



## **FCC 47 CFR PART 15 Subpart C**

### **TEST REPORT**

**For**

**2 way RF Docking Station**

**Model Number: DSS 1001/00**

**Trade Name: Philips**

*Issued to*

**Philips Electronics Singapore Pte. Ltd.  
BU Peripheral & Accessories - LoB Home Control, 620A Lorong 1,  
Toa Payoh, TP1 Building, Level 2, Singapore 319762**

*Issued by*



**Compliance Certification Services Inc.  
No. 81-1, Lane 210, Bade Rd. 2, Luchu Hsiang,  
Taoyuan Hsien, (338) Taiwan, R.O.C.  
<http://www.ccsemc.com.tw>  
[service@tw.ccsemc.com](mailto:service@tw.ccsemc.com)**



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## 1. TEST RESULT CERTIFICATION

**Applicant:** Philips Electronics Singapore Pte. Ltd.  
BU Peripheral & Accessories - LoB Home Control, 620A Lorong 1,  
Toa Payoh, TP1 Building, Level 2, Singapore 319762

**Equipment Under Test:** 2 way RF Docking Station

**Trade Name:** Philips

**Model Number:** DSS 1001/00

**Date of Test:** July 25 ~ 26, 2007

| APPLICABLE STANDARDS         |                         |
|------------------------------|-------------------------|
| STANDARD                     | TEST RESULT             |
| FCC 47 CFR Part 15 Subpart C | No non-compliance noted |

### We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements emission limits of FCC Rules Part 15.107, 15.109, 15.207, 15.209 and 15.249.

The test results of this report relate only to the tested sample identified in this report.

*Approved by:*

*Reviewed by:*

S.C Wang  
Executive Vice President  
Compliance Certification Services Inc.

Miller Lee  
Deputy Manager  
Compliance Certification Services Inc.



## 2. EUT DESCRIPTION

|                             |  |
|-----------------------------|--|
| <b>Product</b>              | 2 way RF Docking Station   |
| <b>Trade Name</b>           | Philips  |
| <b>Model Number</b>         | DSS 1001/00  |
| <b>Model Discrepancy</b>    | N/A  |
| <b>Power Supply</b>         | Docking: from AC Adapter<br>Trade Name: Airline; Model number: EUDF+15120-1250<br>I/P: 100-240VAC, 50/60Hz;<br>O/P: 12VDCm 1.25A |
| <b>Frequency Range</b>      | 2400 ~ 2483.5MHz   |
| <b>Output Power</b>         | 90.36dBuV/m (Max)  |
| <b>Modulation Technique</b> | DSSS   |
| <b>Number of Channels</b>   | 4 Channel: CH 11, CH 15, CH 21, CH 25  |
| <b>Antenna Gain</b>         | -1.0dBi  |
| <b>Antenna Designation</b>  | PCB Antenna  |

**Remark:**

- 1. The sample selected for test was production product and was provided by manufacturer.*
- 2. This submittal(s) (test report) is intended for FCC ID: RCSDSS1001 filing to comply with Section 15.107 & 15.109 (FCC Part 15, Subpart B) and Section 15.207, 15.209, 15.249 (FCC Part 15, Subpart C Rules.)*



### **3. TEST METHODOLOGY**

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.249.

#### **3.1 EUT CONFIGURATION**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

#### **3.2 EUT EXERCISE**

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.107 and 15.109 under the FCC Rules Part 15 Subpart B and Section 15.207, 15.209, 15.249 under the FCC Rules Part 15 Subpart C.

#### **3.3 GENERAL TEST PROCEDURES**

##### **Conducted Emissions**

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

##### **Radiated Emissions**

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4.



### 3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

- (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| MHz                        | MHz                 | MHz             | GHz              |
|----------------------------|---------------------|-----------------|------------------|
| 0.090 - 0.110              | 16.42 - 16.423      | 399.9 - 410     | 4.5 - 5.15       |
| <sup>1</sup> 0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614       | 5.35 - 5.46      |
| 2.1735 - 2.1905            | 16.80425 - 16.80475 | 960 - 1240      | 7.25 - 7.75      |
| 4.125 - 4.128              | 25.5 - 25.67        | 1300 - 1427     | 8.025 - 8.5      |
| 4.17725 - 4.17775          | 37.5 - 38.25        | 1435 - 1626.5   | 9.0 - 9.2        |
| 4.20725 - 4.20775          | 73 - 74.6           | 1645.5 - 1646.5 | 9.3 - 9.5        |
| 6.215 - 6.218              | 74.8 - 75.2         | 1660 - 1710     | 10.6 - 12.7      |
| 6.26775 - 6.26825          | 108 - 121.94        | 1718.8 - 1722.2 | 13.25 - 13.4     |
| 6.31175 - 6.31225          | 123 - 138           | 2200 - 2300     | 14.47 - 14.5     |
| 8.291 - 8.294              | 149.9 - 150.05      | 2310 - 2390     | 15.35 - 16.2     |
| 8.362 - 8.366              | 156.52475 -         | 2483.5 - 2500   | 17.7 - 21.4      |
| 8.37625 - 8.38675          | 156.52525           | 2655 - 2900     | 22.01 - 23.12    |
| 8.41425 - 8.41475          | 156.7 - 156.9       | 3260 - 3267     | 23.6 - 24.0      |
| 12.29 - 12.293             | 162.0125 - 167.17   | 3332 - 3339     | 31.2 - 31.8      |
| 12.51975 - 12.52025        | 167.72 - 173.2      | 3345.8 - 3358   | 36.43 - 36.5     |
| 12.57675 - 12.57725        | 240 - 285           | 3600 - 4400     | ( <sup>2</sup> ) |
| 13.36 - 13.41              | 322 - 335.4         |                 |                  |

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

- (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



### **3.5 DESCRIPTION OF TEST MODES**

The EUT (model: DSS 1001/00) had been tested under operating condition.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in normal link mode only, and powerline conducted emission below 30MHz, which worst case was in normal link mode with charging only.

Channel Low (2405MHz), Channel Mid (2425MHz) and Channel High (2478MHz) were chosen for the final testing.



## 4. INSTRUMENT CALIBRATION

### 4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

### 4.2 MEASUREMENT EQUIPMENT USED

#### Equipment Used for Emissions Measurement

*Remark: Each piece of equipment is scheduled for calibration once a year.*

| 3M Semi Anechoic Chamber |  |         |               |                 |
|--------------------------|--|---------|---------------|-----------------|
| Name of Equipment        | Manufacturer                                 | Model   | Serial Number | Calibration Due |
| Spectrum Analyzer        | R&S  | FSP30   | 100112        | 10/10/2007      |
| Pre-Amplifier            | Anritsu                                      | MH648A  | M89145        | 07/20/2008      |
| Pre-Amplifier            | Agilent                                      | 8449B   | 3008A01738    | 04/11/2008      |
| Bilog Antenna            | FRANKONIA                                    | BTA-M   | 030003M       | N.C.R           |
| Horn Antenna             | EMCO   | 3115    | 00022257      | 12/18/2007      |
| Antenna Tower            | HD   | AS620E  | N/A           | N.C.R           |
| Controller               | HD   | HD100   | N/A           | N.C.R           |
| Turn Table               | HD   | DT-K312 | N/A           | N.C.R           |
| Test S/W                 | LabVIEW 6.1 (Wugu Chamber EMI Teat V1_4.5.3) |         |               |                 |

*Remark: The measurement uncertainty is less than  $\pm 2.0065\text{dB}$  (30MHz ~ 1GHz),  $\pm 3.0958\text{dB}$  (Above 1GHz) which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.*





| Open Area Test Site # 3 |                                    |           |               |                 |
|-------------------------|------------------------------------|-----------|---------------|-----------------|
| Name of Equipment       | Manufacturer                       | Model     | Serial Number | Calibration Due |
| Spectrum Analyzer       | Agilnet                            | E4411B    | MY41440314    | N.C.R           |
| Spectrum Analyzer       | R&S                                | FSP30     | 100112        | 10/10/2007      |
| EMI Test Receiver       | R&S                                | ESVS30    | 828488/004    | 03/12/2008      |
| Pre-Amplifier           | Anritsu                            | MH648A    | M18767        | 08/31/2007      |
| Pre-Amplifier           | Agilent                            | 8449B     | 3008A01738    | 04/11/2008      |
| Bilog Antenna           | SCHWAZBECK                         | VULB9163  | 144           | 03/30/2008      |
| Horn Antenna            | EMCO                               | 3115      | 00022250      | 05/03/2008      |
| Loop Antenna            | EMCO                               | 6502      | 2356          | 06/02/2008      |
| Turn Table              | Chance Most                        | CM-T003-1 | T807-6        | N.C.R           |
| Antenna Tower           | Chance Most                        | CM-A003-1 | A807-6        | N.C.R           |
| Controller              | CCS                                | CC-C-1F   | N/A           | N.C.R           |
| RF Switch               | ANRITSU                            | MP59B     | M53867        | N.C.R           |
| Site NSA                | CCS                                | N/A       | N/A           | 05/18/2008      |
| Test S/W                | LabVIEW 6.1 (CCS OATS EMI SW V2.6) |           |               |                 |

**Remark:** The measurement uncertainty is less than +/- 4.0235dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.

| Powerline Conducted Emissions Test Site |   |                         |               |                 |
|---|---|-------------------------|---------------|-----------------|
| Name of Equipment                       | Manufacturer                                    | Model                   | Serial Number | Calibration Due |
| EMI Test Receiver                       | SCHAFFNER                                       | SCR 3501                | 410           | 12/12/2007      |
| LISN                                    | FCC   | FCC-LISN-50/250-16-2-07 | 06013         | 10/08/2007      |
| LISN                                    | FCC   | FCC-LISN-50/250-16-2-07 | 06012         | 10/08/2007      |
| Test S/W                                | LabVIEW 6.1 (CCS Conduction Test SW Version_01) |                         |               |                 |

**Remark:** The measurement uncertainty is less than +/- 1.9802dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.



## **5. FACILITIES AND ACCREDITATIONS**

### **5.1 FACILITIES**

All measurement facilities used to collect the measurement data are located at

☐ No. 199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☐ No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

☒ No.81-1, Lane 210, Bade 2nd Rd., Luchu Hsiang, Taoyuan Hsien 338, Taiwan

Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

### **5.2 EQUIPMENT**

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.






All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."



### 5.3 TABLE OF ACCREDITATIONS AND LISTINGS

The test facilities used to perform Electromagnetic compatibility tests are registered or accredited by the organizations listed in the following table which includes the recognized scope specifically.

This accredited organization maintains A2LA accreditation to ISO/IEC 17025 for the specific test listed in A2LA Certificate # 0824-01.

| Country | Agency          | Scope of Accreditation  | Logo   |
|---------|-----------------|---|--|
| USA     | A2LA            | EN 55011, EN 55014-1/2, CISPR 11, CISPR 14-1/2, EN 55022, EN 55015, CISPR 22, CISPR 15, AS/NZS 3548, VCCI V3 (2001), CFR 47, FCC Part 15/18, CNS 13783-1, CNS 13439, CNS 13438, CNS 13803, CNS 14115, EN 55024, IEC 801-2, IEC 801-3, IEC 801-4, IEC/EN 61000-3-2, IEC/EN 61000-3-3, IEC/EN 61000-4-2/3/4/5/6/8/11, EN 50081-1/EN 61000-6-3, EN 50081-2/EN 61000-6-4, EN 50081-2/EN 61000-6-1: 2001 | <br>ACCREDITED<br>No. 0824-01   |
| USA     | FCC             | 3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements  | <br>93105, 90471  |
| Japan   | VCCI            | 3/10 meter Open Area Test Sites and conducted test sites to perform radiated/conducted measurements   | <b>VCCI</b><br>R-2541/2316/725/1868<br>C-402/747/912   |
| Norway  | NEMKO           | EN 50081-1/2, EN 50082-1/2, IEC 61000-6-1/2, EN 50091-2, EN 50130-4, EN 55011, EN 55013, EN 55014-1/2, EN 55015, EN 55022, EN 55024, EN 61000-3-2/3, EN 61326-1, IEC 61000-4-2/3/4/5/6/8/11, EN 60601-1-2, EN 300 328-2, EN 300 422-2, EN 301 419-1, EN 301 489-01/03/07/08/09/17, EN 301 419-2/3, EN 300 454-2, EN 301 357-2   | <br>ELA 124a<br>ELA 124b<br>ELA 124c  |
| Taiwan  | TAF             | EN 300 328-1, EN 300 328-2, EN 300 220-1, EN 300 220-2, EN 300 220-3, 47 CFR FCC Part 15 Subpart C, EN 61000-3-2, EN 61000-3-3, CNS 13439, CNS 13783-1, CNS 14115, CNS 13438, AS/NZS CISPR 22, CNS 13022-1, IEC 61000-4-2/3/4/5/6/8/11, CNS 13022-2/3   | <br>Testing Laboratory<br>0363  |
| Taiwan  | BSMI            | CNS 13438, CNS 13783-1, CNS 13439, CNS 14115  | <br>SL2-IS-E-0014 / IN-E-0014<br>/A1-E-0014 /R1-E-0014<br>/R2-E-0014 /L1-E-0014 |
| Canada  | Industry Canada | 3/10 meter Open Area Test Sites (IC 2324C-3, IC 2324C-5) / 3M Semi Anechoic Chamber (IC 6106) to perform RSS 212 Issue 1  | <b>Canada</b><br>IC 2324C-3<br>IC 2324C-5<br>IC 6106   |

\* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.



