



EMI TEST REPORT

JQA APPLICATION NO. : 400-90733

Model No. : WRT-822B

Type of Equipment : UHF Synthesized Transmitter

Regulations Applied : CFR 47 FCC Rules and Regulations Part 74

FCC ID : AK8WRT822B

Applicant : Sony Corporation

Address : 4-14-1, Asahi-cho, Atsugi-shi,
Kanagawa-ken 243-0014, Japan

Manufacture : Sony Corporation

Address : 4-14-1, Asahi-cho, Atsugi-shi,
Kanagawa-ken 243-0014, Japan

Received date of EUT : February 2, 2000

Final Judgment : Passed

TEST RESULTS IN THIS REPORT are obtained in use of equipment that is traceable to Electrotechnical Lab. of MITI Japan and Communications Research Lab. of MPT Japan.

The test results only respond to the tested sample. It is not allowed to copy this report even partly without the allowance of the JQA EMC Engineering Dept. Testing Div.

TABLE OF CONTENTS

	Page
1 Documentation	
1.1 Test Regulation	<u>3</u>
1.2 General Information	<u>3</u>
1.3 Test Condition	<u>4 - 6</u>
1.4 EUT Modifications / Deviation from Standard	<u>7</u>
1.5 Test results	<u>8</u>
1.6 Summary	<u>9</u>
1.7 Test Configuration / Operation of EUT	<u>10</u>
1.8 EUT Arrangement(Drawing)	<u>11</u>
1.9 Preliminary Test and Test-setup (Drawings)	<u>12 - 17</u>
1.10 EUT Arrangement (Photographs)	<u>18</u>
2 Test Data	
2.1 RF Power Output	<u>19</u>
2.2 Modulation Characteristics	<u>20 - 32</u>
2.3 Radiated Emissions	<u>33 - 37</u>
2.4 Occupied Bandwidth	<u>38 - 44</u>
2.3 Frequency Stability	<u>45 - 46</u>

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.

Expiration date of FCC test facility filing : June 04, 2002

- 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, 2000)

1.2.2 Description of the Equipment Under Test (EUT) :

- | | |
|--------------------------------------|-----------------------------------|
| 1) Type of Equipment | : UHF Synthesized Transmitter |
| 2) Product Type | : Production |
| 3) Category | : Broadcast Transmitter worn body |
| 4) EUT Authorization | : Certification |
| 5) FCC ID | : AK8WRT822B |
| 6) Trade Name | : SONY |
| 7) Model No. | : WRT-822B |
| 8) Operating Frequency Range | : 566.125 MHz - 805.875 MHz |
| 9) Highest Frequency Used in the EUT | : 805.875 MHz |
| 10) Bandwidth | : 110 kHz |
| 11) RF Output Power | : 20 mW |
| 12) Serial No. | : 1101/1102/1106 |
| 13) Date of Manufacture | : October, 1999 |
| 14) Power Rating | : DC 3.0(Battery) |
| 15) EUT Grounding | : None |

1.2.3 Definitions for symbols used in this test report :

- 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 Testing 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, 1999

2) Interval :1 year

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<u> </u> - Test Receiver	ESV	Rohde & Schwarz	872148/039	May 1999	1 Year
<u> </u> - Test Receiver	ESVS10	Rohde & Schwarz	826148/002	Jun. 1999	1 Year
<u> x </u> - Test Receiver	ESVP	Rohde & Schwarz	881487/004	May 1999	1 Year
<u> </u> - Test Receiver	ESVP	Rohde & Schwarz	881487/005	Dec. 1999	1 Year
<u> x </u> - Antenna	KBA-511A	Kyoritsu Electrical	0-170-1	Nov. 1999	1 Year
<u> x </u> - Antenna	KBA-511A	Kyoritsu Electrical	0-201-13	Nov. 1999	1 Year
<u> x </u> - Antenna	KBA-611	Kyoritsu Electrical	0-147-14	Nov. 1999	1 Year
<u> x </u> - Antenna	KBA-611	Kyoritsu Electrical	0-210-5	Nov. 1999	1 Year
<u> x </u> - RF Cable	5D-2W	Fujikura	155-21-001E0	Feb. 2000	1 Year
<u> </u> - RF Cable	5D-2W	Fujikura	155-21-002E0	Feb. 2000	1 Year
<u> x </u> - Power Meter	436A	Hewlett Packard	1725A01930	Jun. 1999	1 Year
<u> x </u> - Power Sensor	8482A	Hewlett Packard	1650A00140	Jun. 1999	1 Year
<u> x </u> - Signal Generator	8664A	Hewlett Packard	3035A00140	Jun. 1999	1 Year

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 Testing 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 : N/A

2) Interval : N/A

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<u> </u> - Spectrum Analyzer	8563E	Hewlett Packard	3221A00201	May 1999	1 Year
<u> </u> - Spectrum Analyzer	8560E	Hewlett Packard	3240A00189	May 1999	1 Year
<u> </u> - Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	Apr. 1999	1 Year
<u> </u> - RF Pre-selector	85685A	Hewlett Packard	2648A00522	Apr. 1999	1 Year
<u> x </u> - Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	May 1999	1 Year
<u> x </u> - RF Pre-selector	85685A	Hewlett Packard	2091A00933	May 1999	1 Year
<u> x </u> - Log-Periodic Antenna	HL 025	Rohde & Schwarz	340182/015	Nov. 1999	1 Year
<u> </u> - RF Amplifier	DBP-0102N5334272B	DBS Microwave Inc.	012	Jun. 1999	1 Year
<u> x </u> - RF Amplifier	WJ-6882-814	Watkins-Johnson	0414	Jun. 1999	1 Year
<u> </u> - RF Amplifier	WJ-5315-556	Watkins-Johnson	106	Jun. 1999	1 Year
<u> </u> - RF Amplifier	WJ-5320-307	Watkins-Johnson	645	Jun. 1999	1 Year
<u> x </u> - RF Cable(10m)	S 04272B	Suhner	155-21-011E0	May 1999	1 Year
<u> </u> - RF Cable(2m)	SUCOFLEX 104	Suhner	155-21-012E0	May 1999	1 Year
<u> x </u> - RF Cable(1m)	SUCOFLEX 104	Suhner	155-21-013E0	May 1999	1 Year

1.3.3 The measurement of the Modulation Characteristics and the Occupied Bandwidth

 x - was performed.

 - was not applicable.

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<u> x </u> - Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	Apr. 1999	1 Year
<u> </u> - Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	May 1999	1 Year
<u> x </u> - Function Generator	3325A	Hewlett Packard	2512A21776	June 1999	1 Year
<u> x </u> - FM Linear Detector	MS61A	Anritsu Corp.	M77486	Sep. 1999	1 Year
<u> x </u> - Level Meter	ML422C	Anritsu Corp.	M87571	June 1999	1 Year
<u> x </u> - Attenuator	355D	Hewlett Packard	219-10782	June 1999	1 Year
<u> </u> - Attenuator	49-10-43	Weinschel	KA319	June 1999	1 Year
<u> </u> - Attenuator	49-20-43	Weinschel	KK162	June 1999	1 Year
<u> </u> - Attenuator	49-30-43	Weinschel	KJ988	June 1999	1 Year

1.3.4 The measurement of the Frequency Stability

 x - was performed.

 - was not applicable.

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<u> x </u> - Frequency Counter	53131A	Hewlett Packard	3546A11807	June 1999	1 Year
<u> x </u> - Oven	-	Ohnishi Co. Ltd.	-	Aug. 1999	1 Year
<u> x </u> - DC Power Supply	6628A	Hewlett Packard	3224A00284	July 1999	1 Year



1.4 EUT MODIFICATION / Deviation from Standard

1.4.1 EUT MODIFICATION

- 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:

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



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;

- 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 : February 12, 2000

End of testing : March 17, 2000

- JAPAN QUALITY ASSURANCE ORGANIZATION -

Approved by:

Issued by:



Masaaki Takahashi
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.	FCC ID	Serial No.
A	UHF Synthesized Transmitter	Sony Corporation	WRT-822B	AK8WRT822B	1101/1102/ 1106

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	ECM-77BC	-

1.7.2 Operating condition

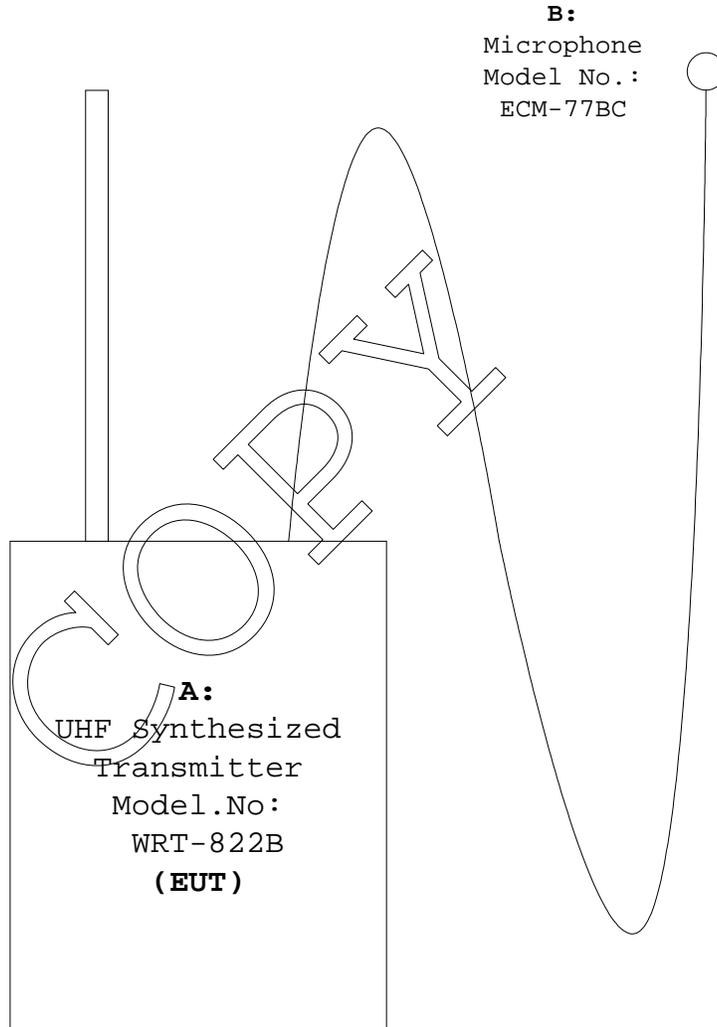
Power supply Voltage : 3VDC(Alkaline Battery) or DC power supply
The tests have been carried out under the transmitting condition.
(Operating Frequency:566.125 MHz, 686.125 MHz and 805.875 MHz)

1.7.3 Generating and Operating frequency of EUT

566.125 MHz, 686.125 MHz and 805.875 MHz

COPY

1.8 EUT ARRANGEMENT (DRAWINGS)



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.

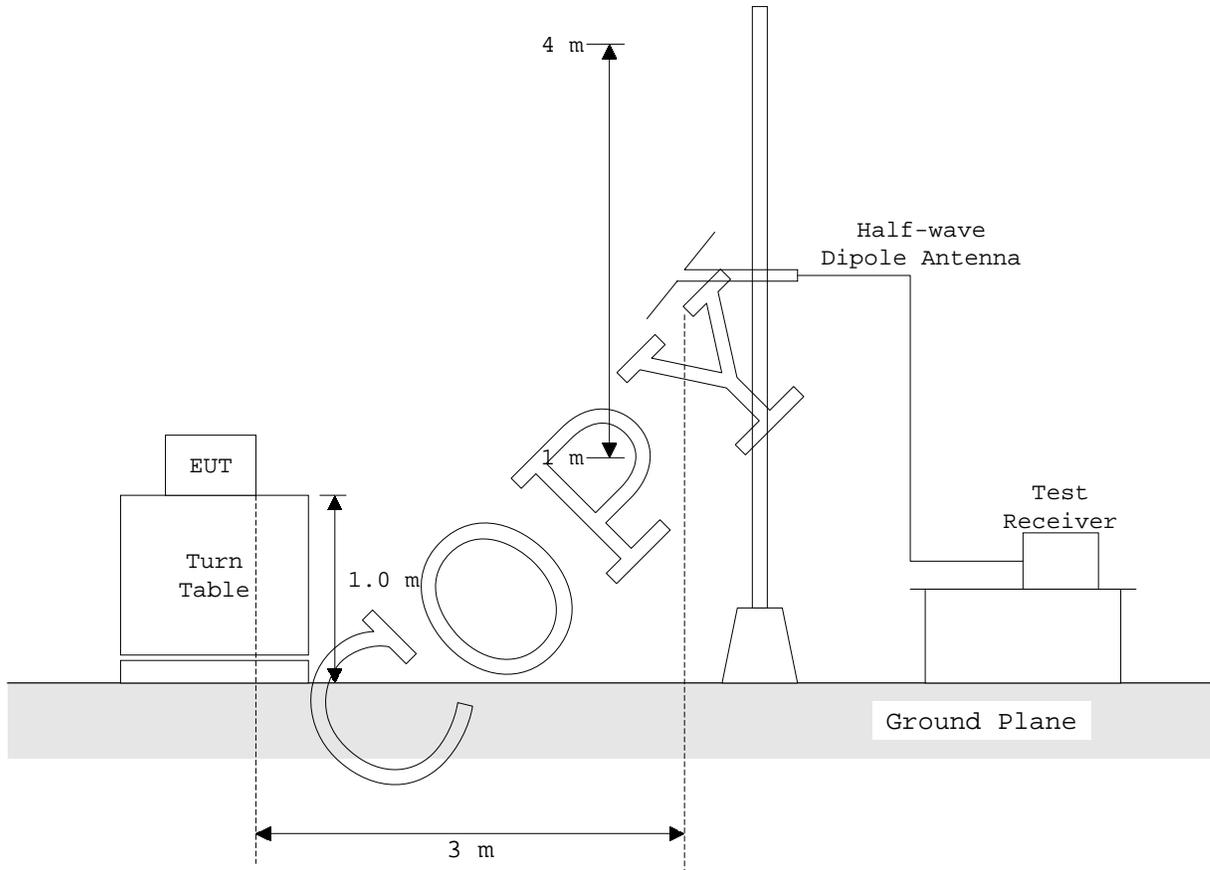
The transmitter was removed and replaced with a half-wave dipole antenna. The center of the half-wave dipole antenna was placed approximately at the same location as the center of the transmitter. (In the case of the lower frequencies, where the half-wave dipole antenna is very long, this will be impossible 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 -



