



Product Service

## RF - TEST REPORT

Report Number : **68/850.9.008.01** Date of Issue: 6 March 2009

Model : **PC-81007**

Product Type : Notebook Computer

Applicant : Wanlida Group Co., Ltd.

Address : No. 618 Jiahe Road, Wanlida Industry Zone,  
Xiamen Fujian, China 361006

Production Facility : Wanlida Group Co., Ltd.

Address : Wanlida Industry Zone, Nanjing, Fujian, China 363601

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including  
Appendices : 45

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## 2 Details about the Test Laboratory

### Details about the Test Laboratory

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Company name: China Shenzhen Academy of Metrology and Quality Inspection,  
Metrology and Quality Inspection building,  
Central Section of LongZhu Road,  
Nan Shan,  
Shenzhen,

Telephone: 86 755 2694 1599  
Fax: 86 755 2694 1545

### 3 Description of the Equipment Under Test

#### Description of the Equipment Under Test

Product: Notebook Computer

Model no.: PC-81007

Serial number: NIL

Options and accessories: NIL

Rating: DC 12V 3A, 36W  
AC Adaptor:  
Model: MPA-12030  
Input: 100-240V ~ 50/60Hz 1.0A MAX  
Output: +12V DC 3A

Antenna: Two integral antennas inside enclosure of EUT, NOT accessible by end user. Also both antennas can't transmit in the same time.  
Antenna Gain: 1.5dBi

RF Transmission  
Frequency: 2412-2462MHz

Description of the EUT: NIL

#### Auxiliary Equipment and Cable Used during Test:

| DESCRIPTION     | MANUFACTURER | MODEL NO.(SHIELD) | S/N(LENGTH) |
|-----------------|--------------|-------------------|-------------|
| LCD monitor     | Lenovo       | 9227-AE1          | V1TDB38     |
| Keyboard        | Lenovo       | SK-8825 (L)       | 02553778    |
| Mouse           | Lenovo       | MO28UOL           | 4418011108  |
| Headphone       | Ouyun        | OH601             | ----        |
| USB flash drive | Kingston     | Data Traveller    | ----        |
| SD card         | Kingston     | SD4/4GBFE         | ----        |
| VGA cable       | Lenovo       | Shield            | 140cm       |
| AC Power cable  | Lenovo       | Unshield          | 180cm       |

#### 4 Summary of Test Standards

| Test Standards        |                                                                        |
|-----------------------|------------------------------------------------------------------------|
| FCC Part 15 Subpart C | PART 15 - RADIO FREQUENCY DEVICES<br>Subpart C - Intentional Radiators |

## 5 Summary of Test Results

| Technical Requirements                         |       |                                     |                          |                          |
|------------------------------------------------|-------|-------------------------------------|--------------------------|--------------------------|
| FCC Part 15 Subpart C                          |       |                                     |                          |                          |
| Test Condition                                 | Pages | Test Result                         |                          |                          |
|                                                |       | Pass                                | Fail                     | N/A                      |
| 15.207 Conducted Emission AC Power Port        | 8     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15.247 (b) (1) Conducted peak output power     | 12    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15.247(d) Band edge compliance of RF emissions | 14    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15.247(d) Spurious RF conducted emissions      | 22    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15.247(d) 15.209 Spurious radiated emissions   | 27    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15.247(a)(2) 6dB bandwidth                     | 33    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15.247(e) Power spectral density               | 39    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

## 6 General Remarks

### Remarks

This submittal(s) (test report) is intended for FCC ID: SMFPC81007 filing to comply with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C Rules.

### SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

□ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements.

□ - **Does not** fulfill the general approval requirements.

Sample Received Date: Jan 25 2009

Testing Start Date: Feb 12 2009

Testing End Date: Feb 27 2009

- TÜV SÜD CHINA, SHENZHEN BRANCH -

Reviewed by:

Prepared by:



Paul Yu  
EMC Project Manager



Ken Li  
EMC Test Engineer

## 7 Technical Requirement

### 7.1 Conducted Emission

#### Test Method

- 1 The EUT was placed on a table, which is 0.8m above ground plane
- 2 The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
- 3 Maximum procedure was performed to ensure EUT compliance
- 4 A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions from both sides of AC line

#### Limit

| Frequency<br>MHz | QP Limit<br>dB $\mu$ V | AV Limit<br>dB $\mu$ V |
|------------------|------------------------|------------------------|
| 0.150-0.500      | 66-56*                 | 56-46*                 |
| 0.500-5          | 56                     | 46                     |
| 5-30             | 60                     | 50                     |

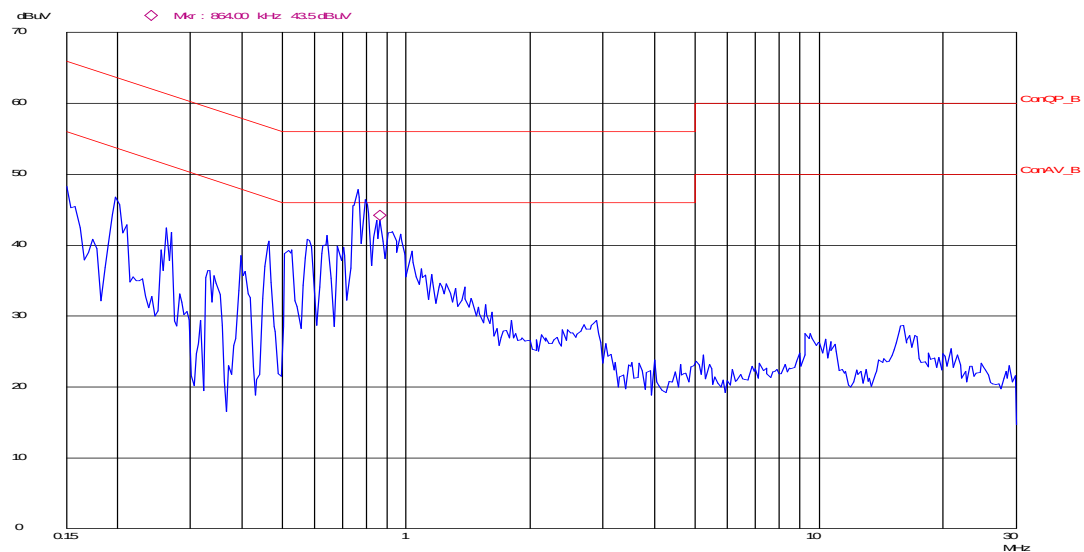
Decreasing linearly with logarithm of the frequency



## Conducted Emission

### Conducted Disturbance

EUT: MNP-C81007  
Op Cond: WiFi Running  
Test Spec: L  
Comment: AC 120V/50Hz



| Frequency<br>MHz | Cable Loss<br>dB | Reading<br>dBμV | QP Test result<br>dBμV | QP Limit<br>dBμV | Margin<br>dB |
|------------------|------------------|-----------------|------------------------|------------------|--------------|
| 0.150            | 9.8              | 28.9            | 38.7                   | 66.0             | 27.3         |
| 0.193            | 9.8              | 35.3            | 45.1                   | 63.9             | 18.8         |
| 0.262            | 9.8              | 30.4            | 40.2                   | 61.4             | 21.2         |
| 0.466            | 9.8              | 26.7            | 36.5                   | 56.6             | 20.1         |
| 0.764            | 9.9              | 33.3            | 43.2                   | 56.0             | 12.8         |
| 0.864            | 9.9              | 31.1            | 41.0                   | 56.0             | 15.0         |

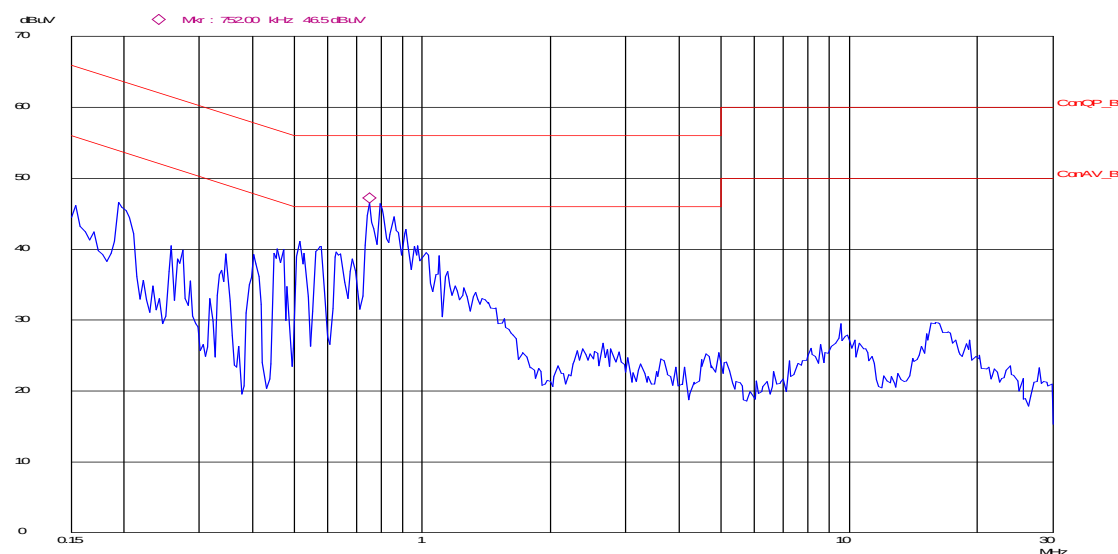
| Frequency<br>MHz | Cable Loss<br>dB | Reading<br>dBμV | AV Test result<br>dBμV | AV Limit<br>dBμV | Margin<br>dB |
|------------------|------------------|-----------------|------------------------|------------------|--------------|
| 0.150            | 9.8              | 10.3            | 20.1                   | 56.0             | 35.9         |
| 0.193            | 9.8              | 20.4            | 30.2                   | 53.9             | 23.7         |
| 0.262            | 9.8              | 11.8            | 21.6                   | 51.4             | 29.8         |
| 0.466            | 9.8              | 18.0            | 27.8                   | 46.6             | 18.8         |
| 0.764            | 9.9              | 20.7            | 30.6                   | 46.0             | 15.4         |
| 0.864            | 9.9              | 23.6            | 33.5                   | 46.0             | 12.5         |

Remark: Test Result= Reading + Cable Loss

## Conducted Emission

### Conducted Disturbance

EUT: MN-PC-81007  
Op Cond: WiFi Running  
Test Spec: N  
Comment: AC 120V/50-Hz



| Frequency<br>MHz | Cable Loss<br>dB | Reading<br>dBμV | QP Test result<br>dBμV | QP Limit<br>dBμV | Margin<br>dB |
|------------------|------------------|-----------------|------------------------|------------------|--------------|
| 0.154            | 9.8              | 28.5            | 38.3                   | 65.8             | 27.5         |
| 0.194            | 9.8              | 35.0            | 44.8                   | 63.9             | 19.1         |
| 0.346            | 9.8              | 25.0            | 34.8                   | 59.1             | 24.3         |
| 0.402            | 9.8              | 26.1            | 35.9                   | 57.8             | 21.9         |
| 0.516            | 9.9              | 28.8            | 38.7                   | 56.0             | 17.3         |
| 0.752            | 9.9              | 34.3            | 44.2                   | 56.0             | 11.8         |

| Frequency<br>MHz | Cable Loss<br>dB | Reading<br>dBμV | AV Test result<br>dBμV | AV Limit<br>dBμV | Margin<br>dB |
|------------------|------------------|-----------------|------------------------|------------------|--------------|
| 0.154            | 9.8              | 5.8             | 15.6                   | 55.8             | 40.2         |
| 0.194            | 9.8              | 18.6            | 28.4                   | 53.9             | 25.5         |
| 0.346            | 9.8              | 20.4            | 30.2                   | 49.1             | 18.9         |
| 0.402            | 9.8              | 21.5            | 31.3                   | 47.8             | 15.7         |
| 0.516            | 9.9              | 23.4            | 33.3                   | 46.0             | 12.7         |
| 0.752            | 9.9              | 26.9            | 36.8                   | 46.0             | 9.2          |

Remark: Test Result= Reading + Cable Loss

## Test Equipment List

| DESCRIPTION       | MANUFACTURER    | MODEL NO. | SERIAL NO. | CAL DUE DATE |
|-------------------|-----------------|-----------|------------|--------------|
| EMI Test Receiver | Rohde & Schwarz | ESCS30    | 100003     | Dec 23 2009  |
| AMN               | Rohde & Schwarz | ESH3-Z5   | 100229     | Dec 23 2009  |
| AMN               | Rohde & Schwarz | ENV216    | 100042     | Dec 23 2009  |

## 7.2 Conducted peak output power

### Test Method

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.

