

## FCC Part 15C Compliance Test Report

|                                                         |                                                                                                                                                                                                                                                                                 |                                   |                                                                                                                                                   |
|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test Report no.:</b>                                 | FCC15CWLAN_RM-820_05.docx                                                                                                                                                                                                                                                       | <b>Date of Report:</b>            | 28-Aug-2012                                                                                                                                       |
| <b>Number of pages:</b>                                 | 34                                                                                                                                                                                                                                                                              | <b>Customer's Contact person:</b> | Vaattovaara Lasse                                                                                                                                 |
| <b>Testing laboratory:</b>                              | TCC Nokia Tampere Laboratory<br>P.O. Box 68<br>Sinitaival 5<br>FIN-33720 TAMPERE, FINLAND<br>Tel. +358 (0) 7180 46800<br>Fax. +358 (0) 7180 46880                                                                                                                               | <b>Customer:</b>                  | Nokia Corporation<br>P.O.Box(86)<br>Joensuunkatu 7H / Kiila 1B<br>FIN-24101 SALO, FINLAND<br>Tel. +358 (0) 7180 08000<br>Fax. +358 (0) 7180 45220 |
| <b>FCC listing no.:</b>                                 | 94436                                                                                                                                                                                                                                                                           |                                   |                                                                                                                                                   |
| <b>IC recognition no.:</b>                              | 661AK-1                                                                                                                                                                                                                                                                         |                                   |                                                                                                                                                   |
| <b>Tested devices/ accessories:</b>                     | Phone RM-820, Battery BP-4GW                                                                                                                                                                                                                                                    |                                   |                                                                                                                                                   |
| <b>FCC ID:</b>                                          | PYAA                                                                                                                                                                                                                                                                            | <b>IC:</b>                        | 661V-A                                                                                                                                            |
| <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), DTS procedures KDB 558074, IC standards, RSS-210 (Issue 8, December 2010). 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>                                    | The EUT complies with the requirements in respect of all parameters subject to the test. The test results relate only to devices specified in this document                                                                                                                     |                                   |                                                                                                                                                   |
| <b>Date and signature for the contents:</b>             |                                                                                                                                                                                                                                                                                 |                                   |                                                                                                                                                   |

Sami Lehtonen, System Specialist, EMC

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

|                               |                                                                      |
|-------------------------------|----------------------------------------------------------------------|
| Date of receipt               | 20-Jun-2012                                                          |
| Testing completed             | 28-Jun-2012                                                          |
| The customer's contact person | Vaattovaara Lasse                                                    |
| Test Plan referred to         | T:\Projects\RM-820\TestPlan\RS_testplan_RM-820_EMCC_FCC_SAR_HAC.xlsm |
| Notes                         | -                                                                    |
| Document name                 | T:\Projects\RM-820\EMC\FCC15CWLAN_RM-820_05.docx                     |

### 1.1. EUT and Accessory Information

The EUT is a mobile phone with following features:  
GSM/WCDMA/WLAN/Bluetooth  
The EUT is tested with maximum rated TX power.

Devices under tests

| Product | Type   | SN              | HW   | MV | SW | DUT   |
|---------|--------|-----------------|------|----|----|-------|
| Phone   | RM-820 | 004402138708866 | 2003 | -  | -  | 42835 |
| Battery | BP-4GW | -               | -    | -  | -  | -     |

### 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(0.4(4))                    | Conducted peak output power          | PASSED |
| 15.247(d), 15.205(b) | A8(0.5)                       | Band edge compliance of RF emissions | -      |
| 15.247(d)            | A8(0.5)                       | Spurious RF conducted emissions      | PASSED |
| 15.247(d), 15.209    | A8(0.5)                       | Spurious radiated emissions          | -      |
| 15.207               | 7.2.2                         | AC powerline conducted emissions     | -      |
| 15.247(a)(2)         | A8(0.1(1))                    | 6dB(bandwidth)                       | PASSED |
| 15.247(e)            | A8(0.1(2))                    | 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 Laboratory.

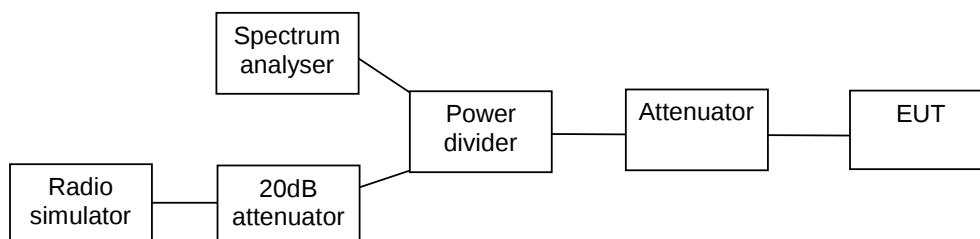
## CONTENTS

|                                                                                   |           |
|-----------------------------------------------------------------------------------|-----------|
| <b>1. Summary for FCC Part 15C Compliance Test Report.....</b>                    | <b>2</b>  |
| 1.1. EUT and Accessory Information.....                                           | 2         |
| 1.2. Summary of Test Results.....                                                 | 2         |
| <b>2. Conducted peak output power<br/>(15.247(b)(1), RSS-210 A8.4 (4)) .....</b>  | <b>4</b>  |
| 2.1. Test Setup.....                                                              | 4         |
| 2.2. Test method and limit.....                                                   | 4         |
| 2.3. WLAN Test results .....                                                      | 5         |
| <b>3. Spurious RF conducted emissions<br/>(FCC §15.247(d), RSS-210 A8.5).....</b> | <b>12</b> |
| 3.1. Test Setup.....                                                              | 12        |
| 3.2. Test method and limit.....                                                   | 12        |
| 3.3. WLAN Test results .....                                                      | 13        |
| <b>4. 6 dB bandwidth<br/>(FCC §15.247(a)(2), RSS-210 A8.2 (1)).....</b>           | <b>19</b> |
| 4.1. Test Setup.....                                                              | 19        |
| 4.2. Test method and limit.....                                                   | 19        |
| 4.3. WLAN Test results .....                                                      | 20        |
| <b>5. Power spectral density<br/>(FCC §15.247(e), RSS-210 A8.2 (2)) .....</b>     | <b>26</b> |
| 5.1. Test Setup.....                                                              | 26        |
| 5.2. Test method and limit.....                                                   | 26        |
| 5.3. WLAN Test results .....                                                      | 27        |
| <b>6. Test Equipment.....</b>                                                     | <b>33</b> |
| 6.1. Conducted measurements .....                                                 | 33        |
| 6.2. Radiated measurements .....                                                  | 34        |

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

|                                                 |                   |
|-------------------------------------------------|-------------------|
| EUT with DUT number                             | RM-820, DUT 42835 |
| Accessories with DUT numbers                    | BP-4GW            |
| Operation Voltage [V] / [Hz]                    | Nominal           |
| Results                                         | PASSED            |
| Remarks                                         | -                 |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 22 / 47 / 100     |
| Date of measurements                            | 28-Jun-2012       |
| Measured by                                     | Hannu Söderholm   |

### 2.1. Test Setup



### 2.2. 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

| Frequency range [MHz]        | Limit [W] | Limit [dBm] |
|------------------------------|-----------|-------------|
| 2400 – 2483.5<br>5725 - 5850 | <= 1      | <= 30       |

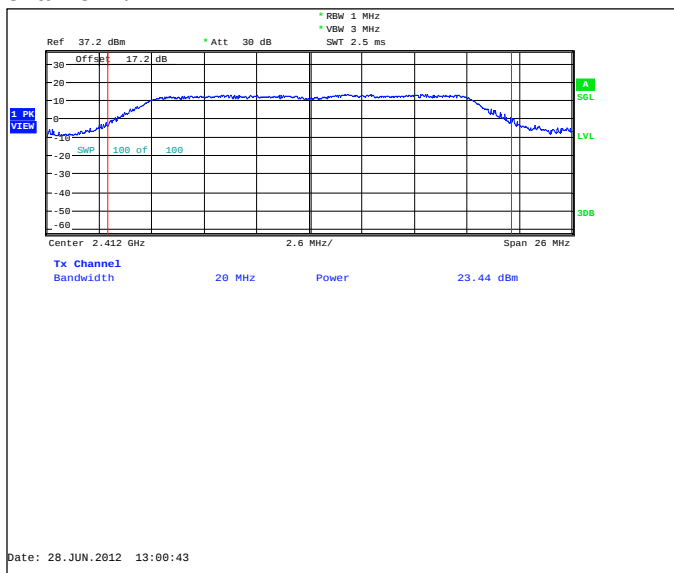
## 2.3. WLAN Test results

| WLAN 2.4 GHz, peak output power [dBm] |       |
|---------------------------------------|-------|
| Mode & data speed                     | Ch 6  |
| b-mode WLAN DSSS 1 Mbps               | 19.09 |
| b-mode WLAN DSSS 2 Mbps               | 19.29 |
| b-mode WLAN DSSS 5.5 Mbps             | 20.88 |
| b-mode WLAN DSSS 11 Mbps              | 22.00 |
| g-mode WLAN OFDM 6 Mbps               | 23.92 |
| g-mode WLAN OFDM 9 Mbps               | 23.85 |
| g-mode WLAN OFDM 12 Mbps              | 22.36 |
| g-mode WLAN OFDM 18 Mbps              | 22.51 |
| g-mode WLAN OFDM 24 Mbps              | 21.33 |
| g-mode WLAN OFDM 36 Mbps              | 20.87 |
| g-mode WLAN OFDM 48 Mbps              | 19.90 |
| g-mode WLAN OFDM 54 Mbps              | 20.30 |
| n-mode MCS 0: OFDM 6.5 / 7.25 Mbps    | 22.81 |
| n-mode MCS 1: OFDM 13.0 / 14.4 Mbps   | 22.31 |
| n-mode MCS 2: OFDM 19.5 / 21.7 Mbps   | 22.42 |
| n-mode MCS 3: OFDM 26.0 / 28.9 Mbps   | 20.68 |
| n-mode MCS 4: OFDM 39.0 / 43.3 Mbps   | 21.33 |
| n-mode MCS 5: OFDM 52.0 / 57.8 Mbps   | 18.96 |
| n-mode MCS 6: OFDM 58.5 / 65.0 Mbps   | 18.84 |
| n-mode MCS 7: OFDM 65.0 / 72.2 Mbps   | 18.78 |
| n-mode MCS 0: OFDM 13.5 / 15.0 Mbps   | 22.77 |
| n-mode MCS 1: OFDM 27.0 / 30.0 Mbps   | 22.38 |
| n-mode MCS 2: OFDM 40.5 / 45.0 Mbps   | 22.34 |
| n-mode MCS 3: OFDM 54.0 / 60.0 Mbps   | 20.75 |
| n-mode MCS 4: OFDM 81.0 / 90.0 Mbps   | 21.08 |
| n-mode MCS 5: OFDM 108.0 / 120.0 Mbps | 19.00 |
| n-mode MCS 6: OFDM 121.5 / 135.0 Mbps | 18.37 |
| n-mode MCS 7: OFDM 135.0 / 150.0 Mbps | 18.69 |

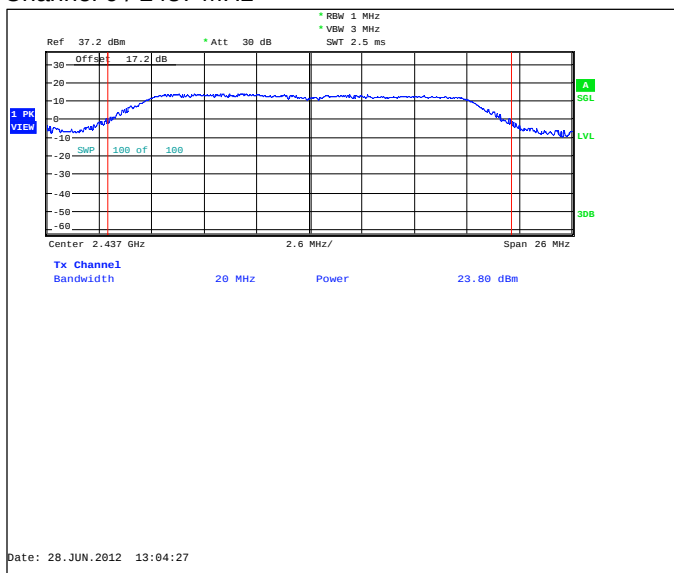
### 2.3.1 OFDM mode, QPSK modulation, 6 Mbps data rate

| Channel / f <sub>c</sub> [MHz] | P [dBm] | P [mW]  | Result |
|--------------------------------|---------|---------|--------|
| 1 / 2412                       | 23.44   | 220.8   | PASSED |
| 6 / 2437                       | 23.8    | 239.883 | PASSED |
| 11 / 2462                      | 23.54   | 225.944 | PASSED |

