



## **EMI TEST REPORT**

JQA File No. : 400-50410

Model No. : WRT-8B

Type of Equipment : UHF Synthesized Transmitter

Regulations Applied : CFR 47 FCC Rules and Regulations Part 74

FCC ID : AK8WRT8B1

Applicant : Sony Corporation

Address : 6-7-35, Kitashinagawa, Shinagawa-ku,  
Tokyo 141-0001, Japan

Manufacturer : Sony EMCS Corporation. Senmaya TEC.

Address : 254 Aza-Shimokomaba, Senmaya, Senmaya-cho,  
Ichinoseki-shi, Iwate-ken, 020-0803 Japan

Received date of EUT : September 6, 2005

**Final Judgment : Passed**

Test results in this report are obtained in use of equipment that is traceable to National Institute of Advanced Industrial Science and Technology (AIST) of Japan and Communication Research Laboratory (CRL) of Japan.

The test results only respond to the tested sample. This report should not be reproduced except in full, without the written approval of JQA EMC Engineering Dept. Testing Div.

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## 1 DOCUMENTATION

### 1.1 TEST REGULATION

FCC Rules and Regulations Part 74 Subpart H Low Power Auxiliary Stations

#### Test procedure :

RF power output, modulation characteristics, occupied bandwidth, field strength of spurious radiation and frequency stability tests were performed according to the procedures in FCC Rules and Regulations Part 2.

### 1.2 GENERAL INFORMATION

#### 1.2.1 Test facility :

- 1) Test Facility located at EMC Engineering Dept. Testing Div. :
  - No.2 and 3 Anechoic Chambers(3 meters Site).
  - Shielded Enclosure.
- 2) EMC Engineering Dept. Testing Div. is recognized under the National Voluntary Laboratory accreditation Program for satisfactory compliance established in title 15, Part 285 Code of Federal Regulations.  
NVLAP Lab Code : 200189-0 (Effective through : June 30, 2006)

#### 1.2.2 Description of the Equipment Under Test (EUT) :

- |                                      |                                   |
|--------------------------------------|-----------------------------------|
| 1) Type of Equipment                 | : UHF Synthesized Transmitter     |
| 2) Product Type                      | : Prototype                       |
| 3) Category                          | : Broadcast Transmitter worn body |
| 4) EUT Authorization                 | : Certification                   |
| 5) FCC ID                            | : AK8WRT8B1                       |
| 6) Trade Name                        | : SONY                            |
| 7) Model No.                         | : WRT-8B                          |
| 8) Operating Frequency Range         | : 470.125 MHz - 709.875 MHz       |
| 9) Highest Frequency Used in the EUT | : 709.875 MHz                     |
| 10) Bandwidth                        | : 120 kHz                         |
| 11) RF Output Power                  | : 50/10 mW selectable             |
| 12) Serial No.                       | : 2101/2102/2103                  |
| 13) Date of Manufacture              | : August, 2005                    |
| 14) Power Rating                     | : DC 3.0(Battery)                 |
| 15) EUT Grounding                    | : None                            |

#### 1.2.3 Definitions for symbols used in this test report :

- x - indicates that the listed condition, standard or equipment is applicable for this report.
- \_\_\_ - indicates that the listed condition, standard or equipment is not applicable for this report.

### 1.3 TEST CONDITION

#### 1.3.1 The measurement of the RF power output the Radiated Emission(30 MHz - 1000 MHz)

  x   - was performed in the following test site.

     - was not applicable.

#### Test location :

Safety & EMC Center EMC Engineering Dept. Testing Div.  
21-25, Kinuta 1-chome, Setagaya-ku, Tokyo 157-8573, Japan

  x   - Anechoic Chamber No. 2 (3 meters)

     - Anechoic Chamber No. 3 (3 meters)

#### Validation of Site Attenuation :

1) Last Confirmed Date :March, 2005

2) Interval :1 year

#### Used test instruments :

Type	Number of test instruments (Refer to Appendix)
Test Receiver	TR05
Cable	CA01
Antenna	AN02, AN04, AN06, AN08
RF Amplifier	N/A
Signal Generator	SG03
Power Meter	AU03
Power Sensor	AU04

**1.3.2 The measurement of the Radiated Emission(Above 1000 MHz)**

  x   - was performed in the following test site.

     - was not applicable.

**Test location :**

Safety & EMC Center EMC Engineering Dept. Testing Div.  
21-25, Kinuta 1-chome, Setagaya-ku, Tokyo 157-8573, Japan

  x   - No. 2 site (3 meters)

     - No. 3 site (3 meters)

**Validation of Site Attenuation :**

- 1) Last Confirmed Date :March, 2005
- 2) Interval :1 year

**Used test instruments :**

Type	Number of test instruments (Refer to Appendix)
Test Receiver	TR07
Spectrum Analyzer	N/A
Cable	CA11, CA13
Antenna	AN10, AN12
RF Amplifier	AM09
Band Reject Filter	N/A
High Pass Filter	N/A

**1.3.3 The measurement of the Modulation Characteristics and the Occupied Bandwidth**

  x   - was performed.  
     - was not applicable.

**Used test instruments :**

<b>Type</b>	<b>Number of test instruments (Refer to Appendix)</b>
Test Receiver	TR07
Spectrum Analyzer	N/A
Function Generator	SG01
FM Linear Detector	AU06
Level Meter	AU07
Cable	CA10
Attenuator	AU20
Antenna	N/A

**1.3.4 The measurement of the Frequency Stability**

  x   - was performed.  
     - was not applicable.

**Used test instruments :**

<b>Type</b>	<b>Number of test instruments (Refer to Appendix)</b>
Frequency Counter	AU13
Antenna	AN04
Cable	CA10
Attenuator	AU20
Oven	AU14
DC Power Supply	AU15



**1.4 EUT MODIFICATION / Deviation from Standard**

**1.4.1 EUT MODIFICATION**

- x   - No modifications were conducted by JQA to achieve compliance to Class B levels.
- To achieve compliance to Class B levels, the following changes were made by JQA during the compliance test.

The modifications will be implemented in all production models of this equipment.

Applicant :	Date :
Typed Name :	Position :

**1.4.2 Deviation from Standard:**

- x   - No deviations from the standard described in clause 1.1.
- The following deviations were employed from the standard described in clause 1.1:

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**1.5 TEST RESULTS**

**RF Power Output [§74.861(e)(1)(ii)]**        x   - **Applicable**      \_\_\_ - **NOT Applicable**

The requirements are        x   - **PASSED**      \_\_\_ - **NOT PASSED**

**Remarks :**

**Modulation Characteristics [§74.861(e)(3)]**        x   - **Applicable**      \_\_\_ - **NOT Applicable**

The requirements are        x   - **PASSED**      \_\_\_ - **NOT PASSED**

**Remarks:**

**Occupied Bandwidth [§74.861(e)(6)]**        x   - **Applicable**      \_\_\_ - **NOT Applicable**

The requirements are        x   - **PASSED**      \_\_\_ - **NOT PASSED**

**Remarks:**

**Spurious Radiation [§74.861(e)(6)]**        x   - **Applicable**      \_\_\_ - **NOT Applicable**

The requirements are        x   - **PASSED**      \_\_\_ - **NOT PASSED**

**Remarks:**

**Frequency Stability [§74.861(e)(4)]**        x   - **Applicable**      \_\_\_ - **NOT Applicable**

The requirements are        x   - **PASSED**      \_\_\_ - **NOT PASSED**

**Remarks:**

**1.6 SUMMARY****General Remarks :**

The EUT was tested according to the requirements of FCC Rules and Regulations Part 74 Subpart H under the test configuration, as shown in clause 1.7 to 1.10. The conclusion for the test items of which are required by the applied regulation is indicated under the final judgment.

**Final Judgment :**

The "as received" sample;

- x   - fulfill the test requirements of the regulation mentioned on clause 1.1.
- fulfill the test requirements of the regulation mentioned on clause 1.1, but with certain qualifications.
- doesn't fulfill the test regulation mentioned on clause 1.1.

Begin of testing : September 9, 2005

End of testing : September 26, 2005

**- JAPAN QUALITY ASSURANCE ORGANIZATION -**

Approved by:

Issued by:



Masaaki Takahashi  
Senior Manager  
JQA EMC Engineering Dept.



Shigeru Osawa  
Assistant Manager  
JQA EMC Engineering Dept.

**1.7 TEST CONFIGURATION / OPERATION OF EUT****1.7.1 Test Configuration**

The equipment under test (EUT) consists of :

Symbol	Item	Manufacturer	Model No.	Serial No.
A	UHF Synthesized Transmitter	Sony EMCS Corporation. Senmaya TEC.	WRT-8B	2101/2102/2103

The measurements was carried out with the following supported connected :

Symbol	Item	Manufacturer	Model No.	Serial No.
B	Microphone (with 1.2 m shielded cable)	Sony Corporation	-	-

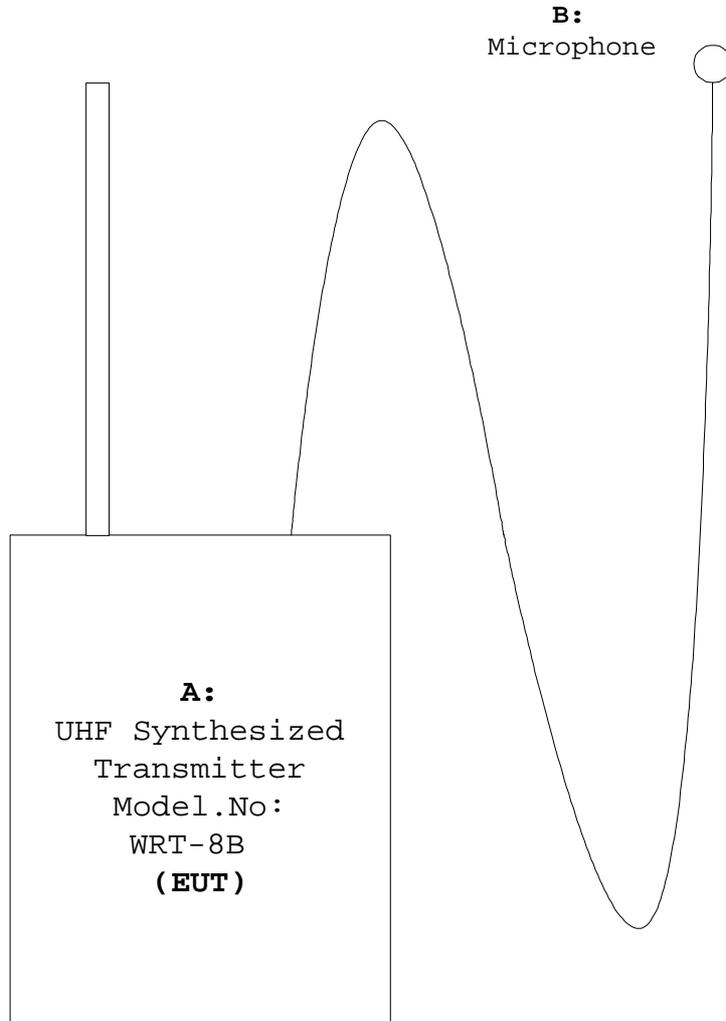
**1.7.2 Operating condition**

Power supply Voltage : 3VDC(Alkaline Battery) or DC power supply  
The tests have been carried out under the transmitting condition.  
(Operating Frequency:470.125 MHz, 589.875 MHz and 709.875 MHz)

**1.7.3 Generating and Operating frequency of EUT**

TX: 470.125 MHz operation,  
TX: 589.875 MHz operation,  
TX: 709.875 MHz operation

**1.8 EUT ARRANGEMENT (DRAWINGS)**



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**1.9 PRELIMINARY TEST AND TEST-SETUP (DRAWINGS)****1.9.1 RF Power Output and Radiated Emission (30 MHz - 1000 MHz) :**

The radiated power output and the field strength of the transmitter harmonic and spurious radiation were measured at the distance at 3 meters away from the transmitter under test which was placed on a wooden turntable 1 meter in height. The receiving antenna was oriented for vertical polarization and raised or lowered through 1 to 4 meters until the maximum signal level was detected on the measuring instrument. The transmitter under test was rotated through 360° until the maximum signal was received. The measurement was repeated with the receiving antenna in the horizontal polarization.

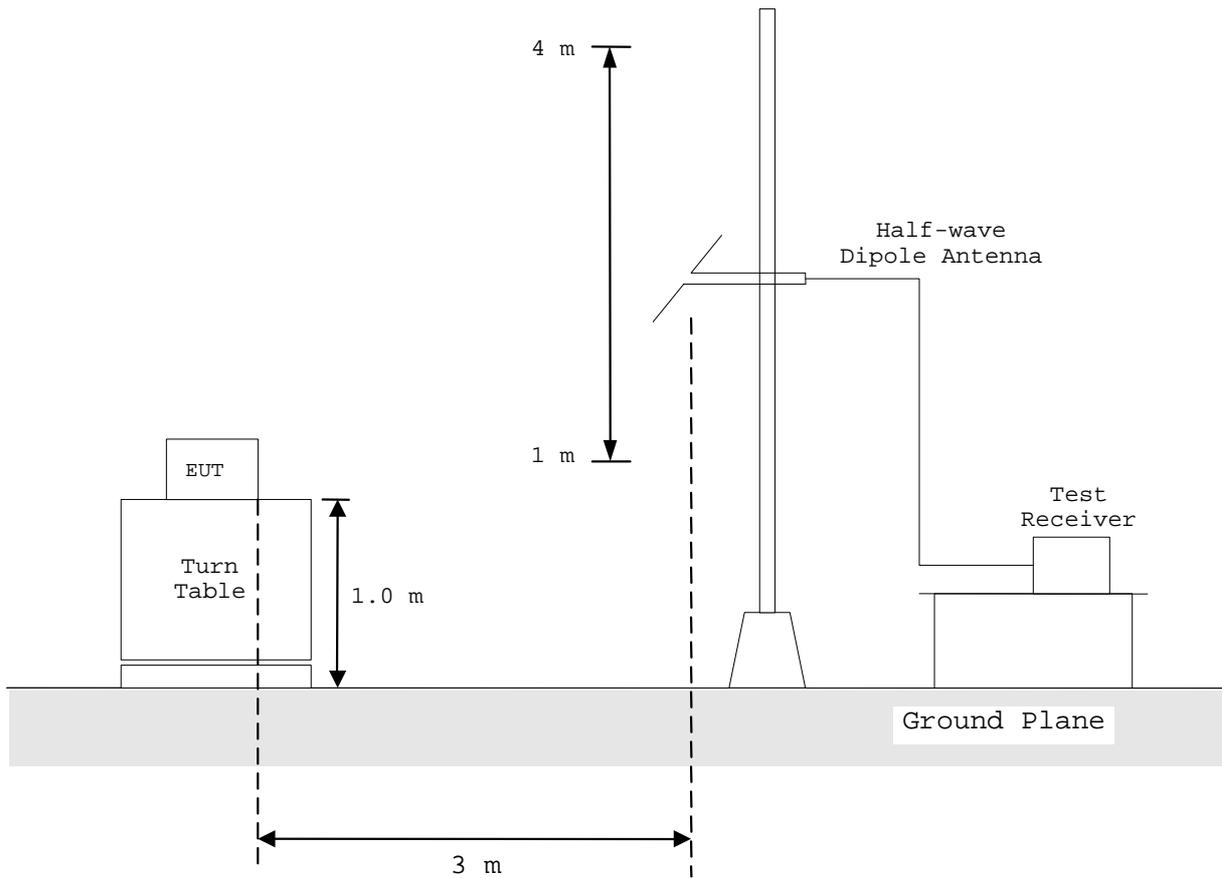
The transmitter was removed and replaced with a half-wave dipole antenna. The center of the half-wave dipole antenna was placed approximately at the same location as the center of the transmitter. (In the case of the lower frequencies, where the half-wave dipole antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such a case the lower end of the antenna was adjusted to 0.3m above the ground). The half-wave dipole antenna was fed with a signal generator, and the output level of the signal generator was adjusted to obtain the previously recorded maximum reading at the particular harmonics and spurious frequency and recorded. This procedure was repeated with the receiving antenna and the half-wave dipole antenna in the orthogonal polarization.