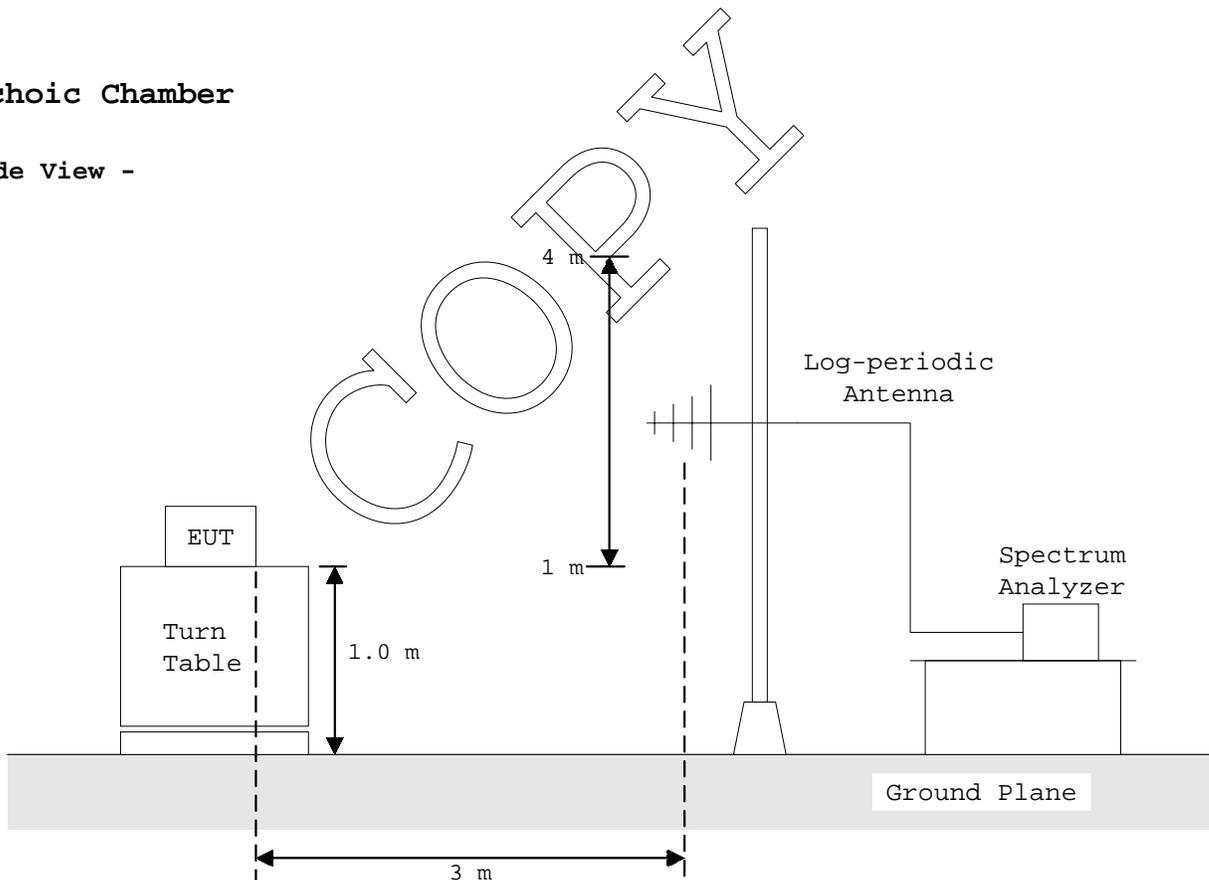
1.9.2 Radiated Emission (Above 1 GHz) :

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

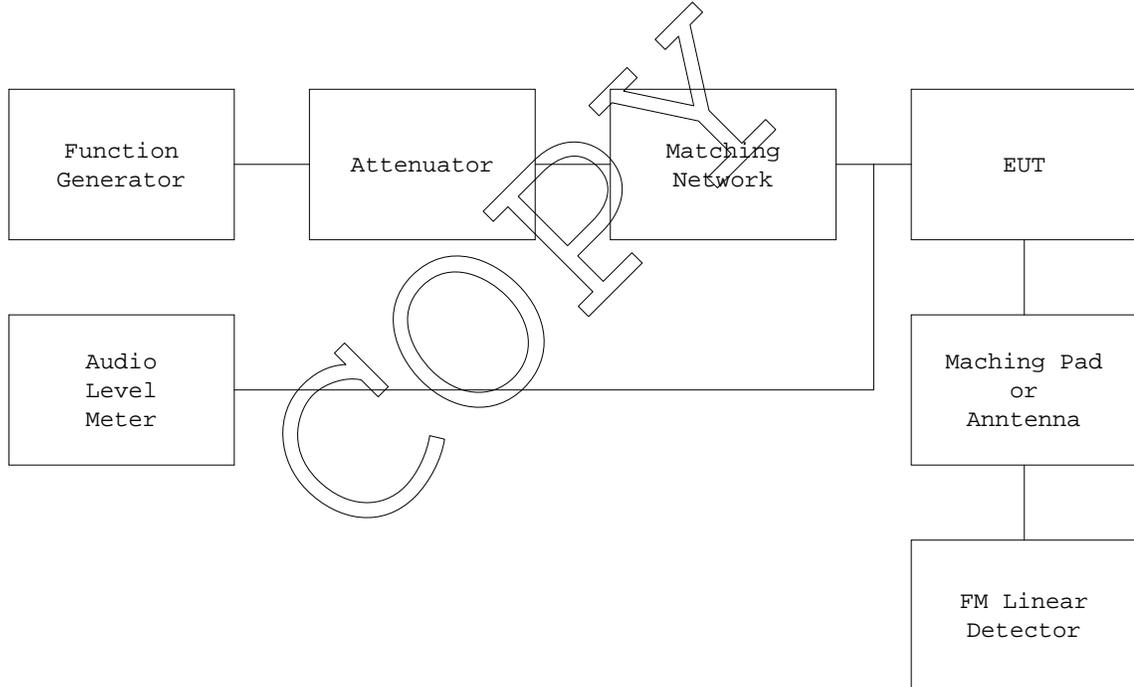
- Side View -



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 15 kHz and the input level to obtain 50% modulation was plotted.

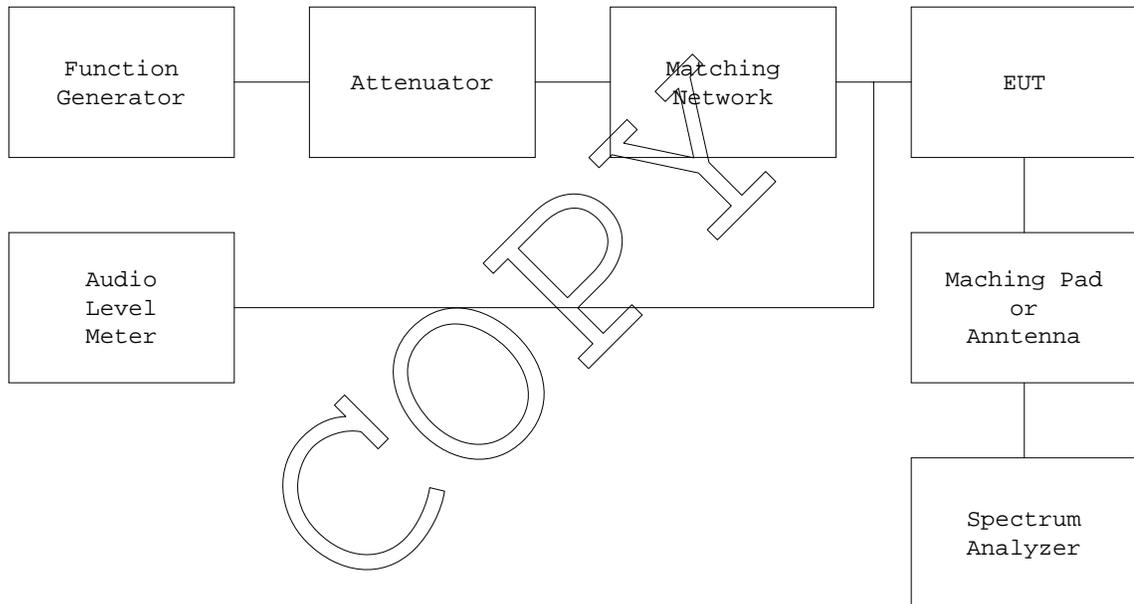
The modulation response was measured up to maximum modulation for each of three tones: 100 Hz, 2500 Hz and 15 kHz. The audio input level was changed from 10% modulation up to maximum rated modulation.



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.

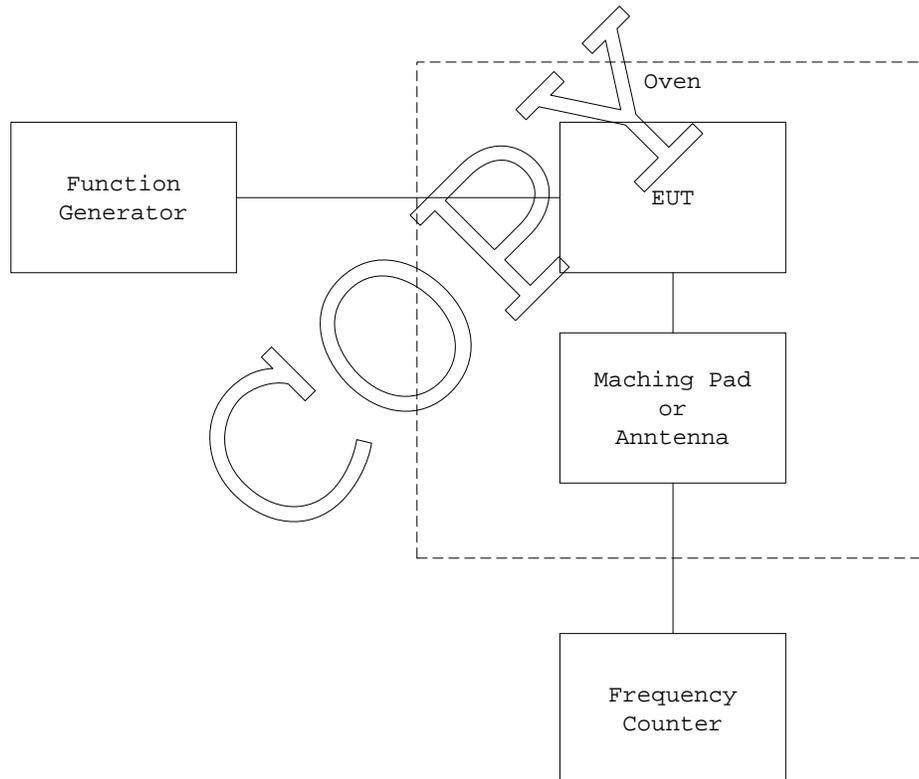
The transmitter was modulated at the input level producing 85% modulation at the maximum response frequency, and with the frequency 2500 Hz.



