



TTI-P-G 166/98-30

## Accredited Bluetooth™ Test Facility (BQTF)

**Test report no.: 2\_2592-5-A/01**  
**FCC Part 15.247 / CANADA RSS-210**  
**IEEE802.11b PC card**  
**WLP1100 (E020EB01)**

CETECOM – ICT Services GmbH  
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### **1 General information**

#### **1.1 Notes**

**The test results of this test report relate exclusively to the test item specified in 1.5. The CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM ICT Services GmbH.**

#### **1.2 Testing laboratory**

CETECOM ICT Services GmbH

Untertürkheimer Straße 6 - 10

66117 Saarbrücken

Germany

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Internet : www.cetecom.de

**Accredited testing laboratory**

**DAR-registration number : TTI-P-G 166/98-30**

**Accredited Bluetooth™ Test Facility (BQTF)**

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**1.3 Details of applicant**

**Name** : Philips Components  
**Street** : 620A Lorong 1, TP3 Level 5  
**City** : Toa Payoh 319762  
**Country** : Singapore  
**Telephone** : +65 350 2766  
**Telefax** : +65 252 6201  
**Contact** : Mr M. Guruprasad  
**Telephone** : +65 350 2766

**1.4 Application details**

Date of receipt of application : 02.08.01  
Date of receipt of test item : 18.09.01  
Date of test : 18.09.01

**1.5 Test item**

Type of equipment : **DSSS RLAN**  
Type designation : **IEEE802.11b PC card /WLP1100 (E020EB01)**  
Manufacturer : See applicant  
Street :  
City :  
Country :  
Serial number : See photographs

**Additional informations: :**

Frequency : 2400 – 2483.5 MHz  
Type of modulation : 22M0P7D (DSSS) (20 dB Bandwidth)  
Number of channels : 13  
Antenna : integral antenna / print antenna  
Power supply : 3,3 V DC from PC  
Output power : EIRP: 89.1mW  
Type of equipment : Temperature range : -10°C - +60°C

**1.6 Test standards:** **FCC Part 15 §15.247**  
**CANADA RSS-210**

## 2 Technical test

### 2.1 Summary of test results

The radiated measurements were performed vertical and horizontal over the whole frequency range. We start at 1 m high with vertical receiving antenna and rotate the dish continuously. During rotation we use the antenna lift system to vary the high from 1 to 4 m. So we find maximum radiation output. At this points we do manual remeasurements. After this we do the same measurements in horizontal position of the receiving antenna. This (horizontal and vertical) is made for all the three planes of the test sample. We use the maximum received results.

The detector function and selection of bandwidth are according ANSI C63.2-1996 item 8.2.1 and ANSI C63.4-1992 Item 4.2.

Antennas are conform with ANSI C63.2-1996 item 15.

150 kHz - 30 MHz: Quasi Peak measurement, 9kHz Bandwidth, passive loop antenna.

30 MHz - 200 MHz: Quasi Peak measurement, 120KHz Bandwidth, biconical antenna

200MHz - 1GHz: Quasi Peak measurement, 120KHz Bandwidth, log periodic antenna

1GHz: Average, RBW 1MHz, VBW 10 MHz, waveguide horn

All measurement settings are according to FCC 15.35, 15.205, 15.209, 15.247 and the „Measurement guidelines for DSSS systems“.

The product fullfills also the requirements for CANACA RSS-210

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

## Final verdict : PASS

Technical responsibility for area of testing :

19.09.2001 RSC 8411 Berg M.

Date

Section

Name

Signature



Technical responsibility for area of testing :

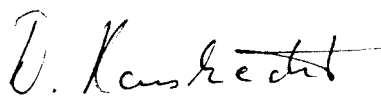
19.09.2001 RSC8412 Hausknecht D.

Date

Section

Name

Signature



## 2.2 Testreport

### TEST REPORT

Testreport no. : 2\_2592-5-A/01

## TEST REPORT REFERENCE

## LIST OF MEASUREMENTS

| Paragraph       | PARAMETER TO BE MEASURED            | PAGE |
|-----------------|-------------------------------------|------|
|                 | <b>Transmitter parameters</b>       |      |
| § 15.247 (a)(2) | Spectrum Bandwidth of a DSSS System | 7    |
| § 15.247 (b)(1) | Maximum peak output power           | 11   |
| § 15.247 (c)(1) | Emission limitations                | 16   |
| § 15.247 (c)    | Band edge compliance                | 33   |
| § 15.247 (d)    | Power Spectral Density              | 36   |
| § 15.247 (e)    | Processing Gain of DSSS System      | 40   |
|                 | <b>Receiver parameters</b>          |      |
| § 15.209        | Spurious radiations - Radiated      | 41   |
|                 | <b>Test equipment listing</b>       | 47   |
|                 | <b>Photographs of the equipment</b> | 49   |

**Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)****Ambient temperature : 24°C****Relative humidity : 34%****SPECTRUM BANDWITH OF DSSS-SYSTEM****SUBCLAUSE § 15.247 (a)(2)**

| TEST CONDITIONS         |                 | 6 dB BANDWIDTH ( kHz ) |       |       |
|-------------------------|-----------------|------------------------|-------|-------|
| Frequency (MHz)         |                 | 2412                   | 2442  | 2472  |
| $T_{nom}(24)^{\circ}C$  | $V_{nom}(3.3)V$ | 11172                  | 11222 | 11222 |
| Measurement uncertainty |                 | $\pm 3dB$              |       |       |

**RBW = 100 KHz, Span >> RBW, here 25 MHz****LIMIT****SUBCLAUSE §15.247(a) (2)****The minimum 6dB bandwidth shall be at least 500 KHz****REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**  
**(for reference numbers see test equipment listing)**

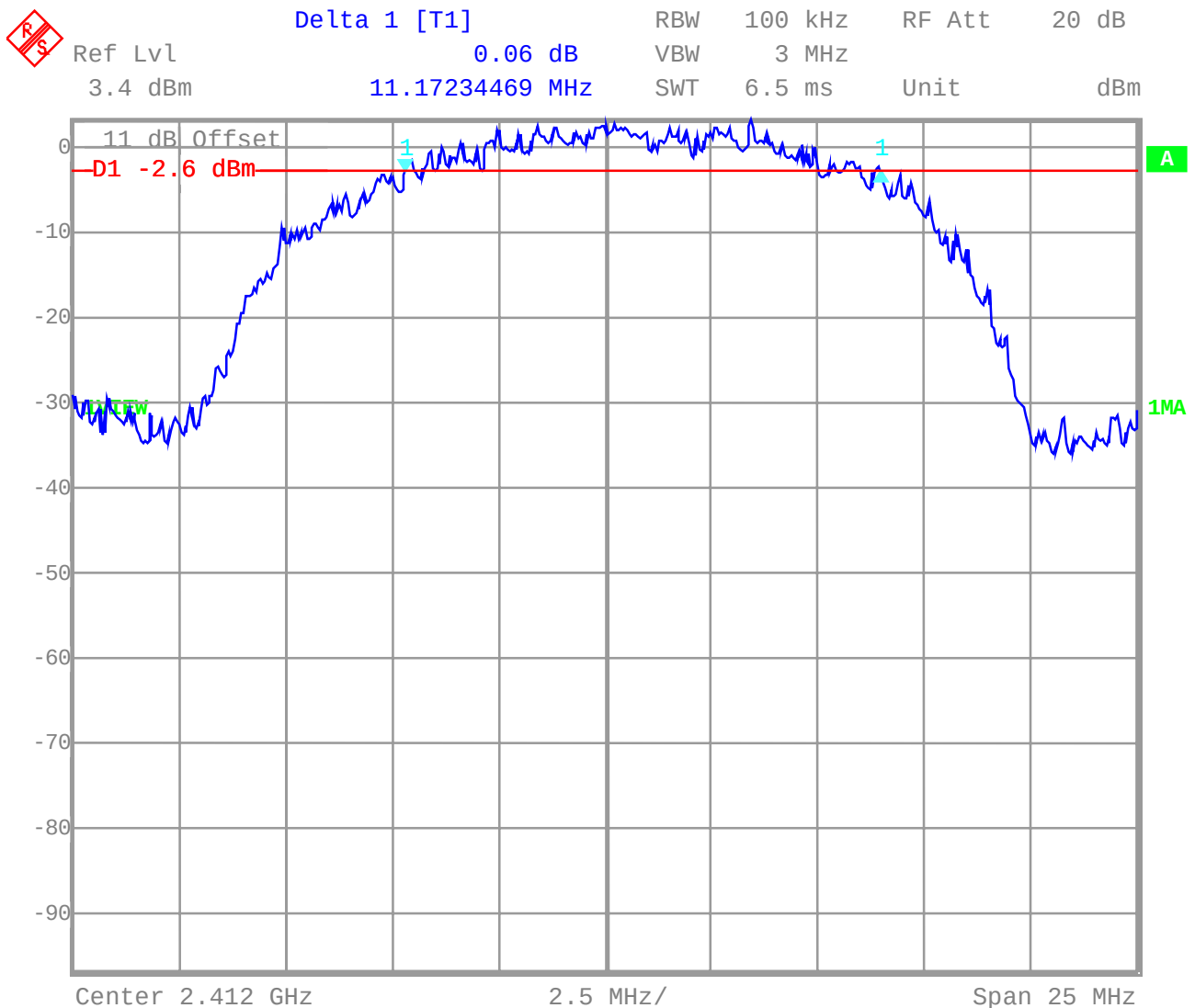
Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

## SPECTRUM BANDWIDTH OF DSSS-SYSTEM 2412 MHz

SUBCLAUSE § 15.247 (a)(2)



Date: 18.SEP.2001 08:19:17

RBW = 100 KHz, Span >> RBW, here 25 MHz

### LIMIT

SUBCLAUSE §15.247(a) (2)

The minimum 6dB bandwidth shall be at least 500 KHz

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)



Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

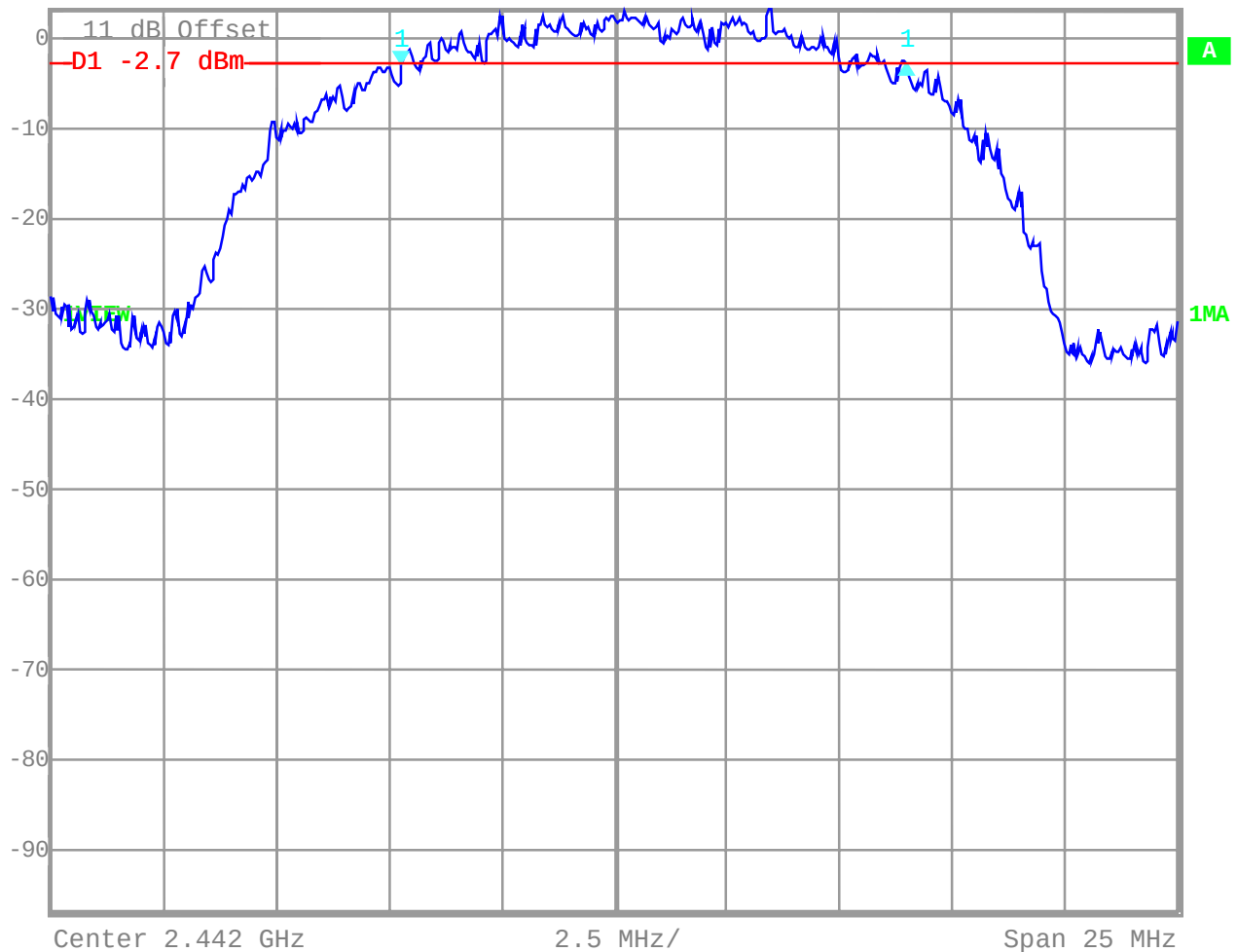
Relative humidity : 34%

## SPECTRUM BANDWIDTH OF DSSS-SYSTEM

## SUBCLAUSE § 15.247 (a)(2)

2442 MHz


 Delta 1 [T1] RBW 100 kHz RF Att 20 dB  
 Ref Lvl 0.14 dB VBW 3 MHz  
 3.3 dBm 11.22244489 MHz SWT 6.5 ms Unit dBm



Date: 18.SEP.2001 08:21:09

RBW = 100 KHz, Span >> RBW, here 25 MHz

### LIMIT

### SUBCLAUSE §15.247(a) (2)

The minimum 6dB bandwidth shall be at least 500 KHz

### REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

**Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)**

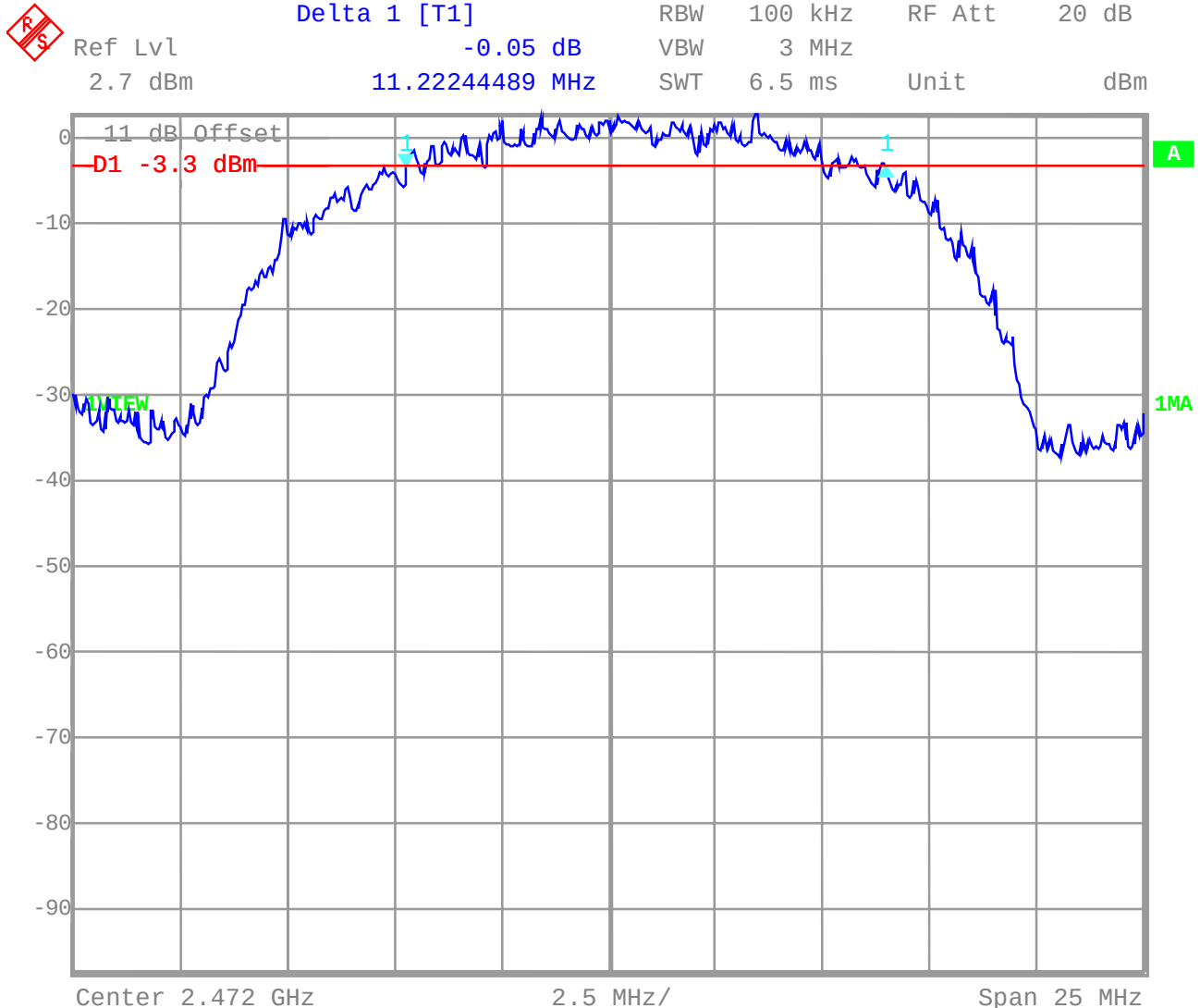
**Ambient temperature : 24°C**

**Relative humidity** : 34%

## PECTRUM BANDWITH OF DSSS-SYSTEM

**SUBCLAUSE § 15.247 (a)(2)**

2472 MHz



Date: 18.SEP.2001 08:22:23

**RBW = 100 KHz, Span >> RBW, here 25 MHz**

## LIMIT

**SUBCLAUSE §15.247(a) (2)**

**The minimum 6dB bandwidth shall be at least 500 KHz**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**

REFERENCE NUMBER(S) OF TEST EQUIPMENT  
(for reference numbers see test equipment listing)

