

**REPORT NO** : RF89051001  
**PRODUCT** : Access Point  
**MODEL NO** : NWH660  
**SERIAL NO** : N/A  
**CLIENT** : National Datacomm Corporation  
**ADDRESS** : 4F, No. 24-2, Industry East 4<sup>th</sup> Road,  
Science Park, Hsinchu, Taiwan R.O.C.  
**ISSUED BY** : Advance Data Technology Corporation (ADT Corp.)  
**OFFICE ADDRESS** : 11F, No. 1, Sec. 4, Nan-King East Rd., Taipei, Taiwan, R.O.C.  
**LABORATORY ADDRESS** : No. 47, 14 Ling, Chia Pau Tsuen, Lin Kou Hsian, Taipei Hsien, Taiwan, R.O.C.  
**TEST STANDARD** : 47CFR Part 15, Subpart C (15.249)  
**TEST DATE** : July 5, 2000  
**TEST RESULT** : Pass

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Accredited Laboratory



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## 1 CERTIFICATION

Issue Date: July 05, 2000

**PRODUCT** : Access Point  
**MODEL NO** : NWH660  
**FCC ID** : IOU0660S02  
**CLIENT** : National Datacomm Corporation.  
**TEST STANDARD** : FCC 47CFR Part 15, Subpart C and Subpart B (Section 15.247)  
ANSI C63.4-1992

We, ADVANCE DATA TECHNOLOGY CORPORATION, hereby certify that one sample of the designated sample has been tested in our facility. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate representation of the measurements of the sample's EMC characteristics and the energy emitted under the conditions herein specified.

|              |                        |                            |
|--------------|------------------------|----------------------------|
| TESTED BY:   | <u>Ellis Wu</u>        | DATE: <u>July 05, 2000</u> |
|              | Ellis Wu               |                            |
| CHECKED BY:  | <u>Delphine Hsu</u>    | DATE: <u>July 05, 2000</u> |
|              | Delphine Hsu           |                            |
| APPROVED BY: | <u>Alan Lane</u>       | DATE: <u>July 05, 2000</u> |
|              | Dr. Alan Lane, Manager |                            |



## 2 SUMMARY OF TEST RESULTS

| 47 CFR Part 15, Subpart C |                                                                                          |                        |                                                         |
|---------------------------|------------------------------------------------------------------------------------------|------------------------|---------------------------------------------------------|
| PARAGRAPH.                | TEST REQUIREMENTS                                                                        | COMPLIANCE<br>(YES/NO) | TEST RESULT                                             |
| 15.107                    | AC Power Conducted Emissions<br>Spec.: 48 dBuV                                           | Yes                    | Minimum passing<br>margin is -8.7 dBuV<br>At 2.52 MHz   |
| 15.247(a)(2)              | Spectrum Bandwidth of a Direct<br>Sequence Spread Spectrum System<br>Spec.: min. 500 kHz | Yes                    | 9.26 MHz > 500 kHz                                      |
| 15.247(b)                 | Maximum Peak Output Power<br>Spec.: max. 30 dBm                                          | Yes                    | 17.18 dBm < 30 dBm                                      |
| 15.247(c)                 | Transmitter Radiated Emissions<br>Spec.: Table 15.209                                    | Yes                    | Minimum passing<br>margin is -2.5 dBuV<br>At 160.00 MHz |
| 15.247(d)                 | Power Spectral Density<br>Spec.: max. 8dBm                                               | Yes                    | -8.92 dBm < 8 dBm                                       |
| 15.247(e)                 | Processing Gain of Direct Sequence<br>Spread Spectrum System<br>Spec.: min. 10 dB        | Yes                    | 11.4dB $\geq$ 10dB                                      |



### **3 DECLARATION OF COMPLIANCE WITH SUBPART B**

The digital circuits and receiver portion of the EUT has been tested in ADT. The test result has been verified to comply with FCC Part 15, Subpart B, Class B – Computing Devices (FCC DoC). The engineering test report can be provided upon FCC requests.



## 4 GENERAL INFORMATION

### 4.1 General Description of EUT

|                             |                                  |
|-----------------------------|----------------------------------|
| Product                     | : Access Point                   |
| Model No                    | : NWH660                         |
| Power Supply                | : AC adapter 100V ~ 240V         |
| Modulation Type             | : BPSK(1Mbps)/QPSK(2/5.5/11Mbps) |
| Transfer Rate               | : 11/5.5/2/1 Mbps                |
| Operating Frequency         | : 2.4 - 2.4835 GHz               |
| Number of Channel           | : 11                             |
| Channel Spacing             | : 10MHz                          |
| Rated RF output power level | : 14 dBm                         |
| Associated devices          | : N/A                            |

*Note: InstantWave High Speed is one of the first IEEE 802.11b wireless standard compliant products in the industry and was designed with a "Maximizing the Convenience of Networking" philosophy in mind.*

*The other detailed information, please refer to user's manual.*



## 4.2 Description of Test mode

1. Below 1 GHz, the channel 1, 6 and 11 were pre-tested in chamber. The channel 11, worst case one, was chosen for final test.
2. Above 1 Ghz, the channel 1, 6 and 11 were chosen for evaluation.

## 4.3 Test Methodology

These tests were conducted on a sample of EUT for the evaluation in compliance with FCC CFR47 Part 15, Subpart C. (15.247)

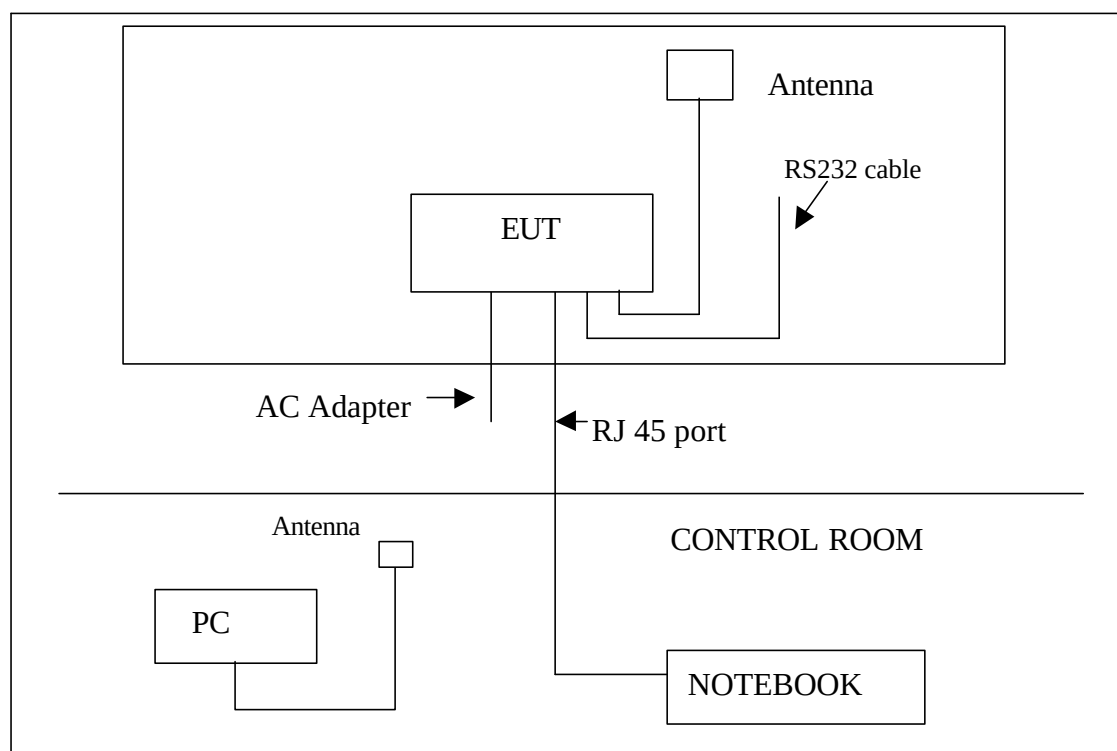
Both conducted and radiated emissions measurements were carried out in accordance with ANSI C63.4:1992.



## 4.4 Support Units List

| No | Product           | Brand    | Model No. | Serial No.       | I/O Cable          |
|----|-------------------|----------|-----------|------------------|--------------------|
| 1. | Note Book         | DEKK     | LS        | N/A              | N/A                |
| 2. | PERSONAL COMPUTER | HP       | Vectra VE | SG72301070       | Nonshielded (1.8m) |
| 3. | Monitor           | ADI      | CM700     | 010042L90203864B | N/A                |
| 4. | Keyboard          | BTC      | 5121W     | N/A              | Nonshielded (2.1m) |
| 5. | Mouse             | LOGITECH | M-S34     | LZE01653092      | N/A                |

## 4.5 Configuration of System Under Test



## 5 GENERAL INFORMATION OF TEST FACILITY

### 5.1 Test Lab.

**Advance Data Technology Corporation (NVLAP accredited)**

No. 47, 14 Ling, Chia Pau Tsuen, Lin Kuo Hsiang, Taipei, Taiwan, R.O.C.

Tel: +886-3-3270910

Fax: +886-3-3270892

### 5.2 Calibration Interval

All calibration intervals of the test sites and test instruments are 12 months. The calibrations are traceable to NML/ROC and NIST/USA.

## 6 TEST PROCEDURES AND TEST RESULTS

### 6.1 Conducted Emission Measurement

#### 6.1.1 Test Instruments

| Description & Manufacturer               | Model No. | Serial No. | Calibrated Until |
|------------------------------------------|-----------|------------|------------------|
| ROHDE & SCHWARZ Test Receiver            | ESH3      | 893495/006 | July 7, 2000     |
| ROHDE & SCHWARZ Spectrum Monitor         | EZM       | 893787/013 | July 8, 2000     |
| ROHDE & SCHWARZ Artificial Mains Network | ESH2-Z5   | 892107/003 | July 13, 2000    |
| EMCO L.I.S.N.                            | 3825/2    | 9504-2359  | July 13, 2000    |
| Shielded Room                            | Site 3    | ADT-C03    | NA               |

**The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS document NIS81.**

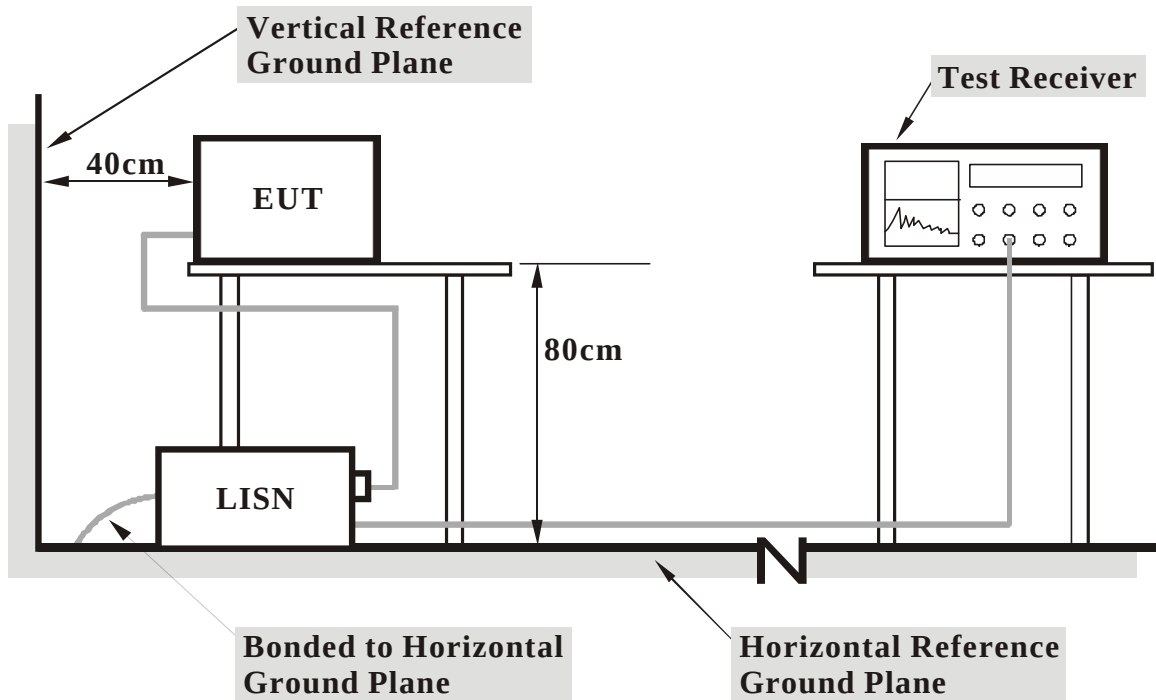
#### 6.1.2 Test Procedure

The EUT was placed 0.4 meter from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 $\Omega$ / 50  $\mu$  H coupling impedance for the measuring instrument.

Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

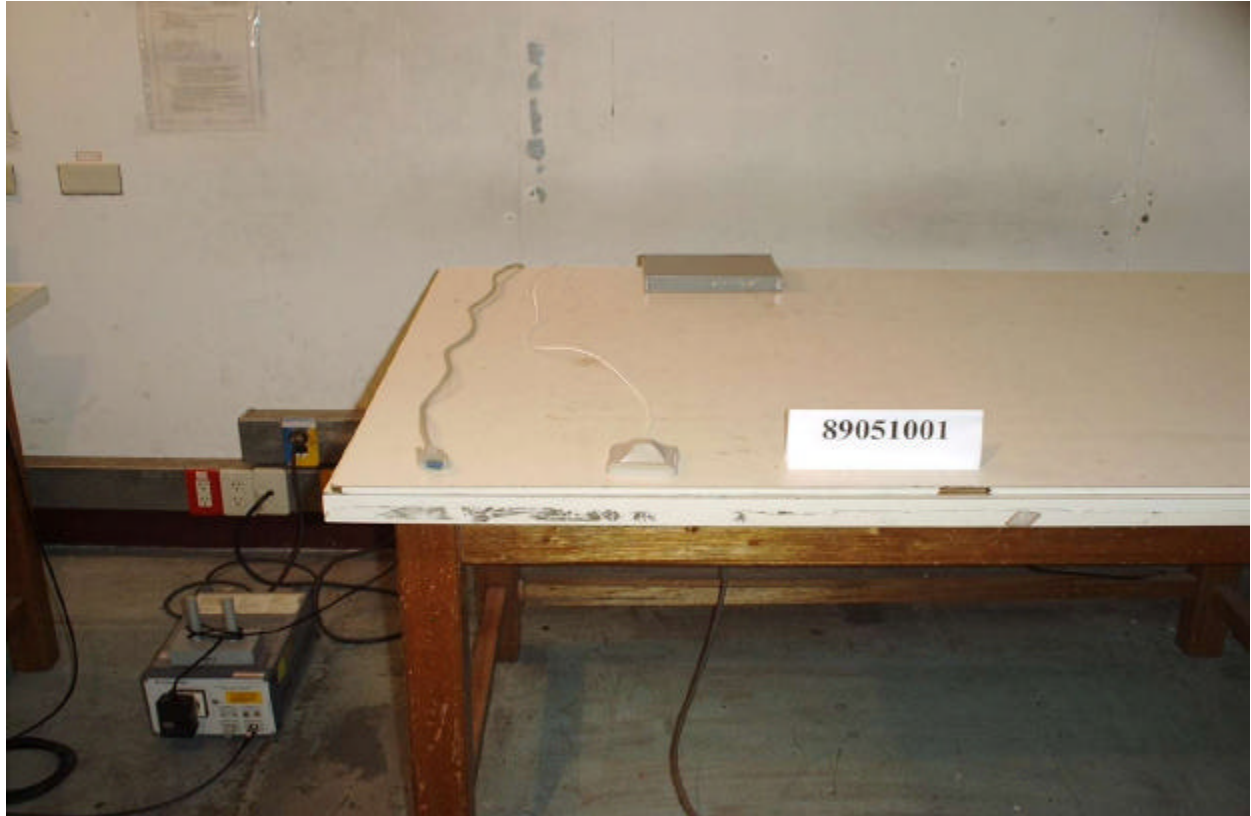
The frequency range from 450 kHz to 30 MHz was searched. The emission levels over 10dB under the prescribed limits could not be reported.

### 6.1.3 Test Setup



- Note:** 1. Support units were connected to second LISN.  
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

#### 6.1.4 Photograph of Test Setup





#### **6.1.5 EUT Operating condition**

1. Place the EUT on the turn table.
2. Connect antenna with antenna port.
3. Use RJ45 cable to connect PC and EUT.
4. Connect RS232 cable on RS 232 port.
5. Power on.
6. Prepare the same setup as above, but place it outside testing area.
7. Send data to EUT (on the turn table) by command "PIN".
8. The linkage between these two PC has been established when the address of the other PC is shown on the monitor.
9. Operate measurement receiver to take data.

#### **6.1.6 Climate Condition**

The temperature and related humidity is 23 degree and 63%.

### 6.1.7 Test Results

| MODE: CH 1     |                         | 6 dB Bandwidth: 10 kHz     |     |                             |     | PHASE: LINE (L)    |     |                |     |
|----------------|-------------------------|----------------------------|-----|-----------------------------|-----|--------------------|-----|----------------|-----|
| Freq.<br>[MHz] | Corr.<br>Factor<br>(dB) | Reading Value<br>[dB (uV)] |     | Emission Level<br>[dB (uV)] |     | Limit<br>[dB (uV)] |     | Margin<br>(dB) |     |
|                |                         | Q.P.                       | AV. | Q.P.                        | AV. | Q.P.               | AV. | Q.P.           | AV. |
| 0.519          | 0.2                     | 37.1                       | -   | 37.3                        | -   | 48                 | -   | -10.7          | -   |
| 1.122          | 0.2                     | 34.7                       | -   | 34.9                        | -   | 48                 | -   | -13.1          | -   |
| 1.467          | 0.2                     | 31.9                       | -   | 32.1                        | -   | 48                 | -   | -15.9          | -   |
| 2.55           | 0.2                     | 37.0                       | -   | 37.2                        | -   | 48                 | -   | -10.8          | -   |
| 12.059         | 0.7                     | 34.1                       | -   | 34.8                        | -   | 48                 | -   | -13.2          | -   |
| 24.01          | 1.3                     | 32.9                       | -   | 34.2                        | -   | 48                 | -   | -13.8          | -   |

| MODE: CH1      |                         | 6 dB Bandwidth: 10 kHz     |     |                             |     | PHASE: Neutral(N)  |     |                |     |
|----------------|-------------------------|----------------------------|-----|-----------------------------|-----|--------------------|-----|----------------|-----|
| Freq.<br>[MHz] | Corr.<br>Factor<br>(dB) | Reading Value<br>[dB (uV)] |     | Emission Level<br>[dB (uV)] |     | Limit<br>[dB (uV)] |     | Margin<br>(dB) |     |
|                |                         | Q.P.                       | AV. | Q.P.                        | AV. | Q.P.               | AV. | Q.P.           | AV. |
| 0.519          | 0.2                     | 35.2                       | -   | 35.4                        | -   | 48                 | -   | -12.6          | -   |
| 1.122          | 0.2                     | 34.9                       | -   | 35.1                        | -   | 48                 | -   | -12.9          | -   |
| 1.467          | 0.2                     | 35.7                       | -   | 35.9                        | -   | 48                 | -   | -12.1          | -   |
| 2.55           | 0.2                     | 37.2                       | -   | 37.4                        | -   | 48                 | -   | -10.6          | -   |
| 12.059         | 0.6                     | 34.1                       | -   | 34.7                        | -   | 48                 | -   | -13.3          | -   |
| 24.01          | 1.2                     | 33.1                       | -   | 34.3                        | -   | 48                 | -   | -13.7          | -   |

- Remarks:
1. "\*": Undetectable
  2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  3. "-": NA
  4. The emission levels of other frequencies were very low against the limit.
  5. Margin value = Emission level - Limit value
  6. Emission Level = Correction Factor + Reading Value.

| MODE: CH 6     |                         | 6 dB Bandwidth: 10 kHz     |     |                             |     | PHASE: LINE (L)    |     |                |     |
|----------------|-------------------------|----------------------------|-----|-----------------------------|-----|--------------------|-----|----------------|-----|
| Freq.<br>[MHz] | Corr.<br>Factor<br>(dB) | Reading Value<br>[dB (uV)] |     | Emission Level<br>[dB (uV)] |     | Limit<br>[dB (uV)] |     | Margin<br>(dB) |     |
|                |                         | Q.P.                       | AV. | Q.P.                        | AV. | Q.P.               | AV. | Q.P.           | AV. |
| 0.477          | 0.2                     | 37.7                       | -   | 37.9                        | -   | 48                 | -   | -10.1          | -   |
| 0.693          | 0.2                     | 34.2                       | -   | 34.4                        | -   | 48                 | -   | -13.6          | -   |
| 1.605          | 0.2                     | 34.9                       | -   | 35.1                        | -   | 48                 | -   | -12.9          | -   |
| 2.56           | 0.2                     | 37.8                       | -   | 38.0                        | -   | 48                 | -   | -10.0          | -   |
| 11.96          | 0.7                     | 34.2                       | -   | 34.9                        | -   | 48                 | -   | -13.1          | -   |
| 24.26          | 1.3                     | 31.1                       | -   | 32.4                        | -   | 48                 | -   | -15.6          | -   |

| MODE: CH6      |                         | 6 dB Bandwidth: 10 kHz     |     |                             |     | PHASE: Neutral(N)  |     |                |     |
|----------------|-------------------------|----------------------------|-----|-----------------------------|-----|--------------------|-----|----------------|-----|
| Freq.<br>[MHz] | Corr.<br>Factor<br>(dB) | Reading Value<br>[dB (uV)] |     | Emission Level<br>[dB (uV)] |     | Limit<br>[dB (uV)] |     | Margin<br>(dB) |     |
|                |                         | Q.P.                       | AV. | Q.P.                        | AV. | Q.P.               | AV. | Q.P.           | AV. |
| 0.477          | 0.2                     | 32.1                       | -   | 32.3                        | -   | 48                 | -   | -15.7          | -   |
| 0.693          | 0.2                     | 34.5                       | -   | 34.7                        | -   | 48                 | -   | -13.3          | -   |
| 1.605          | 0.2                     | 34.1                       | -   | 34.3                        | -   | 48                 | -   | -13.7          | -   |
| 2.56           | 0.2                     | 38.4                       | -   | 38.6                        | -   | 48                 | -   | -9.4           | -   |
| 11.96          | 0.6                     | 35.4                       | -   | 36.0                        | -   | 48                 | -   | -12.0          | -   |
| 24.26          | 1.2                     | 31.2                       | -   | 32.4                        | -   | 48                 | -   | -15.6          | -   |

- Remarks:
1. "\*": Undetectable
  2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  3. "-": NA
  4. The emission levels of other frequencies were very low against the limit.
  5. Margin value = Emission level - Limit value
  6. Emission Level = Correction Factor + Reading Value.



| MODE: CH 11    |                         | 6 dB Bandwidth: 10 kHz     |     |                             |     | PHASE: LINE (L)    |     |                |     |
|----------------|-------------------------|----------------------------|-----|-----------------------------|-----|--------------------|-----|----------------|-----|
| Freq.<br>[MHz] | Corr.<br>Factor<br>(dB) | Reading Value<br>[dB (uV)] |     | Emission Level<br>[dB (uV)] |     | Limit<br>[dB (uV)] |     | Margin<br>(dB) |     |
|                |                         | Q.P.                       | AV. | Q.P.                        | AV. | Q.P.               | AV. | Q.P.           | AV. |
| 0.519          | 0.2                     | 37.1                       | -   | 37.3                        | -   | 48                 | -   | -10.7          | -   |
| 0.825          | 0.2                     | 31.2                       | -   | 31.4                        | -   | 48                 | -   | -16.6          | -   |
| 1.347          | 0.2                     | 34.8                       | -   | 35.0                        | -   | 48                 | -   | -13.0          | -   |
| 2.52           | 0.2                     | 39.1                       | -   | 39.3                        | -   | 48                 | -   | -8.7           | -   |
| 12.287         | 0.7                     | 35.1                       | -   | 35.8                        | -   | 48                 | -   | -12.2          | -   |
| 24.12          | 1.3                     | 34.1                       | -   | 35.4                        | -   | 48                 | -   | -12.6          | -   |

| MODE: CH11     |                         | 6 dB Bandwidth: 10 kHz     |     |                             |     | PHASE: Neutral(N)  |     |                |     |
|----------------|-------------------------|----------------------------|-----|-----------------------------|-----|--------------------|-----|----------------|-----|
| Freq.<br>[MHz] | Corr.<br>Factor<br>(dB) | Reading Value<br>[dB (uV)] |     | Emission Level<br>[dB (uV)] |     | Limit<br>[dB (uV)] |     | Margin<br>(dB) |     |
|                |                         | Q.P.                       | AV. | Q.P.                        | AV. | Q.P.               | AV. | Q.P.           | AV. |
| 0.519          | 0.2                     | 35.1                       | -   | 35.3                        | -   | 48                 | -   | -12.7          | -   |
| 0.825          | 0.2                     | 35.4                       | -   | 35.6                        | -   | 48                 | -   | -12.4          | -   |
| 1.347          | 0.2                     | 36.1                       | -   | 36.3                        | -   | 48                 | -   | -11.7          | -   |
| 2.52           | 0.2                     | 38.2                       | -   | 38.4                        | -   | 48                 | -   | -9.6           | -   |
| 12.287         | 0.6                     | 34.0                       | -   | 34.6                        | -   | 48                 | -   | -13.4          | -   |
| 24.12          | 1.2                     | 34.9                       | -   | 36.1                        | -   | 48                 | -   | -11.9          | -   |

- Remarks:
1. "\*": Undetectable
  2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  3. "-": NA
  4. The emission levels of other frequencies were very low against the limit.
  5. Margin value = Emission level - Limit value
  6. Emission Level = Correction Factor + Reading Value.