## 6. SETUP OF EQUIPMENT UNDER TEST

### 6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### 6.2 SUPPORT EQUIPMENT

| No. | Device Type | Brand | Model | Series No. | FCC ID  | Data Cable | Power Cord |
|-----|-------------|-------|-------|------------|---------|------------|------------|
| 1.  | I-Pod       | Apple | A1136 | N/A        | FCC DoC | N/A        | N/A        |

**Remark:** *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*



## 7. FCC PART 15.249 REQUIREMENTS

### 7.1 BAND EDGES MEASUREMENT

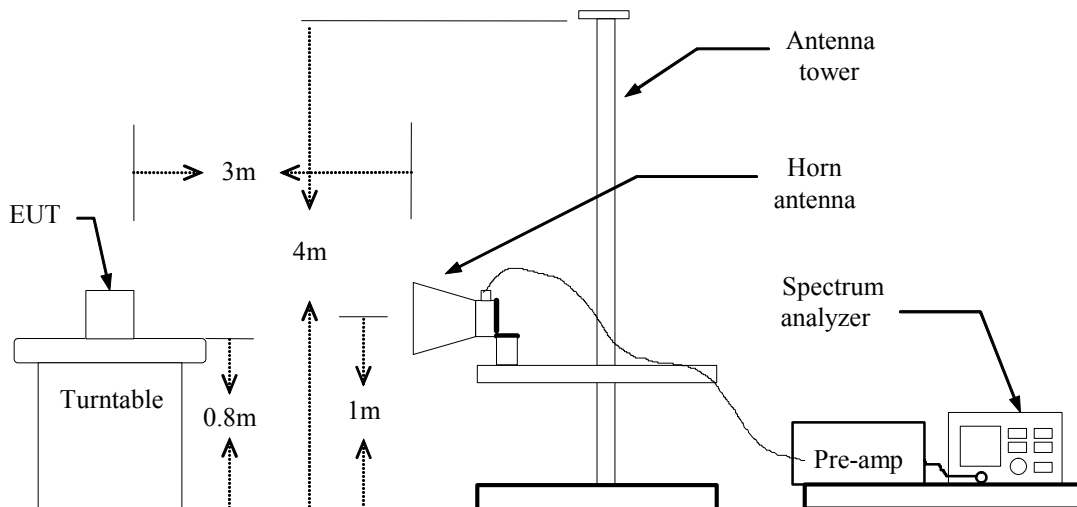
#### LIMIT

1. In the above emission table, the tighter limit applies at the band edges.

| Frequency<br>(MHz) | Field Strength<br>( $\mu$ V/m at 3-meter) | Field Strength<br>(dB $\mu$ V/m at 3-meter) |
|--------------------|---|---|
| 30-88              | 100                                       | 40  |
| 88-216             | 150                                       | 43.5  |
| 216-960            | 200                                       | 46  |
| Above 960          | 500                                       | 54  |

2. As shown in Section 15.35(b), for frequencies above 1000 MHz, the above field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

## Test Configuration



## TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
  - (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
  - (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