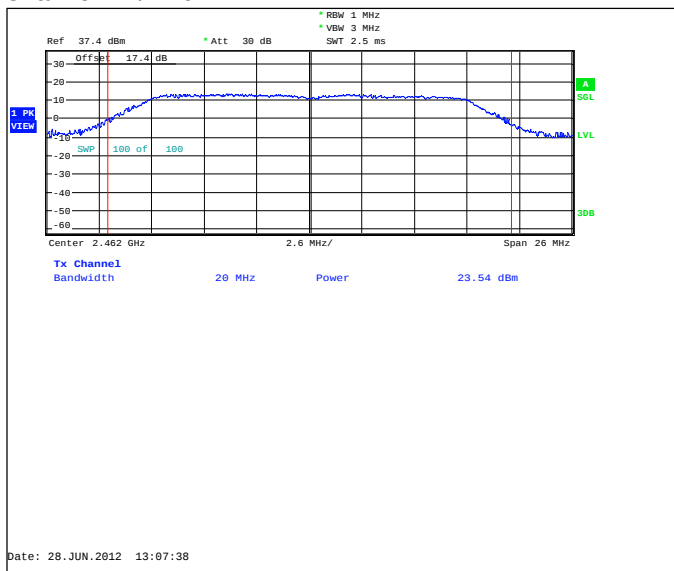
## Channel 1 / 2412 MHz



## Channel 6 / 2437 MHz



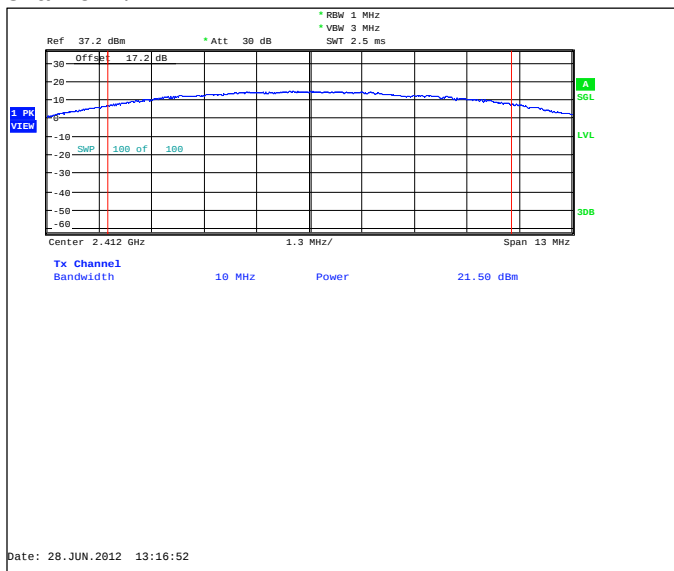
## Channel 11 / 2462 MHz



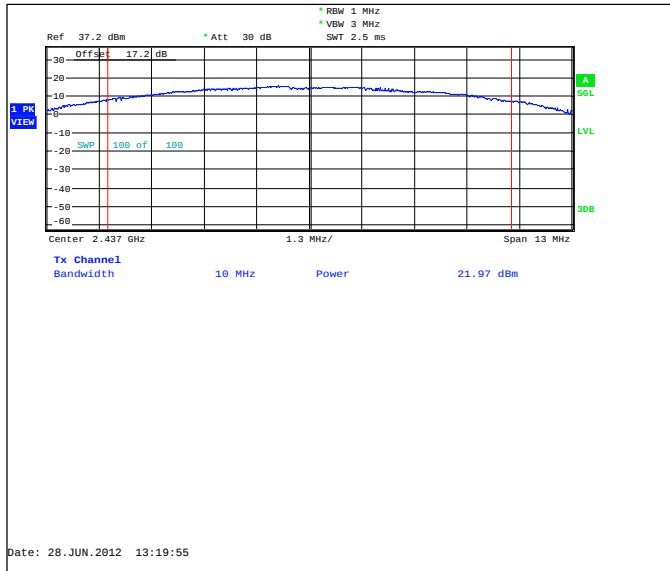
## 2.3.2 DSSS mode, QPSK modulation, 11 Mbps data rate

| Channel / $f_c$ [MHz] | P [dBm] | P [mW]  | Result |
|-----------------------|---------|---------|--------|
| 1 / 2412              | 21.5    | 141.254 | PASSED |
| 6 / 2437              | 21.97   | 157.398 | PASSED |
| 11 / 2462             | 21.81   | 151.705 | PASSED |

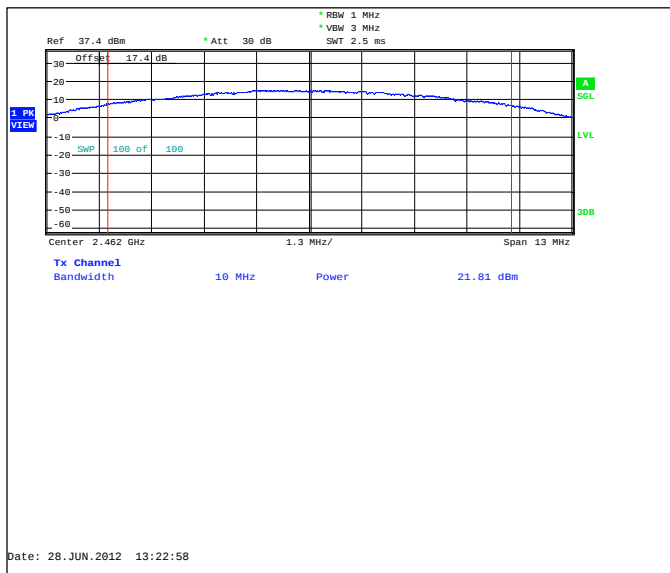
## Channel 1 / 2412 MHz



### Channel 6 / 2437 MHz



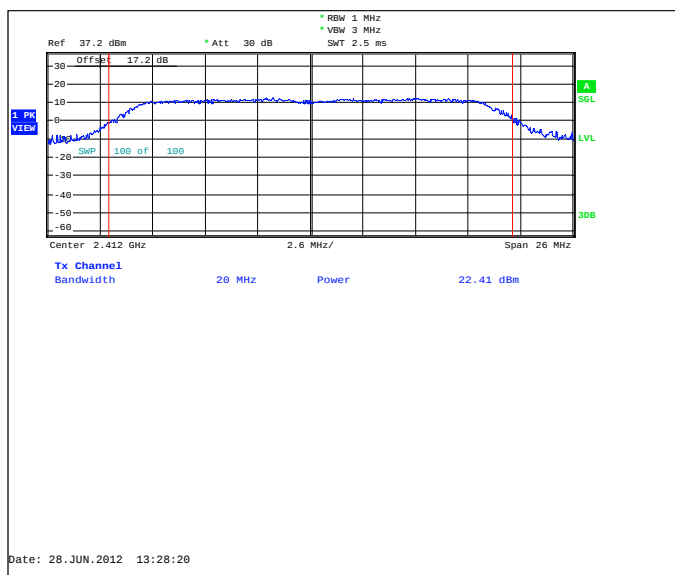
### Channel 11 / 2462 MHz



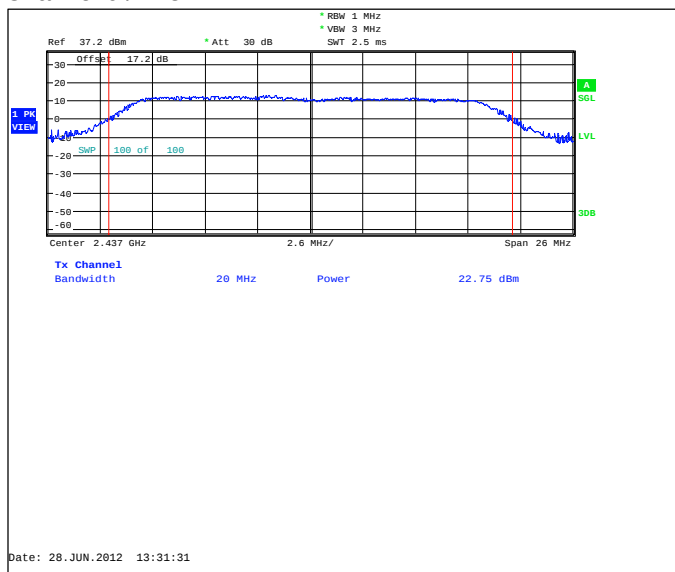
### 2.3.3 822.11n 20HT MS0 , 20 MHz CBW mode, BPSK modulation, 6.5 / 7.25 Mbps data rate

| Channel / f <sub>c</sub> [MHz] | P [dBm] | P [mW]  | Result |
|--------------------------------|---------|---------|--------|
| 1 / 2412                       | 22.41   | 174.181 | PASSED |
| 6 / 2437                       | 22.75   | 188.365 | PASSED |
| 11 / 2462                      | 22.46   | 176.198 | PASSED |

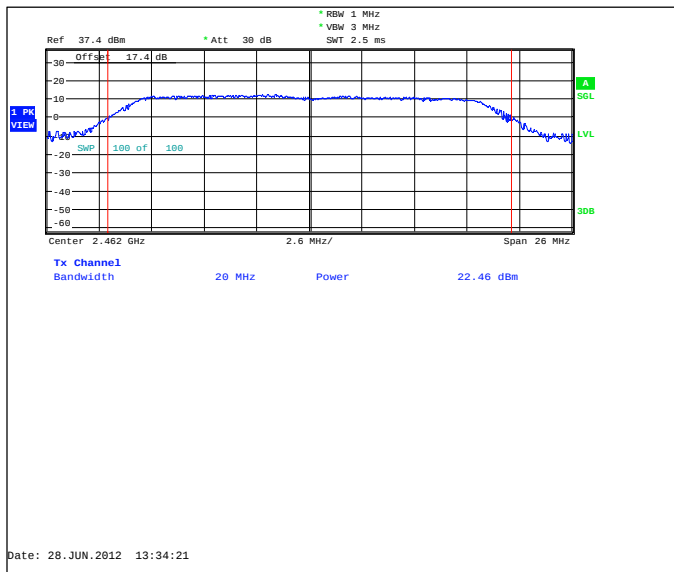
#### Channel 1 / 2412 MHz



#### Channel 6 / 2437 MHz



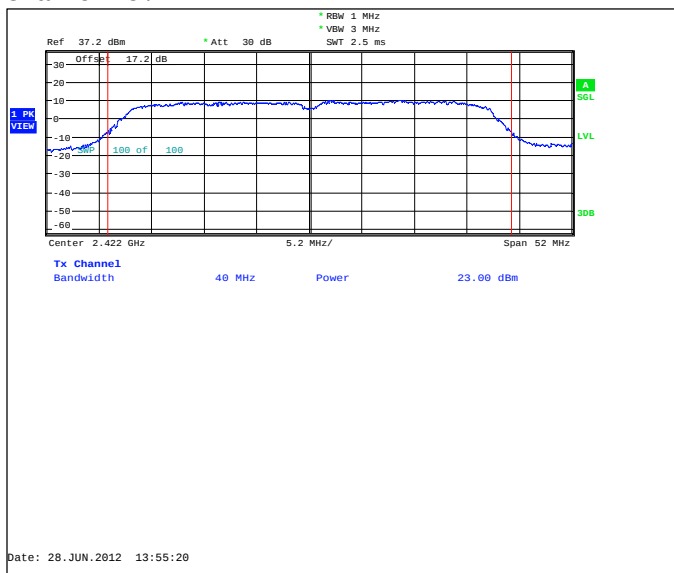
### Channel 11 / 2462 MHz



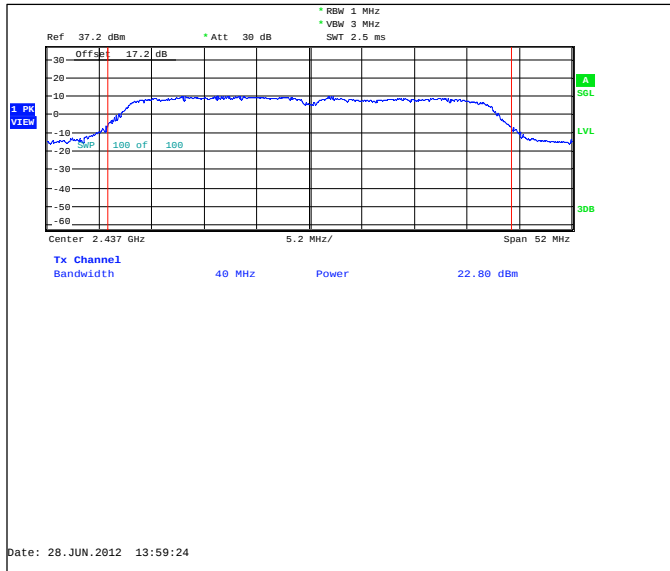
### 2.3.4 822.11n 20HT MS0, 40 MHz CBW mode, BPSK modulation, 13.5 / 15.0 Mbps data rate

| Channel / $f_c$ [MHz] | P [dBm] | P [mW]  | Result |
|-----------------------|---------|---------|--------|
| 1-5 / 2422            | 23      | 199.526 | PASSED |
| 4-8 / 2437            | 22.8    | 190.546 | PASSED |
| 7-11 / 2452           | 22.52   | 178.649 | PASSED |