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

## MAXIMUM PEAK OUTPUT POWER (CONDUCTED)

SUBCLAUSE § 15.247 (b) (1)

| TEST CONDITIONS                                                         |                           | MAXIMUM PEAK OUTPUT POWER (dBm) |               |               |
|-------------------------------------------------------------------------|---------------------------|---------------------------------|---------------|---------------|
| Frequency (MHz)                                                         |                           | 2412                            | 2442          | 2472          |
| T <sub>nom</sub> ( 20 )°C                                               | V <sub>nom</sub> ( 3.3 )V | Peak: 19.46                     | Peak 19.38    | Peak 19.11    |
| Maximum deviation from output power under extreme test conditions (dBc) |                           | not performed                   | not performed | not performed |
| Measurement uncertainty                                                 |                           | ±3dB                            |               |               |

Settings: RBW/VBW 10 MHz

## LIMIT

SUBCLAUSE § 15.247 (b) (1)

| Frequency range                   | RF power output |
|-----------------------------------|-----------------|
| 2400-2483.5 MHz / 5725 – 5850 MHz | 30 dBm          |

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

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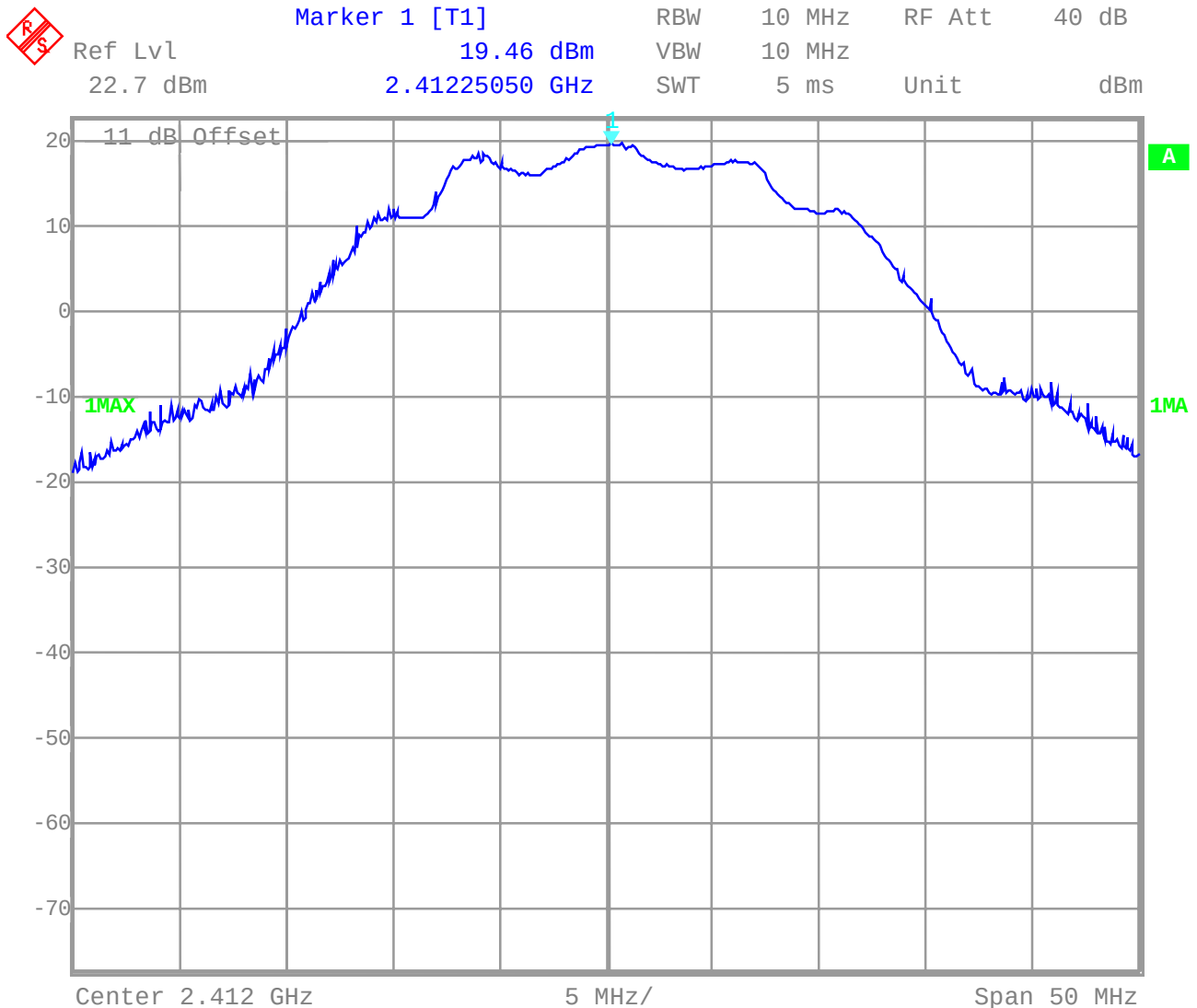
Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

**MAXIMUM PEAK OUTPUT POWER  
(CONDUCTED) (Peak)  
2412 MHz**

**SUBCLAUSE § 15.247 (b) (1)**



Date: 18.SEB.2001 08:25:54

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**  
(for reference numbers see test equipment listing)

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

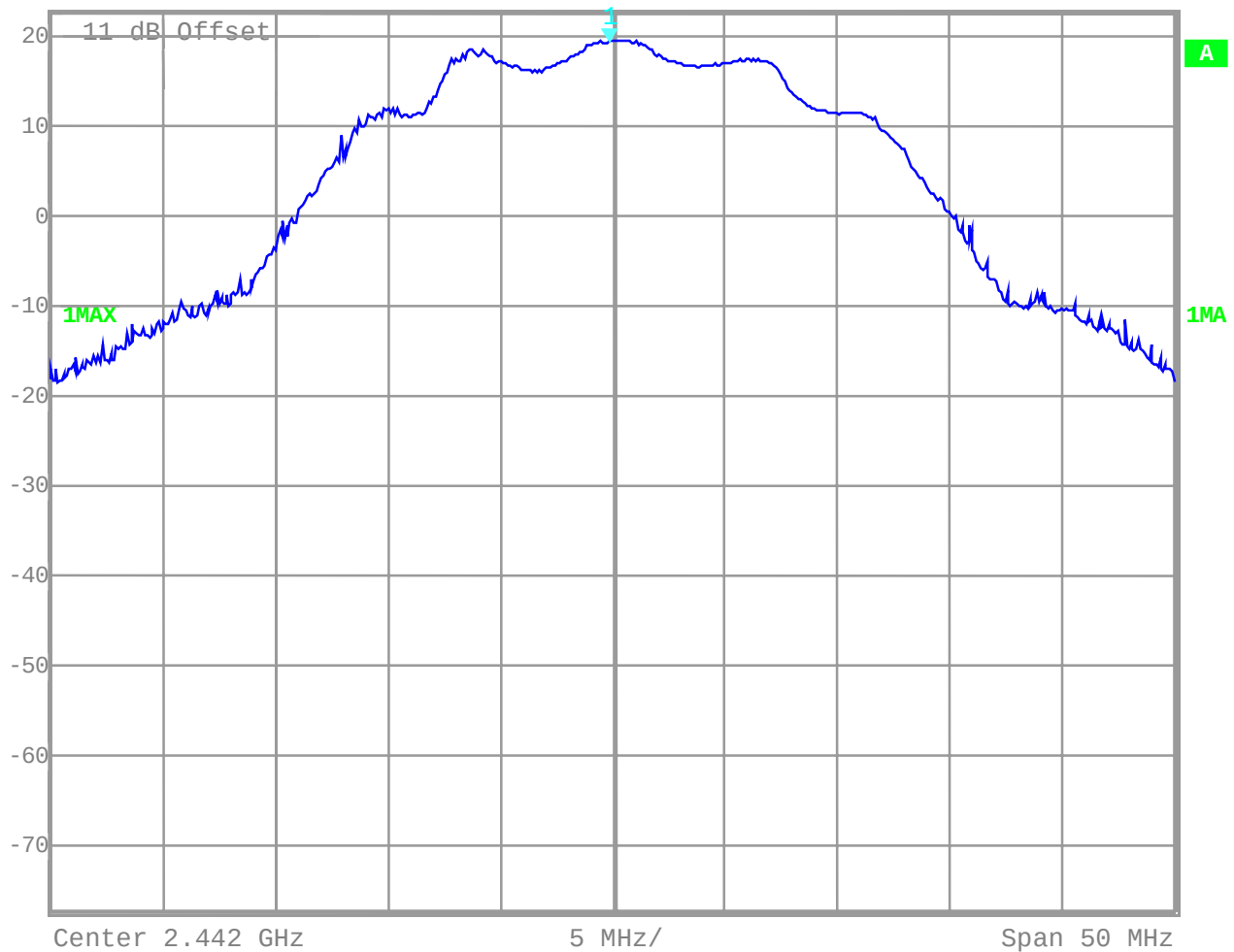
Relative humidity : 34%

## MAXIMUM PEAK OUTPUT POWER (CONDUCTED) (Peak)

SUBCLAUSE § 15.247 (b) (1)

2442 MHz


 Marker 1 [T1] RBW 10 MHz RF Att 40 dB  
 Ref Lvl 19.38 dBm VBW 10 MHz  
 22.7 dBm 2.44184970 GHz SWT 5 ms Unit dBm



Date: 18.SEP.2001 08:25:08

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

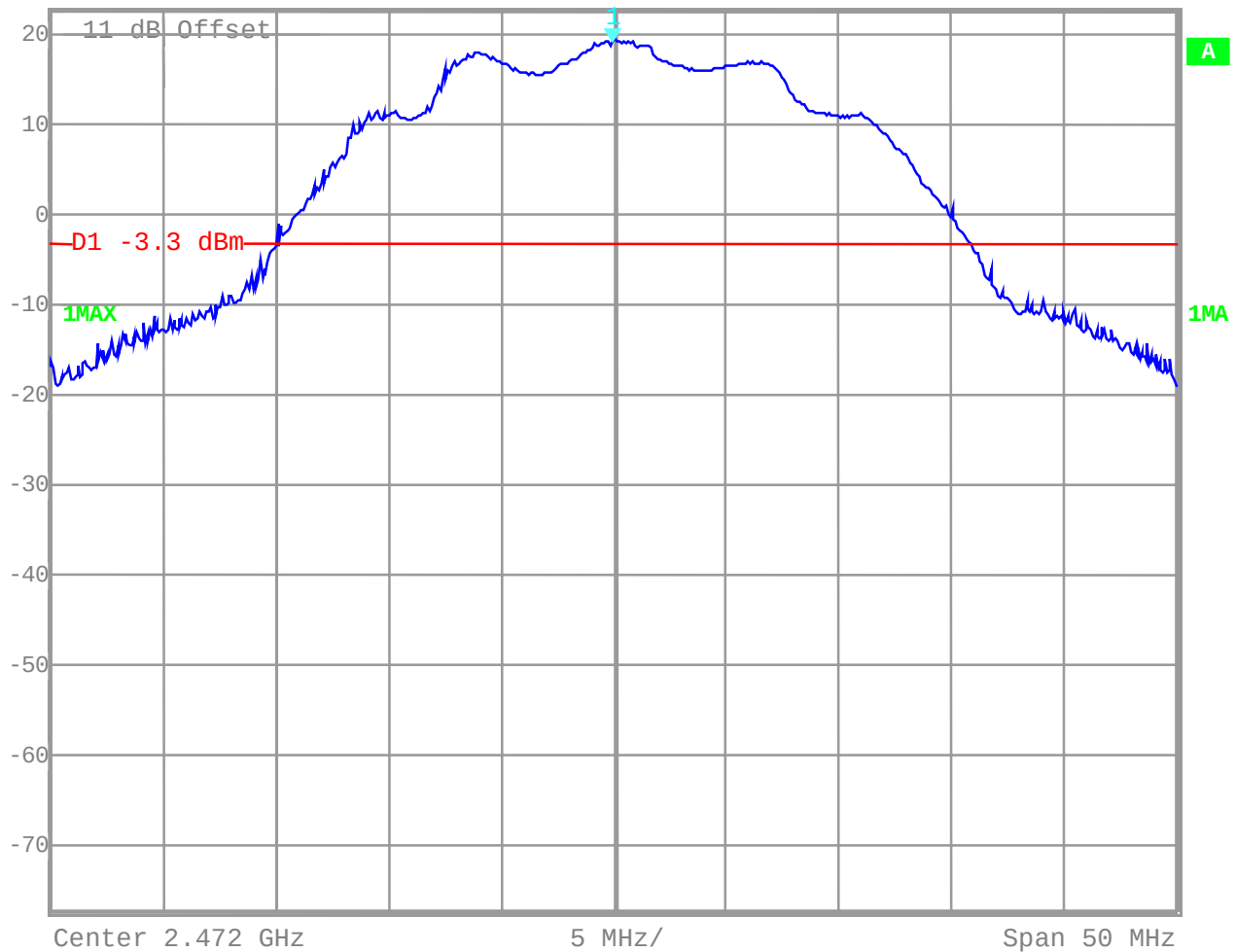
Relative humidity : 34%

## MAXIMUM PEAK OUTPUT POWER (CONDUCTED) (Peak)

SUBCLAUSE § 15.247 (b) (1)

2472 MHz


 Marker 1 [T1] RBW 10 MHz RF Att 40 dB  
 Ref Lvl 19.11 dBm VBW 10 MHz  
 22.7 dBm 2.47194990 GHz SWT 5 ms Unit dBm



Date: 18.SEP.2001 08:24:23

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

**MAXIMUM PEAK OUTPUT POWER  
(RADIATED)****SUBCLAUSE § 15.247 (b) (1)**

This test was performed to find the antenna gain of this integrated system.

The maximum output was measured in vertikal polarisation.