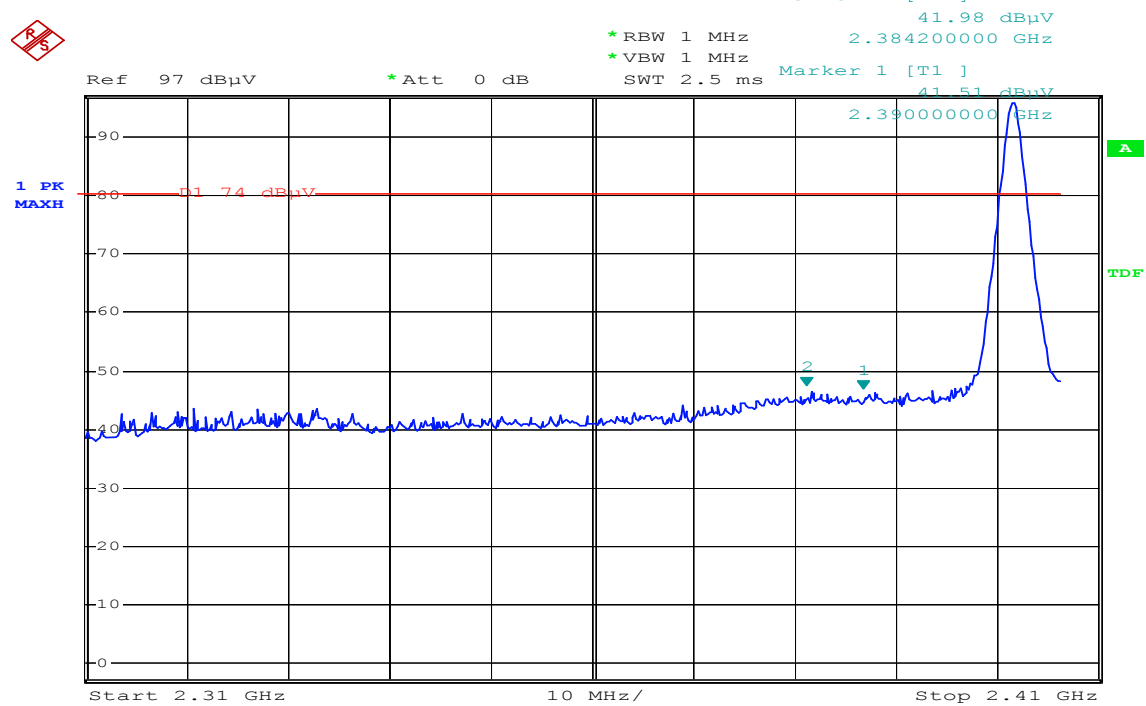


## TEST RESULTS

### Band Edges (CH Low)

Detector mode: Peak

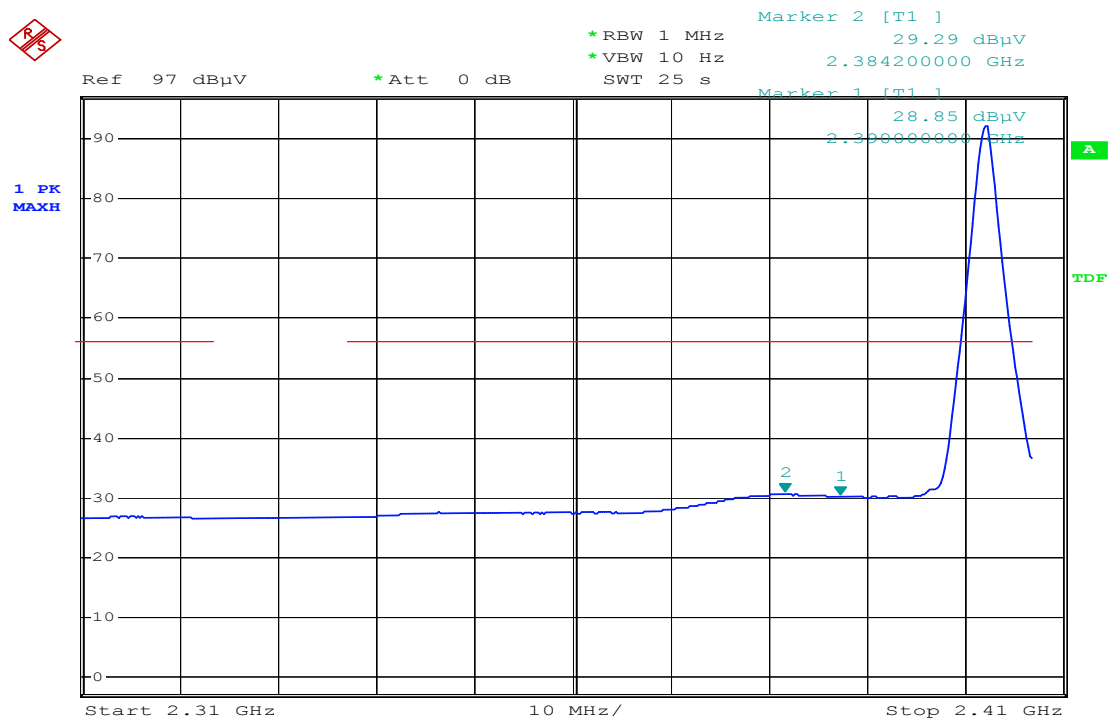
Polarity: Vertical



Date: 25.JUL.2007 15:41:22

Detector mode: Average

Polarity: Vertical

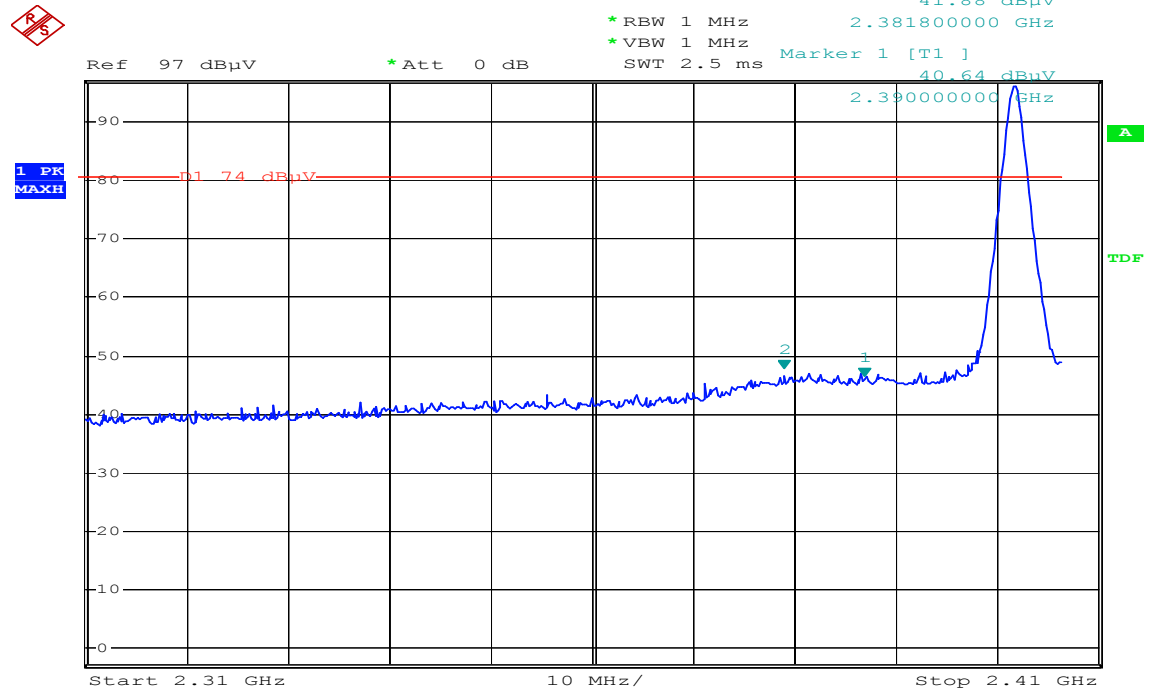


Date: 25.JUL.2007 15:42:06



Detector mode: Peak

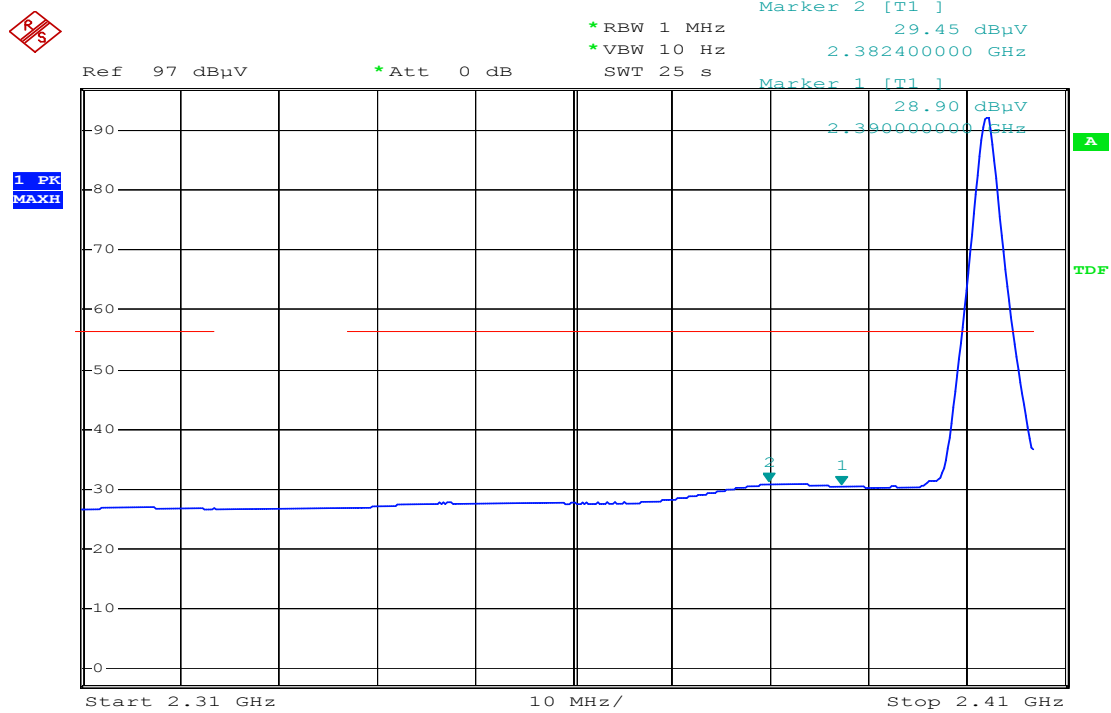
Polarity: Horizontal



Date: 25.JUL.2007 15:38:07

Detector mode: Average

Polarity: Horizontal



Date: 25.JUL.2007 15:39:19

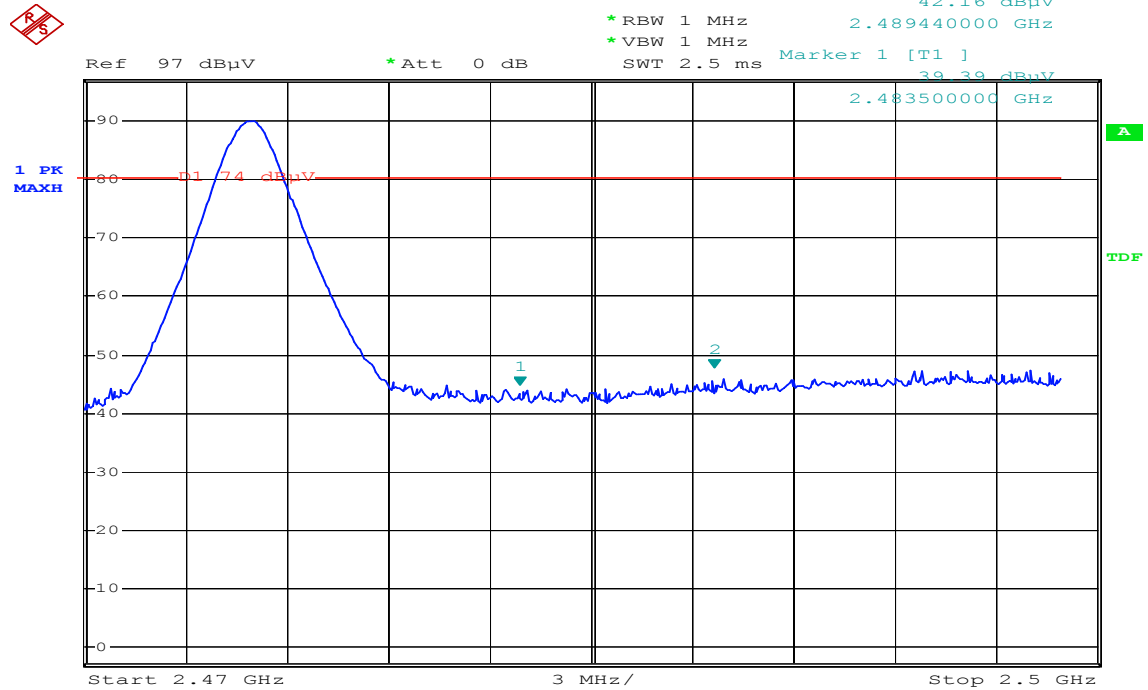




## Band Edges (CH High)

Detector mode: Peak

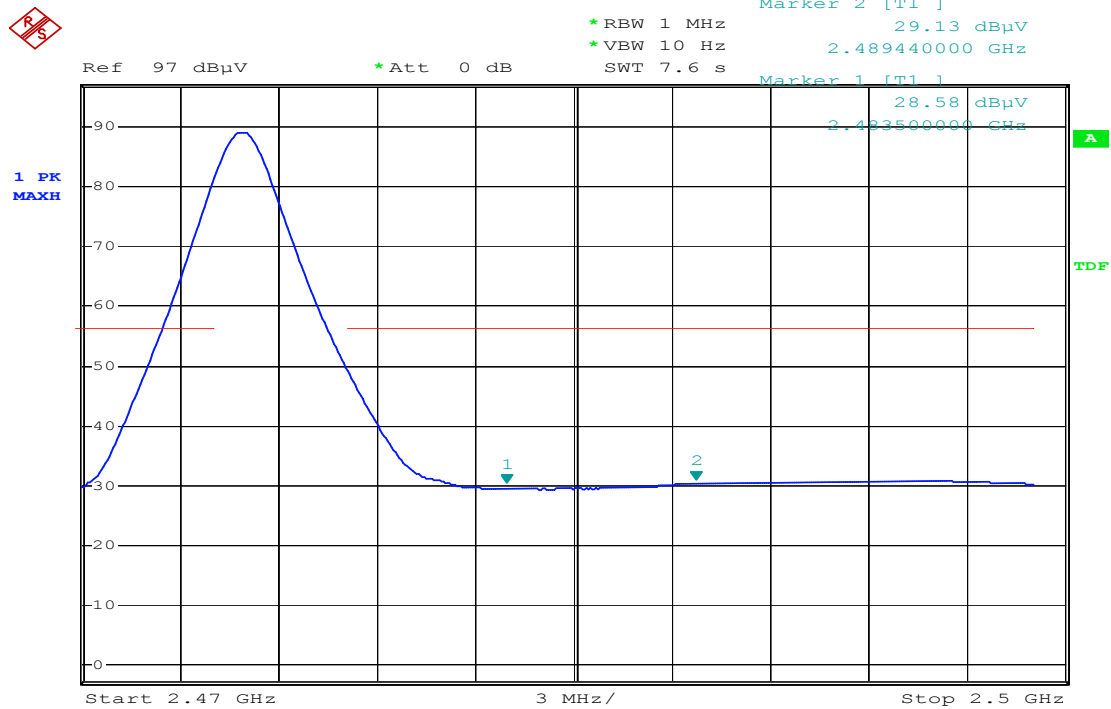
Polarity: Vertical



Date: 25.JUL.2007 15:48:04

Detector mode: Average

Polarity: Vertical

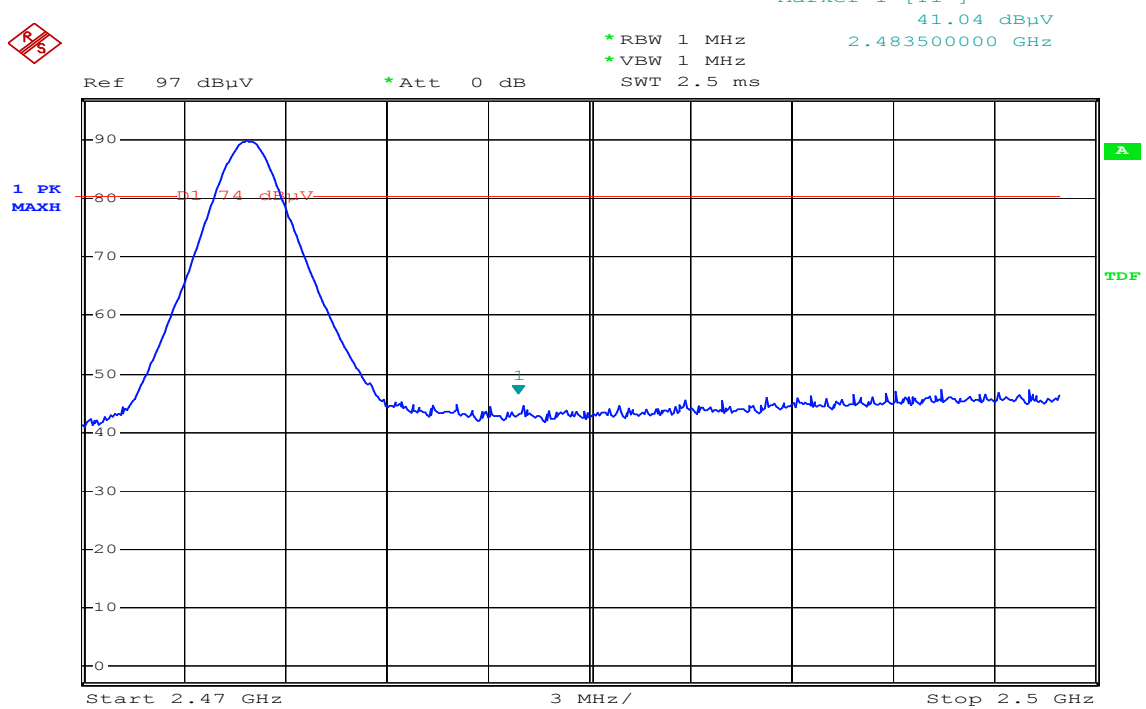


Date: 25.JUL.2007 15:48:35



Detector mode: Peak

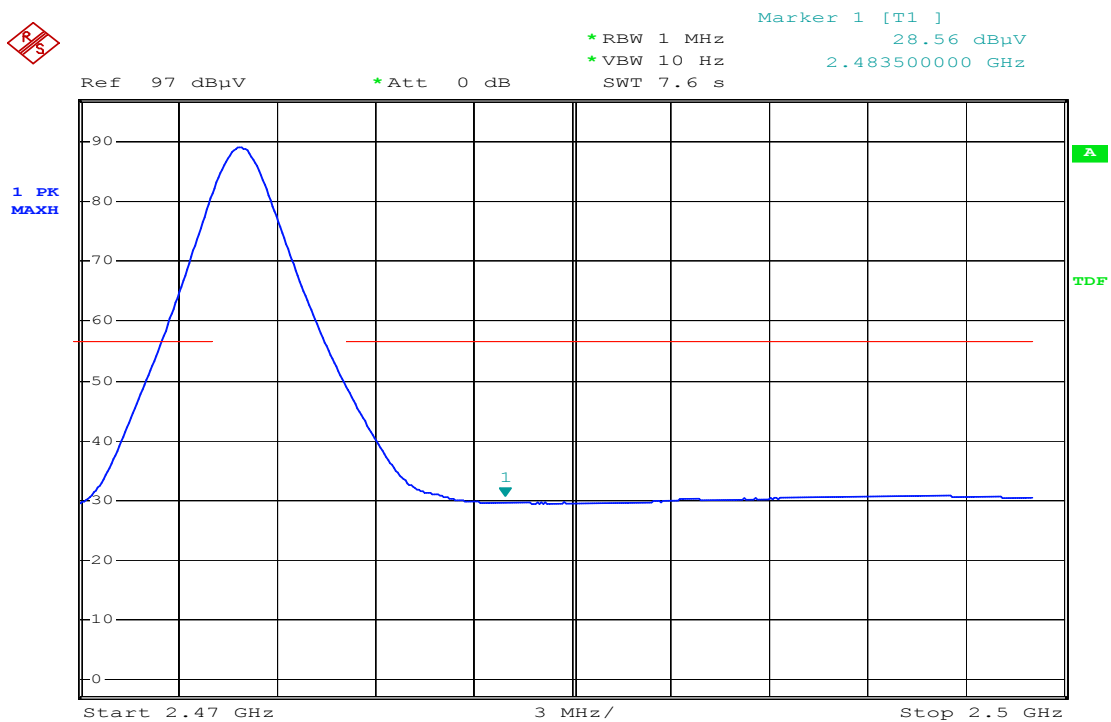
Polarity: Horizontal



Date: 25.JUL.2007 15:51:13

Detector mode: Average

Polarity: Horizontal



Date: 25.JUL.2007 15:51:50



## 7.2 SPURIOUS EMISSION

### LIMIT

1. In the section 15.249(a):

Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Fundamental Frequency (MHz) | Field Strength of Fundamental Field Strength (mV/m) | Field Strength of Harmonics (μV/m) |
|-----------------------------|---|------------------------------------|
| 902-928 MHz                 | 50  | 500                                |
| 2400 - 2483.5 MHz           | 50  | 500                                |
| 5725 - 5875 MHz             | 50  | 500                                |
| 24.0 - 24.25 GHz            | 250   | 2500                               |

2. Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field Strength (μV/m) | Measurement Distance (m) |
|-----------------|-----------------------|--------------------------|
| 30-88           | 100*                  | 3                        |
| 88-216          | 150*                  | 3                        |
| 216-960         | 200*                  | 3                        |
| Above 960       | 500                   | 3                        |

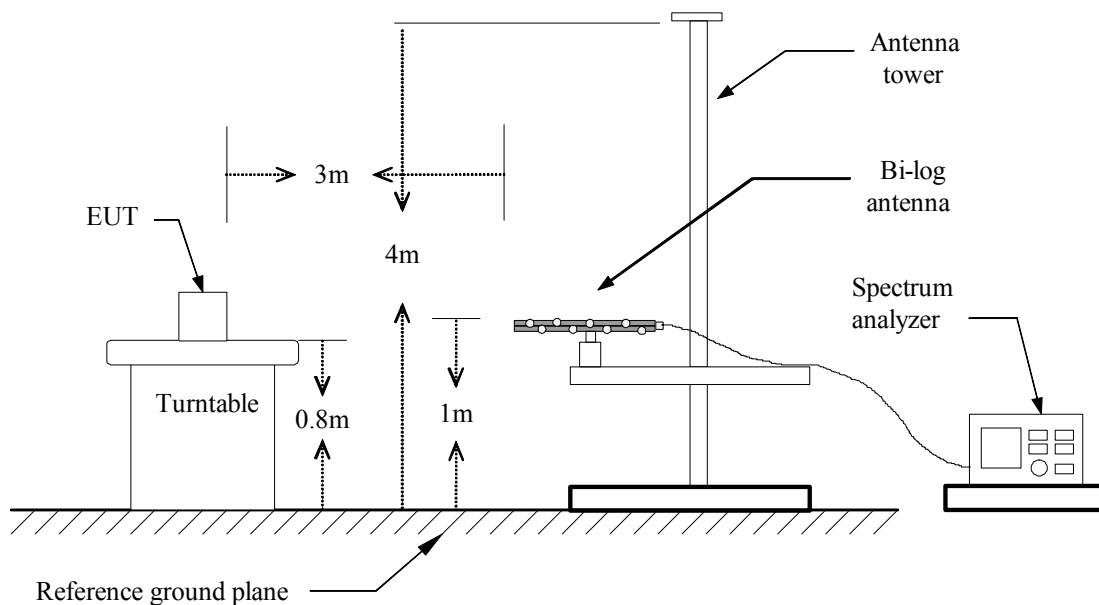
**Remark:** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

3. In the above emission table, the tighter limit applies at the band edges.

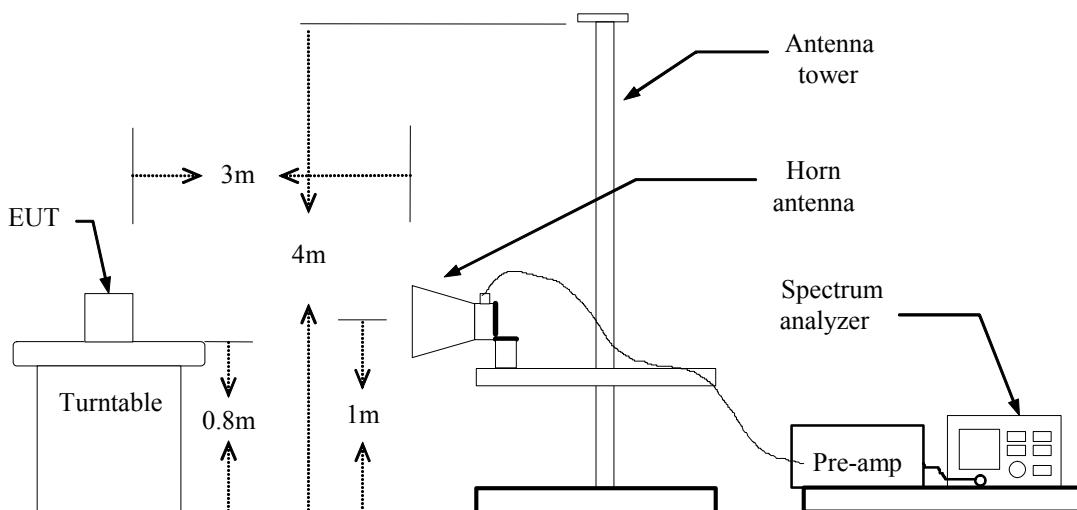
| Frequency (MHz) | Field Strength (μV/m at 3-meter) | Field Strength (dBμV/m at 3-meter) |
|-----------------|----------------------------------|------------------------------------|
| 30-88           | 100                              | 40                                 |
| 88-216          | 150                              | 43.5                               |
| 216-960         | 200                              | 46                                 |
| Above 960       | 500                              | 54                                 |

## Test Configuration

### **Below 1 GHz**



### **Above 1 GHz**





## **TEST PROCEDURE**

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:  
Below 1GHz:  
RBW=100kHz / VBW=300kHz / Sweep=AUTO  
Above 1GHz:  
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO  
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

**TEST RESULTS****Below 1 GHz****Operation Mode:** Normal Link**Test Date:** July 26, 2007**Temperature:** 26°C**Tested by:** Arno Hsieh**Humidity:** 55% RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant.Pol. (H/V) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----------------|----------------|----------------|--------------------------|-----------------|----------------|-------------|--------|
| 57.20           | V              | 9.11           | 13.95                    | 23.05           | 40.00          | -16.95      | Peak   |
| 85.85           | V              | 14.09          | 11.81                    | 25.89           | 40.00          | -14.11      | Peak   |
| 113.58          | V              | 11.67          | 12.81                    | 24.48           | 43.50          | -19.02      | Peak   |
| 163.70          | V              | 14.28          | 10.66                    | 24.94           | 43.50          | -18.56      | Peak   |
| 278.63          | V              | 0.34           | 14.81                    | 15.16           | 46.00          | -30.84      | Peak   |
| 409.20          | V              | -0.73          | 17.87                    | 17.14           | 46.00          | -28.86      | Peak   |
| 57.23           | H              | 10.68          | 13.95                    | 24.62           | 40.00          | -15.38      | Peak   |
| 85.73           | H              | 16.14          | 11.77                    | 27.91           | 40.00          | -12.09      | Peak   |
| 163.65          | H              | 14.22          | 10.65                    | 24.88           | 43.50          | -18.62      | Peak   |
| 245.73          | H              | 3.74           | 14.11                    | 17.84           | 46.00          | -28.16      | Peak   |
| 276.75          | H              | -0.06          | 14.76                    | 14.70           | 46.00          | -31.30      | Peak   |