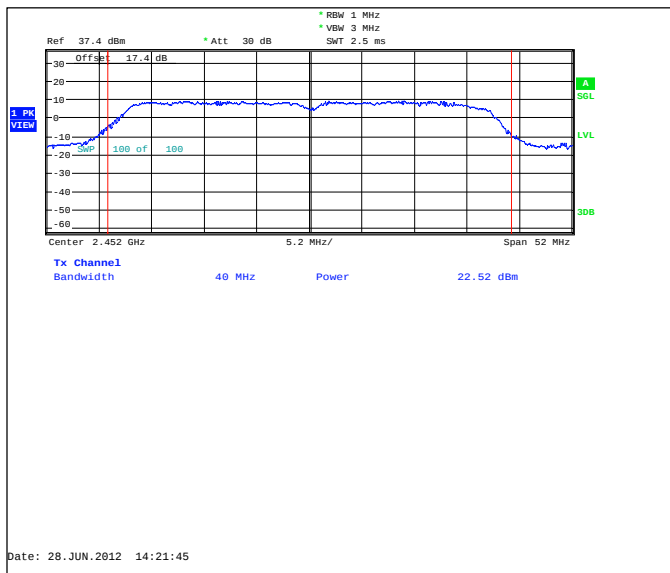
### Channel 1-5 / 2422 MHz



### Channel 4-8 / 2437 MHz



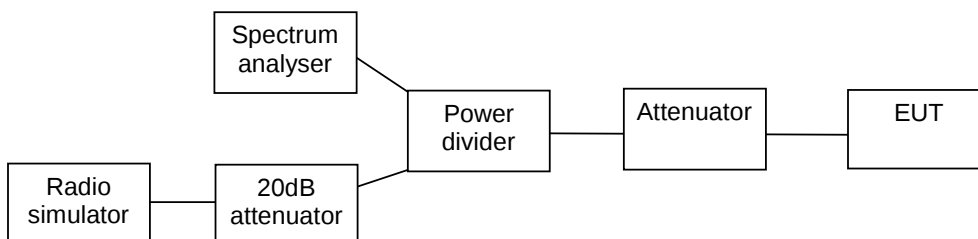
### Channel 7-11 / 2452 MHz



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

|                                                 |                   |
|-------------------------------------------------|-------------------|
| EUT with DUT number                             | RM-820, DUT 42835 |
| Accessories with DUT numbers                    | BP-4GW            |
| Operation Voltage [V] / [Hz]                    | Nominal           |
| Results                                         | PASSED            |
| Remarks                                         | -                 |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 22 / 47 / 100     |
| Date of measurements                            | 28-Jun-2012       |
| Measured by                                     | Hannu Söderholm   |

#### 3.1. Test Setup



#### 3.2. Test method and limit

The measurement is made according to Public notice KDB 558 074 and IC standard RSS-210.

The reference level for the -20 dBc measurement was obtained as instructed in section 5.4.1.1 of the KDB 558074, using 5-30 % wider span than the EBW.

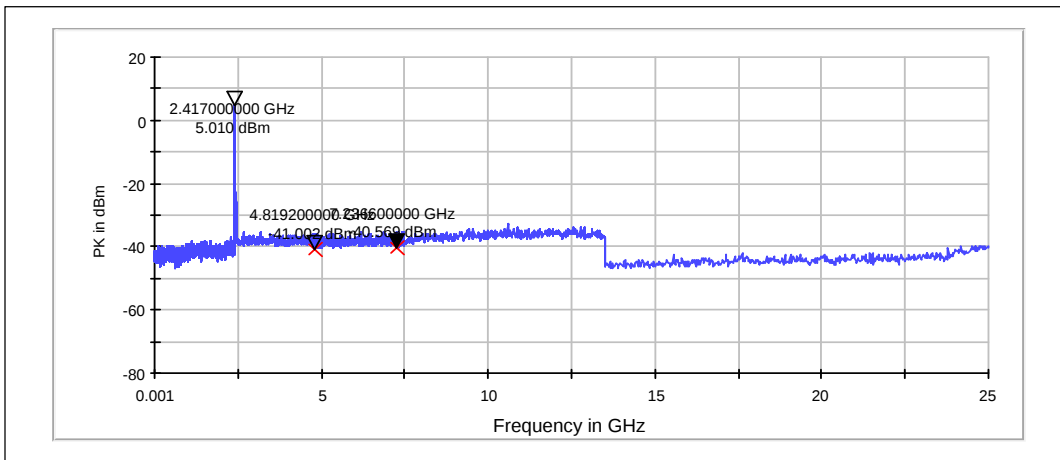
Limits for spurious RF conducted emissions measurements

| Frequency range [MHz] | Limit [dBc] |
|-----------------------|-------------|
| 1 – 25000             | <= -20      |

### 3.3. WLAN Test results

#### 3.3.1 OFDM mode, QPSK modulation, 6 Mbps data rate

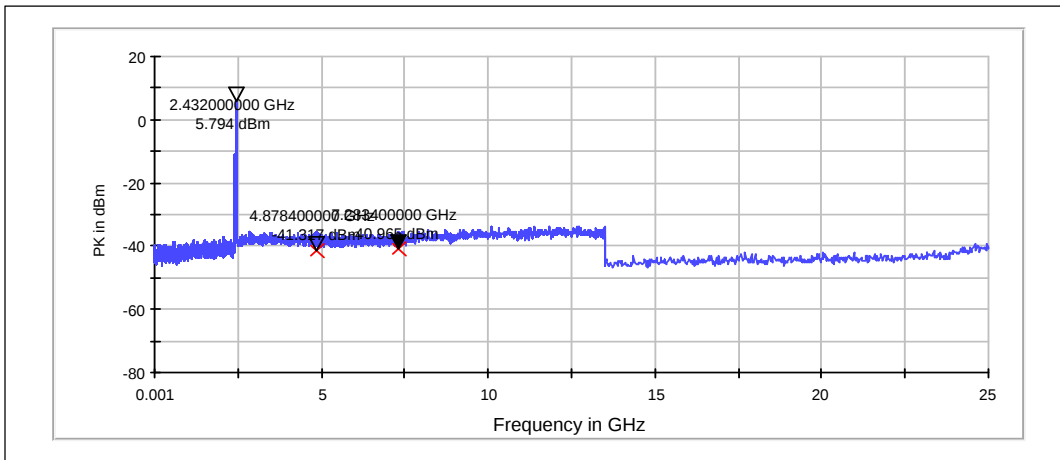
Channel 1 / 2412 MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

| Frequency [MHz] | P [dBc] | Result |
|-----------------|---------|--------|
| 4819.2          | -41     | PASSED |
| 7236.6          | -40.57  | PASSED |

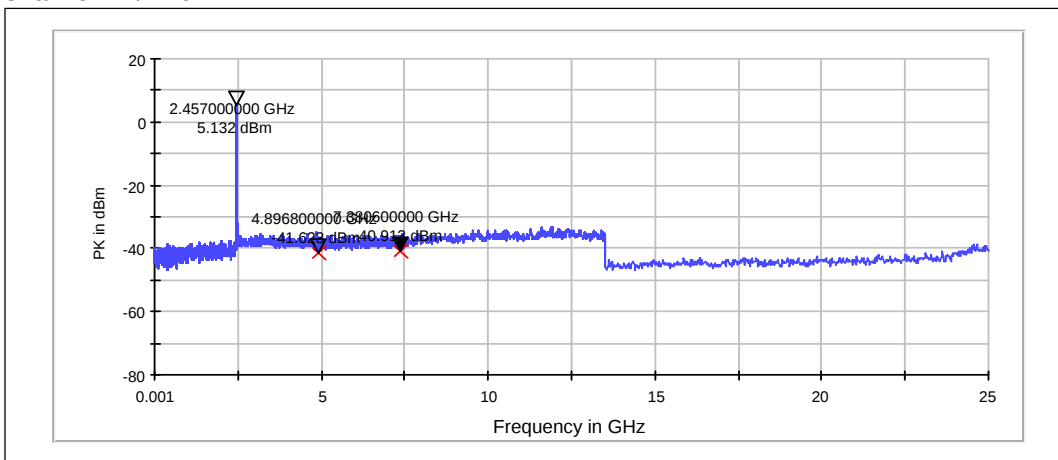
Channel 6 / 2437 MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

| Frequency [MHz] | P [dBc] | Result |
|-----------------|---------|--------|
| 4878.4          | -41.32  | PASSED |
| 7283.4          | -40.96  | PASSED |

### Channel 11 / 2462 MHz

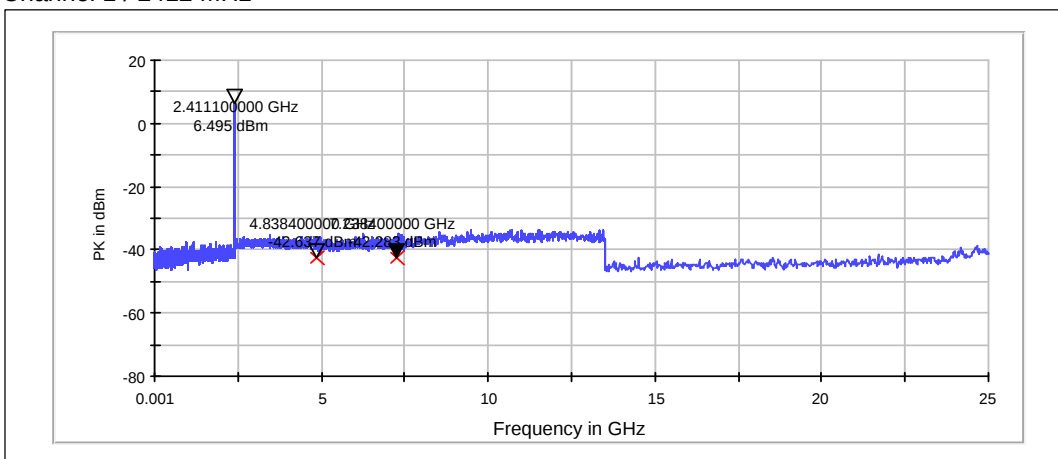


Peak (RBW: 100 kHz, VBW: 300 kHz)

| Frequency [MHz] | P [dBc] | Result |
|-----------------|---------|--------|
| 4896.8          | -41.62  | PASSED |
| 7380.6          | -40.91  | PASSED |

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

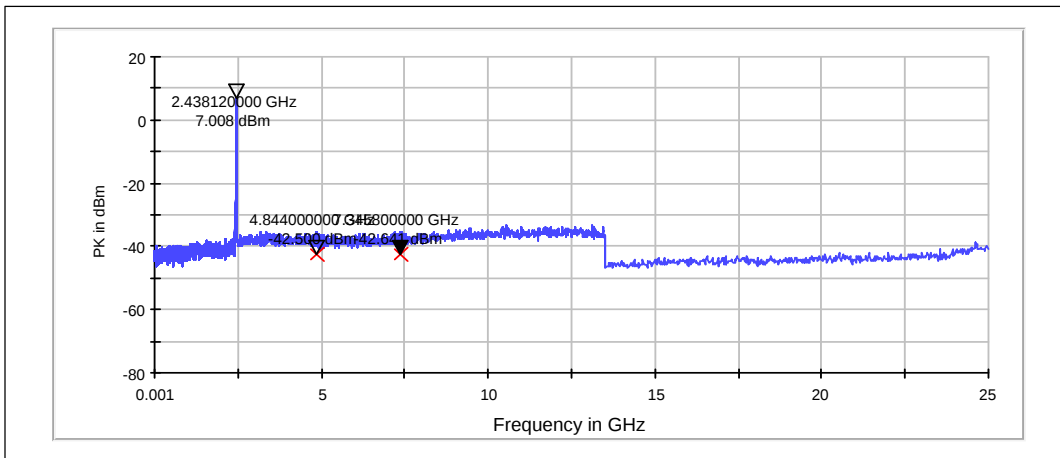
#### Channel 1 / 2412 MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

| Frequency [MHz] | P [dBc] | Result |
|-----------------|---------|--------|
| 4838.4          | -42.64  | PASSED |
| 7238.4          | -42.28  | PASSED |