The input power into the half-wave dipole antenna was calculated from the impedance and signal generator voltage obtained in these reading. The level of the harmonics and spurious emissions in dB were calculated from the following formula:

$$\text{Attenuation(dB)} = 10 \log_{10} \frac{\text{Transmitter Power(ERP)}}{\text{Calculated Spurious Power}}$$

## Anechoic Chamber

- Side View -



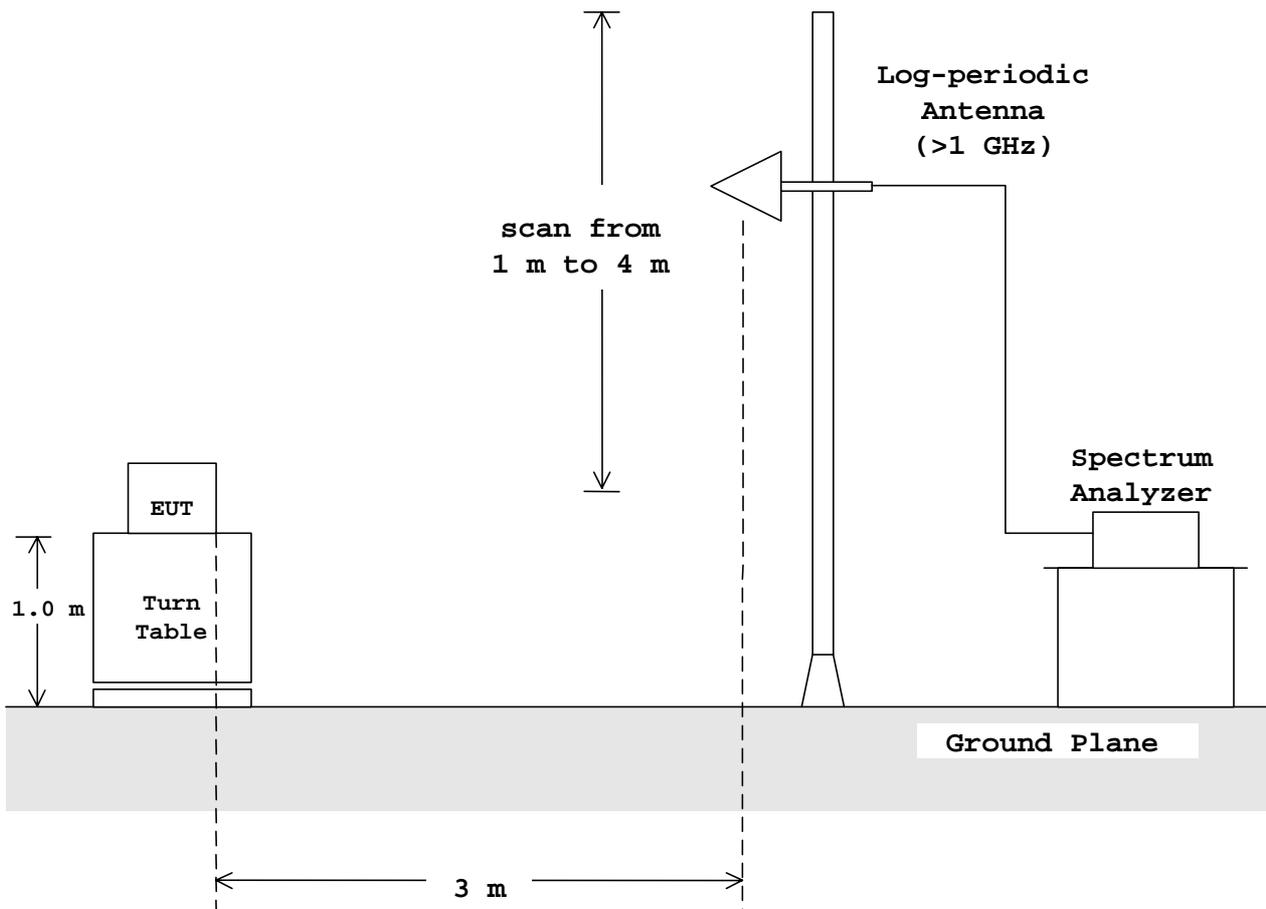
**1.9.2 Radiated Emission (Above 1 GHz) :**

The preliminary radiated emissions measurements were carried out. The preliminary radiated measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.

The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions. These configurations were used for the final radiated emissions measurements.

**Anechoic Chamber**

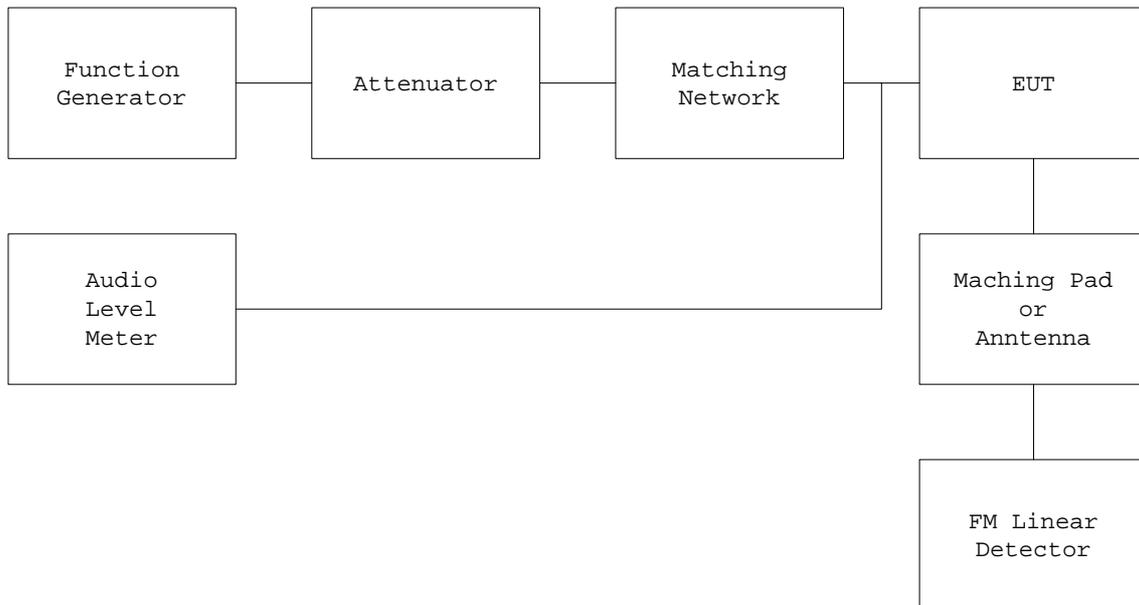
- Side View -



### 1.9.3 Modulation Characteristics

The audio signal generator was connected to the input circuit of the unit under test through a matching network. The audio signal input was adjusted to obtain 50% modulation at the maximum audio frequency response of the transmitter, and this point was taken as the 0 dB reference level. The frequency of the input signal was changed from 100 Hz to 20 kHz and the input level to obtain 50% modulation was plotted.

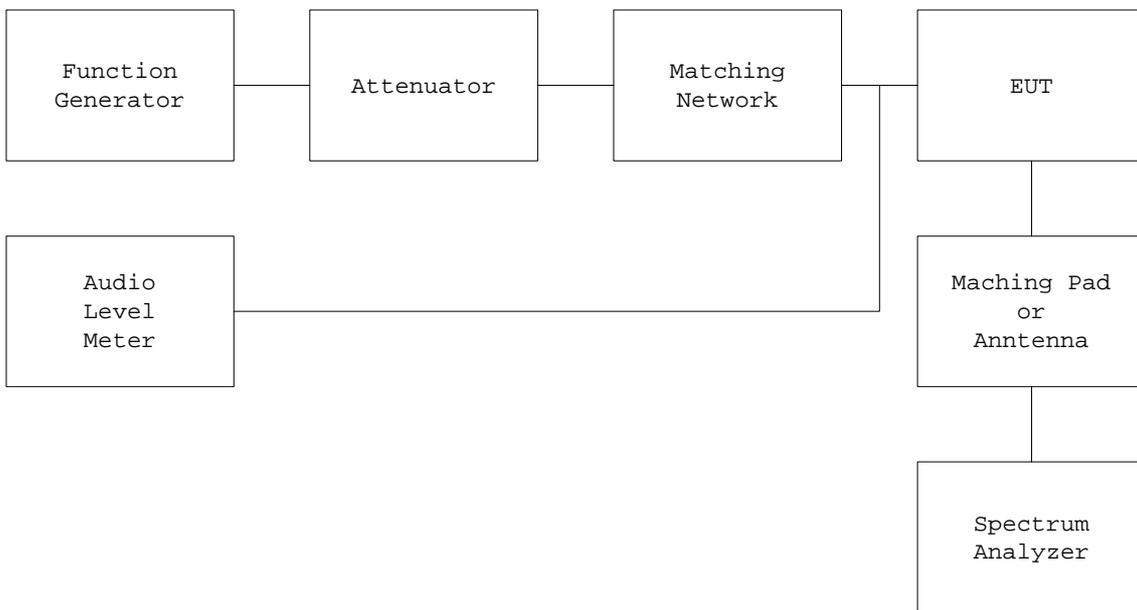
The modulation response was measured up to maximum modulation for each of three tones: 100 Hz, 2500 Hz and 15 kHz. The audio input level was changed from 10% modulation up to maximum rated modulation.



**1.9.4 Occupied Bandwidth :**

According to description of FCC Rules §2.1049, the occupied bandwidth measurements were carried out. By using a spectrum analyzer the measurements of the emission were made under the transmitting modes of the EUT.

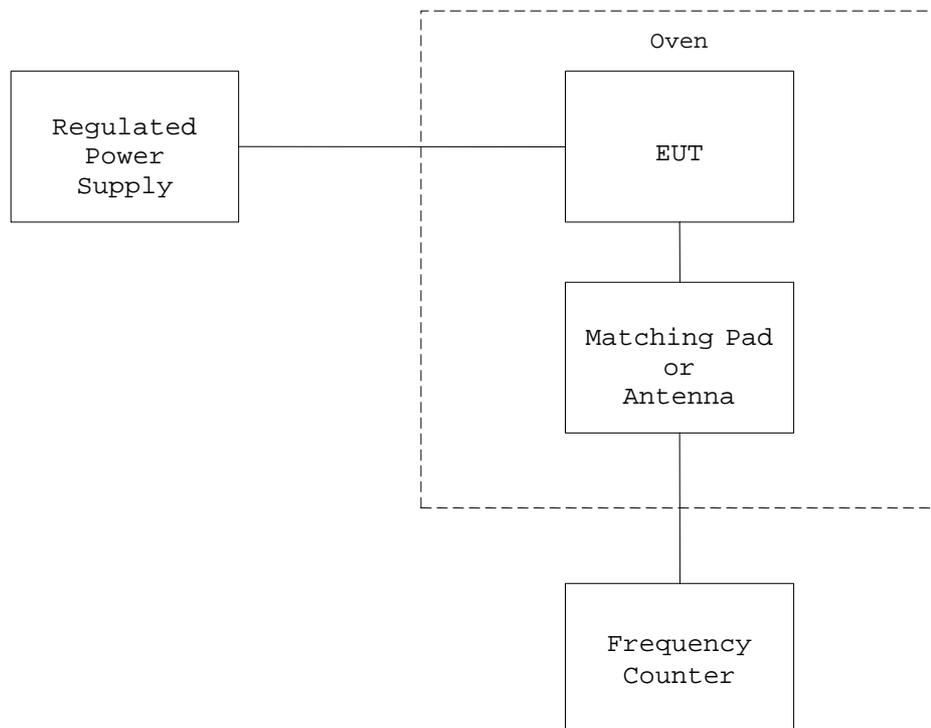
The transmitter was modulated at the input level producing 85% modulation at the maximum response frequency, and with the frequency 2500 Hz.



**1.9.5 Frequency Stability :**

The transmitter was placed in the temperature cycle chamber and was kept at a temperature of  $-30^{\circ}\text{C} \pm 1^{\circ}\text{C}$  for approximately one hour. The rated test voltage was applied to the transmitter and the unit was turned on for ten minutes. The transmit frequency was measured during this period and recorded. A similar measurement was performed with the temperatures changed from  $-20^{\circ}\text{C}$  to  $50^{\circ}\text{C}$  at interval of  $10^{\circ}\text{C}$ . In the latter case, the unit was kept for approximately one hour at the prescribed temperature after completion of the test preceding with it.

The frequency stability tests were performed at the normal supply voltage and if required, with variation of primary supply voltage. (Refer to FCC Rules §2.1055)

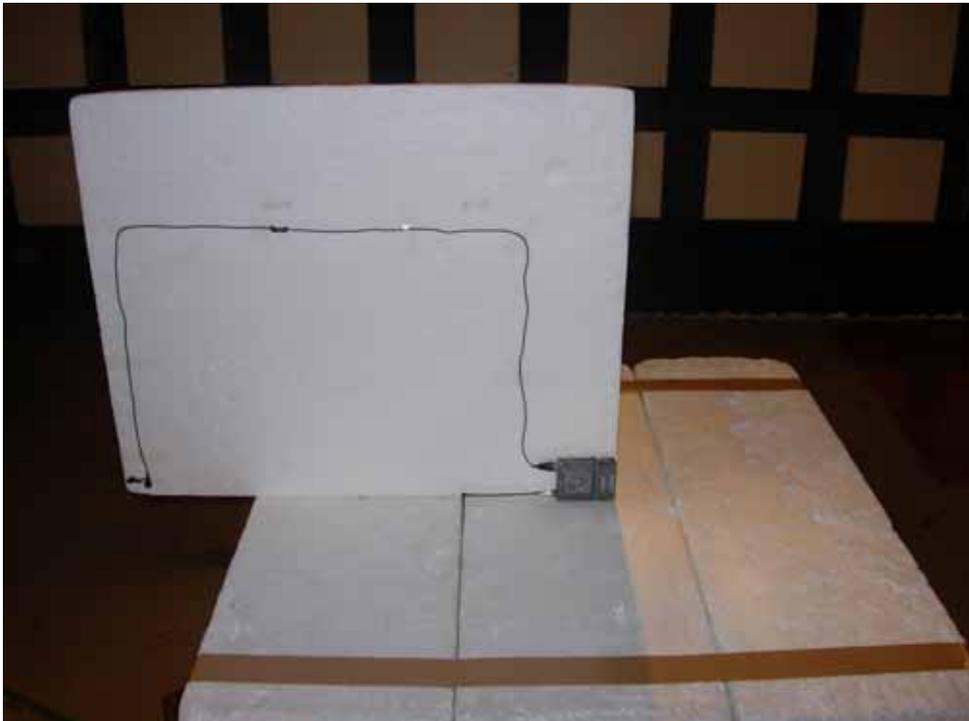


**1.10 TEST ARRANGEMENT (PHOTOGRAPHS)****PHOTOGRAPHS OF EUT CONFIGURATION FOR RADIATED EMISSIONS MEASUREMENT**

Photograph present configuration with maximum emission



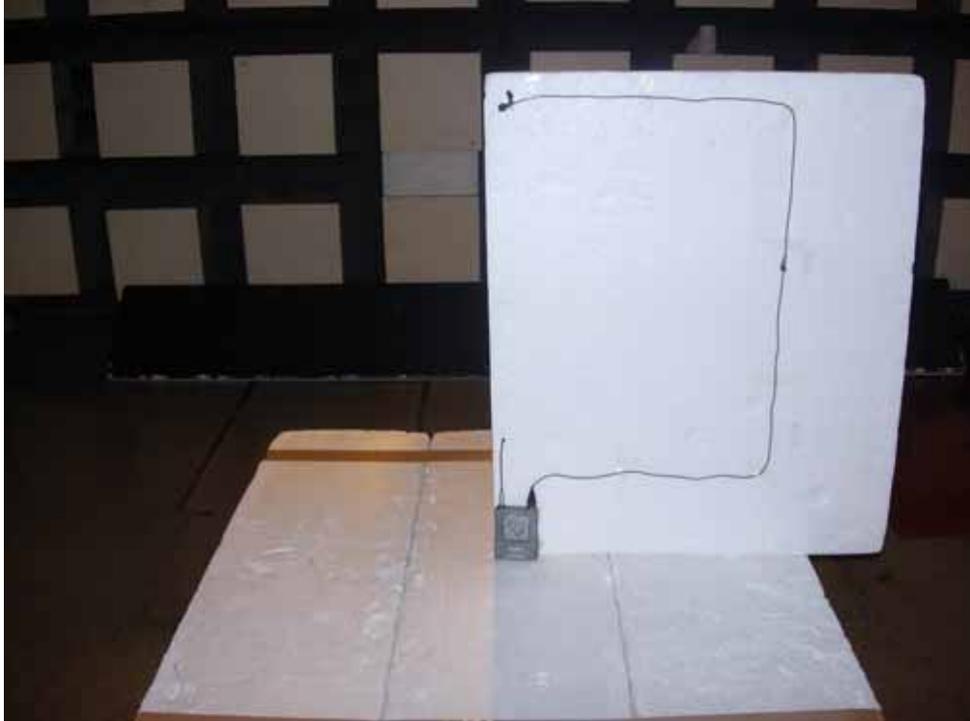
- Front view (X axis) -



- Front view (Y axis) -

**PHOTOGRAPHS OF EUT CONFIGURATION FOR RADIATED EMISSIONS MEASUREMENT**

Photograph present configuration with maximum emission



- Front view (Z axis) -



## TEST DATA

### 2.1 RF Power Output

Date : September 9, 2005  
Temp. : 23 °C Humi. : 65 %

Frequency Range: 470.125 MHz - 709.875 MHz

H:50 mW Setting

Frequency (MHz)	Output Power ERP(mW)
470.125	36.3
589.875	28.2
709.875	42.7

L:10 mW Setting

Frequency (MHz)	Output Power ERP(mW)
470.125	5.62
589.875	6.92
709.875	9.77

Note: 1. Specified limit (§74.861(e)(1)(ii)); 250 mW

Tested by : M. Takahashi  
M.Takahashi  
Testing Engineer



JQA File No. :400-50410  
Model No. :WRT-8B  
Standard :CFR 47 FCC Rules Part 74

FCC ID :AK8WRT8B1  
Issue Date :September 28, 2005  
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## 2.2 Modulation Characteristics

Date : September 26, 2005  
Temp.: 25°C Humi.: 63 %

### Measurements Results :

Maximum deviation(100%): 40 kHz(Manufacturer specified)

Specified Limits: Max deviation  $\pm$  75 kHz( $\S$ 74.861(e)(3))

Refer to the attached graphs.