### Limits for conducted peak output power measurements

| Frequency Range<br>MHz | Limit<br>W | Limit<br>dBm |
|------------------------|------------|--------------|
| 2400-2483              | ≤1         | ≤30          |

## Conducted peak output power

### DSSS mode QPSK modulation 11Mbps data rate Test Result

| Frequency<br>MHz | Conducted Peak<br>Output Power<br>dBm | Result |
|------------------|---------------------------------------|--------|
| CH1 2412MHz      | 17.55                                 | Pass   |
| CH2 2442MHz      | 17.80                                 | Pass   |
| CH3 2462MHz      | 18.26                                 | Pass   |

### OFDM mode BPSK modulation 6Mbps data rate Test Result

| Frequency<br>MHz | Conducted Peak<br>Output Power<br>dBm | Result |
|------------------|---------------------------------------|--------|
| CH1 2412MHz      | 17.20                                 | Pass   |
| CH2 2442MHz      | 17.06                                 | Pass   |
| CH3 2462MHz      | 17.40                                 | Pass   |



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## Test Equipment

| DESCRIPTION       | MANUFACTURER    | MODEL NO. | SERIAL NO. | CAL DUE DATE |
|-------------------|-----------------|-----------|------------|--------------|
| EMI Test Receiver | Rohde & Schwarz | ESPI3     | 100244     | Dec 23 2009  |

## 7.3 Band edge compliance of RF emissions

### Test Method

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.4 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW and VBW to 1MHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength.

The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW and VBW to 100kHz, to measure the conducted peak band edge.

### Limits

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

| Frequency<br>MHz        | Limit Average<br>dBuV/m | Limit Peak<br>dBuV/m |
|-------------------------|-------------------------|----------------------|
| Below 2390 Above 2483.5 | 54                      | 74                   |

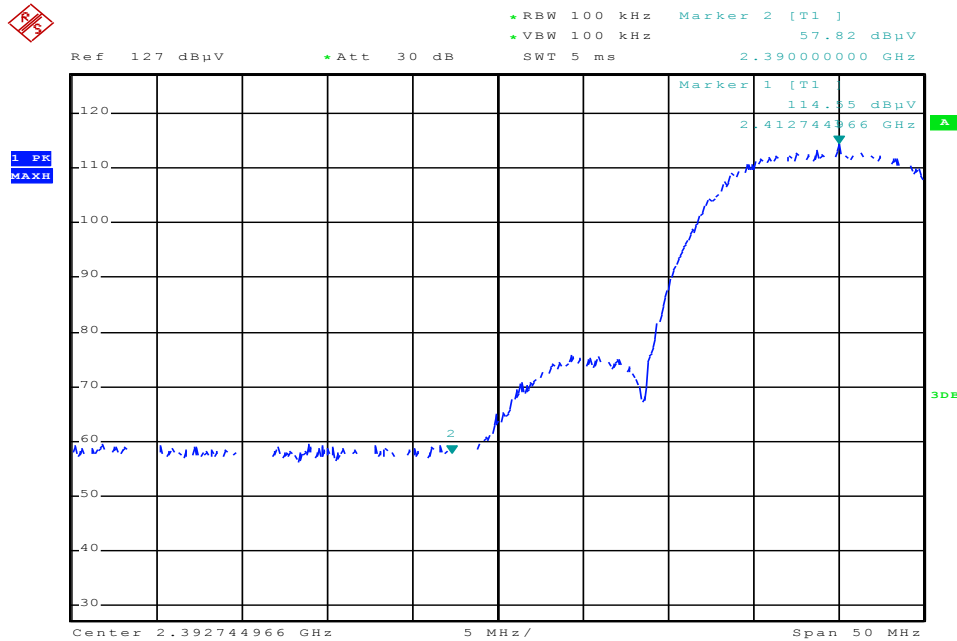
## Band edge compliance of RF emissions

DSSS mode QPSK modulation 11Mbps data rate Test Result

Maximum Carrier Field strength

| Frequency<br>MHz | Cable<br>Loss<br>dB | Antenna<br>Factor<br>dB/m | Reading<br>dBuV | Emission<br>Level<br>dBuV/m | Polarization | Limit<br>dBuV/m | Detector | Result |
|------------------|---------------------|---------------------------|-----------------|-----------------------------|--------------|-----------------|----------|--------|
| 2412.000         | 5.6                 | 28.5                      | 71.0            | 105.1                       | Horizontal   | ---             | PK       | ---    |
| 2412.000         | 5.6                 | 28.5                      | 61.8            | 95.9                        | Horizontal   | ---             | AV       | ---    |
| 2462.000         | 5.6                 | 28.5                      | 72.8            | 106.9                       | Horizontal   | ---             | PK       | ---    |
| 2462.000         | 5.6                 | 28.5                      | 64.2            | 98.3                        | Horizontal   | ---             | AV       | ---    |

## Lower Edge PK plot

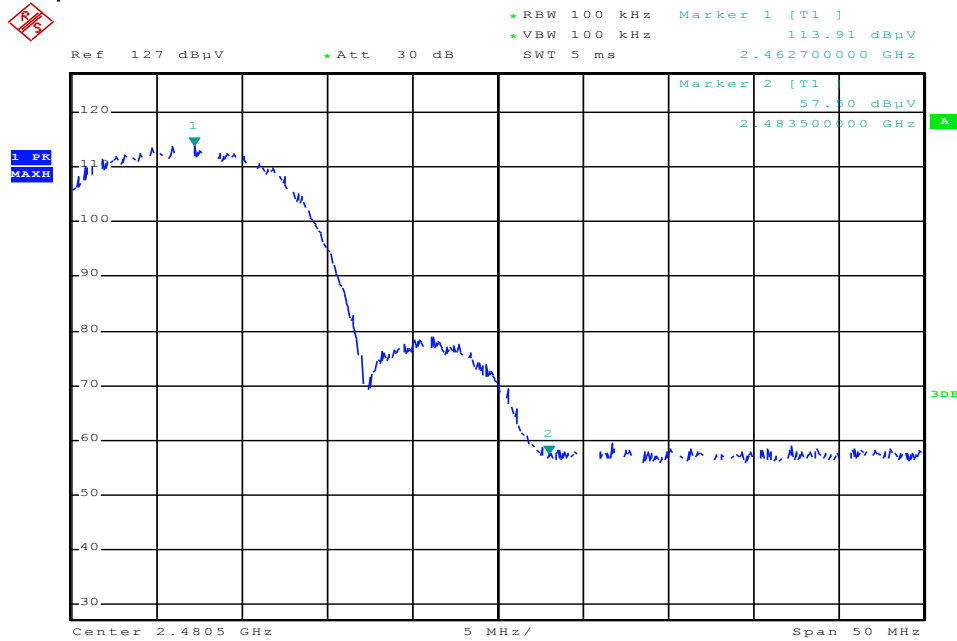


Date: 17.FEB.2009 01:17:16

Max carrier field strength PK 105.1dBuV/m, AV 95.9dBuV/m  
 At 2.390GHz, the deviation of PK plot is 56.73dB  
 The field strength at 2.390GHz PK 48.37dBuV/m  
 Which fulfill the requirement of PK 74dBuV/m, AV 54dBuV/m.  
 PK plot shows compliance with the AV limit, AV plot is omitted.



## Upper Edge PK plot



Date: 17.FEB.2009 01:23:32

Max carrier field strength PK 106.9dBuV/m, AV 98.3dBuV/m  
At 2.4835GHz, the deviation of PK plot is 56.41dB  
The field strength at 2.4835GHz PK 50.49dBuV/m  
Which fulfill the requirement of PK 74dBuV/m, AV 54dBuV/m.  
PK plot shows compliance with the AV limit, AV plot is omitted.