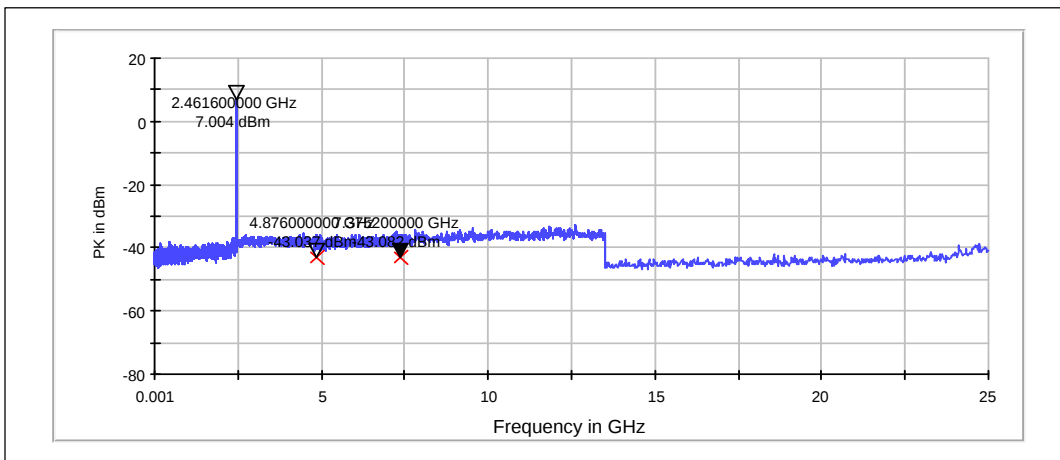
Channel 6 / 2437 MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

| Frequency [MHz] | P [dBc] | Result |
|-----------------|---------|--------|
| 4844            | -42.5   | PASSED |
| 7345.8          | -42.64  | PASSED |

Channel 11 / 2462 MHz

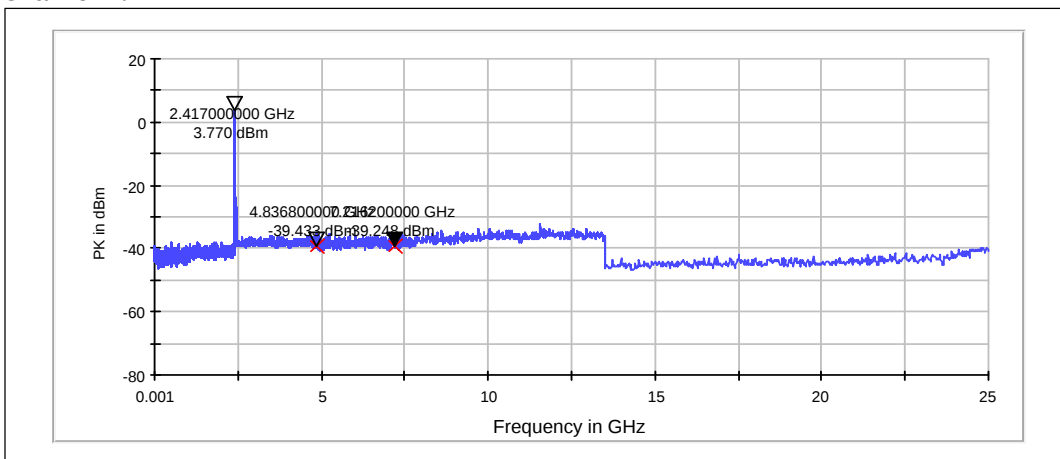


Peak (RBW: 100 kHz, VBW: 300 kHz)

| Frequency [MHz] | P [dBc] | Result |
|-----------------|---------|--------|
| 4876            | -43.04  | PASSED |
| 7375.2          | -43.08  | PASSED |

### 3.3.3 822.11n HT20 MCS0, 20 MHz CBW mode, BPSK modulation, 6.5 / 7.25 Mbps data rate

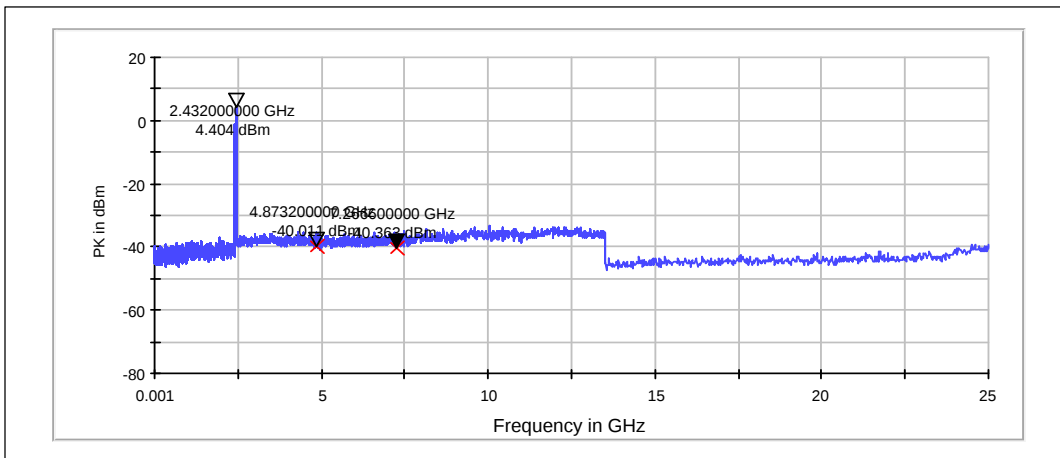
Channel 1 / 2412 MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

| Frequency [MHz] | P [dBc] | Result |
|-----------------|---------|--------|
| 4836.8          | -39.43  | PASSED |
| 7216.2          | -39.25  | PASSED |

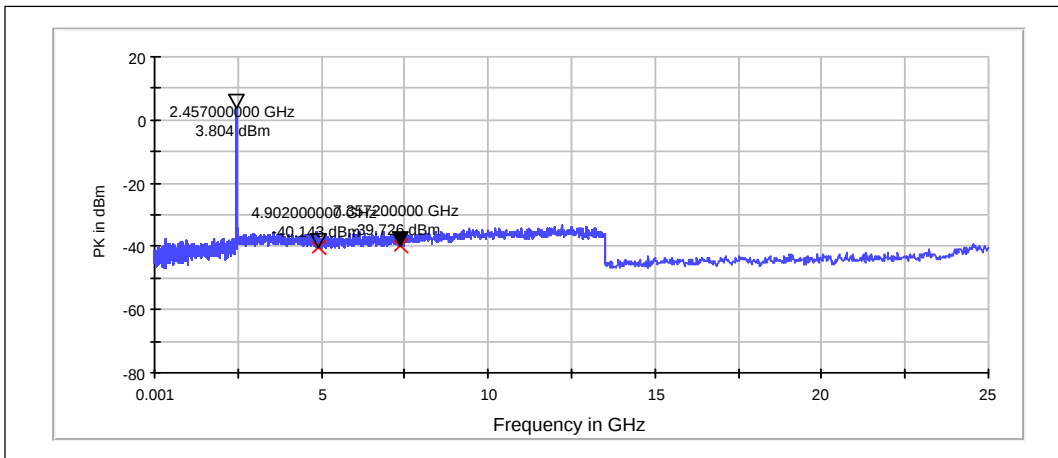
Channel 6 / 2437 MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

| Frequency [MHz] | P [dBc] | Result |
|-----------------|---------|--------|
| 4873.2          | -40.01  | PASSED |
| 7266.6          | -40.36  | PASSED |

Channel 11 / 2462 MHz

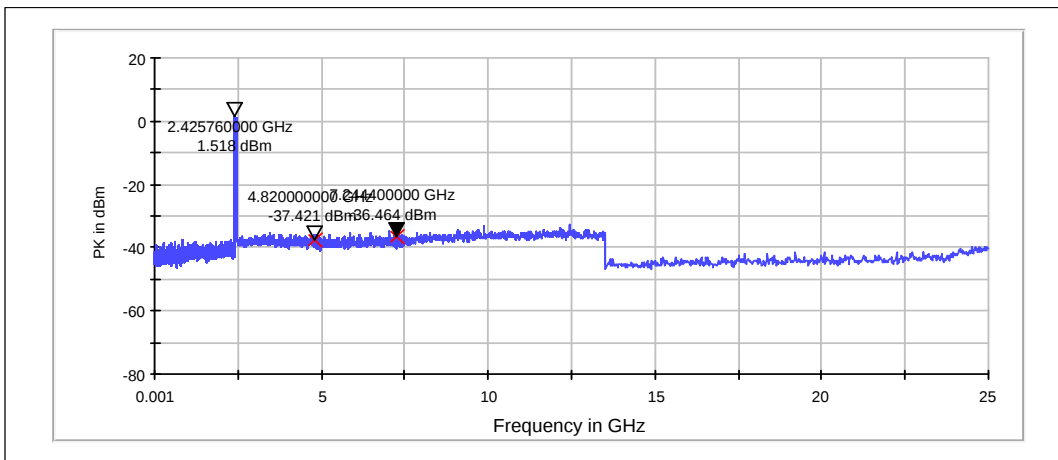


Peak (RBW: 100 kHz, VBW: 300 kHz)

| Frequency [MHz] | P [dBc] | Result |
|-----------------|---------|--------|
| 4902            | -40.14  | PASSED |
| 7357.2          | -39.73  | PASSED |

**3.3.4 822.11n HT20 MCS0, 40 MHz CBW mode, BPSK modulation, 13.5 / 15.0 Mbps data rate**

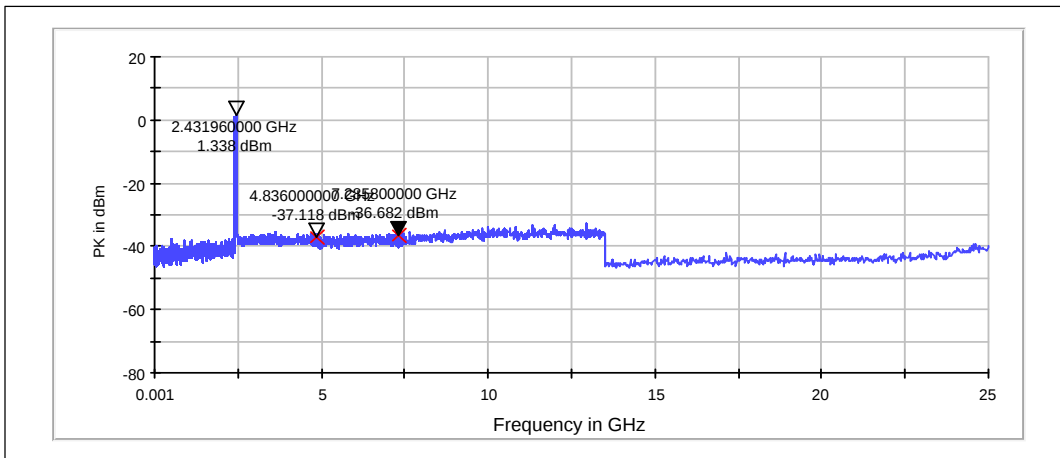
Channel 1-5 / 2422 MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

| Frequency [MHz] | P [dBc] | Result |
|-----------------|---------|--------|
| 4820            | -37.42  | PASSED |
| 7244.4          | -36.46  | PASSED |

