

APPLICATION FOR CERTIFICATION

On Behalf of

Sonos, Inc

Zone Player

Model No. : ZP80

FCC ID : SBVZP002

Prepared for : Sonos, Inc  
223 DeLa Cuerra St. Santa Barbara,  
LA 93101, U.S.A.

Prepared by : Audix Corporation  
Technical Division EMC Department  
No. 53-11, Tin-Fu Tsun, Lin-Kou,  
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Date of Test : Oct. 11 ~ 13, 2005  
Date of Report : Oct. 20, 2005

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## TEST REPORT CERTIFICATION

Applicant : Sonos, Inc  
Manufacturer : Inventec Electronics (M) Sdn Bhd.  
EUT Description : Zone Player  
Canada IC : SBVZP002  
(A) MODEL NO. : ZP80  
(B) SERIAL NO. : N/A  
(C) BRAND : SONOS  
(D) POWER SUPPLY : 100-240Vac, 50/60Hz  
(E) TEST VOLTAGE : AC 120V/60Hz

### Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C, JANUARY 2005  
AND ANSI C63.4/2003

(FCC CFR 47 Part 15C, §15.205, §15.207, §15.209 and §15.247)

The device described above was tested by AUDIX CORPORATION to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C limits.

The measurement results are contained in this test report and AUDIX CORPORATION is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX CORPORATION.

Date of Test: Oct. 11 ~ 13, 2005

Prepared by: Tina Huang Oct. 24, 2005  
(Tina Huang/Assistant)

Test Engineer: Ben Cheng Oct. 24, 2005  
(Ben Cheng/Section Manager)

Approved & Authorized Signer: Leon Liu Oct. 24, 2005  
(Leon Liu/Senior Manager)

## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

|                           |   |  |
|---------------------------|---|--|
| Description               | : | Zone Player<br>This device is a digital music system using a wired or wireless connection.   |
| Model Number              | : | ZP80   |
| Canada IC                 | : | SBVZP002   |
| Brand Name                | : | SONOS  |
| Applicant                 | : | Sonos, Inc<br>223 DeLa Cuerra St. Santa Barbara,<br>LA 93101, U.S.A.   |
| Manufacturer              | : | Inventec Electronics (M) Sdn. Bhd.<br>Plot 102, Bayan Lepas Industrial Estate, 11900<br>Bayan Lepas, Penang, Malaysia.   |
| High Frequency of Used    | : | 16.0MHz, 20.0MHz, 20.0MHz, 20.0MHz,<br>25.0MHz, 33.0MHz for Main Controller<br>11.289MHz for Audio Controller<br>40 MHz for Wireless LAN Card  |
| Wireless LAN Card         | : | Askey, M/N WLL3090(LF)<br>IEEE 802.11g   |
| Interfaces of EUT         | : | <ul style="list-style-type: none"> <li>• Audio Digital Out (RCA x 1)</li> <li>• Audio Analog Out (L/R, RCA x2)</li> <li>• Audio Analog In (L/R, RCA x2)</li> <li>• 10/100 Base-T Ethernet RJ45 x2</li> <li>• AC In x1</li> </ul> |
| AC Power Cord (2Pin)      | : | Non-Shielded, Detachable, 2.0m   |
| Date of Receipt of Sample | : | Oct. 11, 2005  |
| Date of Test              | : | Oct. 11 ~13, 2005  |

## 1.2. Tested Supporting System Details

### 1.2.1. PARTNER NOTEBOOK PC

Model Number : 2378  
 Serial Number : N/A  
 FCC ID : By DoC  
 Manufacturer : IBM  
 Power Adapter : IBM, M/N 02K6808  
 DC Cord: Non-Shielded, Undetachable, 1.0m  
 AC Cord: Non-Shielded, Detachable, 1.8m  
 RJ45 LAN Cable \*1EA : Non-Shielded, Detachable, 20m

### 1.2.2. PARTNER CONTROLLER

Model Number : CR100  
 Serial Number : N/A  
 FCC ID : By DoC  
 Manufacturer : Inventec Electronics (M) Sdn. Bhd.  
 I.T.E. Power Supply : UNIFIUE, M/N UIA324-06  
 S/N 410-0215062, BSMI ID. D53003  
 I/O: AC 100-240V, 50/60Hz, 0.6A  
 O/P: DC 6V, 3.8A  
 DC Cord: Shielded, Undetachable, 1.85m  
 Bonded a ferrite core  
 AC Power Cord : Non-Shielded, Detachable, 2.0m

### 1.2.3. AUDIO INPUT/OUTPUT LOAD

Model Number : N/A  
 Serial Number : N/A  
 Manufacturer : Sonos  
 Audio Cable-In \*1EA : Non-Shielded, Detachable, 1.8m  
 Audio Cable-Out \*2EA : Non-Shielded, Detachable, 1.8m

### 1.2.4. ETHERNET TERMINATOR (100 OHM)

Model Number : N/A  
 Serial Number : N/A  
 Manufacturer : Sonos  
 RJ45 LAN Cable \*1EA : Non-Shielded, Detachable, 1.8m

### 1.3. Description of Test Facility

Name of Firm : **Audix Corporation**  
**Technical Division EMC Department**  
 No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang,  
 Taipei County 24443, Taiwan, R.O.C.

Test Location & Facility (C2/AC) : **No. 2 Shielded Room**  
 No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang,  
 Taipei County 24443, Taiwan, R.O.C.

**Semi-Anechoic Chamber**  
 No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang,  
 Taipei County 24443, Taiwan, R.O.C.

May. 16, 2003 File on  
 Federal Communication Commission  
 Registration Number: 90993

NVLAP Lab. Code : 200077-0  
 (NVLAP is a NATA accredited body under Mutual Recognition Agreement)

### 1.4. Measurement Uncertainty

| Test Item                        | Frequency Range | Uncertainty (dB) |
|----------------------------------|-----------------|------------------|
| Conduction Test                  | 150kHz~30MHz    | ±1.73dB          |
| Radiation Test<br>(Distance: 3m) | 30MHz~300MHz    | ±2.91dB          |
|                                  | 300MHz~1000MHz  | ±2.94dB          |
|                                  | Above 1GHz      | ± 5.02dB         |

Remark : Uncertainty =  $k_{uc}(y)$

| Test Item                 | Uncertainty |
|---------------------------|-------------|
| 6dB Bandwidth             | ± 0.05kHz   |
| Emission Limitations      | ± 0.13dB    |
| Maximum peak output power | ± 0.33dBm   |
| Band edges                | ± 0.13dB    |
| Power spectral density    | ± 0.13dB    |

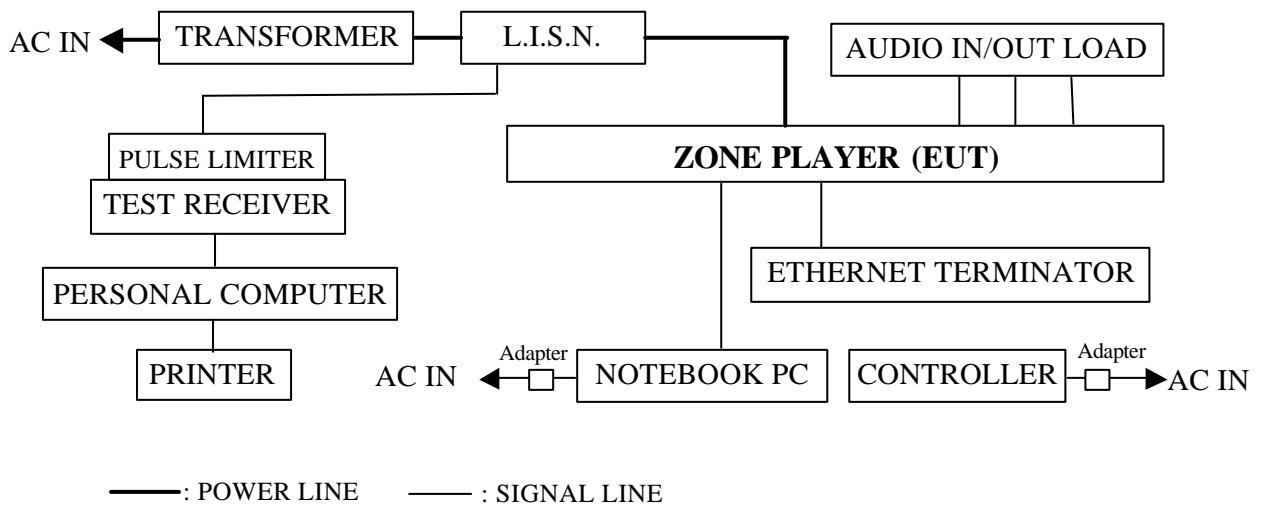
## 2. CONDUCTED EMISSION MEASUREMENT

### 2.1. Test Equipment

The following test equipment was used during the conducted emission measurement:

| Item | Type          | Manufacturer | Model No. | Serial No. | Last Cal.    | Next Cal.    |
|------|---------------|--------------|-----------|------------|--------------|--------------|
| 1.   | Test Receiver | R&S          | ESCS30    | 100265     | Sep. 27, 05' | Sep. 26, 06' |
| 2.   | L.I.S.N.      | Kyoritsu     | KNW-407   | 8-855-9    | Apr.20, 05'  | Apr.19, 06'  |
| 3.   | Pulse Limiter | R & S        | ESH3-Z2   | 001        | Apr.09, 05'  | Apr.08, 06'  |

### 2.2. Block Diagram of Test Setup



### 2.3. Conducted Emission Limits (§15.207)

| Frequency       | Maximum RF Line Voltage |               |
|-----------------|-------------------------|---------------|
|                 | Quasi-Peak Level        | Average Level |
| 150kHz ~ 500kHz | 66 ~ 56 dBμV            | 56 ~ 46 dBμV  |
| 500kHz ~ 5MHz   | 56 dBμV                 | 46 dBμV       |
| 5MHz ~ 30MHz    | 60 dBμV                 | 50 dBμV       |

Remark1.: If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary.

2.: The lower limit applies at the band edges.



## 2.4. Operating Condition of EUT

- 2.4.1. Setup the EUT and simulator as shown on 2.2.
- 2.4.2. Turn on the power of all equipment.
- 2.4.3. Run the notebook PC (IBM ThinkPad) test software “dsp-write” to set EUT (Zone Player) transmitter channel through RJ45 Ethernet during the testing.
- 2.4.4. The controller control Zone Player (EUT) to play music during all testing.

## 2.5. Test Procedure

The EUT was put on table which was above the ground by 80cm and its power supply connected to the power mains through a line impedance stabilization network (L.I.S.N.). Both sides of A.C. line were checked to find out the maximum emission level according to FCC ANSI C63.4-2003 regulations during conducted disturbance measurement.

The bandwidth of the R&S Test Receiver ESCS30 was set at 9kHz.

The frequency range from 150kHz to 30MHz was checked.

All the final readings from Test Receiver were measured with the Quasi-Peak detector and Average detector. (Remark: If the Average limit is met when using a Quasi-Peak detector, the Average detector is unnecessary)

## 2.6. Conducted Emission Measurement Results

**PASSED.** All emissions not reported below are too low against the prescribed limits.

The EUT was performed during conducted measurement and all the test results are attached in the next pages.

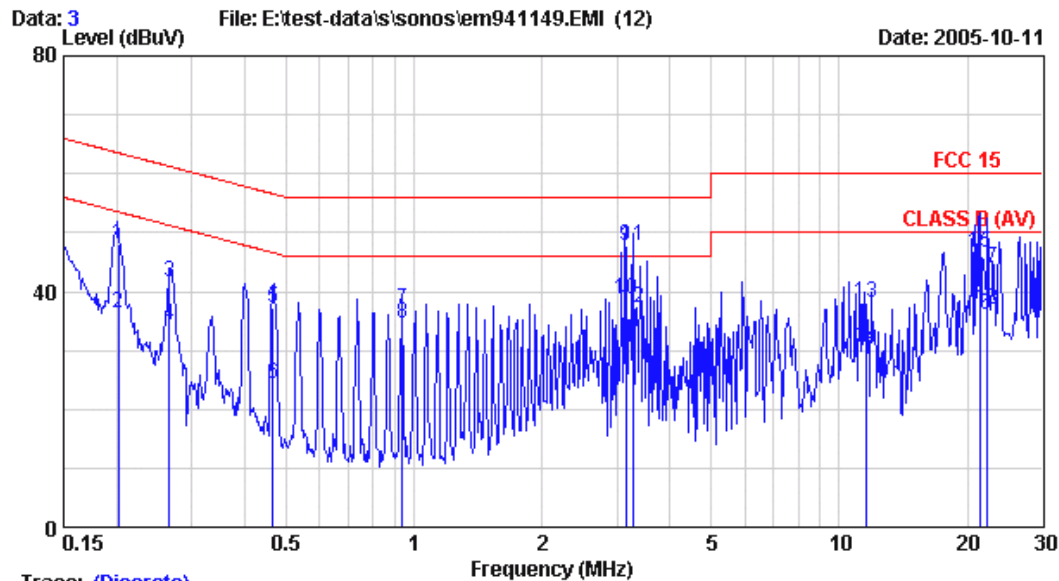
EUT : Zone Player                      M/N : ZP80

Test Date : Oct. 11, 2005      Temperature : 24                      Humidity : 50%

| Mode | Operating Mode of EUT      | Reference Test Data No. |      |
|------|----------------------------|-------------------------|------|
|      |                            | Neutral                 | Line |
| 1.   | Play Music & Communication | # 3                     | # 4  |



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Trace: (Discrete)

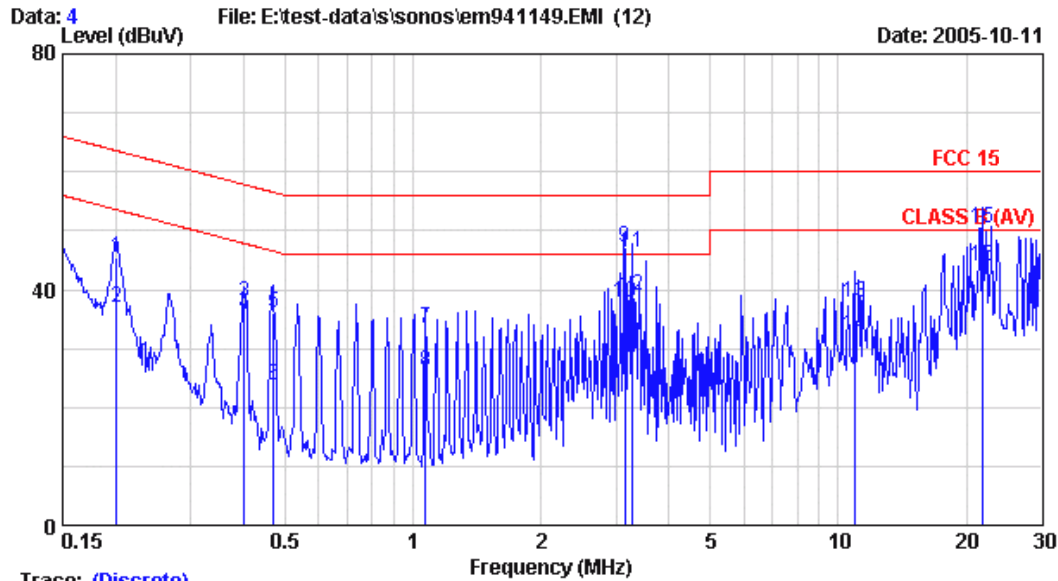
|              |                                     |           |              |
|--------------|-------------------------------------|-----------|--------------|
| Site         | : No.2 Shielded room                | Data      | : 3          |
| Condition    | : KNW-407                           | Phase     | : NEUTRAL    |
| Limit        | : FCC 15                            |           |              |
| Env. / Ins.  | : 24*C,50% / ESCS 30                | Engineer: | : Cater Chou |
| EUT          | : Zone Player (Red Rocks) M/N: ZP80 |           |              |
| Power Rating | : 120Vac/60Hz                       |           |              |
| Test Mode    | : play music & Communication        |           |              |

| Freq.<br>(MHz) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dB μV) | Emission<br>Level<br>(dB μV) | Limits<br>(dB μV) | Margin<br>(dB) | Remark  |
|----------------|------------------------|-----------------------|--------------------|------------------------------|-------------------|----------------|---------|
| 1              | 0.202                  | 0.20                  | 47.58              | 48.04                        | 63.54             | 15.50          | QP      |
| 2              | 0.202                  | 0.20                  | 35.90              | 36.36                        | 53.54             | 17.18          | AVERAGE |
| 3              | 0.266                  | 0.16                  | 41.13              | 41.57                        | 61.23             | 19.65          | QP      |
| 4              | 0.266                  | 0.16                  | 33.75              | 34.19                        | 51.23             | 17.03          | AVERAGE |
| 5              | 0.467                  | 0.10                  | 36.71              | 37.14                        | 56.57             | 19.43          | QP      |
| 6              | 0.467                  | 0.10                  | 23.75              | 24.18                        | 46.57             | 22.39          | AVERAGE |
| 7              | 0.937                  | 0.10                  | 36.56              | 37.05                        | 56.00             | 18.95          | QP      |
| 8              | 0.937                  | 0.10                  | 34.08              | 34.57                        | 46.00             | 11.43          | AVERAGE |
| 9              | 3.143                  | 0.10                  | 47.36              | 47.86                        | 56.00             | 8.14           | QP      |
| 10             | 3.143                  | 0.10                  | 38.29              | 38.79                        | 46.00             | 7.21           | AVERAGE |
| 11             | 3.277                  | 0.10                  | 47.17              | 47.67                        | 56.00             | 8.33           | QP      |
| 12             | 3.277                  | 0.10                  | 36.86              | 37.36                        | 46.00             | 8.64           | AVERAGE |
| 13             | 11.513                 | 0.13                  | 37.28              | 38.11                        | 60.00             | 21.89          | QP      |
| 14             | 11.513                 | 0.13                  | 29.62              | 30.45                        | 50.00             | 19.55          | AVERAGE |
| 15             | 21.490                 | 0.33                  | 45.43              | 46.46                        | 60.00             | 13.54          | QP      |
| 16             | 21.490                 | 0.33                  | 34.89              | 35.92                        | 50.00             | 14.08          | AVERAGE |
| 17             | 22.282                 | 0.35                  | 42.92              | 43.97                        | 60.00             | 16.03          | QP      |
| 18             | 22.282                 | 0.35                  | 35.92              | 36.97                        | 50.00             | 13.03          | AVERAGE |

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.  
 2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.