Tested by : *M. Takahashi*  
M.Takahashi  
Testing Engineer

## Modulation Frequency Response

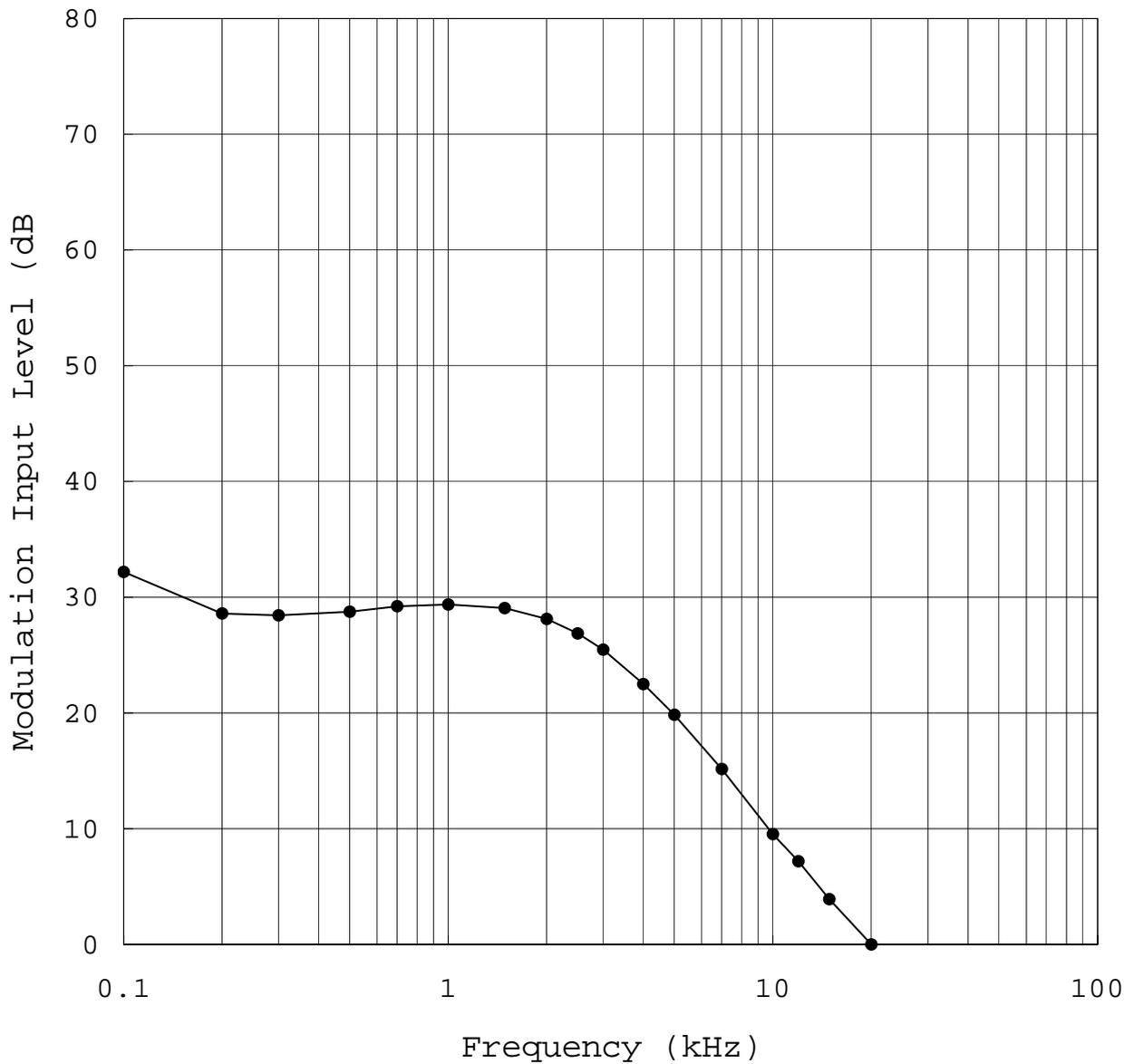
FCC ID : AK8WRT8B1

Model : WRT-8B

Test Frequency : 470.125MHz

Test Condition : H(50mW Setting)

0dB : -68.74dBV



## Modulation Frequency Response

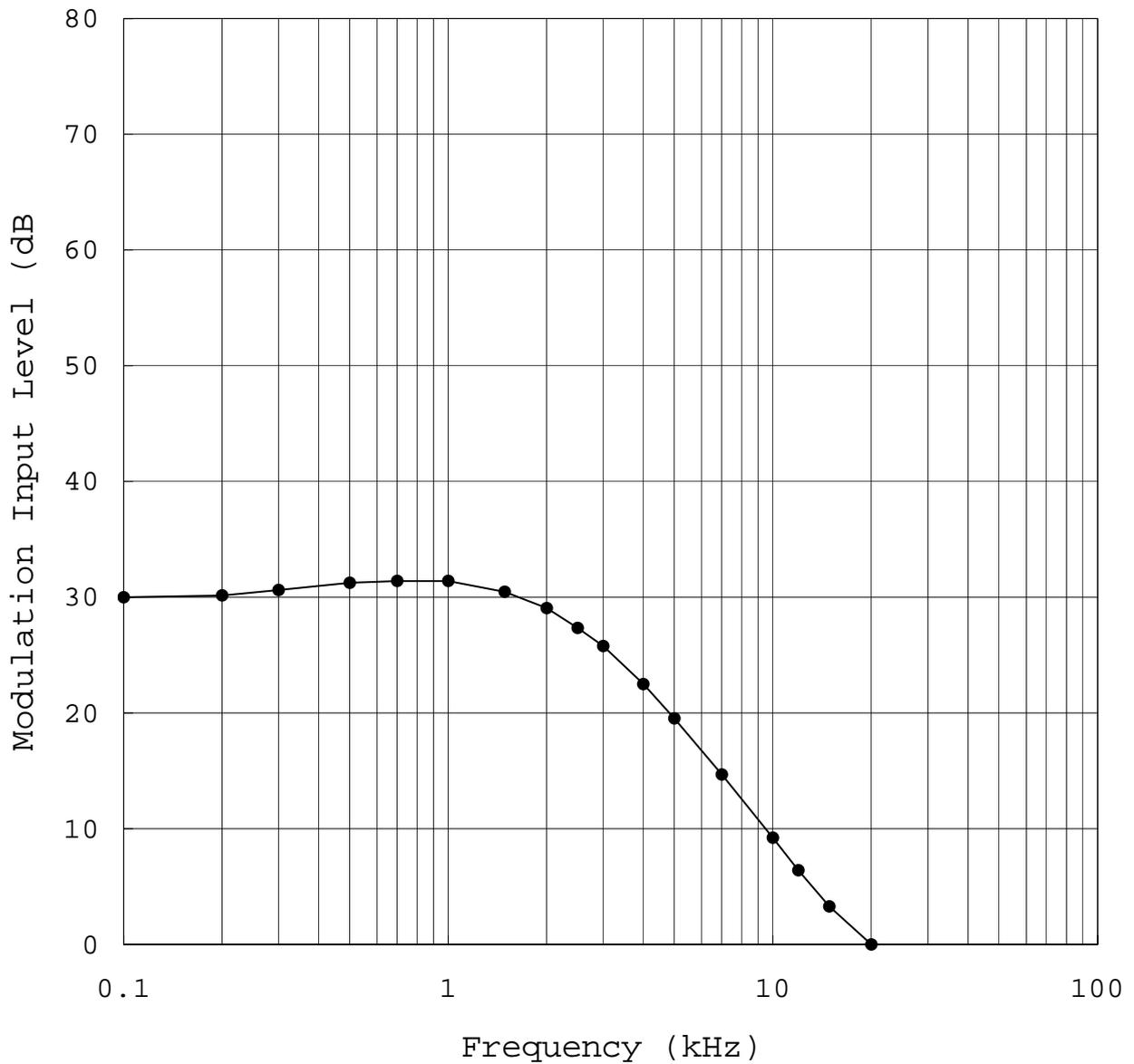
FCC ID : AK8WRT8B1

Model : WRT-8B

Test Frequency : 589.875MHz

Test Condition : H(50mW Setting)

0dB : -68.70dBV



## Modulation Frequency Response

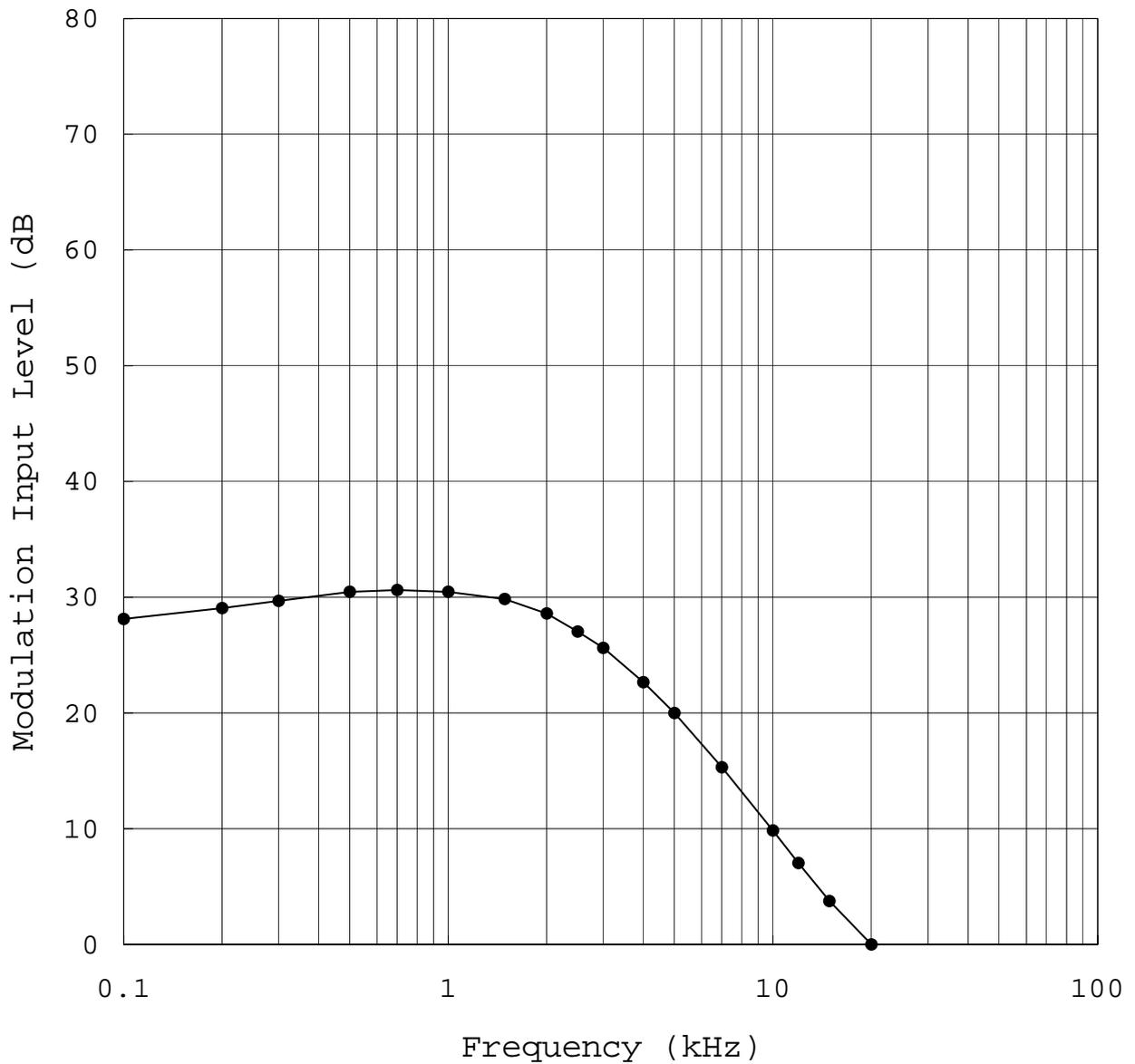
FCC ID : AK8WRT8B1

Model : WRT-8B

Test Frequency : 709.875MHz

Test Condition : H(50mW Setting)

0dB : -68.62dBV



## Modulation Characteristics

FCC ID : AK8WRT8B1

Model : WRT-8B

Mode of EUT : Transmit(H:50mW Setting)