| 327.70          | H              | 1.93           | 16.15                    | 18.07           | 46.00          | -27.93      | Peak   |

***Remark:***

- 1. Measuring frequencies from 30 MHz to the 1GHz.*
- 2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
- 3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.*

**Above 1 GHz****Operation Mode:** Tx / CH Low**Test Date:** July 25, 2007**Temperature:** 26°C**Tested by:** Arno Hsieh**Humidity:** 55% RH**Polarity:** Ver. / Hor.

| Freq.<br>(MHz) | Ant.<br>Pol<br>H/V | Peak<br>Reading<br>(dBuV) | AV<br>Reading<br>(dBuV) | Ant. / CL<br>CF<br>(dB) | Result           |                | Peak<br>Limit<br>(dBuV/m) | AV<br>Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|----------------|--------------------|---------------------------|-------------------------|-------------------------|------------------|----------------|---------------------------|-------------------------|----------------|--------|
|                |                    |                           |                         |                         | Peak<br>(dBuV/m) | AV<br>(dBuV/m) |                           |                         |                |        |
| 2405.00        | V                  | 95.43                     | 95.33                   | -5.53                   | 89.9             | 89.80          | 113.97                    | 93.97                   | -24.07         | Peak   |
| 1164.00        | V                  | 47.66                     | ---                     | -9.94                   | 37.72            | ---            | 74.00                     | 54.00                   | -16.28         | Peak   |
| 1492.00        | V                  | 46.30                     | ---                     | -8.43                   | 37.88            | ---            | 74.00                     | 54.00                   | -16.12         | Peak   |
| 1528.00        | V                  | 46.87                     | ---                     | -8.23                   | 38.64            | ---            | 74.00                     | 54.00                   | -15.36         | Peak   |
| 1784.00        | V                  | 46.77                     | ---                     | -6.77                   | 40.01            | ---            | 74.00                     | 54.00                   | -13.99         | Peak   |
| 2252.00        | V                  | 45.01                     | ---                     | -4.96                   | 40.05            | ---            | 74.00                     | 54.00                   | -13.95         | Peak   |
| 4810.00        | V                  | 47.57                     | ---                     | 1.84                    | 49.41            | ---            | 74.00                     | 54.00                   | -4.59          | Peak   |
|                |                    |                           |                         |                         |                  |                |                           |                         |                |        |
| 2405.00        | H                  | 95.23                     | 95.03                   | -5.53                   | 89.7             | 89.50          | 113.97                    | 93.97                   | -24.27         | Peak   |
| 1076.00        | H                  | 46.04                     | ---                     | -10.35                  | 35.69            | ---            | 74.00                     | 54.00                   | -18.31         | Peak   |
| 1160.00        | H                  | 49.22                     | ---                     | -9.96                   | 39.26            | ---            | 74.00                     | 54.00                   | -14.74         | Peak   |
| 1244.00        | H                  | 46.34                     | ---                     | -9.57                   | 36.77            | ---            | 74.00                     | 54.00                   | -17.23         | Peak   |
| 1420.00        | H                  | 45.81                     | ---                     | -8.76                   | 37.05            | ---            | 74.00                     | 54.00                   | -16.95         | Peak   |
| 1752.00        | H                  | 45.36                     | ---                     | -6.95                   | 38.42            | ---            | 74.00                     | 54.00                   | -15.58         | Peak   |
| 4810.00        | H                  | 47.11                     | ---                     | 1.84                    | 48.95            | ---            | 74.00                     | 54.00                   | -5.05          | Peak   |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" no emission measured remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** Tx / CH Mid**Test Date:** July 25, 2007**Temperature:** 26°C**Tested by:** Arno Hsieh**Humidity:** 55% RH**Polarity:** Ver. / Hor.