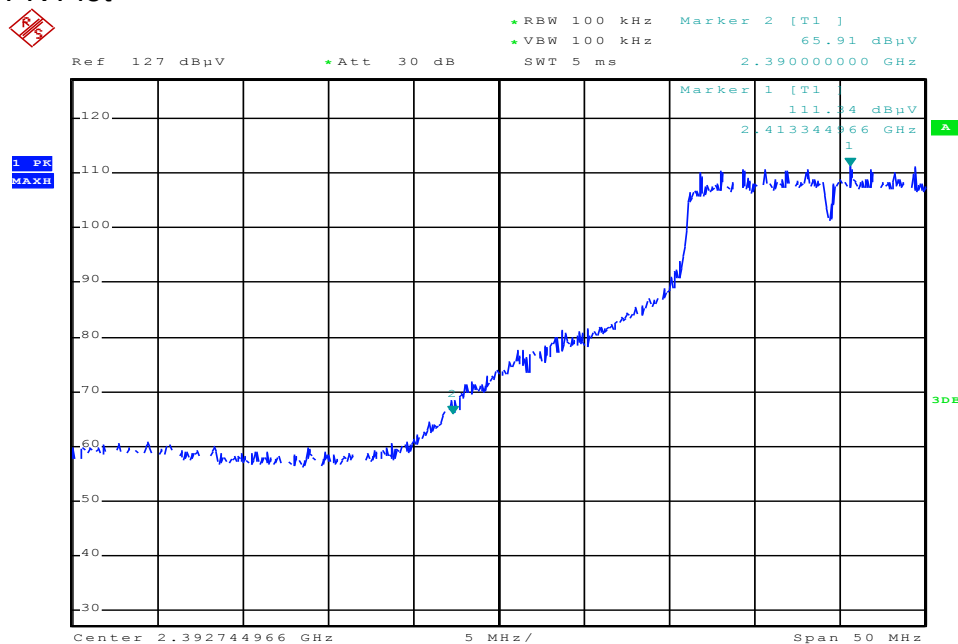
## Band edge compliance of RF emissions

OFDM mode BPSK modulation 6Mbps data rate Test Result

Maximum Carrier Field strength Carrier Field strength

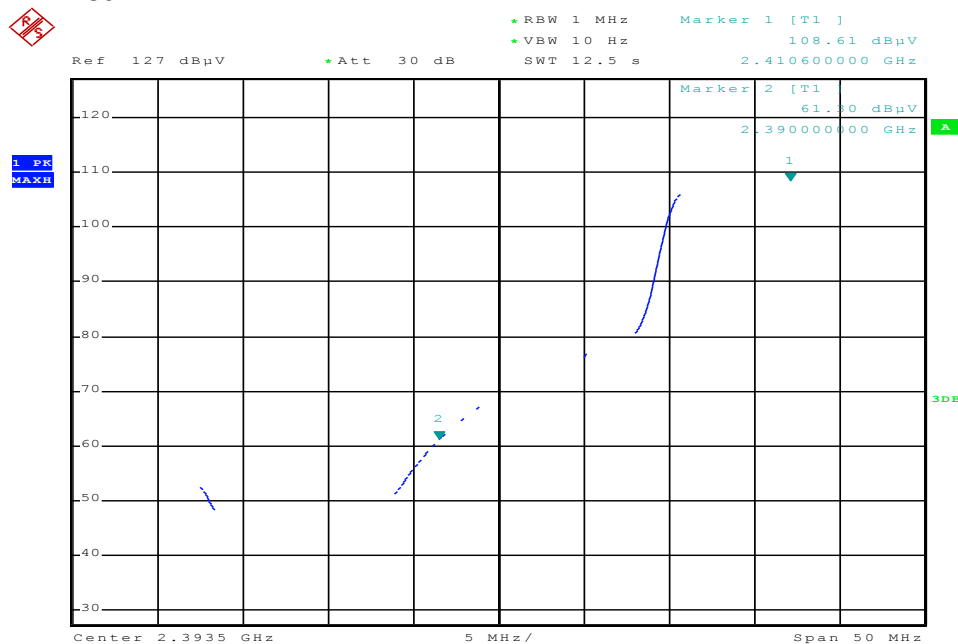
| Frequency<br>MHz | Cable<br>Loss<br>dB | Antenna<br>Factor<br>dB/m | Reading<br>dBuV | Emission<br>Level<br>dBuV/m | Polarization | Limit<br>dBuV/m | Detector | Result |
|------------------|---------------------|---------------------------|-----------------|-----------------------------|--------------|-----------------|----------|--------|
| 2412.000         | 5.6                 | 28.5                      | 71.0            | 105.1                       | Horizontal   | ---             | PK       | ---    |
| 2412.000         | 5.6                 | 28.5                      | 63.4            | 97.5                        | Horizontal   | ---             | AV       | ---    |
| 2462.000         | 5.6                 | 28.5                      | 35.7            | 105.2                       | Horizontal   | ---             | PK       | ---    |
| 2462.000         | 5.6                 | 28.5                      | 61.0            | 95.1                        | Horizontal   | ---             | AV       | ---    |

## Lower Edge PK Plot



Date: 17.FEB.2009 01:18:48

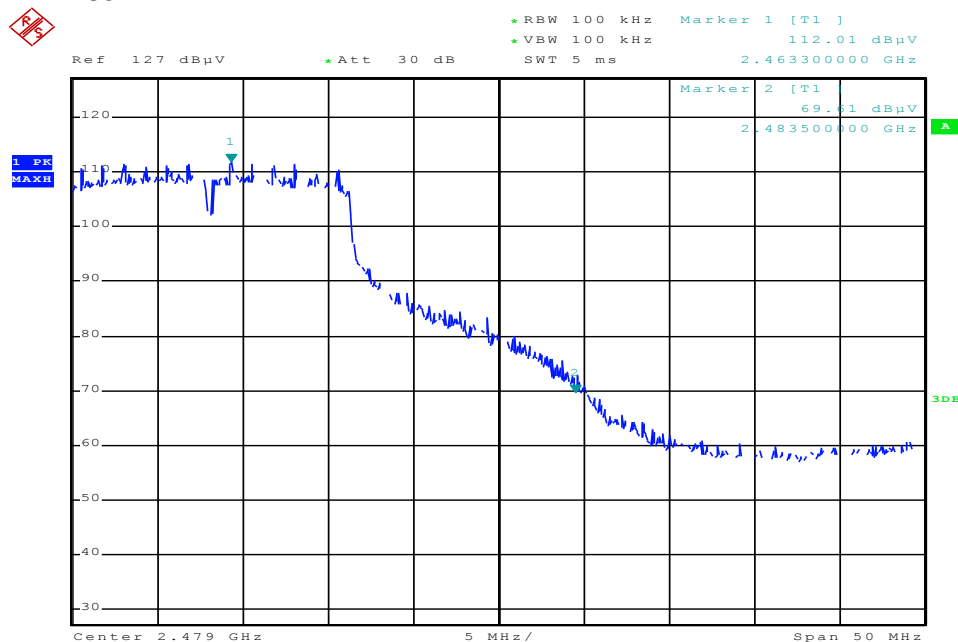
## AV Plot



Date: 17.FEB.2009 01:27:57

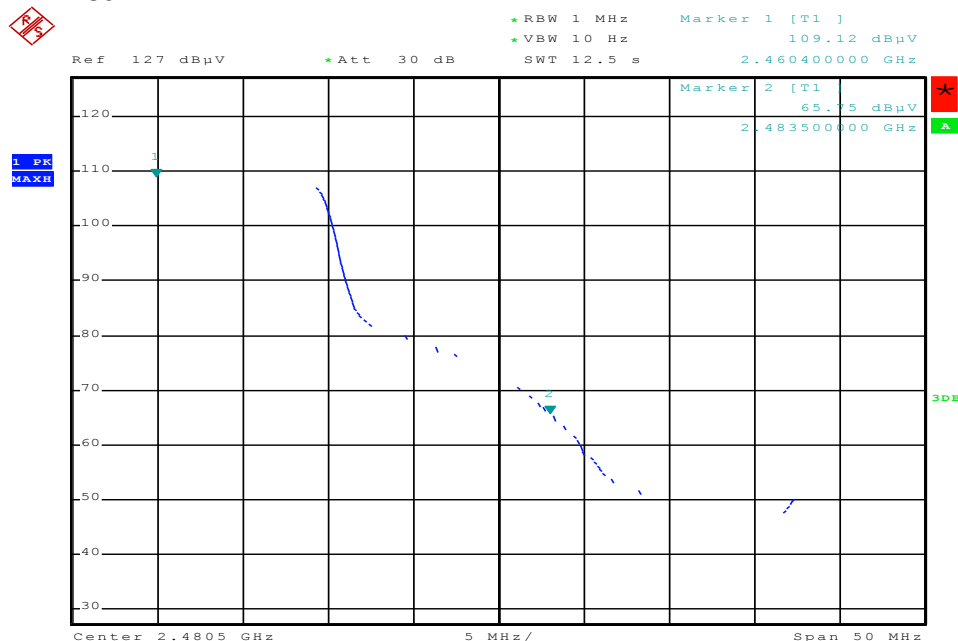
Max carrier field strength PK 105.1dBuV/m, AV 97.5dBuV/m  
 At 2.390GHz, the deviation of PK plot is 45.43dB, AV plot is 47.31dB  
 The field strength at 2.390GHz PK 59.67dBuV/m, AV 50.19dBuV/m  
 Which fulfill the requirement of PK 74dBuV/m and AV 54dBuV/m

## Upper Edge PK Plot



Date: 17.FEB.2009 01:21:41

## AV Plot



Date: 17.FEB.2009 01:25:49

Max carrier field strength PK 105.2dBuV/m, AV 95.1dBuV/m  
 At 2.4835GHz, the deviation of PK plot is 42.4dB, AV plot is 43.37dB  
 The field strength at 2.4835GHz PK 62.8dBuV/m, AV 51.73dBuV/m  
 Which fulfill the requirement of PK 74dBuV/m and AV 54dBuV/m



Product Service

## Test Equipment List

| DESCRIPTION       | MANUFACTURER    | MODEL NO. | SERIAL NO. | CAL DUE DATE |
|-------------------|-----------------|-----------|------------|--------------|
| EMI Test Receiver | Rohde & Schwarz | ESPI3     | 100244     | Dec 23 2009  |

## 7.4 Spurious RF conducted emissions

### Test Method

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The resolution bandwidth(RBW) and the video bandwidth (VBW) of the spectrum analyzer were respectively set to 100kHz and 100kHz.

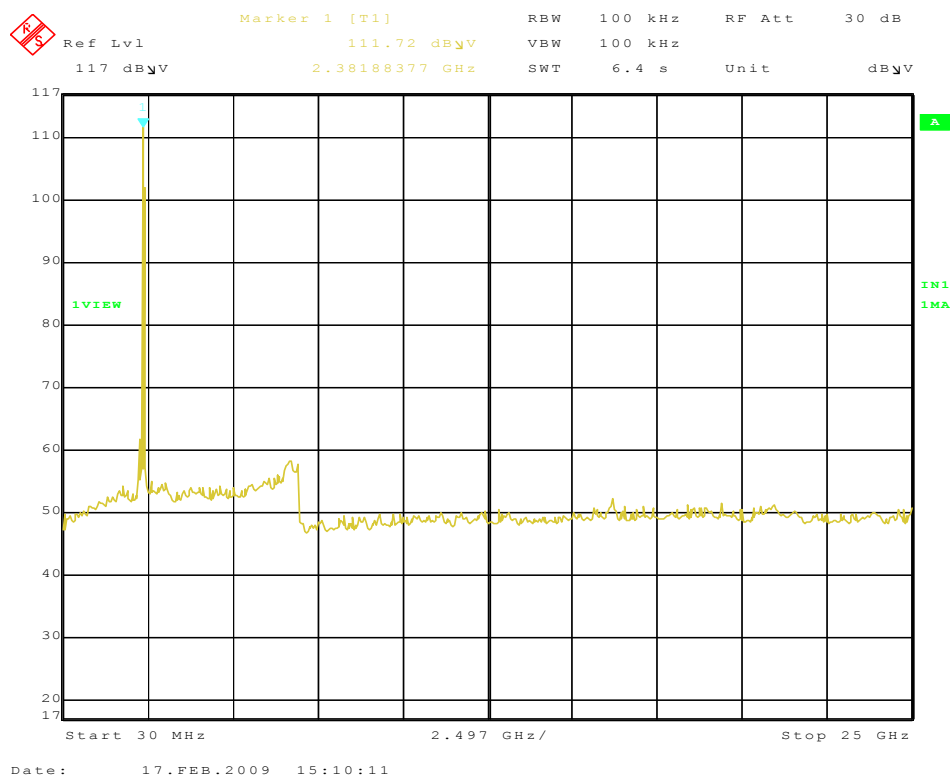
### Limit

| Frequency Range<br>MHz | Limit (dBc) |
|------------------------|-------------|
| 1000-25000             | -20         |