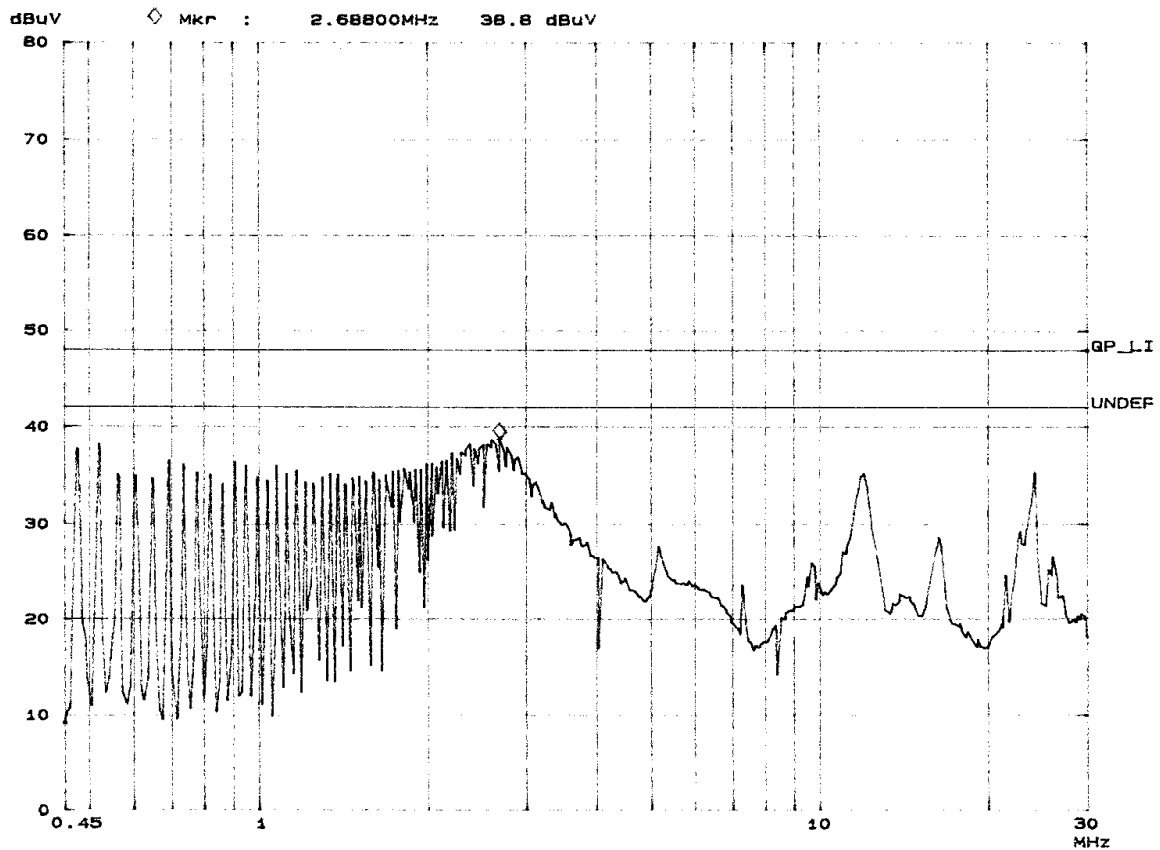
ADT CO. Shielded Room 2  
FCC CLASS B

02. Jun 00 22:39

EUT: ACCESS POINT  
Op Cond: CH 1  
Operator: ELLIS  
Test Spec: LISN: L  
Comment: 120V AC / 60Hz

Fast Scan Settings (2 Ranges)

| Frequencies |      |      | Receiver Settings |          |        |        |        |       |  |
|-------------|------|------|-------------------|----------|--------|--------|--------|-------|--|
| Start       | Stop | Step | IF BW             | Detector | M-Time | Atten  | Preamp | OpRge |  |
| 450K        | 5M   | 3K   | 10K               | PK       | 1ms    | 10dBLN | OFF    | 60dB  |  |
| 5M          | 30M  | 3K   | 10K               | PK       | 1ms    | 10dBLN | OFF    | 60dB  |  |





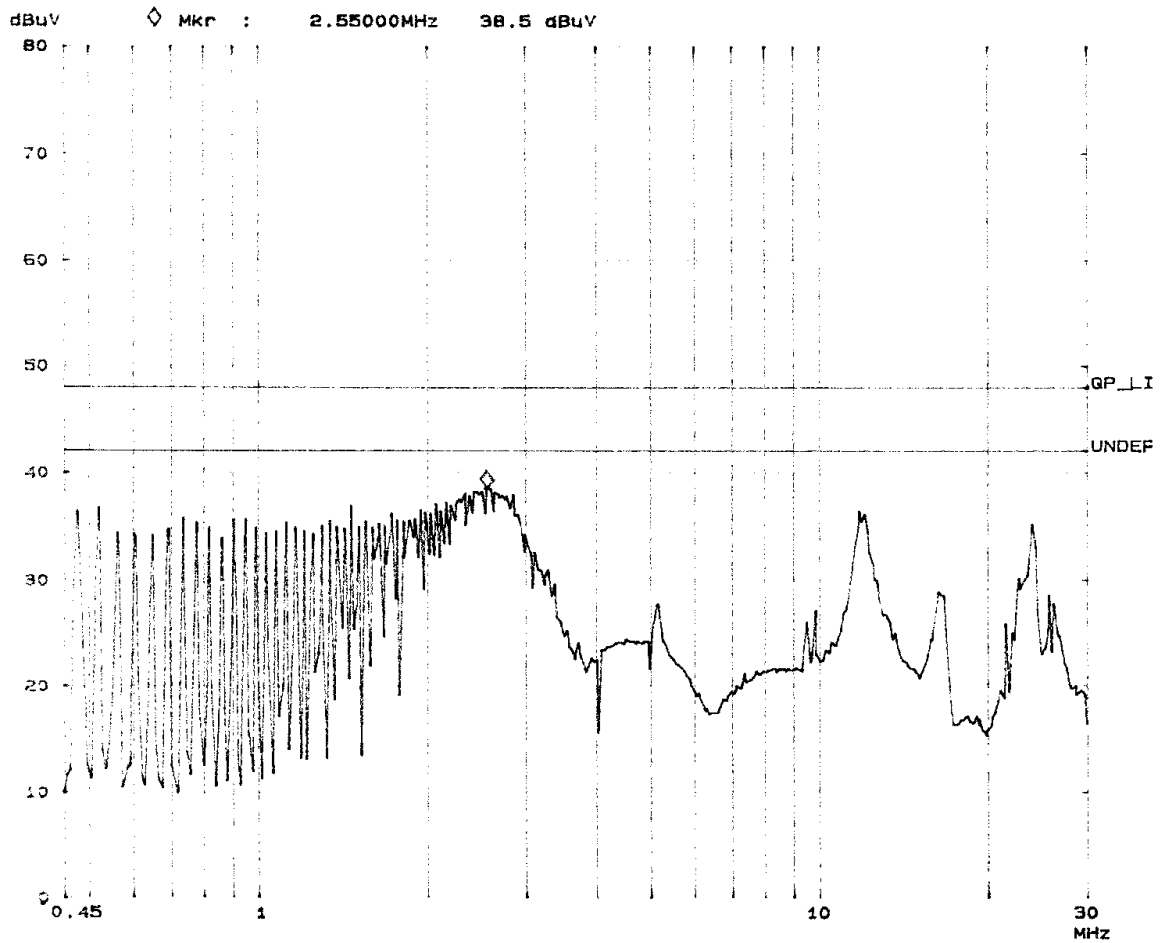
ADT CO. Shielded Room 2  
FCC CLASS B

02. Jun 00 22:30

EUT: ACCESS POINT  
Op Cond: CH 1  
Operator: ELLIS  
Test Spec: LISN : N  
Comment: 120V AC / 60Hz

Fast Scan Settings (2 Ranges)

| Frequencies |      |      | Receiver Settings |          |        |        |         |       |  |
|-------------|------|------|-------------------|----------|--------|--------|---------|-------|--|
| Start       | Stop | Step | IF BW             | Detector | M-Time | Atten  | Preampl | OpRge |  |
| 450k        | 5M   | 3k   | 10k               | PK       | 1ms    | 10dBLN | OFF     | 60dB  |  |
| 5M          | 30M  | 3k   | 10k               | PK       | 1ms    | 10dBLN | OFF     | 60dB  |  |





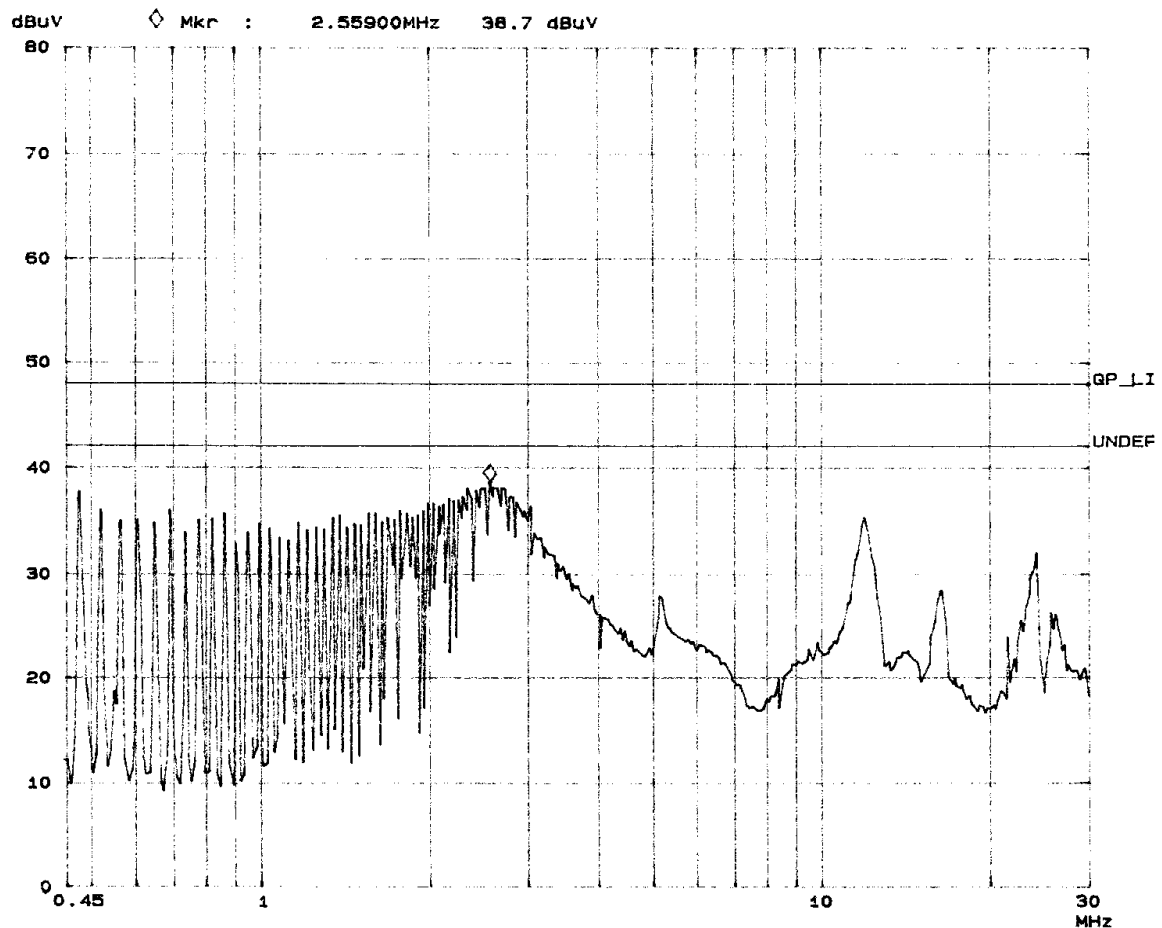
ADT CO. Shielded Room 2  
FCC CLASS B

02. Jun 00 22:44

EUT: ACCESS POINT  
Op Cond: CH 6  
Operator: ELLIS  
Test Spec: LISN : L  
Comment: 120V AC / 60Hz

Fast Scan Settings (2 Ranges)

| Frequencies |      |      | Receiver Settings |          |        |        |        |       |  |
|-------------|------|------|-------------------|----------|--------|--------|--------|-------|--|
| Start       | Stop | Step | IF BW             | Detector | M-Time | Atten  | Preamp | OpRge |  |
| 450k        | 5M   | 3k   | 10k               | PK       | 1ms    | 10dBLN | OFF    | 60dB  |  |
| 5M          | 30M  | 3k   | 10k               | PK       | 1ms    | 10dBLN | OFF    | 60dB  |  |





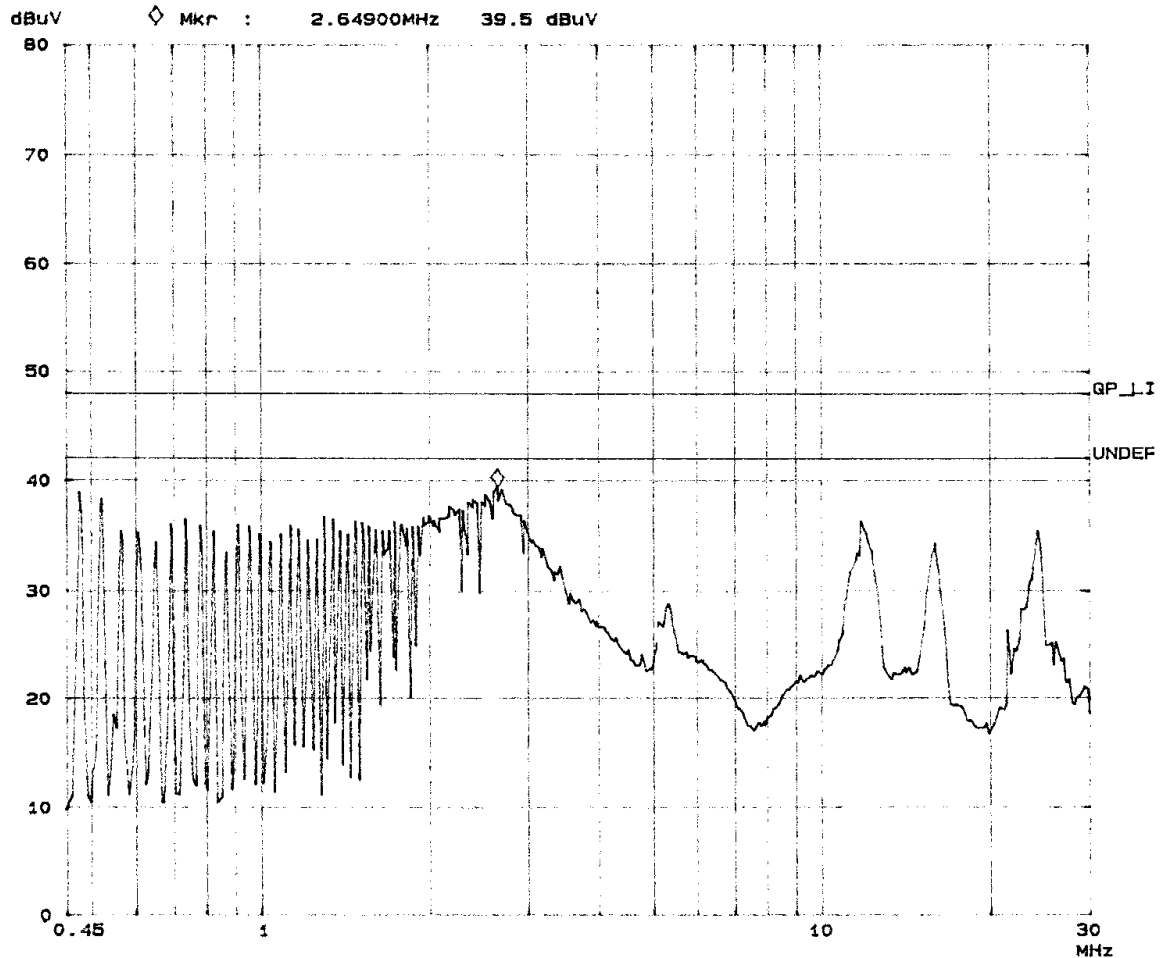
ADT CO. Shielded Room 2  
FCC CLASS B

02. Jun 00 22:55

EUT: ACCESS POINT  
Op Cond: CH 11  
Operator: ELLIS  
Test Spec: LISN : L  
Comment: 120V AC / 60Hz

Fast Scan Settings (2 Ranges)

| Frequencies |      |      | Receiver Settings |          |        |        |        |       |
|-------------|------|------|-------------------|----------|--------|--------|--------|-------|
| Start       | Stop | Step | IF BW             | Detector | M-Time | Atten  | Preamp | OpRge |
| 450k        | 5M   | 3k   | 10k               | PK       | 1ms    | 10dBLN | OFF    | 60dB  |
| 5M          | 30M  | 3k   | 10K               | PK       | 1ms    | 10dBLN | OFF    | 60dB  |





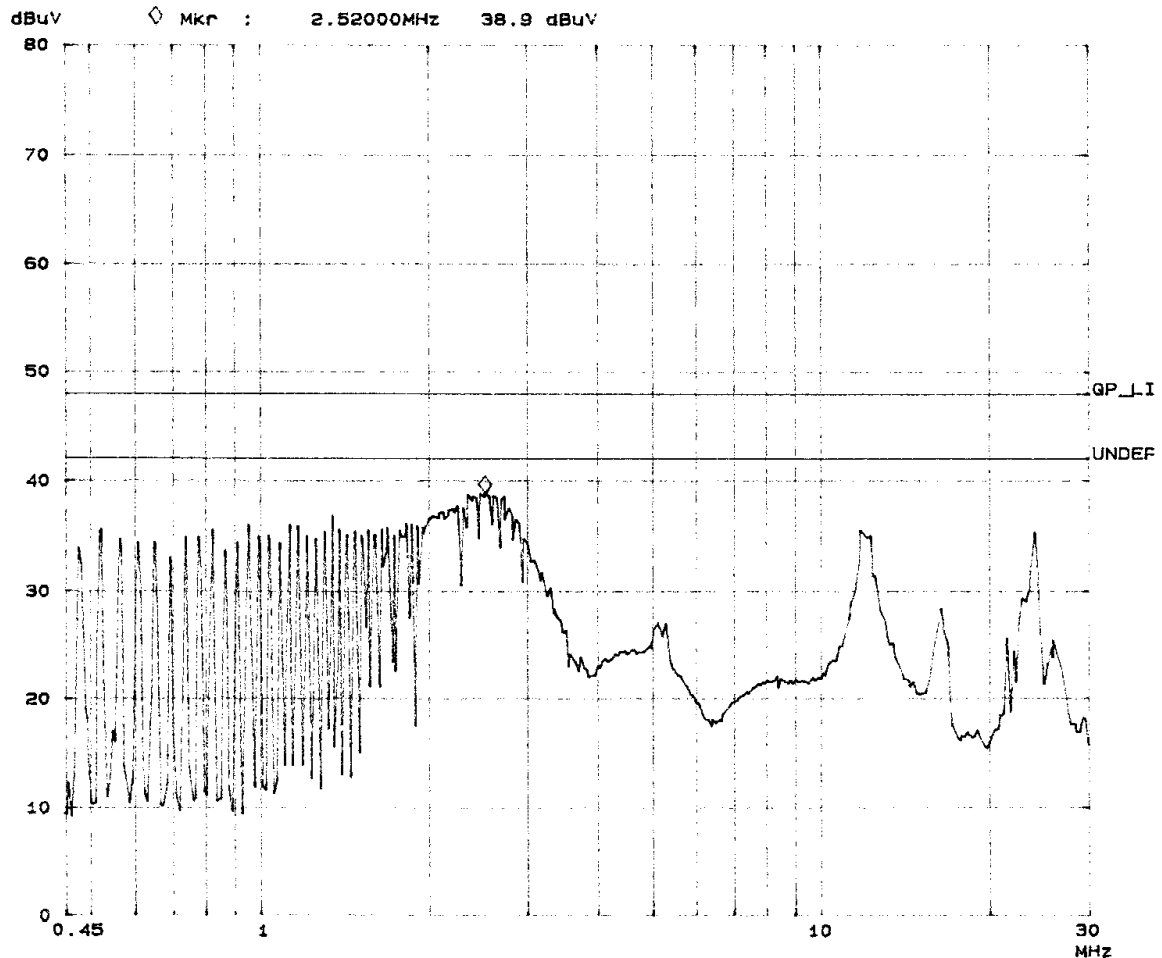
ADT CO. Shielded Room 2  
FCC CLASS B

02. Jun 00 22:52

EUT: ACCESS POINT  
Op Cond: CH 11  
Operator: ELLIS  
Test Spec: LISN : N  
Comment: 120V AC / 60Hz