1.9.5 Frequency Stability :

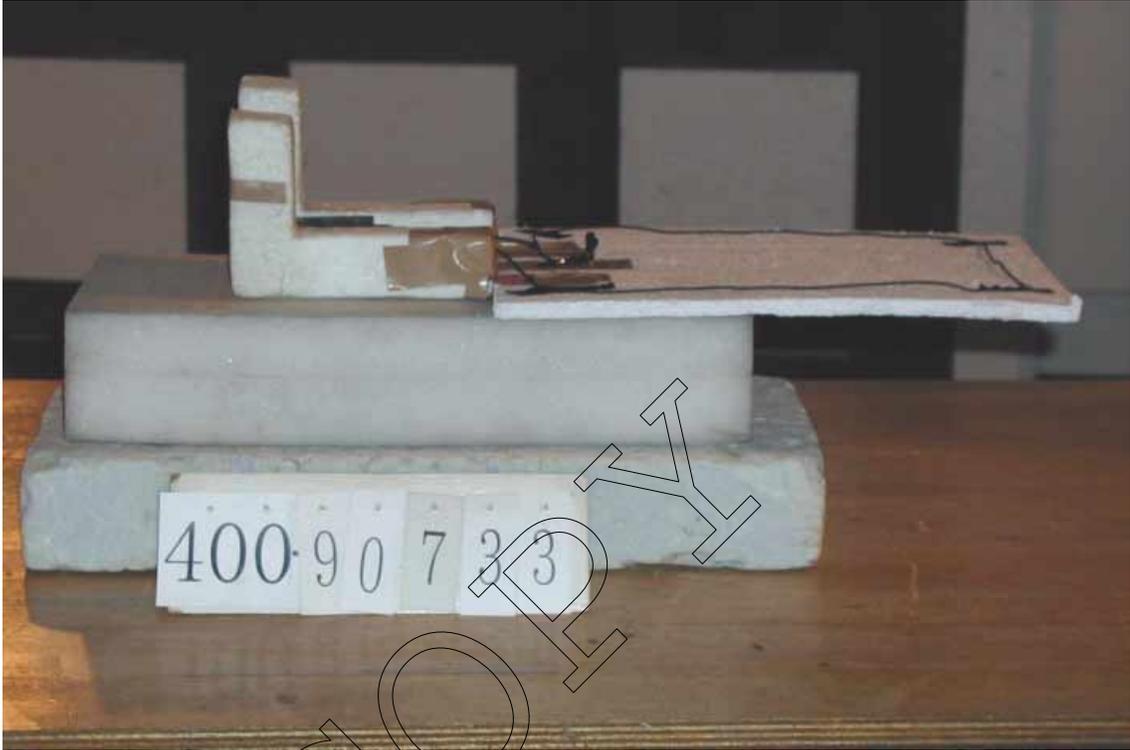
The transmitter was placed in the temperature cycle chamber and was kept at a temperature of $-30^{\circ}\text{C} \pm 1^{\circ}\text{C}$ for approximately one hour. The rated test voltage was applied to the transmitter and the unit was turned on for ten minutes. The transmit frequency was measured during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

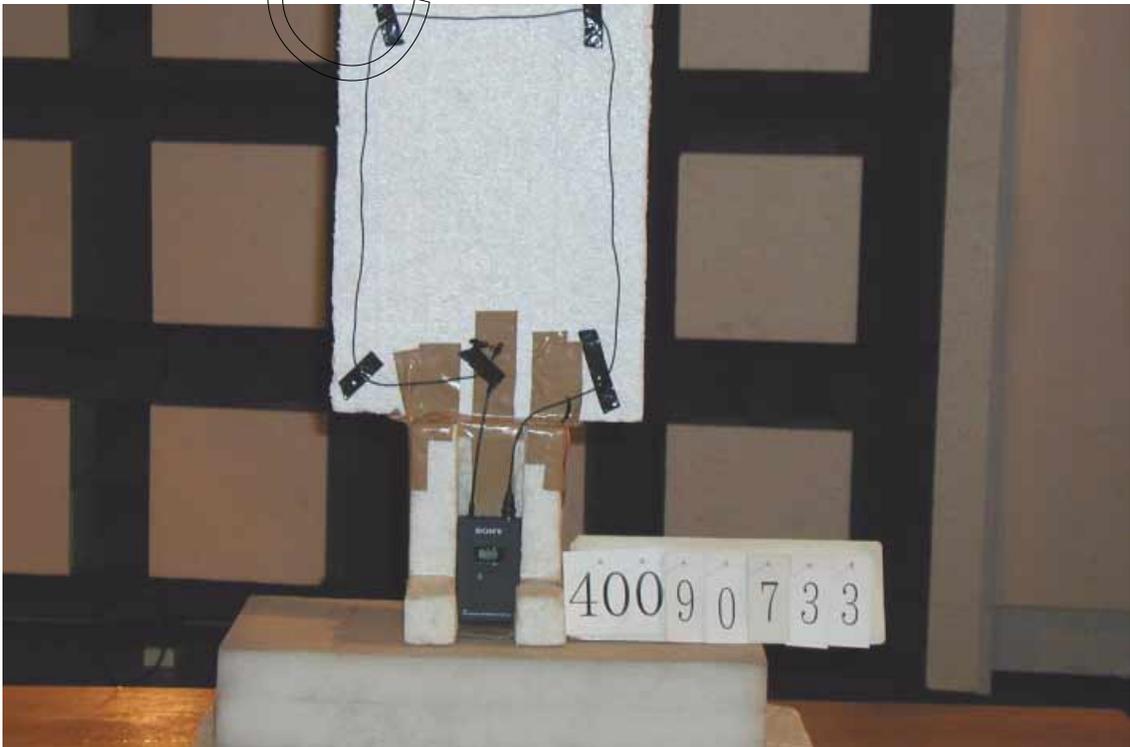


1.10 TEST ARRANGEMENT (PHOTOGRAPHS)

PHOTOGRAPHS OF EUT CONFIGURATION FOR RADIATED EMISSIONS MEASUREMENT
Photograph present configuration with maximum emission
for Horizontal Plane



for Vertical Plane





TEST DATA**2.1 RF Power Output**Date : March 3, 2000Temp. : 23 °C Humi. : 37 %

Frequency Range: 566.125 MHz - 805.875 MHz

Frequency (MHz)	Output Power ERP(mW)
566.125	13.22
686.125	12.71
805.875	10.65

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

Tested by : Shigeru OsawaShigeru Osawa
Testing Engineer

COPY



2.2 Modulation Characteristics

Date : March 16, 2000

Temp. : 22°C Humi. : 36 %

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.

COPY

Tested by :