| Freq.<br>(MHz) | Ant.<br>Pol<br>H/V | Peak<br>Reading<br>(dBuV) | AV<br>Reading<br>(dBuV) | Ant. / CL<br>CF<br>(dB) | Result           |                | Peak<br>Limit<br>(dBuV/m) | AV<br>Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|----------------|--------------------|---------------------------|-------------------------|-------------------------|------------------|----------------|---------------------------|-------------------------|----------------|--------|
|                |                    |                           |                         |                         | Peak<br>(dBuV/m) | AV<br>(dBuV/m) |                           |                         |                |        |
| 2425.00        | V                  | 95.5                      | 95.32                   | -5.14                   | 90.36            | 90.18          | 113.97                    | 93.97                   | -23.61         | Peak   |
| 1172.00        | V                  | 52.29                     | ---                     | -9.91                   | 42.38            | ---            | 74.00                     | 54.00                   | -11.62         | Peak   |
| 1248.00        | V                  | 45.81                     | ---                     | -9.55                   | 36.25            | ---            | 74.00                     | 54.00                   | -17.75         | Peak   |
| 1792.00        | V                  | 47.35                     | ---                     | -6.72                   | 40.63            | ---            | 74.00                     | 54.00                   | -13.37         | Peak   |
| 2164.00        | V                  | 44.53                     | ---                     | -5.16                   | 39.37            | ---            | 74.00                     | 54.00                   | -14.63         | Peak   |
| 2316.00        | V                  | 46.51                     | ---                     | -4.82                   | 41.70            | ---            | 74.00                     | 54.00                   | -12.30         | Peak   |
| 2576.00        | V                  | 44.18                     | ---                     | -4.05                   | 40.13            | ---            | 74.00                     | 54.00                   | -13.87         | Peak   |
| 4850.00        | V                  | 48.30                     | ---                     | 1.96                    | 50.26            | ---            | 74.00                     | 54.00                   | -3.74          | Peak   |
| 9950.00        | V                  | 42.15                     | ---                     | 8.18                    | 50.33            | ---            | 74.00                     | 54.00                   | -3.67          | Peak   |
|                |                    |                           |                         |                         |                  |                |                           |                         |                |        |
| 2425.00        | H                  | 94.23                     | 94.02                   | -5.14                   | 89.09            | 88.88          | 113.97                    | 93.97                   | -24.88         | Peak   |
| 1108.00        | H                  | 51.77                     | ---                     | -10.20                  | 41.57            | ---            | 74.00                     | 54.00                   | -12.43         | Peak   |
| 1168.00        | H                  | 48.31                     | ---                     | -9.92                   | 38.38            | ---            | 74.00                     | 54.00                   | -15.62         | Peak   |
| 1348.00        | H                  | 48.29                     | ---                     | -9.09                   | 39.20            | ---            | 74.00                     | 54.00                   | -14.80         | Peak   |
| 1748.00        | H                  | 45.90                     | ---                     | -6.97                   | 38.93            | ---            | 74.00                     | 54.00                   | -15.07         | Peak   |
| 1788.00        | H                  | 45.27                     | ---                     | -6.74                   | 38.52            | ---            | 74.00                     | 54.00                   | -15.48         | Peak   |
| 2576.00        | H                  | 44.60                     | ---                     | -4.05                   | 40.55            | ---            | 74.00                     | 54.00                   | -13.45         | Peak   |
| 4850.00        | H                  | 47.19                     | ---                     | 1.96                    | 49.15            | ---            | 74.00                     | 54.00                   | -4.85          | Peak   |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" no emission measured remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** Tx / CH High**Test Date:** July 25, 2007**Temperature:** 26°C**Tested by:** Arno Hsieh**Humidity:** 55% RH**Polarity:** Ver. / Hor.

| Freq.<br>(MHz) | Ant.<br>Pol<br>H/V | Peak<br>Reading<br>(dBuV) | AV<br>Reading<br>(dBuV) | Ant. / CL<br>CF<br>(dB) | Result           |                | Peak<br>Limit<br>(dBuV/m) | AV<br>Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|----------------|--------------------|---------------------------|-------------------------|-------------------------|------------------|----------------|---------------------------|-------------------------|----------------|--------|
|                |                    |                           |                         |                         | Peak<br>(dBuV/m) | AV<br>(dBuV/m) |                           |                         |                |        |
| 2475.00        | V                  | 93.74                     | 93.42                   | -4.57                   | 89.17            | 88.85          | 113.97                    | 93.97                   | -24.80         | Peak   |
| 1164.00        | V                  | 48.80                     | ---                     | -9.94                   | 38.86            | ---            | 74.00                     | 54.00                   | -15.14         | Peak   |
| 1328.00        | V                  | 46.81                     | ---                     | -9.18                   | 37.62            | ---            | 74.00                     | 54.00                   | -16.38         | Peak   |
| 1416.00        | V                  | 47.69                     | ---                     | -8.78                   | 38.91            | ---            | 74.00                     | 54.00                   | -15.09         | Peak   |
| 1496.00        | V                  | 47.08                     | ---                     | -8.41                   | 38.68            | ---            | 74.00                     | 54.00                   | -15.32         | Peak   |
| 1780.00        | V                  | 45.72                     | ---                     | -6.79                   | 38.93            | ---            | 74.00                     | 54.00                   | -15.07         | Peak   |
| 2160.00        | V                  | 45.12                     | ---                     | -5.17                   | 39.95            | ---            | 74.00                     | 54.00                   | -14.05         | Peak   |
| 4950.00        | V                  | 48.01                     | ---                     | 2.25                    | 50.27            | ---            | 74.00                     | 54.00                   | -3.73          | Peak   |
|                |                    |                           |                         |                         |                  |                |                           |                         |                |        |
| 2475.00        | H                  | 93.35                     | 92.59                   | -4.57                   | 88.78            | 88.02          | 113.97                    | 93.97                   | -25.19         | Peak   |
| 1020.00        | H                  | 50.72                     | ---                     | -10.61                  | 40.11            | ---            | 74.00                     | 54.00                   | -13.89         | Peak   |
| 1160.00        | H                  | 48.15                     | ---                     | -9.96                   | 38.19            | ---            | 74.00                     | 54.00                   | -15.81         | Peak   |
| 1240.00        | H                  | 47.39                     | ---                     | -9.59                   | 37.80            | ---            | 74.00                     | 54.00                   | -16.20         | Peak   |
| 1744.00        | H                  | 46.52                     | ---                     | -6.99                   | 39.52            | ---            | 74.00                     | 54.00                   | -14.48         | Peak   |
| 2624.00        | H                  | 44.17                     | ---                     | -3.83                   | 40.34            | ---            | 74.00                     | 54.00                   | -13.66         | Peak   |
| 4950.00        | H                  | 48.42                     | ---                     | 2.25                    | 50.67            | ---            | 74.00                     | 54.00                   | -3.33          | Peak   |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" no emission measured remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** Rx**Test Date:** July 25, 2007**Temperature:** 26°C**Tested by:** Arno Hsieh**Humidity:** 55% RH**Polarity:** Ver. / Hor.

| Freq.<br>(MHz) | Ant.<br>Pol<br>H/V | Peak<br>Reading<br>(dBuV) | AV<br>Reading<br>(dBuV) | Ant. / CL<br>CF<br>(dB) | Result           |                | Peak<br>Limit<br>(dBuV/m) | AV<br>Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|----------------|--------------------|---------------------------|-------------------------|-------------------------|------------------|----------------|---------------------------|-------------------------|----------------|--------|
|                |                    |                           |                         |                         | Peak<br>(dBuV/m) | AV<br>(dBuV/m) |                           |                         |                |        |
| 1164.00        | V                  | 48.55                     | ---                     | -9.94                   | 38.61            | ---            | 74.00                     | 54.00                   | -15.39         | Peak   |
| 1488.00        | V                  | 48.54                     | ---                     | -8.45                   | 40.09            | ---            | 74.00                     | 54.00                   | -13.91         | Peak   |
| 1780.00        | V                  | 47.30                     | ---                     | -6.79                   | 40.52            | ---            | 74.00                     | 54.00                   | -13.48         | Peak   |
| 2236.00        | V                  | 46.24                     | ---                     | -5.00                   | 41.24            | ---            | 74.00                     | 54.00                   | -12.76         | Peak   |
| 2320.00        | V                  | 44.82                     | ---                     | -4.81                   | 40.02            | ---            | 74.00                     | 54.00                   | -13.98         | Peak   |
| 4810.00        | V                  | 44.13                     | ---                     | 1.84                    | 45.97            | ---            | 74.00                     | 54.00                   | -8.03          | Peak   |
|                |                    |                           |                         |                         |                  |                |                           |                         |                |        |
| 1084.00        | H                  | 49.12                     | ---                     | -10.31                  | 38.81            | ---            | 74.00                     | 54.00                   | -15.19         | Peak   |
| 1160.00        | H                  | 48.30                     | ---                     | -9.96                   | 38.34            | ---            | 74.00                     | 54.00                   | -15.66         | Peak   |
| 1252.00        | H                  | 46.93                     | ---                     | -9.54                   | 37.39            | ---            | 74.00                     | 54.00                   | -16.61         | Peak   |
| 1352.00        | H                  | 47.69                     | ---                     | -9.07                   | 38.61            | ---            | 74.00                     | 54.00                   | -15.39         | Peak   |
| 1756.00        | H                  | 45.89                     | ---                     | -6.93                   | 38.97            | ---            | 74.00                     | 54.00                   | -15.03         | Peak   |
| 4810.00        | H                  | 43.72                     | ---                     | 1.84                    | 45.56            | ---            | 74.00                     | 54.00                   | -8.44          | Peak   |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown "----" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" no emission measured remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