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Trace: (Discrete)

|              |                                     |           |              |
|--------------|-------------------------------------|-----------|--------------|
| Site         | : No.2 Shielded room                | Data      | : 4          |
| Condition    | : KNW-407                           | Phase     | : LINE       |
| Limit        | : FCC 15                            |           |              |
| Env. / Ins.  | : 24*C,50% / ESCS 30                | Engineer: | : Cater Chou |
| EUT          | : Zone Player (Red Rocks) M/N: ZP80 |           |              |
| Power Rating | : 120Vac/60Hz                       |           |              |
| Test Mode    | : play music & Communication        |           |              |

|    | Freq.<br>(MHz) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dB $\mu$ V) | Emission<br>Level<br>(dB $\mu$ V) | Limits<br>(dB $\mu$ V) | Margin<br>(dB) | Remark  |
|----|----------------|------------------------|-----------------------|-------------------------|-----------------------------------|------------------------|----------------|---------|
| 1  | 0.201          | 0.20                   | 0.26                  | 44.87                   | 45.33                             | 63.58                  | 18.25          | QP      |
| 2  | 0.201          | 0.20                   | 0.26                  | 36.45                   | 36.91                             | 53.58                  | 16.67          | AVERAGE |
| 3  | 0.402          | 0.10                   | 0.32                  | 37.28                   | 37.70                             | 57.82                  | 20.12          | QP      |
| 4  | 0.402          | 0.10                   | 0.32                  | 35.36                   | 35.78                             | 47.82                  | 12.04          | AVERAGE |
| 5  | 0.470          | 0.10                   | 0.33                  | 35.49                   | 35.92                             | 56.52                  | 20.60          | QP      |
| 6  | 0.470          | 0.10                   | 0.33                  | 23.27                   | 23.70                             | 46.52                  | 22.82          | AVERAGE |
| 7  | 1.072          | 0.10                   | 0.40                  | 32.81                   | 33.31                             | 56.00                  | 22.69          | QP      |
| 8  | 1.072          | 0.10                   | 0.40                  | 25.48                   | 25.98                             | 46.00                  | 20.02          | AVERAGE |
| 9  | 3.147          | 0.10                   | 0.40                  | 46.54                   | 47.04                             | 56.00                  | 8.96           | QP      |
| 10 | 3.147          | 0.10                   | 0.40                  | 37.37                   | 37.87                             | 46.00                  | 8.13           | AVERAGE |
| 11 | 3.281          | 0.10                   | 0.40                  | 45.83                   | 46.33                             | 56.00                  | 9.67           | QP      |
| 12 | 3.281          | 0.10                   | 0.40                  | 38.60                   | 39.10                             | 46.00                  | 6.90           | AVERAGE |
| 13 | 10.913         | 0.20                   | 0.70                  | 36.89                   | 37.79                             | 60.00                  | 22.21          | QP      |
| 14 | 10.913         | 0.20                   | 0.70                  | 31.45                   | 32.35                             | 50.00                  | 17.65          | AVERAGE |
| 15 | 21.825         | 0.38                   | 0.70                  | 49.38                   | 50.46                             | 60.00                  | 9.54           | QP      |
| 16 | 21.825         | 0.38                   | 0.70                  | 42.78                   | 43.86                             | 50.00                  | 6.14           | AVERAGE |

Remarks: 1.Emission Level= LISN Factor + Cable Loss + Reading.  
 2.If the average limit is met when using a quasi-peak detector ,the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

### 3. RADIATED EMISSION MEASUREMENT

#### 3.1. Test Equipment

The following test equipment was used during the radiated emission measurement:

##### 3.1.1. For Frequency 30MHz~1000MHz (at Semi-Anechoic Chamber)

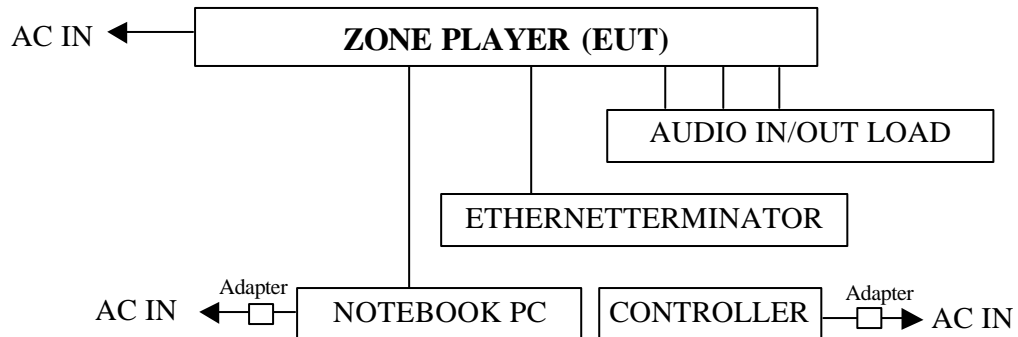
| Item | Type              | Manufacturer | Model No.    | Serial No. | Last Cal.   | Next Cal.   |
|------|-------------------|--------------|--------------|------------|-------------|-------------|
| 1.   | Spectrum Analyzer | HP           | 8593EM       | 3826A00248 | Sep.26, 05' | Sep.25, 06' |
| 2.   | Spectrum Analyzer | Agilent      | E7405A       | MY42000134 | Jun.25, 05' | Jun.24, 06' |
| 3.   | Test Receiver     | R & S        | ESCS30       | 100265     | Sep.27, 05' | Sep.26, 06' |
| 4.   | Pre-Amplifier     | HP           | 8447D        | 2944A06305 | Mar.10, 05' | Mar.09, 06' |
| 5.   | Broadband Antenna | Schwarzbeck  | BBA 9106     | A3L        | Feb.18, 05' | Feb.17, 06' |
| 6.   | Broadband Antenna | Schwarzbeck  | UHALP 9108-A | 0139       | Dec.14, 04' | Dec.13, 05' |

##### 3.1.2. For Frequency Above 1GHz (at Semi-Anechoic Chamber)

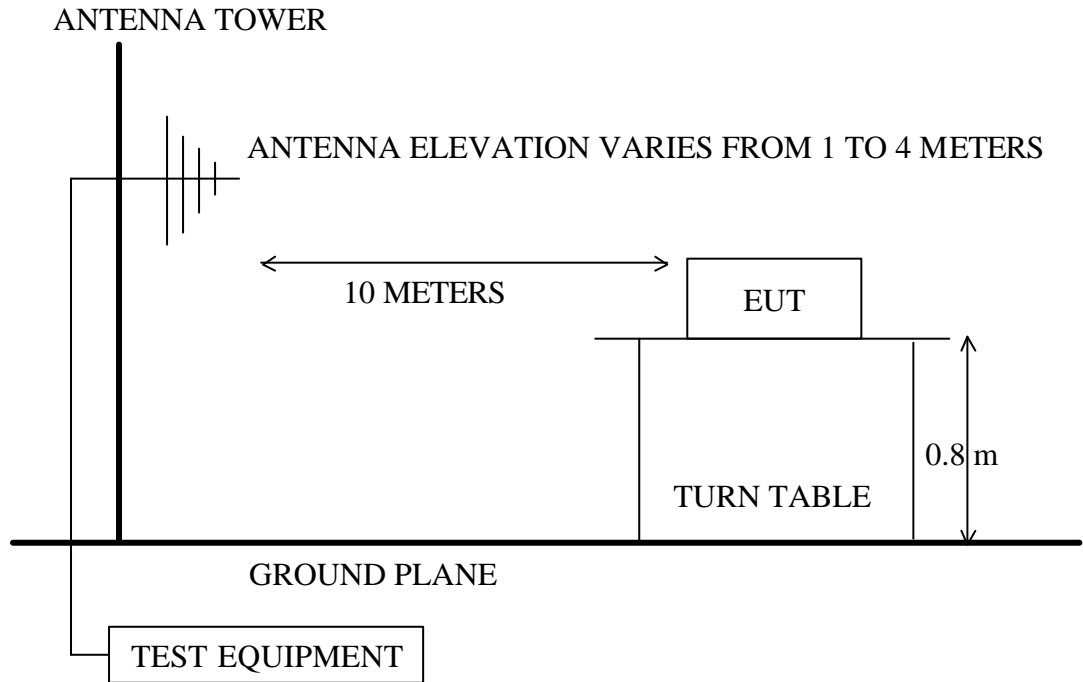
| Item | Type              | Manufacturer | Model No. | Serial No. | Last Cal.    | Next Cal.    |
|------|-------------------|--------------|-----------|------------|--------------|--------------|
| 1.   | Spectrum Analyzer | HP           | 8593EM    | 3826A00248 | Sep.26, 05'  | Sep.25, 06'  |
| 2.   | Spectrum Analyzer | Agilent      | E7405A    | MY42000134 | Jun.25, 05'  | Jun.24, 06'  |
| 3.   | Test Receiver     | R & S        | ESCS30    | 100265     | Sep.27, 05'  | Sep.26, 06'  |
| 4.   | Pre-Amplifier     | HP           | 8449B     | 3008A00529 | Jan.14, 05'  | Jan.13, 06'  |
| 5.   | Horn Antenna      | EMCO         | 3115      | 9112-3775  | May 04, 05'  | May 03, 06'  |
| 6.   | Horn Antenna      | EMCO         | 3116      | 2653       | Nov. 03, 04' | Nov. 02, 05' |

#### 3.2. Test Setup

##### 3.2.1. Block Diagram of connection between EUT and simulators



3.2.2. Semi-Anechoic Chamber (3m) Setup Diagram



3.3. Radiated Emission Limits (§15.209)

| FREQUENCY<br>MHz | DISTANCE<br>Meters | FIELD STRENGTHS LIMITS  |                          |
|------------------|--------------------|---|--------------------------|
|                  |                    | $\mu\text{V/m}$   | $\text{dB}\mu\text{V/m}$ |
| 30 ~ 88          | 3                  | 100   | 40.0                     |
| 88 ~ 216         | 3                  | 150   | 43.5                     |
| 216 ~ 960        | 3                  | 200   | 46.0                     |
| Above 960        | 3                  | 500   | 54.0                     |
| Above 1000       | 3                  | 74.0 $\text{dB}\mu\text{V/m}$ (Peak)<br>54.0 $\text{dB}\mu\text{V/m}$ (Average) |                          |

- Remark :
- (1) Emission level ( $\text{dB}\mu\text{V/m}$ ) = 20 log Emission level ( $\mu\text{V/m}$ )
  - (2) The tighter limit applies at the edge between two frequency bands.
  - (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.4. Operating Condition of EUT

Same as conducted measurement which was listed in 2.4. except the test set up replaced by section 3.2.

### 3.5. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna such as calibrated biconical and log- periodical antenna or horn antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC ANSI C63.4-2003 regulation.

The bandwidth of the R&S Test Receiver ESCS30 was set at 120kHz. (For 30MHz to 1000MHz)

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz for peak detection (PK) at frequency above 1GHz.

The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for average detection (AV) at frequency above 1GHz.

The frequency range from 30MHz to 25GHz (Up to 10<sup>th</sup> harmonics from fundamental frequency) was checked.

### 3.6. Radiated Emission Measurement Results

**PASSED.** All the emissions not reported below are too low against the official limits.

EUT : Zone Player                      M/N : ZP80

Test Date : Oct. 11, 2005      Temperature : 22                      Humidity : 51%

The EUT was tested with the following test modes in frequency range of 30MHz ~ 1000MHz and all the test results are listed in section 3.6.1.

| No. | Test Mode    | Test Frequency | Reference Test Data No. |             |           |             |
|-----|--------------|----------------|-------------------------|-------------|-----------|-------------|
|     |              |                | Horizontal              |             | Vertical  |             |
|     |              |                | 30-300MHz               | 300-1000MHz | 30-300MHz | 300-1000MHz |
| 1.  | Transmitting | 2412MHz (CH1)  | # 10                    | # 7         | # 9       | # 8         |
| 2.  |              | 2437MHz (CH6)  | # 3                     | # 2         | # 4       | # 1         |
| 3.  |              | 2462MHz (CH11) | # 9                     | # 8         | # 10      | # 7         |
| 4.  | Receiver     | 2437MHz (CH6)  | # 6                     | # 7         | # 5       | # 8         |

\* Above all final readings were measured with Quasi-Peak detector.

The EUT was tested with the following test modes in frequency range above 1GHz and all the test results are listed in section 3.6.2.

| No. | Test Mode    | Test Frequency |
|-----|--------------|----------------|
| 1.  | Transmitting | 2412MHz (CH1)  |
| 2.  |              | 2437MHz (CH6)  |
| 3.  |              | 2462MHz (CH11) |

\* Above all final readings were measured with Peak detector and Average detector.

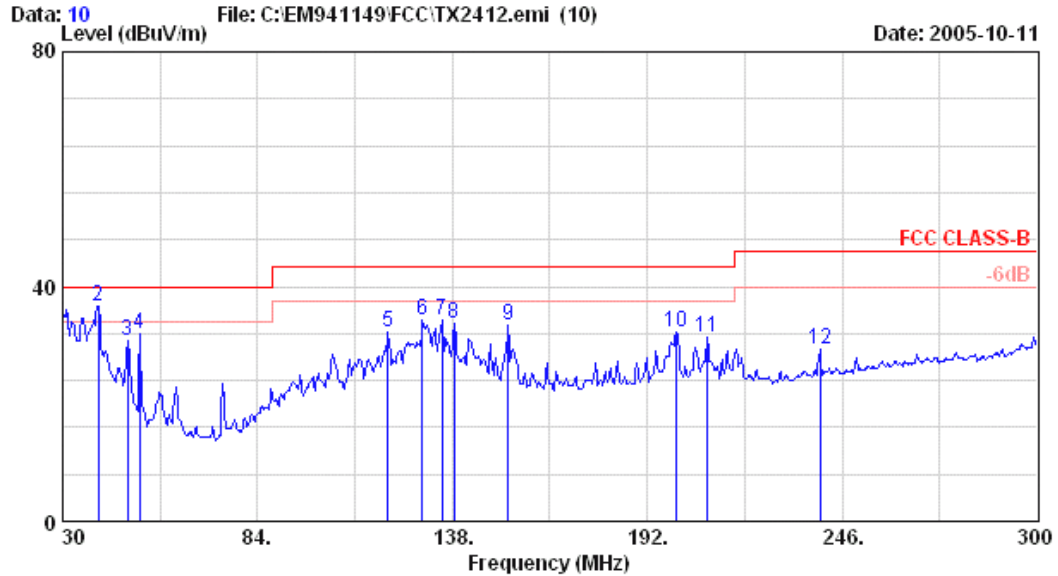
The EUT was tested in restricted bands and all the test results are listed in section 3.6.3. (The restricted bands defined in part 15.205(a))

| No.            | Test Mode    | Reference Test Data No. |            |         |          |     |
|----------------|--------------|-------------------------|------------|---------|----------|-----|
|                |              | Frequency Range         | Horizontal |         | Vertical |     |
| 1.             | Transmitting | 2412MHz (CH1)           | Peak       | # 2     | Peak     | # 1 |
|                |              |                         | Average    | # 4     | Average  | # 3 |
| 2462MHz (CH11) |              | Peak                    | # 5        | Peak    | # 6      |     |
|                |              | Average                 | # 8        | Average | # 7      |     |

3.6.1. Frequency Range: 30MHz~1000MHz



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Site : A/C Chamber Date : 10  
 Condition : 3m BBA9106(A3L) Polarity: HORIZONTAL  
 Limit : FCC CLASS-B  
 Env. / Ins. : 8593EM 22\*C/51% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) M/N:ZP80  
 Power Rating : 120Vac/60Hz  
 Test Mode : TX2412MHz

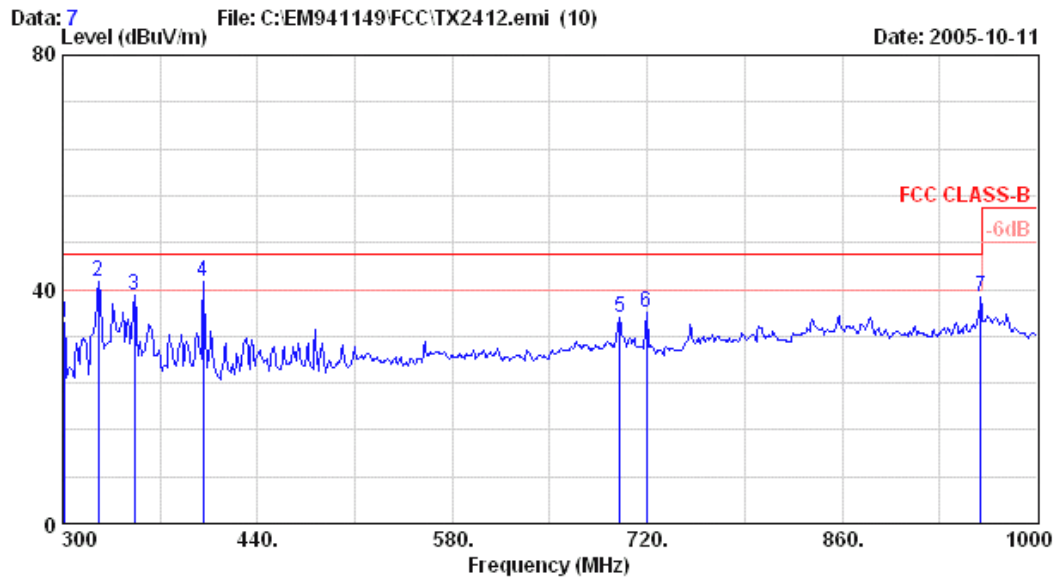
|             | Ant. Factor | Cable Loss | Reading | Emission Level | Limits   | Margin | Remark |
|-------------|-------------|------------|---------|----------------|----------|--------|--------|
| Freq. (MHz) | (dB/m)      | (dB)       | (dBuV)  | (dBuV/m)       | (dBuV/m) | (dB)   |        |
| 1           | 24.86       | 1.10       | 10.13   | 36.09          | 40.00    | 3.91   | QP     |
| 2           | 20.36       | 1.20       | 15.11   | 36.67          | 40.00    | 3.33   |        |
| 3           | 17.15       | 1.40       | 12.20   | 30.75          | 40.00    | 9.25   |        |
| 4           | 15.63       | 1.50       | 14.83   | 31.96          | 40.00    | 8.04   |        |
| 5           | 19.08       | 2.30       | 10.92   | 32.30          | 43.50    | 11.20  |        |
| 6           | 19.71       | 2.40       | 12.10   | 34.21          | 43.50    | 9.29   |        |
| 7           | 19.93       | 2.40       | 11.92   | 34.25          | 43.50    | 9.25   |        |
| 8           | 20.06       | 2.50       | 11.02   | 33.58          | 43.50    | 9.92   |        |
| 9           | 20.70       | 2.60       | 10.06   | 33.36          | 43.50    | 10.14  |        |
| 10          | 22.08       | 3.00       | 7.28    | 32.36          | 43.50    | 11.14  |        |
| 11          | 21.81       | 3.12       | 6.50    | 31.43          | 43.50    | 12.07  |        |
| 12          | 23.05       | 3.40       | 2.82    | 29.27          | 46.00    | 16.73  |        |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.





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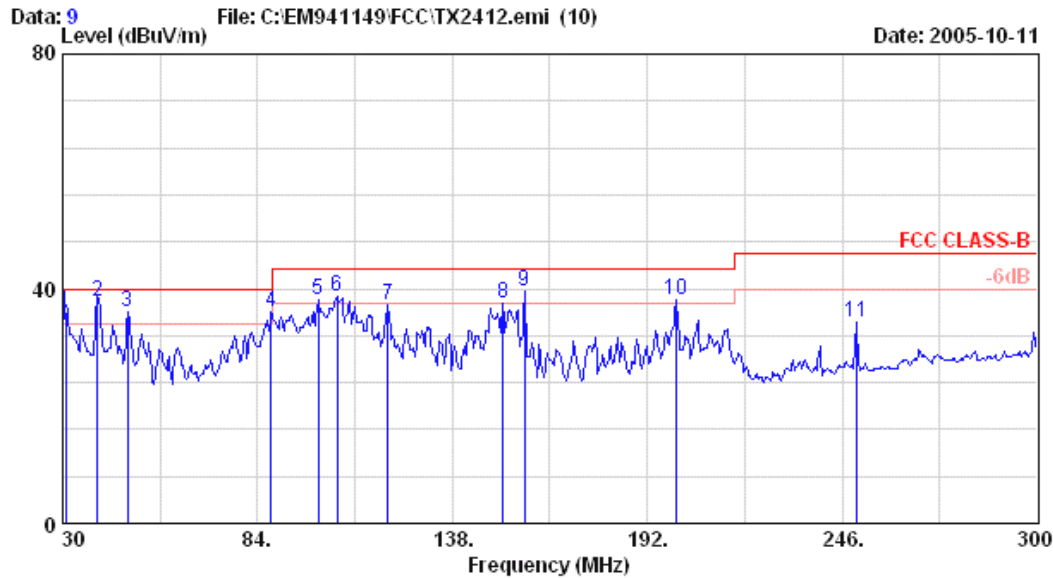
Site : A/C Chamber Date : 7  
 Condition : 3m UHALP9108-A(0139) Polarity: HORIZONTAL  
 Limit : FCC CLASS-B  
 Env. / Ins. : 8593EM 22\*C/51% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) M/N: ZP80  
 Power Rating : 120Vac/60Hz  
 Test Mode : TX2412MHz

|                | Ant.             | Cable        | Emission          |                   |                    |       | Margin | Remark |
|----------------|------------------|--------------|-------------------|-------------------|--------------------|-------|--------|--------|
| Freq.<br>(MHz) | Factor<br>(dB/m) | Loss<br>(dB) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limits<br>(dBuV/m) | (dB)  |        |        |
| 1              | 301.400          | 14.59        | 3.90              | 15.75             | 34.24              | 46.00 | 11.76  | QP     |
| 2              | 325.900          | 15.15        | 4.20              | 21.85             | 41.21              | 46.00 | 4.79   |        |
| 3              | 351.800          | 15.55        | 4.30              | 19.18             | 39.04              | 46.00 | 6.96   |        |
| 4              | 400.800          | 17.63        | 4.80              | 18.96             | 41.39              | 46.00 | 4.61   |        |
| 5              | 700.400          | 23.46        | 6.50              | 5.25              | 35.21              | 46.00 | 10.79  |        |
| 6              | 719.300          | 22.30        | 6.60              | 7.28              | 36.18              | 46.00 | 9.82   |        |
| 7              | 959.400          | 26.38        | 7.60              | 4.58              | 38.56              | 46.00 | 7.44   |        |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