Fast Scan Settings (2 Ranges)

| Frequencies |      |      | Receiver Settings |          |        |        |        |       |
|-------------|------|------|-------------------|----------|--------|--------|--------|-------|
| Start       | Stop | Step | IF BW             | Detector | M-Time | Atten  | Preamp | OpRge |
| 450k        | 5M   | 3k   | 10K               | PK       | 1ms    | 10dBLN | OFF    | 60dB  |
| 5M          | 30M  | 3k   | 10K               | PK       | 1ms    | 10dBLN | OFF    | 60dB  |



## 6.2 Radiated Emission Measurement

### 6.2.1 Test instruments

| Description & Manufacturer         | Model No.            | Serial No.               | Calibrated Until |
|------------------------------------|----------------------|--------------------------|------------------|
| HP Spectrum Analyzer               | 8590L                | 3544A01176               | Apr 18, 2001     |
| HP Preamplifier                    | 8447D                | 2944A08485               | Oct. 23, 2000    |
| HP Preamplifier                    | 8347A                | 3307A01088               | Sep. 09, 2000    |
| ROHDE & SCHWARZ TEST RECEIVER      | ESMI                 | 839013/007<br>839379/002 | Aug. 27, 2000    |
| SCHWARZBECK Tunable Dipole Antenna | VHA 9103<br>UHA 9105 | E101051<br>E101055       | Nov. 25, 2000    |
| CHASE BILOG Antenna                | CBL6112A             | 2221                     | Aug. 10, 2000    |
| SCHWARZBECK Horn Antenna           | BBHA9120-D           | D130                     | Jul. 09, 2000    |
| SCHWARZBECK Horn Antenna           | BBHA9170             | 123                      | Jan. 31, 2001    |
| EMCO Turn Table                    | 1060                 | 1115                     | N/A              |
| SHOSHIN Tower                      | AP-4701              | A6Y005                   | N/A              |
| Open Field Test Site               | Site 5               | ADT-R05                  | Aug. 09, 2000    |

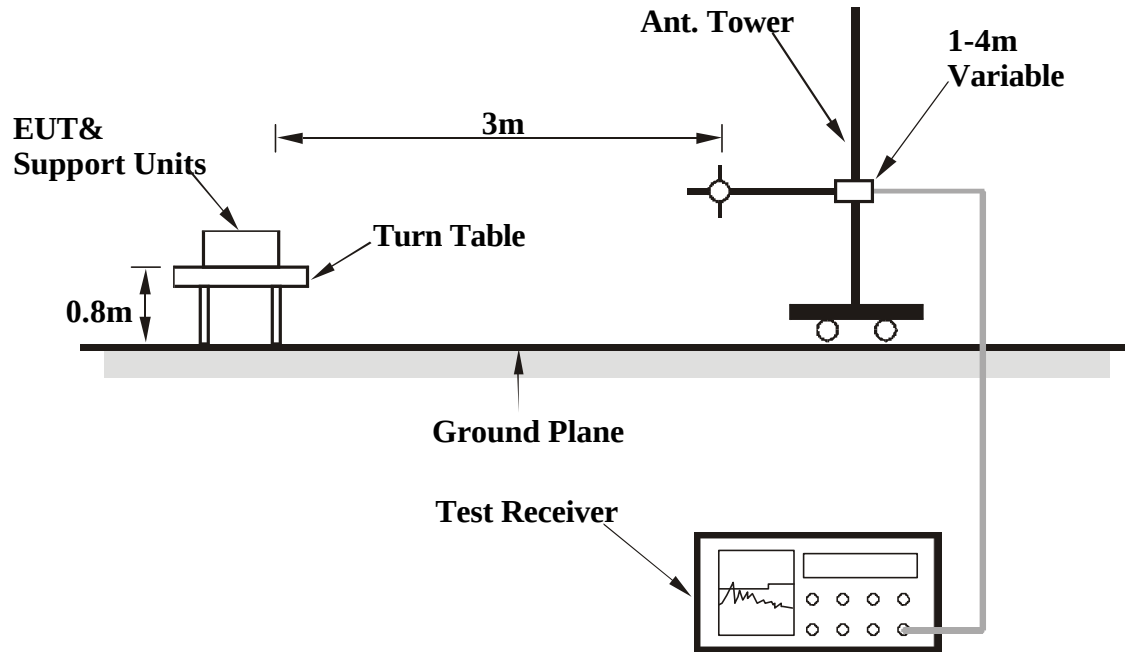
The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMAS document NIS81.

### 6.2.2 Test Procedure

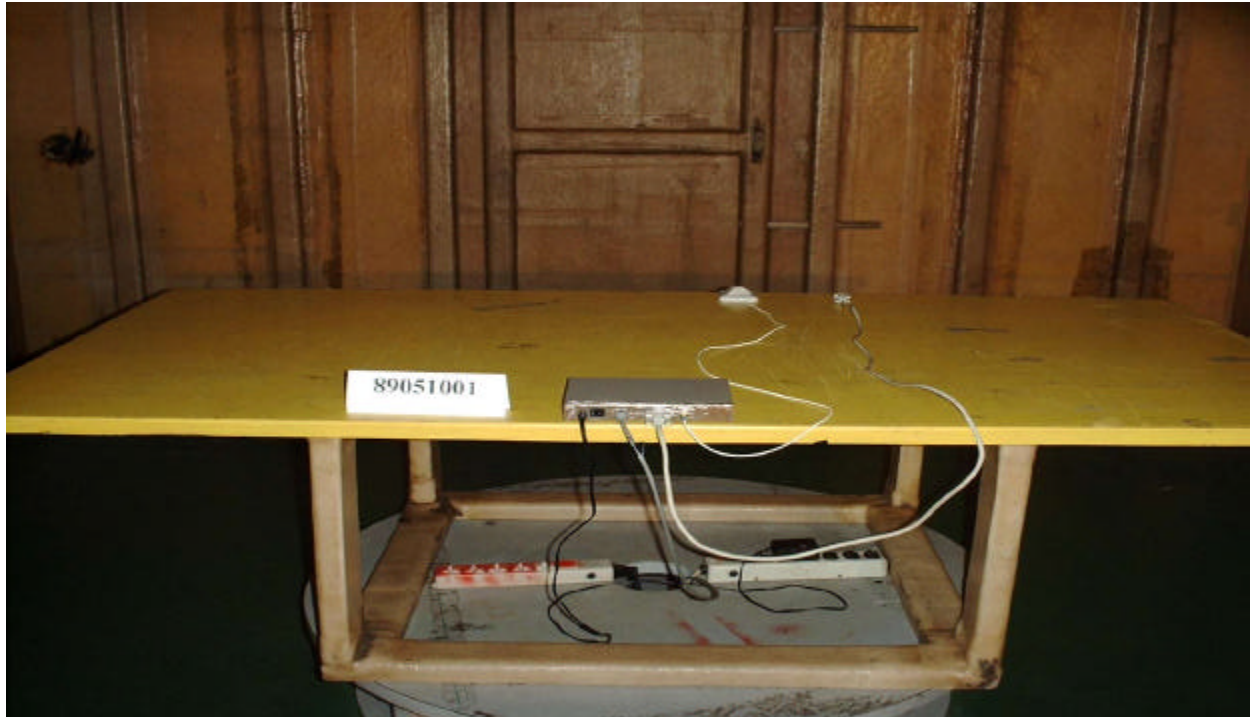
- a. The EUT was placed on the turn table 0.8 meter above ground in 3 meter open area test site.
- b. Set the resolution bandwidth to 120KHz in the test receiver and select Peak function to scan the frequency below 1 GHz.
- c. Shift the interference-receiving antenna located in antenna tower upwards and downwards between 1 and 4 meters above ground and find out the local peak emission on frequency domain.
- d. Locate the interference-receiving antenna at the position where the local peak reach the maximum emission.
- e. Rotate the turn table and stop at the angle where the measurement device has maximum reading
- f. Shift the interference-receiving antenna again to detect the maximum emission of the local peak
- g. If the reading of the local peak under Peak function is lower than limit by 6dB, then Quasi Peak detection is not needed and this reading should be recorded. And if it is higher than Peak limit, then the test is fail. Others, switch the receiver to Quasi Peak function, set the resolution bandwidth to 100kHz and repeat the procedures C ~ F. If the reading is lower than limit, this reading should be recorded, otherwise, the test is fail.
- h. Set the resolution and video bandwidth of the spectrum analyzer to 1MHz and repeat procedures C ~ F for frequency band from 1 GHz to 10 times carrier frequency.
- i. If the reading for the local peak is lower than the Average limit, no further testing is needed in this local peak and this reading should be recorded. If it is higher than Average limit but lower than Peak limit, then set the resolution bandwidth to 1MHz and video bandwidth to 300Hz. Repeat procedures C ~ F. If the maximum reading is lower than Average limit, then this reading should be recorded. If it is higher, then the test is fail.



### 6.2.3 Test Setup



#### 6.2.4 Photograph of Test Setup





### **6.2.5 EUT Operating Condition**

1. Place the EUT on the turn table.
2. Connect antenna with antenna port
3. Use RJ45 cable to connect PC and EUT.
4. Use RS232 cable on RS 232 port.
5. Power on.
6. Prepare the same setup as above, but place it outside testing area.
7. Send data to EUT (on the turn table) by command "PIN".
8. The linkage of these two PC have been established when the address of the other PC is shown on the monitor.
9. Rotate the turn table and scan the antenna mast to detect the maximum emission.

### **6.2.6 Climate Condition**

The temperature and related humidity is 25°C and 65%.



## 6.2.7 Test Results

| ANTENNA POLARITY:<br>Vertical |                           | Detector Function :<br>Quasi-Peak |                               | 6dB Bandwidth : 120<br>kHz. |                | Distance : 3 M<br>Frequency Range :<br>30 – 1000 MHz. |                            |
|-------------------------------|---------------------------|-----------------------------------|-------------------------------|-----------------------------|----------------|-------------------------------------------------------|----------------------------|
| Frequency<br>(MHz)            | Correction<br>Factor (dB) | Reading<br>Value<br>(dBuV)        | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m)           | Margin<br>(dB) | Antenna<br>Height<br>(cm)                             | Table<br>Angle<br>(Degree) |
| 80.00                         | 8.9                       | 22.8                              | 31.7                          | 40.0                        | -8.3           | 224                                                   | 365                        |
| 120.00                        | 12.9                      | 7.9                               | 20.8                          | 43.5                        | -22.7          | 264                                                   | 52                         |
| 160.00                        | 11.7                      | 22.0                              | 33.7                          | 43.5                        | -9.8           | 264                                                   | 181                        |
| 240.01                        | 13.0                      | 7.9                               | 20.9                          | 46.0                        | -25.1          | 184                                                   | 308                        |
| 680.01                        | 21.6                      | 14.7                              | 36.3                          | 46.0                        | -9.7           | 115                                                   | 86                         |
| 560.00                        | 20.9                      | 8.5                               | 29.4                          | 46.0                        | -16.6          | 115                                                   | 351                        |
| 640.00                        | 21.4                      | 5.0                               | 26.4                          | 46.0                        | -19.6          | 100                                                   | 70                         |
| 720.00                        | 22.0                      | 8.1                               | 30.1                          | 46.0                        | -15.9          | 106                                                   | 258                        |
| 760.00                        | 22.4                      | 13.5                              | 35.9                          | 46.0                        | -10.1          | 100                                                   | 23                         |
| 520.00                        | 20.2                      | 7.6                               | 27.8                          | 46.0                        | -18.2          | 140                                                   | 90                         |

| ANTENNA POLARITY:<br>Horizontal |                           | Detector Function :<br>Quasi-Peak |                               | 6dB Bandwidth : 120<br>kHz. |                | Distance : 3 M<br>Frequency Range :<br>30 – 1000 MHz. |                            |
|---------------------------------|---------------------------|-----------------------------------|-------------------------------|-----------------------------|----------------|-------------------------------------------------------|----------------------------|
| Frequency<br>(MHz)              | Correction<br>Factor (dB) | Reading<br>Value<br>(dBuV)        | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m)           | Margin<br>(dB) | Antenna<br>Height<br>(cm)                             | Table<br>Angle<br>(Degree) |
| 80.00                           | 8.9                       | 27.9                              | 36.8                          | 40.0                        | -3.2           | 391                                                   | 92                         |
| 120.00                          | 12.9                      | 12.1                              | 25.0                          | 43.5                        | -18.5          | 268                                                   | 277                        |
| 160.00                          | 11.7                      | 29.3                              | 41.0                          | 43.5                        | -2.5           | 227                                                   | 108                        |
| 200.00                          | 10.2                      | 13.1                              | 23.3                          | 43.5                        | -20.2          | 144                                                   | 43                         |
| 240.00                          | 13.0                      | 16.7                              | 29.7                          | 46.0                        | -16.3          | 183                                                   | 116                        |
| 440.00                          | 18.5                      | 8.6                               | 27.1                          | 46.0                        | -18.9          | 244                                                   | 209                        |
| 520.01                          | 20.2                      | 11.5                              | 31.7                          | 46.0                        | -14.3          | 103                                                   | 50                         |
| 560.01                          | 20.9                      | 15.2                              | 36.1                          | 46.0                        | -9.9           | 174                                                   | 275                        |
| 600.01                          | 20.8                      | 8.2                               | 29.0                          | 46.0                        | -17.0          | 105                                                   | 321                        |
| 640.01                          | 21.4                      | 12.9                              | 34.3                          | 46.0                        | -11.7          | 136                                                   | 10                         |
| 680.00                          | 21.6                      | 20.7                              | 42.3                          | 46.0                        | -3.7           | 137                                                   | 12                         |
| 720.01                          | 22.0                      | 10.0                              | 32.0                          | 46.0                        | -14.0          | 123                                                   | 349                        |
| 760.01                          | 22.4                      | 17.2                              | 39.6                          | 46.0                        | -6.4           | 121                                                   | 351                        |

Remarks: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).  
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level - Limit value  
5. The limit value is defined as per 15.247

| Channel 1<br>ANTENNA POLARITY:<br>Vertical |                           | Detector Function :<br>Peak<br>Average |      |                               |      | 6dB Bandwidth : 1 MHz. |      |             |      | Distance : 3 M<br>Frequency Range :<br>Above 1000 MHz. |                         |
|--------------------------------------------|---------------------------|----------------------------------------|------|-------------------------------|------|------------------------|------|-------------|------|--------------------------------------------------------|-------------------------|
| Frequency<br>(MHz)                         | Correction<br>Factor (dB) | Reading<br>Value (dBuV)                |      | Emission<br>Level<br>(dBuV/m) |      | Limit<br>(dBuV/m)      |      | Margin (dB) |      | Antenna<br>Height<br>(cm)                              | Table Angle<br>(Degree) |
|                                            |                           | P.K.                                   | A.V. | P.K.                          | A.V. | P.K.                   | A.V. | P.K.        | A.V. |                                                        |                         |
| 1000.00                                    | 27.2                      | 16.2                                   | -    | 43.4                          | -    | 74.0                   | 54.0 | -30.6       | -    | 129                                                    | 327                     |
| 1159.27                                    | 28.1                      | 20.2                                   | -    | 48.6                          | -    | 74.0                   | 54.0 | -25.4       | -    | 150                                                    | 188                     |
| 1200.13                                    | 28.3                      | 19.9                                   | -    | 48.2                          | -    | 74.0                   | 54.0 | -25.8       | -    | 100                                                    | 92                      |
| 2038.03                                    | 33.1                      | 16.4                                   | -    | 49.5                          | -    | 74.0                   | 54.0 | -24.5       | -    | 110                                                    | 100                     |
| *2412.00                                   | 34.3                      | 64.9                                   | 57.1 | 99.2                          | 91.4 | -                      | -    | -           | -    | 110                                                    | 269                     |
| 4824.00                                    | 41.3                      | 12.2                                   | -    | 53.5                          | -    | 74.0                   | 54.0 | -20.5       | -    | 118                                                    | 191                     |
| 7236.00                                    | 39.5                      | 11.4                                   | -    | 50.9                          | -    | 74.0                   | 54.0 | -23.1       | -    | 118                                                    | -2                      |

| Channel 1<br>ANTENNA POLARITY:<br>Horizontal |                           | Detector Function :<br>Peak<br>Average |      |                               |      | 6dB Bandwidth : 1 MHz. |      |             |      | Distance : 3 M<br>Frequency Range :<br>Above 1000 MHz. |                         |
|----------------------------------------------|---------------------------|----------------------------------------|------|-------------------------------|------|------------------------|------|-------------|------|--------------------------------------------------------|-------------------------|
| Frequency<br>(MHz)                           | Correction<br>Factor (dB) | Reading<br>Value (dBuV)                |      | Emission<br>Level<br>(dBuV/m) |      | Limit<br>(dBuV/m)      |      | Margin (dB) |      | Antenna<br>Height<br>(cm)                              | Table Angle<br>(Degree) |
|                                              |                           | P.K.                                   | A.V. | P.K.                          | A.V. | P.K.                   | A.V. | P.K.        | A.V. |                                                        |                         |
| 1000.00                                      | 27.2                      | 18.7                                   | -    | 45.9                          | -    | 74.0                   | 54.0 | -28.1       | -    | 100                                                    | 367                     |
| 1160.01                                      | 28.1                      | 18.6                                   | -    | 46.7                          | -    | 74.0                   | 54.0 | -27.3       | -    | 132                                                    | 1                       |
| 1200.14                                      | 28.3                      | 20.3                                   | -    | 48.6                          | -    | 74.0                   | 54.0 | -25.4       | -    | 119                                                    | 354                     |
| 2038.03                                      | 33.1                      | 16.9                                   | -    | 50.0                          | -    | 74.0                   | 54.0 | -24.0       | -    | 108                                                    | 317                     |
| *2411.86                                     | 34.3                      | 71.3                                   | 63.2 | 105.6                         | 97.5 | -                      | -    | -           | -    | 111                                                    | 312                     |
| 4824.01                                      | 41.3                      | 12.7                                   | 8.1  | 54.0                          | 49.4 | 74.0                   | 54.0 | -20.0       | -4.6 | 108                                                    | 29                      |
| 7236.00                                      | 39.5                      | 11.8                                   | -    | 51.3                          | -    | 74.0                   | 54.0 | -22.7       | -    | 109                                                    | 72                      |

- Remarks:**
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
  2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. The limit value is defined as per 15.247
  6. “ \* “ : Fundamental Frequency

| Channel 6<br>ANTENNA POLARITY:<br>Vertical |                           | Detector Function :<br>Peak<br>Average |      |                               |      | 6dB Bandwidth : 1 MHz. |      |             |      | Distance : 3 M<br>Frequency Range :<br>Above 1000 MHz. |                         |
|--------------------------------------------|---------------------------|----------------------------------------|------|-------------------------------|------|------------------------|------|-------------|------|--------------------------------------------------------|-------------------------|
| Frequency<br>(MHz)                         | Correction<br>Factor (dB) | Reading<br>Value (dBuV)                |      | Emission<br>Level<br>(dBuV/m) |      | Limit<br>(dBuV/m)      |      | Margin (dB) |      | Antenna<br>Height<br>(cm)                              | Table Angle<br>(Degree) |
|                                            |                           | P.K.                                   | A.V. | P.K.                          | A.V. | P.K.                   | A.V. | P.K.        | A.V. |                                                        |                         |
| 1000.00                                    | 27.2                      | 16.7                                   | -    | 43.9                          | -    | 74.0                   | 54.0 | -30.1       | -    | 100                                                    | 32                      |
| 1159.52                                    | 28.1                      | 22.4                                   | -    | 50.5                          | -    | 74.0                   | 54.0 | -23.5       | -    | 100                                                    | 182                     |
| 1200.31                                    | 28.3                      | 19.3                                   | -    | 47.6                          | -    | 74.0                   | 54.0 | -26.4       | -    | 139                                                    | 107                     |
| 2063.06                                    | 33.2                      | 17.1                                   | -    | 50.3                          | -    | 74.0                   | 54.0 | -23.7       | -    | 100                                                    | 294                     |
| *2436.91                                   | 34.4                      | 66.6                                   | 59.5 | 101.0                         | 93.9 | -                      | -    | -           | -    | 100                                                    | 278                     |
| 4874.00                                    | 41.2                      | 14.1                                   | 9.1  | 55.3                          | 50.3 | 74.0                   | 54.0 | -18.7       | -3.7 | 100                                                    | -2                      |
| 7311.02                                    | 39.7                      | 13.2                                   | -    | 52.9                          | -    | 74.0                   | -    | -21.1       | -    | 100                                                    | 360                     |

| Channel 6<br>ANTENNA POLARITY:<br>Horizontal |                           | Detector Function :<br>Peak<br>Average |      |                               |      | 6dB Bandwidth : 1 MHz. |      |             |      | Distance : 3 M<br>Frequency Range :<br>Above 1000 MHz. |                         |
|----------------------------------------------|---------------------------|----------------------------------------|------|-------------------------------|------|------------------------|------|-------------|------|--------------------------------------------------------|-------------------------|
| Frequency<br>(MHz)                           | Correction<br>Factor (dB) | Reading<br>Value (dBuV)                |      | Emission<br>Level<br>(dBuV/m) |      | Limit<br>(dBuV/m)      |      | Margin (dB) |      | Antenna<br>Height<br>(cm)                              | Table Angle<br>(Degree) |
|                                              |                           | P.K.                                   | A.V. | P.K.                          | A.V. | P.K.                   | A.V. | P.K.        | A.V. |                                                        |                         |
| 1000.00                                      | 27.2                      | 16.1                                   | -    | 43.3                          | -    | 74.0                   | 54.0 | -30.7       | -    | 100                                                    | 363                     |
| 1159.98                                      | 28.1                      | 18.6                                   | -    | 46.7                          | -    | 74.0                   | 54.0 | -27.3       | -    | 135                                                    | -7                      |
| 1199.99                                      | 28.3                      | 19.0                                   | -    | 47.3                          | -    | 74.0                   | 54.0 | -26.7       | -    | 118                                                    | 182                     |
| 2063.12                                      | 33.2                      | 17.4                                   | -    | 50.6                          | -    | 74.0                   | 54.0 | -23.4       | -    | 143                                                    | 48                      |
| *2437.12                                     | 34.4                      | 71.6                                   | 64.9 | 106.0                         | 99.3 | -                      | -    | -           | -    | 106                                                    | 12                      |
| 4878.01                                      | 41.2                      | 13.7                                   | 9.2  | 54.9                          | 50.4 | 74.0                   | 54.0 | -19.1       | -3.6 | 111                                                    | 194                     |
| 7311.02                                      | 39.7                      | 11.9                                   | -    | 51.6                          | -    | 74.0                   | 54.0 | -22.4       | -    | 111                                                    | 360                     |