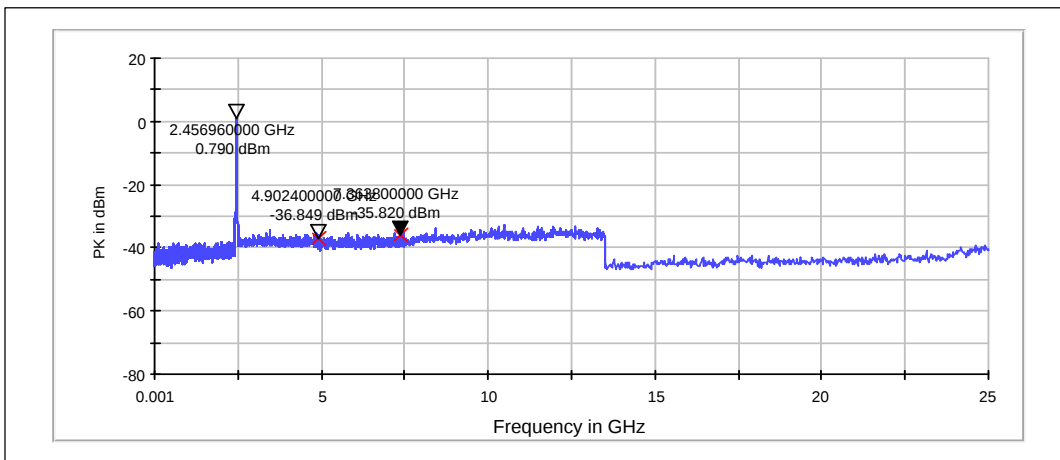
Channel 4-8 / 2437 MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

| Frequency [MHz] | P [dBc] | Result |
|-----------------|---------|--------|
| 4836            | -37.12  | PASSED |
| 7285.8          | -36.68  | PASSED |

Channel 7-11 / 2452 MHz



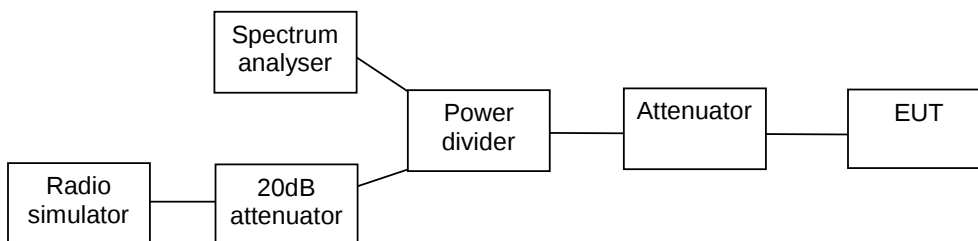
Peak (RBW: 100 kHz, VBW: 300 kHz)

| Frequency [MHz] | P [dBc] | Result |
|-----------------|---------|--------|
| 4902.4          | -36.85  | PASSED |
| 7363.8          | -35.82  | PASSED |

#### 4. 6 dB bandwidth (FCC §15.247(a)(2), RSS-210 A8.2 (1))

|                                                 |                   |
|-------------------------------------------------|-------------------|
| EUT with DUT number                             | RM-820, DUT 42835 |
| Accessories with DUT numbers                    | BP-4GW            |
| Operation Voltage [V] / [Hz]                    | Nominal           |
| Results                                         | PASSED            |
| Remarks                                         | -                 |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 22 / 47 / 100     |
| Date of measurements                            | 28-Jun-2012       |
| Measured by                                     | Hannu Söderholm   |

##### 4.1. Test Setup



##### 4.2. 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

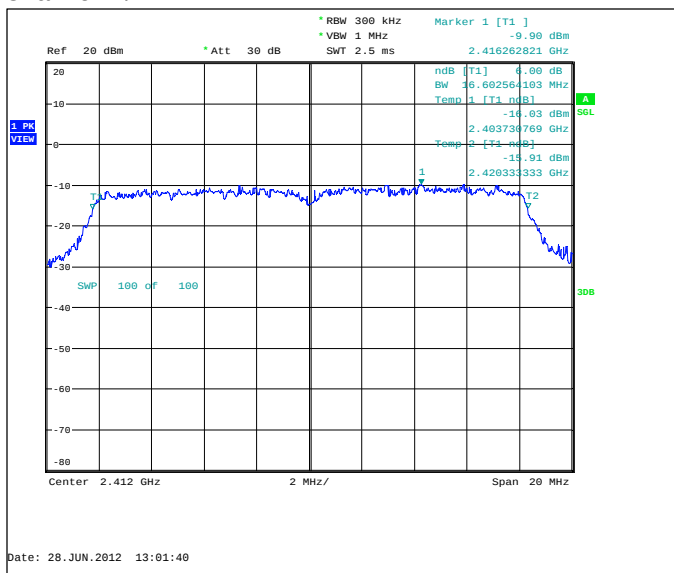
| Limit [kHz] |
|-------------|
| >= 500      |

## 4.3. WLAN Test results

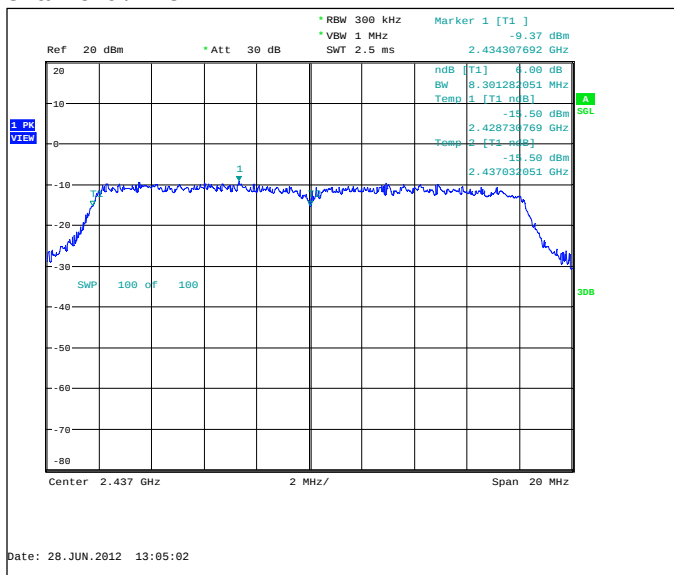
### 4.3.1 OFDM mode, QPSK modulation, 6 Mbps data rate

| Channel / f <sub>c</sub> [MHz] | 6 dB bandwidth [kHz] | Result |
|--------------------------------|----------------------|--------|
| 1 / 2412                       | 16602.6              | PASSED |
| 6 / 2437                       | 8301.3               | PASSED |
| 11 / 2462                      | 16506.4              | PASSED |

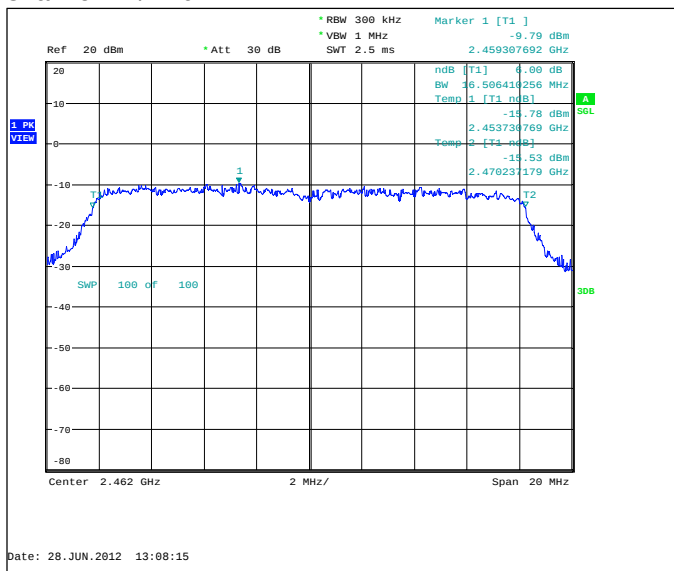
#### Channel 1 / 2412 MHz



#### Channel 6 / 2437 MHz



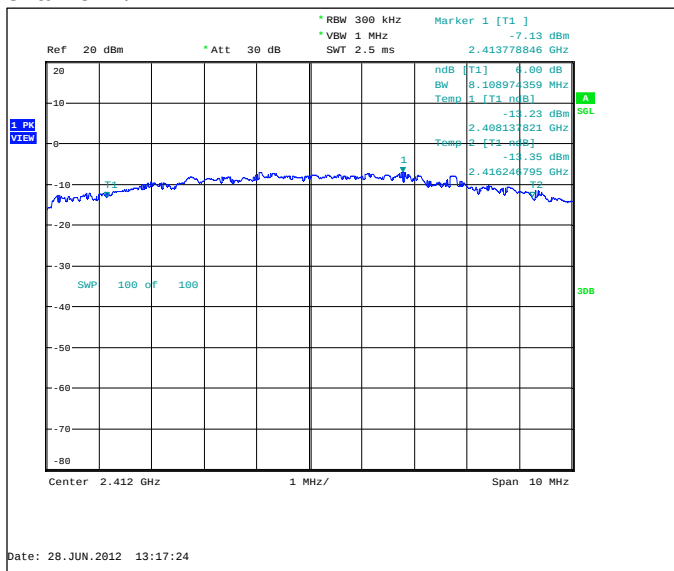
### Channel 11 / 2462 MHz



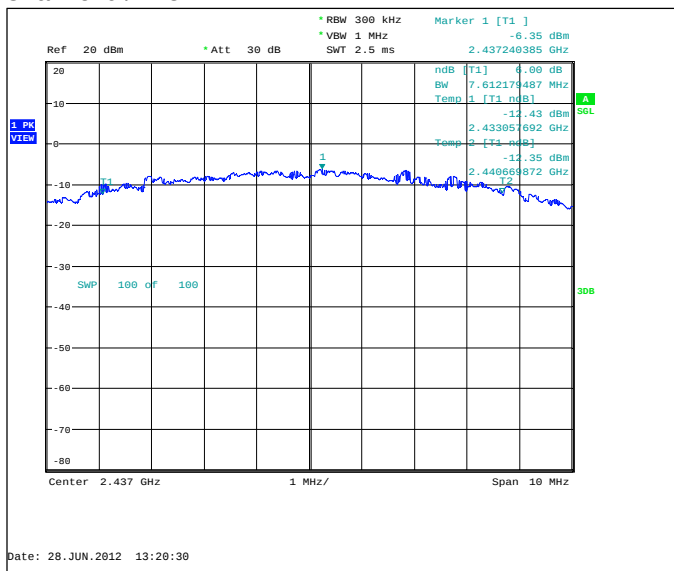
### 4.3.2 DSSS mode, QPSK modulation, 11 Mbps data rate

| Channel / $f_c$ [MHz] | 6 dB bandwidth [kHz] | Result |
|-----------------------|----------------------|--------|
| 1 / 2412              | 8109                 | PASSED |
| 6 / 2437              | 7612.2               | PASSED |
| 11 / 2462             | 6762.8               | PASSED |