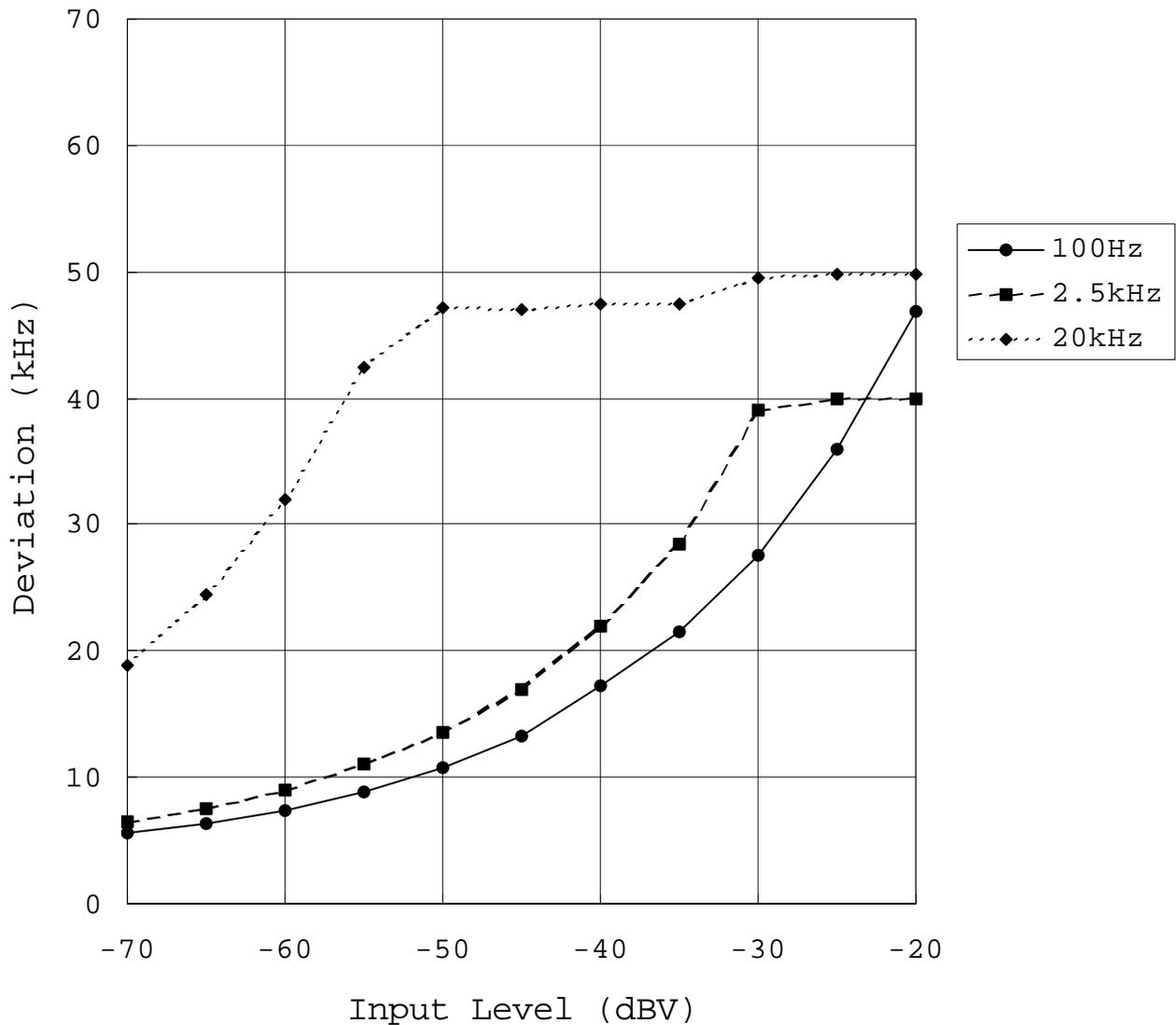
Input terminal : Microphone(100Hz/2.5kHz/20kHz)

Input Level(50% Modulation) : 100Hz/-36.59dBV

2.5kHz/-41.71dBV

20kHz/-68.79dBV

Carrier Frequency : 470.125MHz



## Modulation Characteristics

FCC ID : AK8WRT8B1

Model : WRT-8B

Mode of EUT : Transmit(H:50mW Setting)

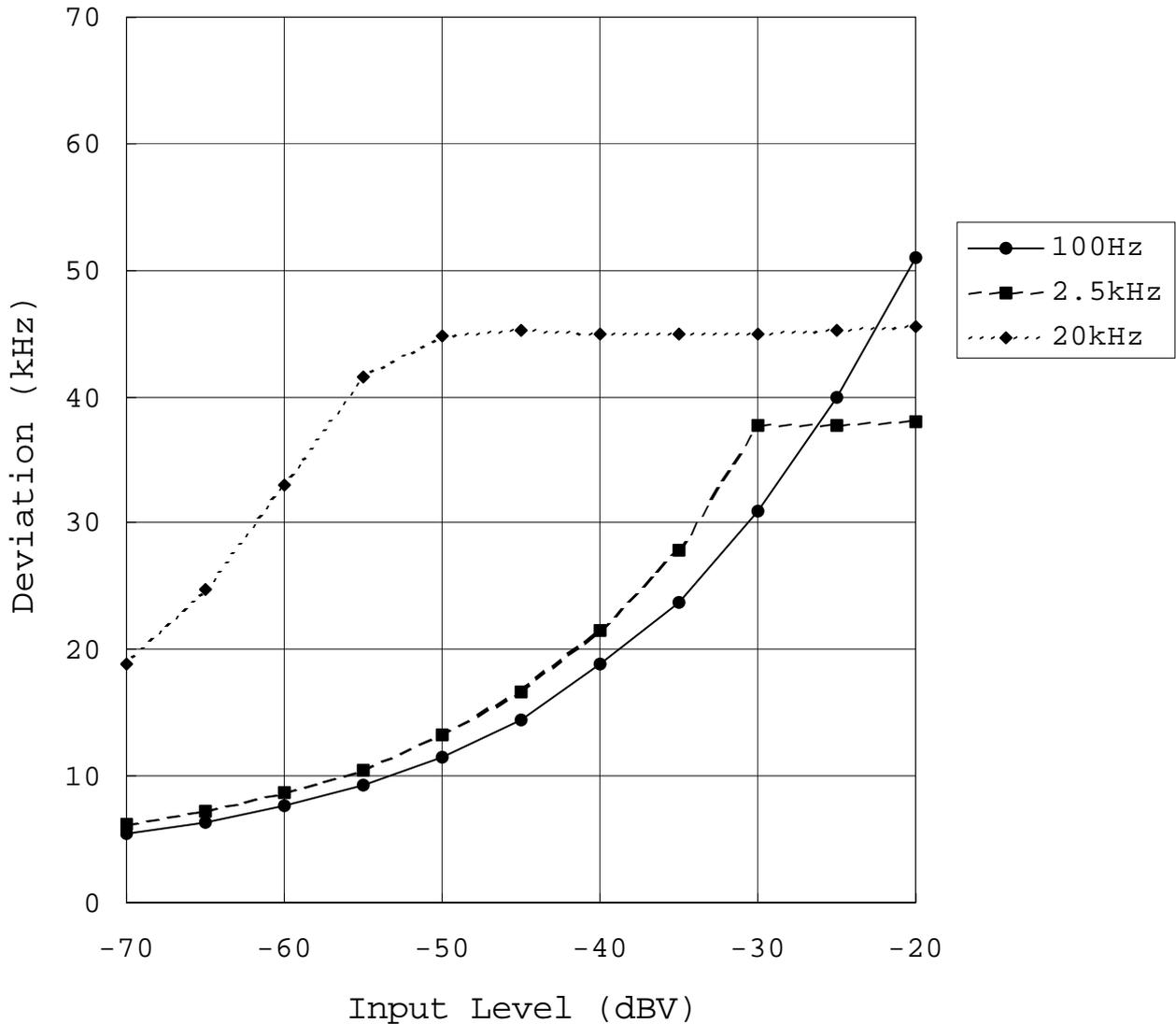
Input terminal : Microphone(100Hz/2.5kHz/20kHz)

Input Level(50% Modulation) : 100Hz/-38.66dBV

2.5kHz/-41.38dBV

20kHz/-68.75dBV

Carrier Frequency : 589.875MHz



## Modulation Characteristics

FCC ID : AK8WRT8B1

Model : WRT-8B

Mode of EUT : Transmit(H:50mW Setting)

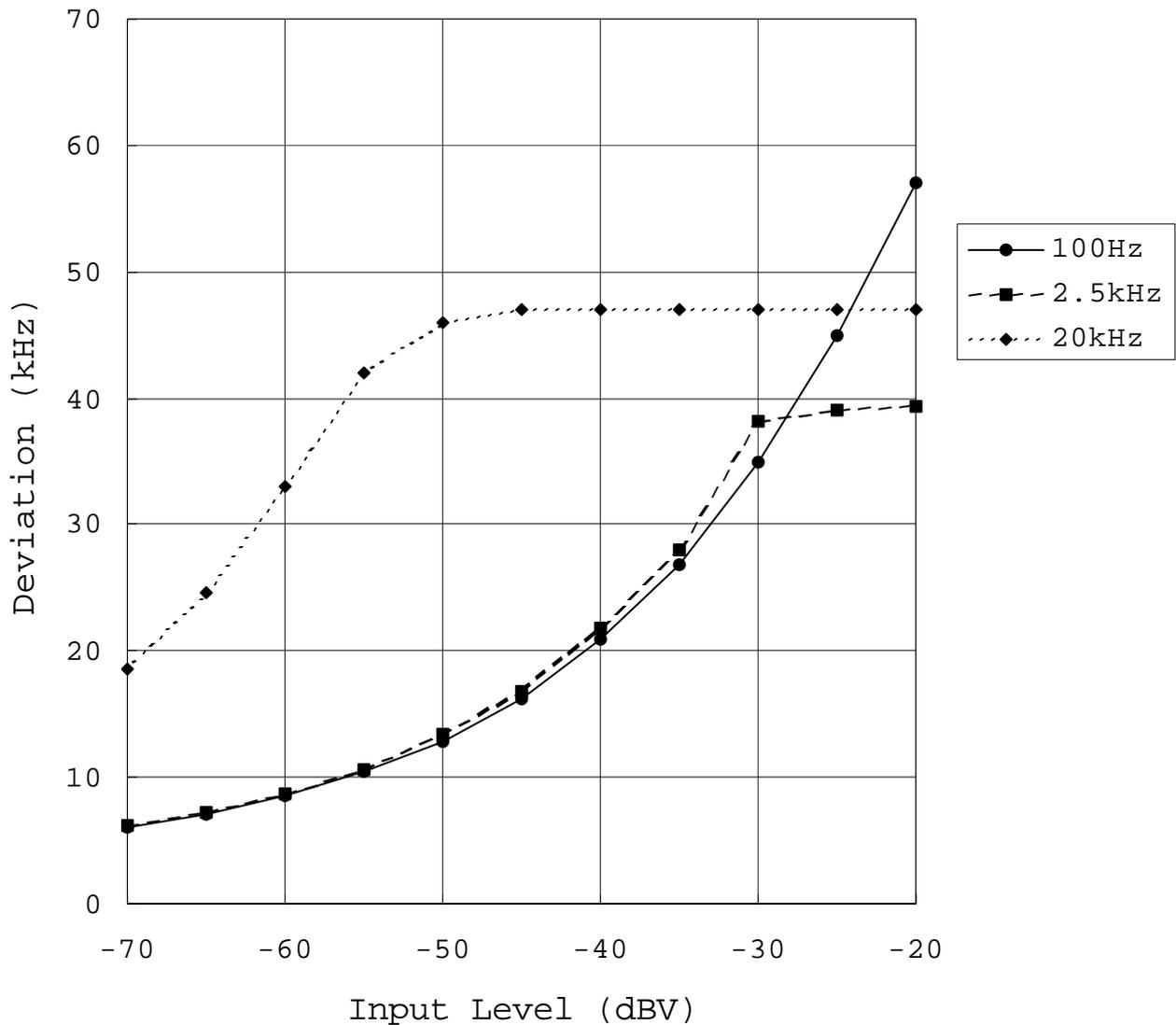
Input terminal : Microphone(100Hz/2.5kHz/20kHz)

Input Level(50% Modulation) : 100Hz/-40.53dBV

2.5kHz/-41.53dBV

20kHz/-68.62dBV

Carrier Frequency : 709.875MHz





**2.3 Radiated Emissions Measurement**

Date : September 16, 2005  
 Temp.: 21 °C Humi.: 65 %

Operating Frequency : 470.125 MHz  
 Reference Carrier Power (ERP) : 36.3 mW (50 mW setting)  
 Distance of Measurement : 3.0 m

Frequency (MHz)	Substituted Power ERP(dBm)		Limits (dB)	Attenuation Ratio (dB)	
	Horiz.	Vert.		Horiz.	Vert.
940.250	-59.0	-60.1	28.6	74.6	75.7
1410.375	< -59.4	< -59.4	28.6	> 75.0	> 75.0
1880.500	< -56.7	< -56.7	28.6	> 72.3	> 72.3
2350.625	< -54.2	< -54.2	28.6	> 69.8	> 69.8
2820.750	< -52.8	< -52.8	28.6	> 68.4	> 68.4
3290.875	< -51.1	< -51.1	28.6	> 66.7	> 66.7
3761.000	-40.8	-43.7	28.6	56.4	59.3
4231.125	-33.9	-37.6	28.6	49.5	53.2
4701.250	-28.5	-28.8	28.6	44.1	44.4

Operating Frequency : 470.125 MHz  
 Reference Carrier Power (ERP) : 5.6 mW (10 mW setting)  
 Distance of Measurement : 3.0 m

Frequency (MHz)	Substituted Power ERP(dBm)		Limits (dB)	Attenuation Ratio (dB)	
	Horiz.	Vert.		Horiz.	Vert.
940.250	-59.1	-60.3	20.5	66.6	67.8
1410.375	< -59.4	< -59.4	20.5	> 66.9	> 66.9
1880.500	< -56.7	< -56.7	20.5	> 64.2	> 64.2
2350.625	-53.0	-53.2	20.5	60.5	60.7
2820.750	< -52.8	< -52.8	20.5	> 60.3	> 60.3
3290.875	< -51.1	< -51.1	20.5	> 58.6	> 58.6
3761.000	-42.5	-40.9	20.5	50.0	48.4
4231.125	-38.3	-43.1	20.5	45.8	50.6
4701.250	-32.3	-32.0	20.5	39.8	39.5



Operating Frequency : 589.875 MHz  
 Reference Carrier Power (ERP) : 28.2 mW (50 mW setting)  
 Distance of Measurement : 3.0 m

Frequency (MHz)	Substituted Power ERP(dBm)		Limits (dB)	Attenuation Ratio (dB)	
	Horiz.	Vert.		Horiz.	Vert.
1179.750	-58.3	-54.4	27.5	72.8	68.9
1769.625	< -57.0	< -57.0	27.5	> 71.5	> 71.5
2359.500	< -54.2	< -54.2	27.5	> 68.7	> 68.7
2949.375	< -52.3	< -52.3	27.5	> 66.8	> 66.8
3539.250	< -50.4	< -50.4	27.5	> 64.9	> 64.9
4129.125	-38.5	-39.6	27.5	53.0	54.1
4719.000	-42.3	-42.6	27.5	56.8	57.1
5308.875	< -46.8	< -46.8	27.5	> 61.3	> 61.3
5898.750	-35.9	-36.7	27.5	50.4	51.2

Operating Frequency : 589.875 MHz  
 Reference Carrier Power (ERP) : 6.9 mW (10 mW setting)  
 Distance of Measurement : 3.0 m

Frequency (MHz)	Substituted Power ERP(dBm)		Limits (dB)	Attenuation Ratio (dB)	
	Horiz.	Vert.		Horiz.	Vert.
1179.750	-59.6	< -61.4	21.4	68.0	> 69.8
1769.625	< -57.0	< -57.0	21.4	> 65.4	> 65.4
2359.500	< -54.2	< -54.2	21.4	> 62.6	> 62.6
2949.375	-52.1	< -52.3	21.4	60.5	> 60.7
3539.250	-49.3	< -50.4	21.4	57.7	> 58.8
4129.125	-40.7	-41.1	21.4	49.1	49.5
4719.000	-42.0	-46.7	21.4	50.4	55.1
5308.875	< -46.8	< -46.8	21.4	> 55.2	> 55.2
5898.750	-39.8	-40.8	21.4	48.2	49.2



Operating Frequency : 709.875 MHz  
 Reference Carrier Power (ERP) : 42.7 mW (50 mW setting)  
 Distance of Measurement : 3.0 m

Frequency (MHz)	Substituted Power ERP(dBm)		Limits (dB)	Attenuation Ratio (dB)	
	Horiz.	Vert.		Horiz.	Vert.
	1419.750	-55.7		-56.9	29.3
2129.625	< -54.9	< -54.9	29.3	> 71.2	> 71.2
2839.500	< -52.8	< -52.8	29.3	> 69.1	> 69.1
3549.375	-43.5	-42.4	29.3	59.8	58.7
4259.250	-35.9	-41.9	29.3	52.2	58.2
4969.125	-33.1	-32.7	29.3	49.4	49.0
5679.000	< -45.8	< -45.8	29.3	> 62.1	> 62.1
6388.875	-41.1	-42.9	29.3	57.4	59.2
7098.750	< -43.3	< -43.3	29.3	> 59.6	> 59.6

Operating Frequency : 709.875 MHz  
 Reference Carrier Power (ERP) : 9.8 mW (10 mW setting)  
 Distance of Measurement : 3.0 m

Frequency (MHz)	Substituted Power ERP(dBm)		Limits (dB)	Attenuation Ratio (dB)	
	Horiz.	Vert.		Horiz.	Vert.
	1419.750	-58.9		< -59.4	22.9
2129.625	< -54.9	< -54.9	22.9	> 64.8	> 64.8
2839.500	-48.2	-50.8	22.9	58.1	60.7
3549.375	-45.1	-46.4	22.9	55.0	56.3
4259.250	-35.3	-37.7	22.9	45.2	47.6
4969.125	-38.6	-39.3	22.9	48.5	49.2
5679.000	-41.5	-44.2	22.9	51.4	54.1
6388.875	-40.0	-42.7	22.9	49.9	52.6
7098.750	< -43.3	< -43.3	22.9	> 53.2	> 53.2

Note: 1. The spectrum was checked from 30 MHz to tenth harmonics.  
All emissions not listed were found to be more than 20 dB below the limits.