- Remarks:**
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
  2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. The limit value is defined as per 15.247
  6. " \* " : Fundamental Frequency

| Channel 11<br>ANTENNA POLARITY:<br>Vertical |                           | Detector Function :<br>Peak<br>Average |      |                               |      | 6dB Bandwidth : 1 MHz. |      |             |      | Distance : 3 M<br>Frequency Range :<br>Above 1000 MHz. |                         |
|---------------------------------------------|---------------------------|----------------------------------------|------|-------------------------------|------|------------------------|------|-------------|------|--------------------------------------------------------|-------------------------|
| Frequency<br>(MHz)                          | Correction<br>Factor (dB) | Reading<br>Value (dBuV)                |      | Emission<br>Level<br>(dBuV/m) |      | Limit<br>(dBuV/m)      |      | Margin (dB) |      | Antenna<br>Height<br>(cm)                              | Table Angle<br>(Degree) |
|                                             |                           | P.K.                                   | A.V. | P.K.                          | A.V. | P.K.                   | A.V. | P.K.        | A.V. |                                                        |                         |
| 1000.00                                     | 27.2                      | 15.2                                   | -    | 42.4                          | -    | 74.0                   | 54.0 | -31.6       | -    | 118                                                    | 362                     |
| 1159.48                                     | 28.1                      | 18.9                                   | -    | 47.0                          | -    | 74.0                   | 54.0 | -27.0       | -    | 118                                                    | -7                      |
| 1200.02                                     | 28.3                      | 18.5                                   | -    | 46.8                          | -    | 74.0                   | 54.0 | -27.2       | -    | 100                                                    | 362                     |
| 2088.01                                     | 33.2                      | 16.6                                   | -    | 49.8                          | -    | 74.0                   | 54.0 | -24.2       | -    | 100                                                    | 365                     |
| *2462.23                                    | 34.5                      | 66.5                                   | 59.0 | 101.0                         | 93.5 | -                      | -    | -           | -    | 100                                                    | 117                     |
| 4924.10                                     | 41.4                      | 15.3                                   | 9.1  | 56.7                          | 50.5 | 74.0                   | 54.0 | -17.3       | -3.5 | 100                                                    | 117                     |
| 7386.48                                     | 39.7                      | 13.1                                   | -    | 52.8                          | -    | 74.0                   | 54.0 | -21.2       | -    | 100                                                    | 171                     |

| Channel 11<br>ANTENNA POLARITY:<br>Horizontal |                           | Detector Function :<br>Peak<br>Average |      |                               |       | 6dB Bandwidth : 1 MHz. |      |             |       | Distance : 3 M<br>Frequency Range :<br>Above 1000 MHz. |                         |
|-----------------------------------------------|---------------------------|----------------------------------------|------|-------------------------------|-------|------------------------|------|-------------|-------|--------------------------------------------------------|-------------------------|
| Frequency<br>(MHz)                            | Correction<br>Factor (dB) | Reading<br>Value (dBuV)                |      | Emission<br>Level<br>(dBuV/m) |       | Limit<br>(dBuV/m)      |      | Margin (dB) |       | Antenna<br>Height<br>(cm)                              | Table Angle<br>(Degree) |
|                                               |                           | P.K.                                   | A.V. | P.K.                          | A.V.  | P.K.                   | A.V. | P.K.        | A.V.  |                                                        |                         |
| 1000.00                                       | 27.2                      | 17.0                                   | -    | 44.2                          | -     | 74.0                   | 54.0 | -29.8       | -     | 100                                                    | 363                     |
| 1159.87                                       | 28.1                      | 18.3                                   | -    | 46.4                          | -     | 74.0                   | 54.0 | -27.6       | -     | 131                                                    | 18                      |
| 1200.00                                       | 28.3                      | 20.0                                   | -    | 48.3                          | -     | 74.0                   | 54.0 | -25.7       | -     | 100                                                    | 362                     |
| 2088.01                                       | 33.2                      | 18.2                                   | -    | 51.4                          | -     | 74.0                   | 54.0 | -22.6       | -     | 108                                                    | 48                      |
| *2462.21                                      | 34.5                      | 72.9                                   | 65.5 | 107.4                         | 100.0 | -                      | -    | -           | -     | 108                                                    | 9                       |
| 4924.08                                       | 41.4                      | 15.9                                   | 9.5  | 57.3                          | 50.9  | 74.0                   | 54.0 | -16.7       | -3.1  | 106                                                    | 365                     |
| 7386.02                                       | 39.7                      | 15.2                                   | 4.2  | 54.9                          | 43.9  | 74.0                   | 54.0 | -19.1       | -10.1 | 108                                                    | 12                      |

- Remarks:** 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).  
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level - Limit value  
5. The limit value is defined as per 15.247  
6. “ \* “ : Fundamental Frequency



## 6.3 6dB Bandwidth Measurement

### 6.3.1 Test Instruments

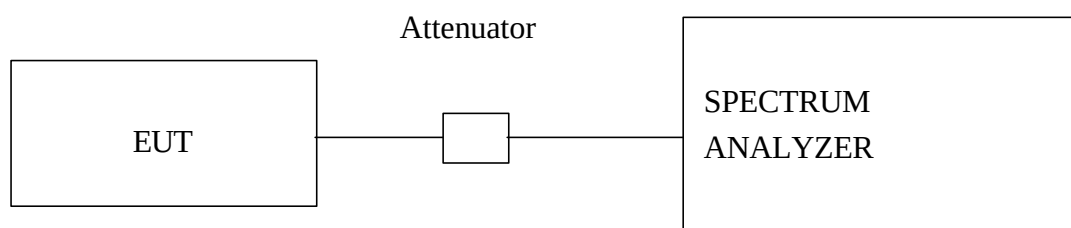
| Description & Manufacturer    | Model No. | Serial No.               | Calibrated Until |
|-------------------------------|-----------|--------------------------|------------------|
| ROHDE & SCHWARZ TEST RECEIVER | ESMI      | 846839/018<br>848926/005 | Dec. 03, 2000    |
| HP ATTENUATOR                 | 8496B     | 3247A18505               | Cal. on use      |
| HP PLOTTER                    | 7475A     | 2641V27755               | N/A              |

The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS document NIS81.

### 6.3.2 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using 100 kHz RBW and 100 kHz VBW. The 6 dB bandwidth is defined as the total spectrum whose power is larger than peak power minus 6 dB.

### 6.3.3 Test Setup



### 6.3.4 EUT Operating Condition

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

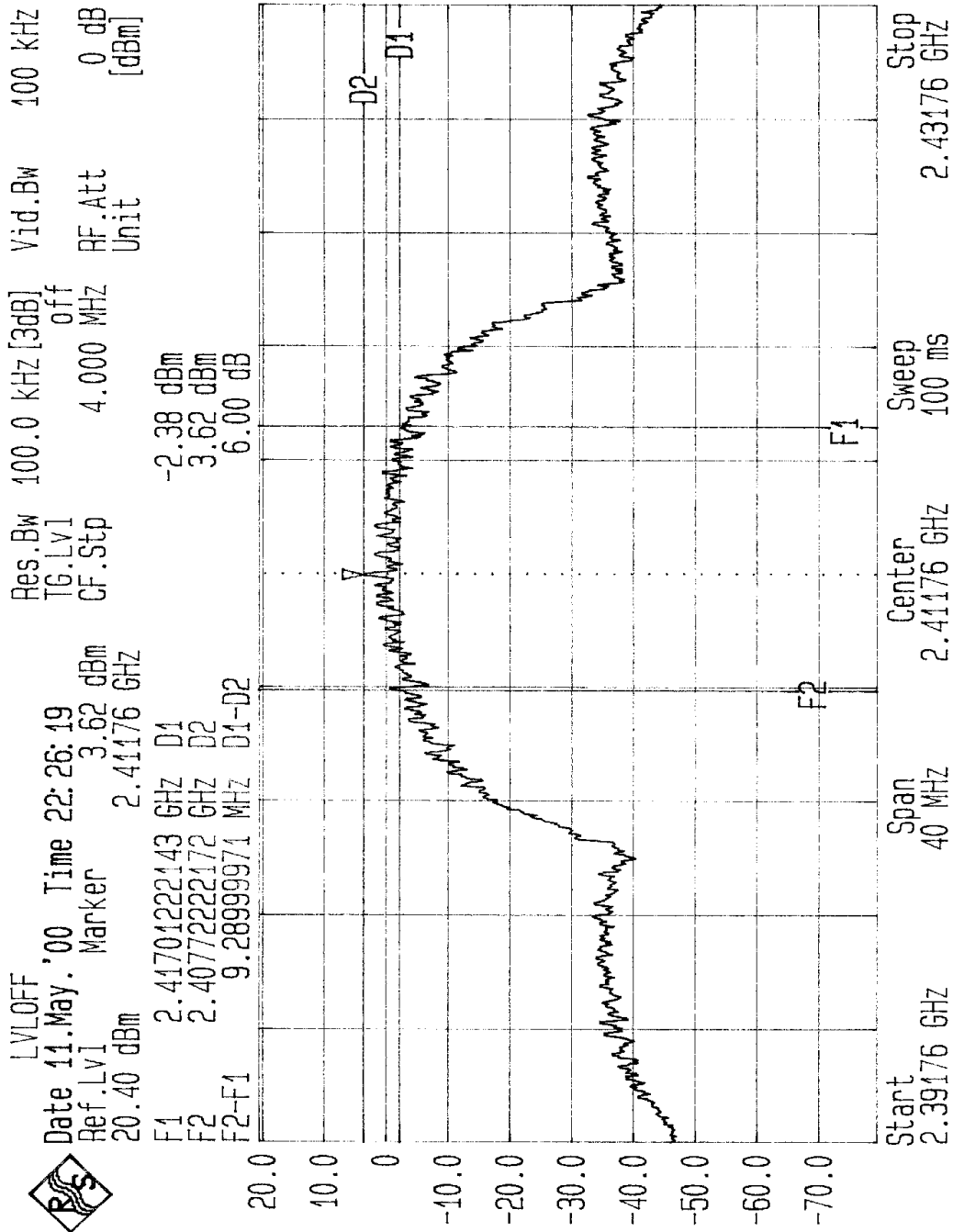


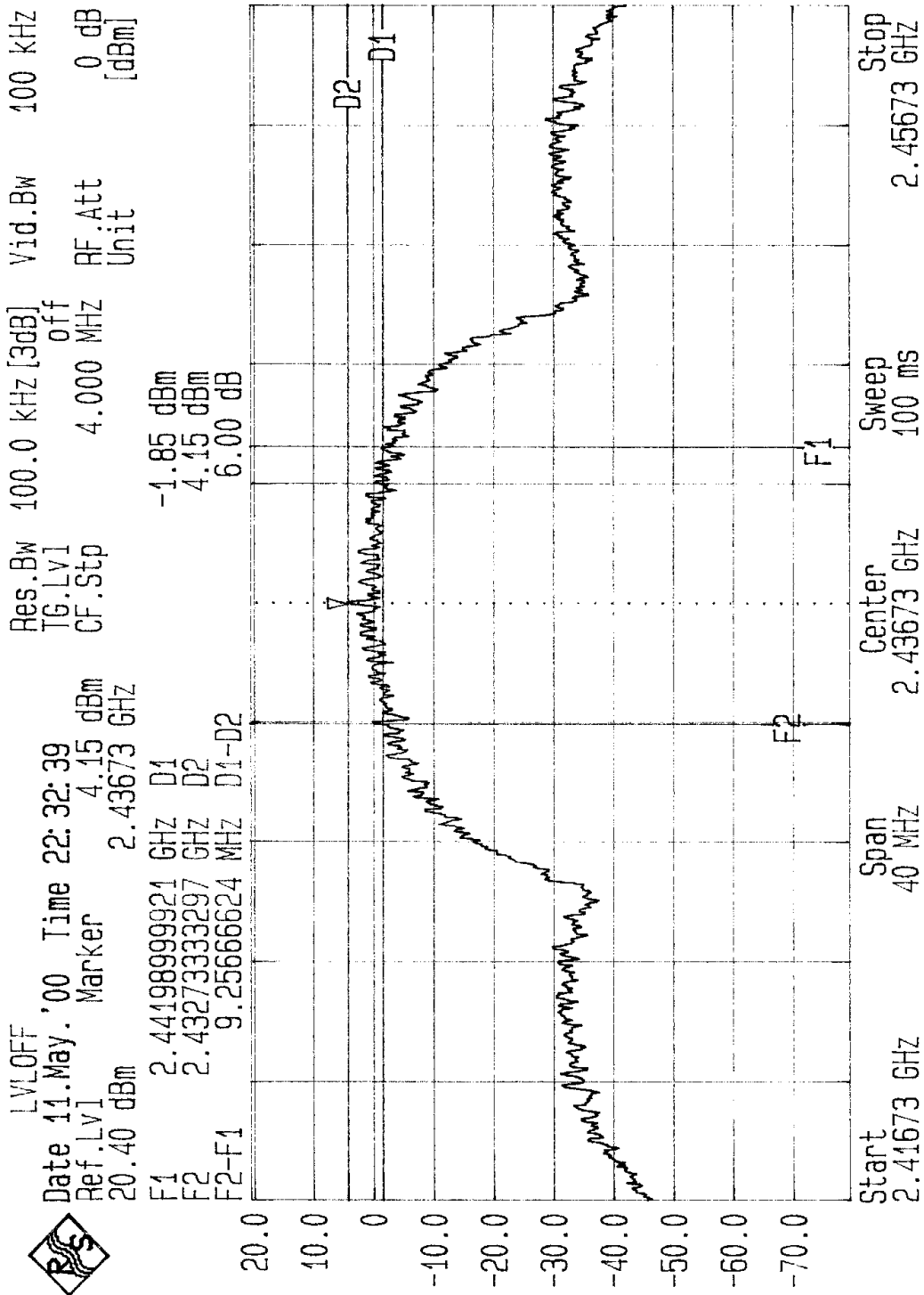
### 6.3.5 Climate Condition

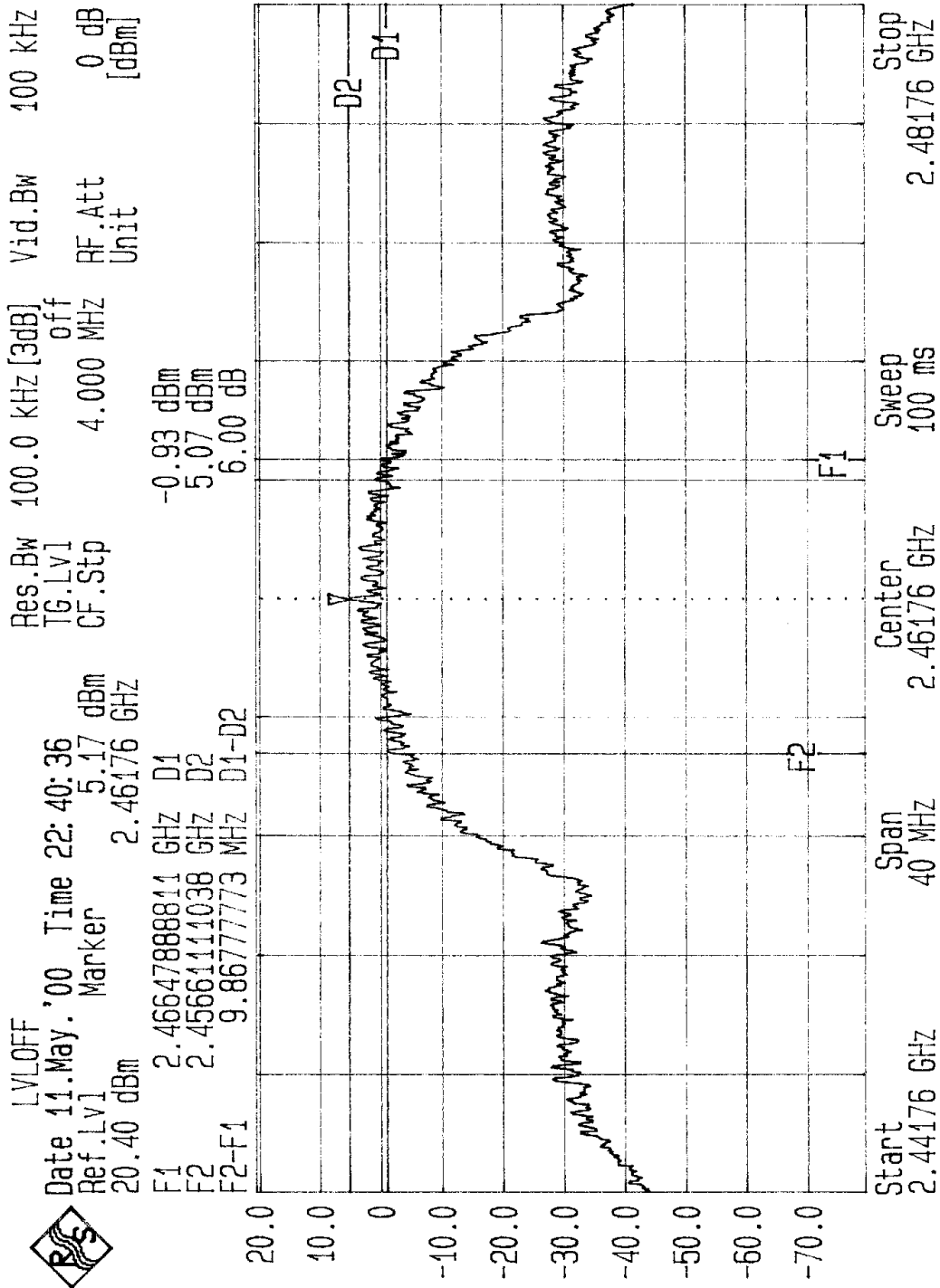
The temperature and related humidity is 18°C and 78%.

### 6.3.6 Test Results

| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | 6 dB<br>BANDWIDTH<br>(MHz) | MINIMUM<br>LIMIT<br>(MHz) | PASS/FAIL |
|---------|-------------------------------|----------------------------|---------------------------|-----------|
| 1       | 2412                          | 9.29                       | 0.5                       | PASS      |
| 6       | 2437                          | 9.26                       | 0.5                       | PASS      |
| 11      | 2462                          | 9.87                       | 0.5                       | PASS      |







## 6.4 Maximum Peak Output Power and RF Exposure Measurement

### 1.1.1 Test Instruments

| Description & Manufacturer    | Model No. | Serial No.               | Calibrated Until |
|-------------------------------|-----------|--------------------------|------------------|
| ROHDE & SCHWARZ TEST RECEIVER | ESMI      | 846839/018<br>848926/005 | Dec. 03, 2000    |
| HP ATTENUATOR                 | 8496B     | 3247A18505               | Cal. on use      |
| HP PLOTTER                    | 7475A     | 2641V27755               | N/A              |

The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS document NIS81.

### 6.4.2 Test Procedure

The transmitter output was connected coupled to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 MHz RBW and 3 MHz VBW. The peak power was measured and recorded.

The total output power to antenna should be recorded for RF exposure calculation. The antenna of EUT is placed in Fully Anechoic Chamber for Gain measurement by Antenna Automatic Measurement System. The RF exposure is verified through the calculation explained in next paragraph.

### 6.4.3 RF exposure limit

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency Range (MHz)                                           | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Average Time (minutes) |
|-----------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| <b>(A)Limits For Occupational / Control Exposures</b>           |                               |                               |                                     |                        |
| 300-1500                                                        | ...                           | ...                           | F/300                               | 6                      |
| 1500-100,000                                                    | ...                           | ...                           | 5                                   | 6                      |
| <b>(B)Limits For General Population / Uncontrolled Exposure</b> |                               |                               |                                     |                        |
| 300-1500                                                        | ...                           | ...                           | F/1500                              | 6                      |
| 1500-100,000                                                    | ...                           | ...                           | 1.0                                 | 30                     |

F = Frequency in MHz

The 20cm separation requirement listed in section 2.1091 is met because the output power and the antenna gain is very low. Please see the calculation below.

**Friis transmission formula :  $P_d = (P_{out} * G) / (4 * \pi * r)^2$**

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

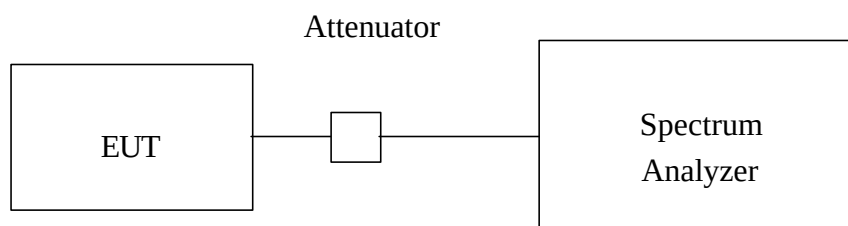
$\pi$  = 3.1416

R = distance between observation point and center of the radiator in cm

**Through the calculation, we know the distance r where the MPE limit is reached.**

Ref. : David K. Cheng, *Field and Wave Electromagnetics*, Second Edition, Page 640, Eq. (11-133).

### 6.4.4 Test Setup



#### 6.4.5 EUT Operating Condition

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

#### 6.4.6 Climate Condition

The temperature and related humidity is 18°C and 78%.