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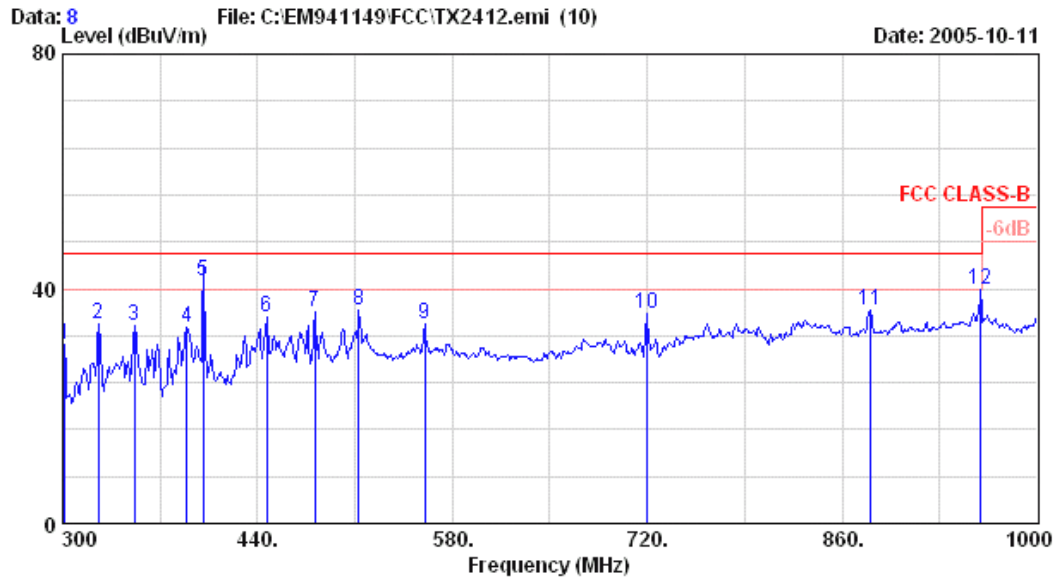
Site : A/C Chamber Date : 9  
 Condition : 3m BBA9106(A3L) Polarity: VERTICAL  
 Limit : FCC CLASS-B  
 Env. / Ins. : 8593EM 22\*C/51% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) M/N: ZP80  
 Power Rating : 120Vac/60Hz  
 Test Mode : TX2412MHz

|    | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBµV) | Emission<br>Level<br>(dBµV/m) | Limits<br>(dBµV/m) | Margin<br>(dB) | Remark |
|----|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1  | 30.810         | 22.98                    | 1.10                  | 12.07             | 36.15                         | 40.00              | 3.85           | QP     |
| 2  | 39.720         | 20.43                    | 1.20                  | 16.22             | 37.86                         | 40.00              | 2.14           |        |
| 3  | 48.090         | 16.36                    | 1.40                  | 18.40             | 36.16                         | 40.00              | 3.84           |        |
| 4  | 87.780         | 15.39                    | 2.00                  | 18.73             | 36.12                         | 40.00              | 3.88           |        |
| 5  | 100.740        | 17.58                    | 2.10                  | 18.43             | 38.11                         | 43.50              | 5.39           |        |
| 6  | 106.140        | 17.71                    | 2.20                  | 18.89             | 38.80                         | 43.50              | 4.70           |        |
| 7  | 120.180        | 17.58                    | 2.30                  | 17.22             | 37.10                         | 43.50              | 6.40           |        |
| 8  | 152.040        | 21.54                    | 2.60                  | 13.31             | 37.45                         | 43.50              | 6.05           |        |
| 9  | 157.980        | 20.86                    | 2.70                  | 16.08             | 39.64                         | 43.50              | 3.86           |        |
| 10 | 199.830        | 22.86                    | 3.00                  | 12.21             | 38.07                         | 43.50              | 5.43           |        |
| 11 | 249.780        | 25.00                    | 3.50                  | 5.80              | 34.30                         | 46.00              | 11.70          |        |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



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Site : A/C Chamber Date : 8  
 Condition : 3m UHALP9108-A(0139) Polarity: VERTICAL  
 Limit : FCC CLASS-B  
 Env. / Ins. : 8593EM 22\*C/51% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) M/N: ZP80  
 Power Rating : 120Vac/60Hz  
 Test Mode : TX2412MHz

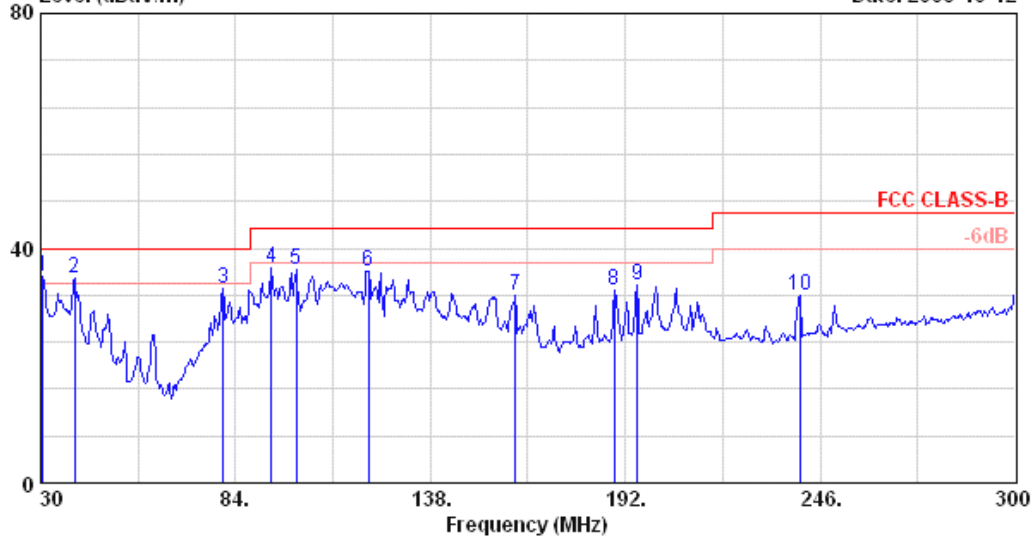
|    | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBµV) | Emission<br>Level<br>(dBµV/m) | Limits<br>(dBµV/m) | Margin<br>(dB) | Remark |
|----|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1  | 301.400        | 14.83                    | 3.90                  | 11.86             | 30.59                         | 46.00              | 15.41          | QP     |
| 2  | 325.900        | 15.47                    | 4.20                  | 14.28             | 33.96                         | 46.00              | 12.04          |        |
| 3  | 351.800        | 15.78                    | 4.30                  | 13.62             | 33.70                         | 46.00              | 12.30          |        |
| 4  | 388.900        | 17.51                    | 4.80                  | 11.00             | 33.31                         | 46.00              | 12.69          |        |
| 5  | 400.800        | 17.54                    | 4.80                  | 18.93             | 41.27                         | 46.00              | 4.73           |        |
| 6  | 446.300        | 17.46                    | 5.40                  | 12.33             | 35.19                         | 46.00              | 10.81          |        |
| 7  | 481.300        | 18.91                    | 6.10                  | 11.08             | 36.09                         | 46.00              | 9.91           |        |
| 8  | 512.800        | 20.92                    | 6.80                  | 8.48              | 36.20                         | 46.00              | 9.80           |        |
| 9  | 560.400        | 22.08                    | 6.70                  | 5.12              | 33.90                         | 46.00              | 12.10          |        |
| 10 | 719.300        | 22.01                    | 6.60                  | 7.25              | 35.86                         | 46.00              | 10.14          |        |
| 11 | 880.300        | 25.31                    | 7.30                  | 3.59              | 36.19                         | 46.00              | 9.81           |        |
| 12 | 959.400        | 27.16                    | 7.60                  | 5.13              | 39.89                         | 46.00              | 6.11           |        |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



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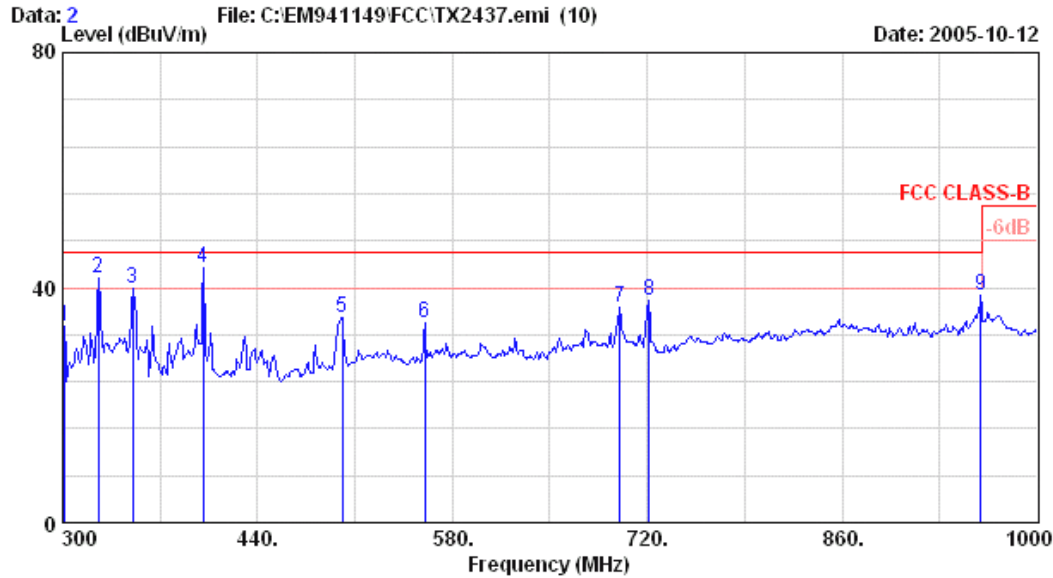
Site : A/C Chamber Date : 3  
 Condition : 3m BBA9106(A3L) Polarity: HORIZONTAL  
 Limit : FCC CLASS-B  
 Env. / Ins. : 8593EM 23\*C/55% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) M/N:2P80  
 Power Rating : 120Vac/60Hz  
 Test Mode : TX 2437MHz

|    | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|----|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1  | 30.540         | 24.76                    | 1.10                  | 9.32              | 35.19                         | 40.00              | 4.81           |        |
| 2  | 39.450         | 20.41                    | 1.20                  | 13.14             | 34.76                         | 40.00              | 5.24           |        |
| 3  | 80.490         | 13.81                    | 1.89                  | 17.52             | 33.22                         | 40.00              | 6.78           |        |
| 4  | 93.990         | 16.37                    | 2.00                  | 18.16             | 36.53                         | 43.50              | 6.97           |        |
| 5  | 100.740        | 17.17                    | 2.10                  | 17.15             | 36.42                         | 43.50              | 7.08           |        |
| 6  | 120.720        | 19.12                    | 2.30                  | 14.59             | 36.00                         | 43.50              | 7.50           |        |
| 7  | 161.490        | 20.84                    | 2.70                  | 8.31              | 31.85                         | 43.50              | 11.65          |        |
| 8  | 189.030        | 21.46                    | 2.90                  | 8.39              | 32.75                         | 43.50              | 10.75          |        |
| 9  | 195.240        | 21.80                    | 3.00                  | 8.90              | 33.70                         | 43.50              | 9.80           |        |
| 10 | 240.330        | 23.09                    | 3.40                  | 5.50              | 31.99                         | 46.00              | 14.01          |        |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



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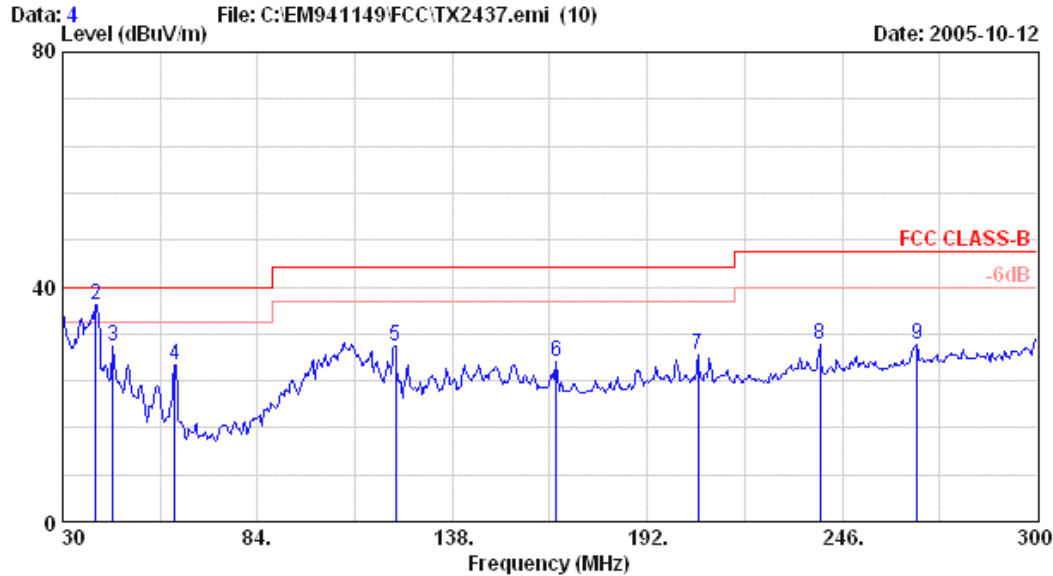
Site : A/C Chamber Date : 2  
 Condition : 3m UHALP9108-A(0139) Polarity: HORIZONTAL  
 Limit : FCC CLASS-B  
 Env. / Ins. : 8593EM 23\*C/55% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) M/N: ZP80  
 Power Rating : 120Vac/60Hz  
 Test Mode : TX 2437MHz

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBµV) | Emission<br>Level<br>(dBµV/m) | Limits<br>(dBµV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 301.400        | 14.59                    | 3.90                  | 14.87             | 33.36                         | 46.00              | 12.64          | QP     |
| 2 | 325.900        | 15.15                    | 4.20                  | 22.12             | 41.48                         | 46.00              | 4.52           |        |
| 3 | 350.400        | 15.44                    | 4.30                  | 20.05             | 39.79                         | 46.00              | 6.21           |        |
| 4 | 400.800        | 17.63                    | 4.80                  | 21.01             | 43.44                         | 46.00              | 2.56           |        |
| 5 | 500.900        | 18.91                    | 6.50                  | 9.57              | 34.98                         | 46.00              | 11.02          |        |
| 6 | 560.400        | 20.03                    | 6.70                  | 7.22              | 33.95                         | 46.00              | 12.05          |        |
| 7 | 700.400        | 23.46                    | 6.50                  | 6.60              | 36.56                         | 46.00              | 9.44           |        |
| 8 | 721.400        | 22.21                    | 6.50                  | 9.02              | 37.73                         | 46.00              | 8.27           |        |
| 9 | 959.400        | 26.38                    | 7.60                  | 4.73              | 38.71                         | 46.00              | 7.29           |        |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



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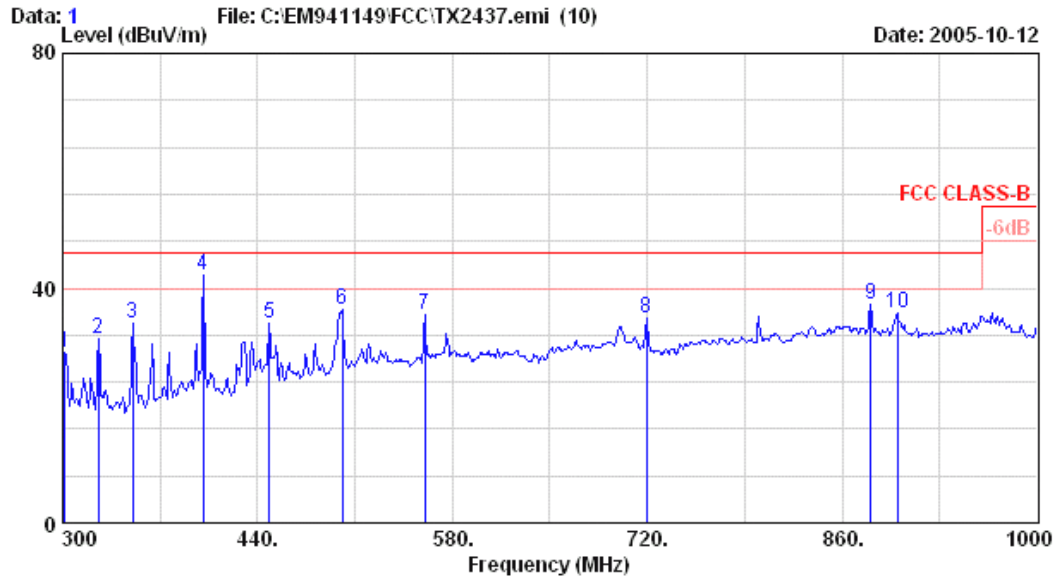
Site : A/C Chamber Date : 4  
 Condition : 3m BBA9106(A3L) Polarity: VERTICAL  
 Limit : FCC CLASS-B  
 Env. / Ins. : 8593EM 23\*C/55% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) M/N: ZP80  
 Power Rating : 120Vac/60Hz  
 Test Mode : TX 2437MHz

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBµV) | Emission<br>Level<br>(dBµV/m) | Limits<br>(dBµV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 30.000         | 23.60                    | 1.10                  | 10.88             | 35.58                         | 40.00              | 4.42           |        |
| 2 | 39.180         | 20.64                    | 1.20                  | 15.11             | 36.95                         | 40.00              | 3.05           |        |
| 3 | 44.040         | 17.90                    | 1.30                  | 10.60             | 29.80                         | 40.00              | 10.20          |        |
| 4 | 61.050         | 13.41                    | 1.60                  | 11.71             | 26.72                         | 40.00              | 13.28          |        |
| 5 | 122.340        | 17.77                    | 2.30                  | 9.87              | 29.94                         | 43.50              | 13.56          |        |
| 6 | 166.890        | 20.41                    | 2.70                  | 4.10              | 27.21                         | 43.50              | 16.29          |        |
| 7 | 206.040        | 22.08                    | 3.10                  | 3.15              | 28.34                         | 43.50              | 15.16          |        |
| 8 | 239.790        | 24.27                    | 3.40                  | 2.38              | 30.05                         | 46.00              | 15.95          |        |
| 9 | 266.790        | 25.62                    | 3.70                  | 0.91              | 30.23                         | 46.00              | 15.77          |        |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