2. The symbol of "<" means "or less".

3. Specified Limits: (§74.861(e)(6)(iii))  
Attenuation Ratio =  $43 + 10\log_{10}(\text{mean output power in watt})$   
This Limit is equivalent to -13 dBm(absolute value).

4. Measuring Instrument Setting:

Less than 1000 MHz

Detector function : Average

IF Bandwidth : 120 kHz

Above 1000 MHz

Resolution Bandwidth : 1 MHz

Tested by :

M. Takahashi

M.Takahashi

Testing Engineer



JQA File No. :400-50410  
Model No. :WRT-8B  
Standard :CFR 47 FCC Rules Part 74

FCC ID :AK8WRT8B1  
Issue Date :September 28, 2005  
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## 2.4 Occupied Bandwidth Measurement

Date : September 26, 2005  
Temp.: 25°C Humi.: 63 %

### Measurements Results :

Necessary Bandwidth: 120 kHz (Manufacturer specified)  
Maximum Deviation (100%): 40 kHz (Manufacturer specified)  
Input Level: 16 dB greater than that necessary to 50 percent modulation

Specified Limits: (§74.861(e)(6)(i)(ii))

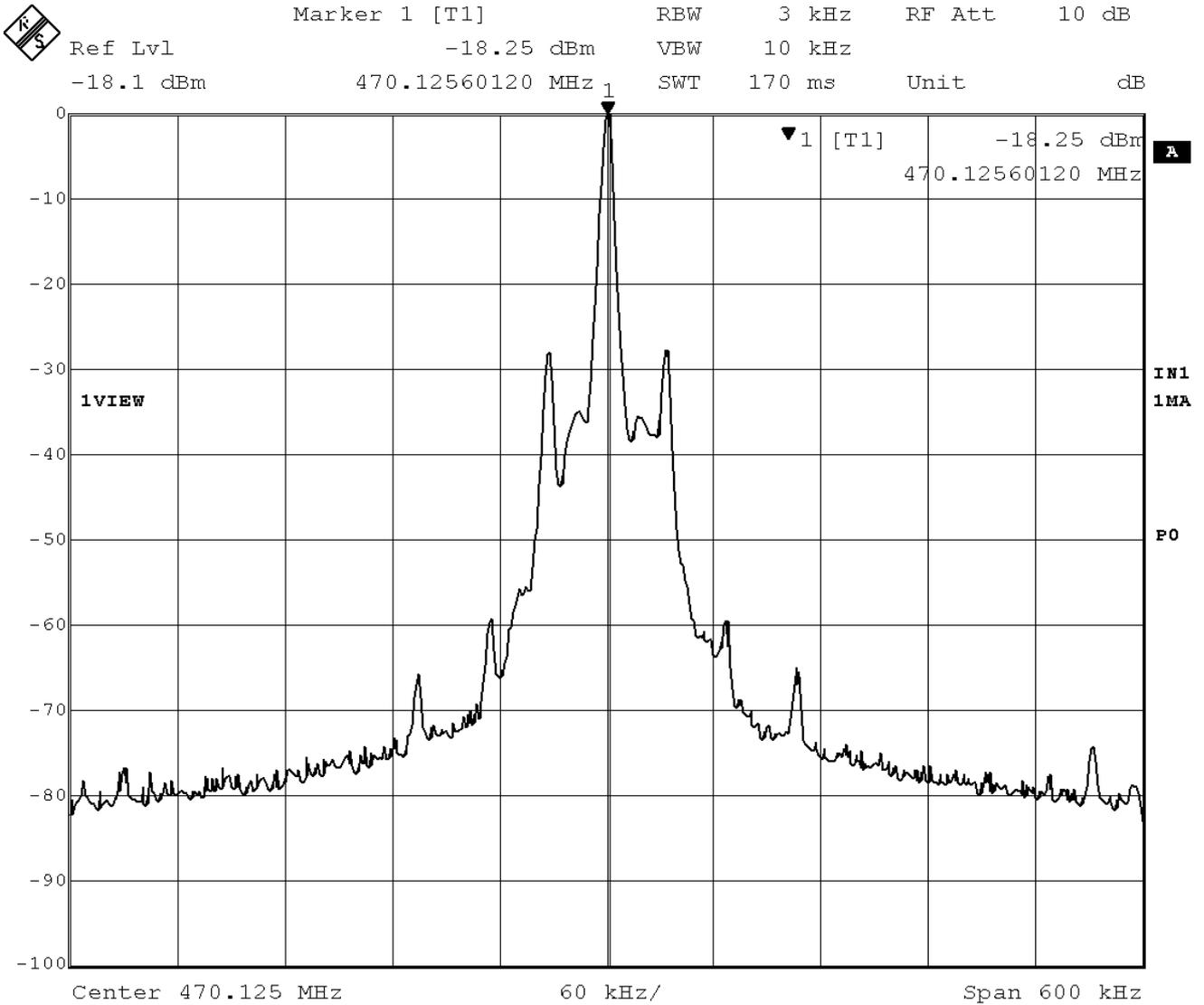
Refer to the attached graphs.

Tested by : *M. Takahashi*  
M.Takahashi  
Testing Engineer

Emission Limitation

FCC ID : AK8WRT8B1  
 Model : WRT-8B

Model of EUT : Transmit(H:50mW Setting)  
 Carrier Frequency : 470.125MHz  
 Reference Carrier Level



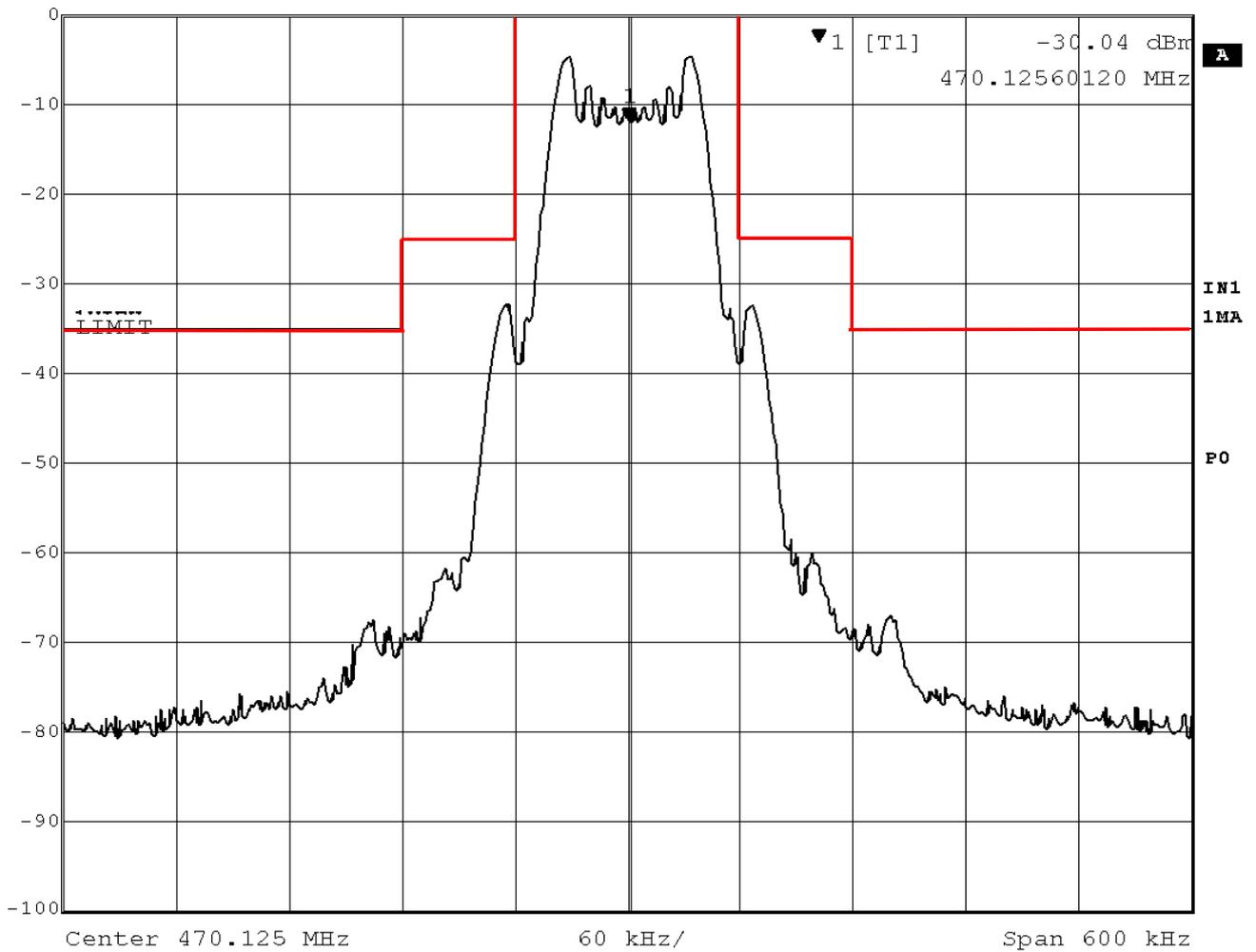
## Emission Limitation

FCC ID : AK8WRT8B1  
 Model : WRT-8B

Model of EUT : Transmit(H:50mW Setting)  
 Carrier Frequency : 470.125MHz  
 2.5kHz, -25.71dBV



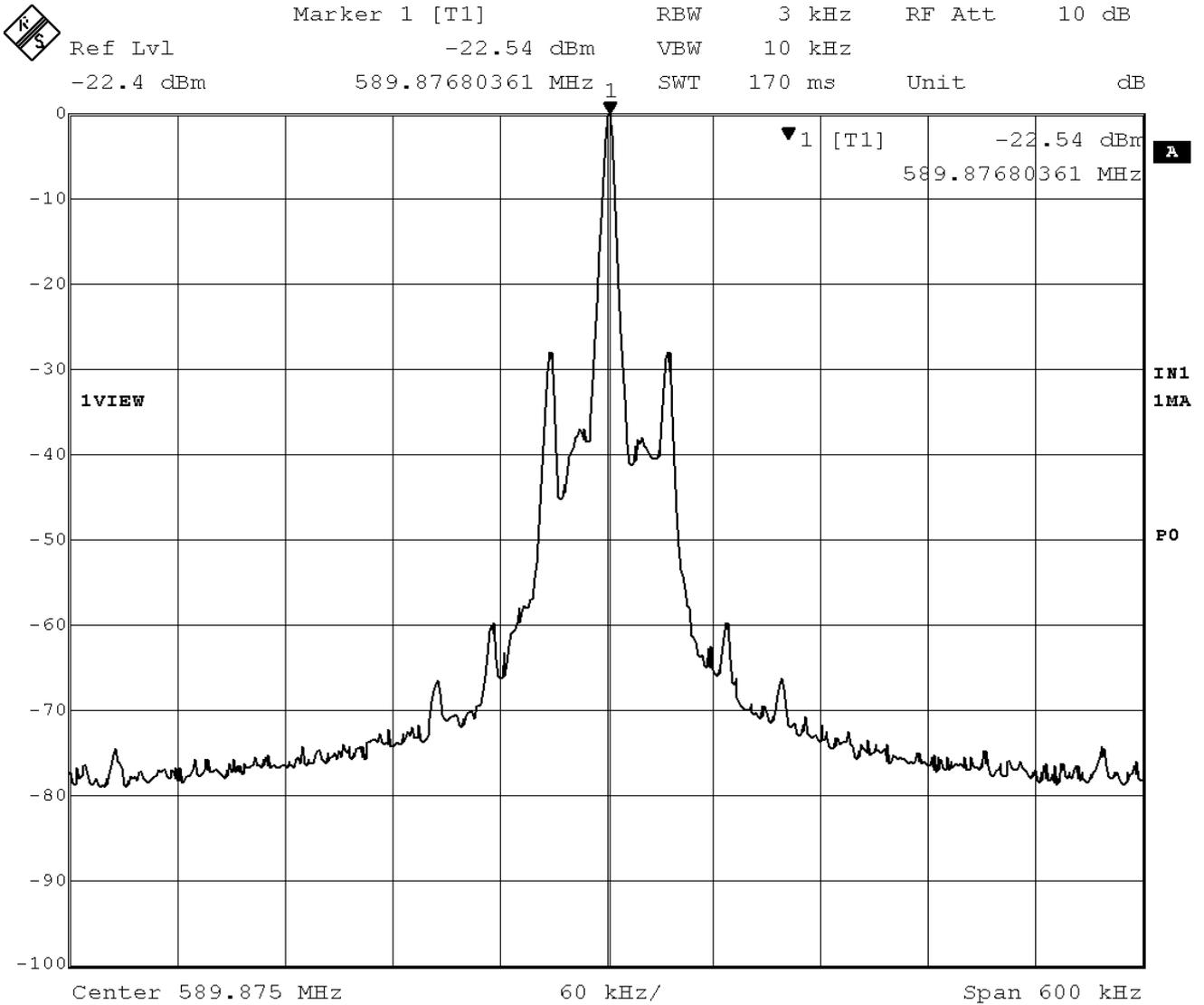
Ref Lvl	Marker 1 [T1]	RBW	3 kHz	RF Att	10 dB
-18.1 dBm	-30.04 dBm	VBW	10 kHz		
	470.12560120 MHz	SWT	170 ms	Unit	dB



Emission Limitation

FCC ID : AK8WRT8B1  
 Model : WRT-8B

Model of EUT : Transmit(L:10mW Setting)  
 Carrier Frequency : 470.125MHz  
 Reference Carrier Level



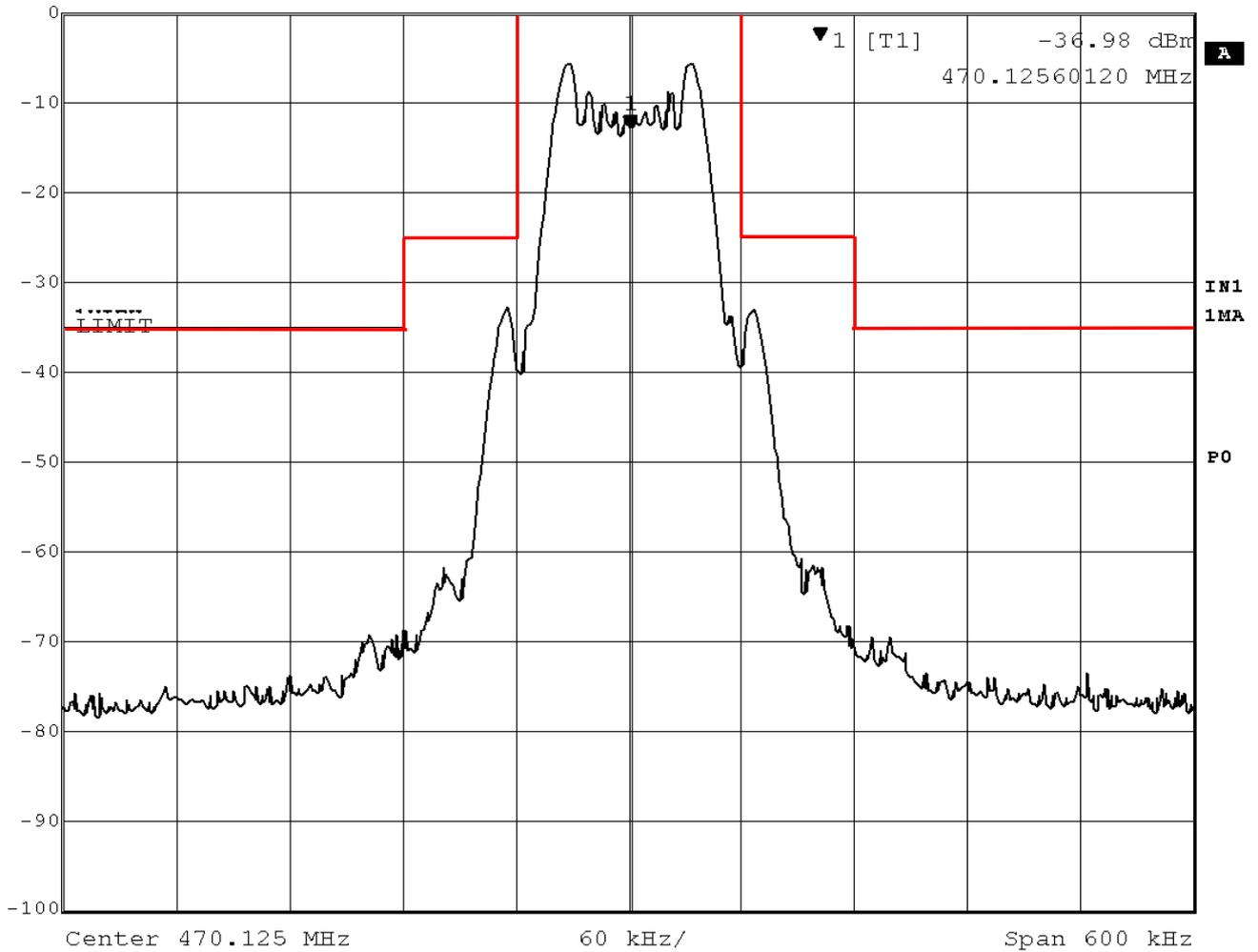
### Emission Limitation

FCC ID : AK8WRT8B1  
 Model : WRT-8B

Model of EUT : Transmit(L:10mW Setting)  
 Carrier Frequency : 470.125MHz  
 2.5kHz, -25.71dBV