#### 6.4.7 Test Result

##### 6.4.7.1 Peak Power

The maximum antenna Gain measured is –4dBi or 0.4 (numeric)

| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER OUTPUT (dBm) | PEAK POWER LIMIT (dBm) | PASS/FAIL |
|---------|-------------------------|-------------------------|------------------------|-----------|
| 1       | 2.414                   | 14.84                   | 30                     | PASS      |
| 6       | 2.437                   | 15.96                   | 30                     | PASS      |
| 11      | 2.464                   | 17.18                   | 30                     | PASS      |

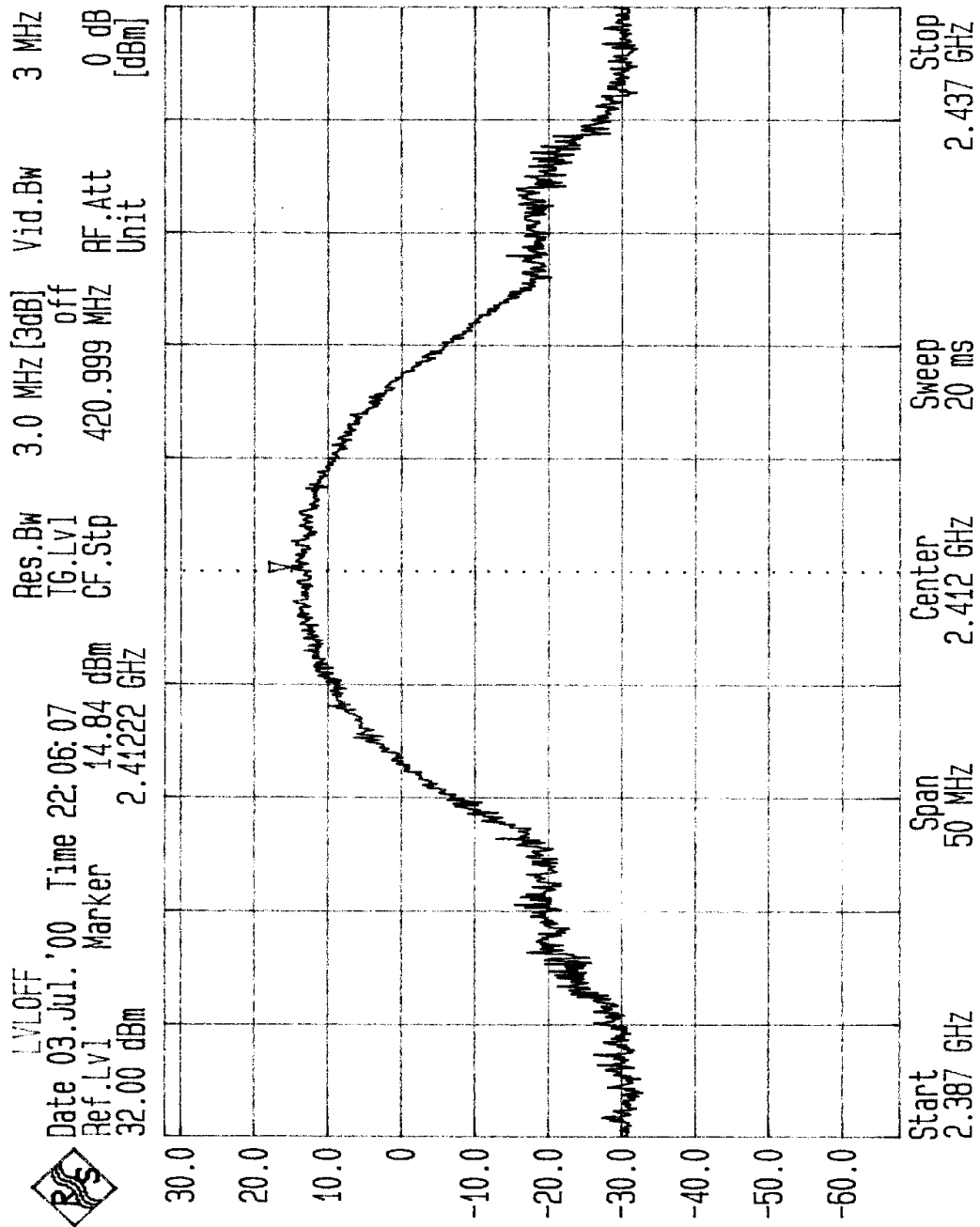
The spectrum plots are attached as below.

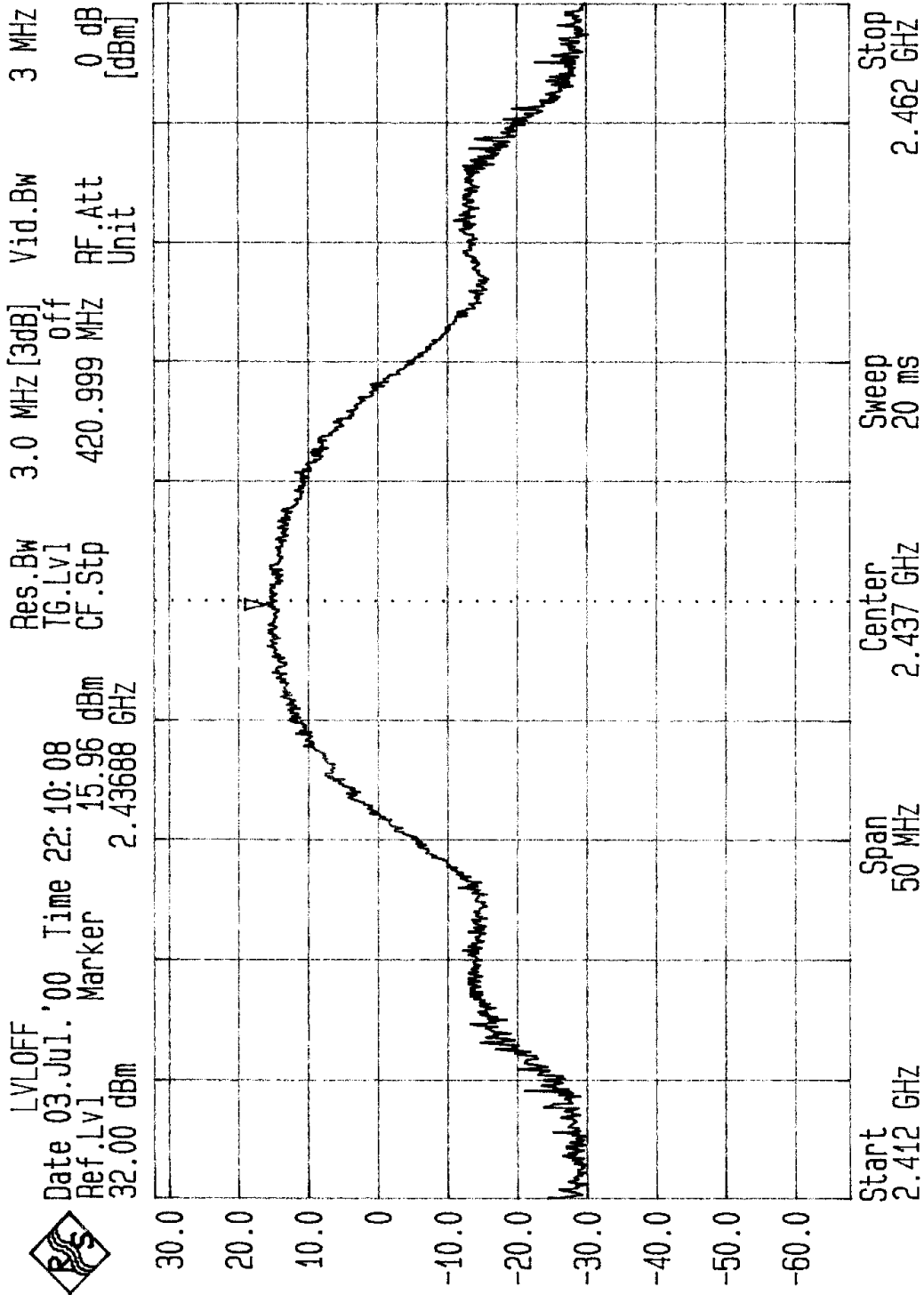
##### 6.4.7.2 RF Exposure Distance Limits :

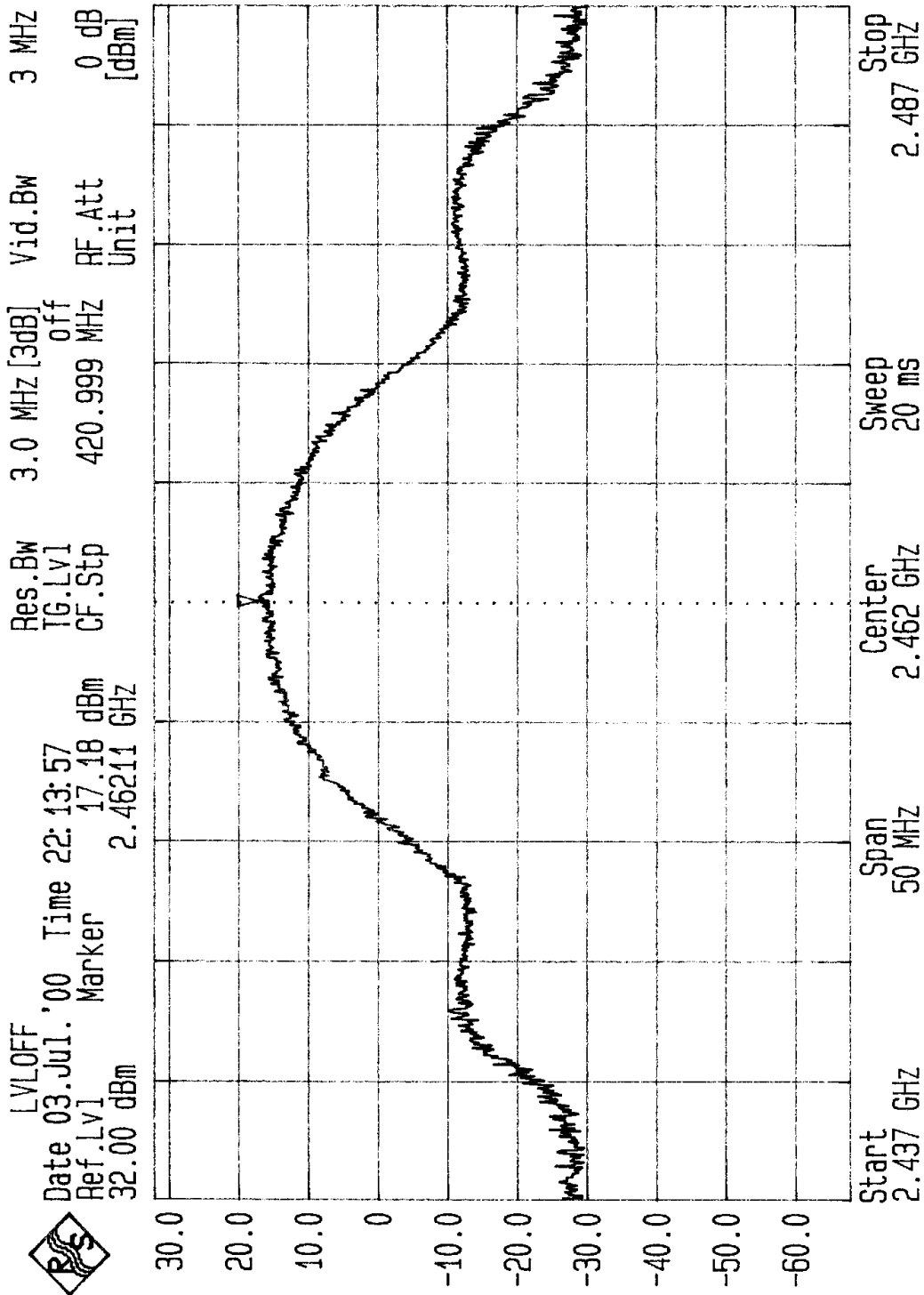
| CHANNEL | CHANNEL FREQUENCY (MHz) | OUTPUT POWER TO ANTENNA (mW) | MINIMUM ALLOWABLE DISTANCE ( r ) FROM SKIN (Centi-Meter) |
|---------|-------------------------|------------------------------|----------------------------------------------------------|
| 1       | 2412                    | 30.84                        | 0.99                                                     |
| 6       | 2437                    | 39.45                        | 1.12                                                     |
| 11      | 2462                    | 52.24                        | 1.29                                                     |

The distance r (4<sup>th</sup> column) calculated from the Friis transmission formula is far more shorter than 20 cm separation requirement. So, RF exposure limit warning or SAR test are not required.









## 6.5 Power Spectral Density Measurement

### 6.5.1 Test Instruments

| Description & Manufacturer    | Model No. | Serial No.               | Calibrated Until |
|-------------------------------|-----------|--------------------------|------------------|
| ROHDE & SCHWARZ TEST RECEIVER | ESMI      | 846839/018<br>848926/005 | Dec. 03, 2000    |
| HP ATTENUATOR                 | 8496B     | 3247A18505               | Cal. on use      |
| HP PLOTTER                    | 7475A     | 2641V27755               | N/A              |

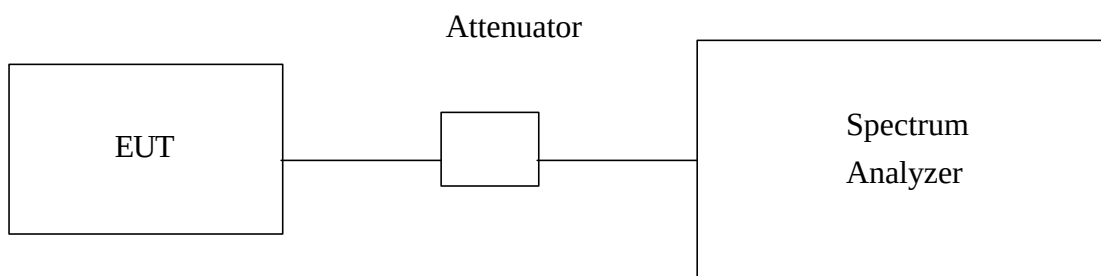
The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS document NIS81.

### 6.5.2 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time=span/3kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3KHz for a full response of the mixer in the spectrum analyzer.

### 6.5.3 Test Setup



### 6.5.4 EUT Operating Condition

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

### 6.5.5 Climate Condition

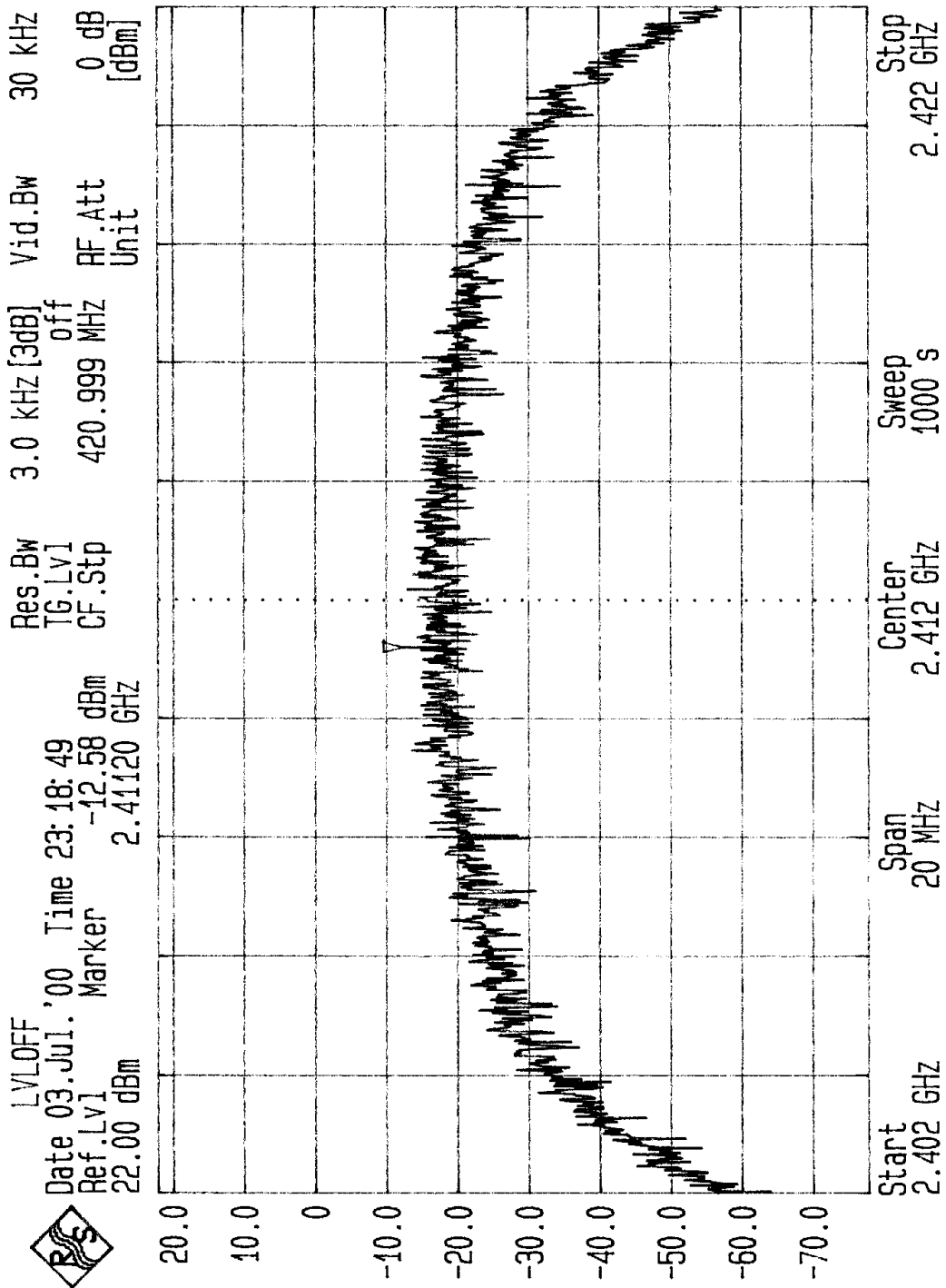
The temperature and related humidity is 18°C and 78%.

**6.5.6 Test Result**

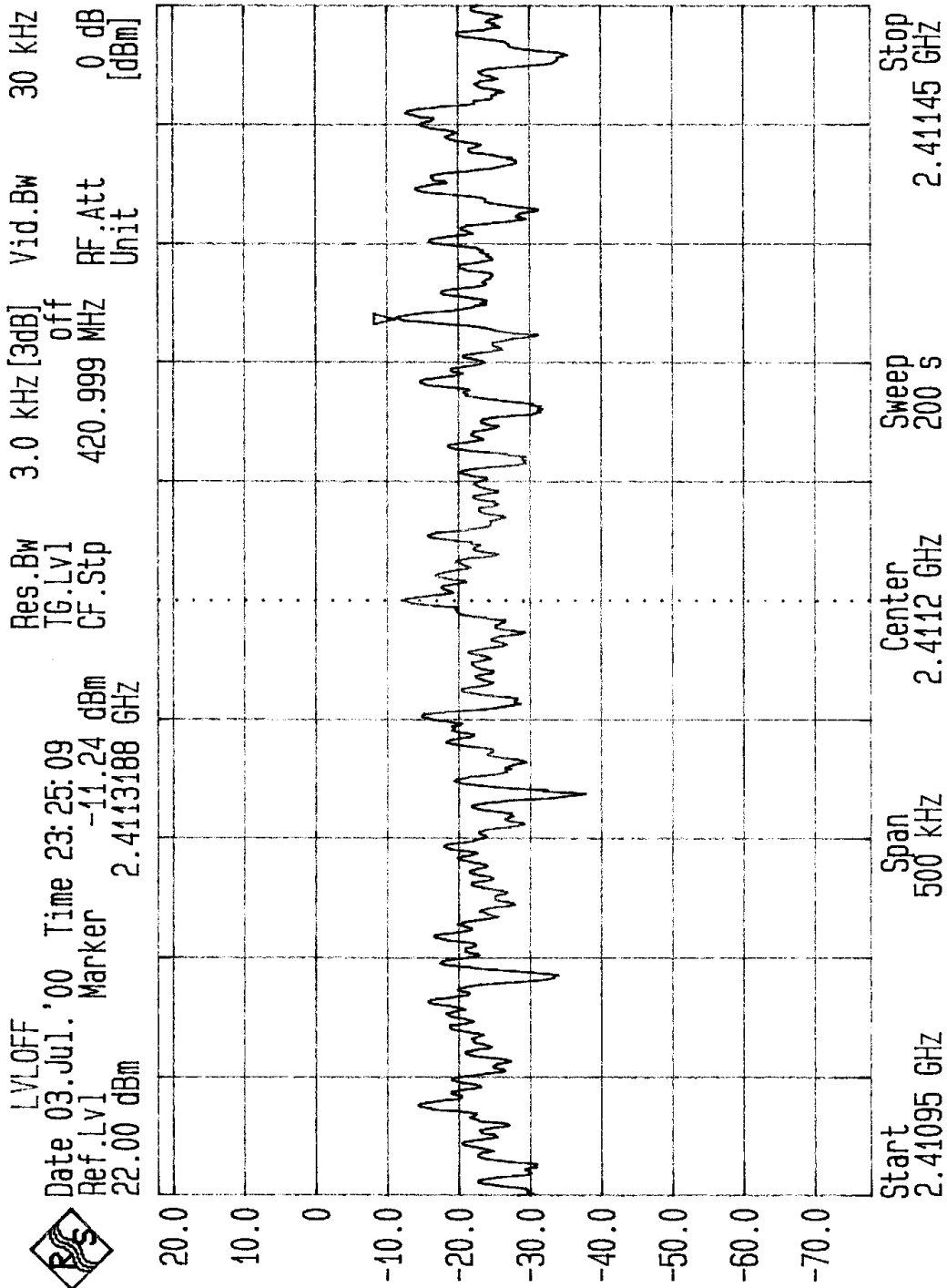
| CHANNEL<br>NUMBER | CHANNEL<br>FREQUENCY<br>(MHz ) | RF POWER<br>LEVEL IN 3 KHz<br>BW | MAXIMUM<br>LIMIT<br>(MHz) | PASS/FAIL |
|-------------------|--------------------------------|----------------------------------|---------------------------|-----------|
| 1                 | 2412                           | -5.63dBm                         | 8dBm                      | PASS      |
| 6                 | 2437                           | -6.03dBm                         | 8dBm                      | PASS      |
| 11                | 2462                           | -4.79dBm                         | 8dBm                      | PASS      |

The spectrum plots of test result are attached as below.