Shigeru Osawa

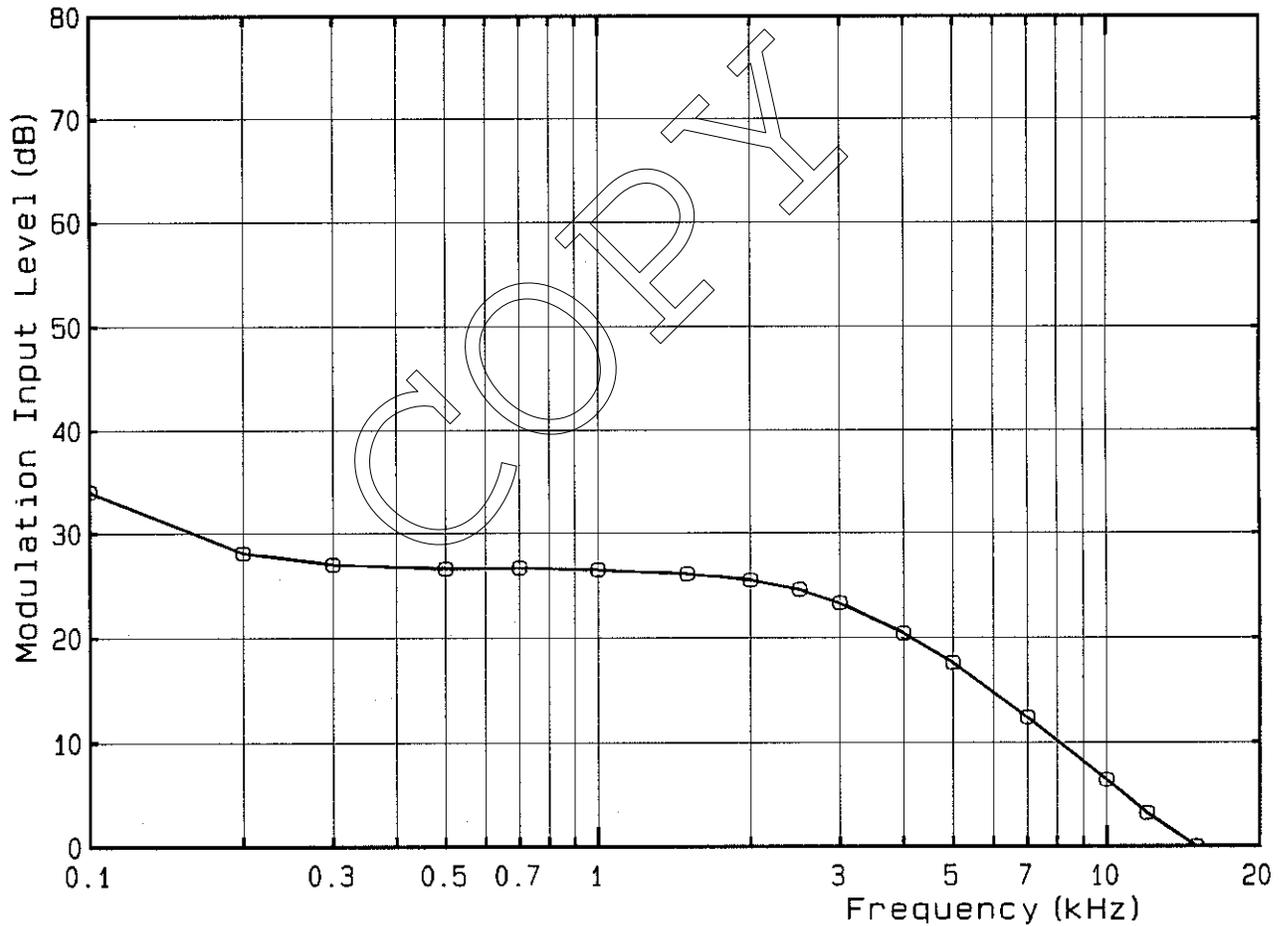
Shigeru Osawa

Testing Engineer

Modulation Frequency Response

FCC ID : AK8WRT822B
Model : WRT-822B
Test Frequency : 566.125 MHz

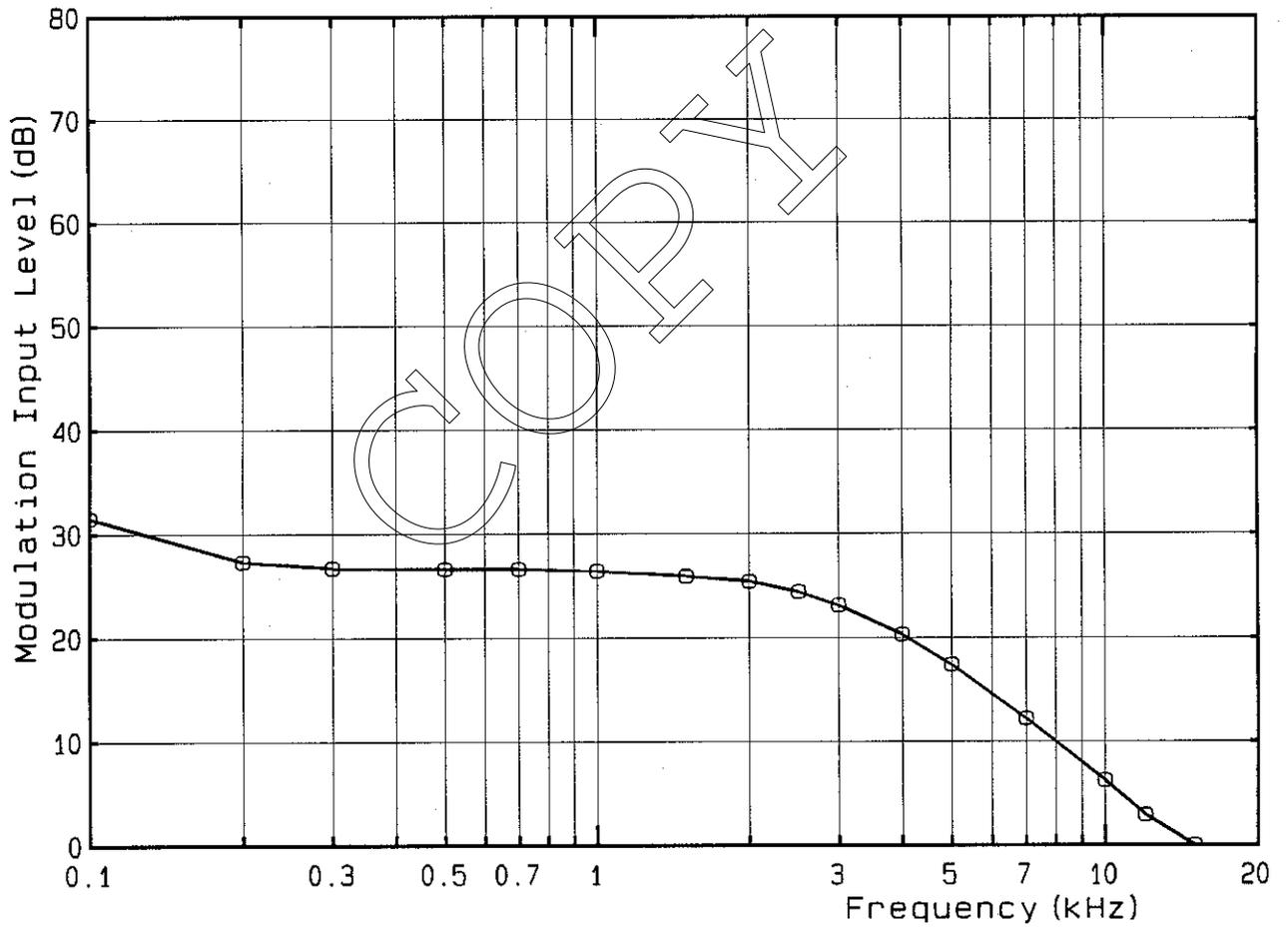
0 dB = -64.5 dBV



Modulation Frequency Response

FCC ID : AK8WRT822B
Model : WRT-822B
Test Frequency : 686.125 MHz

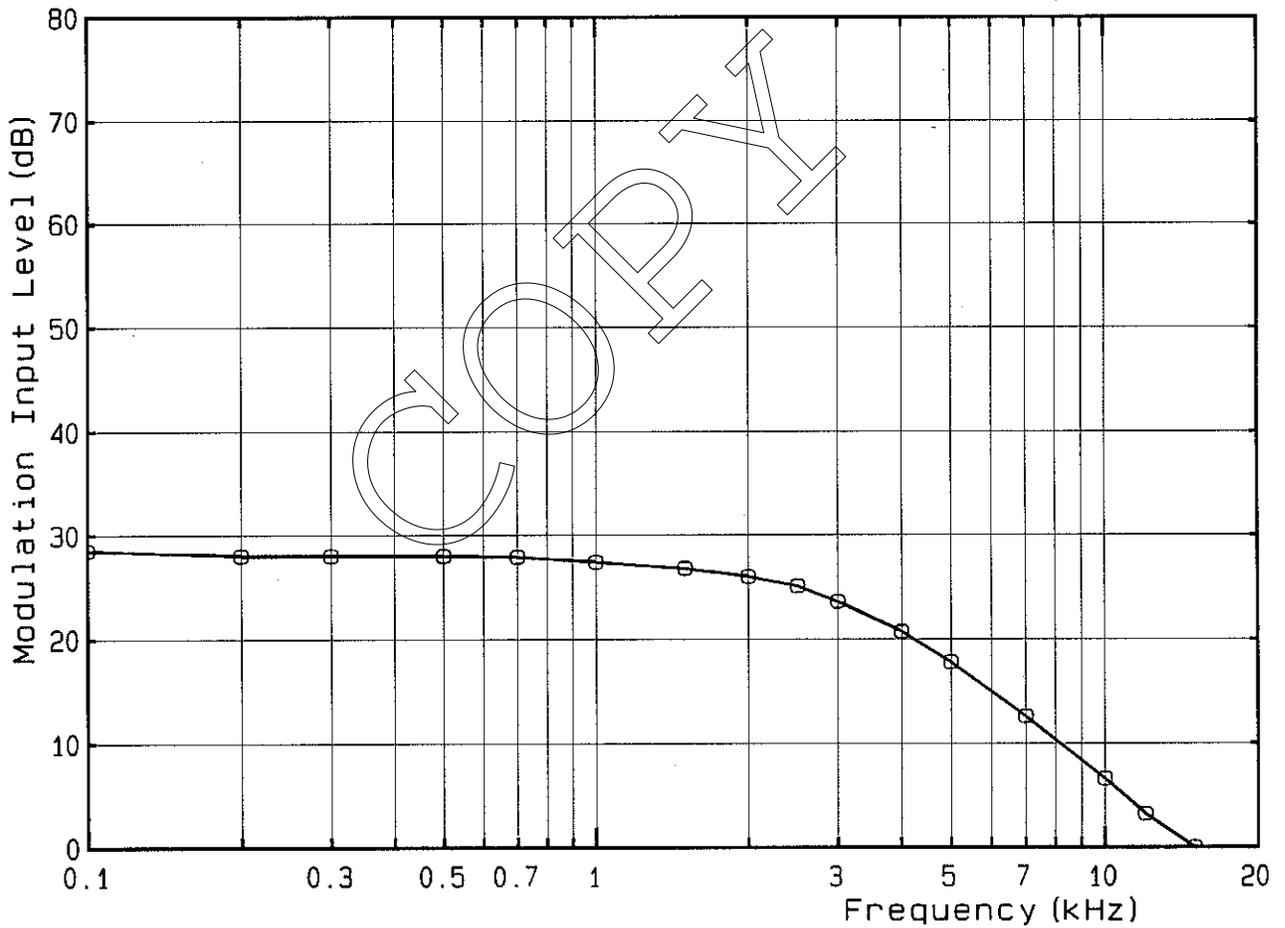
0 dB = -64.5 dBV



Modulation Frequency Response

FCC ID : AK8WRT822B
Model : WRT-822B
Test Frequency : 805.875 MHz

0 dB = -64.9 dBV

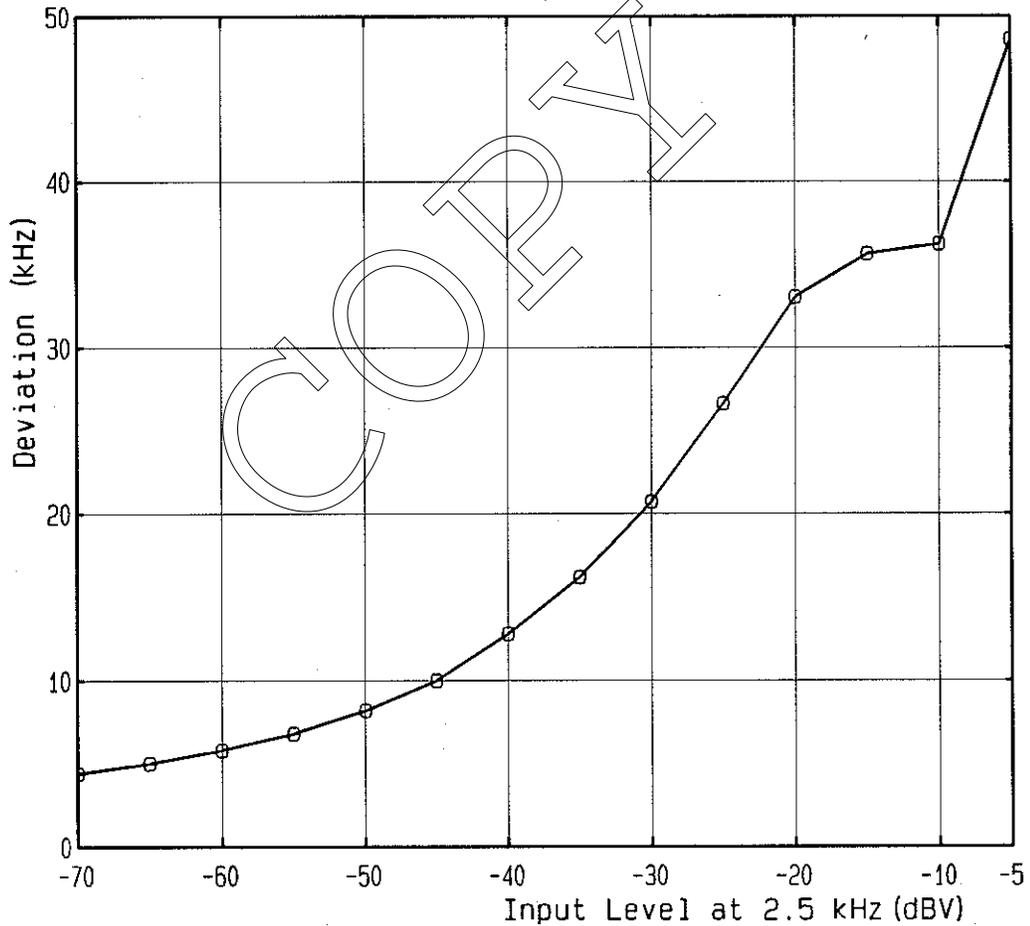


Modulation Characteristics

FCC ID : AK8WRT822B
Model : WRT-822B

Mode of EUT : Transmit
Input Terminal : Microphone (100 Hz)
Input Level (85% modulation) : -12.8 dBV

Carrier Frequency : 566.125 MHz

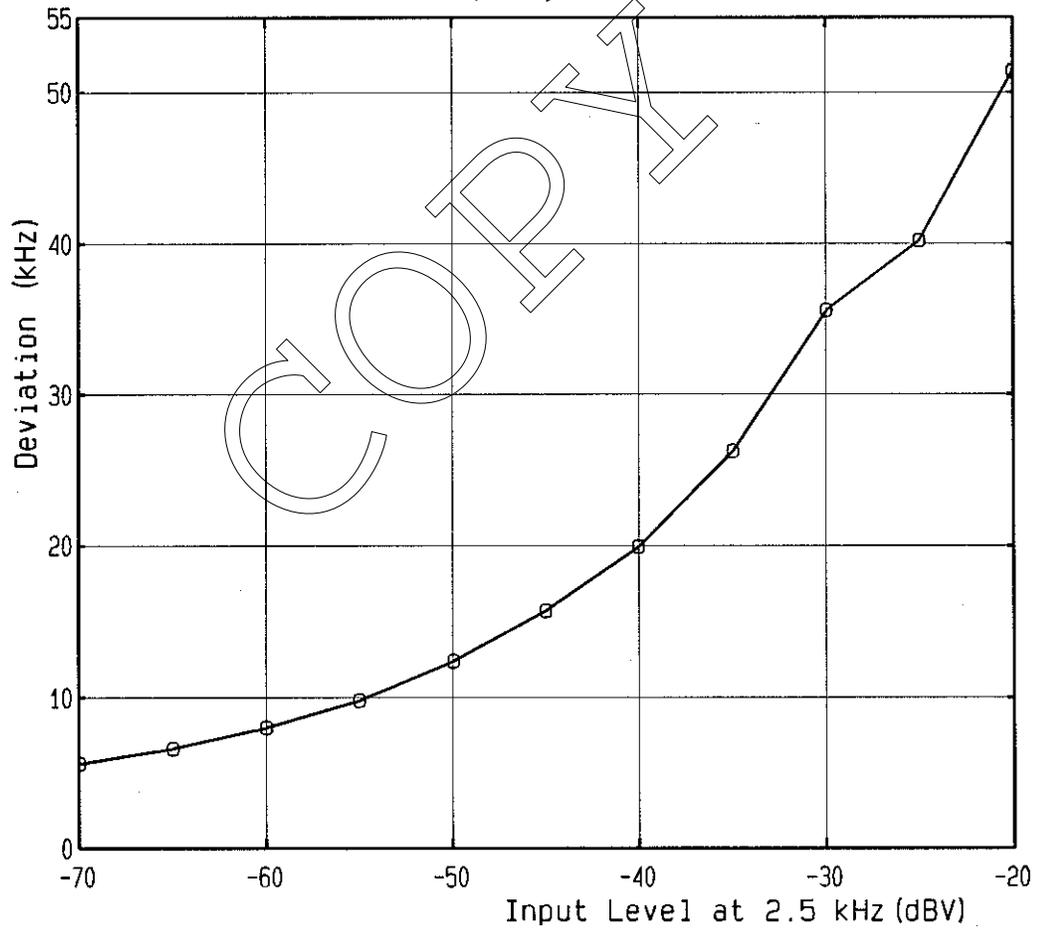


Modulation Characteristics

FCC ID : AK8WRT822B
Model : WRT-822B

Mode of EUT : Transmit
Input Terminal : Microphone (2.5 kHz)
Input Level (85% modulation) : -30.7 dBV

Carrier Frequency : 566.125 MHz



Modulation Characteristics

FCC ID : AK8WRT822B

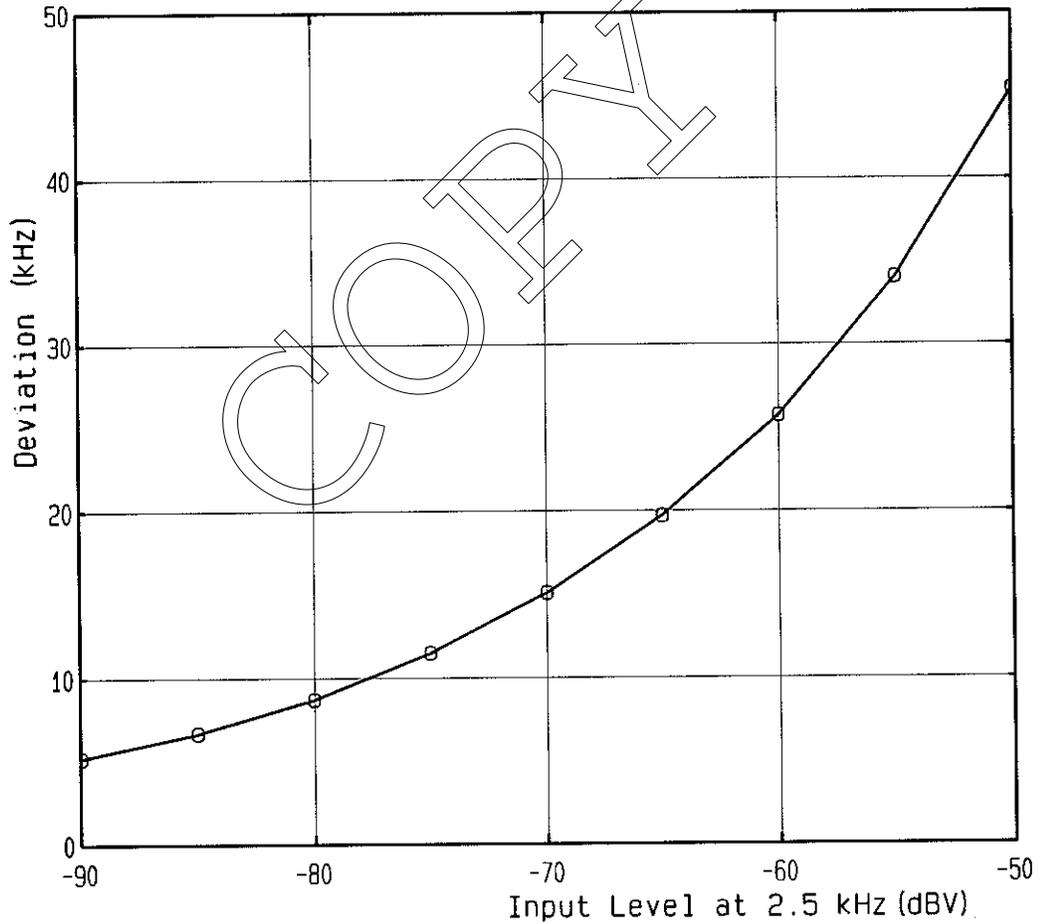
Model : WRT-822B

Mode of EUT : Transmit

Input Terminal : Microphone (15 kHz)