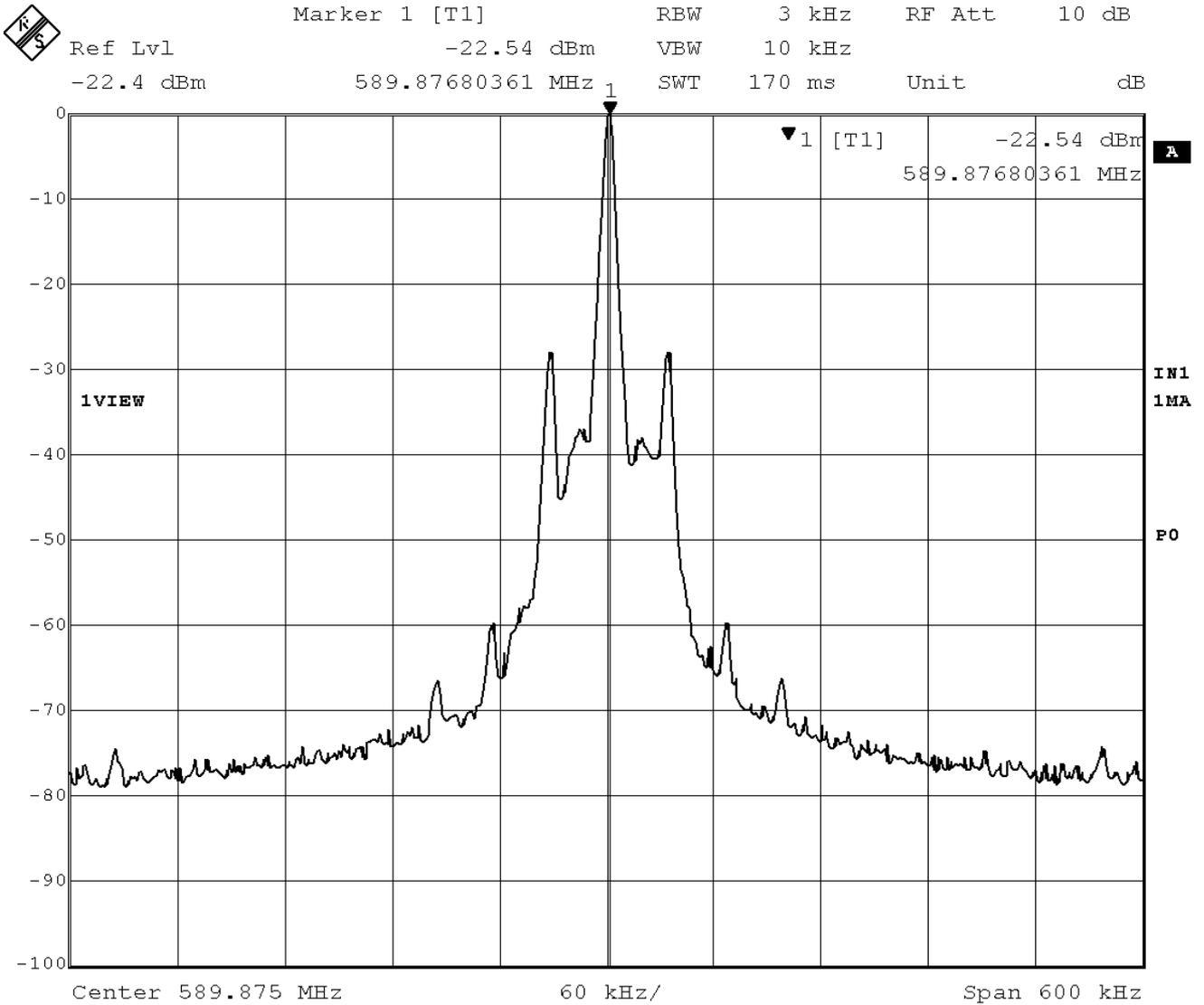
Marker 1 [T1]	RBW	3 kHz	RF Att	10 dB
Ref Lvl	-36.98 dBm	VBW	10 kHz	
-24.2 dBm	470.12560120 MHz	SWT	170 ms	Unit dB



### Emission Limitation

FCC ID : AK8WRT8B1  
 Model : WRT-8B

Model of EUT : Transmit(H:50mW Setting)  
 Carrier Frequency : 589.875MHz  
 Reference Carrier Level



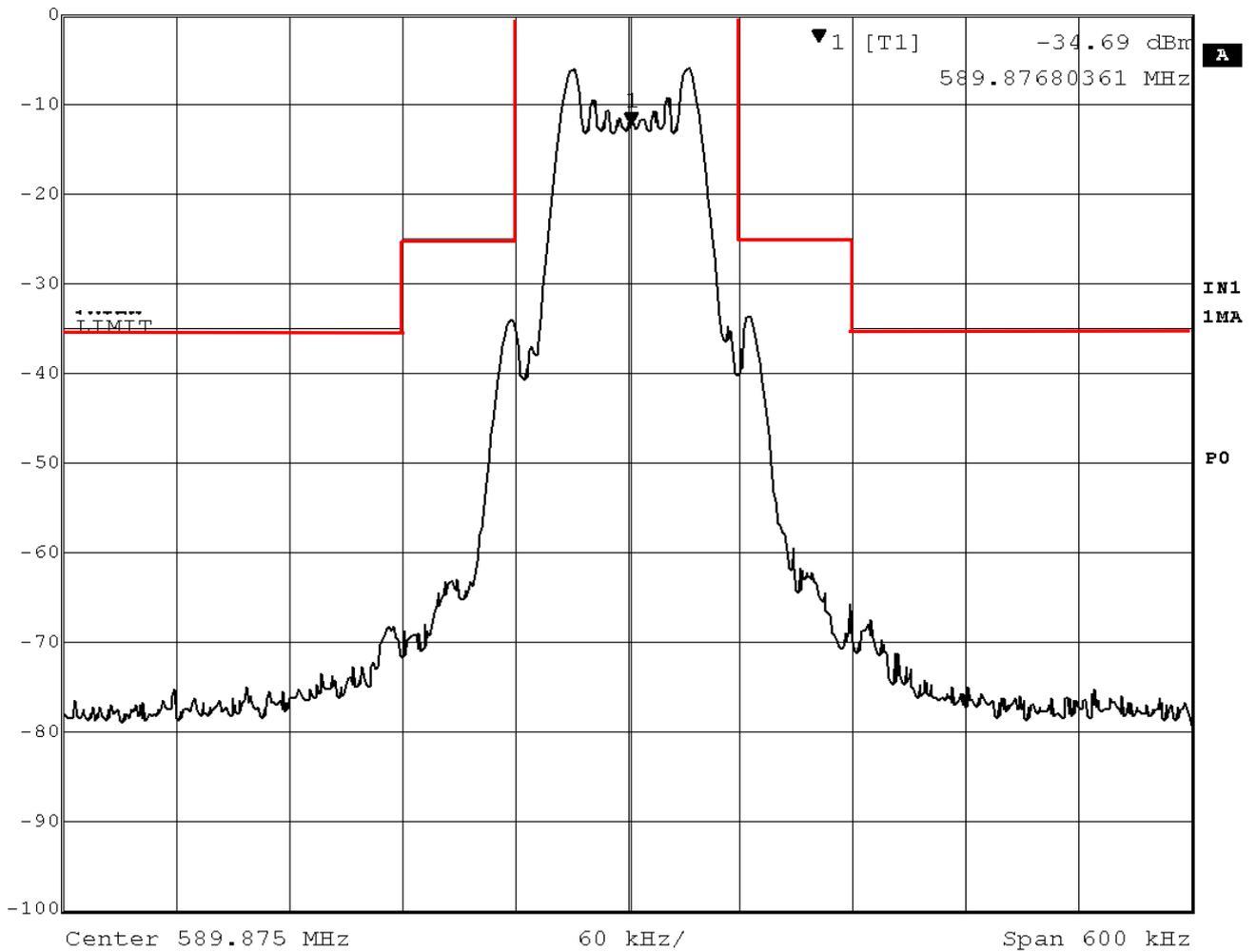
## Emission Limitation

FCC ID : AK8WRT8B1  
 Model : WRT-8B

Model of EUT : Transmit(H:50mW Setting)  
 Carrier Frequency : 589.875MHz  
 2.5kHz, -25.38dBV



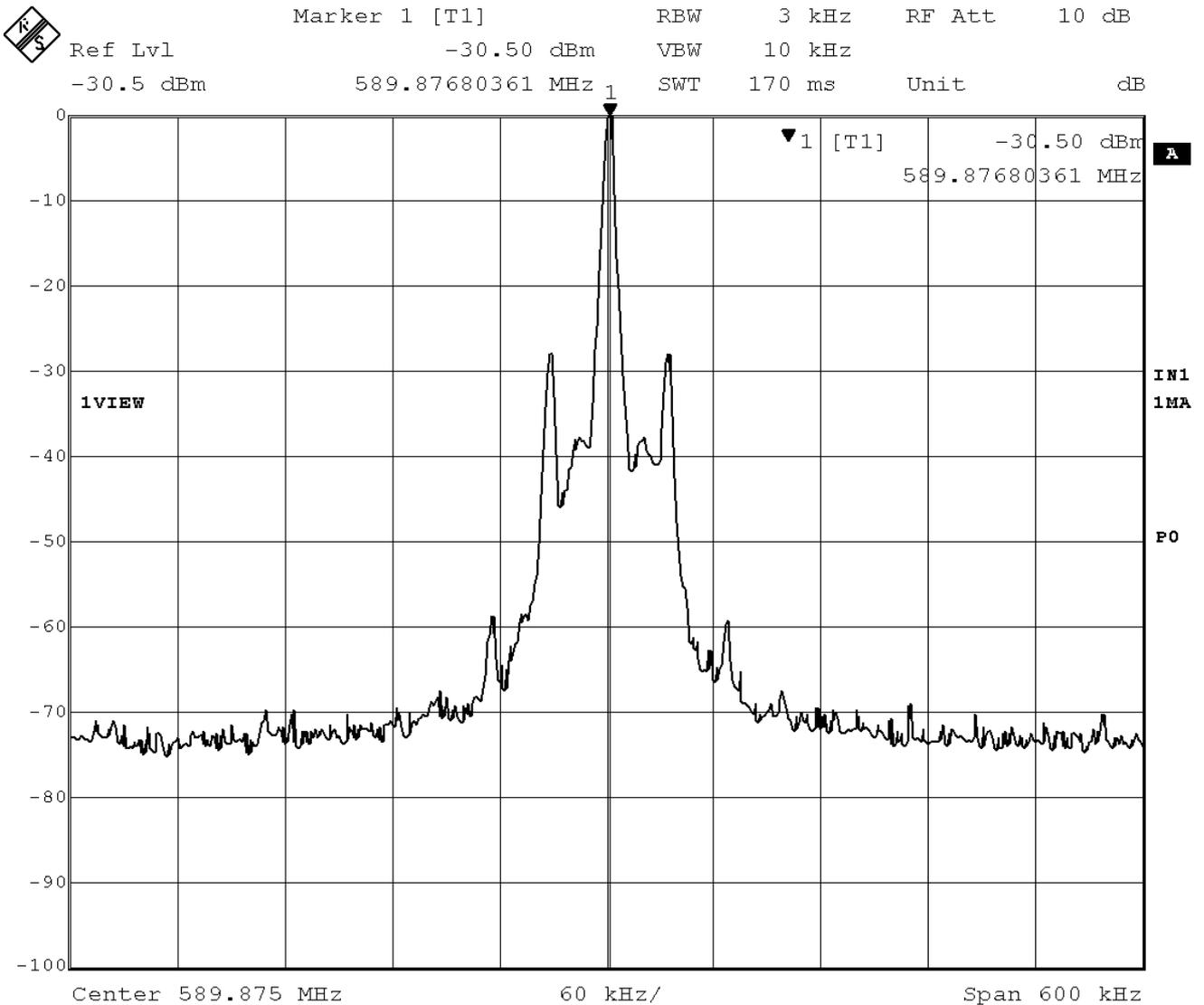
Marker 1 [T1]	RBW	3 kHz	RF Att	10 dB
Ref Lvl	-34.69 dBm	VBW	10 kHz	
-22.4 dBm	589.87680361 MHz	SWT	170 ms	Unit dB



## Emission Limitation

FCC ID : AK8WRT8B1  
 Model : WRT-8B

Model of EUT : Transmit(L:10mW Setting)  
 Carrier Frequency : 589.875MHz  
 Reference Carrier Level



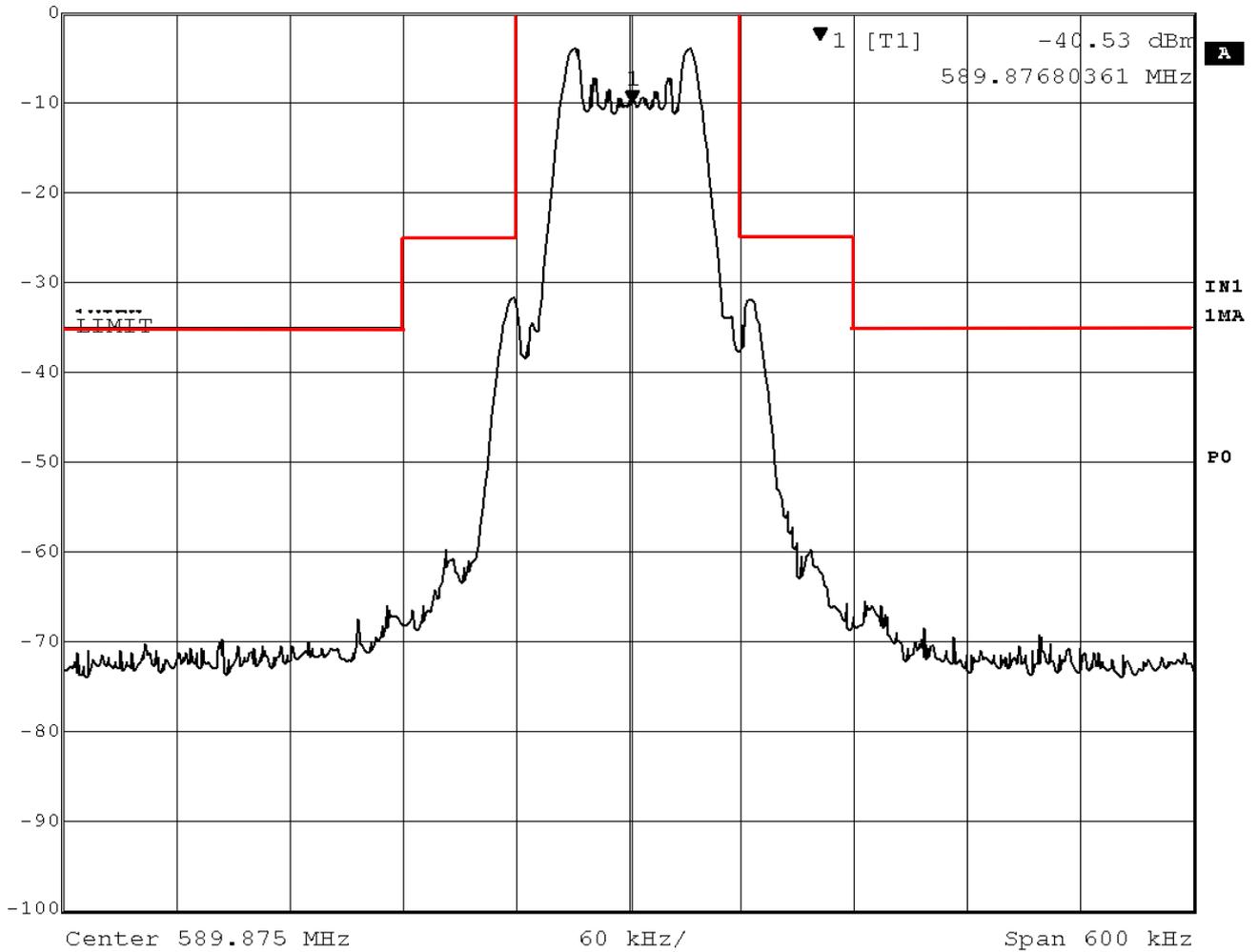
## Emission Limitation

FCC ID : AK8WRT8B1  
 Model : WRT-8B

Model of EUT : Transmit(L:10mW Setting)  
 Carrier Frequency : 589.875MHz  
 2.5kHz, -25.38dBV