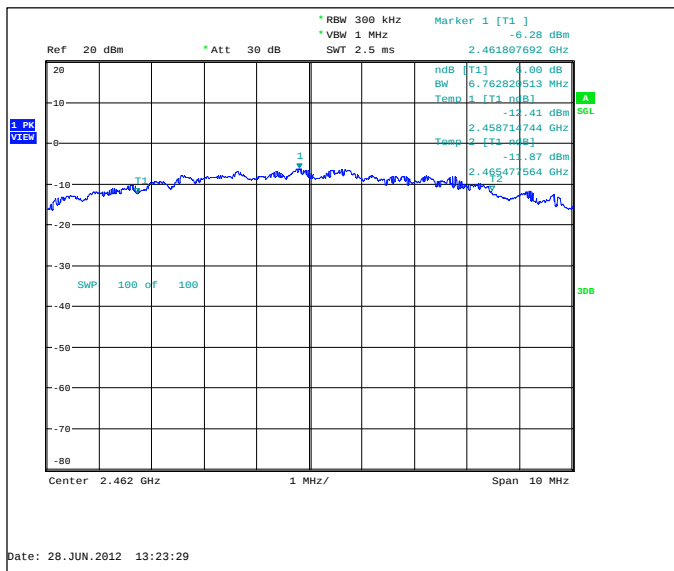
### Channel 1 / 2412 MHz



### Channel 6 / 2437 MHz



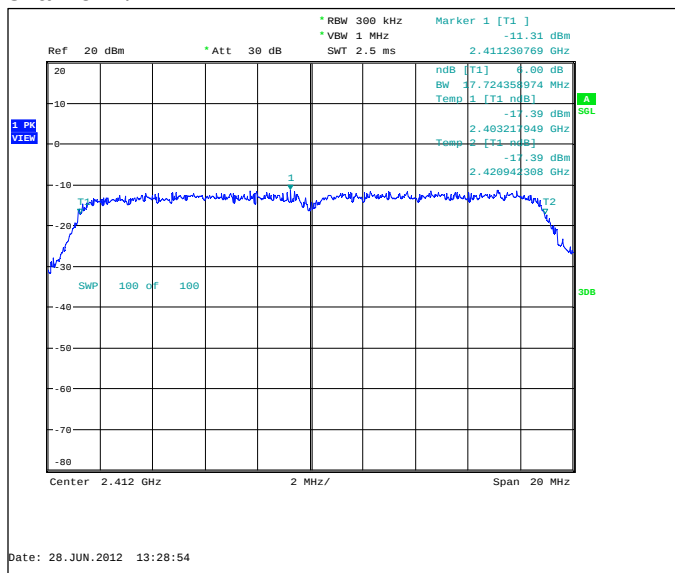
### Channel 11 / 2462 MHz



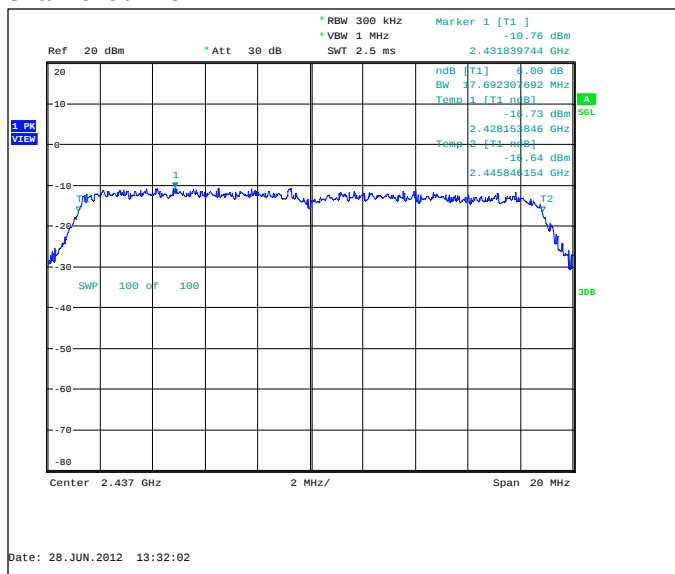
#### 4.3.3 822.11n HT20 MCS0, 20 MHz CBW mode, BPSK modulation, 6.5 / 7.25 Mbps data rate

| Channel / f <sub>c</sub> [MHz] | 6 dB bandwidth [kHz] | Result |
|--------------------------------|----------------------|--------|
| 1 / 2412                       | 17724.4              | PASSED |
| 6 / 2437                       | 17692.3              | PASSED |
| 11 / 2462                      | 17692.3              | PASSED |

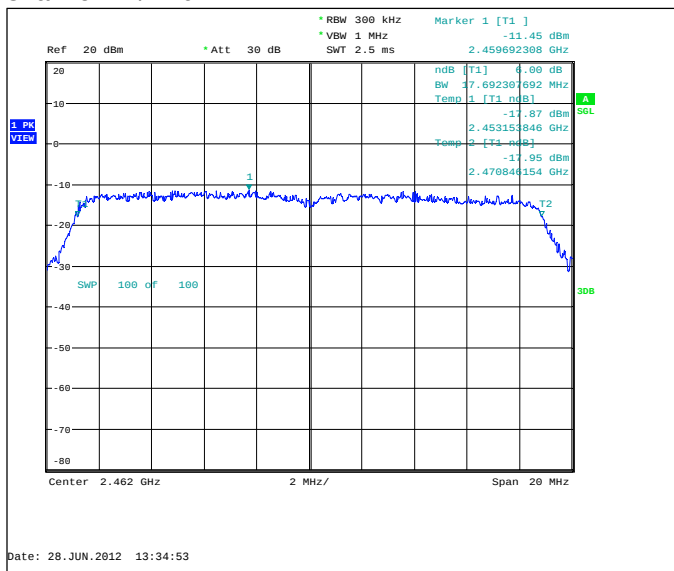
Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



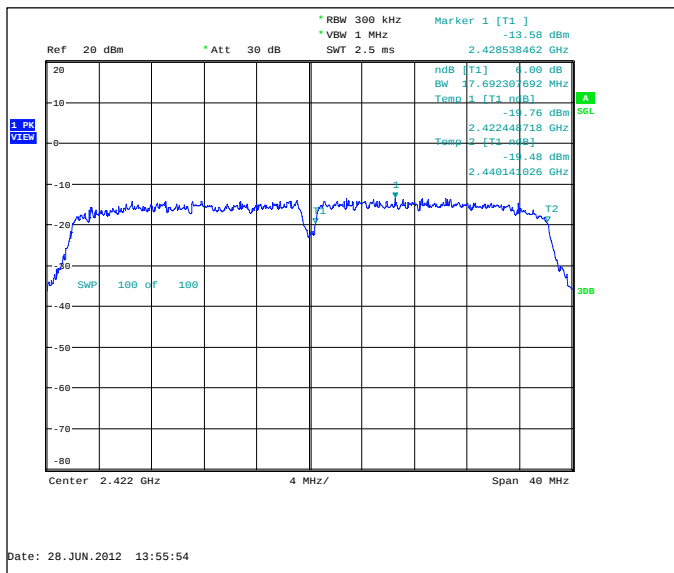
#### Channel 11 / 2462 MHz



#### 4.3.4 822.11n HT20 MCS0, 40 MHz CBW mode, BPSK modulation, 13.5 / 15.0 Mbps data rate

| Channel / f <sub>c</sub> [MHz] | 6 dB bandwidth [kHz] | Result |
|--------------------------------|----------------------|--------|
| 1-5 / 2422                     | 17692.3              | PASSED |
| 4-8 / 2437                     | 17628.2              | PASSED |
| 7-11 / 2452                    | 17692.3              | PASSED |

#### Channel 1-5 / 2422 MHz





1 PK VIEW

Ref 20 dBm Att 30 dB RBW 300 kHz VBW 1 MHz SWT 2.5 ms Marker 1 [T1] -13.40 dBm 2.431807692 GHz

20  
-10  
0  
-10  
-20  
-30  
-40  
-50  
-60  
-70  
-80

dB

2.437 GHz 4 MHz/ Span 40 MHz

SWP 100 CF 100

30B

ndB [T1] 6.00 dB  
BW 17.62828128 MHz  
Temp 1 [T1 ndB] -20.10 dBm  
2.418921077 GHz  
Temp 2 [T1 ndB] -19.46 dBm  
2.436551282 GHz

A SOL

Date: 28.JUN.2012 13:59:58

RBW 300 kHz  
VBW 1 MHz  
SWT 2.5 ms

Marker 1 [T1 ]  
-13.87 dBm  
2.440974359 GHz

Ref 20 dBm  
Att 30 dB

1 PK VIEW

20  
-10  
0  
-10  
-20  
-30  
-40  
-50  
-60  
-70  
-80

2.452 GHz  
4 MHz/  
Span 40 MHz

ndB [T1] 6.00 dB  
BW 17.692387692 MHz  
Temp 1 [T1 ndB] -13.54 dBm  
2.43855974 GHz  
Temp 2 [T1 ndB] -29.38 dBm  
2.45155282 GHz

2.440974359 GHz

2.43855974 GHz

2.45155282 GHz

2.452 GHz

4 MHz/

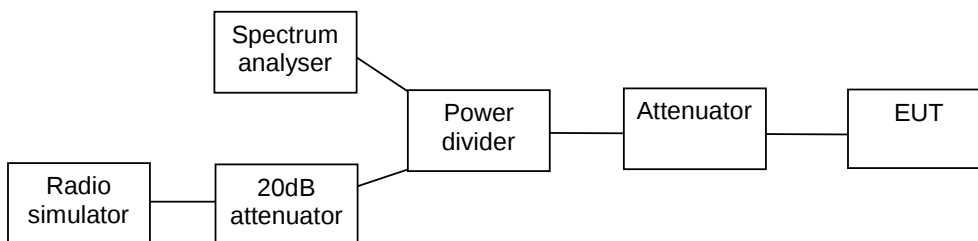
Span 40 MHz

28 JUN 2012 14:03:48

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

|                                                 |                   |
|-------------------------------------------------|-------------------|
| EUT with DUT number                             | RM-820, DUT 42835 |
| Accessories with DUT numbers                    | BP-4GW            |
| Operation Voltage [V] / [Hz]                    | Nominal           |
| Results                                         | PASSED            |
| Remarks                                         | -                 |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 22 / 47 / 100     |
| Date of measurements                            | 28-Jun-2012       |
| Measured by                                     | Hannu Söderholm   |

### 5.1. Test Setup



### 5.2. Test method and limit

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

Result is corrected by bandwidth correction factor -15.2dB (BWCF =  $10\log(3\text{ kHz}/100\text{ kHz}) = -15.2\text{ dB}$ ).

Limits for power spectral density measurements

| Limit [dBm] @ 3 kHz |
|---------------------|
| $\leq 8$            |

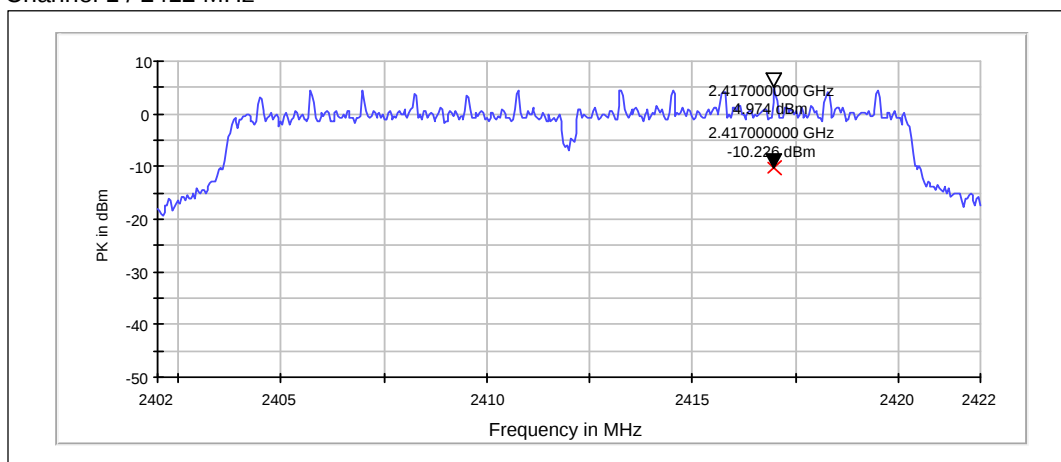
### 5.3. WLAN Test results

#### 5.3.1 OFDM mode, QPSK modulation, 6 Mbps data rate

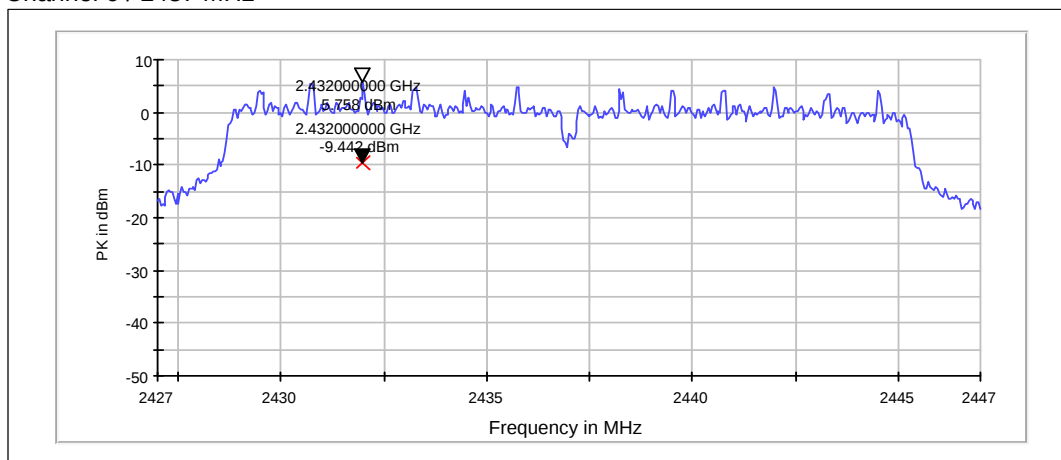
Peak (RBW: 100 kHz, VBW: 300 kHz, Max hold)

| Channel / $f_c$ [MHz] | P [dBm] | Result |
|-----------------------|---------|--------|
| 1 / 2412              | -10.23  | PASSED |
| 6 / 2437              | -9.44   | PASSED |
| 11 / 2462             | -10.64  | PASSED |