Input Level (85% modulation) : -55.0 dBV

Carrier Frequency : 566.125 MHz



Modulation Characteristics

FCC ID : AK8WRT822B

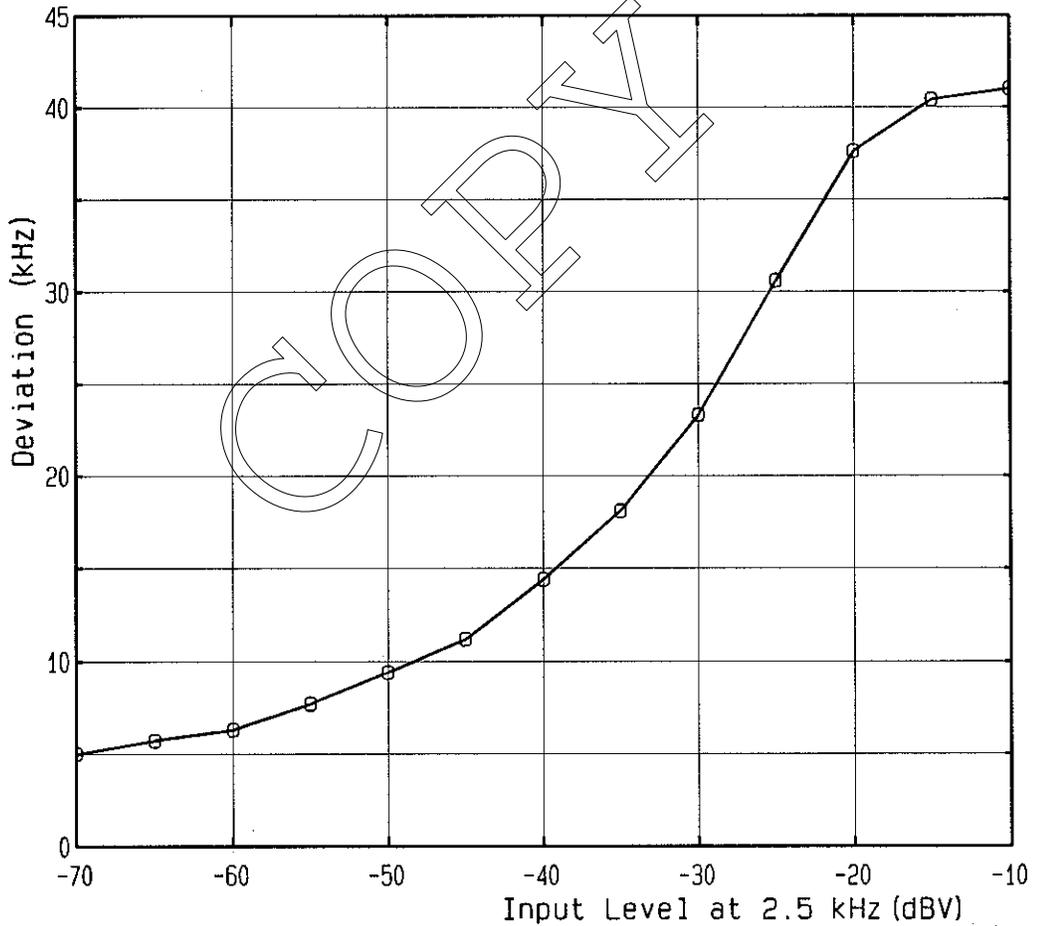
Model : WRT-822B

Mode of EUT : Transmit

Input Terminal : Microphone (100 Hz)

Input Level (85% modulation) : -23.0 dBV

Carrier Frequency : 686.125 MHz

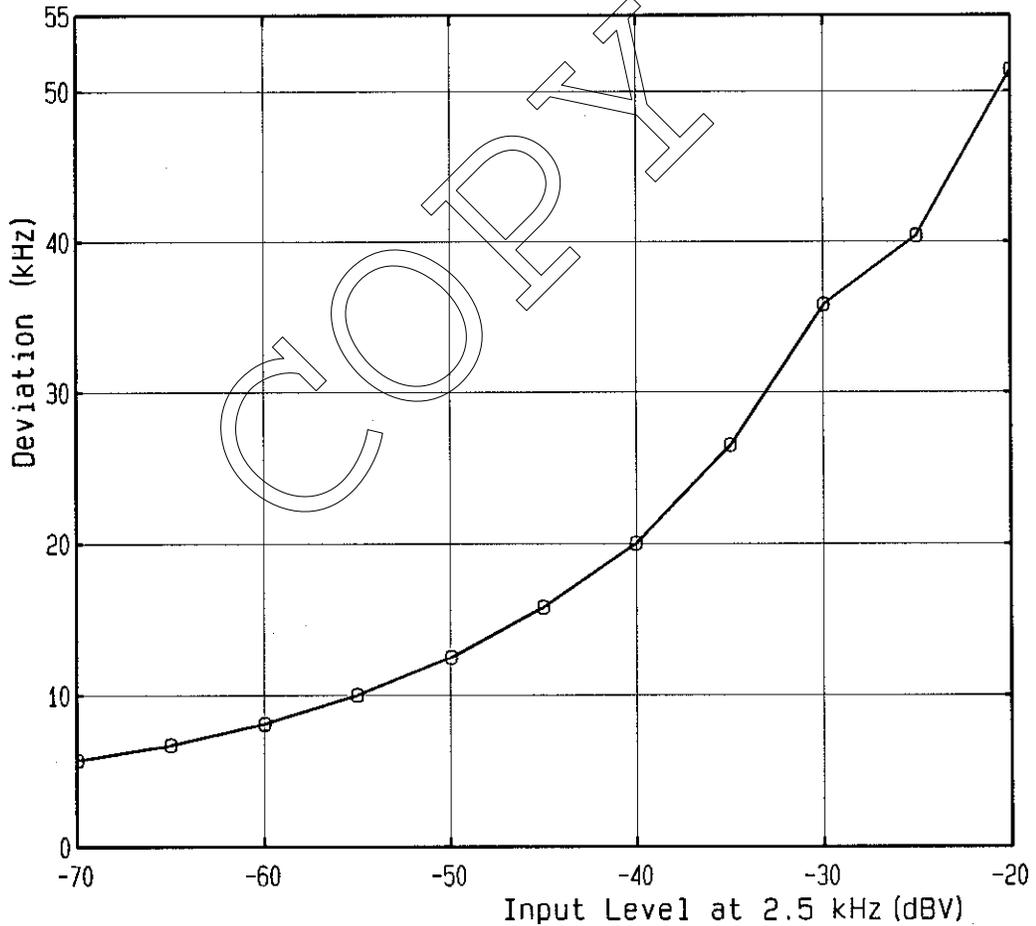


Modulation Characteristics

FCC ID : AK8WRT822B
Model : WRT-822B

Mode of EUT : Transmit
Input Terminal : Microphone (2.5 kHz)
Input Level (85% modulation) : -30.7 dBV

Carrier Frequency : 686.125 MHz



Modulation Characteristics

FCC ID : AK8WRT822B

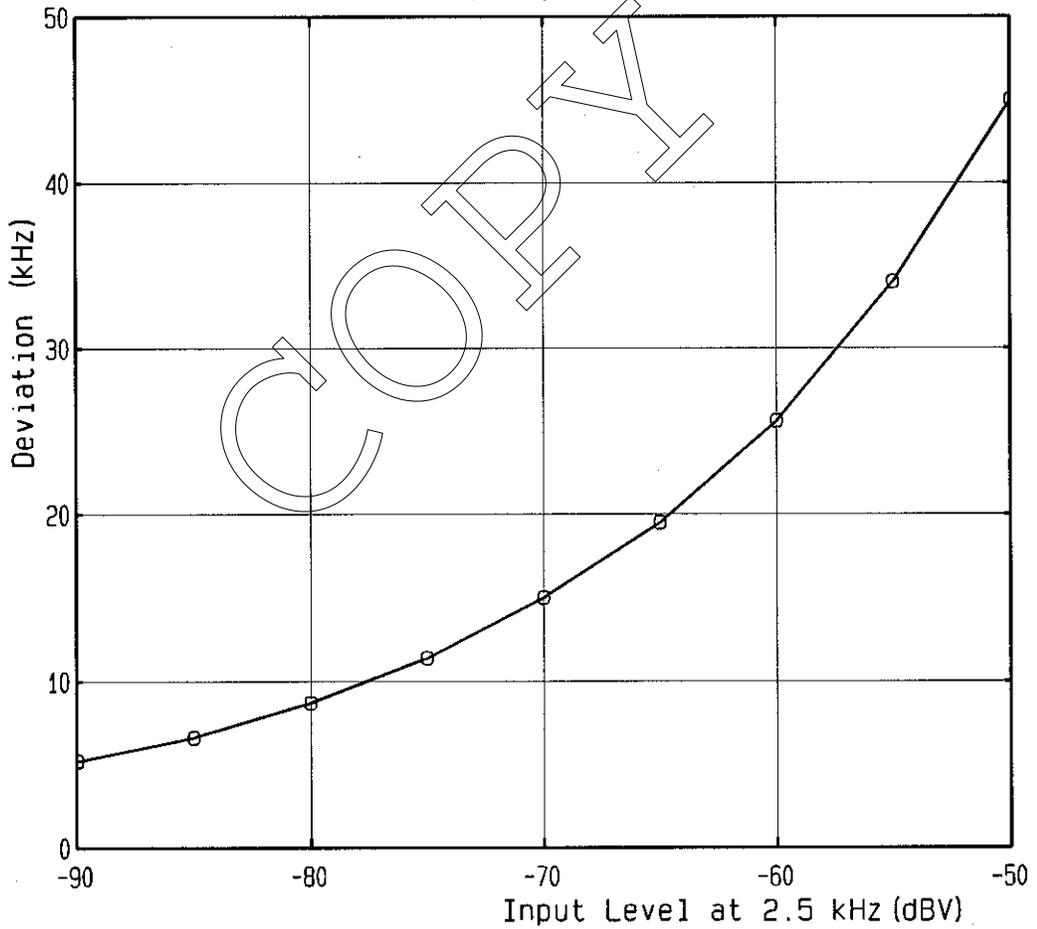
Model : WRT-822B

Mode of EUT : Transmit

Input Terminal : Microphone (15 kHz)