Emissions in horizontal polarisation were up to 20 dB lower.

| TEST CONDITIONS                          |                           | MAXIMUM PEAK OUTPUT POWER (W) |                            |                            |
|------------------------------------------|---------------------------|-------------------------------|----------------------------|----------------------------|
| Frequency (MHz)                          |                           | 2412                          | 2442                       | 2472                       |
| T <sub>nom</sub> ( 23 )°C                | V <sub>nom</sub> ( 3.3 )V | Peak 0.0891<br>(+19.5 dBm)    | Peak 0.0871<br>(+19.4 dBm) | Peak 0.0813<br>(+19.1 dBm) |
| Antenna Gain<br>Power cond. – Power rad. |                           | 0.0 dB                        | 0.0 dB                     | 0.0 dB                     |
| Measurement uncertainty                  |                           | ±3dB                          |                            |                            |

**Settings: RBW/VBW 10 MHz****LIMIT****SUBCLAUSE § 15.247 (b) (1)**

| Frequency range                   | RF power output |
|-----------------------------------|-----------------|
| 2400-2483.5 MHz / 5725 – 5850 MHz | 1.0 Watt        |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**  
(for reference numbers see test equipment listing)

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Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

EMISSION LIMITATIONS (Transmitter)

SUBCLAUSE § 15.247 (c) (1)

conducted (radiated emissions in restricted bands see next table)

2412 MHz

| SPURIOUS LIMITATIONS    |       |                                   |                                    |  |         |
|-------------------------|-------|-----------------------------------|------------------------------------|--|---------|
| f<br>(MHz)              |       | amplitude<br>of emission<br>(dBm) | limit<br>max. allowed<br>emmission |  | results |
| all                     | Peaks | << Limit                          |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
| Measurement uncertainty |       | ± 3dB                             |                                    |  |         |

RBW: 100 kHz VBW: 300 kHz

LIMITS

SUBCLAUSE § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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 §15.205(c)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)



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Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

EMISSION LIMITATIONS (Transmitter)

SUBCLAUSE § 15.247 (c) (2)

**radiated** (Antenna vertikal polarisation, horiz. emissions were up to 20dB lower)

2412 MHz

| SPURIOUS LIMITATIONS    |      |                                      |                                    |  |          |
|-------------------------|------|--------------------------------------|------------------------------------|--|----------|
| f<br>(MHz)              |      | amplitude<br>of emission<br>(dBµV/m) | limit<br>max. allowed<br>emmission |  | results  |
| 373.68                  | rad. | QP: 33.9                             | 46,0 dBµV/m                        |  | complies |
| 845.29                  | rad. | QP: 37.8                             | 46.0 dBµV/m                        |  | complies |
| 900.74                  | rad. | QP: 34.1                             | 46.0 dBµV/m                        |  | complies |
| 1497.5                  | rad. | AV: 38.9                             | 54.0 dBµV/m                        |  | complies |
| 1812.0                  | rad. | AV: 45.8                             | 54.0 dBµV/m                        |  | complies |
| 2037.6                  | rad. | AV: 39.1                             | 54.0 dBµV/m                        |  | complies |
| 2799.6                  | rad  | AV: 33.5                             | 54.0 dBµV/m                        |  | complies |
|                         |      |                                      |                                    |  |          |
|                         |      |                                      |                                    |  |          |
|                         |      |                                      |                                    |  |          |
|                         |      |                                      |                                    |  |          |
| Measurement uncertainty |      | ± 3dB                                |                                    |  |          |

Measurement were performed up to 1 GHz with a CISPR quasi peak adapter and 100/120 kHz BW. Measurements above 1 GHz were performed with RBW 1 MHz and VBW 10Hz.

## LIMITS

SUBCLAUSE § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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 §15.205(c)).

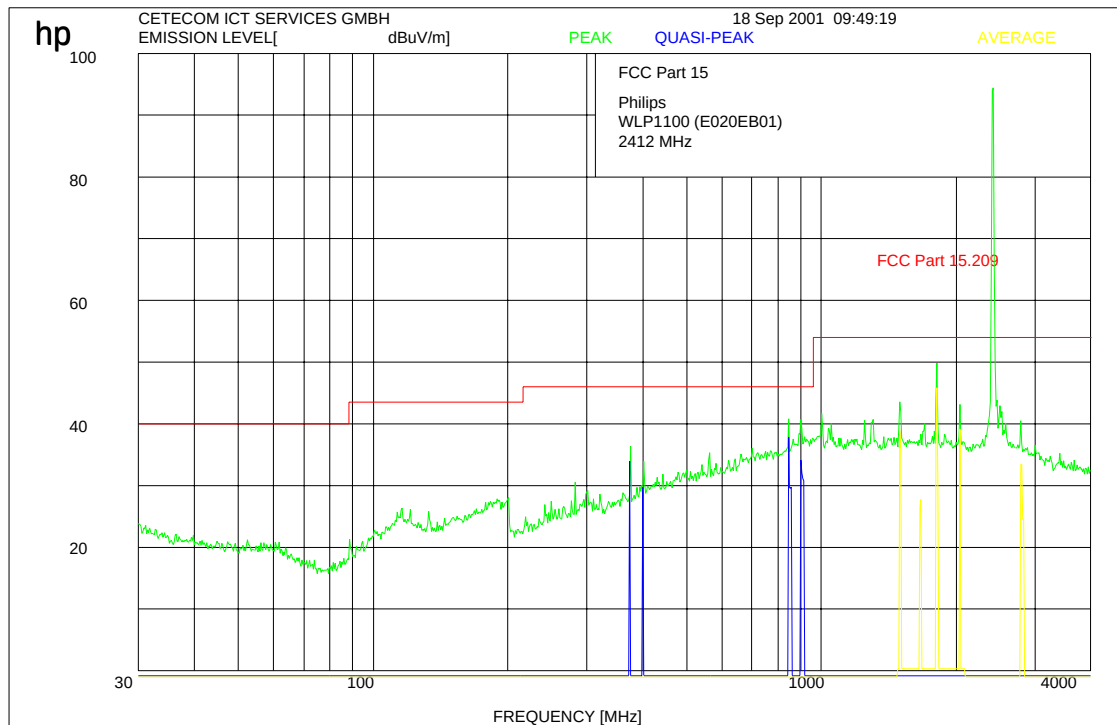
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

## 2412 MHz radiated up to 4000 MHz



This is only a scan:

Measurements were performed with a CISPR quasi peak adapter and 100/120 kHz BW up to 1 GHz ( blue lines), higher frequencies with average (yellow lines) RBW 1MHz and VBW 10 Hz and peak (green lines) with RBW 1 MHz / RBW 1 MHz

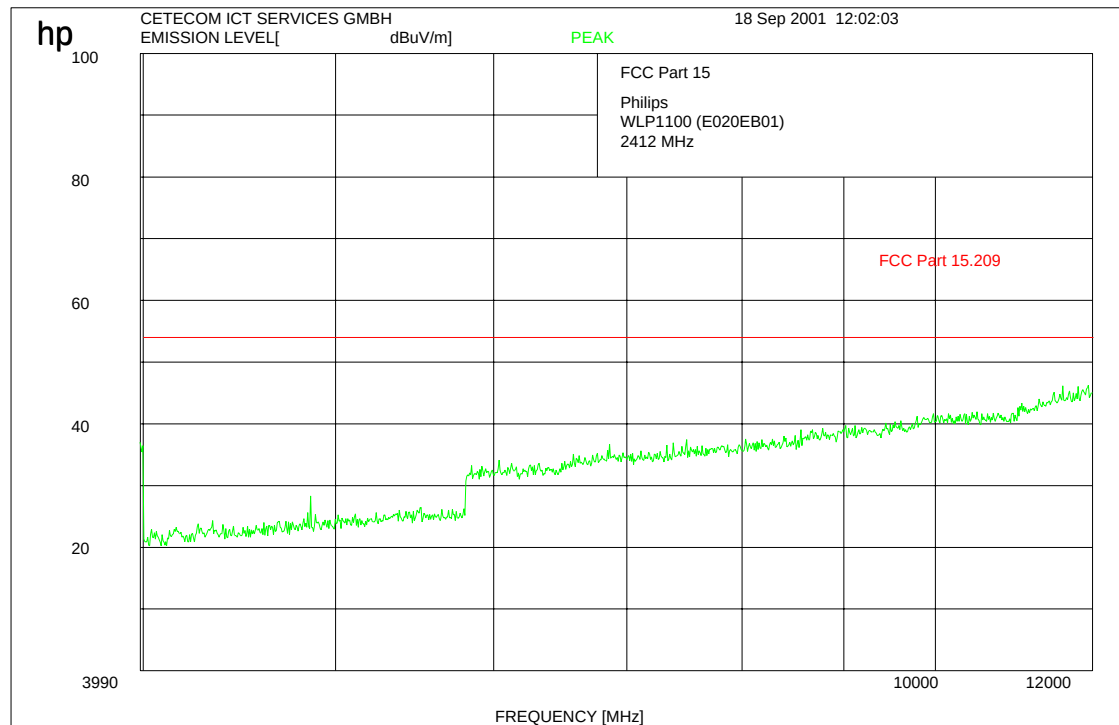
Carrier is suppressed by a stub tuner to avoid oversteering of the low noise amplifier of the measuring system.

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

## 2412 MHz up to 12 GHz radiated



Measurements were performed with 1MHz RBW and VBW 1 MHz

### LIMITS

### SUBCLAUSE § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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 §15.205(c)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

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Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

**2412 MHz up to 18GHz radiated** (This plot is valid for all 3 channels, there were no peaks found)

Average



Ref Lvl  
97 dB $\mu$ V

Marker 1 [T1]

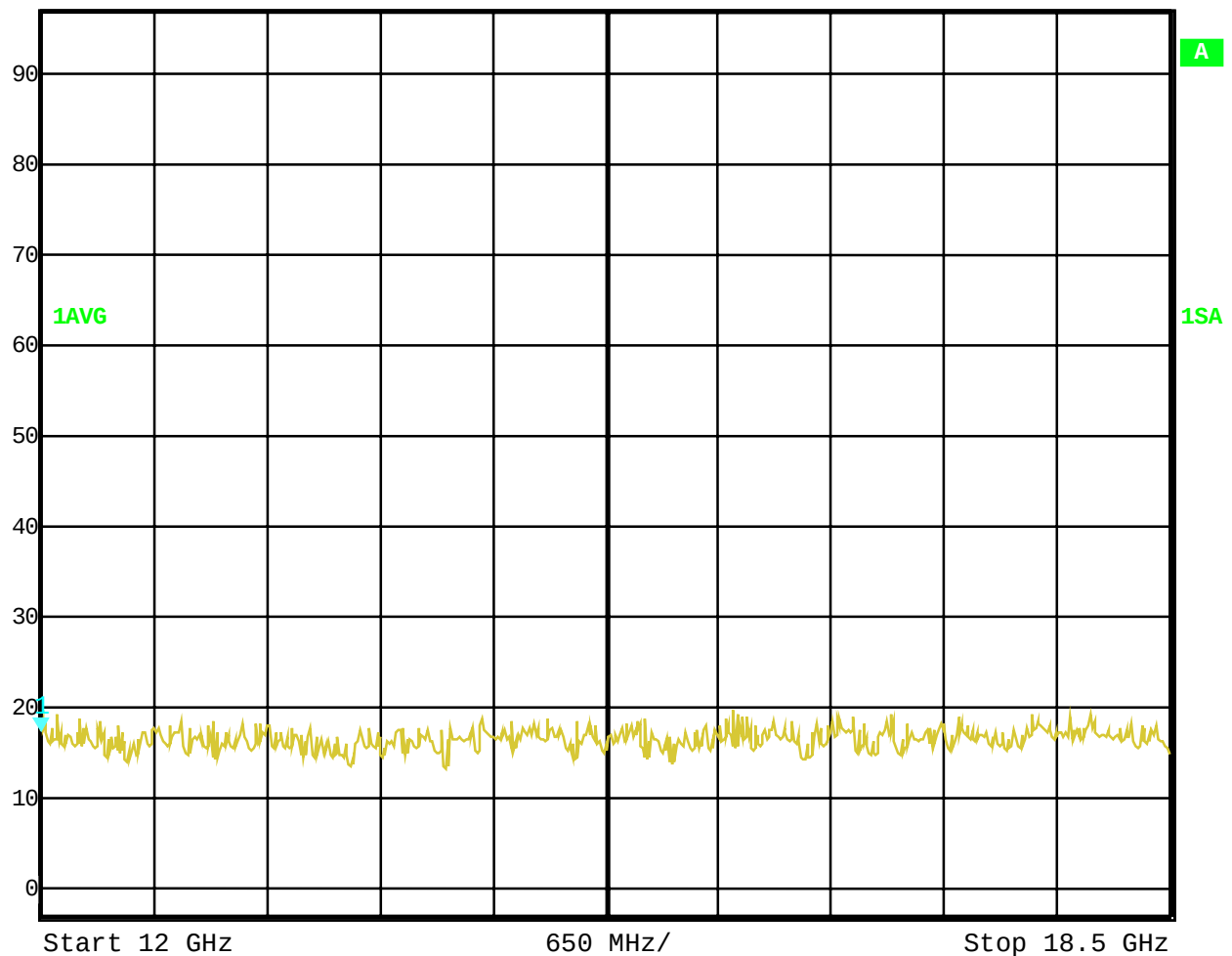
17.41 dB $\mu$ V

12.00000000 GHz

RBW 1 MHz RF Att 0 dB

VBW 1 MHz

SWT 37 ms Unit dB $\mu$ V



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

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Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

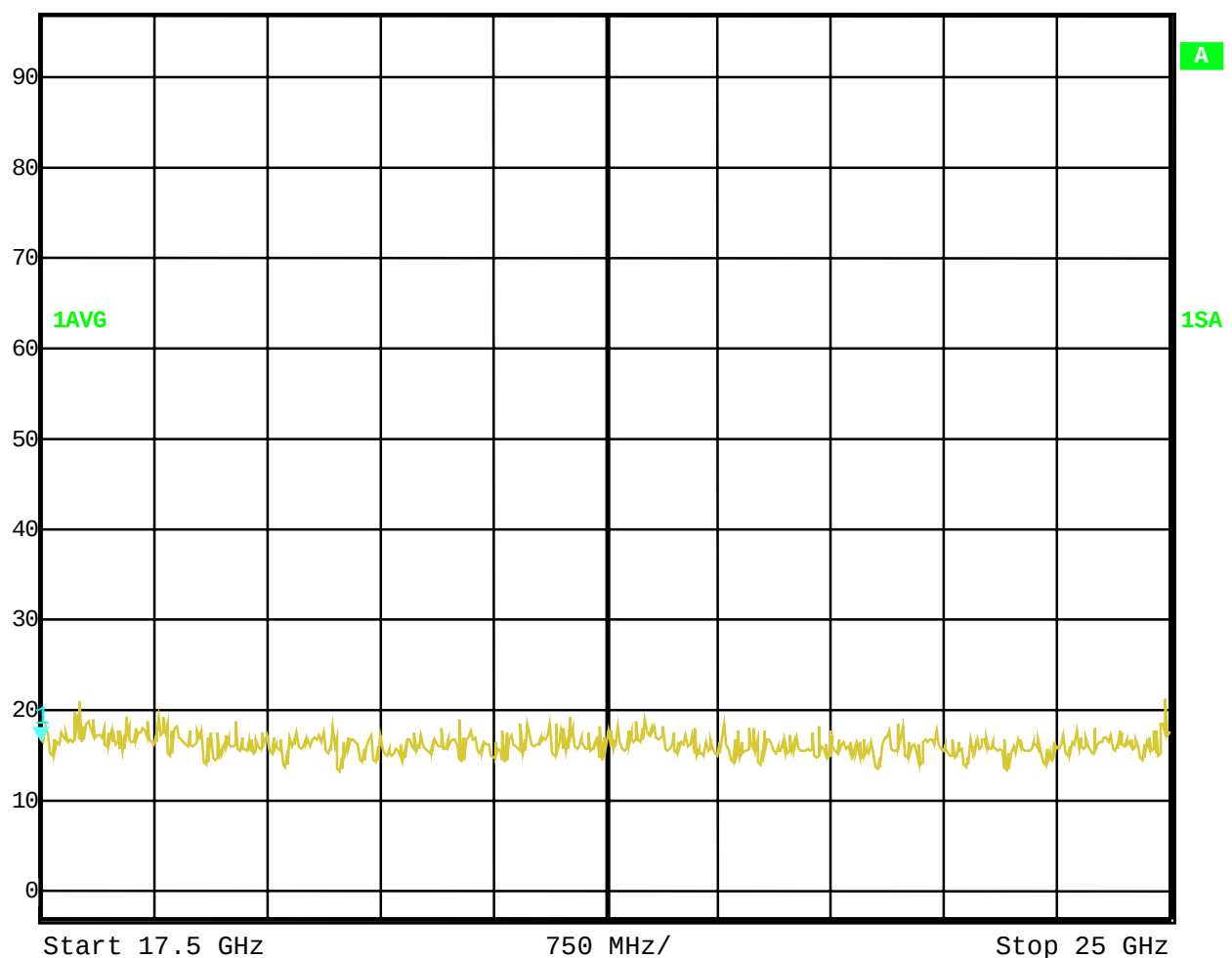
Ambient temperature : 24°C

Relative humidity : 34%

**2412 MHz up to 25GHz radiated** (This plot is valid for all 3 channels, there were no peaks found)

Average


 Marker 1 [T1] RBW 1 MHz RF Att 0 dB  
 Ref Lvl 16.58 dBμV VBW 1 MHz  
 97 dBμV 17.50000000 GHz SWT 43 ms Unit dBμV