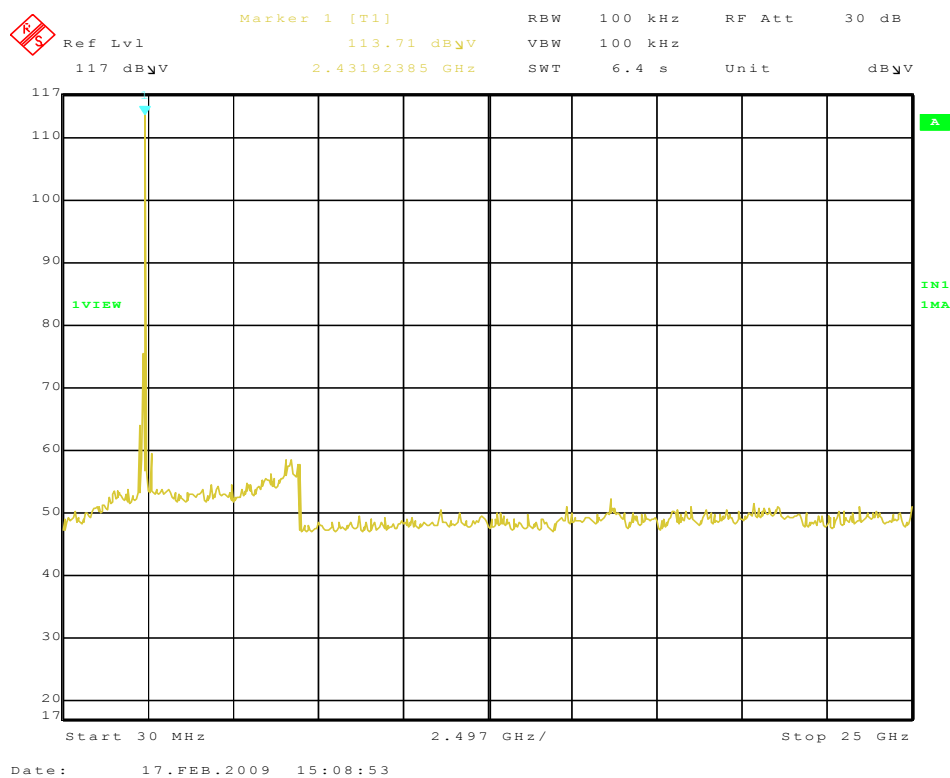
## Spurious RF conducted emissions

### DSSS mode QPSK modulation 11Mbps data rate Test Result

2412MHz

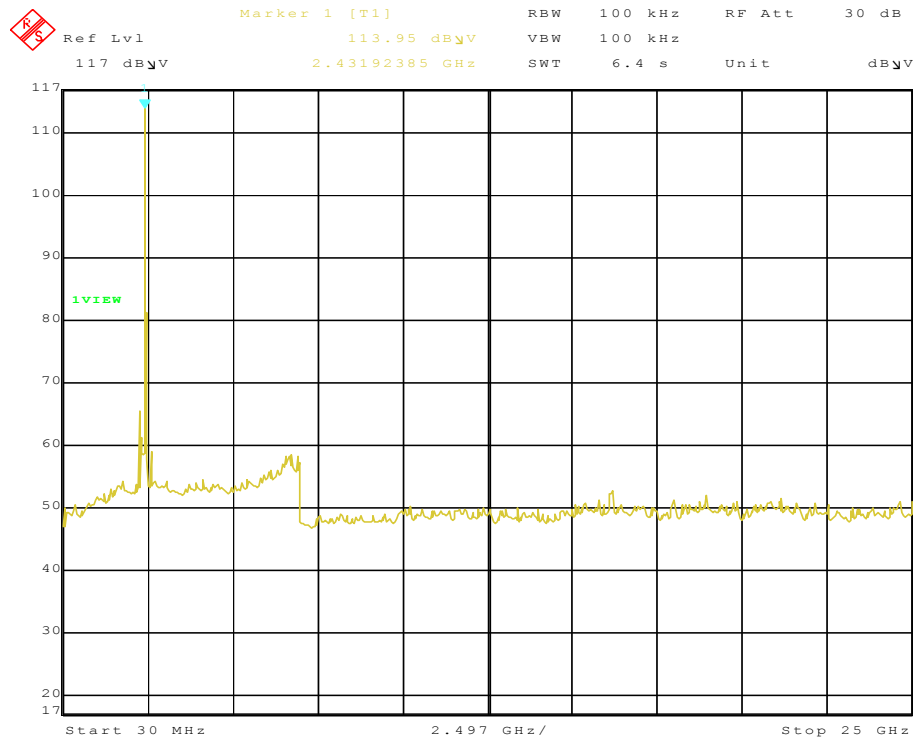


2442MHz



## Spurious RF conducted emissions

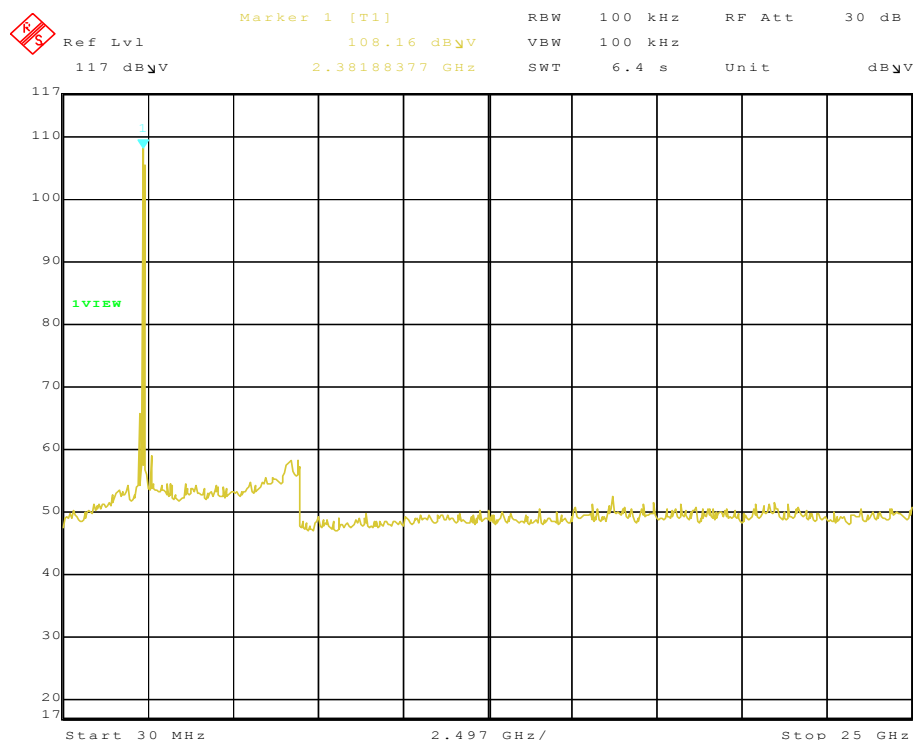
2462MHz



Date: 17.FEB.2009 15:06:51

## OFDM mode BPSK modulation 6Mbps data rate Test Result

2412MHz

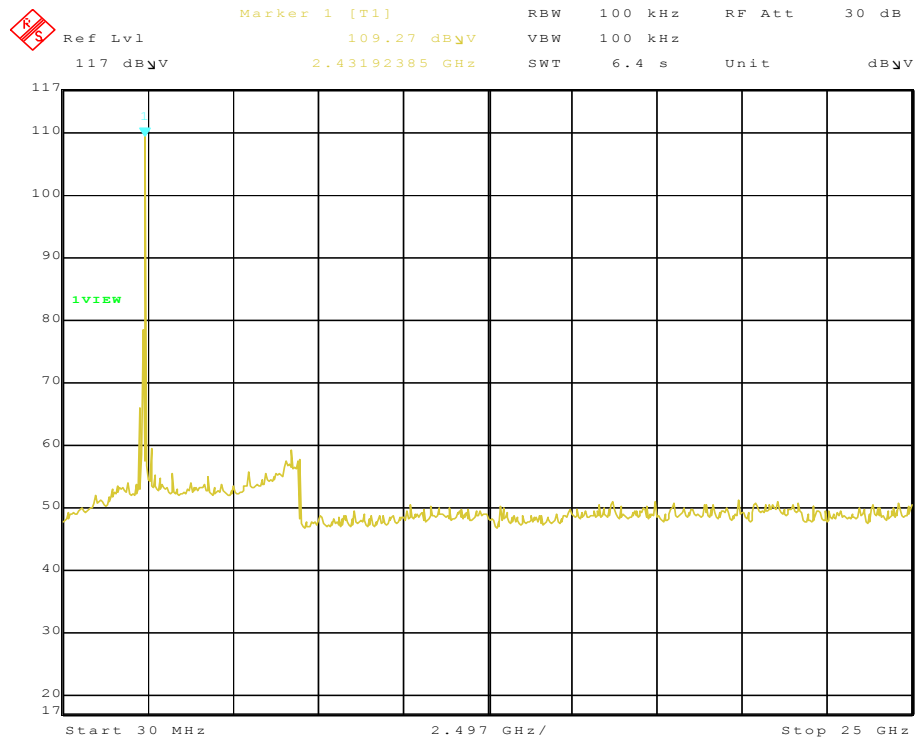


Date: 17.FEB.2009 15:11:09



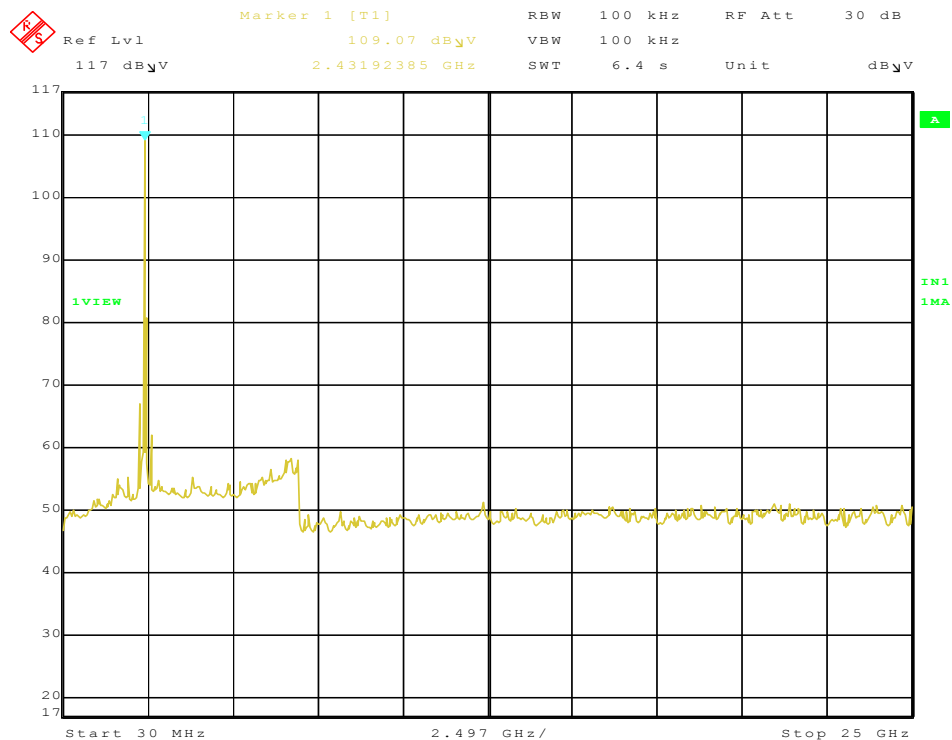
## Spurious RF conducted emissions

2442MHz



Date: 17.FEB.2009 15:09:28

2462MHz



Date: 17.FEB.2009 15:08:17



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## Test Equipment List

| DESCRIPTION       | MANUFACTURER    | MODEL NO. | SERIAL NO. | CAL DUE DATE |
|-------------------|-----------------|-----------|------------|--------------|
| EMI Test Receiver | Rohde & Schwarz | ESl26     | 838786/013 | Dec 23 2009  |

## 7.5 Spurious radiated emissions

### Test Method

- 1 The EUT is placed on a turntable, which is 0.8m above ground plane.
- 2 The turntable shall be rotated for 360 degrees to determine the position of maximum emission level
- 3 EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 4 Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5 Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

### Limit

| Frequency<br>MHz | Field Strength<br>uV/m | Field Strength<br>dBμV/m | Detector |
|------------------|------------------------|--------------------------|----------|
| 30-88            | 100                    | 40                       | QP       |
| 88-216           | 150                    | 43.5                     | QP       |
| 216-960          | 200                    | 46                       | QP       |
| 960-1000         | 500                    | 54                       | QP       |
| Above 1000       | 500                    | 54                       | AV       |
| Above 1000       | 5000                   | 74                       | PK       |