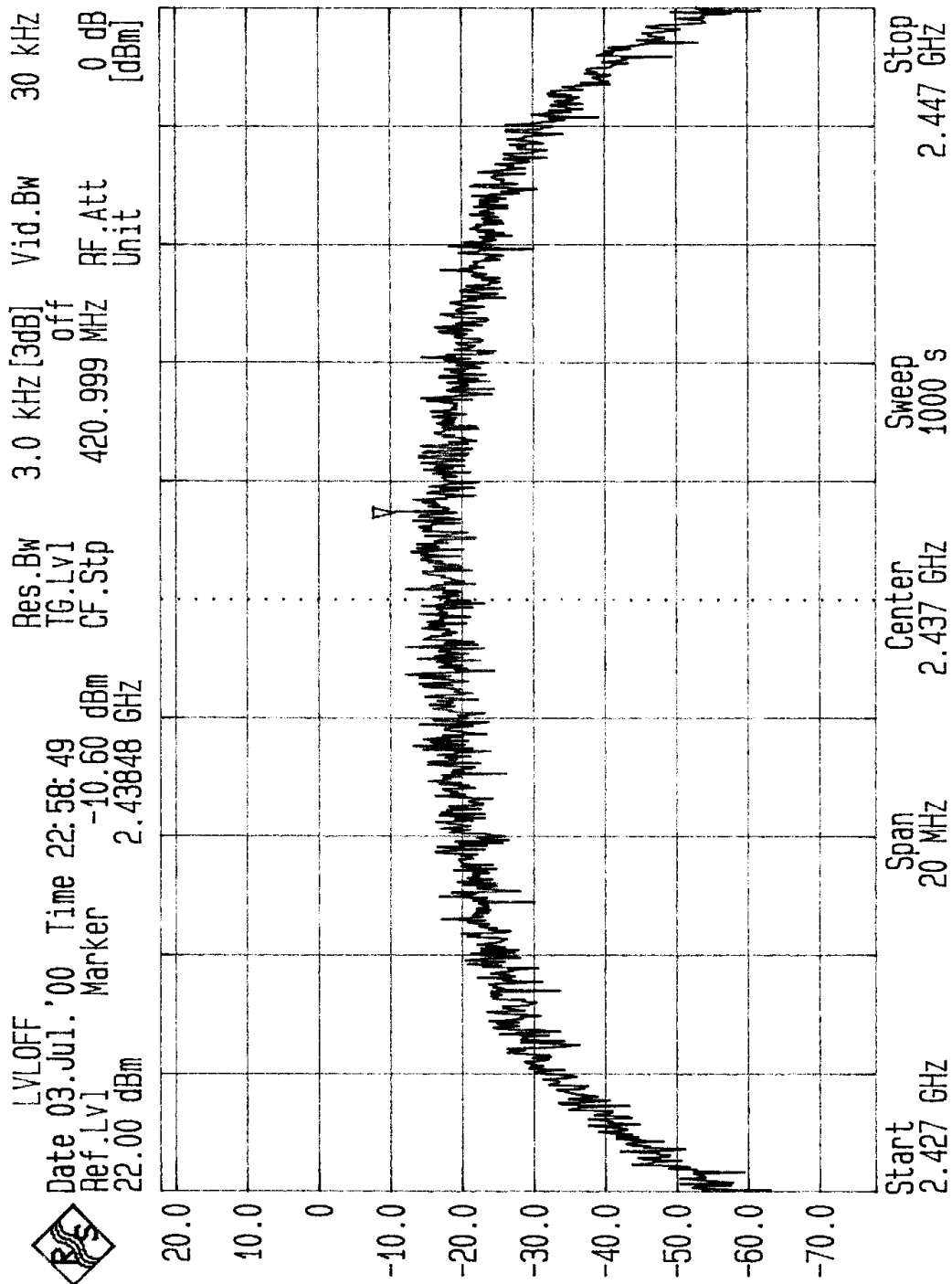
CH 1



CH 1



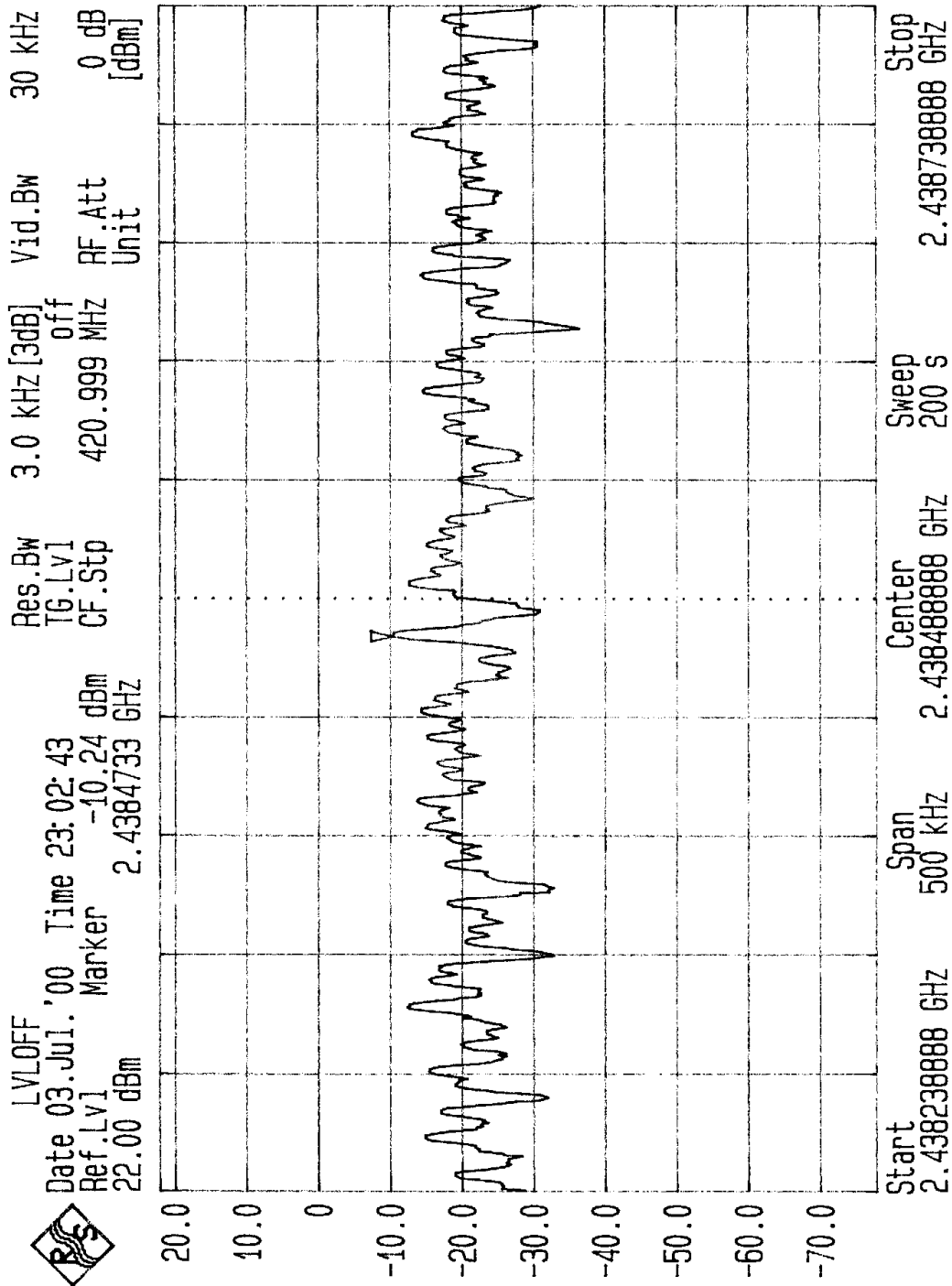
CH 6



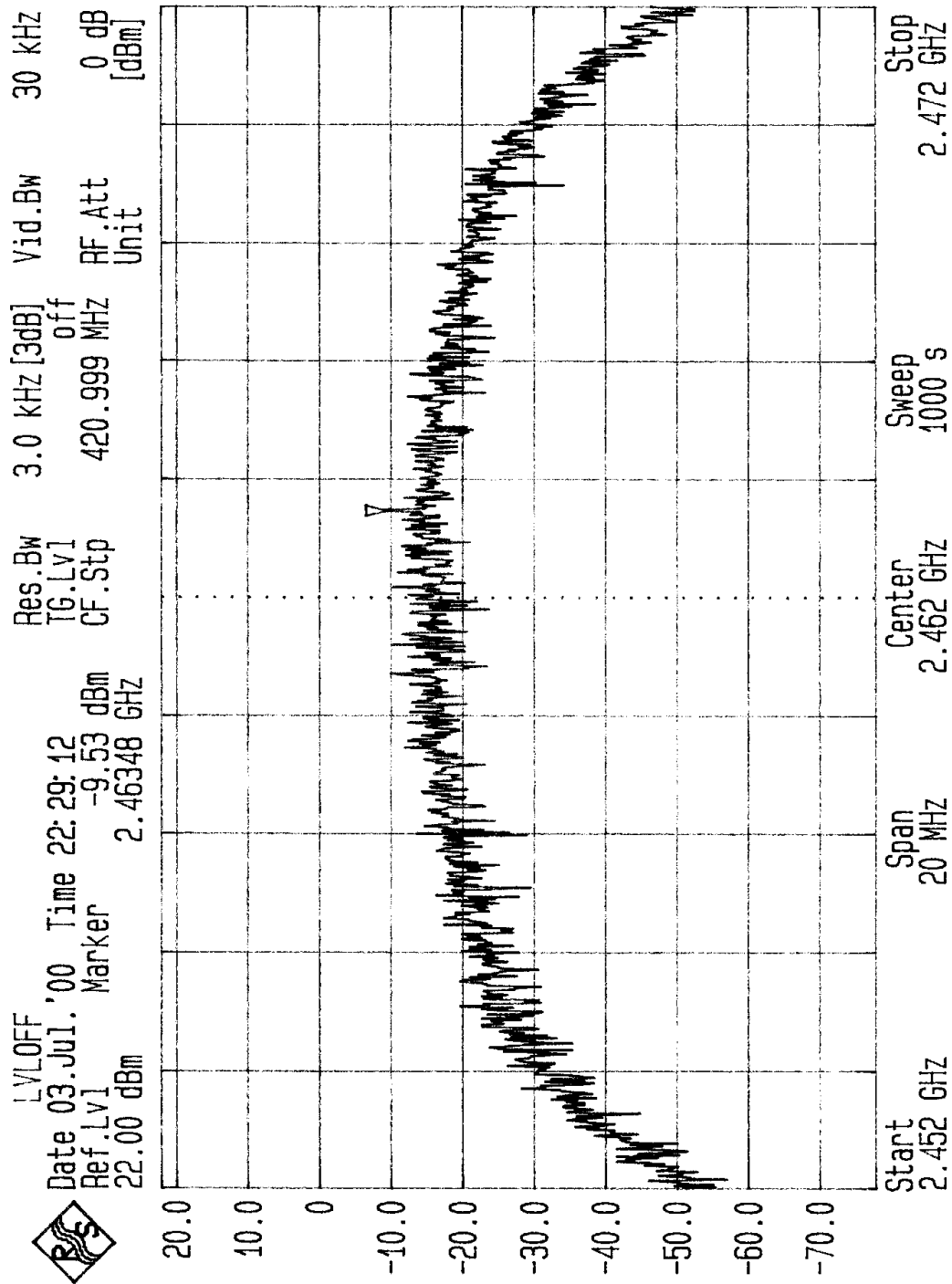




CH 6

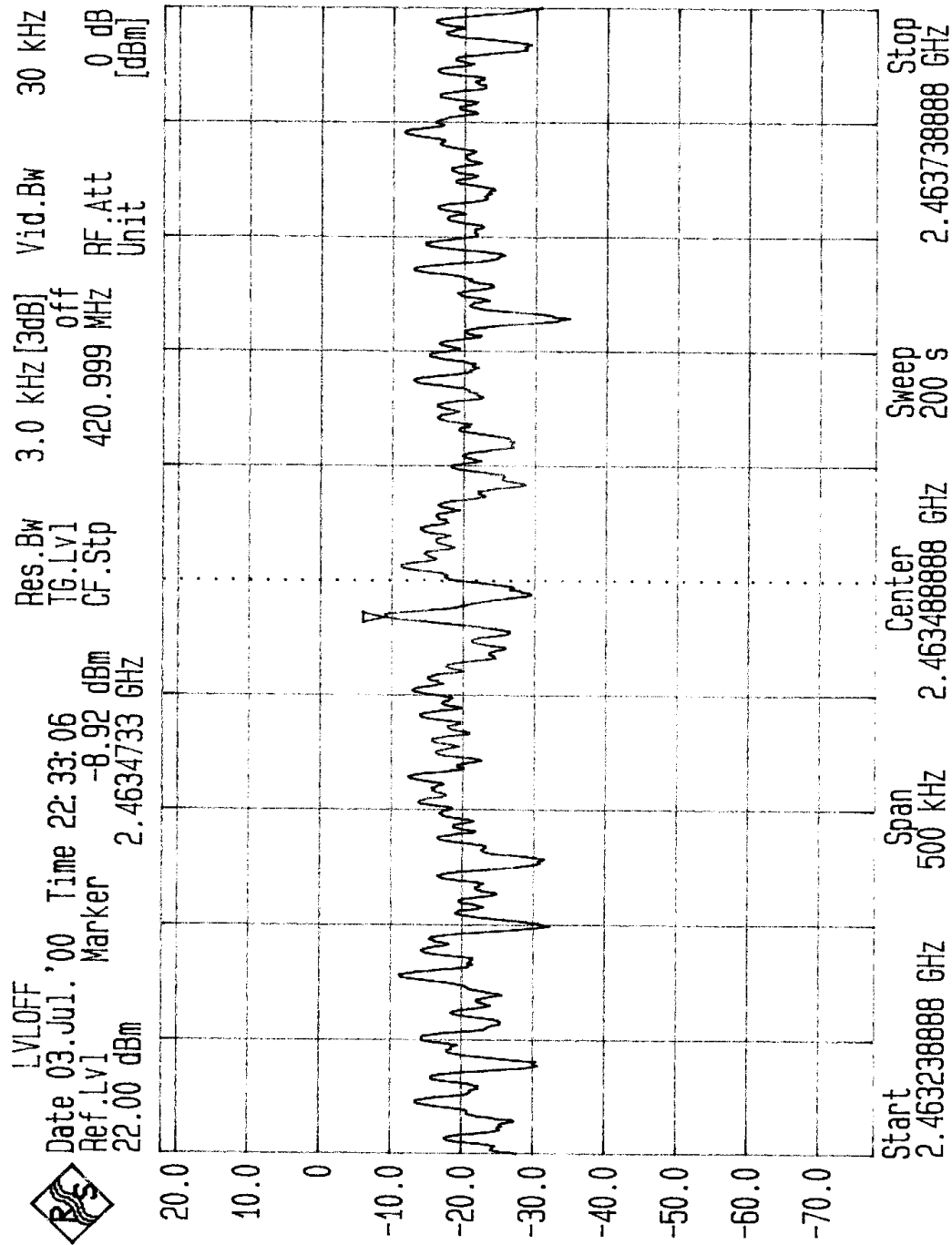


CH 11





CH 11



## 6.6 Processing Gain of a Direct Sequence Spread Spectrum Measurement

### 6.6.1 Test Instruments and Support Units

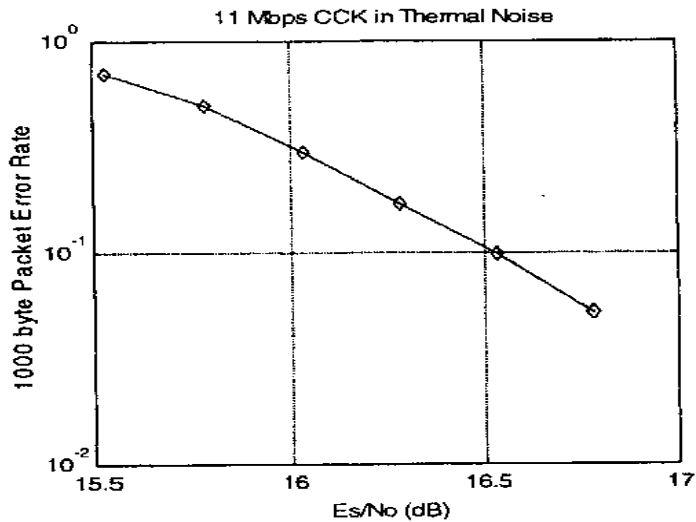
| Description & Manufacturer                       | Model No.   | Serial No. |
|--------------------------------------------------|-------------|------------|
| Hewlett Packard Spectrum Analyzer, 9kHz to 22GHz | HP8593E     | S942848    |
| Marconi Signal Generator, 10kHz to 2.7GHz        | 2031        | 953426     |
| Hewlett Packard Power Meter,                     | HP438A      | S952633    |
| Hewlett Packard Power Sensor, -20 to -70dBm      | HP8481D     | SCD15369   |
| Hewlett Packard Attenuator, 6dB to 10 dB         | HP8493A     | NA         |
| Hewlett Packard Step Attenuator, 1dB steps       | HP8494A     | NA         |
| Hewlett Packard Step Attenuator, 10dB steps      | HP8495D     | NA         |
| Hewlett Packard Power Splitter,                  | HP11667B    | 04390      |
| Campaq Laptop Computer (Qty 2),                  | Armada 1700 | NA         |

### 6.6.2 Method of Measurement

The processing gain may be measured using the CW jamming margin method. Figure 1 shows the test configuration. The test consists of stepping a signal generator in 50 kHz increments across the passband of the system. At each point, the generator level required to produce the recommended Bit Error Rate (BER) is recorded. This level is jammer level. The output power of the transmitting unit is measured at the same point. The jammer to Signal (J/S) ratio is then calculated. Discard the worst 20% of the J/S data points. The lowest remaining J/S ratio is used when calculating the Process Gain.

The reference PER is specified as 8%. The corresponding Es/No (signal to noise ratio per symbol) is 16.4 dB. The curve is attached as below.

### 1.1 1000 byte PER vs. Es/No



This value and the measured J/S ratio are used in the following equation to calculate the Process Gain (Gp) of the system.

$$G_p = (S/N)_0 + M_j + L_{sys}$$

Where:

$(S/N)_0$ : Signal to noise ratio for the chosen BER.

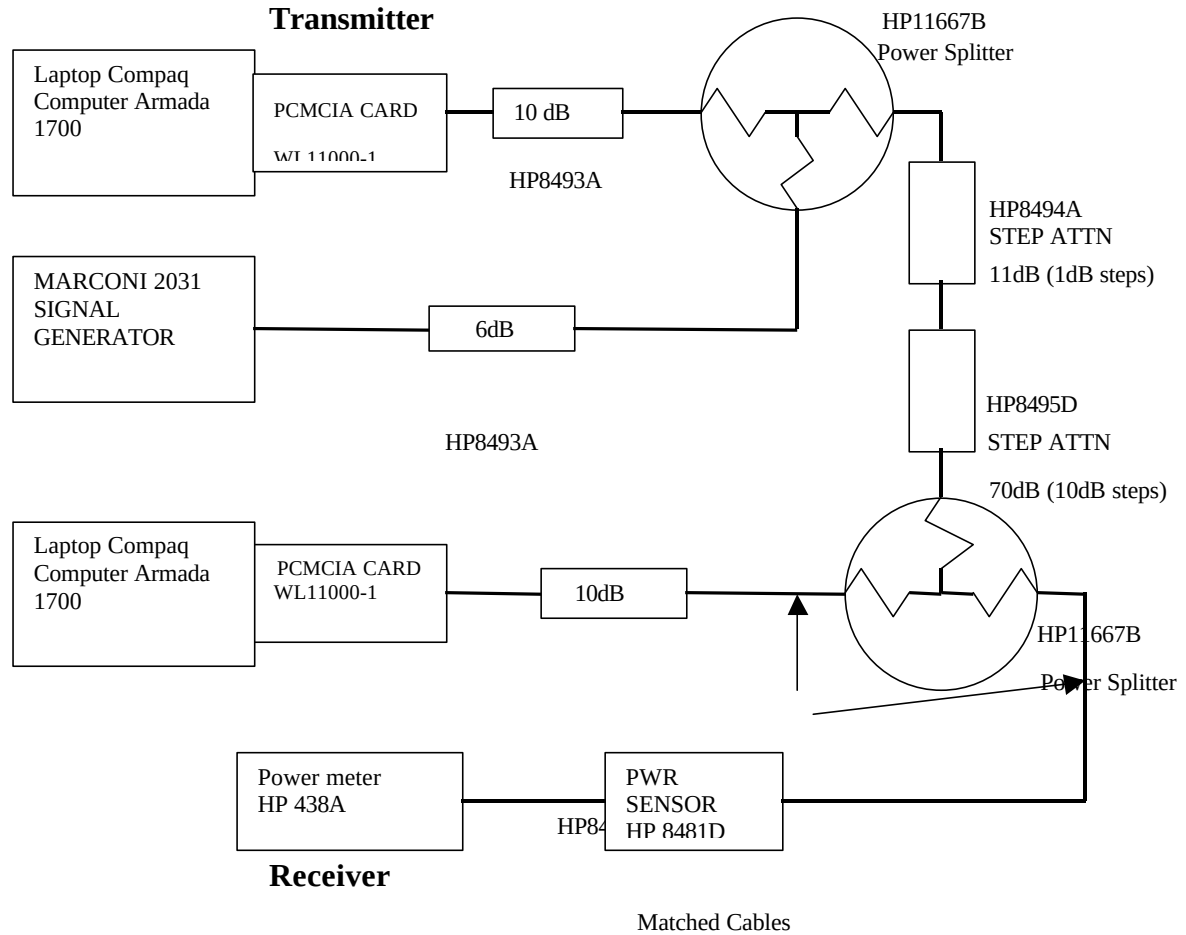
$M_j$ : Maximum jammer to Signal Ratio recorded at the detected BER.

$L_{sys}$ : System losses. For the purpose of this processing gain calculation, we assume  $L_{sys}$  at its minimum value of 2 dB.

Applicable Reference Documents.

1. "HFA3861A Direct Sequence Spread Spectrum Baseband Processor" Harris Corporation Semiconductor Sector Preliminary Data Sheet, Melbourne FL, July 1999.
2. "M-ary Orthogonal Keying BER Curve".

### 6.6.3 Test Setup





#### 6.6.4 Test Procedure

Obtain the simplex link shown. Perform all independent instrumentation calibrations prior to this procedure. Set operating power levels using fixed and variable attenuators in system to meet the following objectives:

1. Signal Power at receiver approximately  $-60\text{dBm}$  (above thermal sensitivity such that thermal noise does not cause bit errors).
2. Signal Power at power meter between  $-20$  and  $-30\text{dBm}$  for optimal linearity.
3. Use spectrum analyzer to monitor test.
4. Ensure that CW Jammer generator RF output is disabled and measure the power at the power meter port using the power meter. This is the relative signal power,  $S_r$ .
5. Disable Transmitter, and set CW Jammer generator RF output frequency equal to the carrier frequency and enable generator output. Set reference CW Jammer power level at power meter port  $8.4\text{dB}$  below  $S_r$  (minimum J/S, or  $10\text{dB}$  processing gain reference level). Note the power level setting on the generator, this is the reference CW Jammer power setting,  $J_r$ .
6. Disable CW Jammer, re-establish link. PER test should be operating essentially error-free.
7. Enable CW Jammer at the reference power level and verify that the PER test indicates a PER of less than 8%.
8. Alternatively, adjust the CW Jammer level to that which causes 8% PER and verify that the S/J is less than  $8.4\text{dB}$ .
9. Repeat step 7 for uniform steps in frequency increments of  $50\text{ kHz}$  across the receiver passband with the CW Jammer. In this case the receiver passband is  $\pm 8.5\text{ MHz}$ .

The numerical data associated with the following radio channel is tabulated and presented for :

|            |           |
|------------|-----------|
| Channel 1  | :2412 MHZ |
| Channel 6  | :2437 MHZ |
| Channel 11 | :2462 MHZ |



#### **6.6.5 EUT Operating condition**

The software provided by client to set the EUT to transmit at lowest, middle and highest channel.