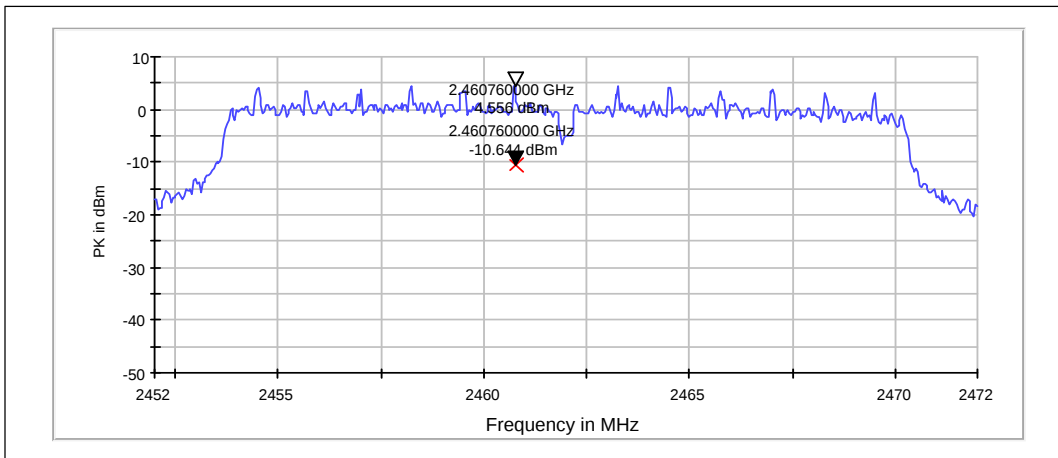
Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



### Channel 11 / 2462 MHz

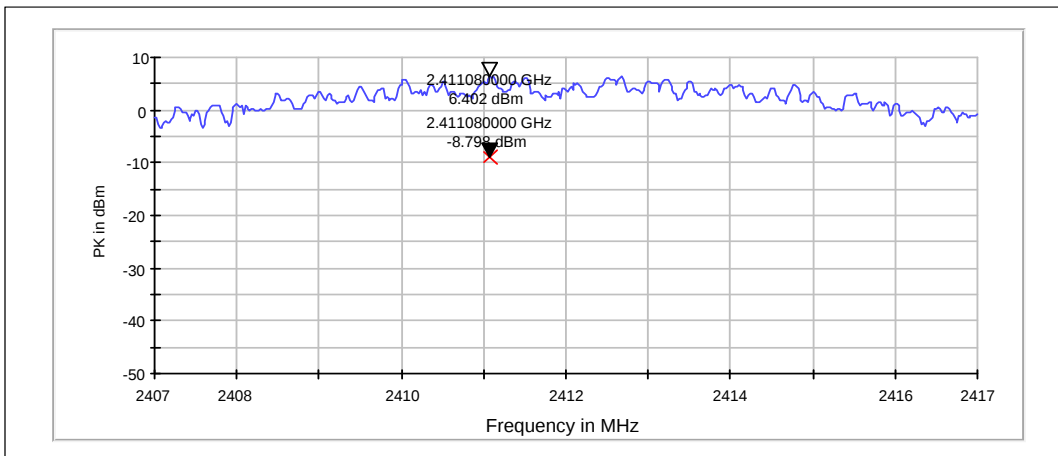


### 5.3.2 DSSS mode, QPSK modulation, 11 Mbps data rate

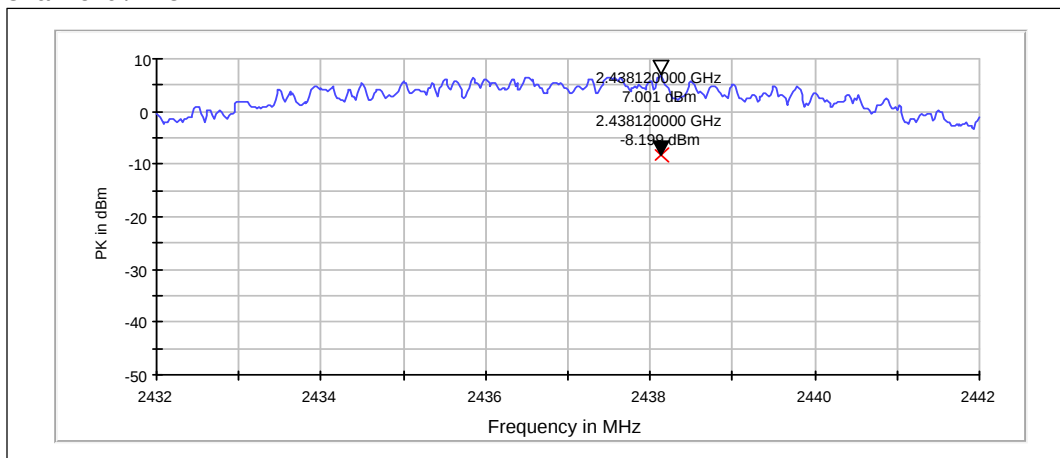
Peak (RBW: 100 kHz, VBW: 300 kHz, Max hold)

| Channel / $f_c$ [MHz] | P [dBm] | Result |
|-----------------------|---------|--------|
| 1 / 2412              | -8.8    | PASSED |
| 6 / 2437              | -8.2    | PASSED |
| 11 / 2462             | -8.26   | PASSED |

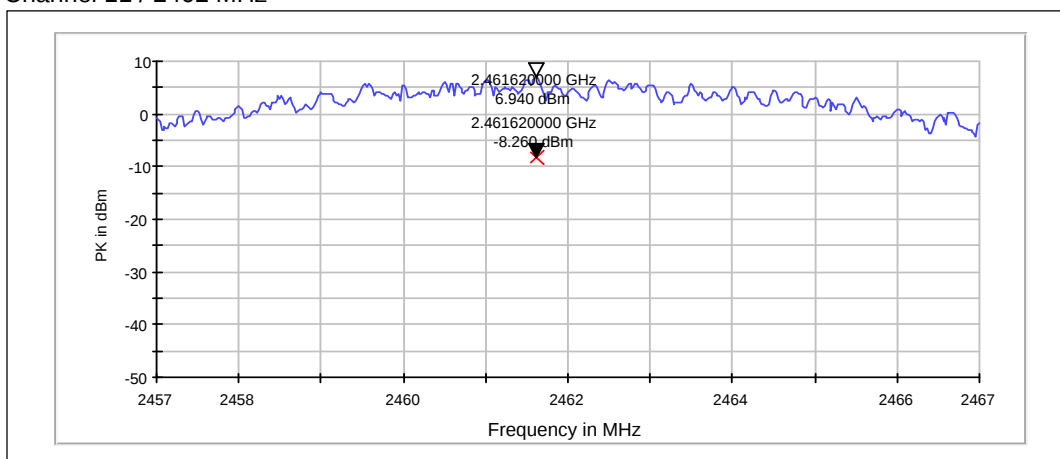
### Channel 1 / 2412 MHz



### Channel 6 / 2437 MHz



### Channel 11 / 2462 MHz

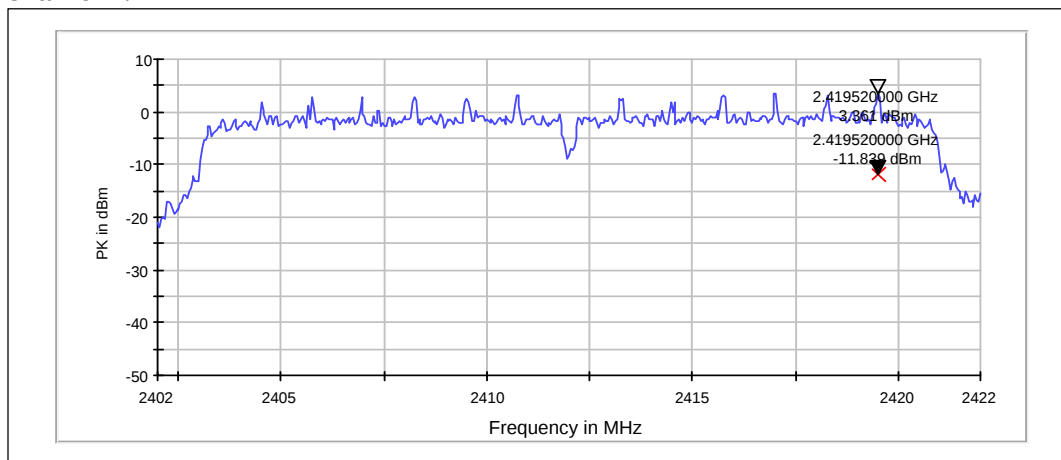


### 5.3.3 822.11n HT20 MCS0, 20 MHz CBW mode, BPSK modulation, 6.5 / 7.25 Mbps data rate

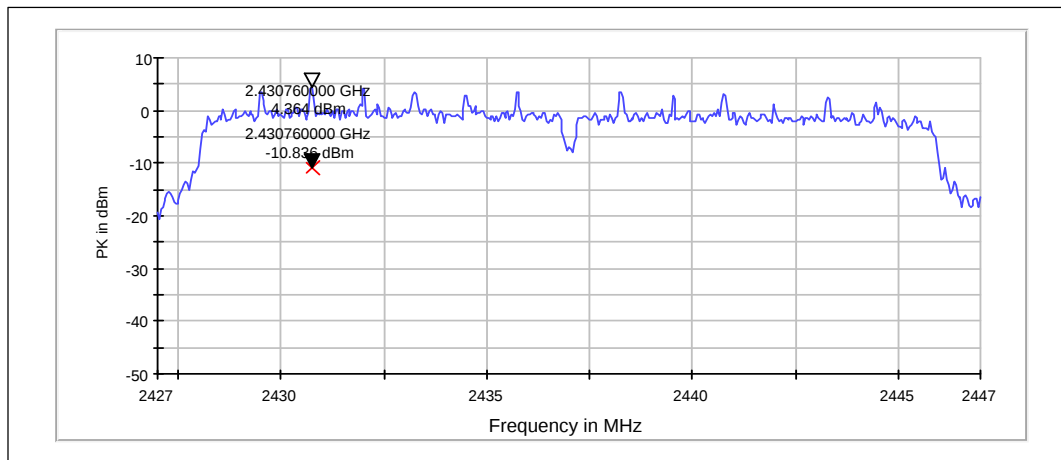
Peak (RBW: 100 kHz, VBW: 300 kHz, Max hold)

| Channel / $f_c$ [MHz] | P [dBm] | Result |
|-----------------------|---------|--------|
| 1 / 2412              | -11.84  | PASSED |
| 6 / 2437              | -10.84  | PASSED |
| 11 / 2462             | -11.42  | PASSED |

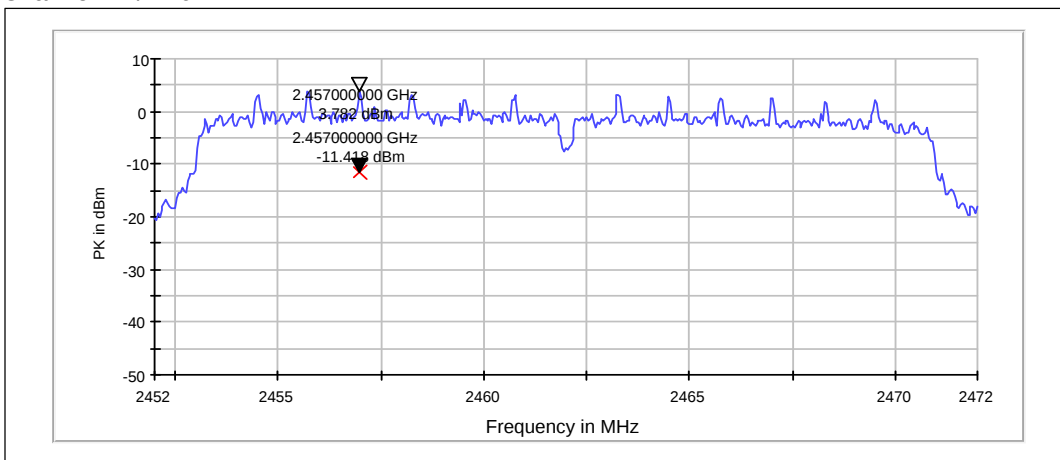
Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