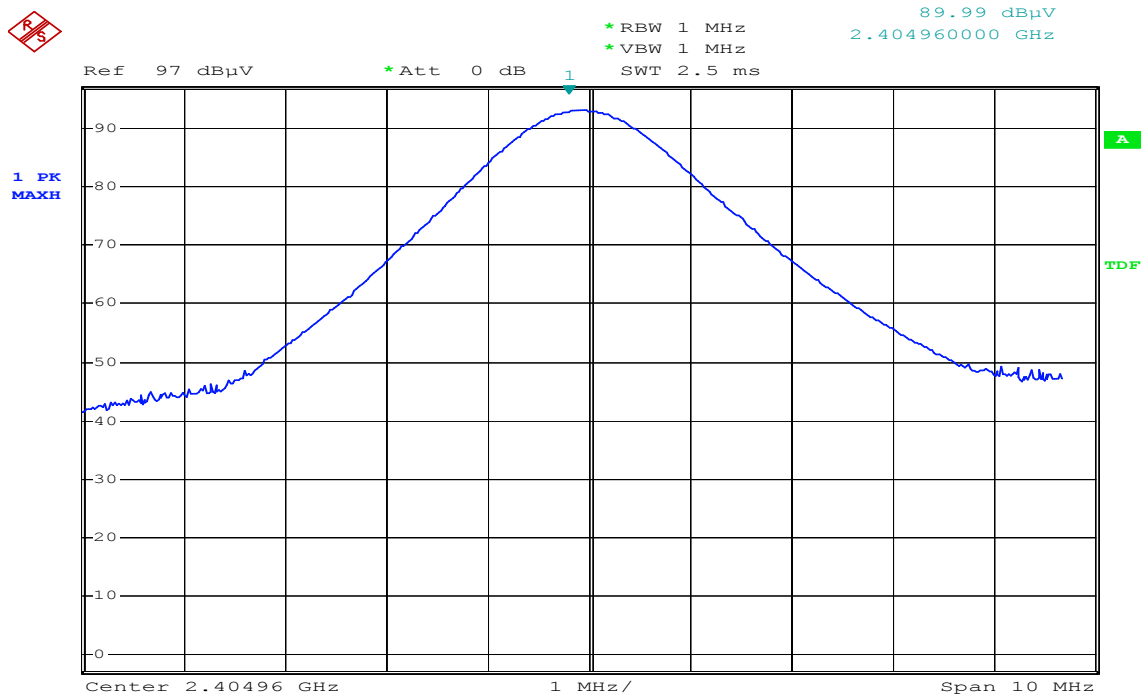


## Test Plots

### CH Low

Detector mode: Peak

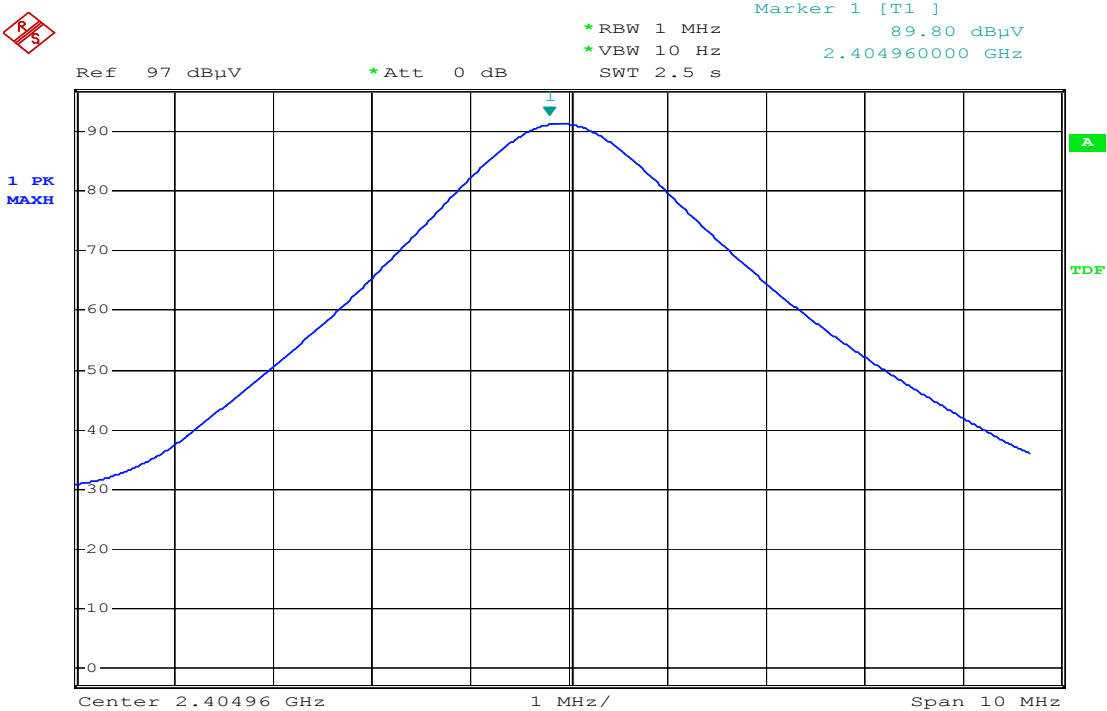
Polarity: Vertical



Date: 25.JUL.2007 17:46:55

Detector mode: Average

Polarity: Vertical

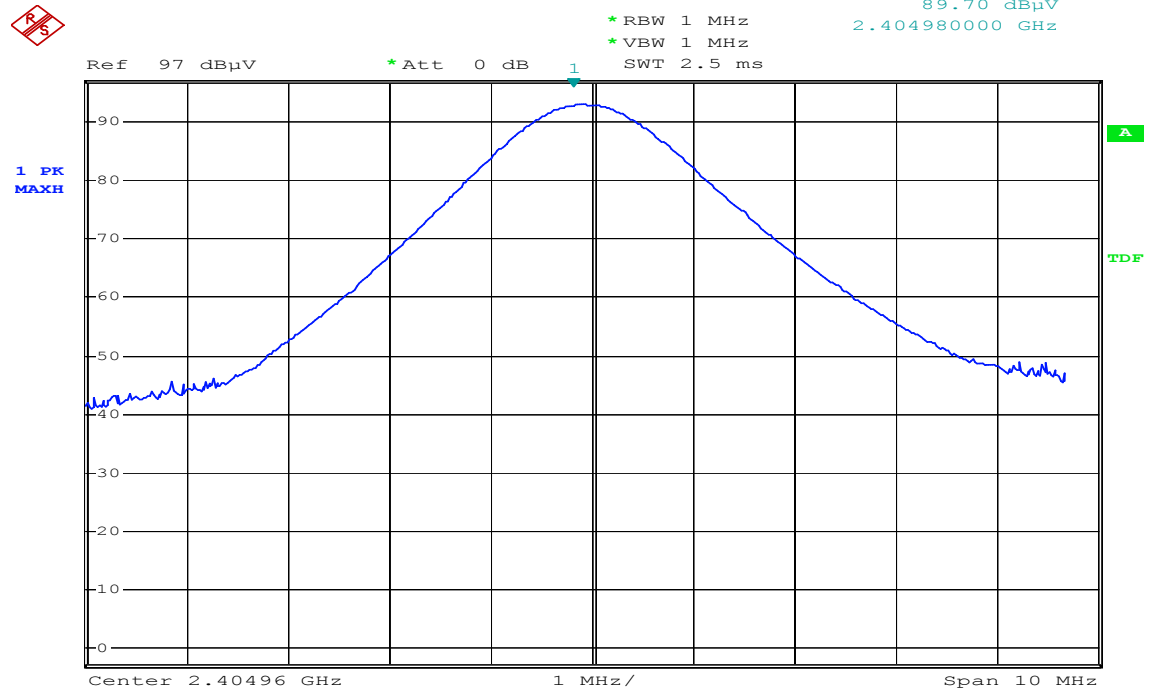


Date: 25.JUL.2007 17:47:25



Detector mode: Peak

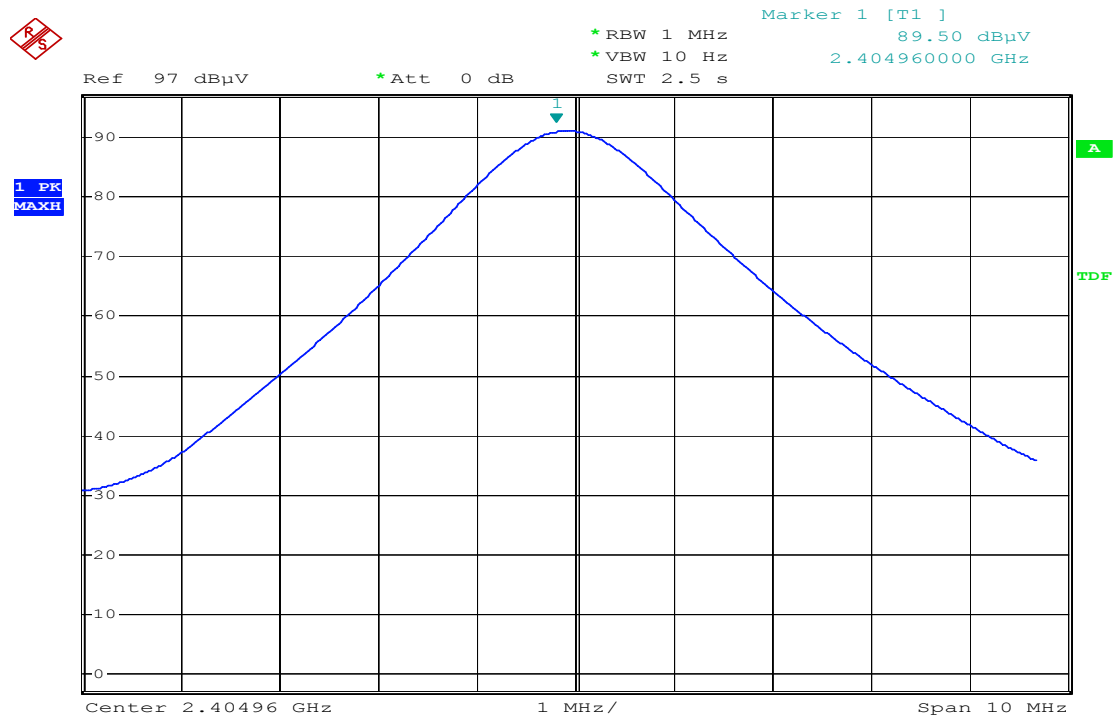
Polarity: Horizontal



Date: 25.JUL.2007 17:42:39

Detector mode: Average

Polarity: Horizontal



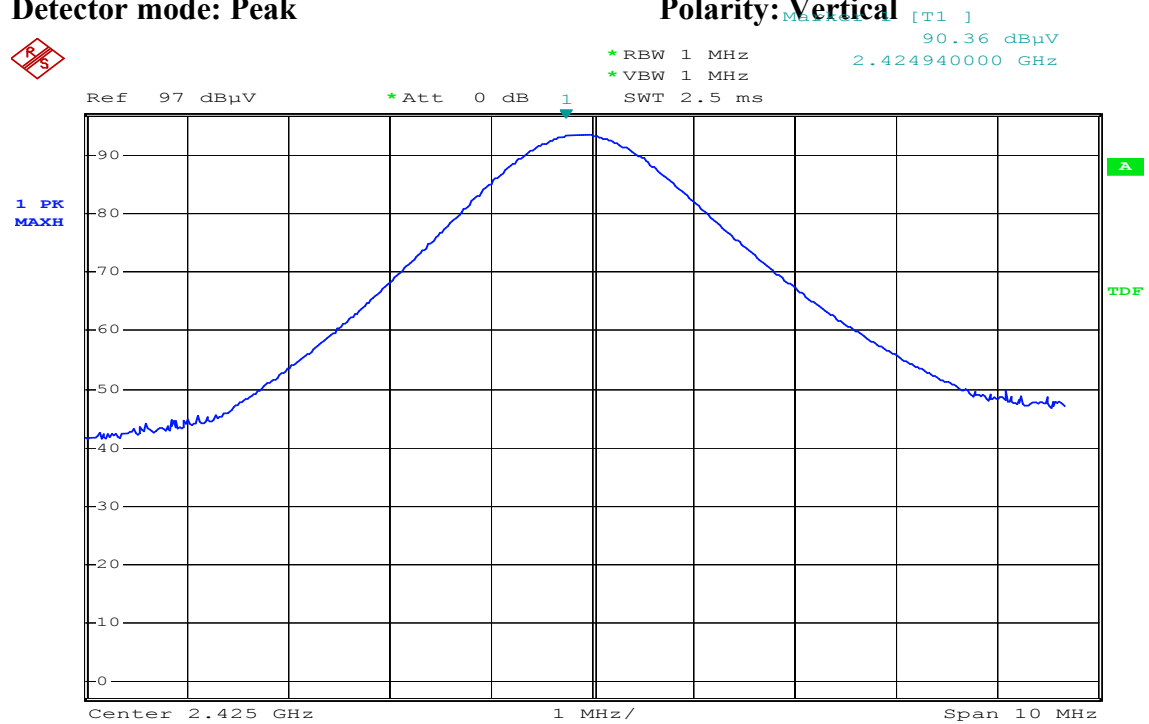
Date: 25.JUL.2007 17:43:37



## CH Mid

Detector mode: Peak

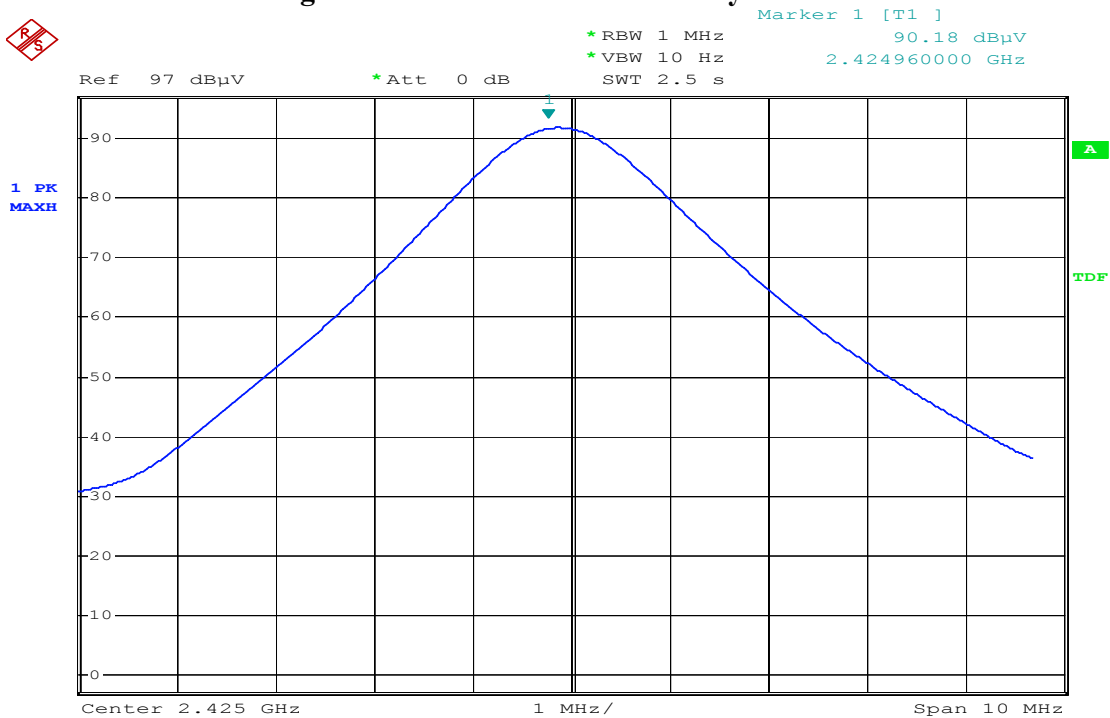
Polarity: Vertical



Date: 25.JUL.2007 17:51:30

Detector mode: Average

Polarity: Vertical

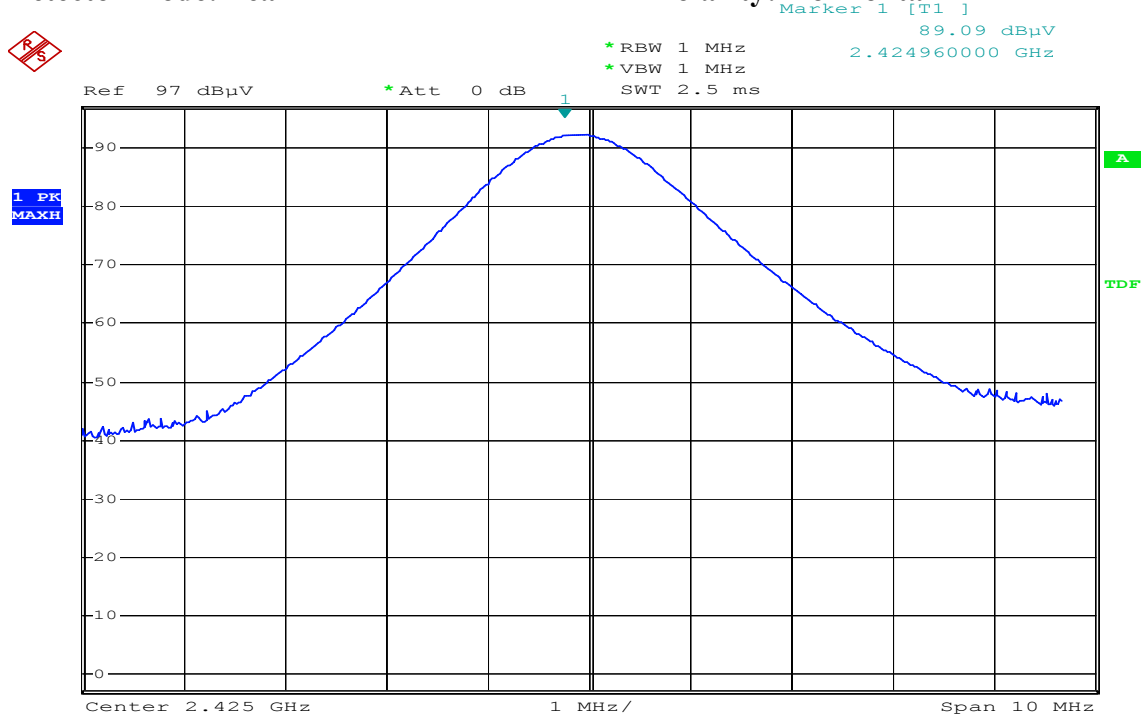


Date: 25.JUL.2007 17:51:59



Detector mode: Peak

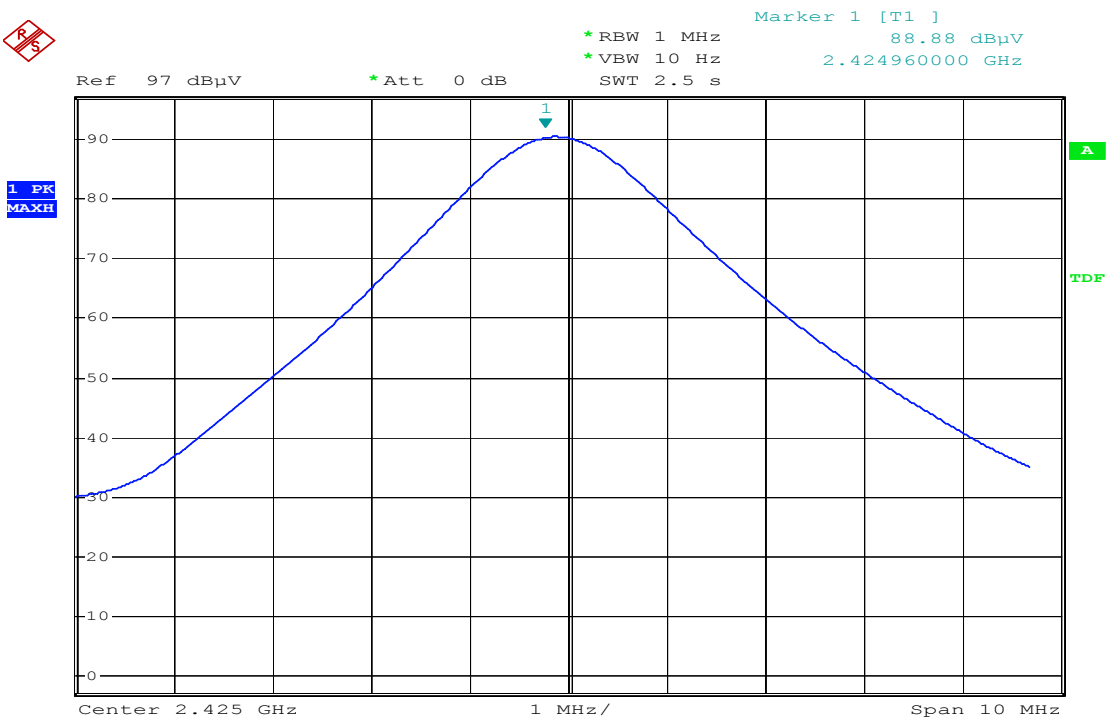
Polarity: Horizontal



Date: 25.JUL.2007 17:53:44

Detector mode: Average

Polarity: Horizontal



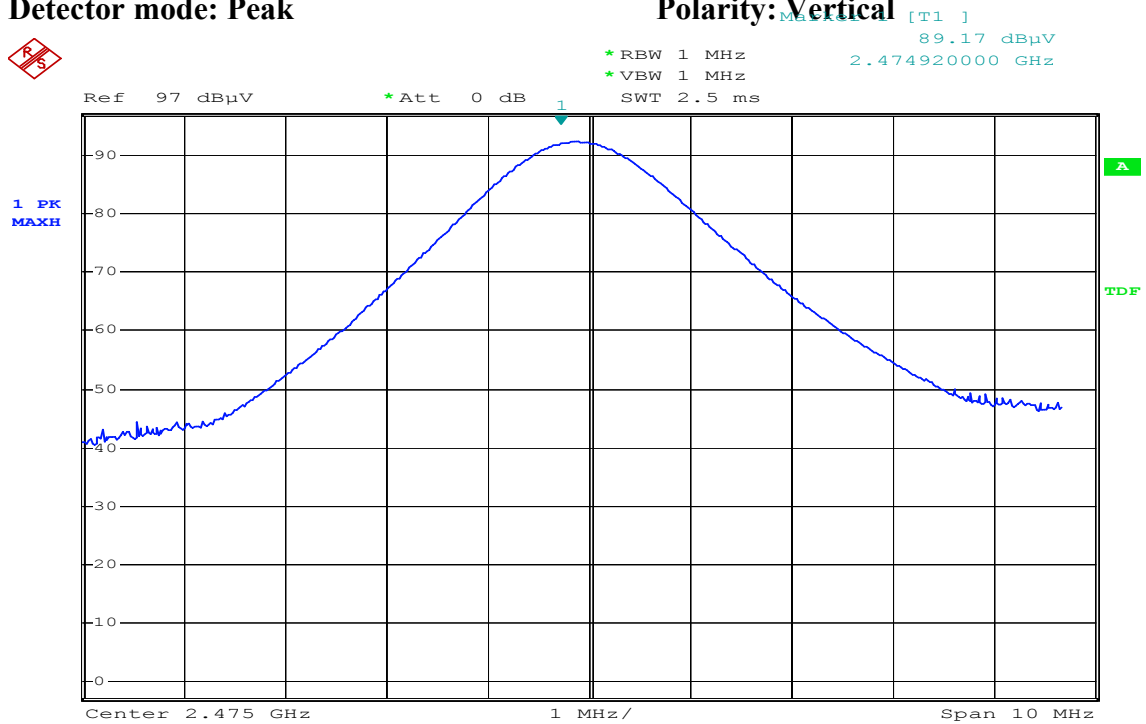
Date: 25.JUL.2007 17:54:18



## CH High

Detector mode: Peak

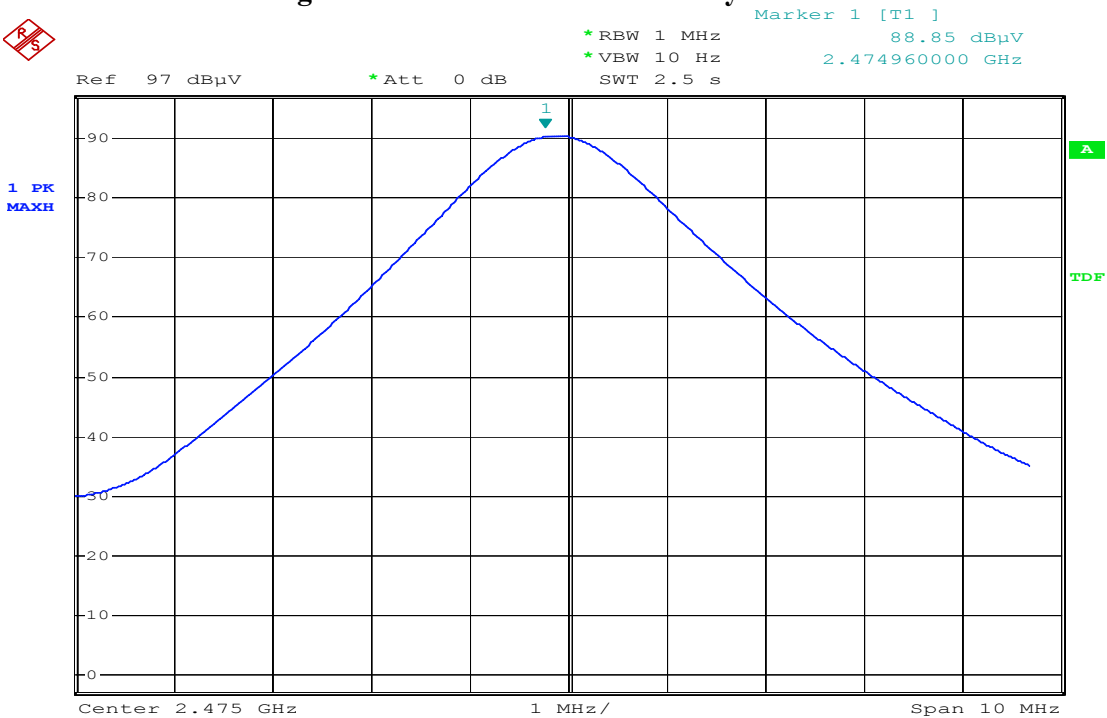
Polarity: Vertical



Date: 25.JUL.2007 18:38:13

Detector mode: Average

Polarity: Vertical

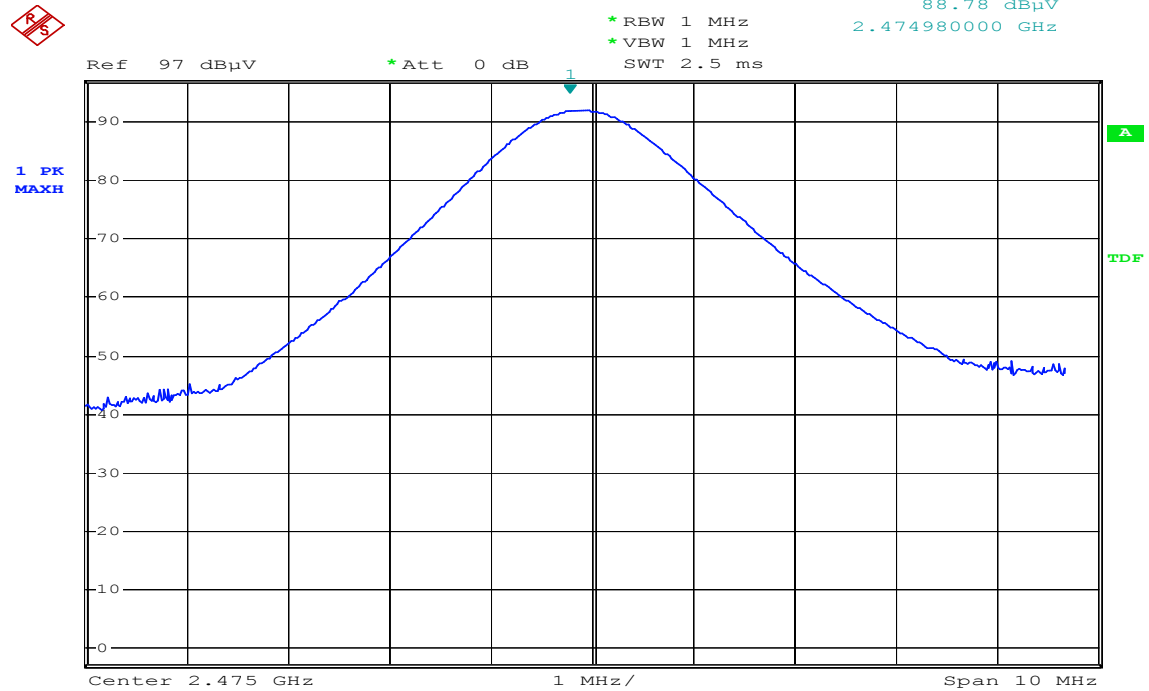


Date: 25.JUL.2007 18:38:40



Detector mode: Peak

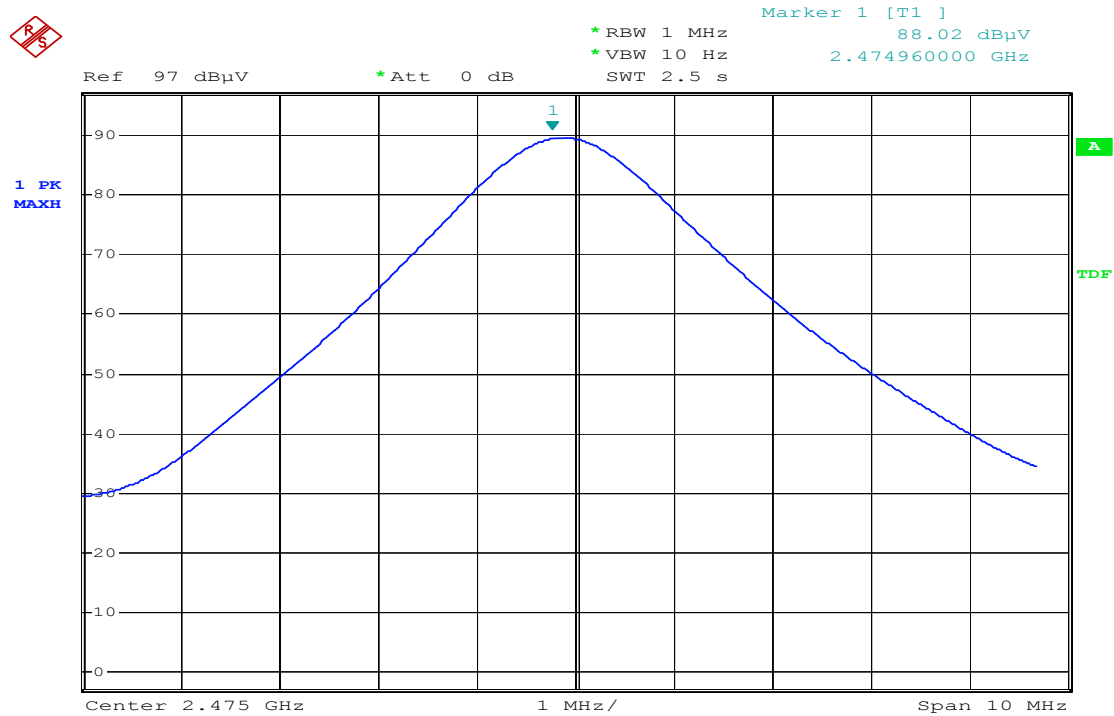
Polarity: Horizontal



Date: 25.JUL.2007 18:36:17

Detector mode: Average

Polarity: Horizontal



Date: 25.JUL.2007 18:36:43





## **7.3 POWERLINE CONDUCTED EMISSIONS**

### **LIMIT**

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

| Frequency Range<br>(MHz) | Limits<br>(dB $\mu$ V) |           |
|--------------------------|------------------------|-----------|
|                          | Quasi-peak             | Average   |
| 0.15 to 0.50             | 66 to 56*              | 56 to 46* |
| 0.50 to 5                | 56                     | 46        |