Input Level (85% modulation) : -55.0 dBV

Carrier Frequency : 686.125 MHz

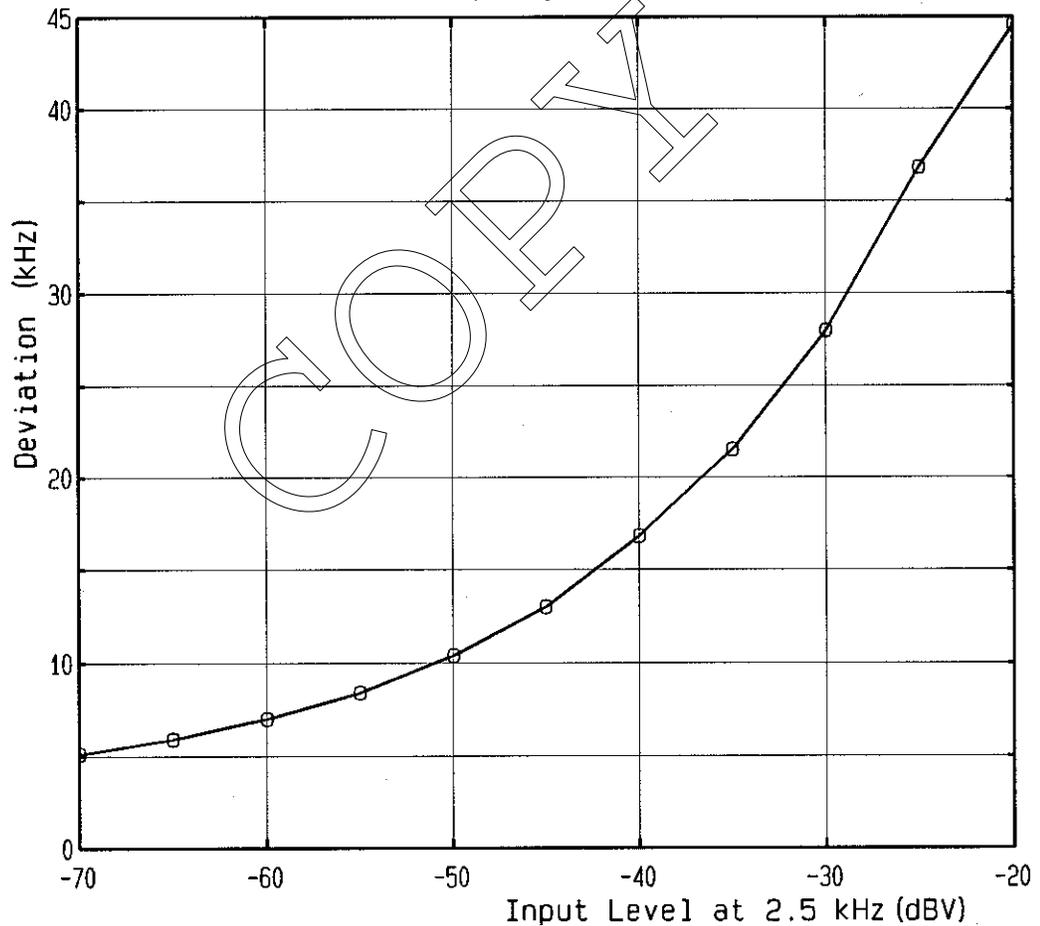


Modulation Characteristics

FCC ID : AK8WRT822B
Model : WRT-822B

Mode of EUT : Transmit
Input Terminal : Microphone (100 Hz)
Input Level (85% modulation) : -26.6 dBV

Carrier Frequency : 805.875 MHz

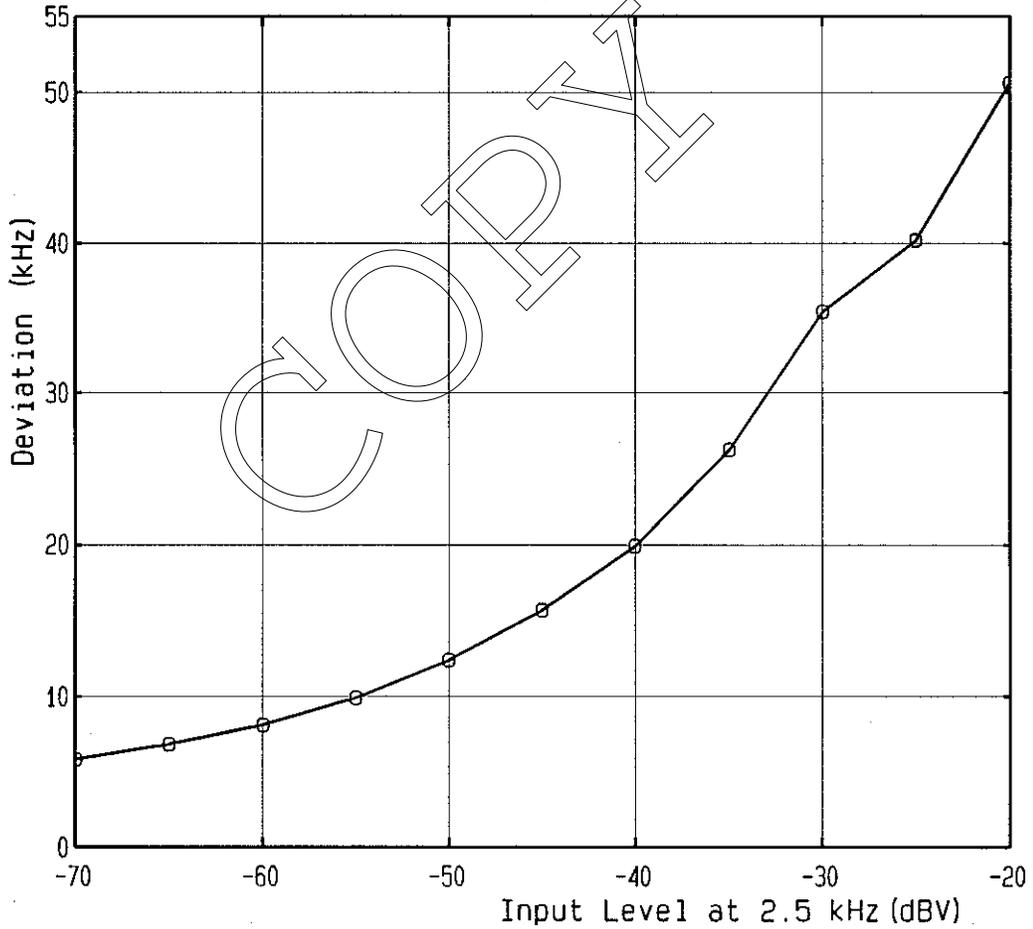


Modulation Characteristics

FCC ID : AK8WRT822B
Model : WRT-822B

Mode of EUT : Transmit
Input Terminal : Microphone (2.5 kHz)
Input Level (85% modulation) : -30.6 dBV

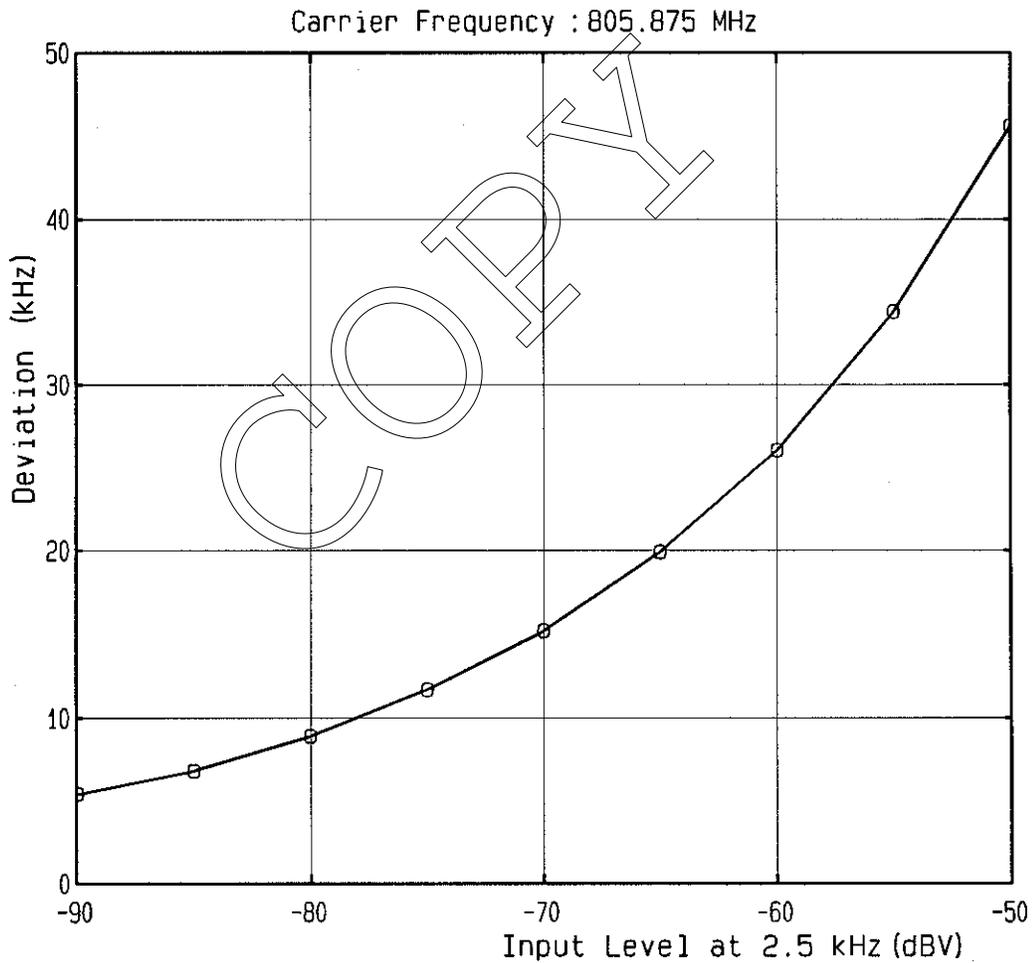
Carrier Frequency : 805.875 MHz



Modulation Characteristics

FCC ID : AK8WRT822B
Model : WRT-822B

Mode of EUT : Transmit
Input Terminal : Microphone (15 kHz)
Input Level (85% modulation) : -55.2 dBV





2.3 Radiated Emissions Measurement

Date : March 3, 2000

Temp.: 23 °C Humi.: 37 %

Operating Frequency : 566.125 MHz
 Reference Carrier Power(ERP): : 13.22 mW
 Distance of Measurement : 3.0 meters

Frequency (MHz)	Substituted Power		Limits (dB)	Attenuation Ratio	
	Horiz. (dBm)	Vert. (dBm)		Horiz. (dB)	Vert. (dB)
176.000	-65.4	-61.5	24.2	76.6	72.7
184.000	-62.6	-58.8	24.2	73.8	70.1
192.000	-65.2	-58.7	24.2	76.4	69.9
1132.250	-31.4	-32.7	24.2	42.6	43.9
1698.375	<-62.4	<-62.4	24.2	>73.6	>73.6
2264.500	-53.4	-53.1	24.2	64.6	64.3
2830.625	-46.8	-48.1	24.2	58.0	59.3
3396.750	-54.6	-55.4	24.2	65.8	66.6
3962.875	<-56.0	<-56.0	24.2	>67.2	>67.2
4529.000	-48.9	-51.9	24.2	60.1	63.1
5095.125	<-52.7	<-52.7	24.2	>64.0	>64.0
5661.250	<-51.3	<-51.3	24.2	>62.5	>62.5

Operating Frequency : 686.125 MHz
 Reference Carrier Power(ERP): : 12.71 mW
 Distance of Measurement : 3.0 meters

Frequency (MHz)	Substituted Power		Limits (dB)	Attenuation Ratio	
	Horiz. (dBm)	Vert. (dBm)		Horiz. (dB)	Vert. (dB)
176.000	-63.5	-58.6	24.0	74.5	69.7
184.000	-59.3	-56.5	24.0	70.3	67.6
192.000	-61.9	-55.8	24.0	73.0	66.8
1372.250	-50.4	-54.0	24.0	61.4	65.0
2058.375	-55.1	-59.1	24.0	66.2	70.2
2744.500	-53.1	-50.8	24.0	64.2	61.9
3430.625	<-57.9	<-57.9	24.0	>68.9	>68.9
4116.750	<-55.5	<-55.5	24.0	>66.5	>66.5
4802.875	<-53.5	<-53.5	24.0	>64.6	>64.6
5489.000	<-51.7	<-51.7	24.0	>62.8	>62.8
6175.125	<-50.1	<-50.1	24.0	>61.1	>61.1
6861.250	<-48.6	<-48.6	24.0	>59.7	>59.7

Operating Frequency : 805.875 MHz
 Reference Carrier Power(ERP): : 10.65 mW
 Distance of Measurement : 3.0 meters

Frequency (MHz)	Substituted Power		Limits (dB)	Attenuation Ratio	
	Horiz. (dBm)	Vert. (dBm)		Horiz. (dB)	Vert. (dB)
180.000	-60.8	-57.9	23.3	71.1	68.2
188.000	-60.7	-56.6	23.3	71.0	66.9
196.000	-64.5	-57.7	23.3	74.7	68.0
1611.750	-40.3	-42.0	23.3	50.6	52.3
2417.625	-47.0	-50.7	23.3	68.4	67.3
3223.500	-58.2	-57.1	23.3	68.4	67.3
4029.375	<-55.8	<-55.8	23.3	>66.0	>66.0
4835.250	<-53.4	<-53.4	23.3	>63.7	>63.7
5641.125	<-51.3	<-51.3	23.3	>61.6	>61.6
6447.000	<-49.5	<-49.5	23.3	>59.8	>59.8
7252.875	<-47.9	<-47.9	23.3	>58.1	>58.1
8058.750	<-46.5	<-46.5	23.3	>56.7	>56.7

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 = $43 + 10\log_{10}(\text{mean output power in watt})$

