | -14.82 | 17.0   | Passed         |

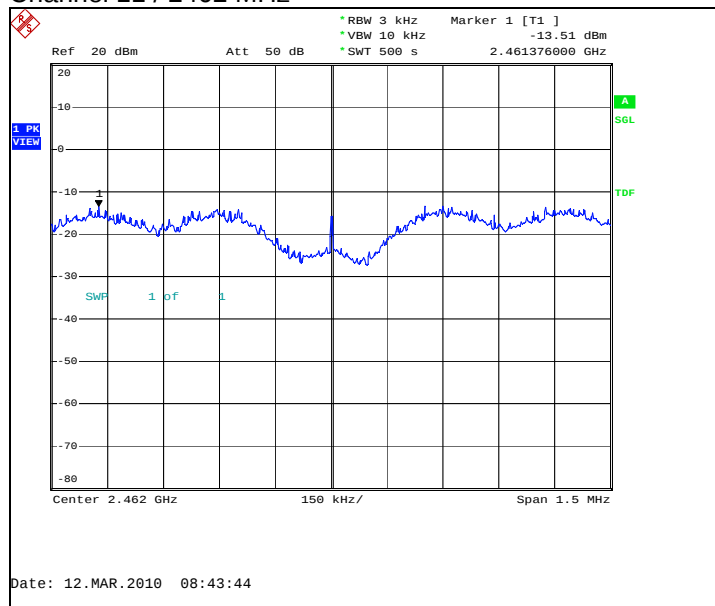
### Channel 1 / 2412 MHz



### Channel 7 / 2442 MHz



### Channel 11 / 2462 MHz



## 10. Test Equipment

### 10.1. Conducted measurements

| Eq. No | Equipment                                      | Type      | Manufacturer    | Used in            |
|--------|------------------------------------------------|-----------|-----------------|--------------------|
| 13037  | Power Supply 0-15V 10A                         | EA3012    | LP Instruments  | 15C, 15B           |
| 13513  | Pulse Limiter 9KHz-30MHz                       | ESH3Z2    | Rohde&Schwarz   | 15C, 15B           |
| 13666  | EMI Test Reciever 9KHz-2,5GHz                  | ESPC      | Rohde&Schwarz   | 15C, 15B           |
| 13935  | Two Lines Artificial Mains Network             | 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  | Universal Radio Communication Tester           | CMU200    | Rohde&Schwarz   | 15C, 15B           |
| 11386  | System DC Power Supply                         | HP6632A   | Hewlett Packard | 22/24/27, 15C, 15B |
| 19678  | Spectrum Analyzer 26 GHz                       | FSP       | Rohde&Schwarz   | 22/24/27, 15C, 15B |
| 16601  | Universal Radio Communication Tester           | CMU200    | Rohde&Schwarz   | 22/24/27, 15C, 15B |
| 19625  | Vötsch Climatic Chamber                        | VT4002EMC | Vötsch          | 22/24/27, 15C, 15B |
| 13357  | Rohde & Schwartz Signal Generator              | SMP02     | Rohde&Schwarz   | 22/24/27, 15C, 15B |
| 20168  | Bluetooth EDR Tester                           | CBT       | Rohde&Schwarz   | 22/24/27, 15C, 15B |