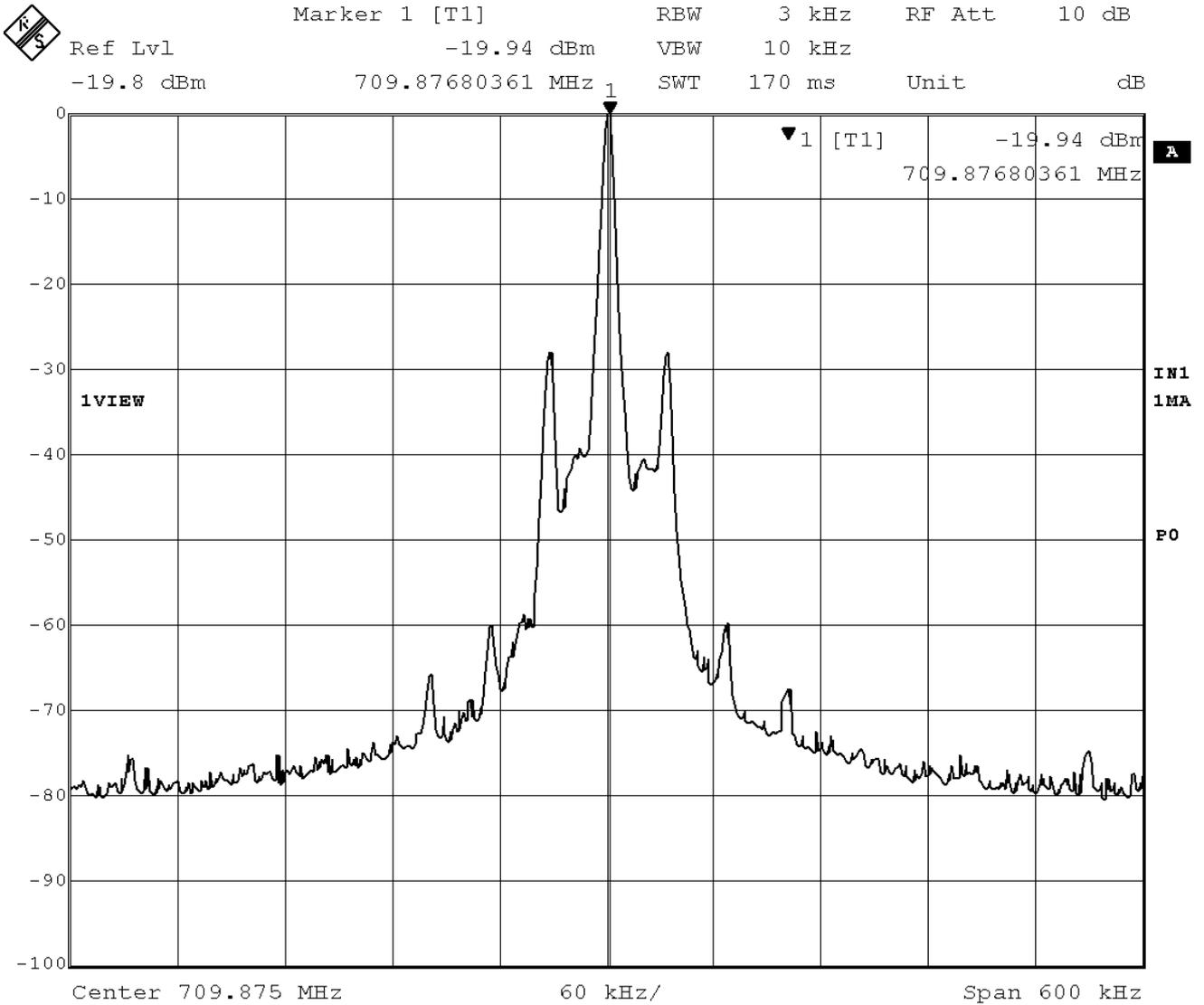
Marker 1 [T1]	RBW	3 kHz	RF Att	10 dB
Ref Lvl	-40.53 dBm	VBW	10 kHz	
-30.5 dBm	589.87680361 MHz	SWT	170 ms	Unit dB



## Emission Limitation

FCC ID : AK8WRT8B1  
 Model : WRT-8B

Model of EUT : Transmit(H:50mW Setting)  
 Carrier Frequency : 709.875MHz  
 Reference Carrier Level



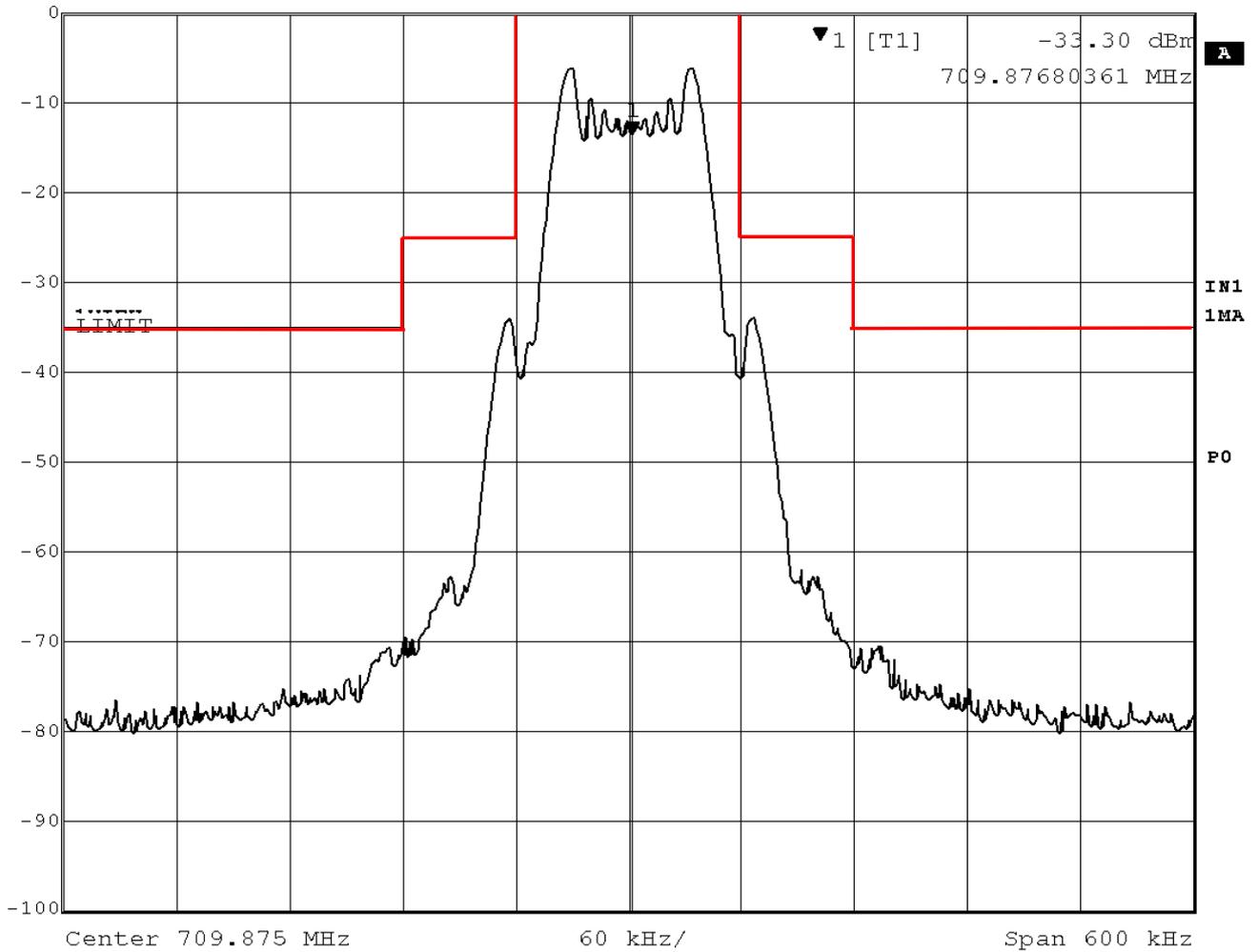
## Emission Limitation

FCC ID : AK8WRT8B1  
 Model : WRT-8B

Model of EUT : Transmit(H:50mW Setting)  
 Carrier Frequency : 709.875MHz  
 2.5kHz, -25.53dBV



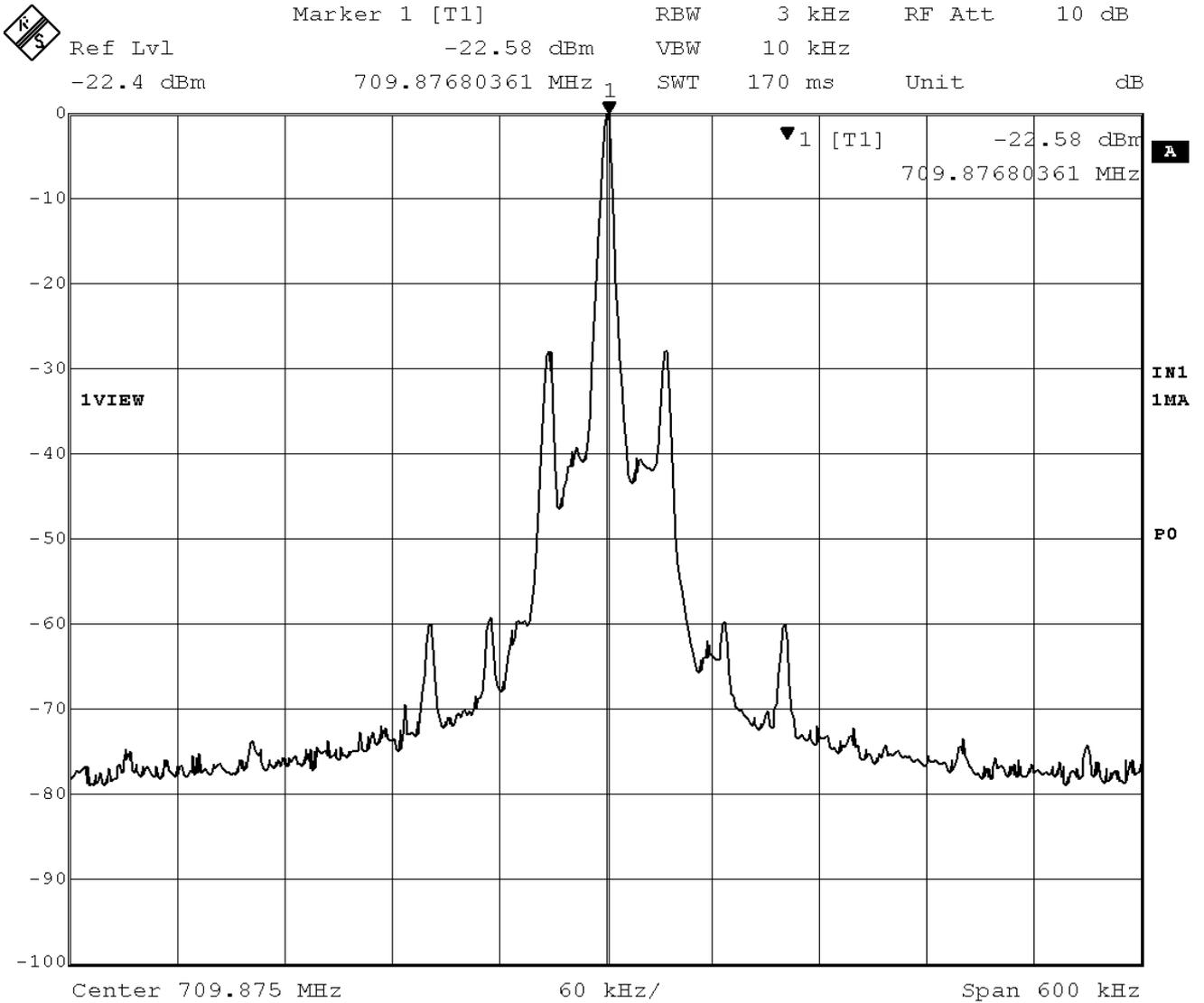
Marker 1 [T1]	RBW	3 kHz	RF Att	10 dB
Ref Lvl	-33.30 dBm	VBW	10 kHz	
-19.8 dBm	709.87680361 MHz	SWT	170 ms	Unit dB



Emission Limitation

FCC ID : AK8WRT8B1  
 Model : WRT-8B

Model of EUT : Transmit(L:10mW Setting)  
 Carrier Frequency : 709.875MHz  
 Reference Carrier Level



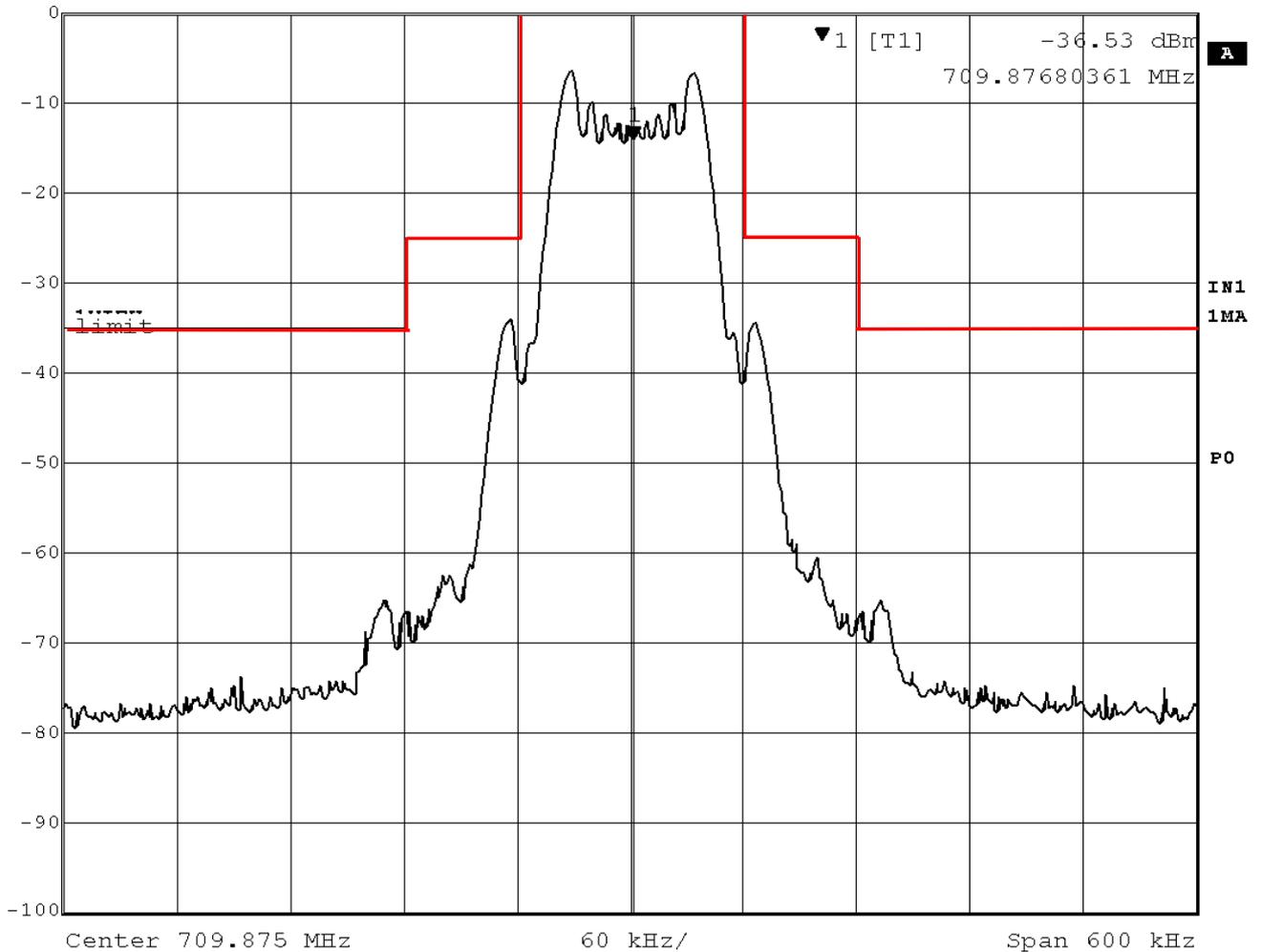
### Emission Limitation

FCC ID : AK8WRT8B1  
 Model : WRT-8B

Model of EUT : Transmit(L:10mW Setting)  
 Carrier Frequency : 709.875MHz  
 2.5kHz, -25.53dBV