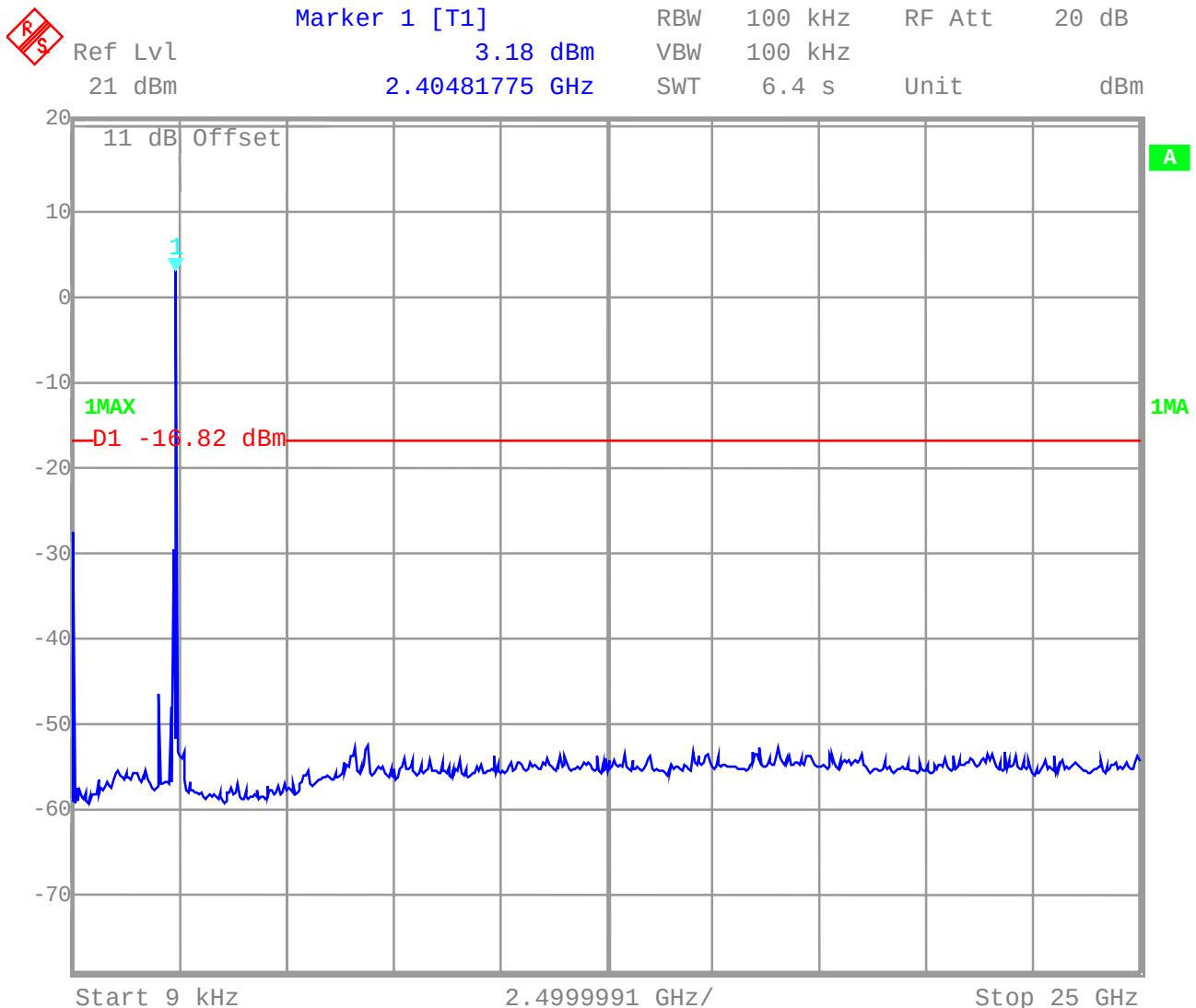
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

2412 MHz conducted up to 25 GHz



Date: 18.SEP.2001 08:00:20

## LIMITS

## SUBCLAUSE § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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 §15.205(c)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

# CETECOM ICT Services GmbH

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Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

EMISSION LIMITATIONS (Transmitter)

SUBCLAUSE § 15.247 (c) (1)

conducted (radiated emissions in restricted bands see next table)

2442 MHz

| SPURIOUS LIMITATIONS    |       |                                   |                                    |  |         |
|-------------------------|-------|-----------------------------------|------------------------------------|--|---------|
| f<br>(MHz)              |       | amplitude<br>of emission<br>(dBm) | limit<br>max. allowed<br>emmission |  | results |
| All                     | peaks | << Limit                          |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
| Measurement uncertainty |       | ± 3dB                             |                                    |  |         |

RBW: 100 kHz VBW: 100 kHz

LIMITS

SUBCLAUSE § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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 §15.205(c)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

# CETECOM ICT Services GmbH

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Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

EMISSION LIMITATIONS (Transmitter)

SUBCLAUSE § 15.247 (c) (2)

**radiated** (Antenna vertikal polarisation, horiz. emissions were up to 20dB lower)

2442 MHz

| SPURIOUS LIMITATIONS    |      |                                      |                                    |  |          |
|-------------------------|------|--------------------------------------|------------------------------------|--|----------|
| f<br>(MHz)              |      | amplitude<br>of emission<br>(dBµV/m) | limit<br>max. allowed<br>emmission |  | results  |
| 375.51                  | rad. | QP:34.0                              | 46,0 dBµV/m                        |  | complies |
| 845.29                  | rad. | QP:37.7                              | 46.0 dBµV/m                        |  | complies |
| 900.74                  | rad. | QP:34.3                              | 46.0 dBµV/m                        |  | complies |
| 1497.5                  | rad. | AV:31.6                              | 54.0 dBµV/m                        |  | complies |
| 1847.8                  | rad. | AV:27.9                              | 54.0 dBµV/m                        |  | complies |
| 2067.7                  | rad  | AV: 46.3                             | 54.0 dBµV/m                        |  | complies |
| 2813.3                  | rad. | AV:40.9                              | 54.0 dBµV/m                        |  | complies |
|                         |      |                                      |                                    |  |          |
|                         |      |                                      |                                    |  |          |
|                         |      |                                      |                                    |  |          |
| Measurement uncertainty |      | ± 3dB                                |                                    |  |          |

Measurement were performed up to 1 GHz with a CISPR quasi peak adapter and 100/120 kHz BW.  
Measurements above 1 GHz were performed with RBW 1 MHz and VBW 10 Hz.

## LIMITS

SUBCLAUSE § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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 §15.205(c)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

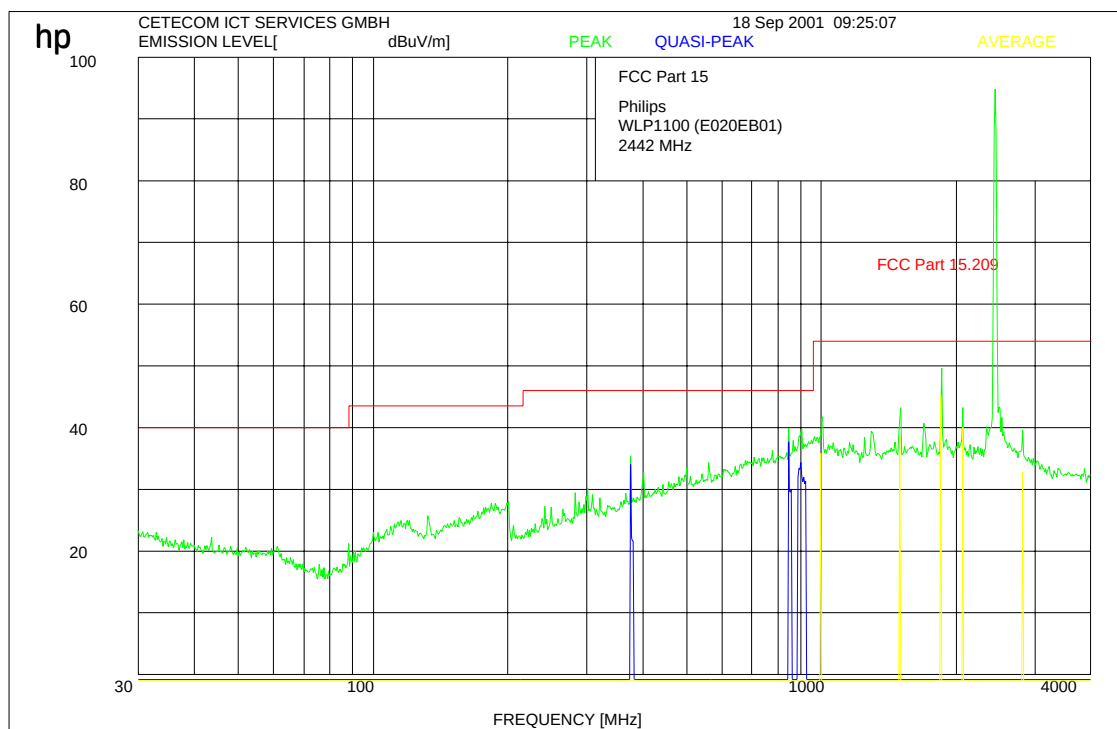


Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

## 2442 MHz radiated up to 4000 MHz



This is only a scan:

Measurements were performed with a CISPR quasi peak adapter and 100/120 kHz BW up to 1 GHz ( blue lines), higher frequencies with average (yellow lines) RBW 1MHz and VBW 10 Hz and peak (green lines) with RBW 1 MHz / RBW 1 MHz

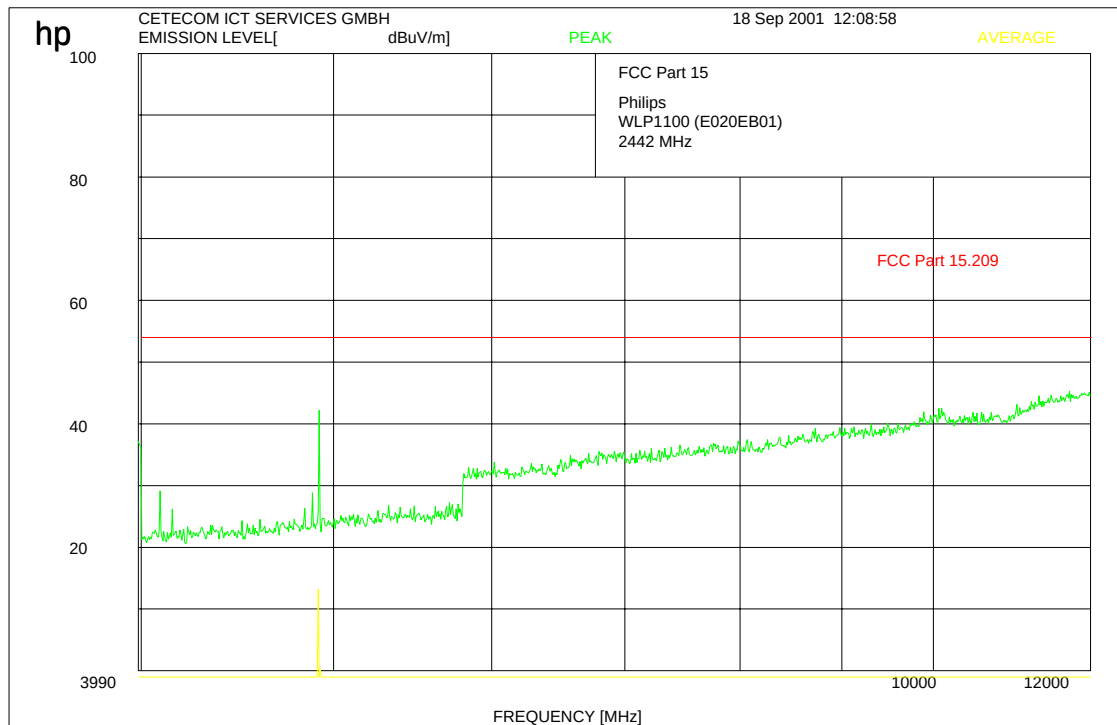
Carrier is suppressed by a stub tuner to avoid oversteering of the lownoise amplifier of the measuring system.

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

## 2442 MHz up to 12 GHz radiated



This is only a scan.

Measurements were performed with: 1 MHz RBW/ and VBW 1 MHz (green line)  
1 MHz RBW and VBW 10 Hz (yellow line)

### LIMITS

### SUBCLAUSE § 15.247 (c)

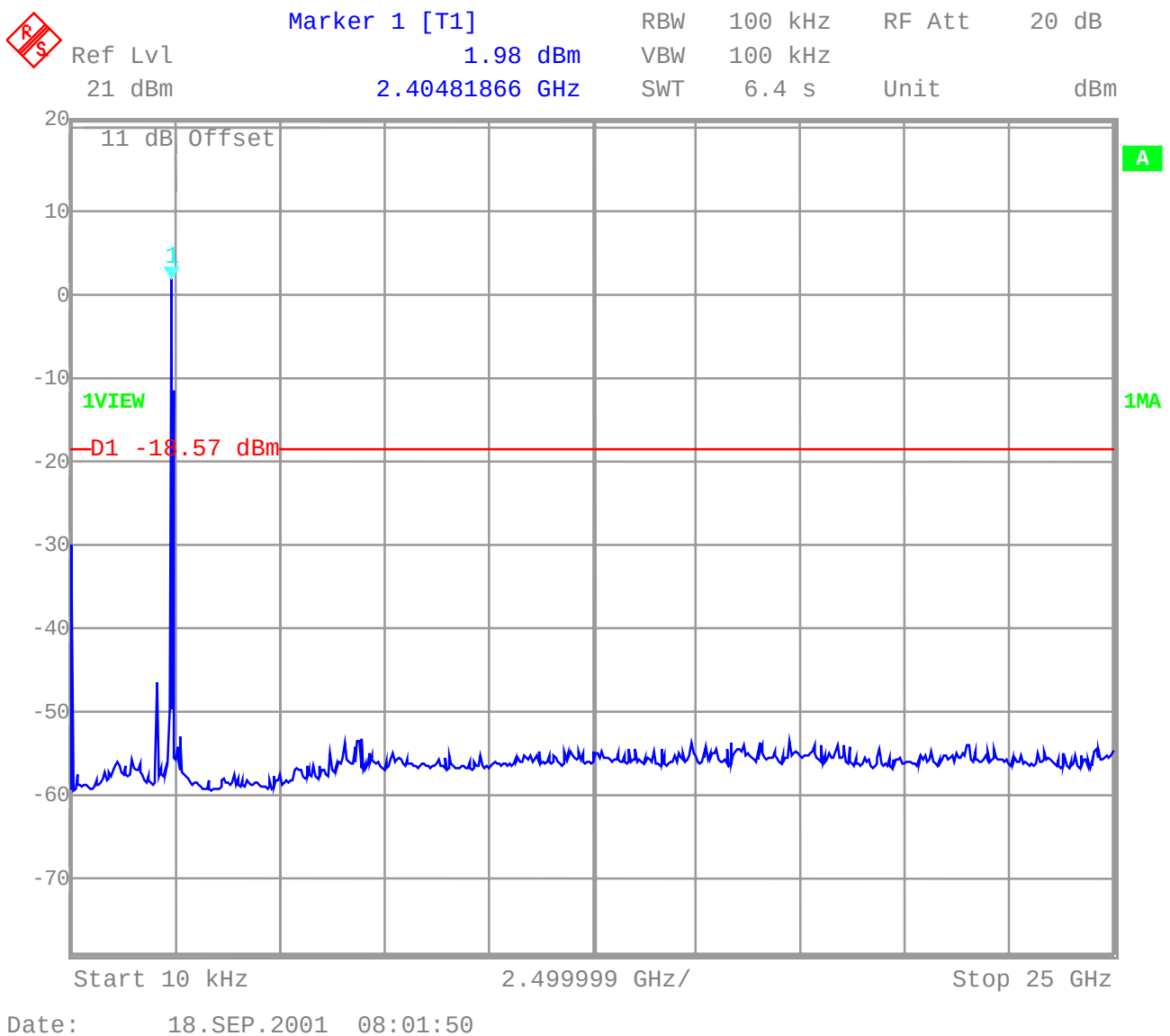
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

2442 MHz conducted up to 25 GHz



## LIMITS

## SUBCLAUSE § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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 §15.205(c)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

EMISSION LIMITATIONS (Transmitter)

SUBCLAUSE § 15.247 (c) (1)

conducted (radiated emissions in restricted bands see next table)

2472 MHz

| SPURIOUS LIMITATIONS    |       |                                   |                                    |  |         |
|-------------------------|-------|-----------------------------------|------------------------------------|--|---------|
| f<br>(MHz)              |       | amplitude<br>of emission<br>(dBm) | limit<br>max. allowed<br>emmission |  | results |
| all                     | peaks | << limit                          |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
|                         |       |                                   |                                    |  |         |
| Measurement uncertainty |       | ± 3dB                             |                                    |  |         |

RBW/ 1 MHz and VBW 10 Hz.

LIMITS

SUBCLAUSE § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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 §15.205(c)).

# CETECOM ICT Services GmbH

Test report nr.: 2\_2592-5-A/01

Issue Date: 19.09.01

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Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

EMISSION LIMITATIONS (Transmitter)

SUBCLAUSE § 15.247 (c) (2)

**radiated** (Antenna vertikal polarisation, horiz. emissions were up to 20dB lower)

2472 MHz

| SPURIOUS LIMITATIONS    |      |                                      |                                    |  |          |
|-------------------------|------|--------------------------------------|------------------------------------|--|----------|
| f<br>(MHz)              |      | amplitude<br>of emission<br>(dBµV/m) | limit<br>max. allowed<br>emmission |  | results  |
| 375.51                  | rad. | QP: 35.7                             | 46.0 dBµV/m                        |  | complies |
| 402.1                   | rad. | QP: 31.5                             | 46.0 dBµV/m                        |  | complies |
| 845.29                  | rad. | QP: 38.4                             | 46.0 dBµV/m                        |  | complies |
| 905.16                  | rad. | QP: 33.4                             | 46.0 dBµV/m                        |  | complies |
| 1497.5                  | rad. | AV: 39.4                             | 46.0 dBµV/m                        |  | complies |
| 1902.8                  | rad. | AV: 44.6                             | 54.0 dBµV/m                        |  | complies |
| 2098.2                  | rad. | AV: 41.8                             | 54.0 dBµV/m                        |  | complies |
| 2854.9                  | rad. | AV: 32.5                             | 54.0 dBµV/m                        |  | complies |
|                         |      |                                      |                                    |  |          |
|                         |      |                                      |                                    |  |          |
| Measurement uncertainty |      | ± 3dB                                |                                    |  |          |

Measurement were performed up to 1 GHz with a CISPR quasi peak adapter and 100/120 kHz BW. Measurements above 1 GHz were performed with RBW 1 MHz and VBW 10 Hz.