## Radiated Emission

### DSSS mode QPSK modulation 11Mbps data rate CH1 2412MHz Test Result

| Frequency<br>MHz | Cable<br>Loss<br>dB | Antenna<br>Factor<br>dB/m | Reading<br>dBuV | Emission<br>Level<br>dBuV/m | Polarization | Limit<br>dBuV/m | Detector | Result |
|------------------|---------------------|---------------------------|-----------------|-----------------------------|--------------|-----------------|----------|--------|
| 266.664          | 2.8                 | 13.2                      | 22.9            | 38.9                        | Horizontal   | 46.0            | QP       | Pass   |
| 750.008          | 4.6                 | 20.2                      | 15.1            | 39.9                        | Horizontal   | 46.0            | QP       | Pass   |
| 375.002          | 3.2                 | 15.9                      | 16.8            | 35.9                        | Vertical     | 46.0            | QP       | Pass   |
| 533.330          | 3.8                 | 18.4                      | 16.7            | 38.9                        | Vertical     | 46.0            | QP       | Pass   |
| 2288.002         | 5.5                 | 28.5                      | 15.5            | 49.5                        | Horizontal   | 74              | PK       | Pass   |
| 2288.002         | 5.5                 | 28.5                      | 11.4            | 45.4                        | Horizontal   | 54              | AV       | Pass   |
| 2640.004         | 5.9                 | 29.9                      | 12.0            | 47.8                        | Horizontal   | 74              | PK       | Pass   |
| 2640.004         | 5.9                 | 29.9                      | 8.6             | 44.4                        | Horizontal   | 54              | AV       | Pass   |
| 4824.865         | 4.2                 | 33.3                      | 11.8            | 49.3                        | Horizontal   | 74              | PK       | Pass   |
| 4824.865         | 4.2                 | 33.3                      | 10.2            | 47.7                        | Horizontal   | 54              | AV       | Pass   |
| 7236.334         | 5.2                 | 36.4                      | 8.3             | 49.9                        | Horizontal   | 74              | PK       | Pass   |
| 7236.334         | 5.2                 | 36.4                      | 6.0             | 47.6                        | Horizontal   | 54              | AV       | Pass   |
| 9648.543         | 6.0                 | 37.5                      | 5.7             | 49.2                        | Horizontal   | 74              | PK       | Pass   |
| 9648.543         | 6.0                 | 37.5                      | 0.9             | 44.4                        | Horizontal   | 54              | AV       | Pass   |
| 12060.609        | 7.0                 | 38.4                      | ----            | ----                        | Horizontal   | 74              | PK       | Pass   |
| 12060.609        | 7.0                 | 38.4                      | ----            | ----                        | Horizontal   | 54              | AV       | Pass   |
| 14472.467        | 7.6                 | 42.6                      | ----            | ----                        | Horizontal   | 74              | PK       | Pass   |
| 14472.467        | 7.6                 | 42.6                      | ----            | ----                        | Horizontal   | 54              | AV       | Pass   |

### DSSS mode QPSK modulation 11Mbps data rate CH7 2442MHz Test Result

| Frequency<br>MHz | Cable<br>Loss<br>dB | Antenna<br>Factor<br>dB/m | Reading<br>dBuV | Emission<br>Level<br>dBuV/m | Polarization | Limit<br>dBuV/m | Detector | Result |
|------------------|---------------------|---------------------------|-----------------|-----------------------------|--------------|-----------------|----------|--------|
| 2133.316         | 5.3                 | 28.5                      | 15.3            | 49.1                        | Horizontal   | 74              | PK       | Pass   |
| 2133.316         | 5.3                 | 28.5                      | 5.8             | 39.6                        | Horizontal   | 54              | AV       | Pass   |
| 2288.003         | 5.5                 | 28.5                      | 13.3            | 47.3                        | Horizontal   | 74              | PK       | Pass   |
| 2288.003         | 5.5                 | 28.5                      | 9.1             | 43.1                        | Horizontal   | 54              | AV       | Pass   |
| 4884.368         | 4.3                 | 33.3                      | 13.9            | 51.5                        | Horizontal   | 74              | PK       | Pass   |
| 4884.368         | 4.3                 | 33.3                      | 12.7            | 50.3                        | Horizontal   | 54              | AV       | Pass   |
| 7326.334         | 5.2                 | 36.4                      | 9.2             | 50.8                        | Horizontal   | 74              | PK       | Pass   |
| 7326.334         | 5.2                 | 36.4                      | 5.4             | 47.0                        | Horizontal   | 54              | AV       | Pass   |
| 9768.609         | 6.0                 | 37.5                      | 4.3             | 47.8                        | Horizontal   | 74              | PK       | Pass   |
| 9768.609         | 6.0                 | 37.5                      | 1.1             | 44.6                        | Horizontal   | 54              | AV       | Pass   |
| 12210.375        | 7.0                 | 38.4                      | ----            | ----                        | Horizontal   | 74              | PK       | Pass   |
| 12210.375        | 7.0                 | 38.4                      | ----            | ----                        | Horizontal   | 54              | AV       | Pass   |
| 14652.187        | 7.6                 | 41.1                      | ----            | ----                        | Horizontal   | 74              | PK       | Pass   |
| 14652.187        | 7.6                 | 41.1                      | ----            | ----                        | Horizontal   | 54              | AV       | Pass   |

## Radiated Emission

DSSS mode QPSK modulation 11Mbps data rate CH11 2462MHz Test Result

| Frequency<br>MHz | Cable<br>Loss<br>dB | Antenna<br>Factor<br>dB/m | Reading<br>dBuV | Emission<br>Level<br>dBuV/m | Polarization | Limit<br>dBuV/m | Detector | Result |
|------------------|---------------------|---------------------------|-----------------|-----------------------------|--------------|-----------------|----------|--------|
| 2288.003         | 5.5                 | 28.5                      | 14.1            | 48.1                        | Horizontal   | 74              | PK       | Pass   |
| 2288.003         | 5.5                 | 28.5                      | 9.4             | 43.4                        | Horizontal   | 54              | AV       | Pass   |
| 2640.006         | 5.9                 | 29.9                      | 10.8            | 46.6                        | Horizontal   | 74              | PK       | Pass   |
| 2640.006         | 5.9                 | 29.9                      | 5.3             | 41.1                        | Horizontal   | 54              | AV       | Pass   |
| 4924.660         | 4.3                 | 33.3                      | 15.8            | 53.4                        | Horizontal   | 74              | PK       | Pass   |
| 4924.660         | 4.3                 | 33.3                      | 12.0            | 49.6                        | Horizontal   | 54              | AV       | Pass   |
| 7386.431         | 5.2                 | 36.4                      | 10.3            | 51.9                        | Horizontal   | 74              | PK       | Pass   |
| 7386.431         | 5.2                 | 36.4                      | 7.5             | 49.1                        | Horizontal   | 54              | AV       | Pass   |
| 9848.221         | 6.0                 | 37.5                      | 7.4             | 50.9                        | Horizontal   | 74              | PK       | Pass   |
| 9848.221         | 6.0                 | 37.5                      | 0.3             | 43.8                        | Horizontal   | 54              | AV       | Pass   |
| 12310.869        | 6.9                 | 38.4                      | ----            | ----                        | Horizontal   | 74              | PK       | Pass   |
| 12310.869        | 6.9                 | 38.4                      | ----            | ----                        | Horizontal   | 54              | AV       | Pass   |
| 14772.432        | 7.6                 | 41.1                      | ----            | ----                        | Horizontal   | 74              | PK       | Pass   |
| 14772.432        | 7.6                 | 41.1                      | ----            | ----                        | Horizontal   | 54              | AV       | Pass   |

Remark:

- (1) Emission Level= Cable Loss(include amplifier factor) + Antenna Factor + Reading
- (2) Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.

## Radiated Emission

### OFDM mode BPSK modulation 6Mbps data rate CH1 2412MHz Test Result

| Frequency<br>MHz | Cable<br>Loss<br>dB | Antenna<br>Factor<br>dB/m | Reading<br>dBuV | Emission<br>Level<br>dBuV/m | Polarization | Limit<br>dBuV/m | Detector | Result |
|------------------|---------------------|---------------------------|-----------------|-----------------------------|--------------|-----------------|----------|--------|
| 263.332          | 2.8                 | 13.7                      | 19.8            | 36.3                        | Vertical     | 46.0            | QP       | Pass   |
| 775.987          | 4.7                 | 20.2                      | 15.3            | 40.2                        | Vertical     | 46.0            | QP       | Pass   |
| 88.098           | 1.6                 | 10.7                      | 17.6            | 29.9                        | Horizontal   | 43.5            | QP       | Pass   |
| 397.446          | 3.2                 | 16.5                      | 17.8            | 37.5                        | Horizontal   | 46.0            | QP       | Pass   |
| 2324.108         | 5.5                 | 28.5                      | 17.3            | 51.3                        | Horizontal   | 74              | PK       | Pass   |
| 2324.108         | 5.5                 | 28.5                      | 7.9             | 41.9                        | Horizontal   | 54              | AV       | Pass   |
| 2133.316         | 5.3                 | 28.5                      | 15.7            | 49.5                        | Horizontal   | 74              | PK       | Pass   |
| 2133.316         | 5.3                 | 28.5                      | 5.8             | 39.6                        | Horizontal   | 54              | AV       | Pass   |
| 4824.690         | 4.2                 | 33.3                      | 10.8            | 48.3                        | Horizontal   | 74              | PK       | Pass   |
| 4824.690         | 4.2                 | 33.3                      | 8.6             | 46.1                        | Horizontal   | 54              | AV       | Pass   |
| 7236.215         | 5.2                 | 36.4                      | 7.3             | 48.9                        | Horizontal   | 74              | PK       | Pass   |
| 7236.215         | 5.2                 | 36.4                      | 3.8             | 45.4                        | Horizontal   | 54              | AV       | Pass   |
| 9648.380         | 6.0                 | 37.5                      | 6.3             | 49.8                        | Horizontal   | 74              | PK       | Pass   |
| 9648.380         | 6.0                 | 37.5                      | 1.1             | 44.6                        | Horizontal   | 54              | AV       | Pass   |
| 12060.032        | 7.0                 | 38.4                      | ----            | ----                        | Horizontal   | 74              | PK       | Pass   |
| 12060.032        | 7.0                 | 38.4                      | ----            | ----                        | Horizontal   | 54              | AV       | Pass   |
| 14472.281        | 7.6                 | 42.6                      | ----            | ----                        | Horizontal   | 74              | PK       | Pass   |
| 14472.281        | 7.6                 | 42.6                      | ----            | ----                        | Horizontal   | 54              | AV       | Pass   |