#### **6.6.6 Climate Condition**

The temperature and related humidity: 25°C and 50%RH



### 6.6.7 Test Results

Although the theoretical processing gain is lower than 10 dB, but the CCK coding provides an extra coding gain of 2.2dB.

| 11Mbps CHANNEL 1 Processing Gain |               |                   |                     |                   |                 |              |
|----------------------------------|---------------|-------------------|---------------------|-------------------|-----------------|--------------|
| $G_p = (S/N)_o + M_j + L_{sys}$  |               |                   |                     |                   |                 |              |
| Freq.<br>(GHz)                   | $G_p$<br>(dB) | $(S/N)_o$<br>(dB) | $M_j = J/S$<br>(dB) | $L_{sys}$<br>(dB) | Jammer<br>(dBm) | LVL<br>(dBm) |
| 2.4095                           | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -0.7         |
| 2.40955                          | 11.4          | 16.4              | -7                  | 2                 | -47             | -0.6         |
| 2.4096                           | 11.4          | 16.4              | -7                  | 2                 | -47             | -0.6         |
| 2.40965                          | 11.4          | 16.4              | -7                  | 2                 | -47             | -0.6         |
| 2.4097                           | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -0.7         |
| 2.40975                          | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -0.7         |
| 2.4098                           | 11.1          | 16.4              | -7.3                | 2                 | -47.3           | -0.9         |
| 2.40985                          | 11.1          | 16.4              | -7.3                | 2                 | -47.3           | 0.9          |
| 2.4099                           | 11            | 16.4              | -7.4                | 2                 | -47.4           | -1           |
| 2.40995                          | 11            | 16.4              | -7.4                | 2                 | -47.4           | -1           |
| 2.41                             | 10.9          | 16.4              | -7.5                | 2                 | -47.5           | -1.1         |
| 2.41005                          | 11            | 16.4              | -7.4                | 2                 | -47.4           | -1           |
| 2.4101                           | 11            | 16.4              | -7.4                | 2                 | -47.4           | -1           |
| 2.41015                          | 11.1          | 16.4              | -7.3                | 2                 | -47.3           | -0.9         |
| 2.4102                           | 11.2          | 16.4              | -7.2                | 2                 | -47.2           | -0.8         |
| 2.41025                          | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -0.7         |
| 2.4103                           | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -0.7         |
| 2.41035                          | 11.4          | 16.4              | -7                  | 2                 | -47             | -0.6         |
| 2.4104                           | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -0.7         |
| 2.41045                          | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -0.7         |
| 2.4105                           | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -0.7         |
| 2.41055                          | 11.2          | 16.4              | -7.2                | 2                 | -47.2           | -0.8         |
| 2.4106                           | 11.2          | 16.4              | -7.2                | 2                 | -47.2           | -0.8         |
| 2.41065                          | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -0.7         |
| 2.4107                           | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -0.7         |
| 2.41075                          | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -0.7         |
| 2.4108                           | 11.4          | 16.4              | -7                  | 2                 | -47             | -0.6         |
| 2.41085                          | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -0.5         |
| 2.4109                           | 11.6          | 16.4              | -6.8                | 2                 | -46.8           | -0.4         |
| 2.41095                          | 11.6          | 16.4              | -6.8                | 2                 | -46.8           | -0.4         |
| 2.411                            | 11.6          | 16.4              | -6.8                | 2                 | -46.8           | -0.4         |
| 2.41105                          | 11.4          | 16.4              | -7                  | 2                 | -47             | -0.6         |
| 2.4111                           | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -0.5         |
| 2.41115                          | 11.6          | 16.4              | -6.8                | 2                 | -46.8           | -0.4         |



| 11Mbps CHANNEL 1 Processing Gain |       |           |             |           |        |       |
|----------------------------------|-------|-----------|-------------|-----------|--------|-------|
| $G_p = (S/N)_o + M_j + L_{sys}$  |       |           |             |           |        |       |
| Freq.                            | $G_p$ | $(S/N)_o$ | $M_j = J/S$ | $L_{sys}$ | Jammer | LVL   |
| (GHz)                            | (dB)  | (dB)      | (dB)        | (dB)      | (dBm)  | (dBm) |
| 2.4112                           | 11.5  | 16.4      | -6.9        | 2         | -46.9  | -0.5  |
| 2.41125                          | 11.5  | 16.4      | -6.9        | 2         | -46.9  | -0.5  |
| 2.4113                           | 11.5  | 16.4      | -6.9        | 2         | -46.9  | -0.5  |
| 2.41135                          | 11.4  | 16.4      | -7          | 2         | -47    | -0.6  |
| 2.4114                           | 11.4  | 16.4      | -7          | 2         | -47    | -0.6  |
| 2.41145                          | 11.4  | 16.4      | -7          | 2         | -47    | -0.6  |
| 2.4115                           | 11.4  | 16.4      | -7          | 2         | -47    | -0.6  |
| 2.41155                          | 11.4  | 16.4      | -7          | 2         | -47    | -0.6  |
| 2.4116                           | 11.6  | 16.4      | -6.8        | 2         | -46.8  | -0.4  |
| 2.41165                          | 11.6  | 16.4      | -6.8        | 2         | -46.8  | -0.4  |
| 2.4117                           | 11.5  | 16.4      | -6.9        | 2         | -46.9  | -0.5  |
| 2.41175                          | 11.4  | 16.4      | -7          | 2         | -47    | -0.6  |
| 2.4118                           | 11.2  | 16.4      | -7.2        | 2         | -47.2  | -0.8  |
| 2.41185                          | 11.1  | 16.4      | -7.3        | 2         | -47.3  | -0.9  |
| 2.4119                           | 11    | 16.4      | -7.4        | 2         | -47.4  | -1    |
| 2.41195                          | 10.8  | 16.4      | -7.6        | 2         | -47.6  | -1.2  |
| 2.412                            | 10.9  | 16.4      | -7.5        | 2         | -47.5  | -1.1  |
| 2.41205                          | 10.9  | 16.4      | -7.5        | 2         | -47.5  | -1.1  |
| 2.4121                           | 11.1  | 16.4      | -7.3        | 2         | -47.3  | -0.9  |
| 2.41215                          | 11.4  | 16.4      | -7          | 2         | -47    | -0.6  |
| 2.4122                           | 11.5  | 16.4      | -6.9        | 2         | -46.9  | -0.5  |
| 2.41225                          | 11.6  | 16.4      | -6.8        | 2         | -46.8  | -0.4  |
| 2.4123                           | 11.7  | 16.4      | -6.7        | 2         | -46.7  | -0.3  |
| 2.41235                          | 11.7  | 16.4      | -6.7        | 2         | -46.7  | -0.3  |
| 2.4124                           | 11.7  | 16.4      | -6.7        | 2         | -46.7  | -0.3  |
| 2.41245                          | 11.6  | 16.4      | -6.8        | 2         | -46.8  | -0.4  |
| 2.4125                           | 11.6  | 16.4      | -6.8        | 2         | -46.8  | -0.4  |
| 2.41255                          | 11.6  | 16.4      | -6.8        | 2         | -46.8  | -0.4  |
| 2.4126                           | 11.6  | 16.4      | -6.8        | 2         | -46.8  | -0.4  |
| 2.41265                          | 11.6  | 16.4      | -6.8        | 2         | -46.8  | -0.4  |
| 2.4127                           | 11.7  | 16.4      | -6.7        | 2         | -46.7  | -0.3  |
| 2.41275                          | 11.6  | 16.4      | -6.8        | 2         | -46.8  | -0.4  |
| 2.4128                           | 11.8  | 16.4      | -6.6        | 2         | -46.6  | -0.2  |
| 2.41285                          | 11.8  | 16.4      | -6.6        | 2         | -46.6  | -0.2  |



| 11Mbps CHANNEL 1 Processing Gain |      |                    |                      |                  |        |       |
|----------------------------------|------|--------------------|----------------------|------------------|--------|-------|
| $G_p = (S/N)_o + M_j + L_{sys}$  |      |                    |                      |                  |        |       |
| Freq.                            | Gp   | (S/N) <sub>o</sub> | M <sub>j</sub> = J/S | L <sub>sys</sub> | Jammer | LVL   |
| (GHz)                            | (dB) | (dB)               | (dB)                 | (dB)             | (dBm)  | (dBm) |
| 2.4129                           | 11.8 | 16.4               | -6.6                 | 2                | -46.6  | -0.2  |
| 2.41295                          | 11.9 | 16.4               | -6.5                 | 2                | -46.5  | -0.1  |
| 2.413                            | 11.8 | 16.4               | -6.6                 | 2                | -46.6  | -0.2  |
| 2.41305                          | 11.8 | 16.4               | -6.6                 | 2                | -46.6  | -0.2  |
| 2.4131                           | 11.8 | 16.4               | -6.6                 | 2                | -46.6  | -0.2  |
| 2.41315                          | 11.7 | 16.4               | -6.7                 | 2                | -46.7  | -0.3  |
| 2.4132                           | 11.6 | 16.4               | -6.8                 | 2                | -46.8  | -0.4  |
| 2.41325                          | 11.7 | 16.4               | -6.7                 | 2                | -46.7  | -0.3  |
| 2.4133                           | 11.6 | 16.4               | -6.8                 | 2                | -46.8  | -0.4  |
| 2.41335                          | 11.6 | 16.4               | -6.8                 | 2                | 46.8   | -0.4  |
| 2.4134                           | 11.6 | 16.4               | -6.8                 | 2                | -46.8  | -0.4  |
| 2.41345                          | 11.6 | 16.4               | -6.8                 | 2                | -46.8  | -0.4  |
| 2.4135                           | 11.6 | 16.4               | -6.8                 | 2                | -46.8  | -0.4  |
| 2.41355                          | 11.7 | 16.4               | -6.8                 | 2                | -46.8  | -0.4  |
| 2.4136                           | 11.6 | 16.4               | -6.7                 | 2                | -46.7  | -0.3  |
| 2.41365                          | 11.7 | 16.4               | -6.7                 | 2                | -46.7  | -0.3  |
| 2.4137                           | 11.7 | 16.4               | -6.7                 | 2                | -46.7  | -0.3  |
| 2.41375                          | 11.7 | 16.4               | -6.7                 | 2                | -46.7  | -0.3  |
| 2.4138                           | 11.6 | 16.4               | -6.8                 | 2                | -46.8  | -0.4  |
| 2.41385                          | 11.5 | 16.4               | -6.9                 | 2                | -46.9  | -0.5  |
| 2.4139                           | 11.4 | 16.4               | -7                   | 2                | -47    | -0.6  |
| 2.41395                          | 11.3 | 16.4               | -7.1                 | 2                | -47.1  | -0.7  |
| 2.414                            | 11.2 | 16.4               | -7.2                 | 2                | -47.2  | -0.8  |
| 2.41405                          | 11.2 | 16.4               | -7.2                 | 2                | -47.2  | -0.8  |
| 2.4141                           | 11.2 | 16.4               | -7.2                 | 2                | -47.2  | -0.8  |
| 2.41415                          | 11.2 | 16.4               | -7.2                 | 2                | -47.2  | -0.8  |
| 2.4142                           | 11.3 | 16.4               | -7.1                 | 2                | -47.1  | -0.7  |
| 2.41425                          | 11.4 | 16.4               | -7                   | 2                | -47    | -0.6  |
| 2.4143                           | 11.5 | 16.4               | -6.9                 | 2                | -46.9  | -0.5  |
| 2.41435                          | 11.5 | 16.4               | -6.9                 | 2                | -46.9  | -0.5  |
| 2.4144                           | 11.5 | 16.4               | -6.9                 | 2                | -46.9  | -0.5  |
| 2.41445                          | 11.5 | 16.4               | -6.9                 | 2                | -46.9  | -0.5  |
| 2.4145                           | 11.4 | 16.4               | -7                   | 2                | -47    | -0.6  |
| Processing Gain : 11.5 dB        |      |                    |                      |                  |        |       |



| 11Mbps CHANNEL 6 Processing Gain |               |                   |                     |                   |                 |              |
|----------------------------------|---------------|-------------------|---------------------|-------------------|-----------------|--------------|
| $G_p = (S/N)_o + M_j + L_{sys}$  |               |                   |                     |                   |                 |              |
| Freq.<br>(GHz)                   | $G_p$<br>(dB) | $(S/N)_o$<br>(dB) | $M_j = J/S$<br>(dB) | $L_{sys}$<br>(dB) | Jammer<br>(dBm) | LVL<br>(dBm) |
| 2.4345                           | 11.2          | 16.4              | -7.2                | 2                 | -47.2           | -3.1         |
| 2.43455                          | 11.2          | 16.4              | -7.2                | 2                 | -47.2           | -3.1         |
| 2.4346                           | 11.2          | 16.4              | -7.2                | 2                 | -47.2           | -3.1         |
| 2.43465                          | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -3           |
| 2.4347                           | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -3           |
| 2.43475                          | 11.2          | 16.4              | -7.2                | 2                 | -47.2           | -3.1         |
| 2.4348                           | 11.1          | 16.4              | -7.3                | 2                 | -47.3           | -3.2         |
| 2.43485                          | 11.1          | 16.4              | -7.3                | 2                 | -47.3           | -3.2         |
| 2.4349                           | 11            | 16.4              | -7.4                | 2                 | -47.4           | -3.3         |
| 2.43495                          | 11            | 16.4              | -7.4                | 2                 | -47.4           | -3.3         |
| 2.435                            | 11            | 16.4              | -7.4                | 2                 | -47.4           | -3.3         |
| 2.43505                          | 11.1          | 16.4              | -7.3                | 2                 | -47.3           | -3.2         |
| 2.4351                           | 11.1          | 16.4              | -7.3                | 2                 | -47.3           | -3.2         |
| 2.43515                          | 11.2          | 16.4              | -7.2                | 2                 | -47.2           | -3.1         |
| 2.4352                           | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -3           |
| 2.43525                          | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -3           |
| 2.4353                           | 11.4          | 16.4              | -7                  | 2                 | -47             | -2.9         |
| 2.43535                          | 11.4          | 16.4              | -7                  | 2                 | -47             | -2.9         |
| 2.4354                           | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -3           |
| 2.43545                          | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -3           |
| 2.4355                           | 11.2          | 16.4              | -7.2                | 2                 | -47.2           | -3.1         |
| 2.43555                          | 11.2          | 16.4              | -7.2                | 2                 | -47.2           | -3.1         |
| 2.4356                           | 11.2          | 16.4              | -7.2                | 2                 | -47.2           | -3.1         |
| 2.43565                          | 11.2          | 16.4              | -7.2                | 2                 | -47.2           | -3.1         |
| 2.4357                           | 11.2          | 16.4              | -7.2                | 2                 | -47.2           | -3.1         |
| 2.43575                          | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -3           |
| 2.4358                           | 11.4          | 16.4              | -7                  | 2                 | -47             | -2.9         |
| 2.43585                          | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |
| 2.4359                           | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |
| 2.43595                          | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |
| 2.436                            | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |
| 2.43605                          | 11.4          | 16.4              | -7                  | 2                 | -47             | -2.9         |
| 2.4361                           | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |
| 2.43615                          | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |



| 11Mbps CHANNEL 6 Processing Gain |               |                   |                     |                   |                 |              |
|----------------------------------|---------------|-------------------|---------------------|-------------------|-----------------|--------------|
| $G_p = (S/N)_o + M_j + L_{sys}$  |               |                   |                     |                   |                 |              |
| Freq.<br>(GHz)                   | $G_p$<br>(dB) | $(S/N)_o$<br>(dB) | $M_j = J/S$<br>(dB) | $L_{sys}$<br>(dB) | Jammer<br>(dBm) | LVL<br>(dBm) |
| 2.4362                           | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |
| 2.43625                          | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |
| 2.4363                           | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |
| 2.43635                          | 11.4          | 16.4              | -7                  | 2                 | -47             | -2.9         |
| 2.4364                           | 11.4          | 16.4              | -7                  | 2                 | -47             | -2.9         |
| 2.43645                          | 11.4          | 16.4              | -7                  | 2                 | -47             | -2.9         |
| 2.4365                           | 11.4          | 16.4              | -7                  | 2                 | -47             | -2.9         |
| 2.43655                          | 11.4          | 16.4              | -7                  | 2                 | -47             | -2.9         |
| 2.4366                           | 11.4          | 16.4              | -7                  | 2                 | -47             | -2.9         |
| 2.43665                          | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |
| 2.4367                           | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |
| 2.43675                          | 11.4          | 16.4              | -7                  | 2                 | -47             | -2.9         |
| 2.4368                           | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -3           |
| 2.43685                          | 11.1          | 16.4              | -7.3                | 2                 | -47.3           | -3.2         |
| 2.4369                           | 11            | 16.4              | -7.4                | 2                 | -47.4           | -3.3         |
| 2.43695                          | 10.9          | 16.4              | -7.5                | 2                 | -47.5           | -3.4         |
| 2.437                            | 10.9          | 16.4              | -7.5                | 2                 | -47.5           | -3.4         |
| 2.43705                          | 11            | 16.4              | -7.4                | 2                 | -47.4           | -3.3         |
| 2.4371                           | 11.1          | 16.4              | -7.3                | 2                 | -47.3           | -3.2         |
| 2.43715                          | 11.2          | 16.4              | -7.2                | 2                 | -47.2           | -3.1         |
| 2.4372                           | 11.3          | 16.4              | -7.1                | 2                 | -47.1           | -3           |
| 2.43725                          | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |
| 2.4373                           | 11.6          | 16.4              | -6.8                | 2                 | -46.8           | -2.7         |
| 2.43735                          | 11.6          | 16.4              | -6.8                | 2                 | -46.8           | -2.7         |
| 2.4374                           | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |
| 2.43745                          | 11.4          | 16.4              | -7                  | 2                 | -47             | -2.9         |
| 2.4375                           | 11.4          | 16.4              | -7                  | 2                 | -47             | -2.9         |
| 2.43755                          | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |
| 2.4376                           | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |
| 2.43765                          | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |
| 2.4377                           | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |
| 2.43775                          | 11.5          | 16.4              | -6.9                | 2                 | -46.9           | -2.8         |
| 2.4378                           | 11.6          | 16.4              | -6.8                | 2                 | -46.8           | -2.7         |
| 2.43785                          | 11.7          | 16.4              | -6.7                | 2                 | -46.7           | -2.6         |



| 11Mbps CHANNEL 6 Processing Gain |            |                            |                              |                          |                 |              |
|----------------------------------|------------|----------------------------|------------------------------|--------------------------|-----------------|--------------|
| $G_p = (S/N)_o + M_j + L_{sys}$  |            |                            |                              |                          |                 |              |
| Freq.<br>(GHz)                   | Gp<br>(dB) | (S/N) <sub>o</sub><br>(dB) | M <sub>j</sub> = J/S<br>(dB) | L <sub>sys</sub><br>(dB) | Jammer<br>(dBm) | LVL<br>(dBm) |
| 2.4379                           | 11.8       | 16.4                       | -6.6                         | 2                        | -46.6           | -2.5         |
| 2.43795                          | 11.7       | 16.4                       | -6.7                         | 2                        | -46.7           | -2.6         |
| 2.438                            | 11.7       | 16.4                       | -6.7                         | 2                        | -46.7           | -2.6         |
| 2.43805                          | 11.6       | 16.4                       | -6.8                         | 2                        | -46.8           | -2.7         |
| 2.4381                           | 11.6       | 16.4                       | -6.8                         | 2                        | -46.8           | -2.7         |
| 2.43815                          | 11.5       | 16.4                       | -6.9                         | 2                        | -46.9           | -2.8         |
| 2.4382                           | 11.5       | 16.4                       | -6.9                         | 2                        | -46.9           | -2.8         |
| 2.43825                          | 11.4       | 16.4                       | -7                           | 2                        | -47             | -2.9         |
| 2.4383                           | 11.4       | 16.4                       | -7                           | 2                        | -47             | -2.9         |
| 2.43835                          | 11.3       | 16.4                       | -7.1                         | 2                        | -47.1           | -3           |
| 2.4384                           | 11.3       | 16.4                       | -7.1                         | 2                        | -47.1           | -3           |
| 2.43845                          | 11.3       | 16.4                       | -7.1                         | 2                        | -47.1           | -3           |
| 2.4385                           | 11.3       | 16.4                       | -7.1                         | 2                        | -47.1           | -3           |
| 2.43855                          | 11.4       | 16.4                       | -7                           | 2                        | -47             | -2.9         |
| 2.4386                           | 11.4       | 16.4                       | -7                           | 2                        | -47             | -2.9         |
| 2.43865                          | 11.4       | 16.4                       | -7                           | 2                        | -47             | -2.9         |
| 2.4387                           | 11.4       | 16.4                       | -7                           | 2                        | -47             | -2.9         |
| 2.43875                          | 11.4       | 16.4                       | -7                           | 2                        | -47             | -2.9         |
| 2.4388                           | 11.3       | 16.4                       | -7.1                         | 2                        | -47.1           | -3           |
| 2.43885                          | 11.3       | 16.4                       | -7.1                         | 2                        | -47.1           | -3           |
| 2.4389                           | 11.2       | 16.4                       | -7.2                         | 2                        | -47.2           | -3.1         |
| 2.4895                           | 11.1       | 16.4                       | -7.3                         | 2                        | -47.3           | -3.2         |
| 2.439                            | 11.1       | 16.4                       | -7.3                         | 2                        | -47.3           | -3.2         |
| 2.43905                          | 11         | 16.4                       | -7.4                         | 2                        | -47.4           | -3.3         |
| 2.4391                           | 11         | 16.4                       | -7.4                         | 2                        | -47.4           | -3.3         |
| 2.43915                          | 11         | 16.4                       | -7.4                         | 2                        | -47.4           | -3.3         |
| 2.4392                           | 11         | 16.4                       | -7.4                         | 2                        | -47.4           | -3.3         |
| 2.43925                          | 11.1       | 16.4                       | -7.3                         | 2                        | -47.3           | -3.2         |
| 2.4393                           | 11.2       | 16.4                       | -7.2                         | 2                        | -47.2           | -3.1         |
| 2.43935                          | 11.2       | 16.4                       | -7.2                         | 2                        | -47.2           | -3.1         |
| 2.4394                           | 11.4       | 16.4                       | -7                           | 2                        | -47             | -2.9         |
| 2.43945                          | 11.4       | 16.4                       | -7                           | 2                        | -47             | -2.9         |
| 2.4395                           | 11.2       | 16.4                       | -7.2                         | 2                        | -47.2           | -3.1         |
| Processing Gain : 11.4 dB        |            |                            |                              |                          |                 |              |