4. Measuring Instrument Setting:

Less than 1000 MHz

Detector function : Average

IF Bandwidth : 120 kHz

Above 1000 MHz

Resolution Bandwidth : 1 MHz

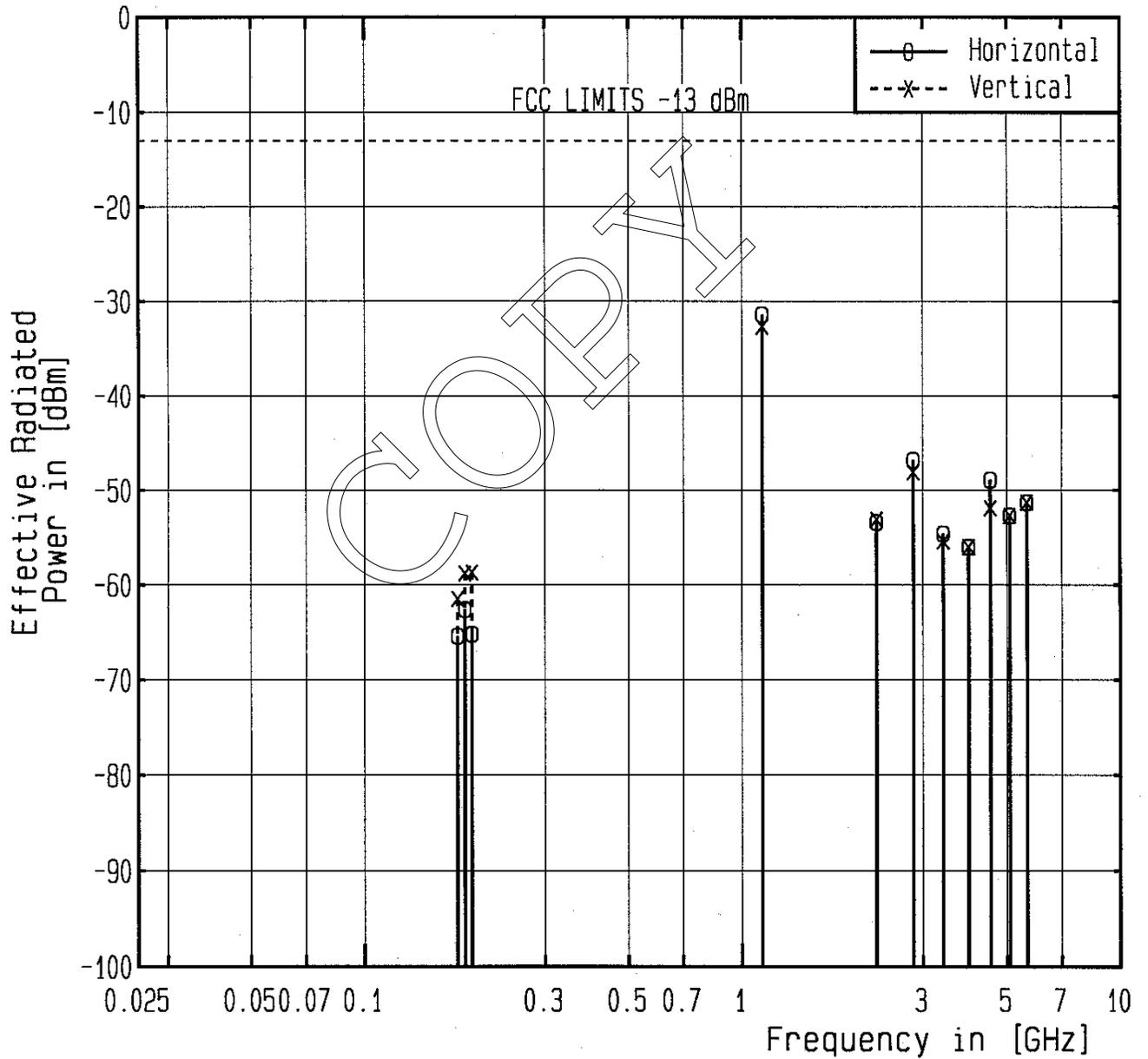
Tested by : Shigeru Osawa
 Shigeru Osawa
 Testing Engineer

Radiated Spurious Emissions

FCC ID : AK8WRT822B

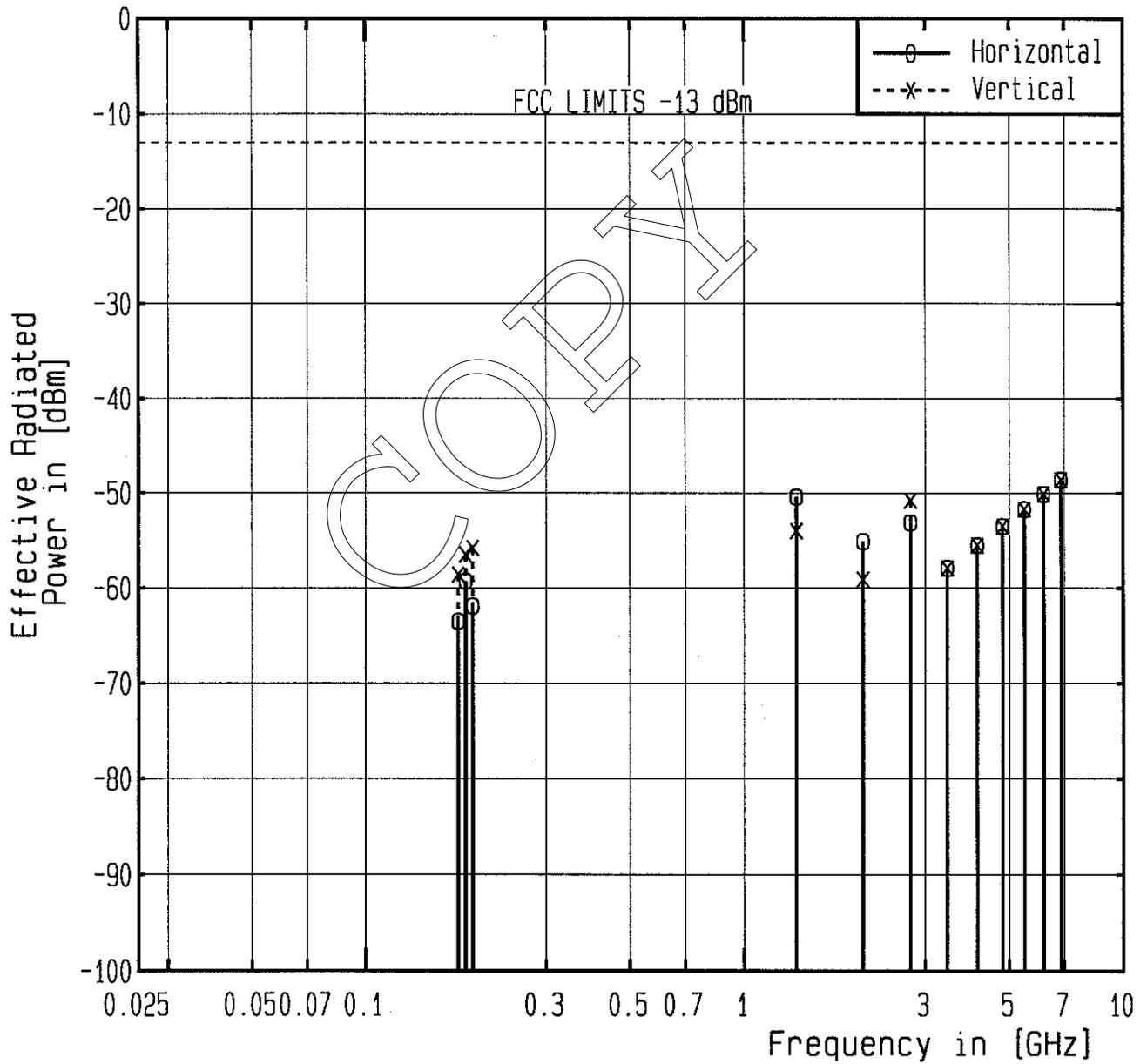
Serial No. : 1101

Carrier : 13.22 [mW] at 566.125 [MHz]



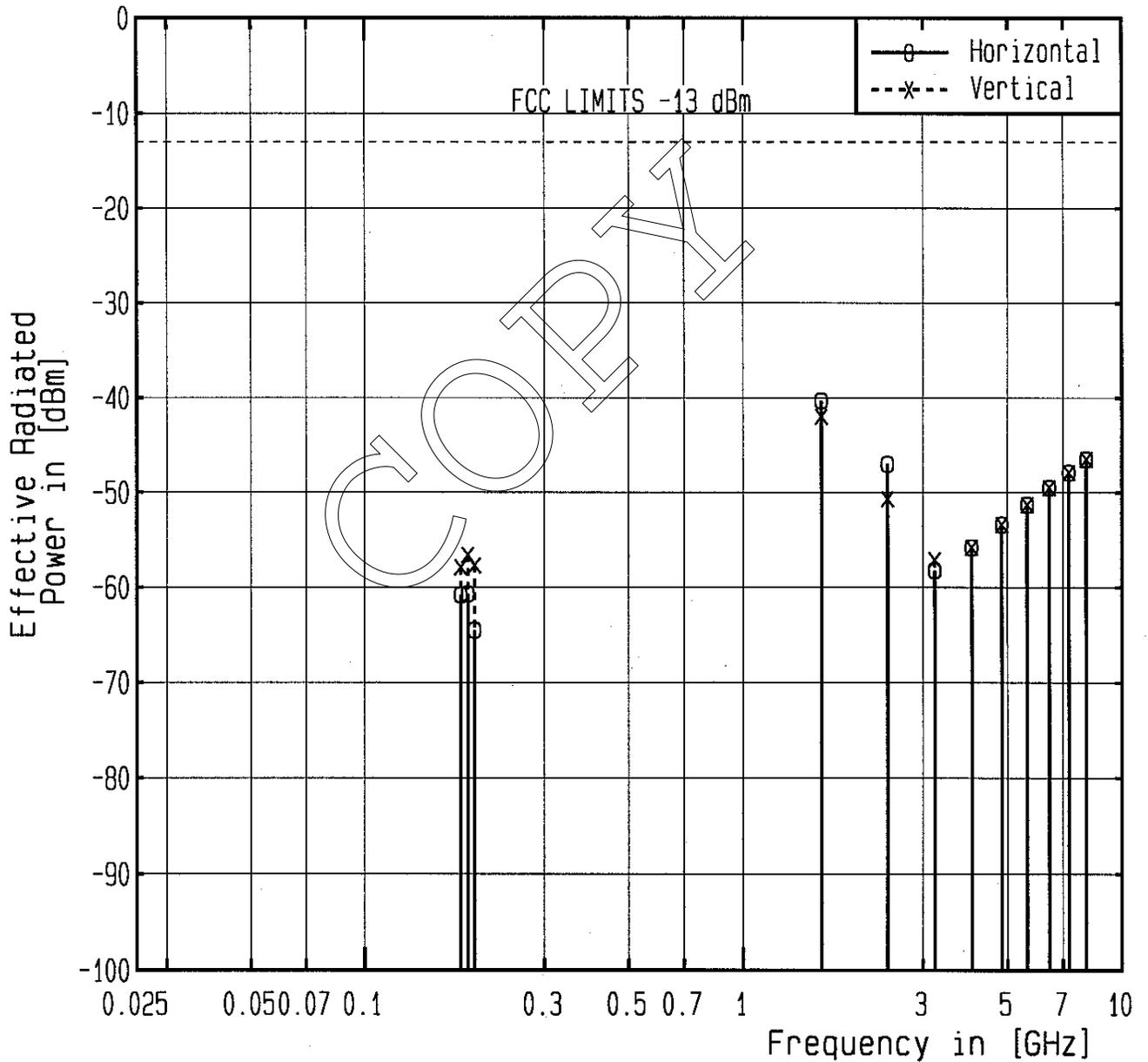
Radiated Spurious Emissions

FCC ID : AK8WRT822B
Serial No. : 1102
Carrier : 12.71 [mW] at 686.125 [MHz]



Radiated Spurious Emissions

FCC ID : AK8WRT822B
Serial No. : 1106
Carrier : 10.65 [mW] at 805.875 [MHz]





2.4 Occupied Bandwidth Measurement

Date : March 16, 2000

Temp. : 22°C Humi. : 36 %

Measurements Results :

Necessary Bandwidth: 110 kHz (Manufacturer specified)

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

Input Level: 85% modulation point

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

Refer to the attached graphs.