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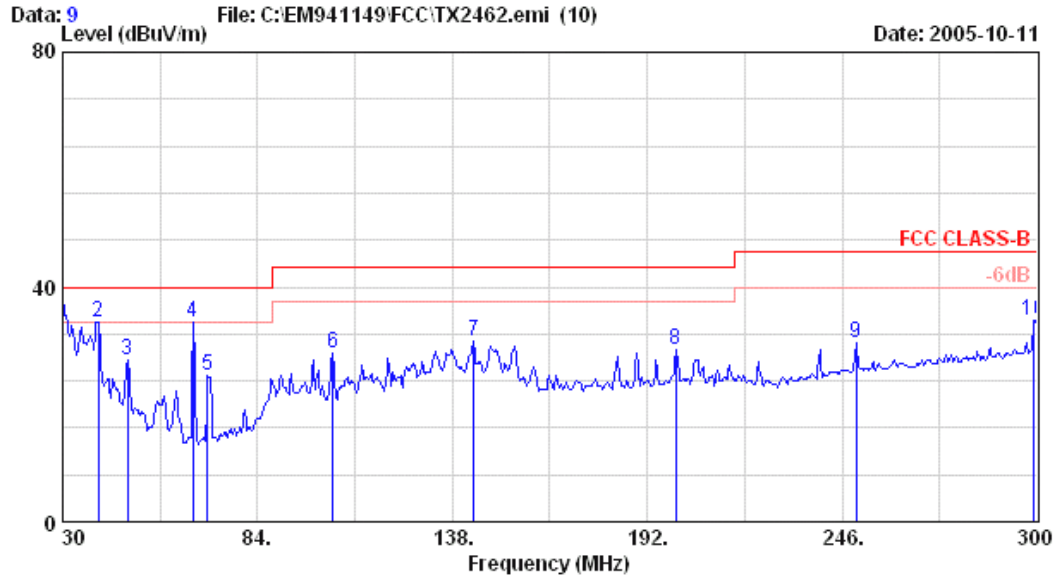
Site : A/C Chamber Date : 1  
 Condition : 3m UHALP9108-A(0139) Polarity: VERTICAL  
 Limit : FCC CLASS-B  
 Env. / Ins. : 8593EM 23\*C/55% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) M/N: ZP80  
 Power Rating : 120Vac/60Hz  
 Test Mode : TX 2437MHz

|    | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|----|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1  | 301.400        | 14.83                    | 3.90                  | 10.36             | 29.10                         | 46.00              | 16.90          | QP     |
| 2  | 325.900        | 15.47                    | 4.20                  | 11.59             | 31.27                         | 46.00              | 14.73          |        |
| 3  | 350.400        | 15.73                    | 4.30                  | 13.86             | 33.90                         | 46.00              | 12.10          |        |
| 4  | 400.800        | 17.54                    | 4.80                  | 19.91             | 42.25                         | 46.00              | 3.75           |        |
| 5  | 448.400        | 17.49                    | 5.40                  | 11.10             | 33.99                         | 46.00              | 12.01          |        |
| 6  | 500.900        | 19.84                    | 6.50                  | 9.98              | 36.32                         | 46.00              | 9.68           |        |
| 7  | 560.400        | 22.08                    | 6.70                  | 6.74              | 35.53                         | 46.00              | 10.47          |        |
| 8  | 719.300        | 22.01                    | 6.60                  | 6.17              | 34.78                         | 46.00              | 11.22          |        |
| 9  | 880.300        | 25.31                    | 7.30                  | 4.48              | 37.09                         | 46.00              | 8.91           |        |
| 10 | 899.900        | 25.83                    | 7.37                  | 2.47              | 35.68                         | 46.00              | 10.32          |        |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



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Site : A/C Chamber Date : 9  
 Condition : 3m BBA9106(A3L) Polarity: HORIZONTAL  
 Limit : FCC CLASS-B  
 Env. / Ins. : 8593EM 22\*C/51% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) M/N: ZP80  
 Power Rating : 120Vac/60Hz  
 Test Mode : TX 2462MHz

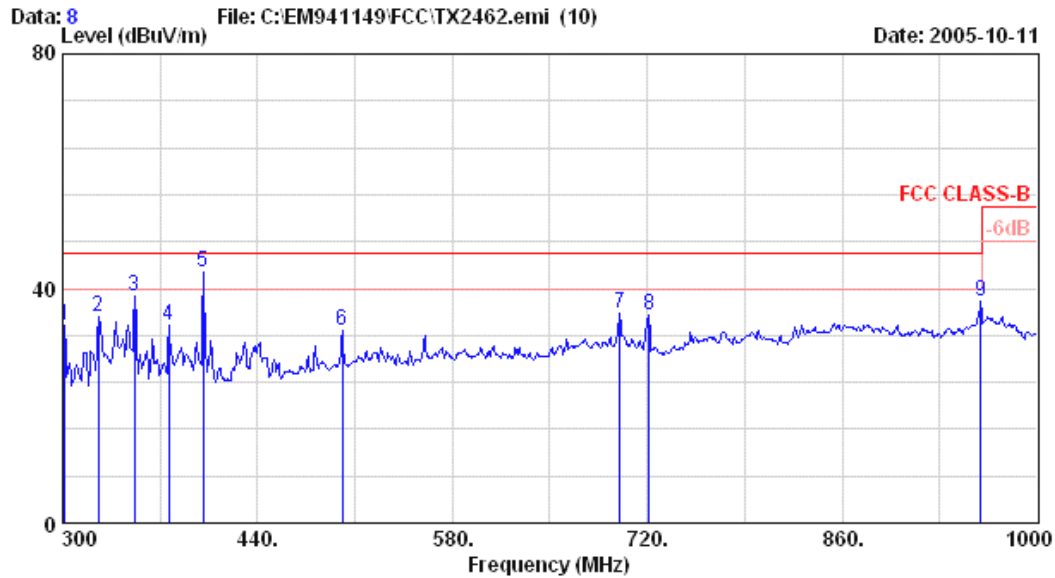
|    | Freq.<br>(MHz) | Ant. Factor<br>(dB/m) | Cable Loss<br>(dB) | Reading<br>(dBuV) | Emission Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|----|----------------|-----------------------|--------------------|-------------------|----------------------------|--------------------|----------------|--------|
| 1  | 30.000         | 24.86                 | 1.10               | 10.47             | 36.43                      | 40.00              | 3.57           | QP     |
| 2  | 39.990         | 20.36                 | 1.20               | 12.51             | 34.07                      | 40.00              | 5.93           |        |
| 3  | 48.090         | 17.15                 | 1.40               | 9.14              | 27.69                      | 40.00              | 12.31          |        |
| 4  | 66.180         | 11.78                 | 1.70               | 20.56             | 34.04                      | 40.00              | 5.96           |        |
| 5  | 70.230         | 12.09                 | 1.70               | 11.03             | 24.82                      | 40.00              | 15.18          |        |
| 6  | 104.790        | 17.58                 | 2.15               | 9.07              | 28.79                      | 43.50              | 14.71          |        |
| 7  | 143.940        | 20.27                 | 2.50               | 8.13              | 30.90                      | 43.50              | 12.60          |        |
| 8  | 199.830        | 22.08                 | 3.00               | 4.33              | 29.41                      | 43.50              | 14.09          |        |
| 9  | 249.780        | 23.78                 | 3.50               | 3.10              | 30.38                      | 46.00              | 15.62          |        |
| 10 | 299.190        | 26.75                 | 3.90               | 3.74              | 34.38                      | 46.00              | 11.62          |        |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.





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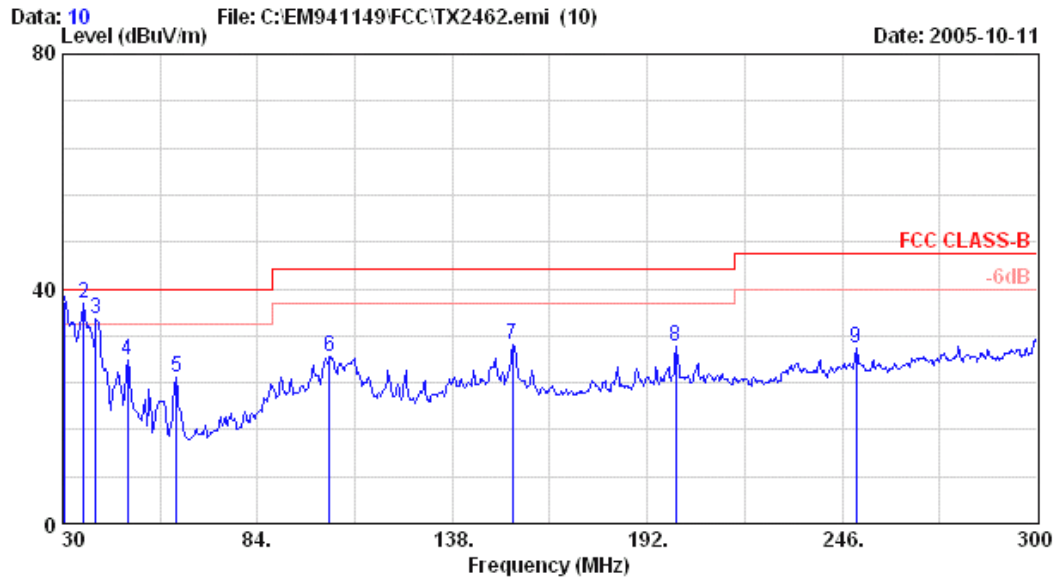
Site : A/C Chamber Date : 8  
 Condition : 3m UHALP9108-A(0139) Polarity: HORIZONTAL  
 Limit : FCC CLASS-B  
 Env. / Ins. : 8593EM 22\*C/51% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) M/N: ZP80  
 Power Rating : 120Vac/60Hz  
 Test Mode : TX 2462MHz

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBµV) | Emission<br>Level<br>(dBµV/m) | Limits<br>(dBµV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 301.400        | 14.59                    | 3.90                  | 15.34             | 33.83                         | 46.00              | 12.17          | QP     |
| 2 | 325.900        | 15.15                    | 4.20                  | 15.68             | 35.04                         | 46.00              | 10.96          |        |
| 3 | 351.800        | 15.55                    | 4.30                  | 18.97             | 38.83                         | 46.00              | 7.17           |        |
| 4 | 376.300        | 17.15                    | 4.60                  | 11.84             | 33.59                         | 46.00              | 12.41          |        |
| 5 | 400.800        | 17.63                    | 4.80                  | 20.24             | 42.67                         | 46.00              | 3.33           |        |
| 6 | 500.900        | 18.91                    | 6.50                  | 7.42              | 32.83                         | 46.00              | 13.17          |        |
| 7 | 700.400        | 23.46                    | 6.50                  | 5.76              | 35.72                         | 46.00              | 10.28          |        |
| 8 | 721.400        | 22.21                    | 6.50                  | 6.85              | 35.56                         | 46.00              | 10.44          |        |
| 9 | 959.400        | 26.38                    | 7.60                  | 3.78              | 37.76                         | 46.00              | 8.24           |        |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



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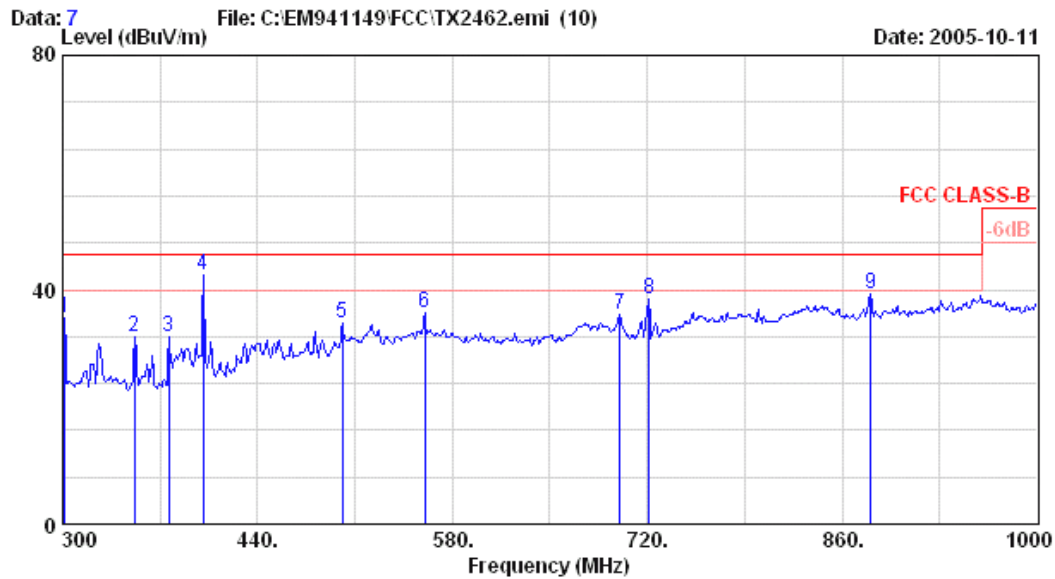
Site : A/C Chamber Date : 10  
 Condition : 3m BBA9106(A3L) Polarity: VERTICAL  
 Limit : FCC CLASS-B  
 Env. / Ins. : 8593EM 22\*C/51% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) M/N: ZP80  
 Power Rating : 120Vac/60Hz  
 Test Mode : TX 2462MHz

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBµV) | Emission<br>Level<br>(dBµV/m) | Limits<br>(dBµV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 30.270         | 23.39                    | 1.10                  | 13.26             | 37.76                         | 40.00              | 2.24           | QP     |
| 2 | 35.940         | 21.76                    | 1.20                  | 14.55             | 37.51                         | 40.00              | 2.49           |        |
| 3 | 39.180         | 20.64                    | 1.20                  | 12.94             | 34.78                         | 40.00              | 5.22           |        |
| 4 | 48.090         | 16.36                    | 1.40                  | 9.98              | 27.74                         | 40.00              | 12.26          |        |
| 5 | 61.590         | 13.32                    | 1.60                  | 10.05             | 24.97                         | 40.00              | 15.03          |        |
| 6 | 103.980        | 17.73                    | 2.10                  | 8.63              | 28.47                         | 43.50              | 15.03          |        |
| 7 | 154.740        | 21.10                    | 2.63                  | 6.72              | 30.45                         | 43.50              | 13.05          |        |
| 8 | 199.830        | 22.86                    | 3.00                  | 4.42              | 30.28                         | 43.50              | 13.22          |        |
| 9 | 249.780        | 25.00                    | 3.50                  | 1.49              | 29.99                         | 46.00              | 16.01          |        |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



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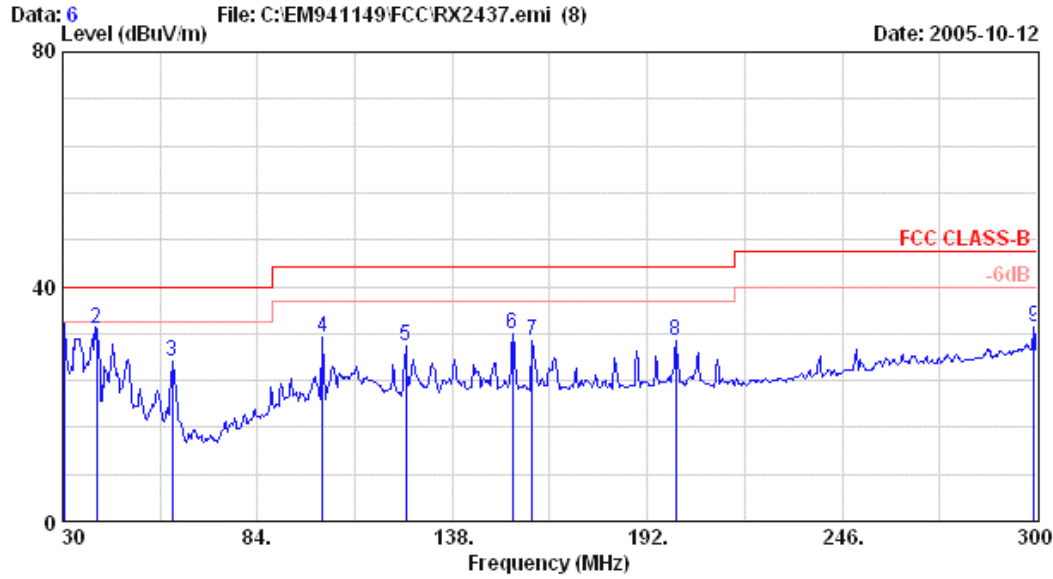
Site : A/C Chamber Date : 7  
 Condition : 3m UHALP9108-A(0139) Polarity: VERTICAL  
 Limit : FCC CLASS-B  
 Env. / Ins. : 8593EM 22\*C/51% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) M/N: ZP80  
 Power Rating : 120Vac/60Hz  
 Test Mode : TX 2462MHz

|             | Ant.          | Cable     | Emission       |                |                 |       | Margin | Remark |
|-------------|---------------|-----------|----------------|----------------|-----------------|-------|--------|--------|
| Freq. (MHz) | Factor (dB/m) | Loss (dB) | Reading (dBuV) | Level (dBuV/m) | Limits (dBuV/m) | (dB)  |        |        |
| 1           | 301.400       | 14.83     | 3.90           | 16.50          | 35.23           | 46.00 | 10.77  | QP     |
| 2           | 351.800       | 15.78     | 4.30           | 11.97          | 32.05           | 46.00 | 13.95  |        |
| 3           | 376.300       | 16.19     | 4.60           | 11.11          | 31.90           | 46.00 | 14.10  |        |
| 4           | 400.800       | 17.54     | 4.80           | 20.22          | 42.56           | 46.00 | 3.44   |        |
| 5           | 500.900       | 19.84     | 6.50           | 8.09           | 34.43           | 46.00 | 11.57  |        |
| 6           | 560.400       | 22.08     | 6.70           | 7.39           | 36.17           | 46.00 | 9.83   |        |
| 7           | 700.400       | 22.57     | 6.50           | 6.67           | 35.74           | 46.00 | 10.26  |        |
| 8           | 721.400       | 22.11     | 6.50           | 9.79           | 38.40           | 46.00 | 7.60   |        |
| 9           | 880.300       | 25.31     | 7.30           | 6.73           | 39.33           | 46.00 | 6.67   |        |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



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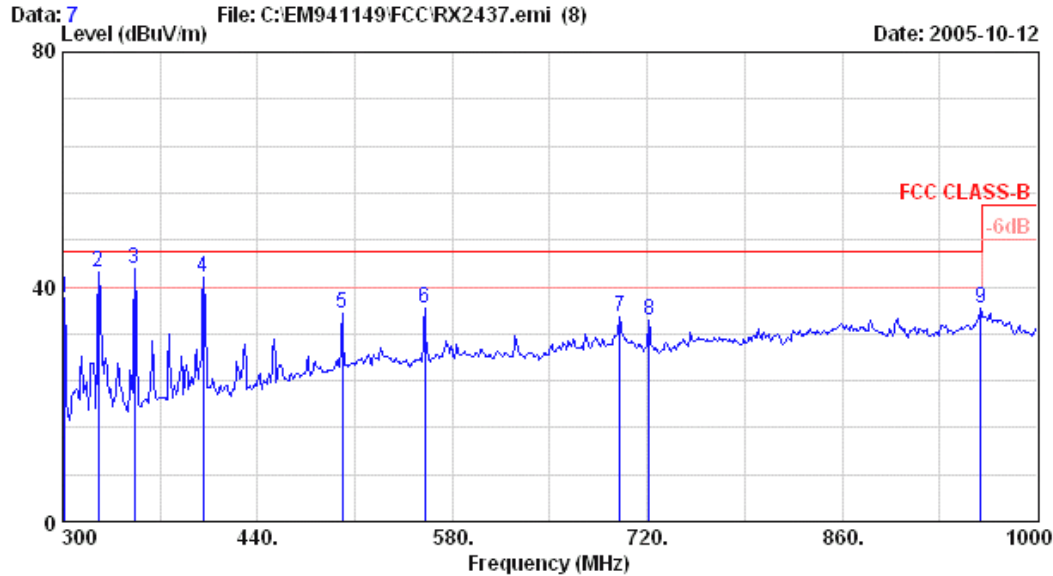
Site : A/C Chamber Date : 6  
 Condition : 3m BBA9106(A3L) Polarity: HORIZONTAL  
 Limit : FCC CLASS-B  
 Env. / Ins. : 8593EM 23\*C/56% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) M/N: ZP80  
 Power Rating : 120Vac/60Hz  
 Test Mode : RX2437MHz

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBµV) | Emission<br>Level<br>(dBµV/m) | Limits<br>(dBµV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 30.270         | 24.81                    | 1.10                  | 7.94              | 33.85                         | 40.00              | 6.15           | QP     |
| 2 | 39.450         | 20.41                    | 1.20                  | 11.35             | 32.97                         | 40.00              | 7.03           |        |
| 3 | 60.240         | 12.55                    | 1.60                  | 13.05             | 27.20                         | 40.00              | 12.80          |        |
| 4 | 102.090        | 17.32                    | 2.10                  | 12.04             | 31.46                         | 43.50              | 12.04          |        |
| 5 | 125.040        | 19.38                    | 2.30                  | 8.28              | 29.96                         | 43.50              | 13.54          |        |
| 6 | 154.740        | 20.71                    | 2.63                  | 8.48              | 31.82                         | 43.50              | 11.68          |        |
| 7 | 160.140        | 20.80                    | 2.70                  | 7.14              | 30.64                         | 43.50              | 12.86          |        |
| 8 | 199.830        | 22.08                    | 3.00                  | 5.59              | 30.67                         | 43.50              | 12.83          |        |
| 9 | 299.190        | 26.75                    | 3.90                  | 2.42              | 33.06                         | 46.00              | 12.94          |        |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