#### Channel 11 / 2462 MHz

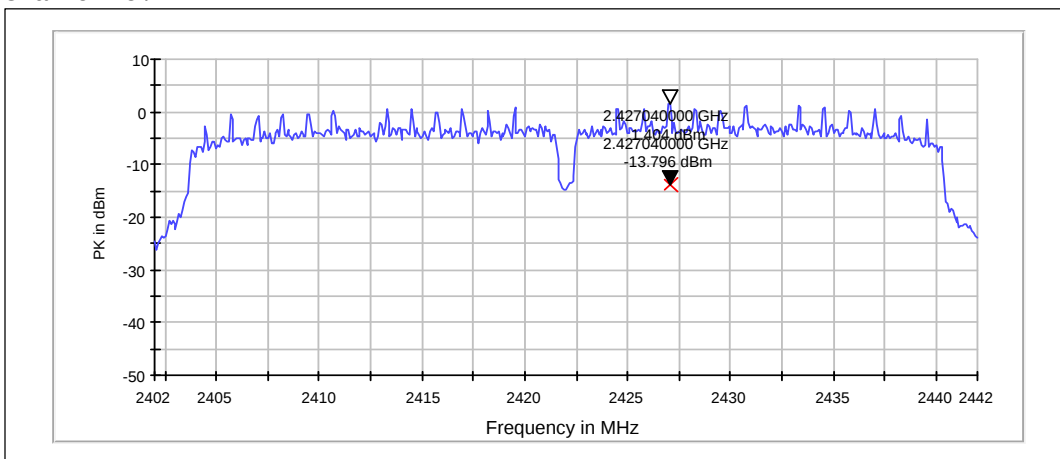


#### 5.3.4 822.11n HT20 MCS0, 40 MHz CBW mode, BPSK modulation, 13.5 / 15.0 Mbps data rate

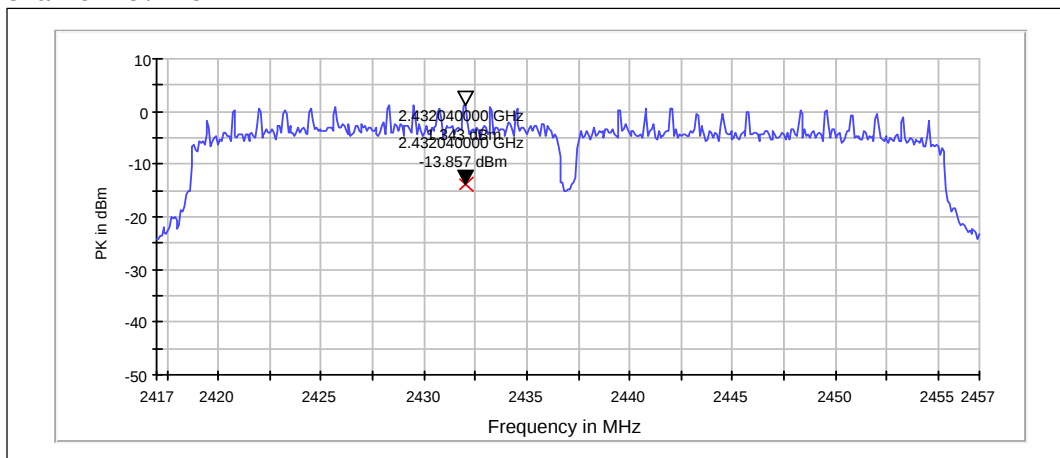
Peak (RBW: 100 kHz, VBW: 300 kHz, Max hold)

| Channel / $f_c$ [MHz] | P [dBm] | Result |
|-----------------------|---------|--------|
| 1-5 / 2422            | -13.8   | PASSED |
| 4-8 / 2437            | -13.86  | PASSED |
| 7-11 / 2452           | -14.48  | PASSED |

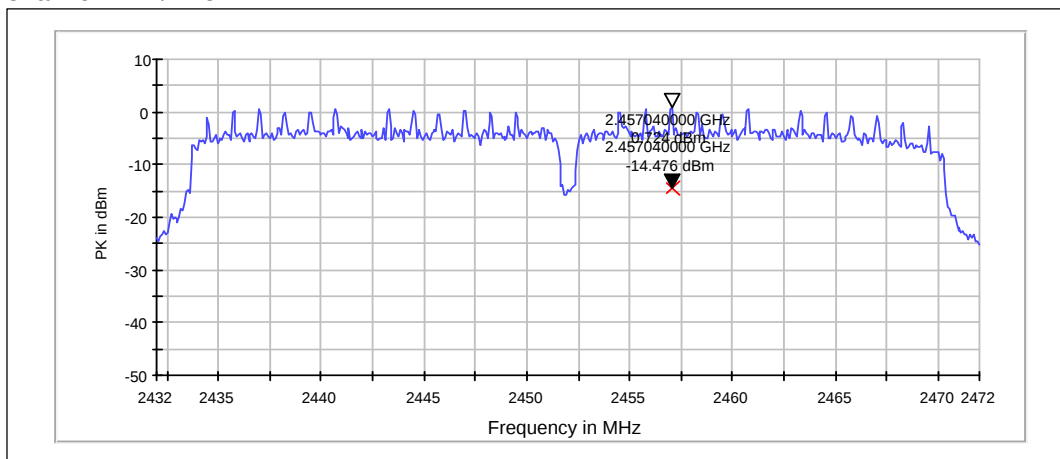
#### Channel 1-5 / 2422 MHz



Channel 4-8 / 2437 MHz



Channel 7-11 / 2452 MHz



## 6. Test Equipment

### 6.1. Conducted measurements

| Eq. No  | Equipment                           | Type        | Manufacturer  | Used in            |
|---------|-------------------------------------|-------------|---------------|--------------------|
| TM38112 | Power supply                        | 6632A       | Agilent       | 22/24/27, 15C      |
| TM38631 | Signal Generator                    | 83640L      | Agilent       | 22/24/27, 15C, 15B |
| OM06312 | Signal Generator                    | E4422B      | Agilent       | 22/24              |
| TM37678 | Communication Tester                | CMU200      | R&S           | 15C, 15B           |
| TM30600 | Impulse limiter                     | ESH3-Z2     | R&S           | 15C, 15B           |
| TM26490 | LISN 50 µH                          | ESH3-Z5     | R&S           | 15C, 15B           |
| TM26491 | LISN 50 µH                          | ESH3-Z5     | R&S           | 15C, 15B           |
| TM37610 | Spectrum Analyzer                   | FSU26       | R&S           | 22/24/27, 15C      |
| TM22806 | Battery                             | BAT 20/E    | Fiskars       | 15C, 15B           |
| TM22805 | UPS                                 | PS 20/1.2   | Fiskars       | 15C, 15B           |
| -       | Temperature and humidity logger     | 175-H2      | Testo         | 15C, 15B           |
| -       | Temperature and humidity logger     | 175-H2      | Testo         | 22/24/27, 15C      |
| -       | Air pressure and temperature logger | 635-2       | Testo         | 22/24/27, 15C, 15B |
| -       | Air pressure sensor                 | 0638-1835   | Testo         | 22/24/27, 15C, 15B |
| -       | Temperature test chamber            | VT 4002     | Vötsch        | 22/24              |
| 2058    | Receiver                            | ESPC        | R&S           | 15C, 15B           |
| 2001    | Bluetooth tester                    | CBT         | R&S           | 22/24/27, 15C, 15B |
| 2002    | Communication Tester                | CMU200      | R&S           | 22/24/27, 15C      |
| 2009    | LISN 50 µH                          | ENV216      | R&S           | 15C, 15B           |
| 2010    | LISN 50 µH                          | ENV216      | R&S           | 15C, 15B           |
| 2012    | Power splitter                      | 11667B      | Agilent       | 22/24/27, 15C      |
| 2013    | Attenuator                          | 8493C       | Agilent       | 22/24/27, 15C      |
| 2014    | Attenuator                          | 8493C       | Agilent       | 22/24/27, 15C      |
| 2019    | Power splitter                      | ZN2PD-9G-S+ | Mini-Circuits | 15E                |
| 2020    | Power splitter                      | ZN2PD-9G-S+ | Mini-Circuits | 15E                |
| 2023    | Spectrum Analyzer                   | ESMI-RF     | R&S           | 15B/15C            |
| 2024    | Analyzer display unit               | ESAI-D      | R&S           | 15B/15C            |

## 6.2. Radiated measurements

| Eq. No  | Equipment                           | Type                                   | Manufacturer   | Used in            |
|---------|-------------------------------------|----------------------------------------|----------------|--------------------|
| TM38114 | Power supply                        | 6632A                                  | Agilent        | 22/24/27, 15C, 15B |
| TM38631 | Signal Generator                    | 83640L                                 | Agilent        | 22/24/27, 15C, 15B |
| TM38323 | Preamplifier                        | PA-02 18-26 GHz                        | EMC Automation | 22/24/27, 15C, 15B |
| -       | Antenna                             | BBHA 9120 D                            | Schwarzbeck    | 22/24/27, 15C      |
| TM26497 | Antenna                             | 3115                                   | Emco           | 22/24/27, 15C, 15B |
| TM37773 | Communication Tester                | CMU200                                 | R&S            | 22/24/27, 15C, 15B |
| TM38845 | Receiver                            | ESIB 26                                | R&S            | 22/24/27, 15C, 15B |
| -       | Antenna                             | HL562                                  | R&S            | 22/24/27, 15C, 15B |
| -       | Turntable                           | 2188                                   | EMCO           | 22/24/27, 15C, 15B |
| -       | Turntable controller                | 2090                                   | EMCO           | 22/24/27, 15C, 15B |
| -       | RF system panel                     | TS-RSP                                 | R&S            | 22/24/27, 15C, 15B |
| -       | RF system panel                     | TS-RSP                                 | R&S            | 22/24/27, 15C, 15B |
| -       | Mini mast                           | 2075-2                                 | ETS Lindgren   | 22/24/27, 15C, 15B |
| TM38843 | Mini mast                           | 2075                                   | Emco           | 22/24/27, 15C, 15B |
| TM38842 | Antenna mast controller             | 2090                                   | Emco           | 22/24/27, 15C, 15B |
| TM30643 | LISN 50 $\mu$ H                     | LISN-5-20-2                            | FCC            | 22/24/27, 15C, 15B |
| TM30644 | LISN 50 $\mu$ H                     | LISN-5-20-2                            | FCC            | 22/24/27, 15C, 15B |
| -       | Temperature and humidity logger     | 175-H2                                 | Testo          | 22/24/27, 15C, 15B |
| -       | Air pressure and temperature logger | 635-2                                  | Testo          | 22/24/27, 15C, 15B |
| -       | Air pressure sensor                 | 0638-1835                              | Testo          | 22/24/27, 15C, 15B |
| TM39180 | Laser distance meter                | Disto Pro                              | Leica          | 22/24/27, 15C, 15B |
| TM37523 | Preamplifier                        | AMF-4D-10M-3G-25-20P                   | Miteq          | 22/24/27, 15C, 15B |
| TM37498 | Preamplifier                        | AMF-5D-020180-26-10P                   | Miteq          | 22/24/27, 15C, 15B |
| TM30599 | Semi anechoic chambre               | UNKNOWN                                | TDK            | 22/24/27, 15C, 15B |
| TM22638 | Power supply                        | OL63743-901                            | -              | 22/24/27, 15C, 15B |
| TM38066 | High pass filter                    | 4HC3000/18000-3-KK                     | Trilithic      | 22/24/27, 15C, 15B |
| -       | High pass filter                    | WHKX 1.6/15G-12SS                      | Wainwright     | 22/24/27, 15C, 15B |
| TM37545 | Tunable notch filter                | 800.0/960.0-0.2/40-8SSK                | Wainwright     | 22                 |
| TM26512 | Tunable notch filter                | WRCD1850/1910-0.2/40-10SSK             | Wainwright     | 24                 |
| -       | Band reject filter                  | WRCG1877/1883-1870/1890-40/6EE         | Wainwright     | 24                 |
| -       | Band reject filter                  | WRCG1729.4/1735.4-1722.4/1742.4-40/6SS | Wainwright     | 27                 |
| -       | Band reject filter                  | WRCG832/838-825/848-40/5SS             | Wainwright     | 22                 |
| TM23892 | Controller                          | G-1000SDX                              | Yaesu          | 22/24/27           |
| 2001    | Bluetooth tester                    | CBT                                    | R&S            | 22/24/27, 15C, 15B |
| 6023    | Antenna                             | VUBA 9117                              | Schwarzbeck    | 22/24/27, 15C      |