| 5 to 30                  | 60                     | 50        |

*\* Decreases with the logarithm of the frequency.*

### **Test Configuration**

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### **TEST PROCEDURE**

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.



## TEST RESULTS

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

### Test Data

**Operation Mode:** Normal link mode

**Test Date:** July 26, 2007

**Temperature:** 28°C

**Tested by:** Arno Hsieh

**Humidity:** 52% RH

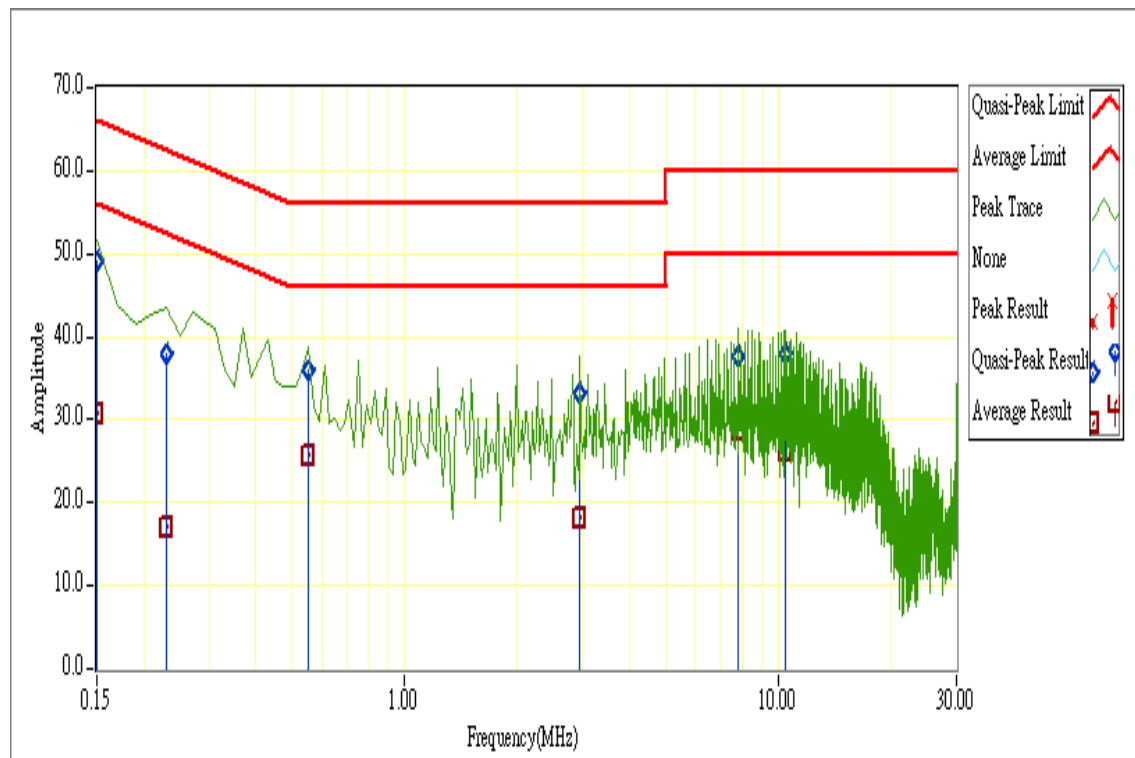
| Freq. (MHz) | QP Reading (dBuV) | AV Reading (dBuV) | Corr. factor (dB) | QP Result (dBuV) | AV Result (dBuV) | QP Limit (dBuV) | AV Limit (dBuV) | QP Margin (dB) | AV Margin (dB) | Note |
|-------------|-------------------|-------------------|-------------------|------------------|------------------|-----------------|-----------------|----------------|----------------|------|
| 0.15        | 48.99             | 30.52             | 0.20              | 49.19            | 30.72            | 66.00           | 56.00           | -16.81         | -25.28         | L1   |
| 0.23        | 37.64             | 16.78             | 0.20              | 37.84            | 16.98            | 62.45           | 52.45           | -24.61         | -35.47         | L1   |
| 0.55        | 35.91             | 25.51             | 0.10              | 36.01            | 25.61            | 56.00           | 46.00           | -19.99         | -20.39         | L1   |
| 2.95        | 32.90             | 17.97             | 0.25              | 33.15            | 18.22            | 56.00           | 46.00           | -22.85         | -27.78         | L1   |
| 7.83        | 37.08             | 28.02             | 0.61              | 37.69            | 28.63            | 60.00           | 50.00           | -22.31         | -21.37         | L1   |