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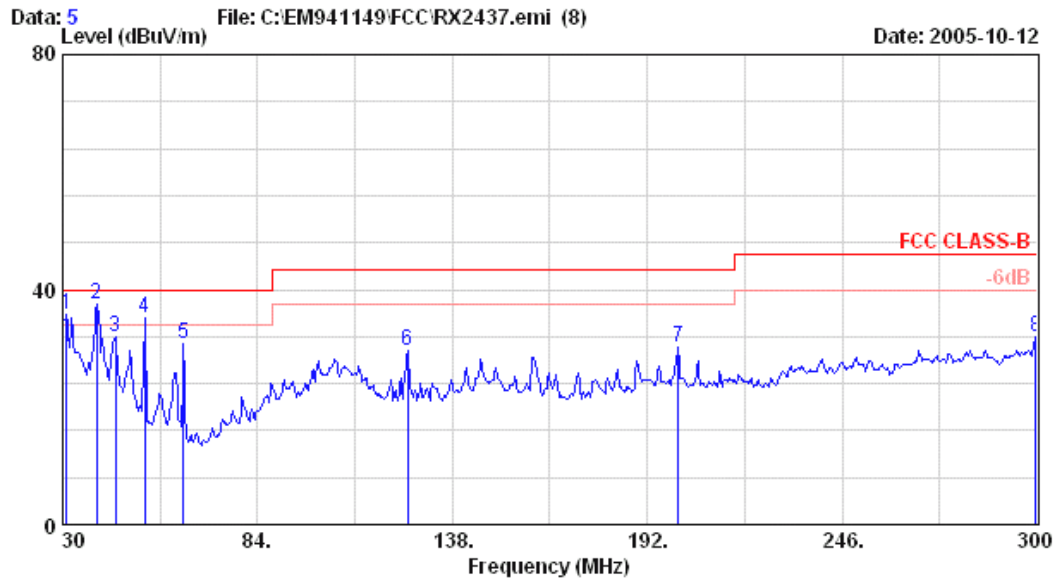
Site : A/C Chamber Date : 7  
 Condition : 3m UHALP9108-A(0139) Polarity: HORIZONTAL  
 Limit : FCC CLASS-B  
 Env. / Ins. : 8593EM 23\*C/56% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) M/N: ZP80  
 Power Rating : 120Vac/60Hz  
 Test Mode : RX2437MHz

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBµV) | Emission<br>Level<br>(dBµV/m) | Limits<br>(dBµV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 301.400        | 14.59                    | 3.90                  | 19.63             | 38.12                         | 46.00              | 7.88           | QP     |
| 2 | 325.900        | 15.15                    | 4.20                  | 23.27             | 42.63                         | 46.00              | 3.37           |        |
| 3 | 351.800        | 15.55                    | 4.30                  | 23.26             | 43.12                         | 46.00              | 2.88           |        |
| 4 | 400.800        | 17.63                    | 4.80                  | 19.19             | 41.62                         | 46.00              | 4.38           |        |
| 5 | 500.900        | 18.91                    | 6.50                  | 9.93              | 35.34                         | 46.00              | 10.66          |        |
| 6 | 560.400        | 20.03                    | 6.70                  | 9.64              | 36.37                         | 46.00              | 9.63           |        |
| 7 | 700.400        | 23.46                    | 6.50                  | 4.95              | 34.91                         | 46.00              | 11.09          |        |
| 8 | 721.400        | 22.21                    | 6.50                  | 5.72              | 34.43                         | 46.00              | 11.57          |        |
| 9 | 959.400        | 26.38                    | 7.60                  | 2.43              | 36.41                         | 46.00              | 9.59           |        |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



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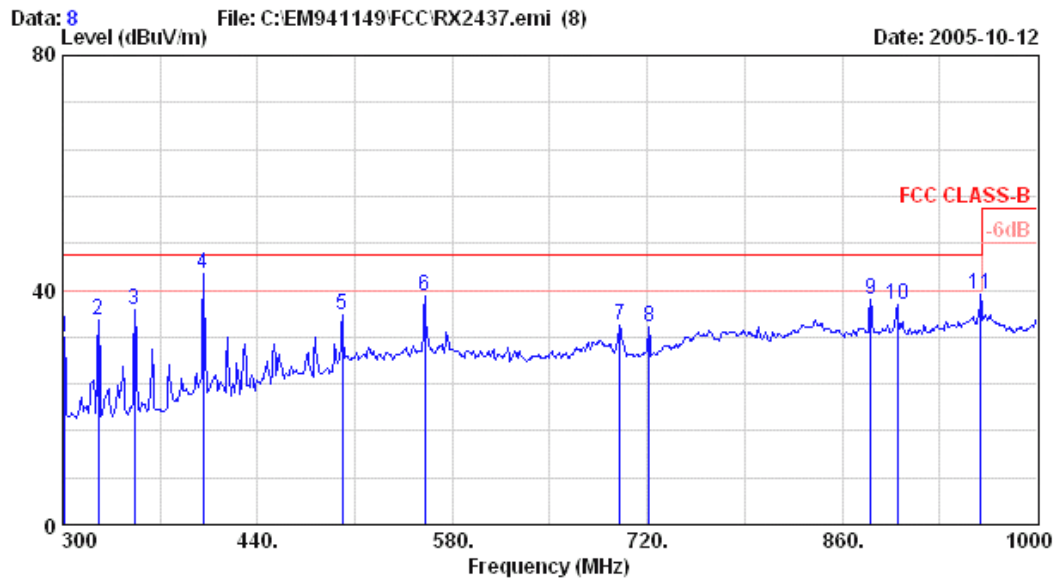
Site : A/C Chamber Date : 5  
 Condition : 3m BBA9106(A3L) Polarity: VERTICAL  
 Limit : FCC CLASS-B  
 Env. / Ins. : 8593EM 23\*C/56% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) M/N:ZP80  
 Power Rating : 120Vac/60Hz  
 Test Mode : RX2437MHz

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBµV) | Emission<br>Level<br>(dBµV/m) | Limits<br>(dBµV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 31.080         | 22.77                    | 1.10                  | 11.74             | 35.61                         | 40.00              | 4.39           | QP     |
| 2 | 39.450         | 20.54                    | 1.20                  | 15.66             | 37.39                         | 40.00              | 2.61           |        |
| 3 | 44.580         | 17.60                    | 1.36                  | 12.91             | 31.87                         | 40.00              | 8.13           |        |
| 4 | 52.680         | 15.05                    | 1.50                  | 18.56             | 35.11                         | 40.00              | 4.89           |        |
| 5 | 63.480         | 13.00                    | 1.67                  | 16.07             | 30.75                         | 40.00              | 9.25           |        |
| 6 | 125.580        | 17.92                    | 2.38                  | 9.41              | 29.71                         | 43.50              | 13.79          |        |
| 7 | 200.640        | 22.94                    | 3.00                  | 4.23              | 30.17                         | 43.50              | 13.33          |        |
| 8 | 299.730        | 26.86                    | 3.90                  | 1.24              | 32.00                         | 46.00              | 14.00          |        |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



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Site : A/C Chamber Date : 8  
 Condition : 3m UHALP9108-A(0139) Polarity: VERTICAL  
 Limit : FCC CLASS-B  
 Env. / Ins. : 8593EM 23\*C/56% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) M/N: ZP80  
 Power Rating : 120Vac/60Hz  
 Test Mode : RX2437MHz

|                | Ant.             | Cable        | Emission          |                   |                    |       | Margin | Remark |
|----------------|------------------|--------------|-------------------|-------------------|--------------------|-------|--------|--------|
| Freq.<br>(MHz) | Factor<br>(dB/m) | Loss<br>(dB) | Reading<br>(dBµV) | Level<br>(dBµV/m) | Limits<br>(dBµV/m) | (dB)  |        |        |
| 1              | 301.400          | 14.83        | 3.90              | 13.18             | 31.91              | 46.00 | 14.09  | QP     |
| 2              | 325.900          | 15.47        | 4.20              | 15.34             | 35.02              | 46.00 | 10.98  |        |
| 3              | 351.800          | 15.78        | 4.30              | 16.67             | 36.75              | 46.00 | 9.25   |        |
| 4              | 400.800          | 17.54        | 4.80              | 20.49             | 42.83              | 46.00 | 3.17   |        |
| 5              | 500.900          | 19.84        | 6.50              | 9.46              | 35.80              | 46.00 | 10.20  |        |
| 6              | 560.400          | 22.08        | 6.70              | 10.25             | 39.03              | 46.00 | 6.97   |        |
| 7              | 700.400          | 22.57        | 6.50              | 5.02              | 34.09              | 46.00 | 11.91  |        |
| 8              | 721.400          | 22.11        | 6.50              | 5.08              | 33.69              | 46.00 | 12.31  |        |
| 9              | 880.300          | 25.31        | 7.30              | 5.86              | 38.46              | 46.00 | 7.54   |        |
| 10             | 899.900          | 25.83        | 7.37              | 4.30              | 37.50              | 46.00 | 8.50   |        |
| 11             | 959.400          | 27.16        | 7.60              | 4.54              | 39.30              | 46.00 | 6.70   |        |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.

3.6.2. Frequency Range Above 1GHz

Date of Test : Oct. 11, 2005 Temperature : 22

EUT : Zone Player Humidity : 51%

Test Mode : Transmitting Mode, Frequency: 2412MHz (CH1)

|         | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB $\mu$ V | Meter Reading Horizontal dB $\mu$ V/m | Emission Level Horizontal dB $\mu$ V/m | Limits dB | Margin |
|---------|------------------------|---------------------|-----------------------|---------------------------------------|--|-----------|--------|
| Peak    | 1610.792               | 26.00               | 6.21                  | 14.31                                 | 46.52                                  | 74.00     | 27.48  |
| Average | 1610.792               | 26.00               | 6.21                  | 11.30                                 | 43.51                                  | 54.00     | 10.49  |
|         | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB $\mu$ V | Meter Reading Vertical dB $\mu$ V/m   | Emission Level Vertical dB $\mu$ V/m   | Limits dB | Margin |
| Peak    | 1610.792               | 26.00               | 6.21                  | 21.08                                 | 53.29                                  | 74.00     | 20.71  |
| Average | 1610.792               | 26.00               | 6.21                  | 17.05                                 | 49.26                                  | 54.00     | 4.74   |

Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.  
 2. Measurement was up to 25GHz, but the emissions level were too low against the official limit and not report.



Date of Test : Oct. 11, 2005 Temperature : 22

EUT : Zone Player Humidity : 51%

Test Mode : Transmitting Mode, Frequency: 2437MHz (CH6)

|         | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dBμV | Meter Reading Horizontal dBμV/m | Emission Level Horizontal dBμV/m | Limits dB | Margin |
|---------|------------------------|---------------------|-----------------|---------------------------------|----------------------------------|-----------|--------|
| Peak    | 1627.572               | 26.10               | 6.36            | 12.75                           | 45.21                            | 74.00     | 28.79  |
|         | 2399.452               | 28.62               | 6.35            | 14.76                           | 49.73                            | 74.00     | 24.27  |
| Average | 1627.572               | 26.10               | 6.36            | 11.49                           | 43.95                            | 54.00     | 10.05  |
|         | 2399.452               | 28.62               | 6.35            | 11.82                           | 46.79                            | 54.00     | 7.21   |

|         | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dBμV | Meter Reading Vertical dBμV/m | Emission Level Vertical dBμV/m | Limits dB | Margin |
|---------|------------------------|---------------------|-----------------|-------------------------------|--------------------------------|-----------|--------|
| Peak    | 1627.572               | 26.10               | 6.36            | 21.78                         | 54.24                          | 74.00     | 19.76  |
|         | 2642.762               | 29.40               | 6.69            | 12.17                         | 48.26                          | 74.00     | 25.74  |
| Average | 1627.572               | 26.10               | 6.36            | 15.91                         | 48.37                          | 54.00     | 5.63   |
|         | 2642.762               | 29.40               | 6.69            | 9.19                          | 45.28                          | 54.00     | 8.72   |

Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.  
 2. Measurement was up to 25GHz, but the emissions level were too low against the official limit and not report.

Date of Test : Oct. 11, 2005 Temperature : 22

EUT : Zone Player Humidity : 51%

Test Mode : Transmitting Mode, Frequency: 2462MHz (CH11)

|         | Emission Frequency<br>MHz | Antenna Factor<br>dB/m | Cable Loss<br>dB $\mu$ V | Meter Reading<br>Horizontal<br>dB $\mu$ V/m | Emission Level<br>Horizontal<br>dB $\mu$ V/m | Limits<br>dB | Margin |
|---------|---------------------------|------------------------|--------------------------|---|--|--------------|--------|
| Peak    | 1644.352                  | 26.17                  | 6.45                     | 22.58                                       | 55.20  | 74.00        | 18.80  |
| Average | 1644.352                  | 26.17                  | 6.45                     | 16.58                                       | 49.20  | 54.00        | 4.80   |
|         | Emission Frequency<br>MHz | Antenna Factor<br>dB/m | Cable Loss<br>dB $\mu$ V | Meter Reading<br>Vertical<br>dB $\mu$ V/m   | Emission Level<br>Vertical<br>dB $\mu$ V/m   | Limits<br>dB | Margin |
| Peak    | 1644.352                  | 26.17                  | 6.45                     | 14.64                                       | 47.26  | 74.00        | 26.74  |
| Average | 1644.352                  | 26.17                  | 6.45                     | 12.64                                       | 45.26  | 54.00        | 8.74   |

Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.  
 2. Measurement was up to 25GHz, but the emissions level were too low against the official limit and not report.

3.6.3. Restricted Bands Measurement Results

Date of Test : Oct. 11, 2005 Temperature : 22

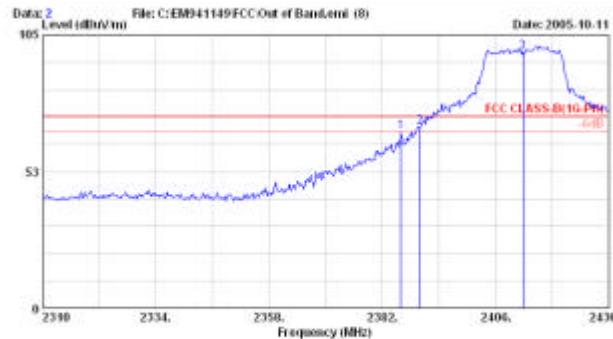
EUT : Zone Player Humidity : 51%

Test Mode : Transmitting Mode, Frequency: 2412MHz (CH1)

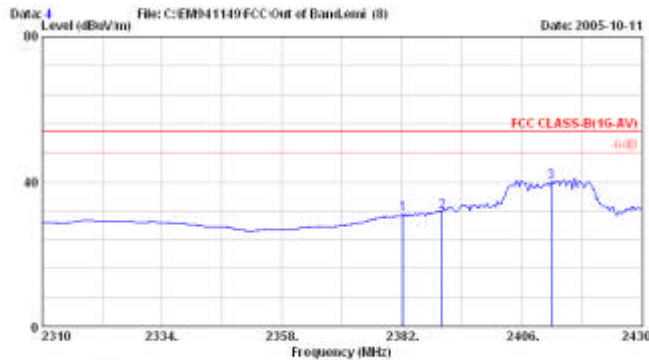
|           | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB $\mu$ V | Meter Reading Horizontal dB $\mu$ V/m | Emission Level Horizontal dB $\mu$ V/m | Limits dB | Margin |
|-----------|------------------------|---------------------|-----------------------|---------------------------------------|--|-----------|--------|
| Peak *    | 2386.000               | 28.59               | 6.33                  | 32.92                                 | 67.84                                  | 74.00     | 6.16   |
|           | 2390.000               | 28.59               | 6.34                  | 34.82                                 | 69.75                                  | 74.00     | 4.25   |
| Average * | 2382.240               | 28.58               | 6.33                  | -3.84                                 | 31.07                                  | 54.00     | 22.93  |
|           | 2390.000               | 28.59               | 6.34                  | -3.16                                 | 31.77                                  | 54.00     | 22.23  |

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.  
 2. Low frequency section (spurious in the restricted band 2310-2390MHz).  
 3. ‘\*’ The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

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 Email:ttenc@ttenc.com.tw



Site : A/C Chamber Date : 2  
 Condition : 3m 3115 Polarity: HORIZONTAL  
 Limit : FCC CLASS-B(1G-PR)  
 Env. / Ins. : 8593EM 22°C/51% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) N/N: ZP00  
 Power Rating : 120Vac/60Hz  
 Test Mode : Out of Band



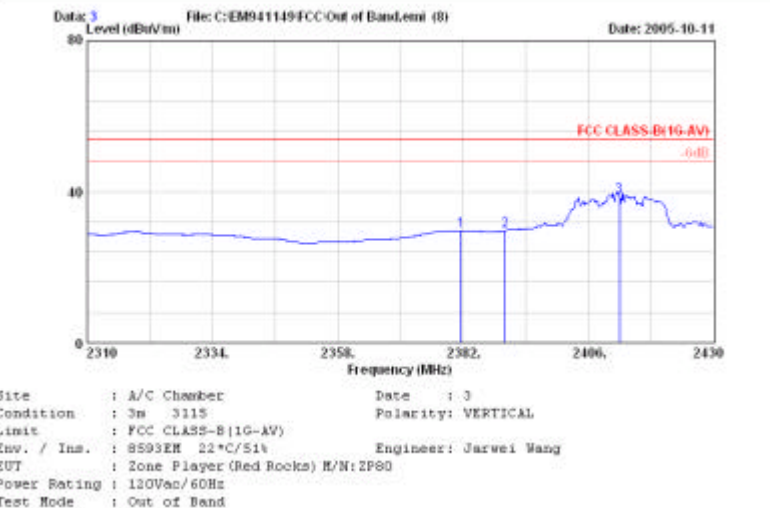
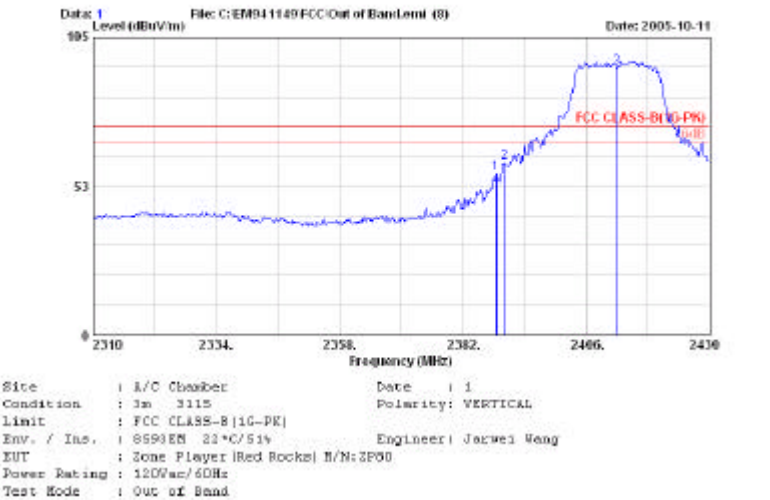
Site : A/C Chamber Date : 4  
 Condition : 3m 3115 Polarity: HORIZONTAL  
 Limit : FCC CLASS-B(1G-AV)  
 Env. / Ins. : 8593EM 22°C/51% Engineer: Jarwei Wang  
 EUT : Zone Player (Red Rocks) N/N: ZP00  
 Power Rating : 120Vac/60Hz  
 Test Mode : Out of Band

Date of Test : Oct. 11, 2005 Temperature : 22  
 EUT : Zone Player Humidity : 51%  
 Test Mode : Transmitting Mode, Frequency: 2412MHz (CH1)

|           | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB $\mu$ V | Meter Reading Vertical dB $\mu$ V/m | Emission Level Vertical dB $\mu$ V/m | Limits dB | Margin |
|-----------|------------------------|---------------------|-----------------------|-------------------------------------|--------------------------------------|-----------|--------|
| Peak *    | 2388.480               | 28.59               | 6.34                  | 21.96                               | 56.89                                | 74.00     | 17.11  |
|           | 2390.000               | 28.59               | 6.34                  | 25.82                               | 60.75                                | 74.00     | 13.25  |
| Average * | 2381.640               | 28.58               | 6.33                  | -5.27                               | 29.64                                | 54.00     | 24.36  |
|           | 2390.000               | 28.59               | 6.34                  | -5.23                               | 29.70                                | 54.00     | 24.30  |

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.  
 2. Low frequency section (spurious in the restricted band 2310-2390MHz).  
 3. ‘\*’ The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