### OFDM mode BPSK modulation 6Mbps data rate CH7 2442MHz Test Result

| Frequency<br>MHz | Cable<br>Loss<br>dB | Antenna<br>Factor<br>dB/m | Reading<br>dBuV | Emission<br>Level<br>dBuV/m | Polarization | Limit<br>dBuV/m | Detector | Result |
|------------------|---------------------|---------------------------|-----------------|-----------------------------|--------------|-----------------|----------|--------|
| 2288.011         | 5.5                 | 28.5                      | 15.0            | 49                          | Horizontal   | 74              | PK       | Pass   |
| 2288.011         | 5.5                 | 28.5                      | 11.2            | 45.2                        | Horizontal   | 54              | AV       | Pass   |
| 2640.006         | 5.9                 | 29.9                      | 11.5            | 47.3                        | Horizontal   | 74              | PK       | Pass   |
| 2640.006         | 5.9                 | 29.9                      | 6.7             | 42.5                        | Horizontal   | 54              | AV       | Pass   |
| 4884.341         | 4.3                 | 33.3                      | 13.1            | 50.7                        | Horizontal   | 74              | PK       | Pass   |
| 4884.341         | 4.3                 | 33.3                      | 9.5             | 47.1                        | Horizontal   | 54              | AV       | Pass   |
| 7326.220         | 5.2                 | 36.4                      | 8.2             | 49.8                        | Horizontal   | 74              | PK       | Pass   |
| 7326.220         | 5.2                 | 36.4                      | 5.9             | 47.5                        | Horizontal   | 54              | AV       | Pass   |
| 9768.455         | 6.0                 | 37.5                      | 4.9             | 48.4                        | Horizontal   | 74              | PK       | Pass   |
| 9768.455         | 6.0                 | 37.5                      | 2.0             | 45.5                        | Horizontal   | 54              | AV       | Pass   |
| 12210.264        | 7.0                 | 38.4                      | ----            | ----                        | Horizontal   | 74              | PK       | Pass   |
| 12210.264        | 7.0                 | 38.4                      | ----            | ----                        | Horizontal   | 54              | AV       | Pass   |
| 14652.292        | 7.6                 | 41.1                      | ----            | ----                        | Horizontal   | 74              | PK       | Pass   |
| 14652.292        | 7.6                 | 41.1                      | ----            | ----                        | Horizontal   | 54              | AV       | Pass   |

## Radiated Emission

OFDM mode BPSK modulation 6Mbps data rate CH11 2462MHz Test Result

| Frequency<br>MHz | Cable<br>Loss<br>dB | Antenna<br>Factor<br>dB/m | Reading<br>dBuV | Emission<br>Level<br>dBuV/m | Polarization | Limit<br>dBuV/m | Detector | Result |
|------------------|---------------------|---------------------------|-----------------|-----------------------------|--------------|-----------------|----------|--------|
| 2288.003         | 5.5                 | 28.5                      | 17.0            | 51.0                        | Horizontal   | 74              | PK       | Pass   |
| 2288.003         | 5.5                 | 28.5                      | 13.0            | 47.0                        | Horizontal   | 54              | AV       | Pass   |
| 2640.006         | 5.9                 | 29.9                      | 14.3            | 50.1                        | Horizontal   | 74              | PK       | Pass   |
| 2640.006         | 5.9                 | 29.9                      | 9.2             | 45.0                        | Horizontal   | 54              | AV       | Pass   |
| 4924.333         | 4.3                 | 33.3                      | 10.6            | 48.2                        | Horizontal   | 74              | PK       | Pass   |
| 4924.333         | 4.3                 | 33.3                      | 8.4             | 46.0                        | Horizontal   | 54              | AV       | Pass   |
| 7386.187         | 5.2                 | 36.4                      | 6.9             | 48.5                        | Horizontal   | 74              | PK       | Pass   |
| 7386.187         | 5.2                 | 36.4                      | 4.1             | 45.7                        | Horizontal   | 54              | AV       | Pass   |
| 9848.543         | 6.0                 | 37.5                      | 4.6             | 47.0                        | Horizontal   | 74              | PK       | Pass   |
| 9848.543         | 6.0                 | 37.5                      | 2.2             | 45.7                        | Horizontal   | 54              | AV       | Pass   |
| 12310.789        | 6.9                 | 38.4                      | ----            | ----                        | Horizontal   | 74              | PK       | Pass   |
| 12310.789        | 6.9                 | 38.4                      | ----            | ----                        | Horizontal   | 54              | AV       | Pass   |
| 14772.116        | 7.6                 | 41.1                      | ----            | ----                        | Horizontal   | 74              | PK       | Pass   |
| 14772.116        | 7.6                 | 41.1                      | ----            | ----                        | Horizontal   | 54              | AV       | Pass   |

Remark:

- (1) Emission Level= Cable Loss(include amplifier factor) + Antenna Factor + Reading
- (2) Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.



Product Service

## Test Equipment List

| DESCRIPTION       | MANUFACTURER    | MODEL NO. | SERIAL NO. | CAL DUE DATE |
|-------------------|-----------------|-----------|------------|--------------|
| EMI Test Receiver | Rohde & Schwarz | ES126     | 838786/013 | Dec 23 2009  |
| Bilog Antenna     | Chase           | CBL6112B  | 2591       | Dec 23 2009  |
| Signal Generator  | Rohde & Schwarz | SMR20     | 100047     | Dec 23 2009  |
| Antenna           | Schwarzbeck     | VUBA9117  | 115        | Dec 23 2009  |
| Horn Antenna      | Rohde & Schwarz | HF906     | 100013     | Dec 23 2009  |



## 7.6 6 dB bandwidth

### Test Method

- 1 Place the EUT on the table and set it in the transmitting mode.
- 2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3 Mark the peak frequency and –6dB (upper and lower) frequency.

### Limit

Limit [kHz]

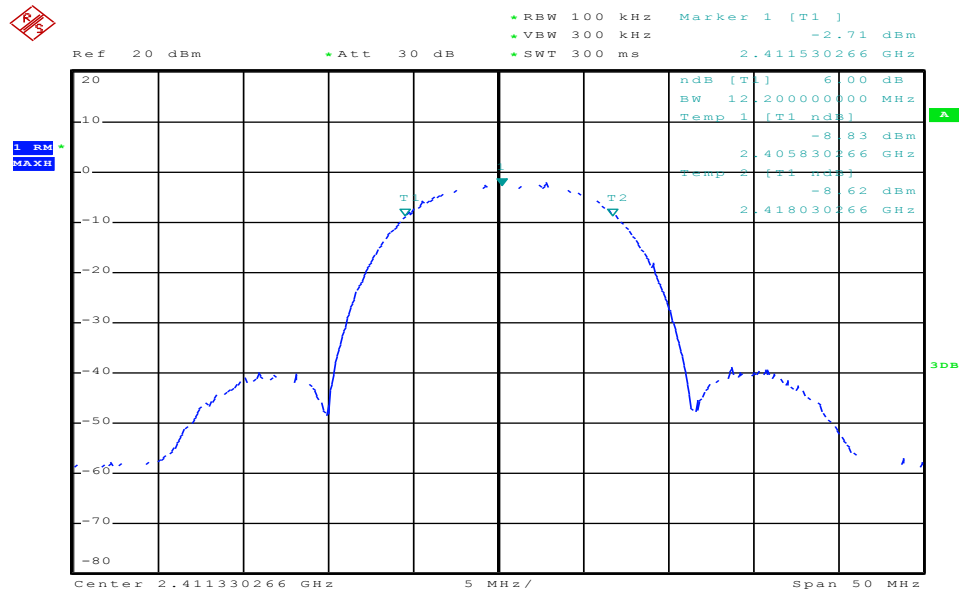
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$\geq 500$

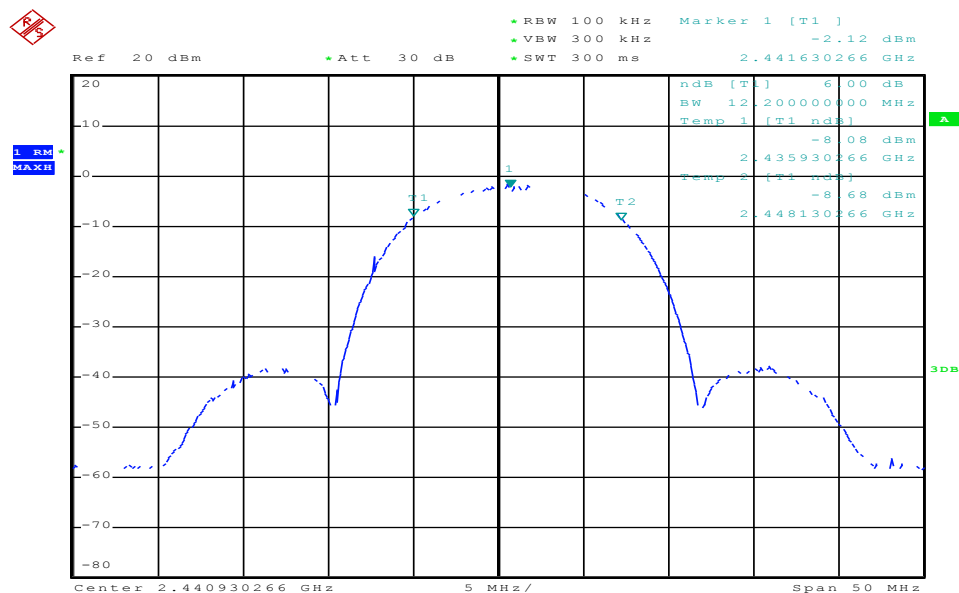
## 6 dB bandwidth

### DSSS mode QPSK modulation 11Mbps data rate Test Result

| Frequency<br>MHz | Bandwidth<br>kHz | Limit<br>kHz | Result |
|------------------|------------------|--------------|--------|
| 2412             | 12200            | ≥ 500        | Pass   |
| 2442             | 12200            | ≥ 500        | Pass   |
| 2462             | 11800            | ≥ 500        | Pass   |