## LIMITS

SUBCLAUSE § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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 §15.205(c)).

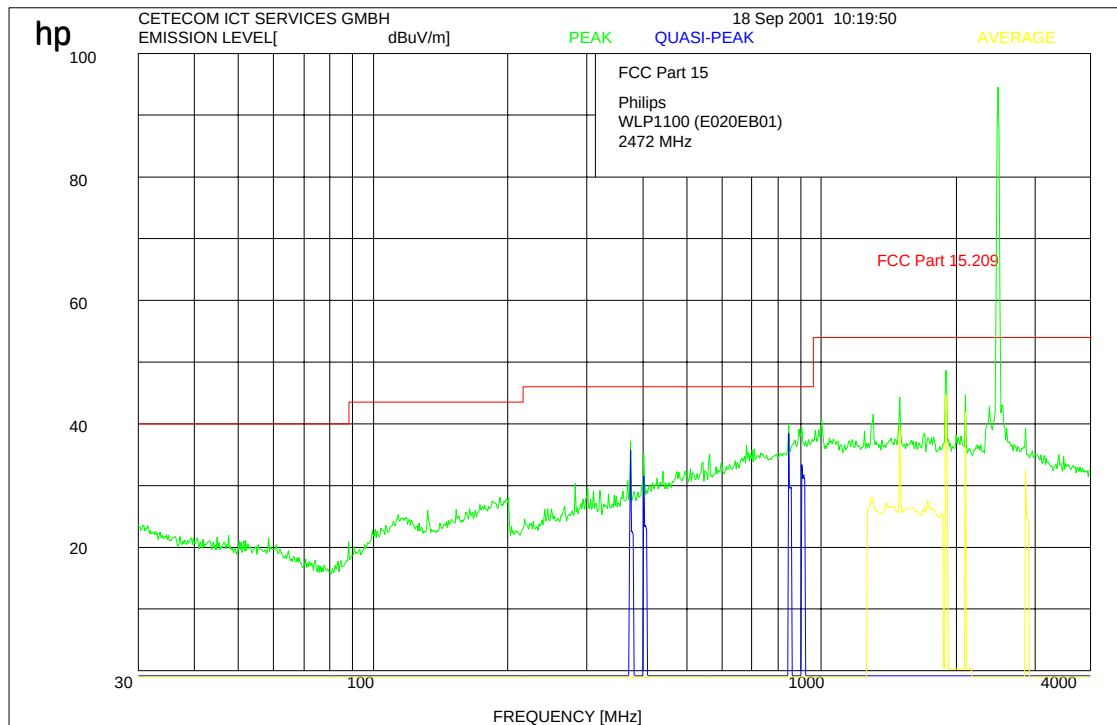
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

## 2472 MHz up to 4 GHz radiated



This is only a scan:

Measurements were performed with a CISPR quasi peak adapter and 100/120 kHz BW up to 1 GHz (blue lines), higher frequencies with average (yellow lines) RBW 1MHz and VBW 10 Hz and peak (green lines) with RBW 1 MHz / RBW 1 MHz

Carrier is suppressed by a stub tuner to avoid oversteering of the lownoise amplifier of the measuring system.

### LIMITS

### SUBCLAUSE § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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 §15.205(c)).

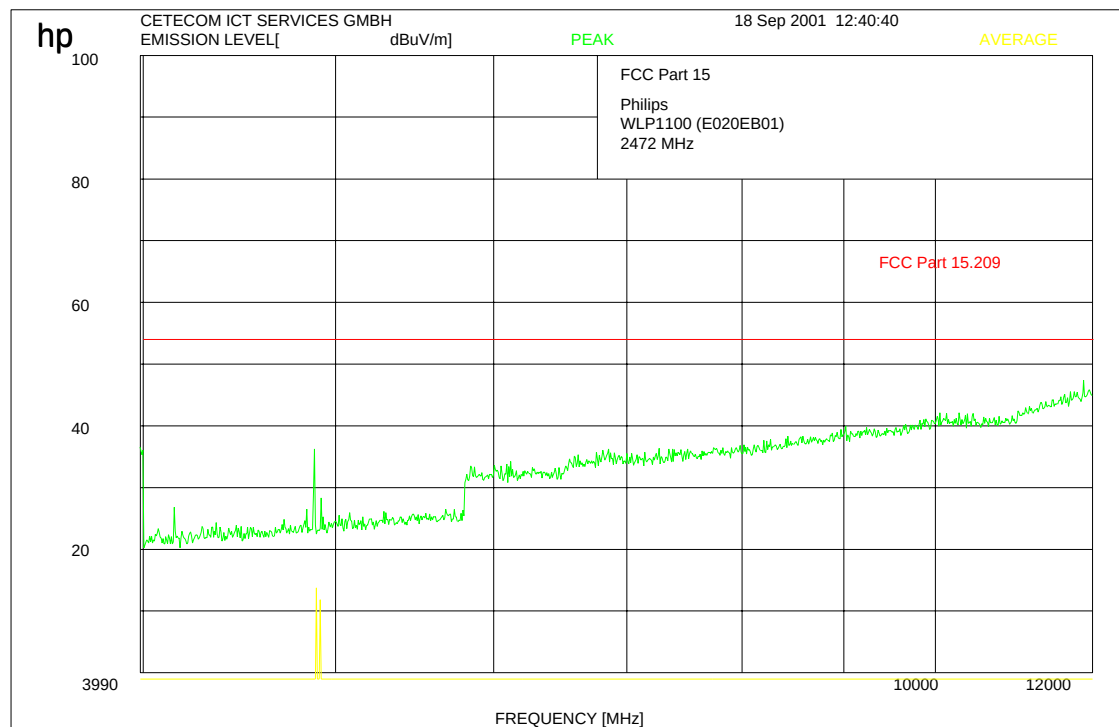
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

## 2472 MHz up to 12 GHz radiated



RBW 1 MHz and VBW 10 Hz (yellow line)

RBW 1 MHz and VBW 1 MHz (green line, scan only)

### LIMITS

### SUBCLAUSE § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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 §15.205(c)).

# CETECOM ICT Services GmbH

Test report nr.:2\_2592-5-A/01

Issue Date:19.09.01

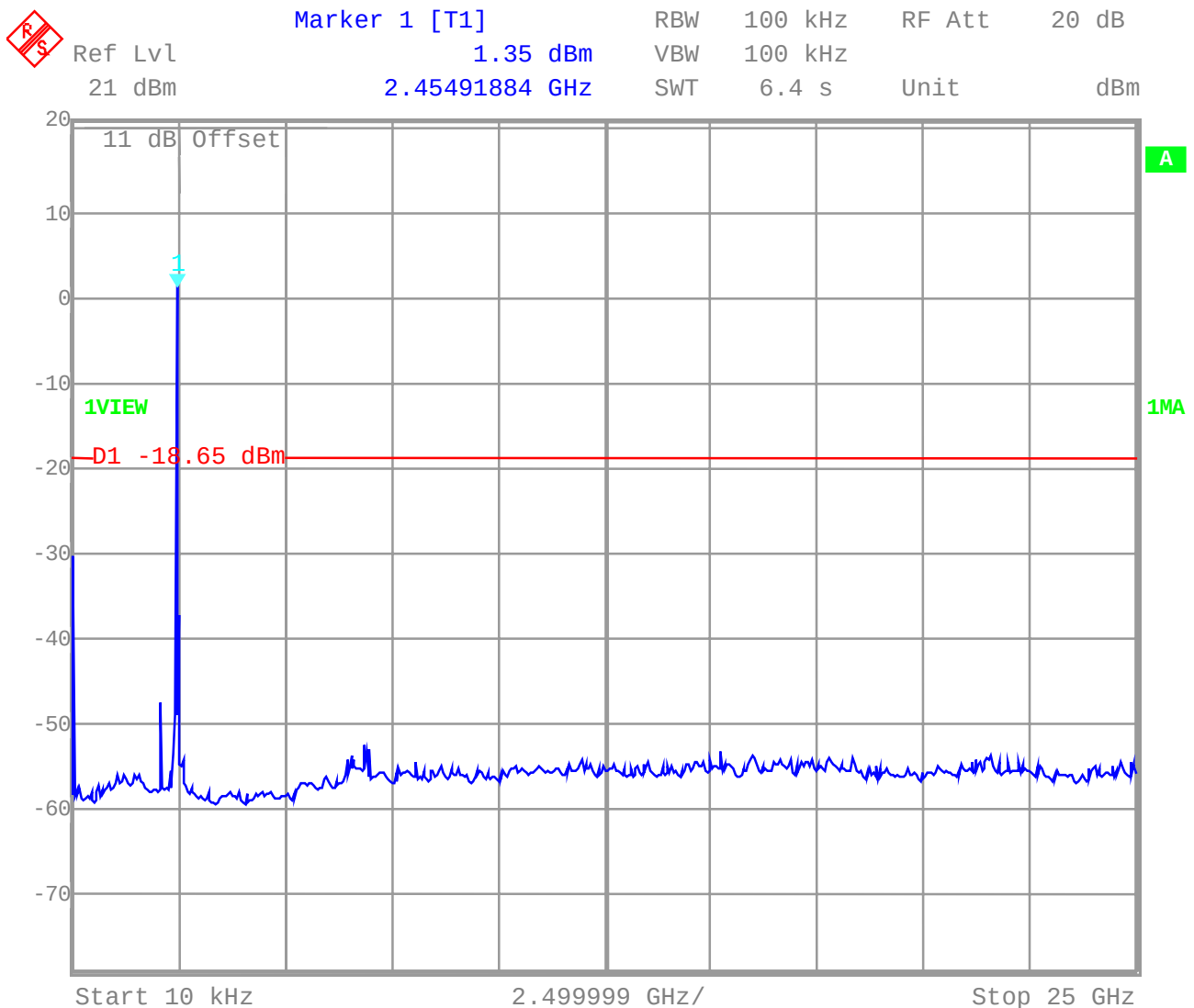
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Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

2472 MHz conducted up to 25 GHz



Date: 18.SEP.2001 08:03:30

## LIMITS

## SUBCLAUSE § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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 §15.205(c)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)



Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

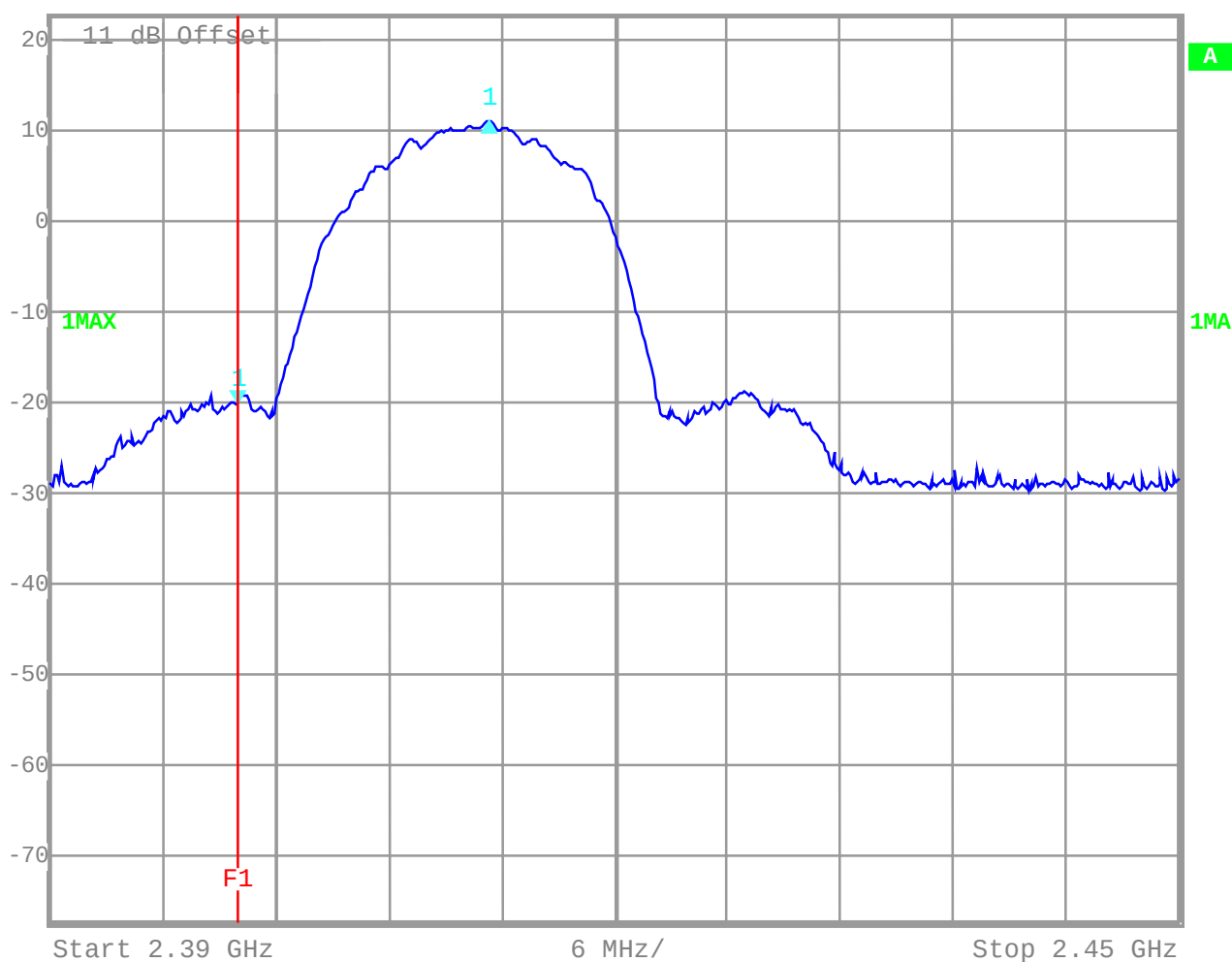
Relative humidity : 34%

Band-edge compliance of conducted emissions

§15.247 (c)



|          |                 |     |       |        |       |
|----------|-----------------|-----|-------|--------|-------|
| Ref Lvl  | Delta 1 [T1]    | RBW | 1 MHz | RF Att | 40 dB |
| 22.7 dBm | 31.02 dB        | VBW | 1 MHz |        |       |
|          | 13.34669339 MHz | SWT | 5 ms  | Unit   | dBm   |