**AUDIX**<sup>®</sup> EMC Laboratory  
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 Email: t.tsmc@ttsmc.com.tw

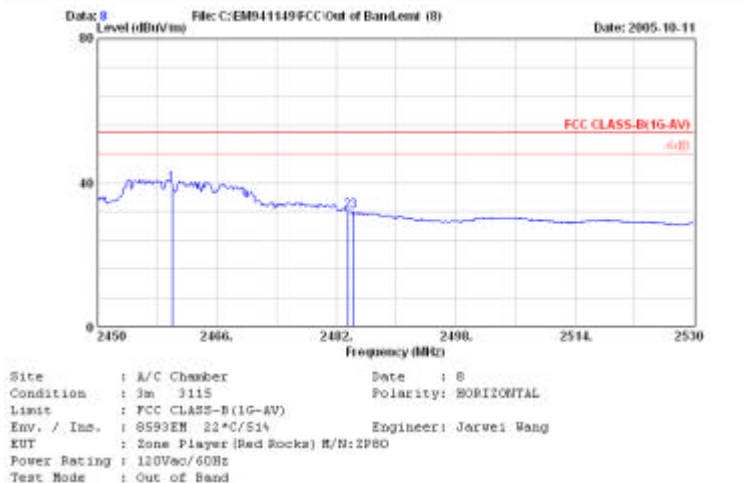
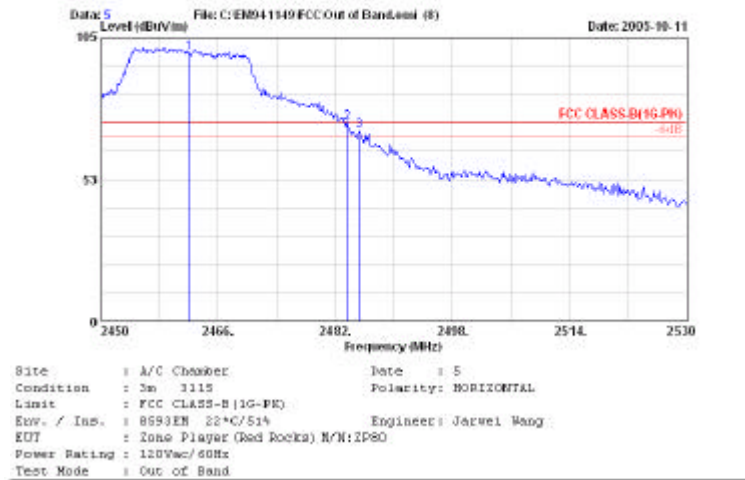


Date of Test : Oct. 11, 2005 Temperature : 22  
 EUT : Zone Player Humidity : 51%  
 Test Mode : Transmitting Mode, Frequency: 2462MHz (CH11)

|           | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dBμV | Meter Reading Horizontal dBμV/m | Emission Level Horizontal dBμV/m | Limits dB | Margin |
|-----------|------------------------|---------------------|-----------------|---------------------------------|----------------------------------|-----------|--------|
| Peak *    | 2483.600               | 28.77               | 6.45            | 38.08                           | 73.30                            | 74.00     | 0.70   |
|           | 2485.360               | 28.77               | 6.45            | 35.27                           | 70.49                            | 74.00     | 3.51   |
| Average * | 2483.520               | 28.77               | 6.45            | -3.24                           | 31.98                            | 54.00     | 22.02  |
|           | 2484.320               | 28.77               | 6.45            | -3.38                           | 31.84                            | 54.00     | 22.16  |

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.  
 2. Low frequency section (spurious in the restricted band 2483.5-2500MHz).  
 3. ‘\*’ The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

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 Email: tctenc@tctenc.com.tw



Date of Test : Oct. 11, 2005 Temperature : 22

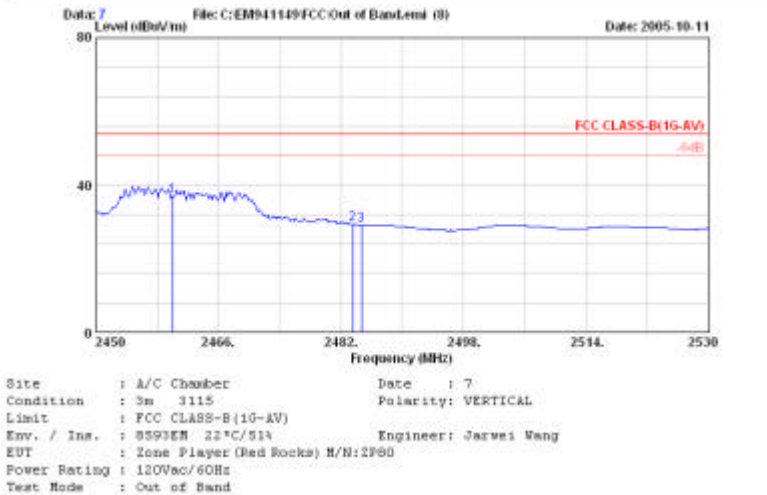
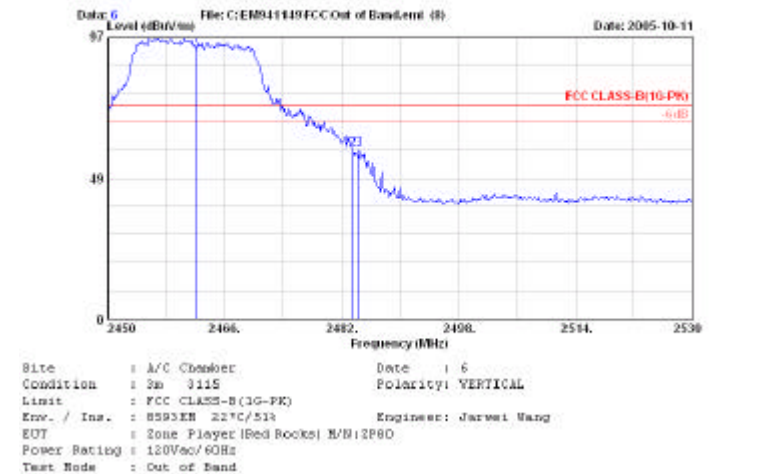
EUT : Zone Player Humidity : 51%

Test Mode : Transmitting Mode, Frequency: 2462MHz (CH11)

|           | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB $\mu$ V | Meter Reading Vertical dB $\mu$ V/m | Emission Level Vertical dB $\mu$ V/m | Limits dB | Margin |
|-----------|------------------------|---------------------|-----------------------|-------------------------------------|--------------------------------------|-----------|--------|
| Peak *    | 2483.520               | 28.77               | 6.45                  | 23.20                               | 58.42                                | 74.00     | 15.58  |
|           | 2484.320               | 28.77               | 6.45                  | 23.18                               | 58.40                                | 74.00     | 15.60  |
| Average * | 2483.520               | 28.77               | 6.45                  | -5.98                               | 29.24                                | 54.00     | 24.76  |
|           | 2484.640               | 28.77               | 6.45                  | -6.15                               | 29.07                                | 54.00     | 24.93  |

- Remark :
1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
  2. Low frequency section (spurious in the restricted band 2483.5-2500MHz).
  3. ‘\*’ The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

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 Email: ttenc@ttenc.com.tw



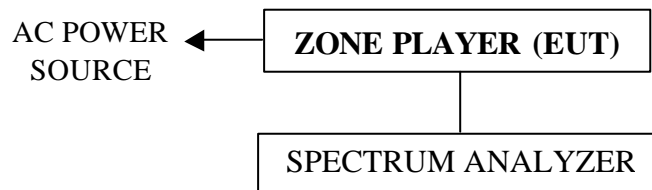
## 4. 6dB BANDWIDTH MEASUREMENT

### 4.1. Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

| Item | Type             | Manufacturer | Model No. | Serial No. | Last Cal.    | Next Cal.    |
|------|------------------|--------------|-----------|------------|--------------|--------------|
| 1.   | Spectrum Monitor | Agilent      | E4446A    | US44300366 | Aug. 27, 04' | Aug. 26. 05' |

### 4.2. Block Diagram of Test Setup



### 4.3. Specification Limits (§15.247(a)(2))

The minimum 6dB bandwidth shall be at least 500kHz.

### 4.4. Operating Condition of EUT

- 4.4.1. Setup the EUT and simulator as shown on 4.2.
- 4.4.2. Turn on the power of all equipment.
- 4.4.3. Run the notebook PC (IBM ThinkPad) test software “dsp-write” to set EUT (Zone Player) transmitter channel through RJ45 Ethernet during the testing.

### 4.5. Test Procedure

The RF output of EUT was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

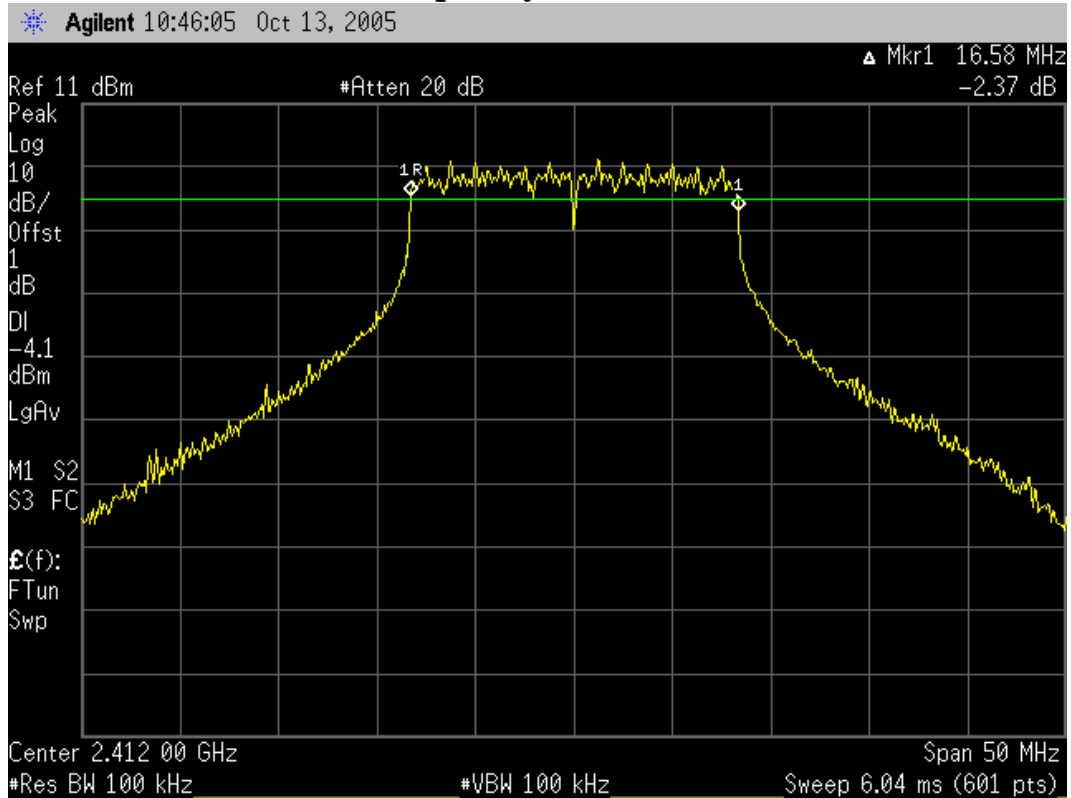
### 4.6. Test Results

**PASSED.** All the test results are attached in next pages.

Test Date : Oct. 13, 2005    Temperature : 23    Humidity : 56 %

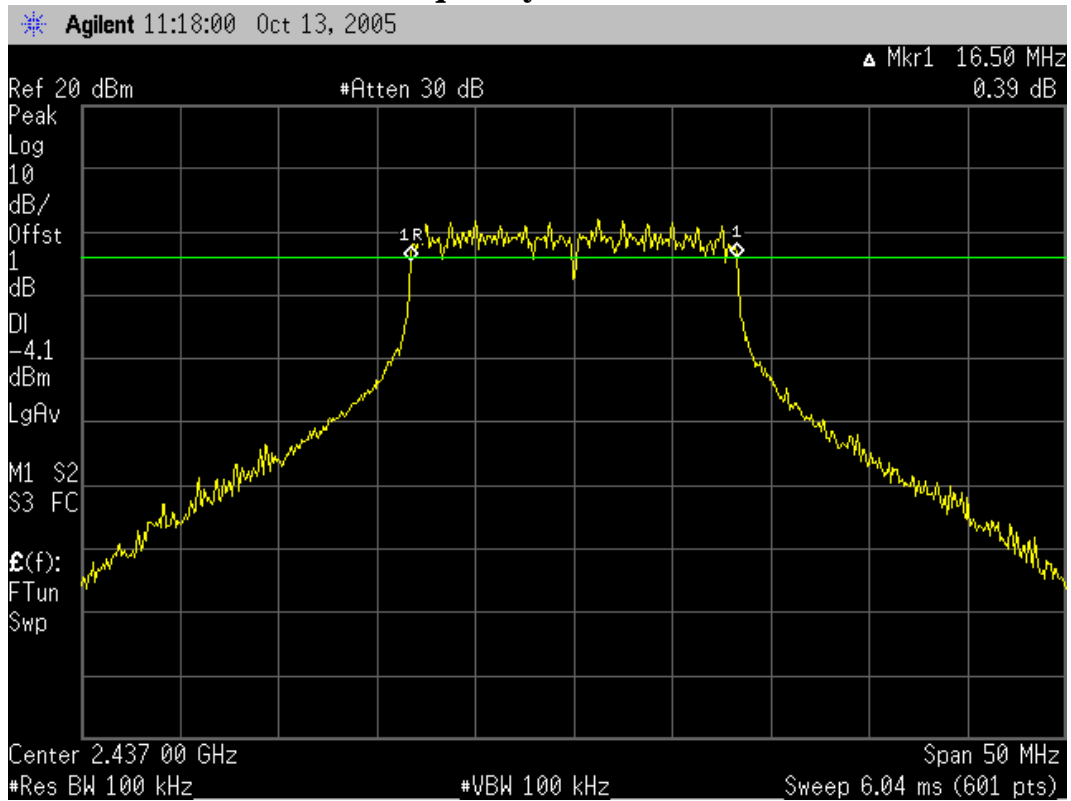
| Channel | Frequency | 6dB Bandwidth   |
|---------|-----------|-----------------|
| 1.      | 2412MHz   | <b>16.58MHz</b> |
| 6       | 2437MHz   | <b>16.50MHz</b> |
| 11      | 2462MHz   | <b>16.58MHz</b> |

### Frequency : 2412MHz

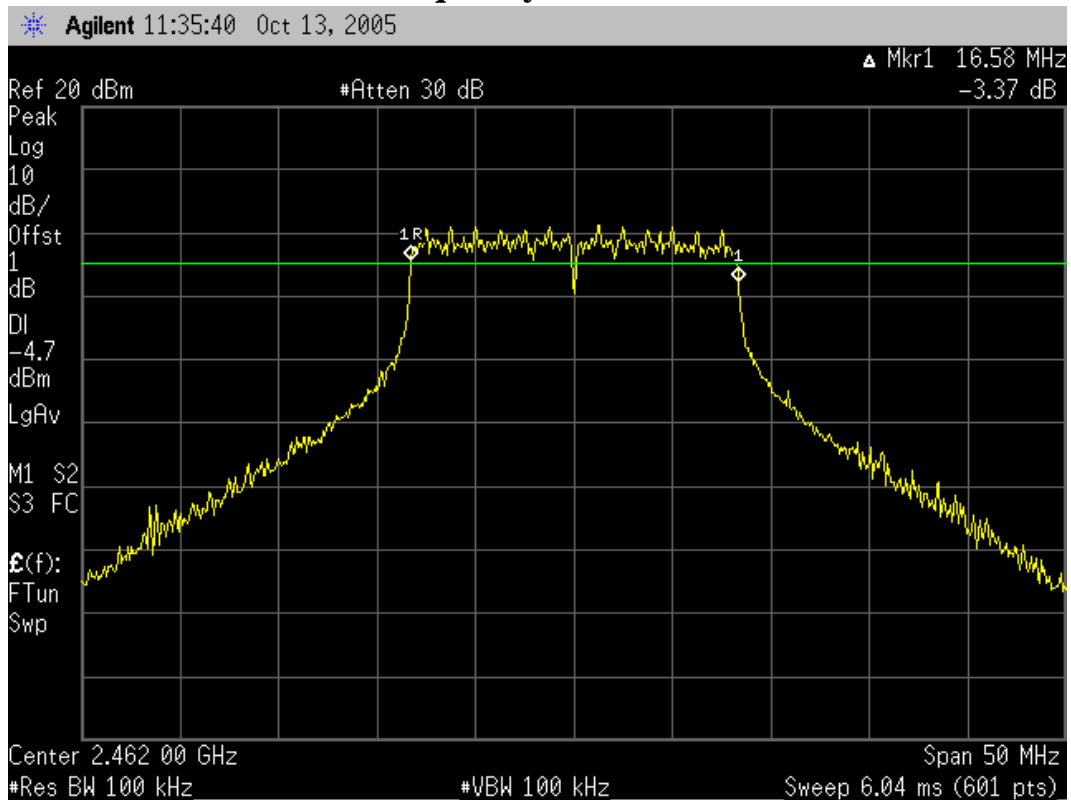




### Frequency : 2437MHz



### Frequency : 2462MHz



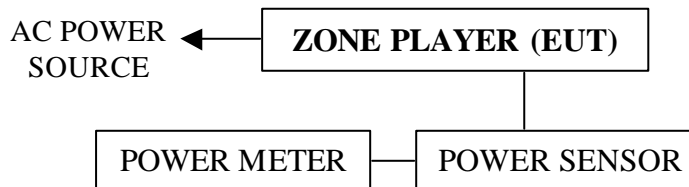
## 5. MAXIMUM PEAK OUTPUT POWER MEASUREMENT

### 5.1. Test Equipment

The following test equipment was used during the maximum peak output power measurement:

| Item | Type                              | Manufacturer | Model No. | Serial No.  | Last Cal.    | Next Cal.    |
|------|-----------------------------------|--------------|-----------|-------------|--------------|--------------|
| 1.   | Power Meter                       | Anritsu      | ML2487A   | 6K000001563 | Jan. 15, 05' | Jan. 14. 06' |
| 2.   | Power Sensor with 20MHz Bandwidth | Anritsu      | MA2491A   | 030873      | Jan. 15, 05' | Jan. 14. 06' |

### 5.2. Block Diagram of Test Setup



### 5.3. Specification Limits (§15.247(b)-(3))

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5MHz is : 1Watt. (30dBm)

### 5.4. Operating Condition of EUT

Same as 6dB bandwidth measurement which was listed in 4.4. except the test set up replaced by section 5.2.

### 5.5. Test Procedure

The RF output of EUT was connected to the power meter and sensor with 20MHz bandwidth that was designed to detect peak value automatically.

### 5.6. Test Results

**PASSED.** All the test results are listed below.

Test Date : Oct. 13, 2005 Temperature : 23 Humidity : 56 %

| Channel | Frequency | Peak Output Power | Limit |
|---------|-----------|-------------------|-------|
| 1       | 2412MHz   | <b>20.66dBm</b>   | 30dBm |
| 6       | 2437MHz   | <b>20.75dBm</b>   | 30dBm |
| 11      | 2462MHz   | <b>21.24dBm</b>   | 30dBm |

## 6. EMISSION LIMITATIONS MEASUREMENT

### 6.1. Test Equipment

The following test equipment was used during the emission limitations test :

| Item | Type             | Manufacturer | Model No. | Serial No. | Last Cal.    | Next Cal.    |
|------|------------------|--------------|-----------|------------|--------------|--------------|
| 1.   | Spectrum Monitor | Agilent      | E4446A    | US44300366 | Aug. 27, 04' | Aug. 26. 05' |

### 6.2. Block Diagram of Test Setup

The same as section.4.2.

### 6.3. Specification Limits (§15.247(c))

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (See Section 15.205(c)).( This test result attaching to §3.6.3)

### 6.4. Operating Condition of EUT

Same as 6dB bandwidth measurement which was listed in 4.4. except the test set up replaced by section 6.2.

### 6.5. Test Procedure

The RF output of EUT was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 100kHz RBW and 100kHz VBW.