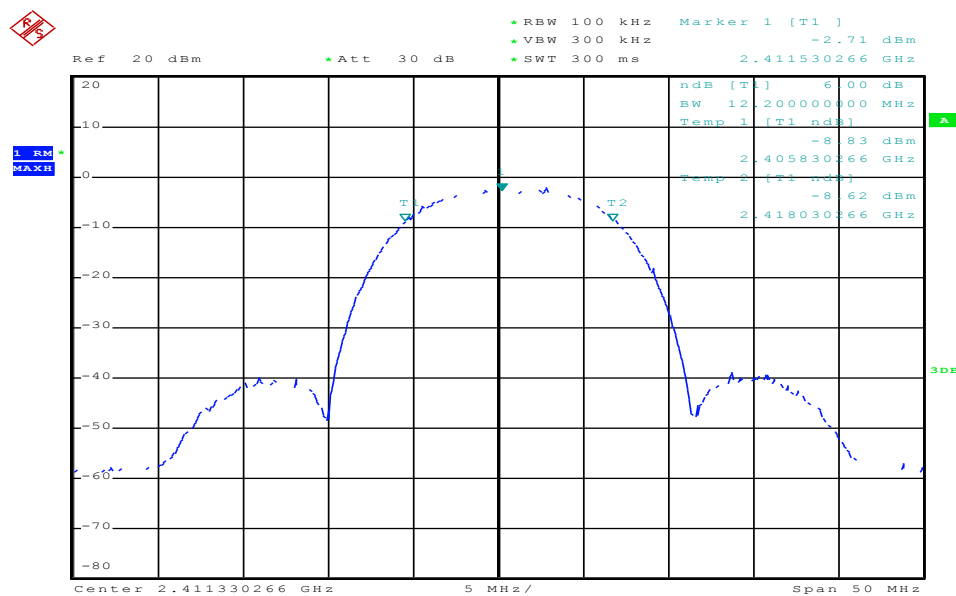


Date: 17.FEB.2009 00:34:56



Date: 17.FEB.2009 00:33:45

## 6 dB bandwidth

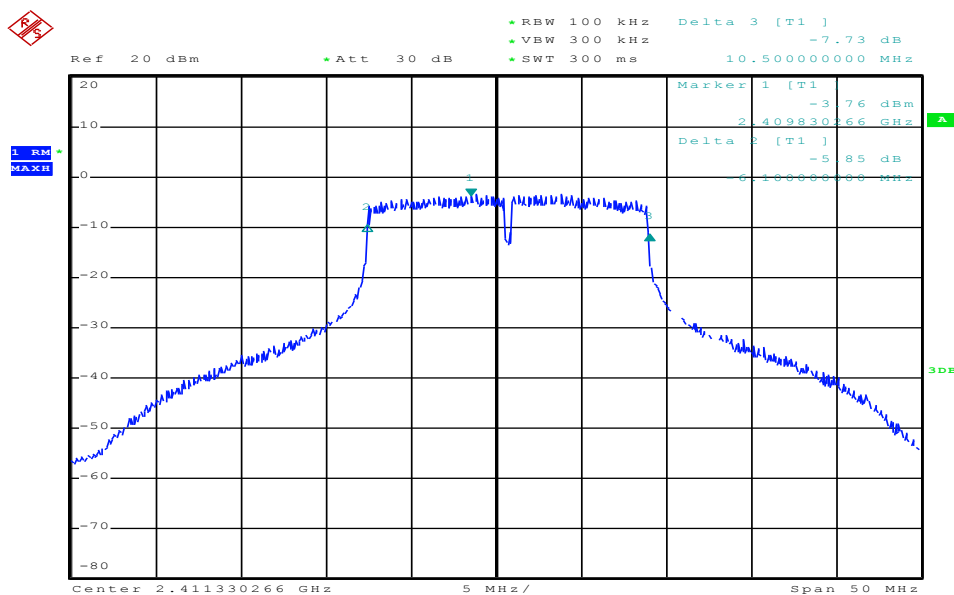


Date: 17.FEB.2009 00:34:56

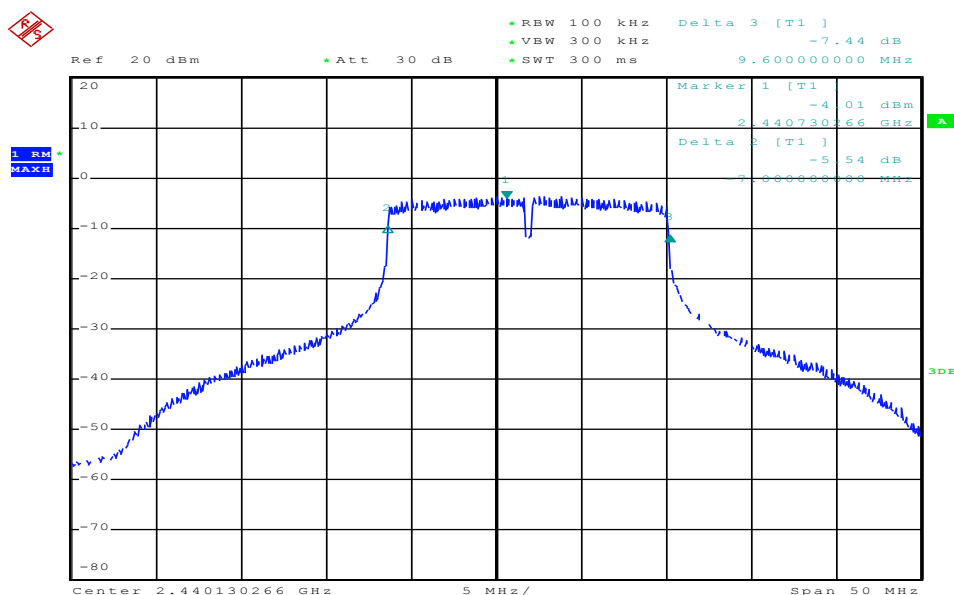
## 6 dB bandwidth

### OFDM mode BPSK modulation 6Mbps data rate Test Result

| Frequency<br>MHz | Bandwidth<br>kHz | Limit<br>kHz | Result |
|------------------|------------------|--------------|--------|
| 2412             | 16600            | ≥ 500        | Pass   |
| 2442             | 16600            | ≥ 500        | Pass   |
| 2462             | 16600            | ≥ 500        | Pass   |

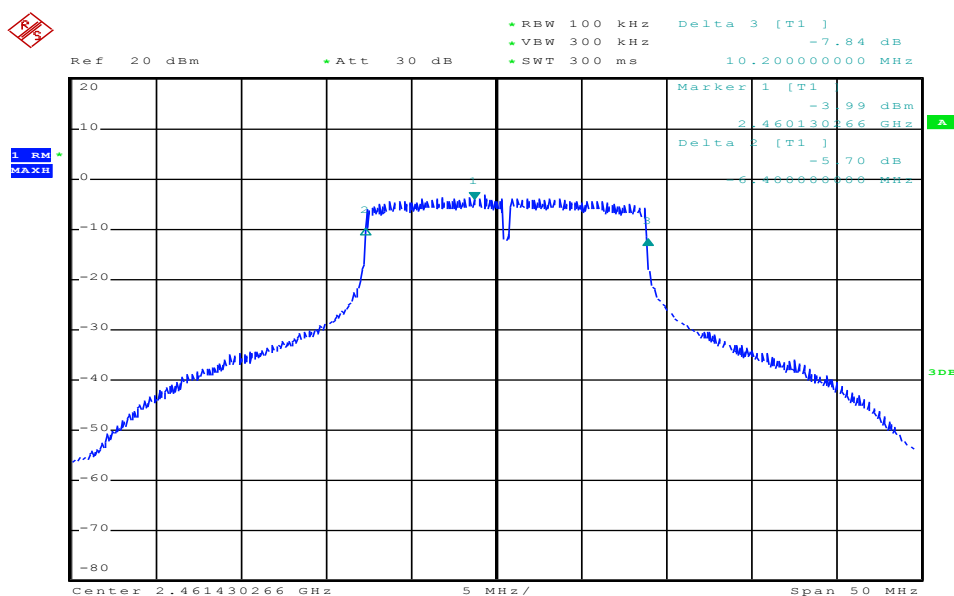


Date: 17.FEB.2009 00:37:22



Date: 17.FEB.2009 00:39:07

## 6 dB bandwidth



Date: 17.FEB.2009 00:41:42



Product Service

## Test Equipment

| DESCRIPTION       | MANUFACTURER    | MODEL NO. | SERIAL NO. | CAL DUE DATE |
|-------------------|-----------------|-----------|------------|--------------|
| EMI Test Receiver | Rohde & Schwarz | ESPI3     | 100244     | Dec 23 2009  |

## 7.7 Power spectral density

### Test Method

- 1 Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 2 Set the spectrum analyzer as RBW = 3 kHz, VBW = 10 kHz, Span = 300kHz, Sweep = 100 s
- 3 Record the max reading.

### Limit

Limit  
dBm / 3 kHz

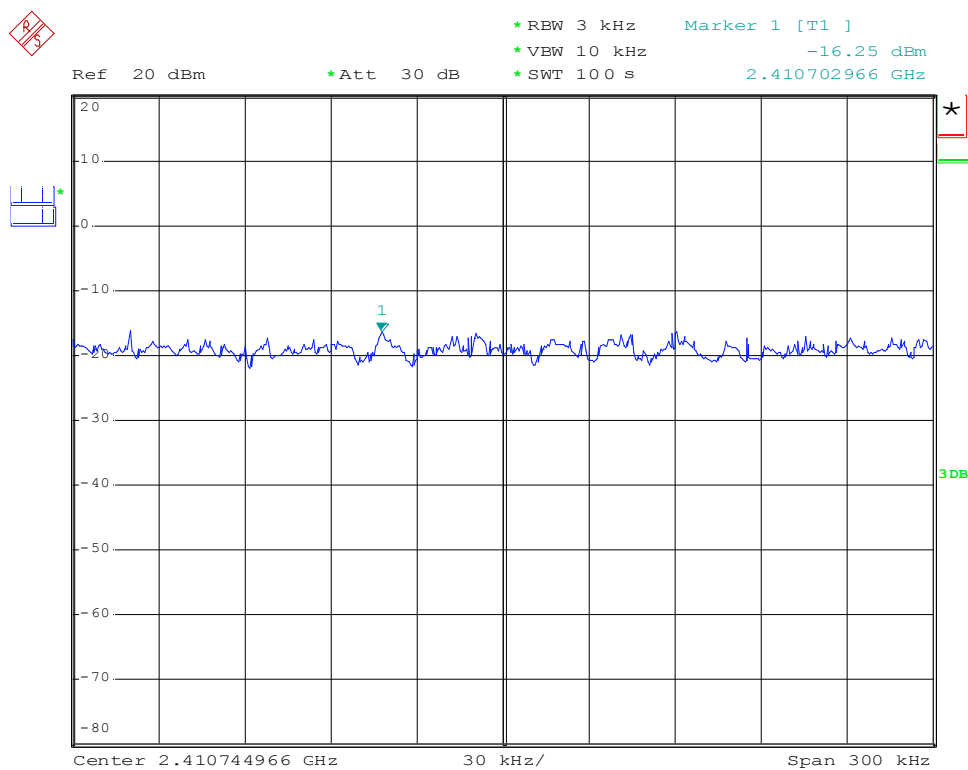
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8

## Power spectral density

### DSSS mode QPSK modulation 11Mbps data rate Test Result

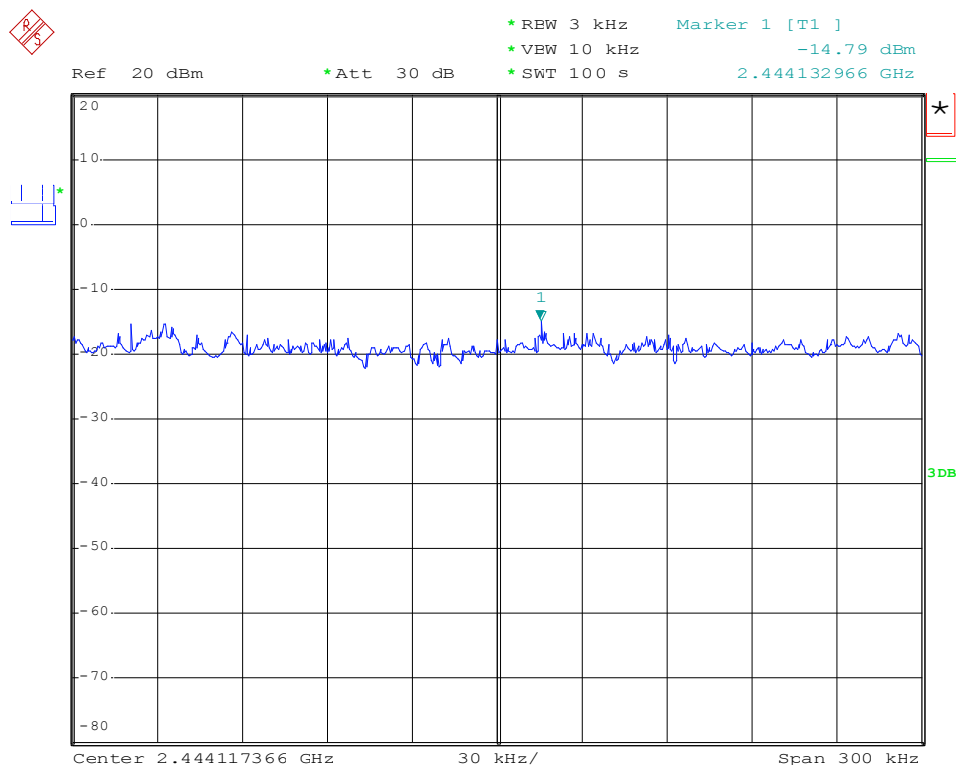
| Frequency<br>MHz | P<br>dBm | Result |
|------------------|----------|--------|
| 2412             | -16.25   | Pass   |
| 2442             | -14.79   | Pass   |
| 2462             | -14.61   | Pass   |