Date: 18.SEP.2001 08:28:16

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

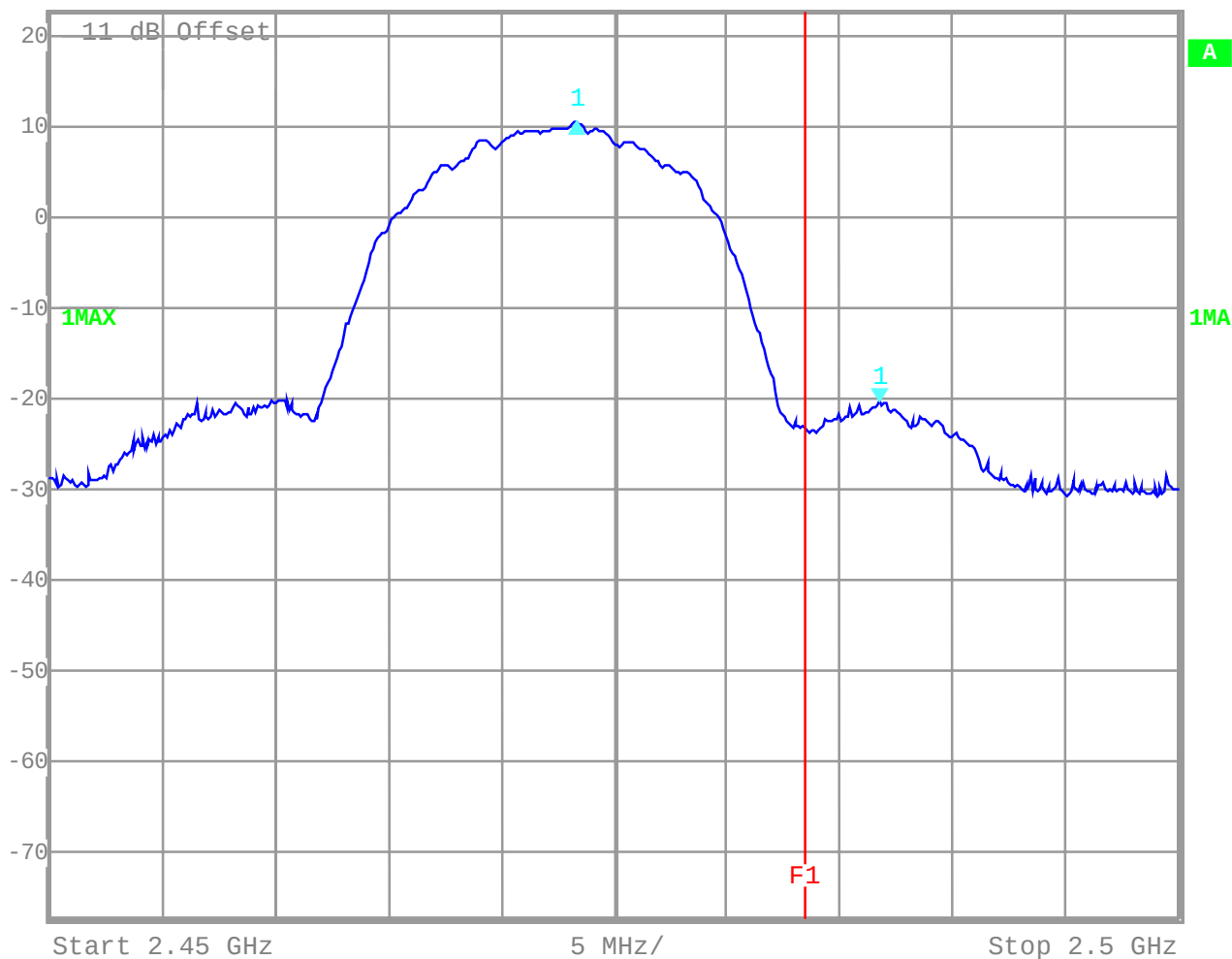
Relative humidity : 34%

Band-edge compliance of conducted emissions

§15.247 (c)



|          |                  |     |       |        |       |
|----------|------------------|-----|-------|--------|-------|
| Ref Lvl  | Delta 1 [T1]     | RBW | 1 MHz | RF Att | 40 dB |
| 22.7 dBm | 30.76 dB         | VBW | 1 MHz |        |       |
|          | -13.42685371 MHz | SWT | 5 ms  | Unit   | dBm   |



Date: 18.SEP.2001 08:29:32

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

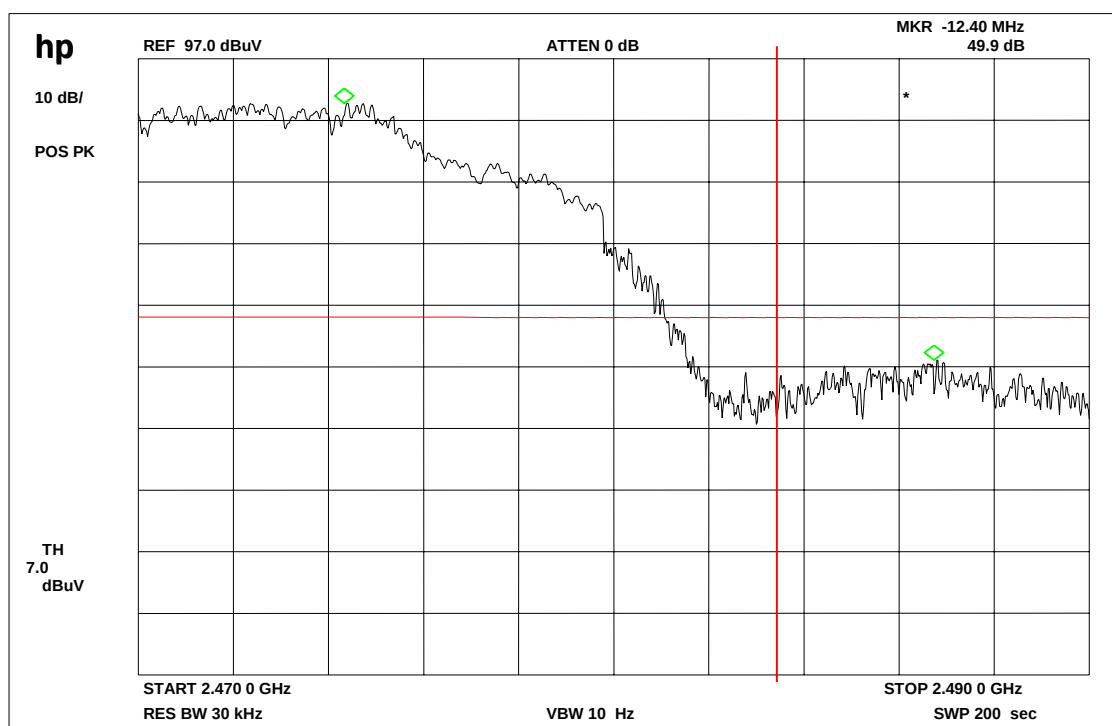
Relative humidity : 34%

Band-edge compliance of conducted emissions

§15.247 (c)

## Spurious radiations in the restricted band 2483.5 to 2500 MHz

### Average



## LIMITS

## SUBCLAUSE § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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 §15.205(c)).

**Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)****Ambient temperature : 24°C****Relative humidity : 34%****POWER SPECTRAL DENSITY****SUBCLAUSE § 15.247 (d)**

| TEST CONDITIONS                                                         |                         | RF POWER LEVEL IN 3 kHz BW |        |        |
|-------------------------------------------------------------------------|-------------------------|----------------------------|--------|--------|
| Frequency (MHz)                                                         |                         | 2412                       | 2442   | 2472   |
| T <sub>nom</sub> ( 23 )°C                                               | V <sub>nom</sub> (3.3)V | -21,3                      | -20,31 | -20,96 |
| Maximum deviation from output power under extreme test conditions (dBc) |                         | -.-                        | -.-    | -.-    |
| Measurement uncertainty                                                 |                         | ±3dB                       |        |        |

The measurement was performed with RBW 3 kHz, VBW 10 kHz, Span 1.5 MHz, Sweep 500 sec.

**LIMIT****SUBCLAUSE §15.247(d)**

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

## POWER SPECTRAL DENSITY

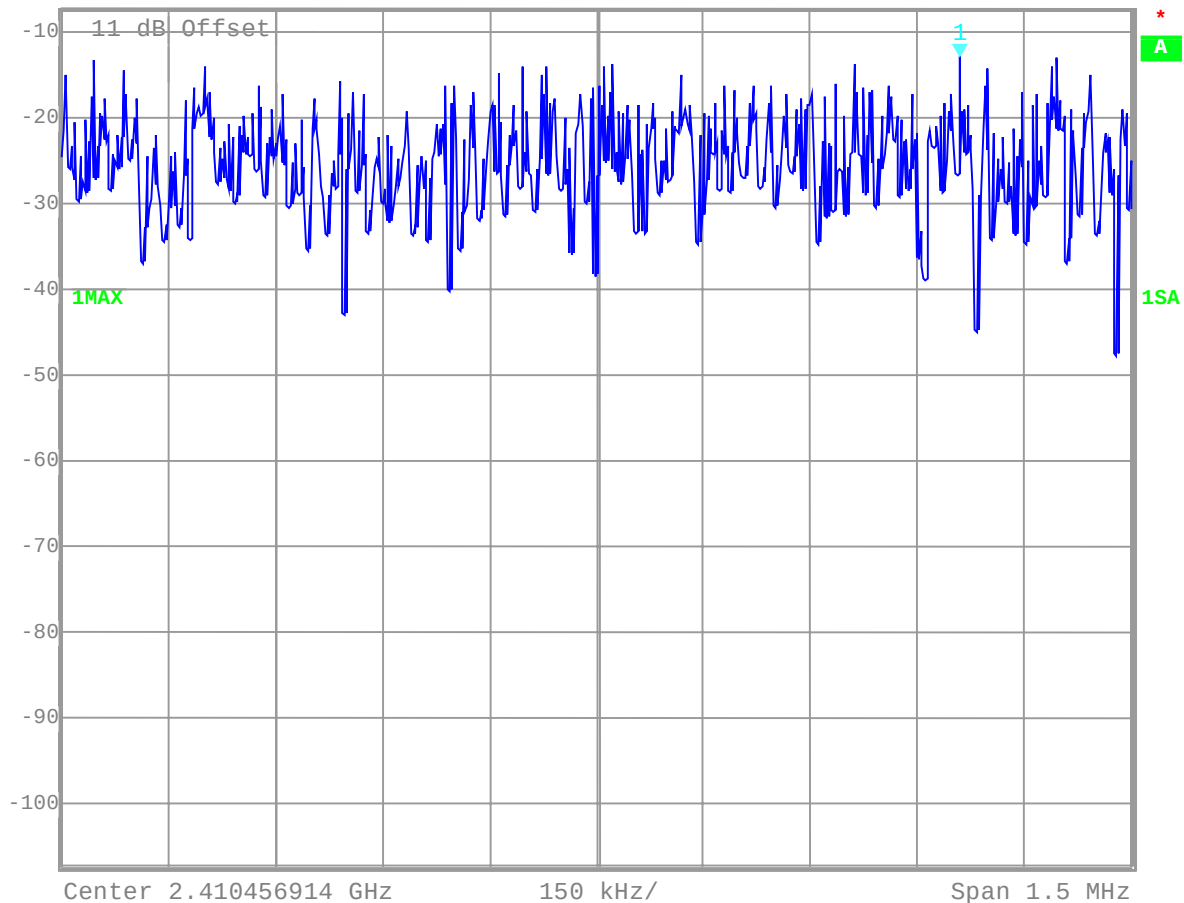
## SUBCLAUSE § 15.247 (d)

2412 MHz



Marker 1 [T1 NOI]  
Ref Lvl -56.10 dBm/Hz  
-7.3 dBm 2.41096643 GHz

RBW 3 kHz RF Att 10 dB  
VBW 10 kHz  
SWT 500 s Unit dBm



Date: 18.SEP.2001 08:56:53

to convert dBm/ Hz to dBm/3kHz add 34,8 dB

## LIMIT

## SUBCLAUSE §15.247(d)

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

# CETECOM ICT Services GmbH

Test report nr.:2\_2592-5-A/01

Issue Date:19.09.01

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Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

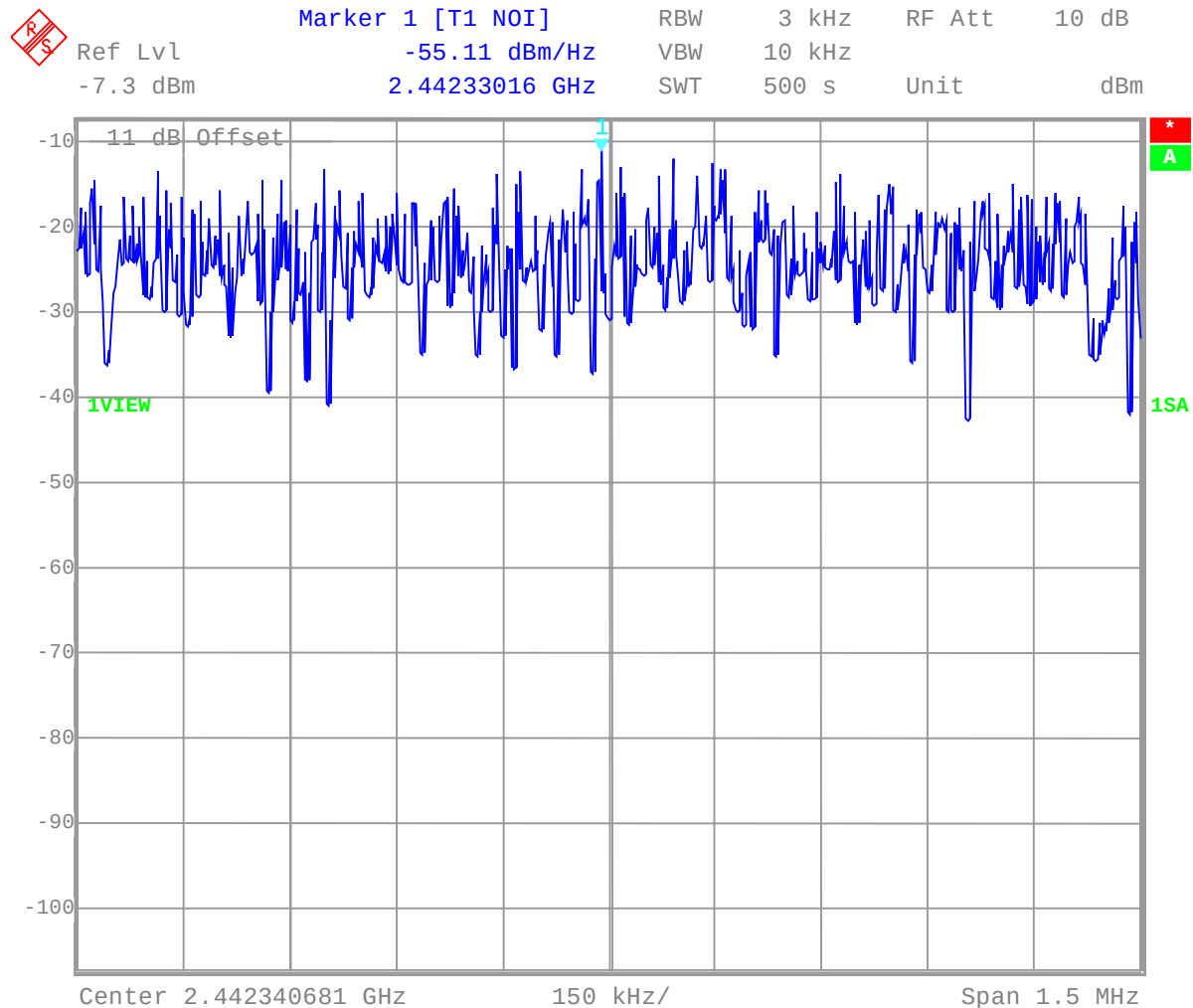
Ambient temperature : 24°C

Relative humidity : 34%

2442 MHz

## POWER SPECTRAL DENSITY

## SUBCLAUSE § 15.247 (d)



Date: 18.SEP.2001 08:48:45

to convert dBm/ Hz to dBm/3kHz add 34,8 dB

## LIMIT

## SUBCLAUSE §15.247(d)

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
 (for reference numbers see test equipment listing)

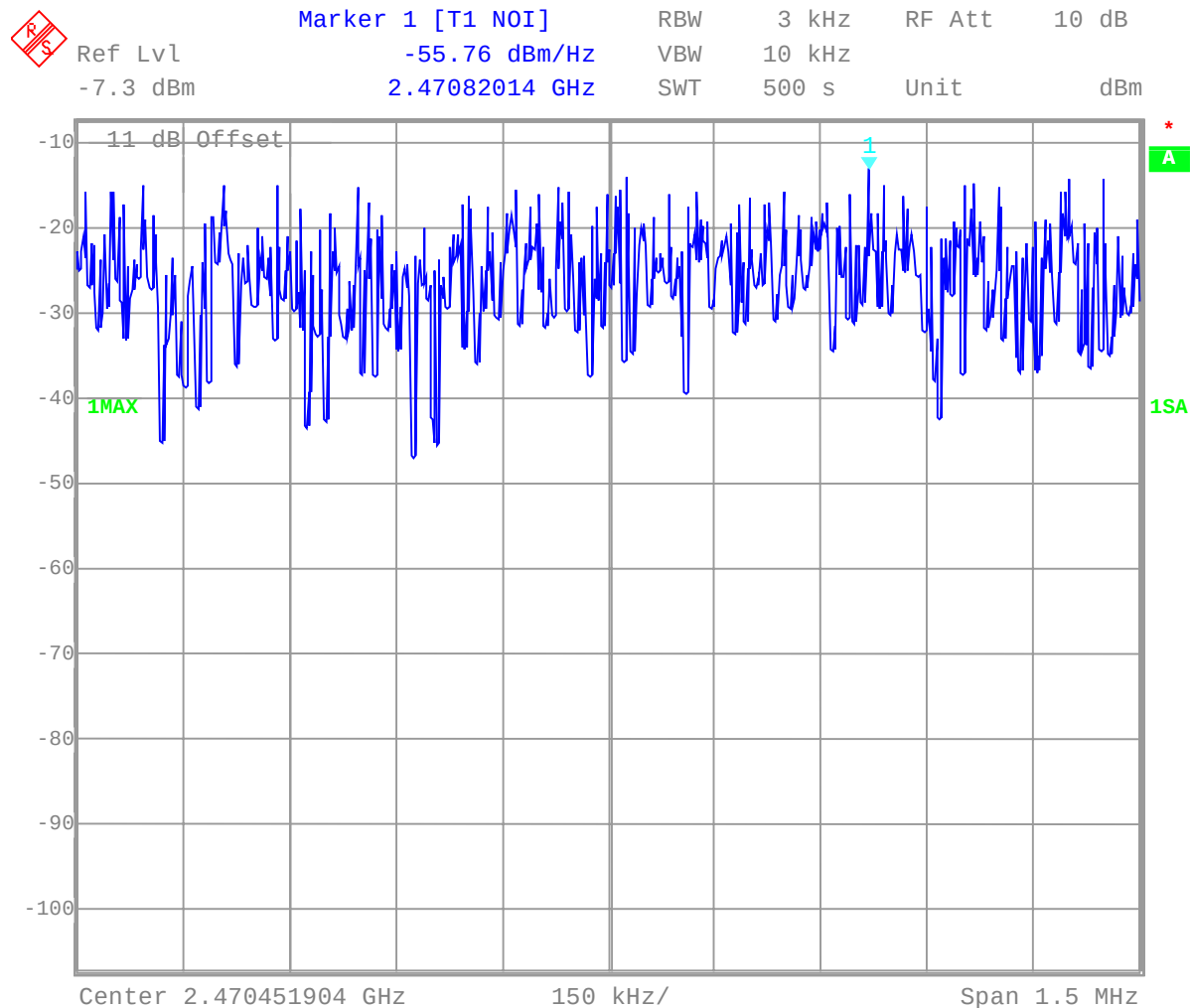
Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