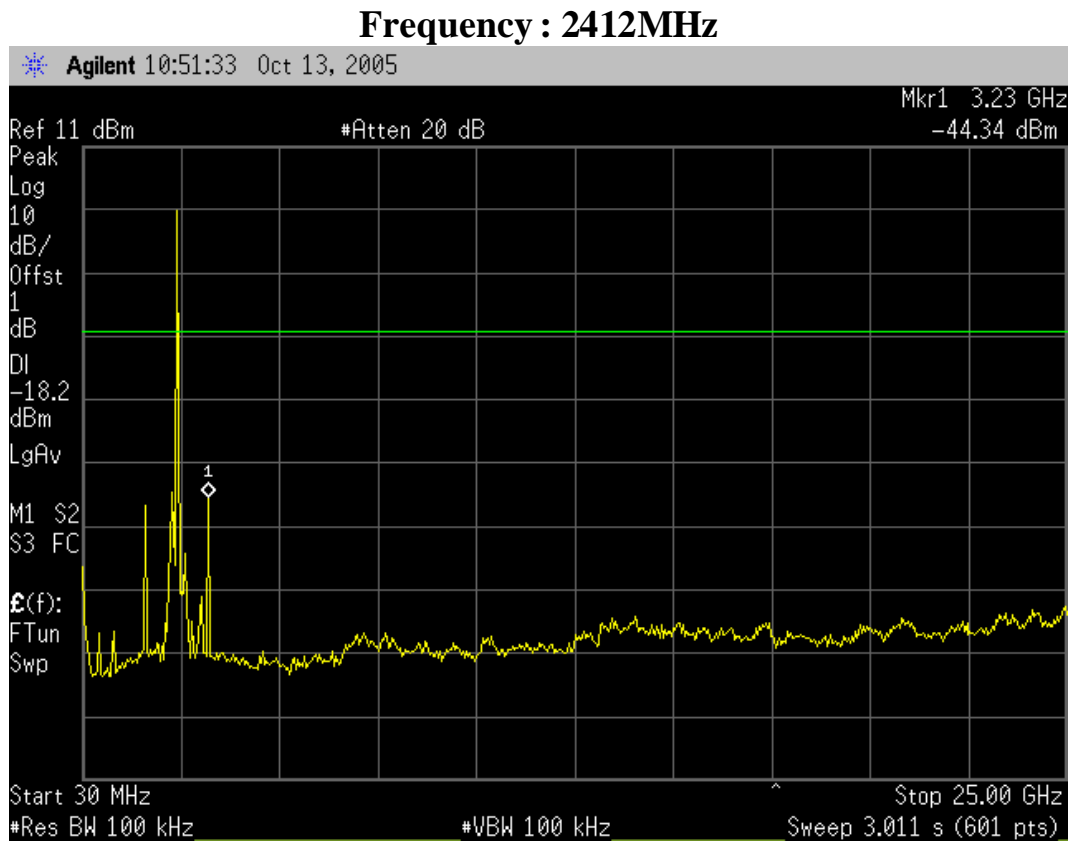
### 6.6. Test Results

**PASSED.** The testing data was attached in the next pages.

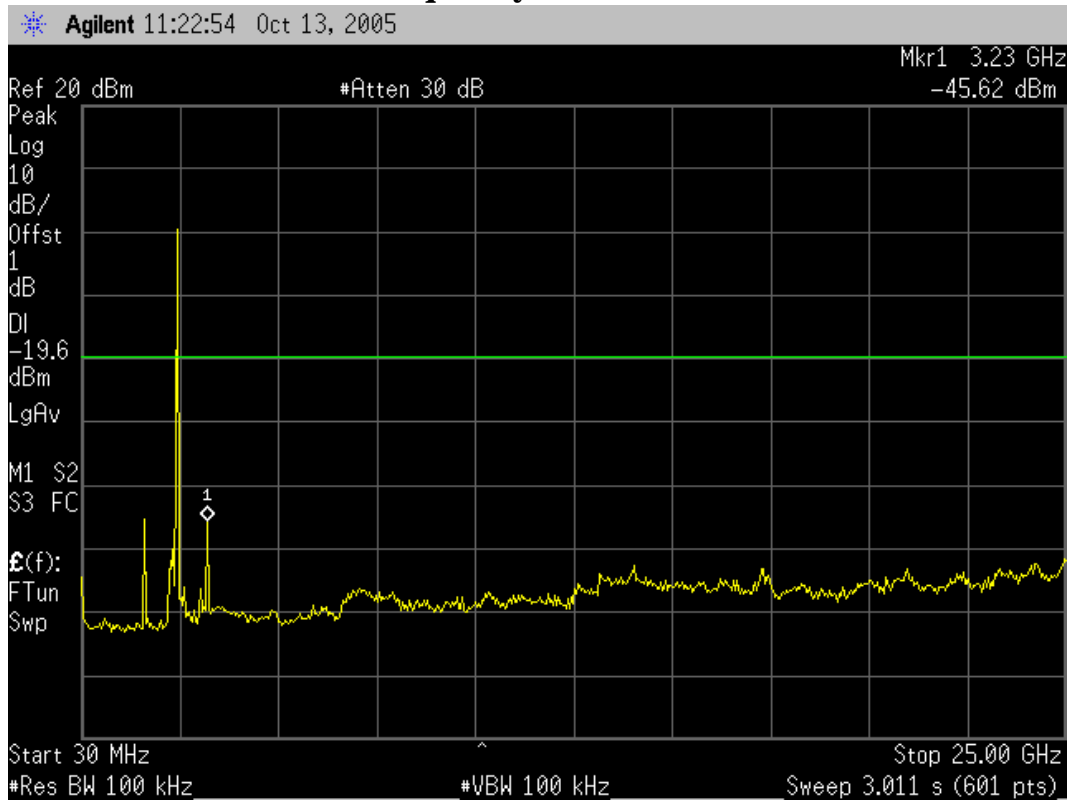
Test Date : Oct. 13, 2005 Temperature : 23 Humidity : 56 %

1. 2412MHz: During 30MHz~25GHz bandwidth. In the 2.4GHz, the -44.34dBm is max value that is lower than 20dB of primary channel.
2. 2437MHz: During 30MHz~25GHz bandwidth. In the 2.4GHz, the -45.62dBm is max value that is lower than 20dB of primary channel.
3. 2462MHz: During 30MHz~25GHz bandwidth. In the 2.4GHz, the -44.52dBm is max value that is lower than 20dB of primary channel.

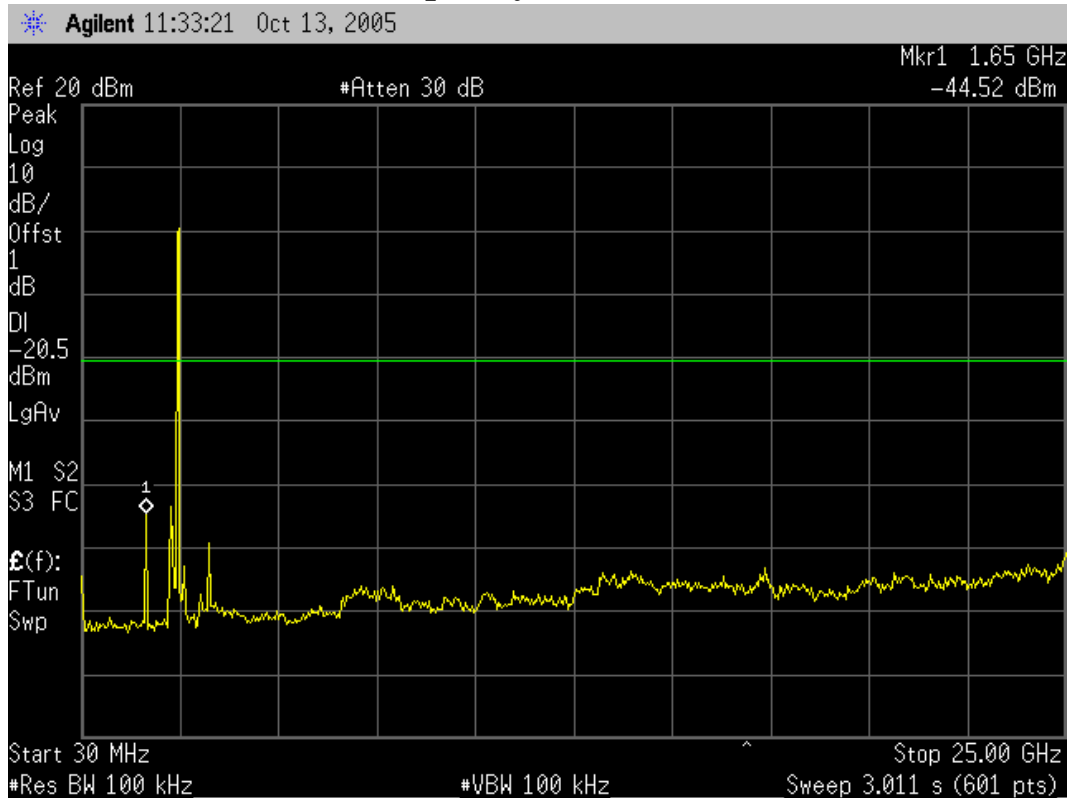
Note: The peak above the limit line is the carrier frequency.



### Frequency : 2437MHz



### Frequency : 2462MHz



## 7. BAND EDGES MEASUREMENT

### 7.1. Test Equipment

The following test equipment was used during the band edges measurement:

| Item | Type             | Manufacturer | Model No. | Serial No. | Last Cal.    | Next Cal.    |
|------|------------------|--------------|-----------|------------|--------------|--------------|
| 1.   | Spectrum Monitor | Agilent      | E4446A    | US44300366 | Aug. 27, 04' | Aug. 26. 05' |

### 7.2. Block Diagram of Test Setup

The same as section.4.2.

### 7.3. Specification Limits (§15.247(c))

The highest level should be at least 20 dB below that in the 100kHz bandwidth.

### 7.4. Operating Condition of EUT

Same as 6dB bandwidth measurement which was listed in 4.4. except the test set up replaced by section 7.2.

### 7.5. Test Procedure

The RF output of EUT was connected to the spectrum analyzer. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100kHz bandwidth from band edge.

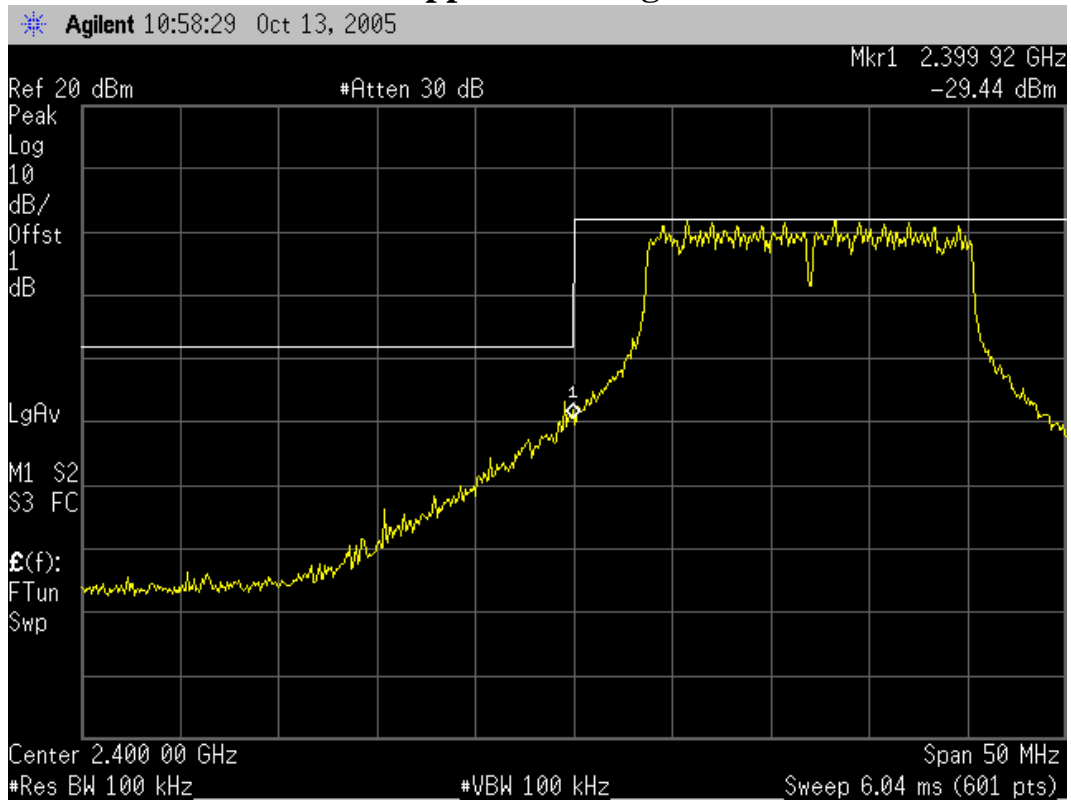
### 7.6. Test Results

**PASSED.** All the test results are attached in next page.

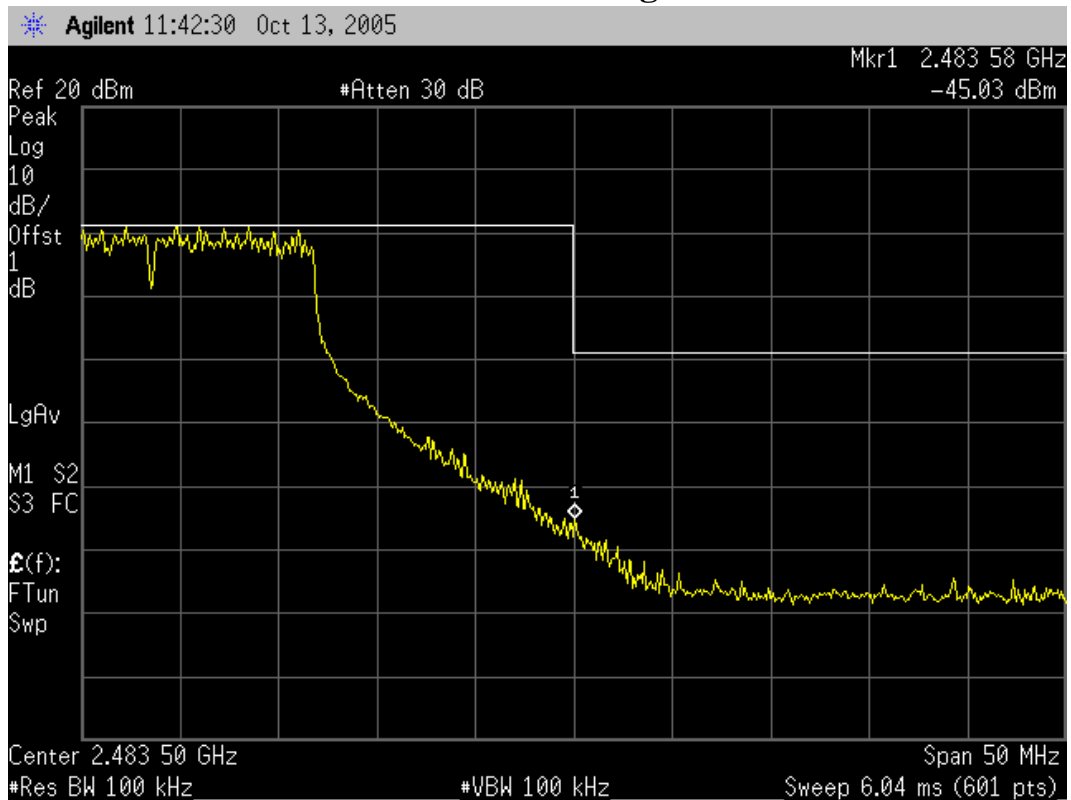
Test Date : Oct. 13, 2005    Temperature : 23        Humidity : 56 %

1. Upper Band edge: The highest emission level is – 29.44dBm on 2.39992GHz.
2. Below Band edge : The highest emission level is – 45.03dBm on 2.48358GHz.

### Upper Band edge



### Below Band edge



## 8. POWER SPECTRAL DENSITY MEASUREMENT

### 8.1. Test Equipment

The following test equipment was used during the power spectral density measurement:

| Item | Type             | Manufacturer | Model No. | Serial No. | Last Cal.    | Next Cal.    |
|------|------------------|--------------|-----------|------------|--------------|--------------|
| 1.   | Spectrum Monitor | Agilent      | E4446A    | US44300366 | Aug. 27, 04' | Aug. 26. 05' |

### 8.2. Block Diagram of Test Setup

The same as section.4.2.

### 8.3. Specification Limits (§15.247(d))

The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band.

### 8.4. Operating Condition of EUT

Same as 6dB bandwidth measurement which was listed in 4.4. except the test set up replaced by section 8.2.

### 8.5. Test Procedure

The RF output of EUT was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, span 300kHz set sweep time = span/3kHz.

### 8.6. Test Results

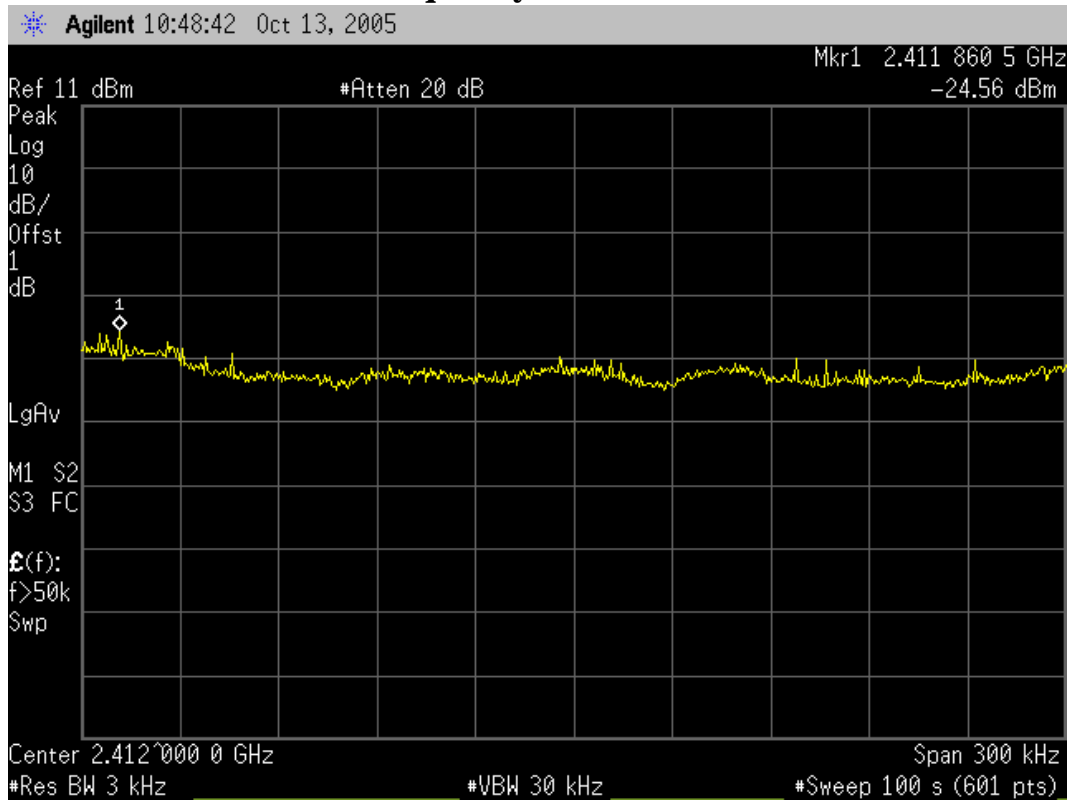
**PASSED.** All the test results are attached in next pages.