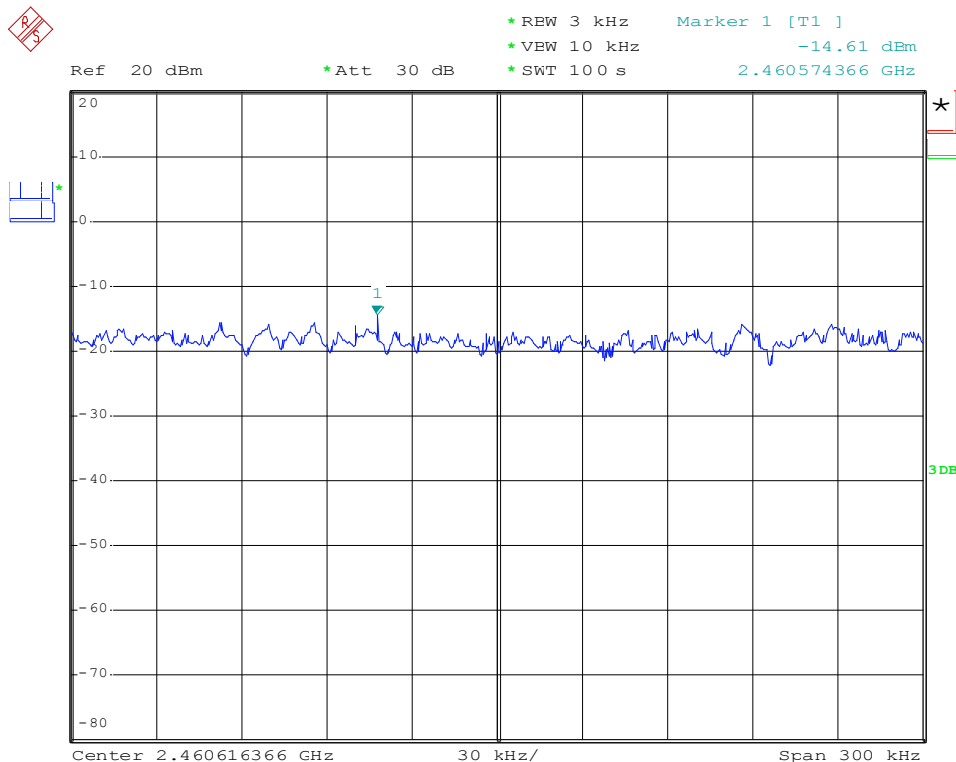
Date: 17.FEB.2009 01:08:33



## Power spectral density



Date: 17.FEB.2009 01:04:04

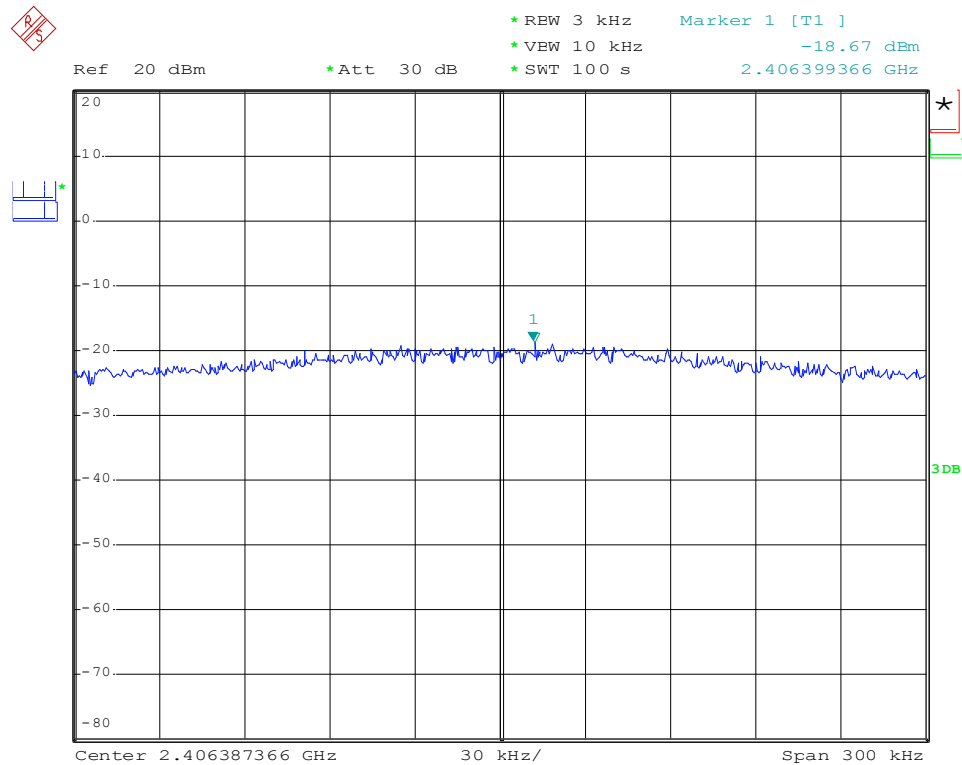


Date: 17.FEB.2009 01:02:00

## Power spectral density

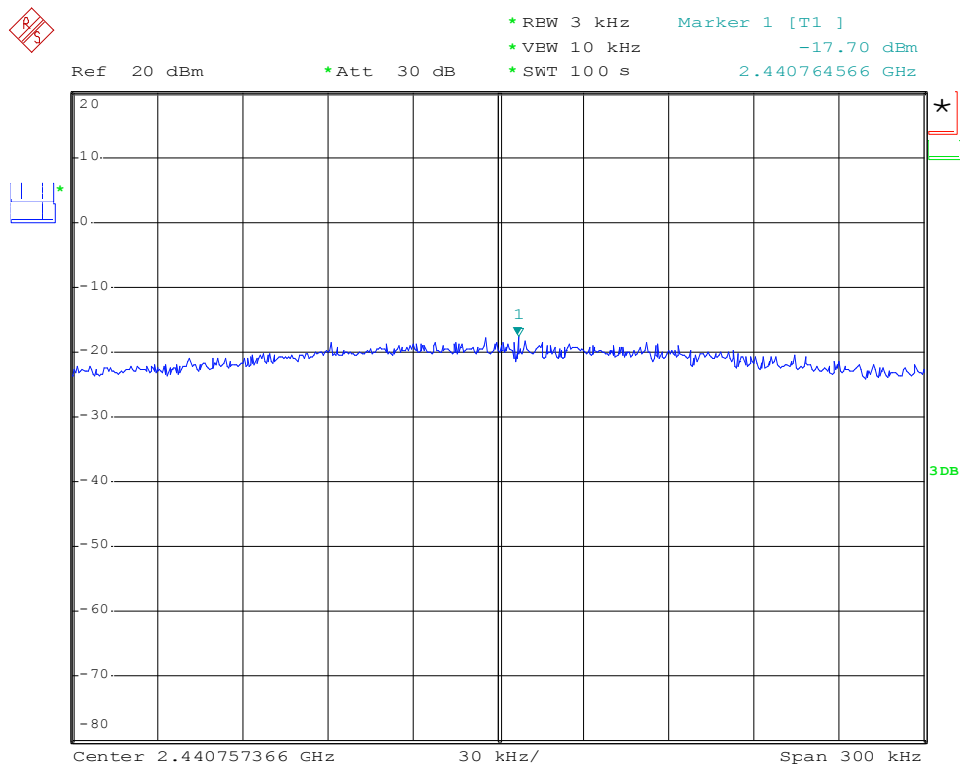
### OFDM mode BPSK modulation 6Mbps data rate Test Result

| Frequency<br>MHz | P<br>dBm | Result |
|------------------|----------|--------|
| 2412             | -18.67   | Pass   |
| 2442             | -17.70   | Pass   |
| 2462             | -17.42   | Pass   |

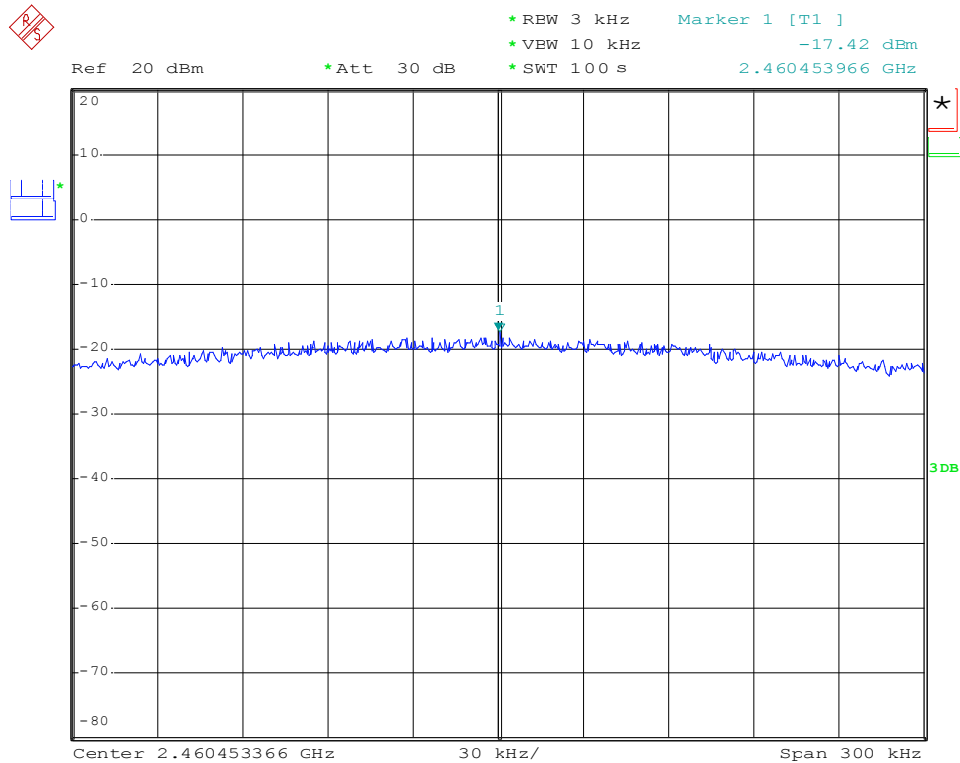


Date: 17.FEB.2009 01:07:29

## Power spectral density



Date: 17.FEB.2009 01:05:56



Date: 17.FEB.2009 00:57:56



Product Service

## Test Equipment

| DESCRIPTION       | MANUFACTURER    | MODEL NO. | SERIAL NO. | CAL DUE DATE |
|-------------------|-----------------|-----------|------------|--------------|
| EMI Test Receiver | Rohde & Schwarz | ESPI3     | 100244     | Dec 23 2009  |

## 8 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

**System Measurement Uncertainty**

| Items |                                  | Extended Uncertainty     |
|-------|----------------------------------|--------------------------|
| RE    | Field strength (dB $\mu$ V/m)    | U=4.6dB; k=2(30MHz-1GHz) |
| CE    | Disturbance Voltage (dB $\mu$ V) | U=3.3dB; k=2             |