## POWER SPECTRAL DENSITY 2472 MHz

## SUBCLAUSE § 15.247 (d)



Date: 18.SEP.2001 08:41:32

to convert dBm/ Hz to dBm/3kHz add 34,8 dB

## LIMIT

## SUBCLAUSE §15.247(d)

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

## PROCESSING GAIN OF DSSS SYSTEMS SUBCLAUSE §15.247 (e)

The processing gain of this product:

For 11 Mbit/s :  $18 \text{ dB} + (-7,1) + 2 = 12,9 \text{ dB}$

For 5,5 Mbit/s :  $15 \text{ dB} + (-3,2) + 2 = 13,8 \text{ dB}$

For 2 Mbit/s :  $15 \text{ dB} + (-3,6) + 2 = 13,4 \text{ dB}$

For 1 Mbit/s :  $13 \text{ dB} + (-1,3) + 2 = 13,7 \text{ dB}$

See additional CETECOM ICT Services GmbH test report no.: 2\_2592-4-C/01

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

-



Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

Relative humidity : 34%

## RECEIVER SPURIOUS RADIATION

§ 15.209

### Radiated

| SPURIOUS EMISSIONS LEVEL (dBµV/m) |          |              |          |          |              |          |          |              |
|-----------------------------------|----------|--------------|----------|----------|--------------|----------|----------|--------------|
| 2412 MHz                          |          |              | 2442 MHz |          |              | 2472 MHz |          |              |
| f (MHz)                           | Detector | Level dBµV/m | f (MHz)  | Detector | Level (µV/m) | f (MHz)  | Detector | Level (µV/m) |
| All                               | peaks    | < limit      | 281.43   | QP       | 31.3         | All      | peaks    | < limit      |
|                                   |          |              | 375.51   | QP       | 32.9         |          |          |              |
|                                   |          |              | 402.1    | QP       | 30.9         |          |          |              |
|                                   |          |              | 857.77   | QP       | 30.1         |          |          |              |
|                                   |          |              | 896.35   | QP       | 33.0         |          |          |              |
|                                   |          |              | 1012.9   | AV       | 36.0         |          |          |              |
|                                   |          |              | 1280.7   | AV       | 32.2         |          |          |              |
|                                   |          |              | 1497.5   | AV       | 40.8         |          |          |              |
|                                   |          |              | 2077.8   | AV       | 38.8         |          |          |              |
| Measurement uncertainty           |          |              | ±3 dB    |          |              |          |          |              |

Measurement were performed up to 1 GHz with a CISPR quasi peak adapter and 100/120 kHz BW. Measurements above 1 GHz were performed with RBW 1 MHz and VBW 10Hz.

All spurious including such in restricted bands are below the limits.

Measurement distance see table

### Limits

SUBCLAUSE § 15.209

| Frequency (MHz) | Field strength (dBµV/m) | Measurement distance (m) |
|-----------------|-------------------------|--------------------------|
| 30 - 88         | 40                      | 3                        |
| 88 - 216        | 43.5                    | 3                        |
| 216 - 960       | 46                      | 3                        |
| above 960       | 54                      | 3                        |

### REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

Ambient temperature : 24°C

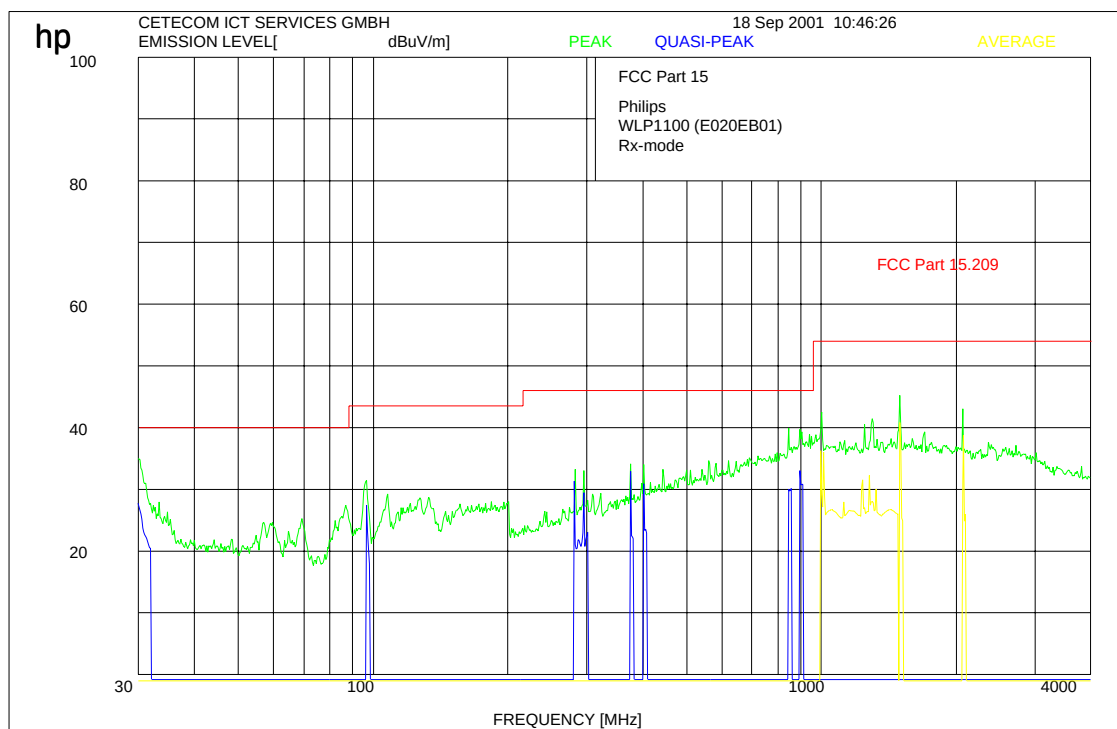
Relative humidity : 34%

## RECEIVER SPURIOUS RADIATION

§ 15.209

up to 4 GHz

The following plots are valid for all three measured frequencies.



This is only a scan:

Measurements were performed with a CISPR quasi peak adapter and 100/120 kHz BW up to 1 GHz ( blue lines), higher frequencies with average (yellow lines) RBW 1MHz and VBW 10 Hz and peak (green lines) with RBW 1 MHz / RBW 1 MHz

## Limits

## SUBCLAUSE § 15.209

| Frequency (MHz) | Field strength (µV/m) | Measurement distance (m) |
|-----------------|-----------------------|--------------------------|
| 30 - 88         | 100                   | 3                        |
| 88 - 216        | 150                   | 3                        |
| 216 - 960       | 200                   | 3                        |
| above 960       | 500                   | 3                        |

## REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

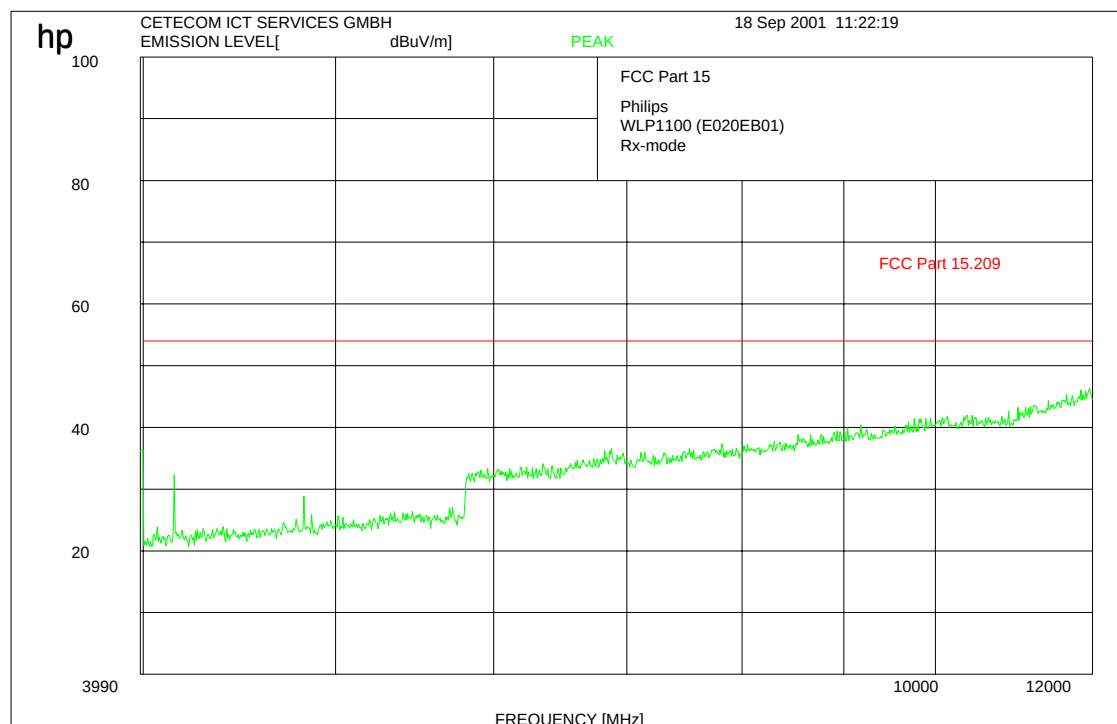
Ambient temperature : 24°C

Relative humidity : 34%

## RECEIVER SPURIOUS RADIATION

§ 15.209

up to 12 GHz



The measurements were performed up to 25 GHz. There were no peaks found.

Measurements were performed with RBW/VBW 1 MHz. (scan only, peak >> 10 dB below limit)

### Limits

### SUBCLAUSE § 15.209

| Frequency (MHz) | Field strength (µV/m) | Measurement distance (m) |
|-----------------|-----------------------|--------------------------|
| 30 - 88         | 100                   | 3                        |
| 88 - 216        | 150                   | 3                        |
| 216 - 960       | 200                   | 3                        |
| above 960       | 500                   | 3                        |

### REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

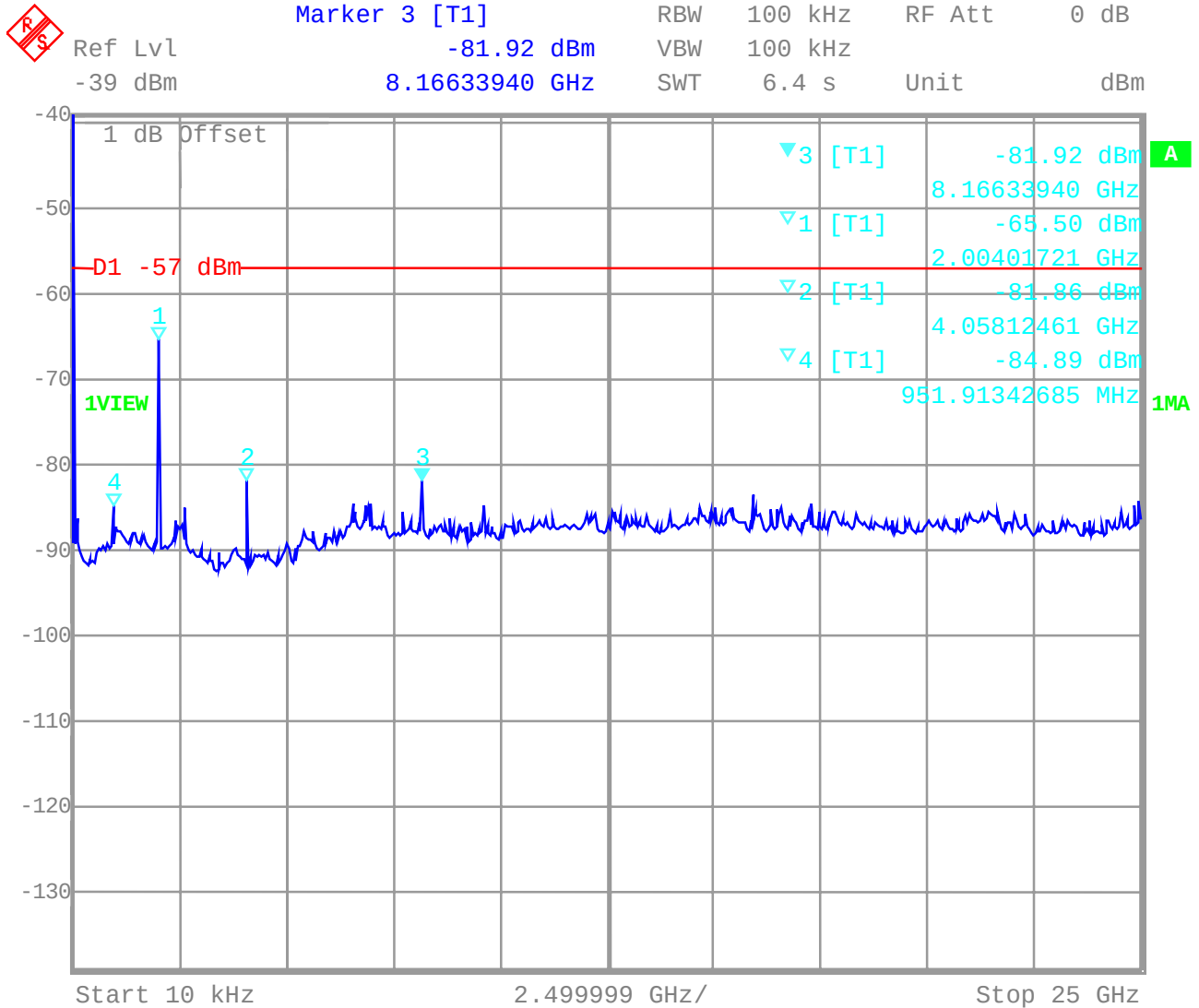
Ambient temperature : 24°C

Relative humidity : 34%

RECEIVER SPURIOUS EMISSIONS conducted

§ 15.209

2412 MHz



Date: 18.SEP.2001 08:09:40

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

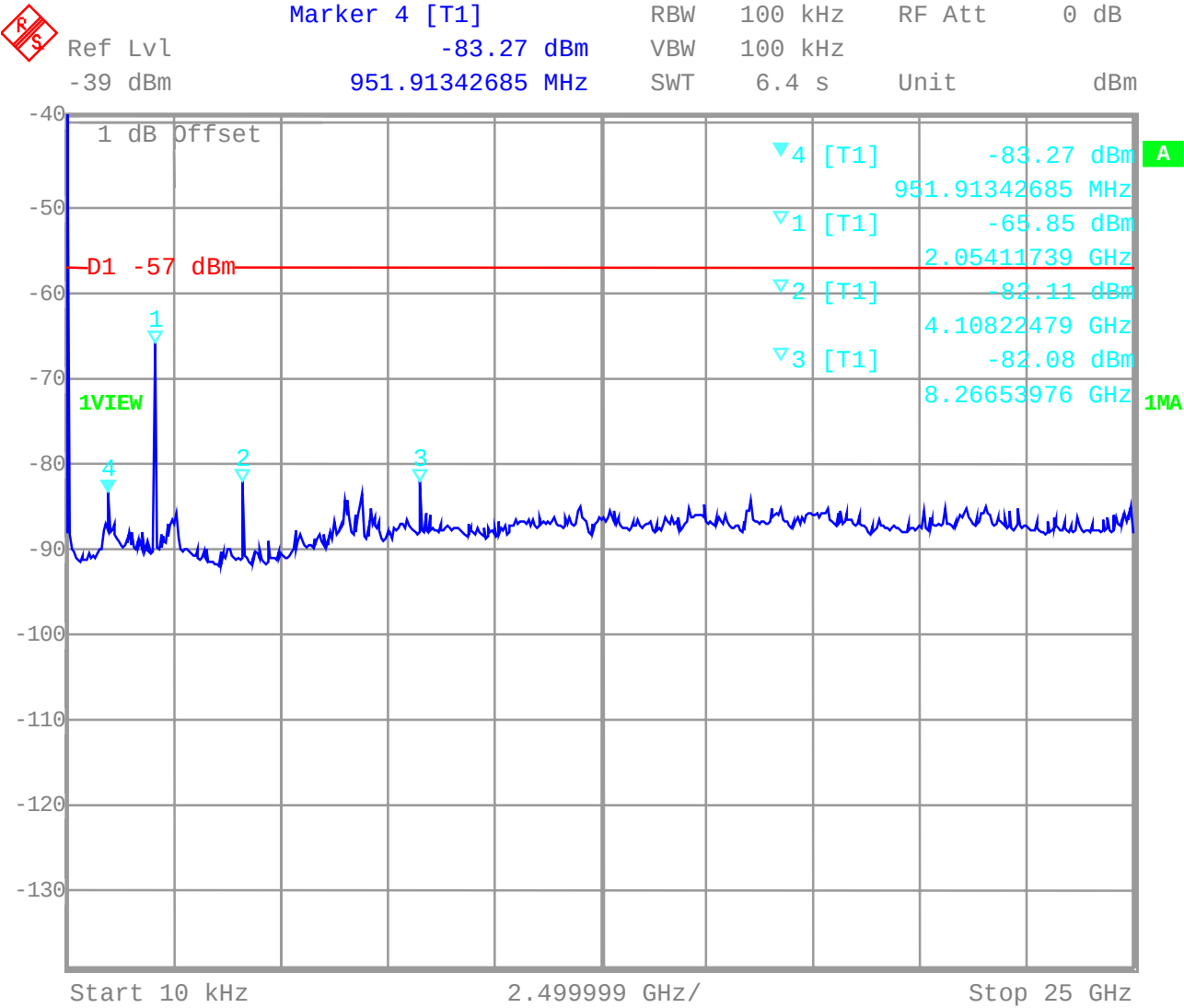
Ambient temperature : 24°C

Relative humidity : 34%

RECEIVER SPURIOUS EMISSIONS conducted

§ 15.209

2442 MHz



Date: 18.SEP.2001 08:08:47

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

Equipment under test : IEEE802.11b PC card WLP1100 (E020EB01)