Test Date : Oct. 13, 2005 Temperature : 23 Humidity : 56 %

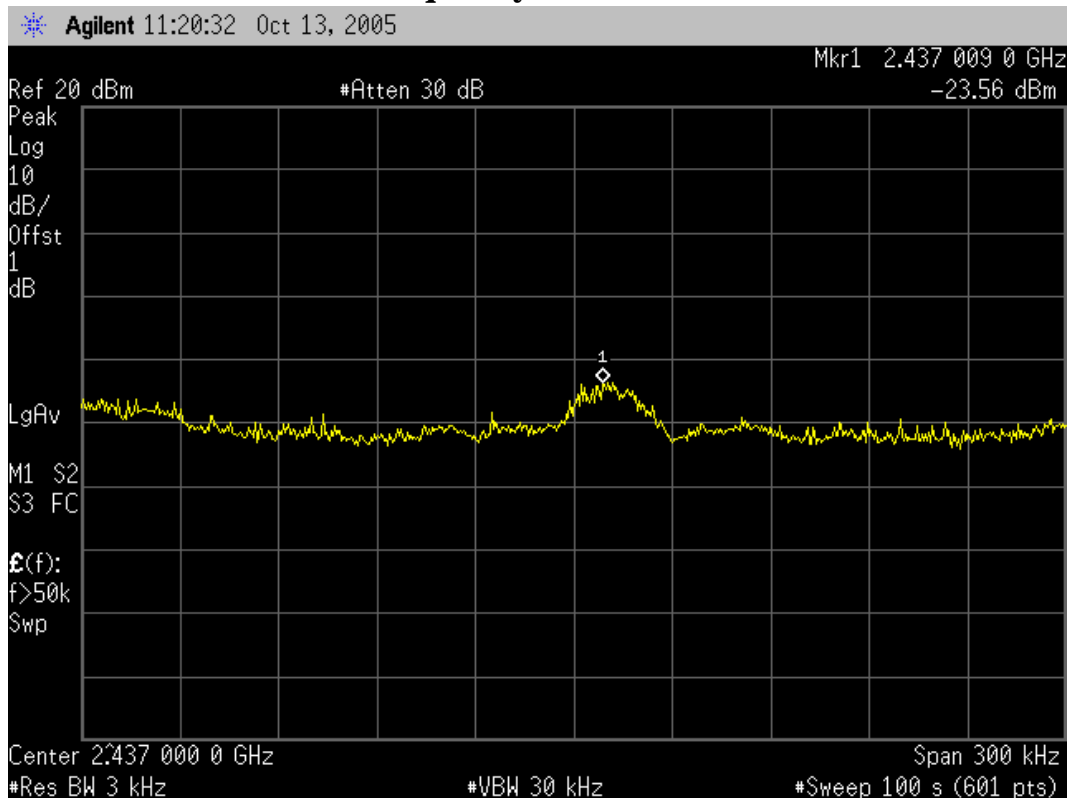
| Channel | Frequency | Power Spectral Density | Limit |
|---------|-----------|------------------------|-------|
| 1       | 2412MHz   | <b>-24.56dBm</b>       | 8dBm  |
| 6       | 2437MHz   | <b>-23.56dBm</b>       | 8dBm  |
| 11      | 2462MHz   | <b>-20.49dBm</b>       | 8dBm  |



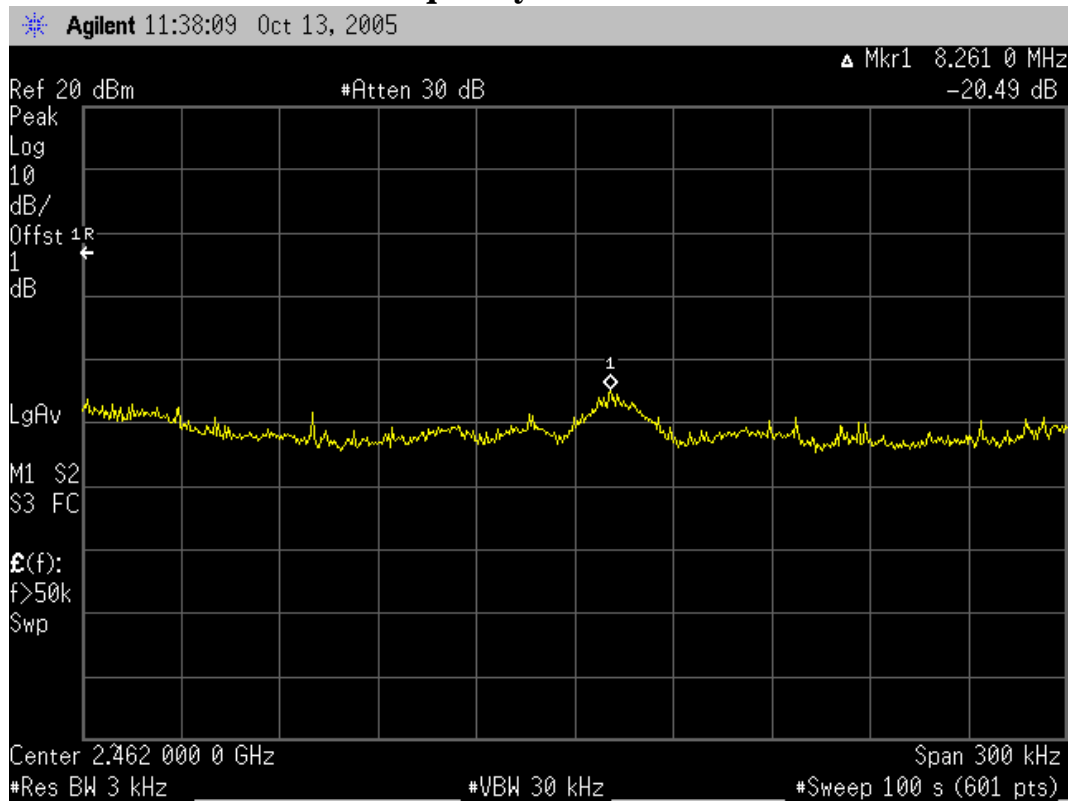
### Frequency : 2412MHz



### Frequency : 2437MHz



### Frequency : 2462MHz



## 9. DEVIATION TO TEST SPECIFICATIONS

【NONE】

## 10.PHOTOGRAPHS

### 10.1.Photos of Conducted Emission Measurement



FRONT VIEW OF CONDUCTED MEASUREMENT



BACK VIEW OF CONDUCTED MEASUREMENT

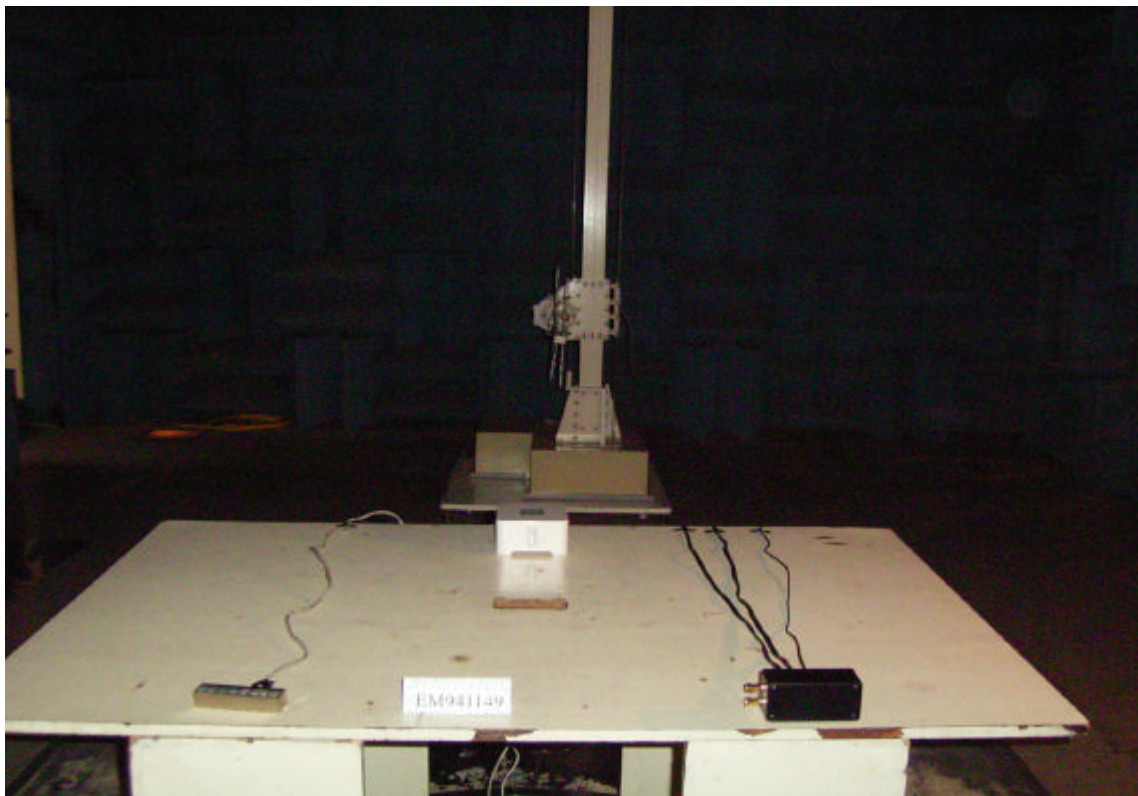
PARTNER NOTEBOOK PC & CONTROLLER



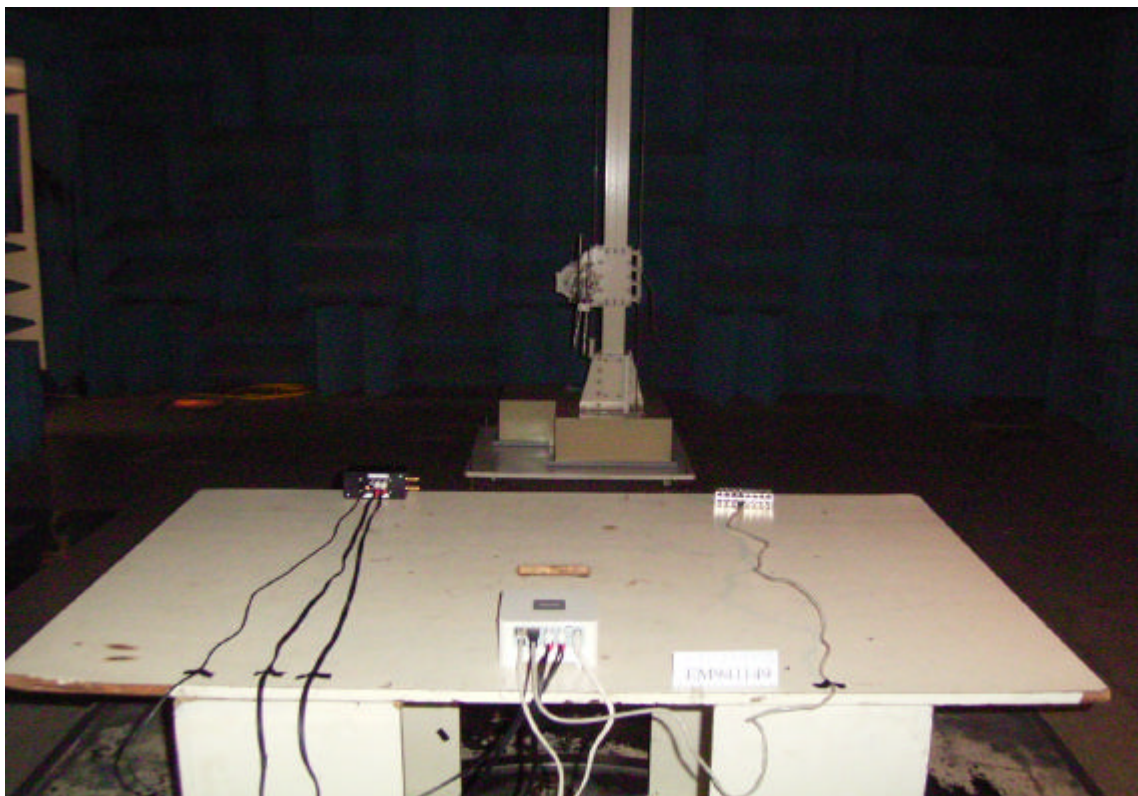
VIEW OF CONDUCTED MEASUREMENT

## 10.2. Photos of Radiated Measurement at Semi-Anechoic Chamber

### 10.2.1. Frequency Range: 30MHz to 1GHz

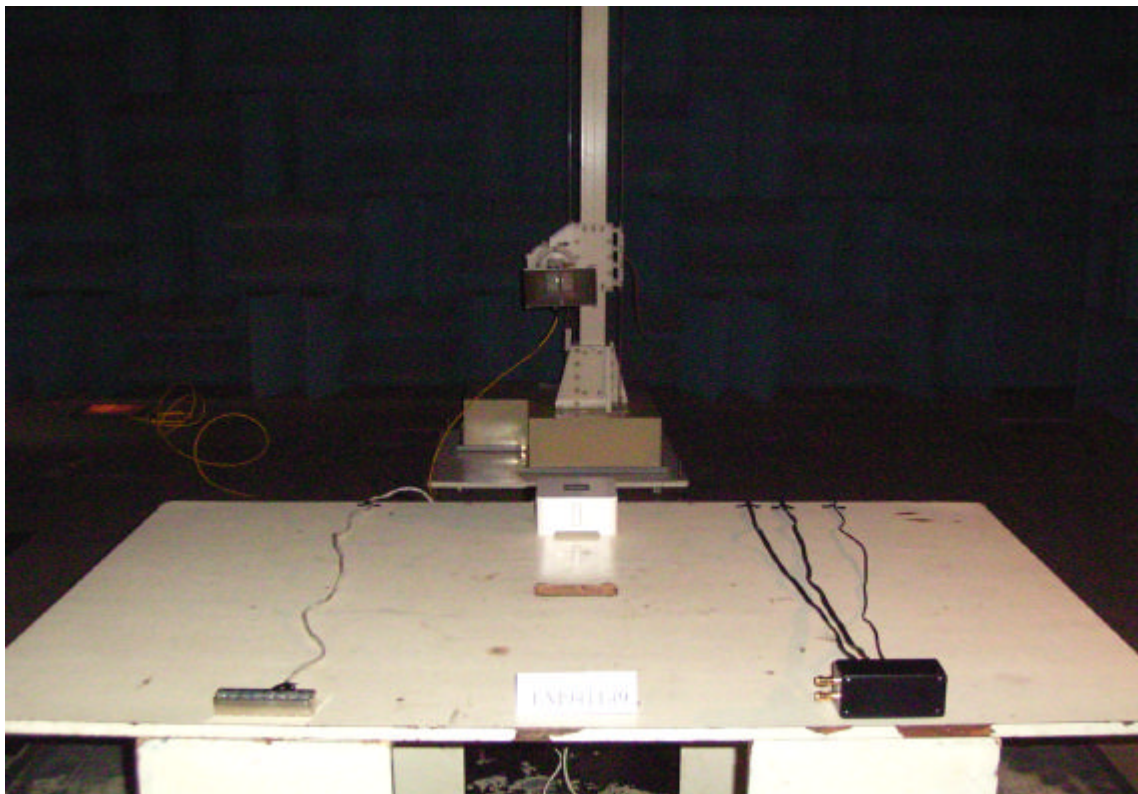


FRONT VIEW OF RADIATED MEASUREMENT

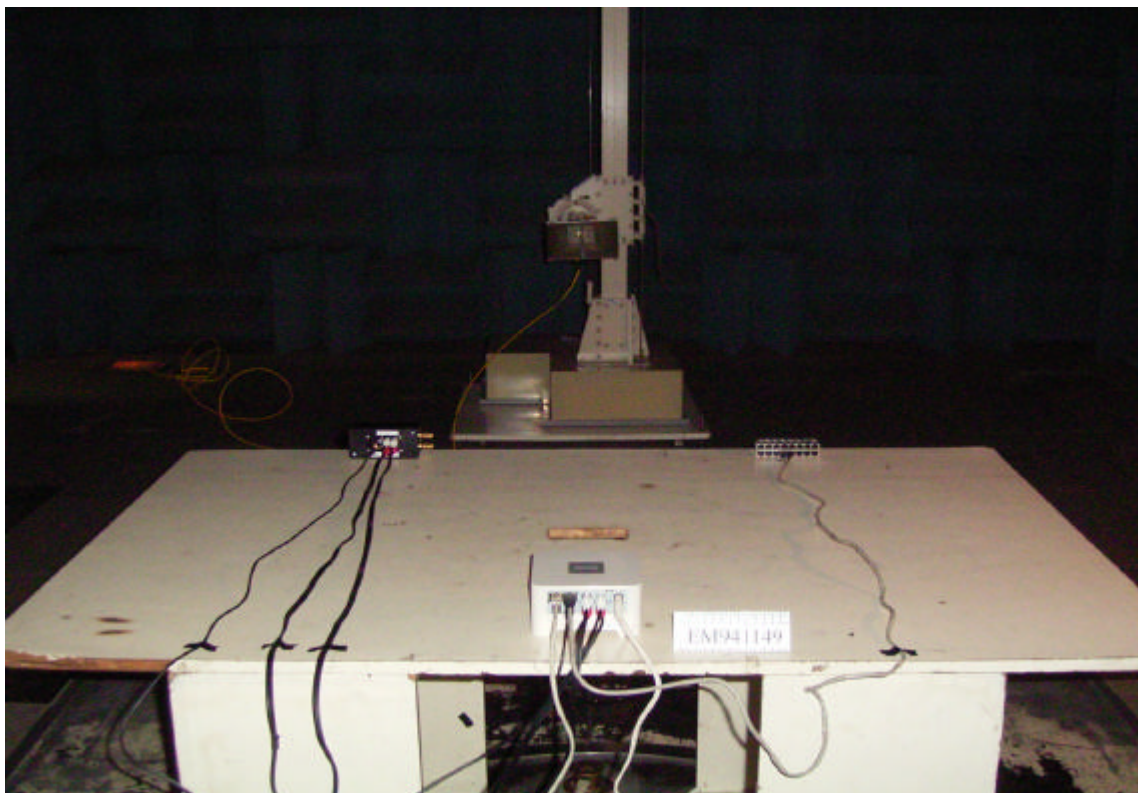


BACK VIEW OF RADIATED MEASUREMENT

10.2.2. Frequency Range: Above 1GHz



FRONT VIEW OF RADIATED MEASUREMENT



BACK VIEW OF RADIATED MEASUREMENT

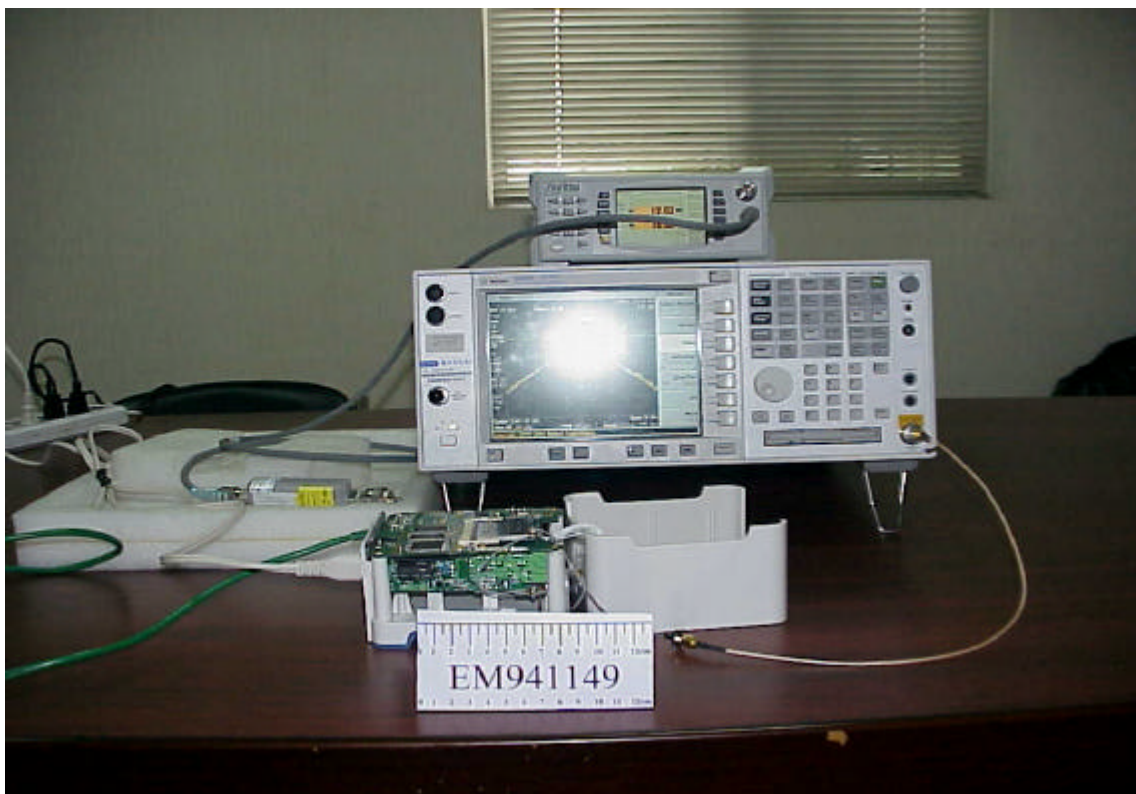
PARTNER NOTEBOOK PC & CONTROLLER



VIEW OF RADIATED MEASUREMENT



10.3. Photo of Measurement for Section 4, 6 ~ 8



10.4. Photo of Measurement for Section 5