| 10.49       | 36.94             | 25.21             | 0.94              | 37.88            | 26.15            | 60.00           | 50.00           | -22.12         | -23.85         | L1   |
|             |                   |                   |                   |                  |                  |                 |                 |                |                |      |
| 0.15        | 48.56             | 28.46             | 0.20              | 48.76            | 28.66            | 66.00           | 56.00           | -17.24         | -27.34         | L2   |
| 0.27        | 39.62             | 30.00             | 0.20              | 39.82            | 30.20            | 61.12           | 51.12           | -21.30         | -20.92         | L2   |
| 0.55        | 31.86             | 23.00             | 0.10              | 31.96            | 23.10            | 56.00           | 46.00           | -24.04         | -22.90         | L2   |
| 1.29        | 23.78             | 10.94             | 0.13              | 23.91            | 11.07            | 56.00           | 46.00           | -32.09         | -34.93         | L2   |
| 2.87        | 20.92             | 6.33              | 0.20              | 21.12            | 6.53             | 56.00           | 46.00           | -34.88         | -39.47         | L2   |
| 8.51        | 34.56             | 20.97             | 0.60              | 35.16            | 21.57            | 60.00           | 50.00           | -24.84         | -28.43         | L2   |

### Remark:

1. Measuring frequencies from 0.15 MHz to 30MHz.
2. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.
3. The IF bandwidth of SPN between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz;
4. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)

## Test Plots

### Conducted emissions (Line 1)



### Conducted emissions (Line 2)