| 11Mbps CHANNEL 11 Processing Gain |       |           |             |           |        |       |
|-----------------------------------|-------|-----------|-------------|-----------|--------|-------|
| $G_p = (S/N)_o + M_j + L_{sys}$   |       |           |             |           |        |       |
| Freq.                             | $G_p$ | $(S/N)_o$ | $M_j = J/S$ | $L_{sys}$ | Jammer | LVL   |
| (GHz)                             | (dB)  | (dB)      | (dB)        | (dB)      | (dBm)  | (dBm) |
| 2.4595                            | 11.7  | 16.4      | -6.7        | 2         | -46.7  | -4.9  |
| 2.45955                           | 11.8  | 16.4      | -6.6        | 2         | -46.6  | -4.8  |
| 5.4596                            | 11.8  | 16.4      | -6.6        | 2         | -46.6  | -4.8  |
| 2.45965                           | 11.7  | 16.4      | -6.7        | 2         | -46.7  | -4.9  |
| 2.4597                            | 11.7  | 16.4      | -6.7        | 2         | -46.7  | -4.9  |
| 2.45975                           | 11.6  | 16.4      | -6.8        | 2         | -46.8  | -5    |
| 2.4598                            | 11.5  | 16.4      | -6.9        | 2         | -46.9  | -5.1  |
| 2.45985                           | 11.4  | 16.4      | -7          | 2         | -47    | -5.2  |
| 2.4599                            | 11.4  | 16.4      | -7          | 2         | -47    | -5.2  |
| 2.45995                           | 11.3  | 16.4      | -7.1        | 2         | -47.1  | -5.3  |
| 2.46                              | 11.3  | 16.4      | -7.1        | 2         | -47.1  | -5.3  |
| 2.46005                           | 11.3  | 16.4      | -7.1        | 2         | -47.1  | -5.3  |
| 2.4601                            | 11.4  | 16.4      | -7          | 2         | -47    | -5.2  |
| 2.46015                           | 11.5  | 16.4      | -6.9        | 2         | -46.9  | -5.1  |
| 2.4602                            | 11.5  | 16.4      | -6.9        | 2         | -46.9  | -5.1  |
| 2.46025                           | 11.6  | 16.4      | -6.8        | 2         | -46.8  | -5    |
| 2.4603                            | 11.6  | 16.4      | -6.8        | 2         | -46.8  | -5    |
| 2.46035                           | 11.6  | 16.4      | -6.8        | 2         | -46.8  | -5    |
| 2.4604                            | 11.6  | 16.4      | -6.8        | 2         | -46.8  | -5    |
| 2.46045                           | 11.5  | 16.4      | -6.9        | 2         | -46.9  | -5.1  |
| 2.4605                            | 11.5  | 16.4      | -6.9        | 2         | -46.9  | -5.1  |
| 2.46055                           | 11.4  | 16.4      | -7          | 2         | -47    | -5.2  |
| 2.4606                            | 11.4  | 16.4      | -7          | 2         | -47    | -5.2  |
| 2.46065                           | 11.5  | 16.4      | -6.9        | 2         | -46.9  | -5.1  |
| 2.4607                            | 11.5  | 16.4      | -6.9        | 2         | -46.9  | -5.1  |
| 2.46075                           | 11.6  | 16.4      | -6.8        | 2         | -46.8  | -5    |
| 2.4608                            | 11.6  | 16.4      | -6.8        | 2         | -46.8  | -5    |
| 2.46085                           | 11.8  | 16.4      | -6.6        | 2         | -46.6  | -4.8  |
| 2.4609                            | 11.9  | 16.4      | -6.5        | 2         | -46.5  | -4.7  |
| 2.46095                           | 12    | 16.4      | -6.4        | 2         | -46.4  | -4.6  |
| 2.461                             | 12    | 16.4      | -6.4        | 2         | -46.4  | -4.6  |
| 2.46105                           | 11.9  | 16.4      | -6.5        | 2         | -46.5  | -4.7  |
| 2.4611                            | 12    | 16.4      | -6.4        | 2         | -46.4  | -4.6  |
| 2.46115                           | 12.1  | 16.4      | -6.3        | 2         | -46.3  | -4.5  |



| 11Mbps CHANNEL 11 Processing Gain |      |                    |                      |                  |        |       |
|-----------------------------------|------|--------------------|----------------------|------------------|--------|-------|
| $G_p = (S/N)_o + M_j + L_{sys}$   |      |                    |                      |                  |        |       |
| Freq.                             | Gp   | (S/N) <sub>o</sub> | M <sub>j</sub> = J/S | L <sub>sys</sub> | Jammer | LVL   |
| (GHz)                             | (dB) | (dB)               | (dB)                 | (dB)             | (dBm)  | (dBm) |
| 2.4612                            | 12.1 | 16.4               | -6.3                 | 2                | -46.3  | -4.5  |
| 2.46125                           | 12.1 | 16.4               | -6.3                 | 2                | -46.3  | -4.5  |
| 2.4613                            | 12.1 | 16.4               | -6.3                 | 2                | -46.3  | -4.5  |
| 2.46135                           | 12.1 | 16.4               | -6.3                 | 2                | -46.3  | -4.5  |
| 2.4614                            | 12.1 | 16.4               | -6.3                 | 2                | -46.3  | -4.5  |
| 2.46145                           | 12.1 | 16.4               | -6.3                 | 2                | -46.3  | -4.5  |
| 2.4615                            | 12.2 | 16.4               | -6.2                 | 2                | -46.2  | -4.4  |
| 2.46155                           | 12.2 | 16.4               | -6.2                 | 2                | -46.2  | -4.4  |
| 2.4616                            | 12.3 | 16.4               | -6.1                 | 2                | -46.1  | -4.3  |
| 2.46165                           | 12.3 | 16.4               | -6.1                 | 2                | -46.1  | -4.3  |
| 2.4617                            | 12.4 | 16.4               | -6                   | 2                | -46    | -4.2  |
| 2.46175                           | 12.3 | 16.4               | -6.1                 | 2                | -46.1  | -4.3  |
| 2.4618                            | 12.2 | 16.4               | -6.2                 | 2                | -46.2  | -4.4  |
| 2.46185                           | 12.1 | 16.4               | -6.3                 | 2                | -46.3  | -4.5  |
| 2.4619                            | 12   | 16.4               | -6.4                 | 2                | -46.4  | -4.6  |
| 2.46195                           | 12   | 16.4               | -6.4                 | 2                | -46.4  | -4.6  |
| 2.462                             | 11.9 | 16.4               | -6.5                 | 2                | -46.5  | -4.7  |
| 2.46205                           | 12   | 16.4               | -6.4                 | 2                | -46.4  | -4.6  |
| 2.4621                            | 12.1 | 16.4               | -6.3                 | 2                | -46.3  | -4.5  |
| 2.46215                           | 12.2 | 16.4               | -6.2                 | 2                | -46.2  | -4.4  |
| 2.4622                            | 12.3 | 16.4               | -6.1                 | 2                | -46.1  | -4.3  |
| 2.46225                           | 12.4 | 16.4               | -6                   | 2                | -46    | -4.2  |
| 2.4623                            | 12.5 | 16.4               | -5.9                 | 2                | -45.9  | -4.1  |
| 2.46235                           | 12.4 | 16.4               | -6                   | 2                | -46    | -4.2  |
| 2.4624                            | 12.4 | 16.4               | -6                   | 2                | -46    | -4.2  |
| 2.46245                           | 12.3 | 16.4               | -6.1                 | 2                | -46.1  | -4.3  |
| 2.4625                            | 12.3 | 16.4               | -6.1                 | 2                | -46.1  | -4.3  |
| 2.46255                           | 12.3 | 16.4               | -6.1                 | 2                | -46.1  | -4.3  |
| 2.4626                            | 12.3 | 16.4               | -6.1                 | 2                | -46.1  | -4.3  |
| 2.46265                           | 12.3 | 16.4               | -6.1                 | 2                | -46.1  | -4.3  |
| 2.4627                            | 12.2 | 16.4               | -6.2                 | 2                | -46.2  | -4.4  |
| 2.46275                           | 12.3 | 16.4               | -6.1                 | 2                | -46.1  | -4.3  |
| 2.4628                            | 12.3 | 16.4               | -6.1                 | 2                | -46.1  | -4.3  |
| 2.46285                           | 12.3 | 16.4               | -6.1                 | 2                | -46.1  | -4.3  |





| 11Mbps CHANNEL 11 Processing Gain |       |           |             |           |        |       |
|-----------------------------------|-------|-----------|-------------|-----------|--------|-------|
| $G_p = (S/N)_o + M_j + L_{sys}$   |       |           |             |           |        |       |
| Freq.                             | $G_p$ | $(S/N)_o$ | $M_j = J/S$ | $L_{sys}$ | Jammer | LVL   |
| (GHz)                             | (dB)  | (dB)      | (dB)        | (dB)      | (dBm)  | (dBm) |
| 2.4629                            | 12.2  | 16.4      | -6.2        | 2         | -46.2  | -4.4  |
| 2.46295                           | 12.2  | 16.4      | -6.2        | 2         | -46.2  | -4.4  |
| 2.463                             | 12.2  | 16.4      | -6.2        | 2         | -46.2  | -4.4  |
| 2.46305                           | 12.1  | 16.4      | -6.3        | 2         | -46.3  | -4.5  |
| 2.4631                            | 12    | 16.4      | -6.4        | 2         | -46.4  | -4.6  |
| 2.46315                           | 11.9  | 16.4      | -6.5        | 2         | -46.5  | -4.7  |
| 2.4632                            | 11.9  | 16.4      | -6.5        | 2         | -46.5  | -4.7  |
| 2.46325                           | 11.8  | 16.4      | -6.6        | 2         | -46.6  | -4.8  |
| 2.4633                            | 11.8  | 16.4      | -6.6        | 2         | -46.6  | -4.8  |
| 2.46335                           | 11.7  | 16.4      | -6.7        | 2         | -46.7  | -4.9  |
| 2.4634                            | 11.8  | 16.4      | -6.6        | 2         | -46.6  | -4.8  |
| 2.46345                           | 11.8  | 16.4      | -6.6        | 2         | -46.6  | -4.8  |
| 2.4635                            | 11.9  | 16.4      | -6.5        | 2         | -46.5  | -4.7  |
| 2.46355                           | 11.9  | 16.4      | -6.5        | 2         | -46.5  | -4.7  |
| 2.4636                            | 12    | 16.4      | -6.4        | 2         | -46.4  | -4.6  |
| 2.46365                           | 12    | 16.4      | -6.4        | 2         | -46.4  | -4.6  |
| 2.4637                            | 12.1  | 16.4      | -6.3        | 2         | -46.3  | -4.5  |
| 2.46375                           | 12.1  | 16.4      | -6.3        | 2         | -46.3  | -4.5  |
| 2.4638                            | 12    | 16.4      | -6.4        | 2         | -46.4  | -4.6  |
| 2.46385                           | 12    | 16.4      | -6.4        | 2         | -46.4  | -4.6  |
| 2.4639                            | 11.9  | 16.4      | -6.5        | 2         | -46.5  | -4.7  |
| 2.46395                           | 11.8  | 16.4      | -6.6        | 2         | -46.6  | -4.8  |
| 2.464                             | 11.8  | 16.4      | -6.6        | 2         | -46.6  | -4.8  |
| 2.46405                           | 11.8  | 16.4      | -6.6        | 2         | -46.6  | -4.8  |
| 2.4641                            | 11.8  | 16.4      | -6.6        | 2         | -46.6  | -4.8  |
| 2.46415                           | 11.8  | 16.4      | -6.6        | 2         | -46.6  | -4.8  |
| 2.4642                            | 11.9  | 16.4      | -6.5        | 2         | -46.5  | -4.7  |
| 2.46425                           | 12    | 16.4      | -6.4        | 2         | -46.4  | -4.6  |
| 2.4643                            | 12.1  | 16.4      | -6.3        | 2         | -46.3  | -4.5  |
| 2.46435                           | 12.2  | 16.4      | -6.2        | 2         | -46.2  | -4.4  |
| 4.4644                            | 12.2  | 16.4      | -6.2        | 2         | -46.2  | -4.4  |
| 2.46445                           | 12.2  | 16.4      | -6.2        | 2         | -46.2  | -4.4  |
| 2.4645                            | 12.2  | 16.4      | -6.2        | 2         | -46.2  | -4.4  |
| Processing Gain : 12 dB           |       |           |             |           |        |       |



| 2Mbps CHANNEL 6 Processing Gain |       |           |             |           |        |       |
|---------------------------------|-------|-----------|-------------|-----------|--------|-------|
| $G_p = (S/N)_o + M_j + L_{sys}$ |       |           |             |           |        |       |
| Freq.                           | $G_p$ | $(S/N)_o$ | $M_j = J/S$ | $L_{sys}$ | Jammer | LVL   |
| (GHz)                           | (dB)  | (dB)      | (dB)        | (dB)      | (dBm)  | (dBm) |
| 2.4345                          | 12.1  | 13.3      | -3.2        | 2         | -43.2  | 0.5   |
| 2.43455                         | 12.7  | 13.3      | -2.6        | 2         | -42.6  | 1.1   |
| 2.4346                          | 12.9  | 13.3      | -2.4        | 2         | -42.4  | 1.3   |
| 2.43465                         | 13    | 13.3      | -2.3        | 2         | -42.3  | 1.4   |
| 2.4347                          | 13    | 13.3      | -2.3        | 2         | -42.3  | 1.4   |
| 2.43475                         | 12.9  | 13.3      | -2.4        | 2         | -42.4  | 1.3   |
| 2.4348                          | 13.1  | 13.3      | -2.2        | 2         | -42.2  | 1.5   |
| 2.43485                         | 12.4  | 13.3      | -2.9        | 2         | -42.9  | 0.8   |
| 2.4349                          | 12.1  | 13.3      | -3.2        | 2         | -43.2  | 0.5   |
| 2.43495                         | 12.6  | 13.3      | -2.7        | 2         | -42.7  | 1     |
| 2.435                           | 12.6  | 13.3      | -2.7        | 2         | -42.7  | 1     |
| 2.43505                         | 12.5  | 13.3      | -2.8        | 2         | -42.8  | 0.9   |
| 2.4351                          | 12.4  | 13.3      | -2.9        | 2         | -42.9  | 0.8   |
| 2.43515                         | 12.4  | 13.3      | -2.9        | 2         | -42.9  | 0.8   |
| 2.4352                          | 12.2  | 13.3      | -3.1        | 2         | -43.1  | 0.6   |
| 2.43525                         | 12.2  | 13.3      | -3.1        | 2         | -43.7  | 0.6   |
| 2.4353                          | 12.3  | 13.3      | -3          | 2         | -43    | 0.7   |
| 2.43535                         | 11.9  | 13.3      | -3.4        | 2         | -43.4  | 0.3   |
| 2.4354                          | 11.5  | 13.3      | -3.8        | 2         | -43.8  | -0.1  |
| 2.43545                         | 12.1  | 13.3      | -3.2        | 2         | -43.2  | 0.5   |
| 2.4355                          | 11.5  | 13.3      | -3.8        | 2         | -43.8  | -0.1  |
| 2.43555                         | 12.4  | 13.3      | -2.9        | 2         | -42.9  | 0.8   |
| 2.4356                          | 12.7  | 13.3      | -2.6        | 2         | -42.6  | 1.1   |
| 2.43565                         | 12.9  | 13.3      | -2.4        | 2         | -42.4  | 1.3   |
| 2.4357                          | 12.8  | 13.3      | -2.5        | 2         | -42.5  | 1.2   |
| 5.43575                         | 12.8  | 13.3      | -2.5        | 2         | -42.5  | 1.2   |
| 2.4358                          | 12.9  | 13.3      | -2.4        | 2         | -42.4  | 1.3   |
| 2.43585                         | 12.1  | 13.3      | -3.2        | 2         | -43.2  | 0.5   |
| 2.4359                          | 11.7  | 13.3      | -3.6        | 2         | -43.6  | 0.1   |
| 2.43595                         | 12.4  | 13.3      | -2.9        | 2         | -42.9  | 0.8   |
| 2.436                           | 12.5  | 13.3      | -2.8        | 2         | -42.8  | 0.9   |
| 2.43605                         | 12.5  | 13.3      | -2.8        | 2         | -42.8  | 0.9   |
| 2.4361                          | 12.4  | 13.3      | -2.9        | 2         | -42.9  | 0.8   |
| 2.43615                         | 12.4  | 13.3      | -2.9        | 2         | -42.9  | 0.8   |



| 2Mbps CHANNEL 6 Processing Gain |       |           |             |           |        |       |
|---------------------------------|-------|-----------|-------------|-----------|--------|-------|
| $G_p = (S/N)_o + M_j + L_{sys}$ |       |           |             |           |        |       |
| Freq.                           | $G_p$ | $(S/N)_o$ | $M_j = J/S$ | $L_{sys}$ | Jammer | LVL   |
| (GHz)                           | (dB)  | (dB)      | (dB)        | (dB)      | (dBm)  | (dBm) |
| 2.4362                          | 12.1  | 13.3      | -3.2        | 2         | -43.2  | 0.5   |
| 2.43625                         | 12.1  | 13.3      | -3.2        | 2         | -43.2  | 0.5   |
| 2.4363                          | 12.1  | 13.3      | -3.2        | 2         | -43.2  | 0.5   |
| 2.43635                         | 11.5  | 13.3      | -3.8        | 2         | -43.8  | -0.1  |
| 2.4364                          | 11.1  | 13.3      | -4.2        | 2         | -44.2  | -0.5  |
| 2.43645                         | 11.7  | 13.3      | -3.6        | 2         | -43.6  | 0.1   |
| 2.4365                          | 11.2  | 13.3      | -4.1        | 2         | -44.1  | -0.4  |
| 2.43655                         | 12.6  | 13.3      | -2.7        | 2         | -42.7  | 1     |
| 2.4366                          | 13.1  | 13.3      | -2.2        | 2         | -42.2  | 1.5   |
| 2.43665                         | 13.7  | 13.3      | -1.6        | 2         | -41.6  | 2.1   |
| 2.4367                          | 14.1  | 13.3      | -1.2        | 2         | -41.2  | 2.5   |
| 2.43675                         | 15.1  | 13.3      | -0.2        | 2         | -40.2  | 3.5   |
| 2.4368                          | 15.7  | 13.3      | 0.4         | 2         | -39.6  | 4.1   |
| 2.43685                         | 16.2  | 13.3      | 0.9         | 2         | -39.1  | 4.6   |
| 2.4369                          | 16.1  | 13.3      | 0.8         | 2         | -39.2  | 4.5   |
| 2.43695                         | 16.3  | 13.3      | 1           | 2         | -39    | 4.7   |
| 2.437                           | 16.6  | 13.3      | 1.3         | 2         | -38.7  | 5     |
| 2.43705                         | 16.3  | 13.3      | 1           | 2         | -39    | 4.7   |
| 2.4371                          | 16.3  | 13.3      | 1           | 2         | -39    | 4.7   |
| 2.43715                         | 16    | 13.3      | 0.7         | 2         | -39.3  | 4.4   |
| 2.4372                          | 15.5  | 13.3      | 0.2         | 2         | -39.8  | 3.9   |
| 2.43725                         | 14.8  | 13.3      | -0.5        | 2         | -40.5  | 3.2   |
| 2.4373                          | 14    | 13.3      | -1.3        | 2         | -41.3  | 2.4   |
| 2.43735                         | 13.5  | 13.3      | -1.8        | 2         | -41.8  | 1.9   |
| 2.4374                          | 12.7  | 13.3      | -2.6        | 2         | -42.6  | 1.1   |
| 2.43745                         | 12.6  | 13.3      | -2.7        | 2         | -42.7  | 1     |
| 2.4375                          | 11.6  | 13.3      | -3.7        | 2         | -43.7  | 0     |
| 2.43755                         | 12.1  | 13.3      | -3.2        | 2         | -43.2  | 0.5   |
| 2.4376                          | 12.1  | 13.3      | -3.2        | 2         | -43.2  | 0.5   |
| 2.43765                         | 12.1  | 13.3      | -3.2        | 2         | -43.2  | 0.5   |
| 2.4377                          | 12    | 13.3      | -3.3        | 2         | -43.3  | 0.4   |
| 2.43775                         | 11.7  | 13.3      | -3.6        | 2         | -43.6  | 0.1   |
| 2.4378                          | 12    | 13.3      | -3.3        | 2         | -43.3  | 0.4   |
| 2.43785                         | 11.1  | 13.3      | -4.2        | 2         | -44.2  | -0.5  |



| 2Mbps CHANNEL 6 Processing Gain |       |           |             |           |        |       |
|---------------------------------|-------|-----------|-------------|-----------|--------|-------|
| $G_p = (S/N)_o + M_j + L_{sys}$ |       |           |             |           |        |       |
| Freq.                           | $G_p$ | $(S/N)_o$ | $M_j = J/S$ | $L_{sys}$ | Jammer | LVL   |
| (GHz)                           | (dB)  | (dB)      | (dB)        | (dB)      | (dBm)  | (dBm) |
| 2.4379                          | 11.2  | 13.3      | -4.1        | 2         | -44.1  | -0.4  |
| 2.43795                         | 12.1  | 13.3      | -3.2        | 2         | -43.2  | 0.5   |
| 2.438                           | 12.5  | 13.3      | -2.8        | 2         | -42.8  | 0.9   |
| 2.43805                         | 12.7  | 13.3      | -2.6        | 2         | -42.6  | 1.1   |
| 2.4381                          | 12.8  | 13.3      | -2.5        | 2         | -42.5  | 1.2   |
| 2.43815                         | 12.9  | 13.3      | -2.4        | 2         | -42.4  | 1.3   |
| 2.4382                          | 12.9  | 13.3      | -2.4        | 2         | -42.4  | 1.3   |
| 2.43825                         | 12.9  | 13.3      | -2.4        | 2         | -42.4  | 1.3   |
| 2.4383                          | 12.8  | 13.3      | -2.5        | 2         | -42.5  | 1.2   |
| 2.43835                         | 12.6  | 13.3      | -2.7        | 2         | -42.7  | 1     |
| 2.4384                          | 12    | 13.3      | -3.3        | 2         | -43.3  | 0.4   |
| 2.43845                         | 12.4  | 13.3      | -2.9        | 2         | -42.9  | 0.8   |
| 2.4385                          | 11.7  | 13.3      | -3.6        | 2         | -43.6  | 0.1   |
| 2.43855                         | 12.3  | 13.3      | -3          | 2         | -43    | 0.7   |
| 2.4386                          | 12.3  | 13.3      | -3          | 2         | -43    | 0.7   |
| 2.43865                         | 12.3  | 13.3      | -3          | 2         | -43    | 0.7   |
| 2.4387                          | 12.2  | 13.3      | -3.1        | 2         | -43.1  | 0.6   |
| 2.43875                         | 12    | 13.3      | -3.3        | 2         | -43.3  | 0.4   |
| 2.4388                          | 12.3  | 13.3      | -3          | 2         | -43    | 0.7   |
| 2.43885                         | 11.6  | 13.3      | -3.7        | 2         | -43.7  | 0     |
| 2.4389                          | 11.6  | 13.3      | -3.7        | 2         | -43.7  | 0     |
| 2.43895                         | 12.4  | 13.3      | -2.9        | 2         | -42.9  | 0.8   |
| 2.439                           | 12.7  | 13.3      | -2.6        | 2         | -42.6  | 1.1   |
| 2.43905                         | 12.7  | 13.3      | -2.6        | 2         | -42.6  | 1.1   |
| 2.4391                          | 12.8  | 13.3      | -2.5        | 2         | -42.5  | 1.2   |
| 2.43915                         | 12.9  | 13.3      | -2.4        | 2         | -42.4  | 1.3   |
| 2.4392                          | 12.8  | 13.3      | -2.5        | 2         | -42.5  | 1.2   |
| 2.43925                         | 12.9  | 13.3      | -2.4        | 2         | -42.4  | 1.3   |
| 2.4393                          | 12.8  | 13.3      | -2.5        | 2         | -42.5  | 1.2   |
| 2.43935                         | 12.6  | 13.3      | -2.7        | 2         | -42.7  | 1     |
| 2.4394                          | 12.3  | 13.3      | -3          | 2         | -43    | 0.7   |
| 2.43945                         | 12.5  | 13.3      | -2.8        | 2         | -42.8  | 0.9   |
| 2.4395                          | 12    | 13.3      | -3.3        | 2         | -43.3  | 0.4   |
| Processing Gain : 12.5 dB       |       |           |             |           |        |       |



## 7 ANTENNA REQUIREMENT

### 7.1 Standard Applicable

For intentional device, according to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to § 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 7.2 Antenna Connected Construction

The antenna connector used here in this product is reverse SMA, which is not a standard type connector.

## 8 EUT PHOTOS