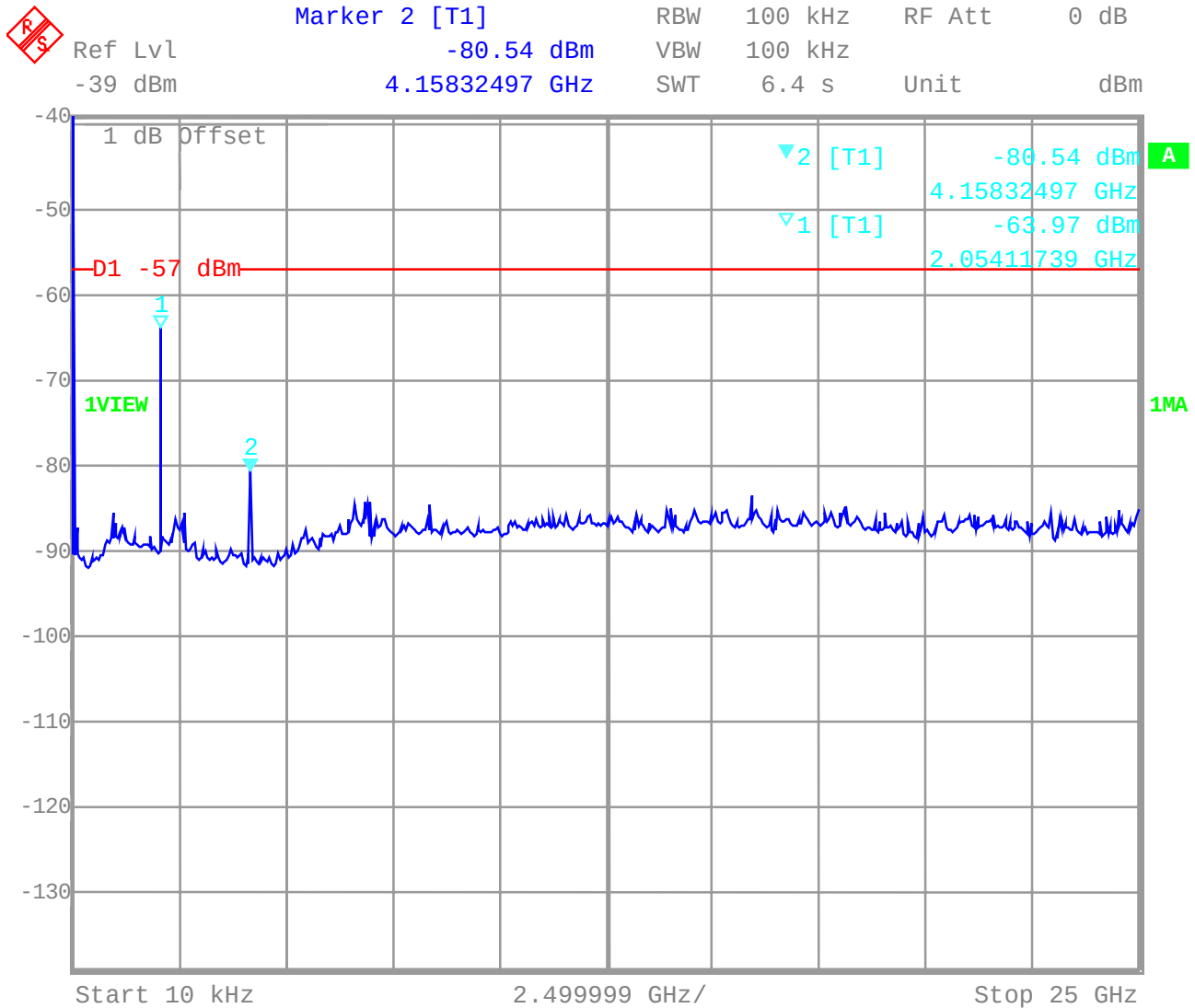
Ambient temperature : 24°C

Relative humidity : 34%

RECEIVER SPURIOUS EMISSIONS conducted

§ 15.209

2472 MHz



Date: 18.SEP.2001 08:06:47

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

**TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS**

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

| No | Instrument/Ancillary  | Type      | Manufacturer    | Serial No.  |
|----|-----------------------|-----------|-----------------|-------------|
| 01 | Spectrum Analyzer     | 8566 A    | Hewlett-Packard | 1925A00257  |
| 02 | Analyzer Display      | 8566 A    | Hewlett-Packard | 1925A00860  |
| 03 | Oscilloscope          | 7633      | Tektronix       | 230054      |
| 04 | Radio Analyzer        | CMTA 54   | Rohde & Schwarz | 894 043/010 |
| 05 | System Power Supply   | 6038 A    | Hewlett-Packard | 2848A07027  |
| 06 | Signal Generator      | 8111 A    | Hewlett-Packard | 2215G00867  |
| 07 | Signal Generator      | 8662 A    | Hewlett-Packard | 2224A01012  |
| 08 | Funktionsgenerator    | AFGU      | Rohde & Schwarz | 862 480/032 |
| 09 | Regeltrenntrafo       | MPL       | Erfi            | 91350       |
| 10 | Netznachbildung       | NNLA 8120 | Schwarzbeck     | 8120331     |
| 11 | Relais-Matrix         | PSU       | Rohde & Schwarz | 893 285/020 |
| 12 | Power-Meter           | 436 A     | Hewlett-Packard | 2101A12378  |
| 13 | Power-Sensor          | 8484 A    | Hewlett-Packard | 2237A10156  |
| 14 | Power-Sensor          | 8482 A    | Hewlett-Packard | 2237A00616  |
| 15 | Modulationsmeter      | 9008      | Racal-Dana      | 2647        |
| 16 | Frequenzzähler        | 5340 A    | Hewlett-Packard | 1532A03899  |
| 17 | Absorber Schirmkabine | ---       | MWB             | 87400/002   |
| 18 | Spectrum Analyzer     | 85660 B   | Hewlett-Packard | 2747A05306  |
| 19 | Analyzer Display      | 85662 A   | Hewlett-Packard | 2816A16541  |
| 20 | Quasi Peak Adapter    | 85650 A   | Hewlett-Packard | 2811A01131  |
| 21 | RF-Preselector        | 85685 A   | Hewlett-Packard | 2833A00768  |
| 22 | Biconical Antenne     | 3104      | Emco            | 3758        |
| 23 | Log. Per. Antenne     | 3146      | Emco            | 2130        |
| 24 | Double Ridge Horn     | 3115      | Emco            | 3088        |
| 25 | EMI-Testreceiver      | ESAI      | Rohde & Schwarz | 863 180/013 |
| 26 | EMI-Analyzer-Display  | ESAI-D    | Rohde & Schwarz | 862 771/008 |
| 27 | Biconical Antenne     | HK 116    | Rohde & Schwarz | 888 945/013 |
| 28 | Log. Per. Antenne     | HL 223    | Rohde & Schwarz | 825 584/002 |
| 29 | Relais-Switch-Unit    | RSU       | Rohde & Schwarz | 375 339/002 |
| 30 | Highpass              | HM985955  | FSY Microwave   | 001         |
| 31 | Amplifier             | P42-GA29  | Tron-Tech       | B 23602     |
| 32 | Absorber Schirmkabine |           | Frankonia       |             |
| 33 | Steuerrechner         | PSM 7     | Rohde & Schwarz | 834 621/004 |
| 34 | EMI Test Reciever     | ESMI      | Rohde & Schwarz | 827 063/010 |
| 35 | EMI Test Receiver     | Display   | Rohde & Schwarz | 829 808/010 |

**TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS**

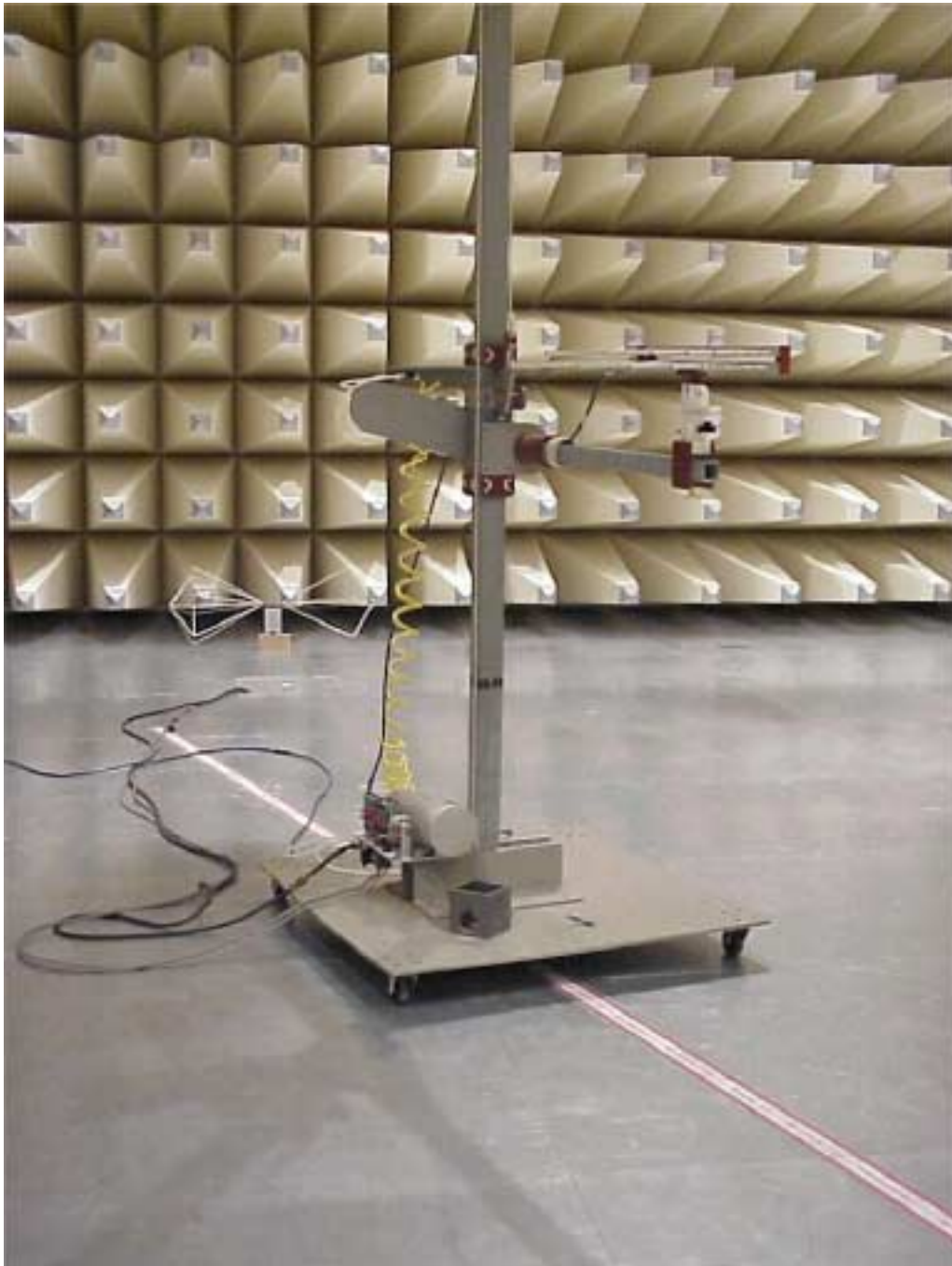
To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

| No | Instrument/Ancillary                   | Type      | Manufacturer    | Serial No.   |
|----|----------------------------------------|-----------|-----------------|--------------|
| 36 | Controler                              | HD 100    | Deisel          | 100/322/93   |
| 37 | Relais Matrix                          | PSN       | Rohde & Schwarz | 829 065/003  |
| 38 | Control Unit                           | GB 016 A2 | Rohde & Schwarz | 344 122/008  |
| 39 | Relais Switch Unit                     | RSU       | Rohde & Schwarz | 316 790/001  |
| 40 | Power Supply                           | 6032A     | Hewlett Packard | 2846A04063   |
| 41 | Spektrum Monitor                       | EZM       | Rohde & Schwarz | 883 720/006  |
| 42 | Meßempfänger                           | ESH 3     | Rohde & Schwarz | 890 174/002  |
| 43 | Meßempfänger                           | ESVP      | Rohde & Schwarz | 891 752/005  |
| 44 | Biconi Ant. 20-300MHz                  | HK 116    | Rohde & Schwarz | 833 162/011  |
| 45 | Logper Ant. 0.3-1 GHz                  | HL 223    | Rohde & Schwarz | 832 914/010  |
| 46 | Amplifier 0.1-4 GHz                    | AFS4      | Miteq Inc.      | 206461       |
| 47 | Logper Ant. 1-18 GHz                   | HL 024 A2 | Rohde & Schwarz | 342 662/002  |
| 48 | Polarisationsnetzwerk                  | HL 024 Z1 | Rohde & Schwarz | 341 570/002  |
| 49 | Double Ridge G Horn Antenne 1-26.5 GHz | 3115      | EMCO            | 9107-3696    |
| 50 | Microw. Sys. Amplifier 0.5- 26.5 GHz   | 8317A     | Hewlett Packard | 3123A00105   |
| 51 | Audio Analyzer                         | UPD       | Rohde & Schwarz | 1030.7500.04 |
| 52 | Steuerrechner                          | PSM 7     | Rohde & Schwarz | 883 086/026  |
| 53 | DC V-Netzwerk                          | ESH3-Z6   | Rohde & Schwarz | 861 406/005  |
| 54 | DC V-Netzwerk                          | ESH3-Z6   | Rohde & Schwarz | 893 689/012  |
| 55 | AC 2 Phasen V-Netzwerk                 | ESH3-Z5   | Rohde & Schwarz | 861 189/014  |
| 56 | AC 2 Phasen V-Netzwerk                 | ESH3-Z5   | Rohde & Schwarz | 894 981/019  |
| 57 | AC-3 Phasen V-Netzwerk                 | ESH2-Z5   | Rohde & Schwarz | 882 394/007  |
| 58 | Stromversorgung                        | 6032A     | Rohde & Schwarz | 2933A05441   |
| 59 | HF-Test Empfänger                      | ESVP.52   | Rohde & Schwarz | 881 487/021  |
| 60 | Spectrum Monitor                       | EZM       | Rohde & Schwarz | 883 086/026  |
| 61 | HF-Test Empfänger                      | ESH3      | Rohde & Schwarz | 881 515/002  |
| 62 | Relais Matrix                          | PSU       | Rohde & Schwarz | 882 943/029  |
| 63 | Relais Matrix                          | PSU       | Rohde & Schwarz | 828 628/007  |
| 64 | Spectrum Analyzer                      | FSIQ 26   | Rohde & Schwarz | 119.6001.27  |
| 67 |                                        |           |                 |              |



Test site  
RADIATED EMISSIONS

Picture 1:



**Photographs of the equipment**



**Photographs of the equipment**



**Photographs of the equipment**





**Photographs of the equipment**



**Photographs of the equipment**