### 10.2. Radiated measurements

| Eq. No | Equipment                                      | Type          | Manufacturer  | Used in            |
|--------|------------------------------------------------|---------------|---------------|--------------------|
| 18416  | Universal Radio Communication Tester           | CMU200        | Rohde&Schwarz | 22/24/27, 15C, 15B |
|        | Programmable Relay Switching System            | -----         | Pickering     | 22/24/27, 15C, 15B |
| 15742  | Programmable Relay Switching System            | -----         | Pickering     | 22/24/27, 15C, 15B |
| 14020  | Power Supply Module Relay Switching System 45W | 10-910-002    | Pickering     | 22/24/27, 15C, 15B |
| 15743  | Power Supply Module Relay Switching System 50W | 10-910L-001   | Pickering     | 22/24/27, 15C, 15B |
| 16490  | RS-232/IEEE-488.2 Interface                    | 10-921-001    | Pickering     | 22/24/27, 15C, 15B |
|        | RS-232/IEEE-488.2 Interface                    | 10-921-001    | 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 |
| 18792  | Multi Device Controller                        | 2090          | ETS-EMCO      | 22/24/27, 15C, 15B |
| 14963  | RF Preamplifier 100MHz-4GHz (Metal Chassis)    | AFS3-00100400 | Miteq/NMP Cph | 22/24/27, 15C, 15B |
| 18861  | EMI Test Receiver 20Hz-26,5GHz                 | ESI           | Rohde&Schwarz | 22/24/27, 15C, 15B |
| 20335  | Ultra Broadband Antenna Ultralog 30-3000MHz    | HL562         | Rohde&Schwarz | 22/24/27, 15C, 15B |
| 18773  | Shielded Chamber                               | RFD-100       | ETS-Lindgren  | 22/24/27, 15C, 15B |
| 18774  | Shielded Chamber                               | RFSD-F/A-100  | ETS-Lindgren  | 22/24/27, 15C, 15B |
| 19151  | High Pass Filter 3GHz                          | WHJS3000-10SS | Wainwright    | 22/24/27, 15C, 15B |

| Eq. No | Equipment                                   | Type                            | Manufacturer           | Used in            |
|--------|---------------------------------------------|---------------------------------|------------------------|--------------------|
|        | WHK3.0/18G-10ss                             |                                 |                        |                    |
| 13937  | Ultra Stable Notch Filter 850MHz            | WRCA902.4-0.2/40-6SS            | Wainwright Instruments | 22/24/27, 15C, 15B |
| 13936  | Ultra Stable Notch Filter 1747,5MHz         | 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  | Ultra Stable Notch Filter 902,4MHz          | WRCA902.4-0.2/40-6SS            | Wainwright             | 22/24/27, 15C, 15B |
| 14187  | Ultra Stable Notch Filter 1747,5MHz         | WRCD1747.5-0.2/40-10SS          | Wainwright             | 22/24/27, 15C, 15B |
| 16633  | Ultra Stable Notch Filter 1880,0MHz         | WRCD1880.0-0.2/40-10SS          | Wainwright             | 22/24/27, 15C, 15B |
| 19587  | BT/WLAN Band Reject Filter                  | WRCG2400/2483-2390/2493-35/10SS | Wainwright             | 22/24/27, 15C, 15B |
| 20115  | WDCMA Band 2 filter                         |                                 | Wainwright             | 24, 15C, 15B       |
| 20114  | WDCMA Band 4 filter                         | WRCG1737/1743-1733/1747-40/6SS  | Wainwright             | 27, 15C, 15B       |
| 20116  | WDCMA Band 5&6 filter                       | WRCG832/83/-825/845-40/5SS      | Wainwright             | 22, 15C, 15B       |
| 18323  | Band reject filter 1947-1953MHz 40dB        | WRCG1947/1953-1940/1960-40/6SS  | Wainwright             | 22/24/27, 15C, 15B |
| 20031  | Double Ridged Broadband Horn                | BBHA 9120 D                     | SCHWARZBECK            | 22/24/27, 15C, 15B |
| 19966  | Magnetic Loop Antenna 9 kHz - 30 MHz        | HFH2-Z2                         | Rohde&Schwarz          | 15C, 15B           |
| 14993  | EMI Test Receiver 9KHz-2750MHz              | ESCS30                          | 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 |
| 19374  | Resonant Dipole Antenna 850MHz SMA m Conn.  | -----                           | NMP Cph                | 22/24/27, 15C, 15B |
| 19375  | Resonant Dipole Antenna 1900MHz SMA m Conn. | -----                           | NMP Cph                | 22/24/27, 15C, 15B |
| 20168  | Bluetooth EDR Tester                        | CBT                             | Rohde&Schwarz          | 22/24/27, 15C, 15B |