Ref Lvl	Marker 1 [T1]	RBW	3 kHz	RF Att	10 dB
-22.4 dBm	-36.53 dBm	VBW	10 kHz		
	709.87680361 MHz	SWT	170 ms	Unit	dB





## 2.5 Frequency Stability Measurement

Date : September 21, 2005  
 Temp. : 26°C Humi. : 65 %

Ambient Temp. ( °C)	Frequency (MHz)	Transmitting Frequency (MHz)	Maximum Tolerance (%)
-30	470.125	470.121541	-0.000736
	589.875	589.861707	-0.002254
	709.875	709.853295	-0.003058
-20	470.125	470.124313	-0.000146
	589.875	589.866362	-0.001464
	709.875	709.860013	-0.002111
-10	470.125	470.126114	+0.000237
	589.875	589.870146	-0.000823
	709.875	709.865112	-0.001393
0	470.125	470.126395	+0.000297
	589.875	589.872233	-0.000469
	709.875	709.868760	-0.000879
+10	470.125	470.126406	+0.000299
	589.875	589.875385	+0.000065
	709.875	709.872328	-0.000376
+20	470.125	470.125764	+0.000163
	589.875	589.875670	+0.000113
	709.875	709.874270	-0.000103
+30	470.125	470.125124	+0.000026
	589.875	589.876432	+0.000243
	709.875	709.876184	+0.000167
+40	470.125	470.124514	-0.000103
	589.875	589.876774	+0.000301
	709.875	709.877875	+0.000405
+50	470.125	470.124364	-0.000135
	589.875	589.877716	+0.000460
	709.875	709.879964	+0.000699

Supply Voltage: 2.0VDC(Battery operating and point,  
 Manufacturer defined.)

Specified limit: ±0.005% (74.861(e)(4))

Ambient Temp. ( °C)	Frequency (MHz)	Transmitting Frequency (MHz)	Maximum Tolerance (%)
-30	470.125	470.121541	-0.000736
	589.875	589.861707	-0.002254
	709.875	709.853295	-0.003058
-20	470.125	470.124313	-0.000146
	589.875	589.866362	-0.001464
	709.875	709.860013	-0.002111
-10	470.125	470.126114	+0.000237
	589.875	589.870146	-0.000823
	709.875	709.865112	-0.001393
0	470.125	470.126395	+0.000297
	589.875	589.872233	-0.000469
	709.875	709.868760	-0.000879
+10	470.125	470.126406	+0.000299
	589.875	589.875385	+0.000065
	709.875	709.872328	-0.000376
+20	470.125	470.125764	+0.000163
	589.875	589.875670	+0.000113
	709.875	709.874270	-0.000103
+30	470.125	470.125124	+0.000026
	589.875	589.876432	+0.000243
	709.875	709.876184	+0.000167
+40	470.125	470.124514	-0.000103
	589.875	589.876774	+0.000301
	709.875	709.877875	+0.000405
+50	470.125	470.124364	-0.000135
	589.875	589.877716	+0.000460
	709.875	709.879964	+0.000699

Supply Voltage: 2.0V(Battery operating and point,  
Manufacturer defined.)  
Specified limit:  $\pm 0.005\%$ ( $\S 74.861(e)(4)$ )

Tested by : M. Takahashi  
M.Takahashi  
Testing Engineer



JQA File No. :400-50410  
Model No. :WRT-8B  
Standard :CFR 47 FCC Rules Part 74

FCC ID :AK8WRT8B1  
Issue Date :September 28, 2005  
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# Appendix

## Test Instruments List



September 5, 2005

### Test Facilities

No.	Type	Model	Manufacturer	Serial	ID	Last Cal.	Interval
TF01	Anechoic Chamber A	-	TDK	-	800-01-502E0	Mar. 2005	1 Year
TF02	Anechoic Chamber B	-	TDK	-	800-01-503E0	Mar. 2005	1 Year
TF03	Shield Room A	-	TDK	-	800-01-501E0	-	-
TF04	Shield Room B	-	Ray Proof	-	800-01-010E0	-	-
TF05	Shield Room C	-	TDK	-	800-01-504E0	-	-
TF06	Shield Room D	-	Emerson	-	800-01-022E0	-	-
TF07	Shield Room E	-	TDK	-	800-01-505E0	-	-

### Test Receivers

No.	Type	Model	Manufacturer	Serial	ID	Last Cal.	Interval
TR01	Test Receiver	ESH2	Rohde & Schwarz	880370/016	119-01-503E0	May 2005	1 Year
TR02	Test Receiver	ESH3	Rohde & Schwarz	881460/030	119-01-023E0	May 2005	1 Year
TR03	Test Receiver	ESHS10	Rohde & Schwarz	835871/004	119-01-505E0	Apr. 2005	1 Year
TR05	Test Receiver	ESVS10	Rohde & Schwarz	826148/002	119-03-504E0	Apr. 2005	1 Year
TR06	Test Receiver	ESVS10	Rohde & Schwarz	832699/001	119-03-506E0	Apr. 2005	1 Year
TR07	Test Receiver	ESI26	Rohde & Schwarz	100043	119-04-511E0	Aug. 2005	1 Year

### Spectrum Analyzers

No.	Type	Model	Manufacturer	Serial	ID	Last Cal.	Interval
SA01	Spectrum Analyzer	R3182	ADVANTEST	120600581	122-02-521E0	Mar. 2005	1 Year
SA02	Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	122-02-501E0	Oct. 2004	1 Year
SA03	RF Pre-selector	85685A	Hewlett Packard	2648A00522	122-02-503E0	Oct. 2004	1 Year
SA04	Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	122-02-517E0	Apr. 2005	1 Year
SA05	RF Pre-selector	85685A	Hewlett Packard	2901A00933	122-02-519E0	Apr. 2005	1 Year
SA06	Spectrum Analyzer	R3132	ADVANTEST	120500072	122-02-520E0	Sep. 2005	1 Year
SA07	Spectrum Analyzer	R3132	ADVANTEST	150400998	122-02-523E0	Aug. 2005	1 Year



### Antennas

No.	Type	Model	Manufacturer	Serial	ID	Last Cal.	Interval
AN01	Loop Antenna	HFH2-Z2	Rohde & Schwarz	881058/62	119-05-033E0	May. 2005	1 Year
AN02	Dipole Antenna	KBA-511	Kyoritsu	0-170-1	119-05-506E0	Oct. 2004	1 Year
AN03	Dipole Antenna	KBA-511A	Kyoritsu	0-201-13	119-05-504E0	Oct. 2004	1 Year
AN04	Dipole Antenna	KBA-611	Kyoritsu	0-147-14	119-05-507E0	Oct. 2004	1 Year
AN05	Dipole Antenna	KBA-611	Kyoritsu	0-210-5	119-05-505E0	Oct. 2004	1 Year
AN06	Biconical Antenna	BBA9106	Schwarzbeck	VHA91031150	119-05-111E0	Nov. 2004	1 Year
AN07	Biconical Antenna	BBA9106	Schwarzbeck	-	119-05-078E0	Nov. 2004	1 Year
AN08	Log-peri. Antenna	UHALP9107	Schwarzbeck	-	119-05-079E0	Nov. 2004	1 Year
AN09	Log-peri. Antenna	UHALP9107	Schwarzbeck	-	119-05-110E0	Nov. 2004	1 Year
AN10	Log-peri. Antenna	HL025	Rohde & Schwarz	340182/015	119-05-100E0	Feb. 2005	1 Year
AN11	Horn Antenna	3115	EMC Test Systems	6442	119-05-514E0	Jan. 2005	1 Year
AN12	Horn Antenna	3116	EMC Test Systems	2547	119-05-515E0	May 2005	2 Year

### Networks

No.	Type	Model	Manufacturer	Serial	ID	Last Cal.	Interval
NE01	LISN	KNW-407	Kyoritsu	8-833-6	149-04-052E0	Apr. 2005	1 Year
NE02	LISN	KNW-407	Kyoritsu	8-855-2	149-04-055E0	Apr. 2005	1 Year
NE03	LISN	KNW-407	Kyoritsu	8-1130-6	149-04-062E0	Apr. 2005	1 Year
NE04	LISN	KNW-242C	Kyoritsu	8-837-13	149-04-054E0	Apr. 2005	1 Year
NE05	Absorbing Clamp	MDS21	Luthi	03293	119-06-506E0	Aug. 2005	1 Year

### Cables

No.	Type	Model	Manufacturer	Serial	ID	Last Cal.	Interval
CA01	RF Cable	5D-2W	Fujikura	-	155-21-001E0	Feb. 2005	1 Year
CA02	RF Cable	5D-2W	Fujikura	-	155-21-002E0	Feb. 2005	1 Year
CA03	RF Cable	3D-2W	Fujikura	-	155-21-005E0	Apr. 2005	1 Year
CA04	RF Cable	3D-2W	Fujikura	-	155-21-006E0	Apr. 2005	1 Year
CA05	RF Cable	3D-2W	Fujikura	-	155-21-007E0	Apr. 2005	1 Year
CA06	RF Cable	RG213/U	Rohde & Schwarz	-	155-21-010E0	Apr. 2005	1 Year
CA07	RF Cable(10m)	S 04272B	Suhner	-	155-21-011E0	May 2005	1 Year
CA08	RF Cable(2m 18GHz)	SUCOFLEX 104	Suhner	-	155-21-012E0	May 2005	1 Year
CA09	RF Cable(1m 18GHz)	SUCOFLEX 104	Suhner	-	155-21-013E0	May 2005	1 Year
CA10	RF Cable(1m N)	S 04272B	Suhner	-	155-21-015E0	May 2005	1 Year
CA11	RF Cable(1m 26GHz)	SUCOFLEX 104	Suhner	182811/4	155-21-016E0	Dec. 2004	1 Year
CA12	RF Cable(4m 26GHz)	SUCOFLEX 104	Suhner	190630	155-21-017E0	Dec. 2004	1 Year
CA13	RF Cable(10m)	F130-S1S1-394	MEGA PHASE	10510	155-21-018E0	Dec. 2004	1 Year
CA14	RF Cable(7m)	3D-2W	Fujikura	-	155-21-009E0	Apr. 2005	1 Year
CA15	RF Cable(7m)	RG223/U	Suhner	-	155-21-021E0	May 2005	1 Year



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### Amplifiers

No.	Type	Model	Manufacturer	Serial	ID	Last Cal.	Interval
AM01	AF Amplifier	P-500L	Accuphase	BOY806	127-01-501E0	Feb. 2005	1 Year
AM06	RF Amplifier	WJ-6882-814	Watkins-Johnson	0414	127-04-017E0	Jun. 2005	1 Year
AM07	RF Amplifier	WJ-5315-556	Watkins-Johnson	106	127-04-006E0	Jun. 2005	1 Year
AM08	RF Amplifier	WJ-5320-307	Watkins-Johnson	645	127-04-005E0	Jun. 2005	1 Year
AM09	RF Amplifier	JS4-00102600 -28-5A	MITEQ	669167	127-04-502E0	Apr. 2005	1 Year

### Signal Generators

No.	Type	Model	Manufacturer	Serial	ID	Last Cal.	Interval
SG01	Function Generator	3325B	Hewlett Packard	2847A03284	118-08-124E0	Jul. 2005	1 Year
SG02	Function Generator	VP-7422A	Matsushita Communication	050351E122	118-08-503E0	Jul. 2005	1 Year
SG03	Signal Generator	8664A	Hewlett Packard	3035A00140	118-03-014E0	Jun. 2005	1 Year
SG04	Signal Generator	8664A	Hewlett Packard	3438A00756	118-04-502E0	Jun. 2005	1 Year
SG05	Signal Generator	6061A	Gigatronics	5130593	118-04-024E0	Mar. 2005	1 Year



### Auxiliary Equipment

No.	Type	Model	Manufacturer	Serial	ID	Last Cal.	Interval
AU01	Termination(50)	-	Suhner	-	154-06-501E0	Jan. 2005	1 Year
AU02	Termination(50)	-	Suhner	-	154-06-502E0	Jan. 2005	1 Year
AU03	Power Meter	436A	Hewlett Packard	1725A01930	100-02-501E0	Apr. 2005	1 Year
AU04	Power Sensor	8482A	Hewlett Packard	1551A01013	100-02-501E0	Apr. 2005	1 Year
AU05	Power Sensor	8485A	Hewlett Packard	2942A08969	100-04-021E0	Apr. 2005	1 Year
AU06	FM Linear Detector	MS61A	Anritsu	M77486	123-02-008E0	Oct. 2004	1 Year
AU07	Level Meter	ML422C	Anritsu	M87571	114-02-501E0	Jun. 2005	1 Year
AU08	Measuring Amplifier	2636	B & K	1614851	082-01-502E0	May 2005	1 Year
AU09	Microphone	4134	B & K	1253497	147-01-502E0	May 2005	1 Year
AU10	Preamplifier	2639	B & K	1268763	127-01-504E0	N/A	N/A
AU11	Pistonphone	4220	B & K	1165008	147-02-501E0	Mar. 2005	1 Year
AU12	Artificial Mouth	4227	B & K	1274869	-	N/A	N/A
AU13	Frequency Counter	53131A	Hewlett Packard	3546A11807	102-02-075E0	May 2005	1 Year
AU14	Oven	-	Ohnishi	-	023-02-018E0	May 2005	1 Year
AU15	DC Power Supply	6628A	Hewlett Packard	3224A00284	072-05-503E0	Jun. 2005	1 Year
AU16	Band Reject Filter	BRM12294	Micro-tronics	003	149-01-501E0	Jan. 2005	1 Year
AU17	High Pass Filter	F-100-4000 -5-R	RLC Electronics	0149	149-01-502E0	Feb. 2005	1 Year
AU18	Attenuator	43KC-10	Anritsu	-	148-03-506E0	Feb. 2005	1 Year
AU19	Attenuator	43KC-20	Anritsu	-	148-03-507E0	Feb. 2005	1 Year
AU20	Attenuator	355D	Hewlett Packard	219-10782	148-03-065E0	Apr. 2005	1 Year
AU21	FFT Analyzer	R9211C	Advantest	02020253	122-02-506E0	Jun. 2005	1 Year
AU22	Noise Meter	MN-446	Meguro	53030478	082-01-144E0	Apr. 2005	1 Year
AU23	RF Detector	75KC-50	Anritsu	305002	100-02-506E0	Jul. 2005	1 Year
AU24	Peak Power Analyzer	8990A/84815A	Hewlett Packard	3220A00486/ 3227A00118	100-02-016E0	Apr. 2005	1 Year