COPY

Tested by : Shigeru Osawa

Shigeru Osawa

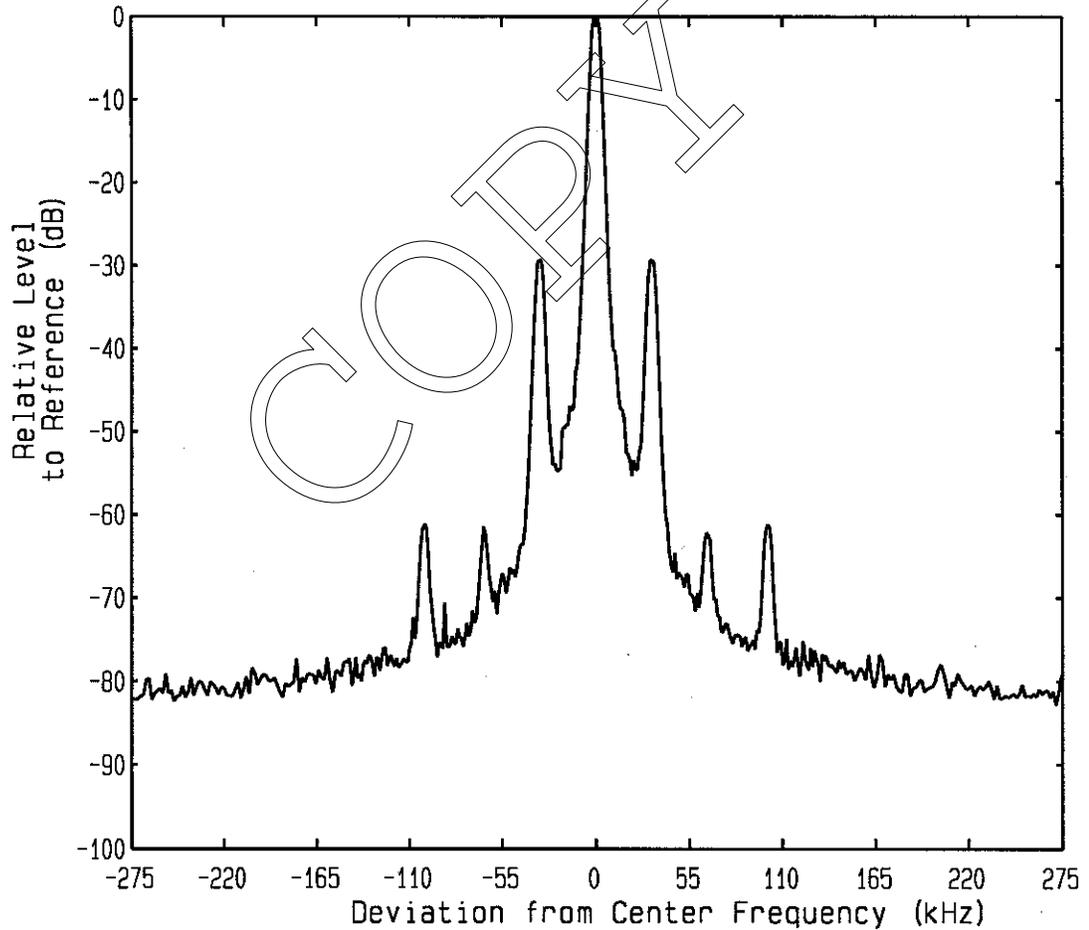
Testing Engineer

Emission Limitation

FCC ID : AK8WRT822B
Model : WRT-822B

Mode of EUT : Transmit
Reference Carrier Level

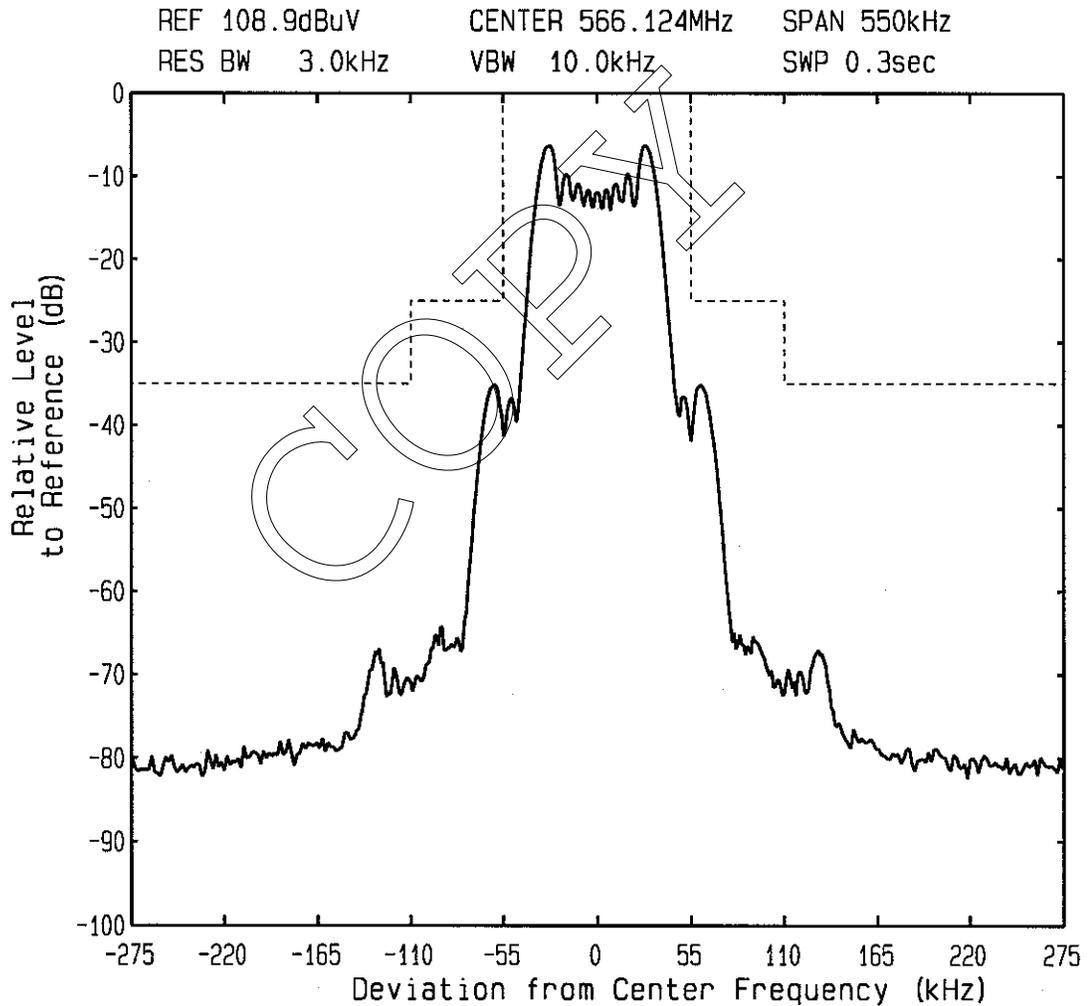
REF 108.9dBuV CENTER 566.124MHz SPAN 550kHz
RES BW 3.0kHz VBW 10.0kHz SWP 0.3sec



Emission Limitation

FCC ID : AK8WRT822B
Model : WRT-822B

Mode of EUT : Transmit
External Signal : 2.5 kHz, -30.7 dBV



Emission Limitation

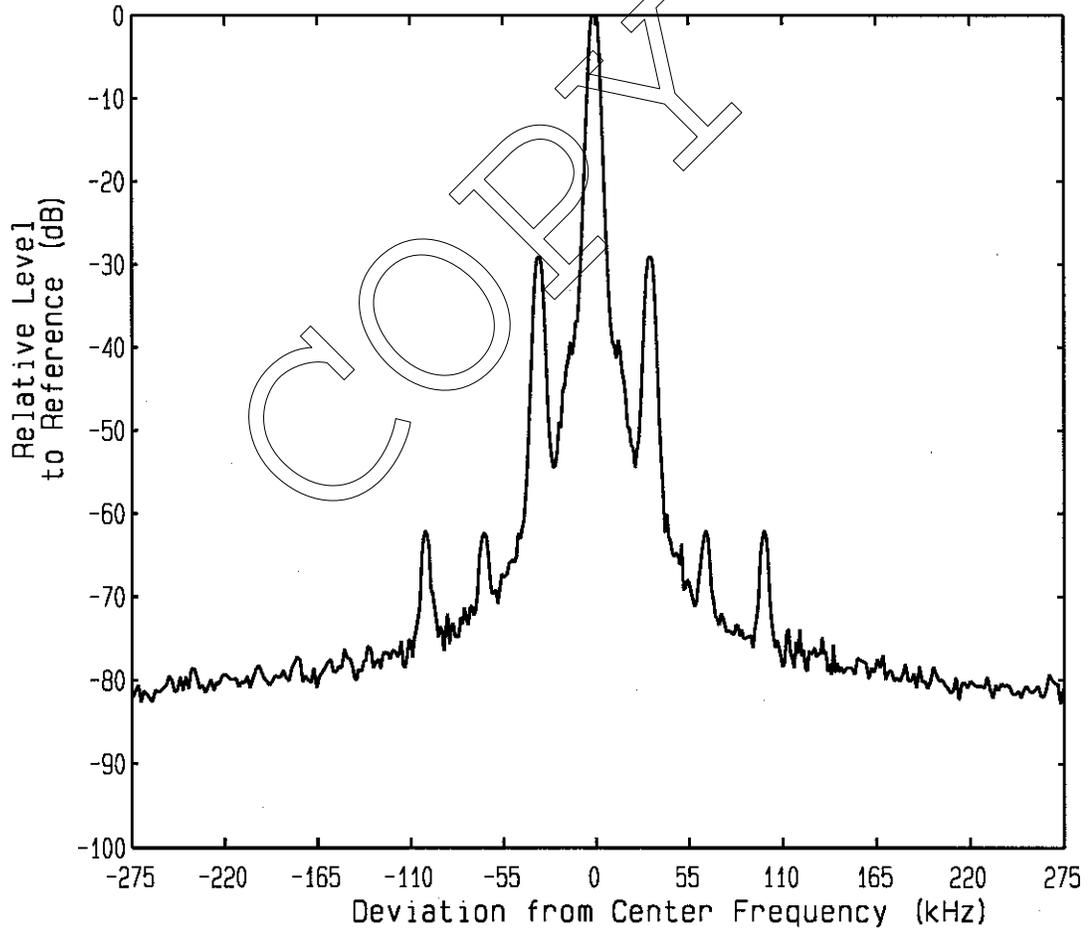
FCC ID : AK8WRT822B

Model : WRT-822B

Mode of EUT : Transmit

Reference Carrier Level

REF 109.2dBuV CENTER 686.126MHz SPAN 550kHz
RES BW 3.0kHz VBW 10.0kHz SWP 0.3sec



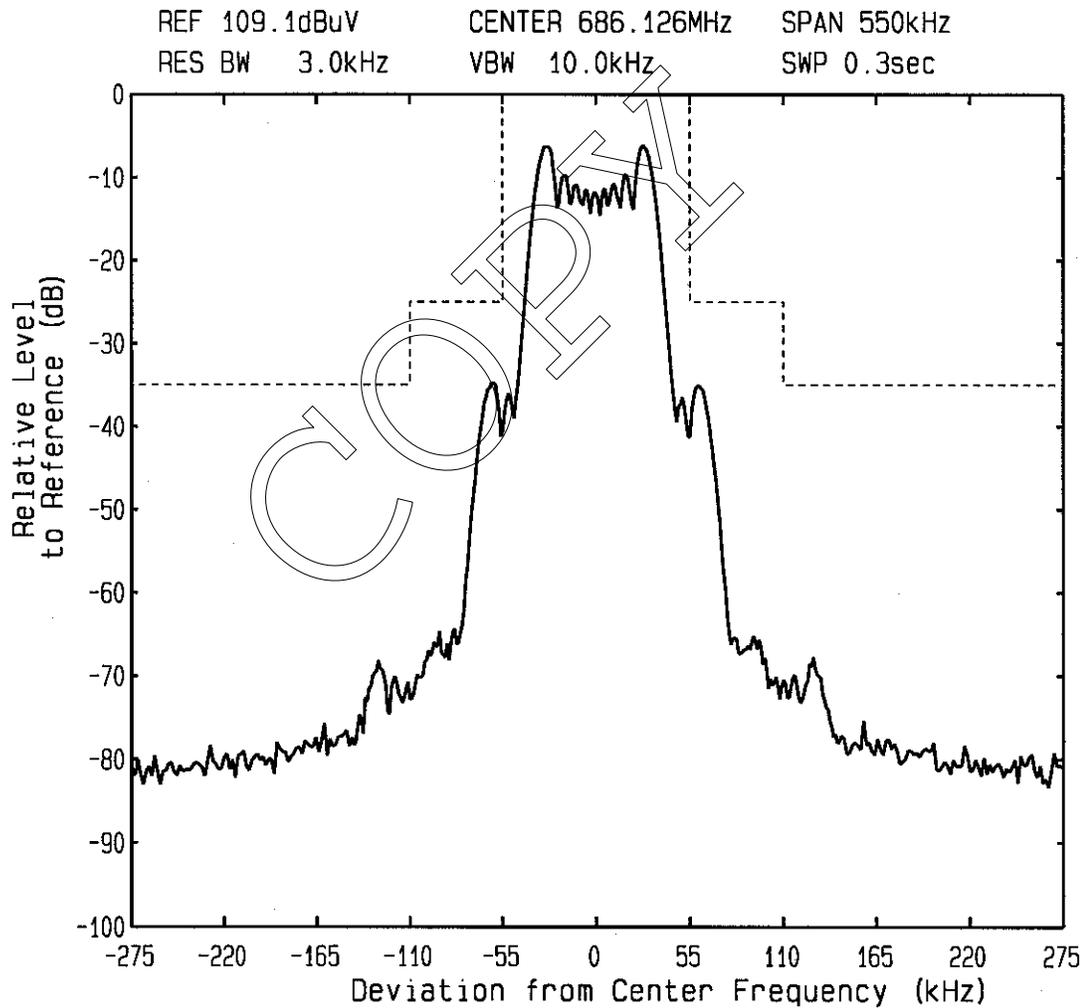
Emission Limitation

FCC ID : AK8WRT822B

Model : WRT-822B

Mode of EUT : Transmit

External Signal : 2.5 kHz, -30.7 dBV



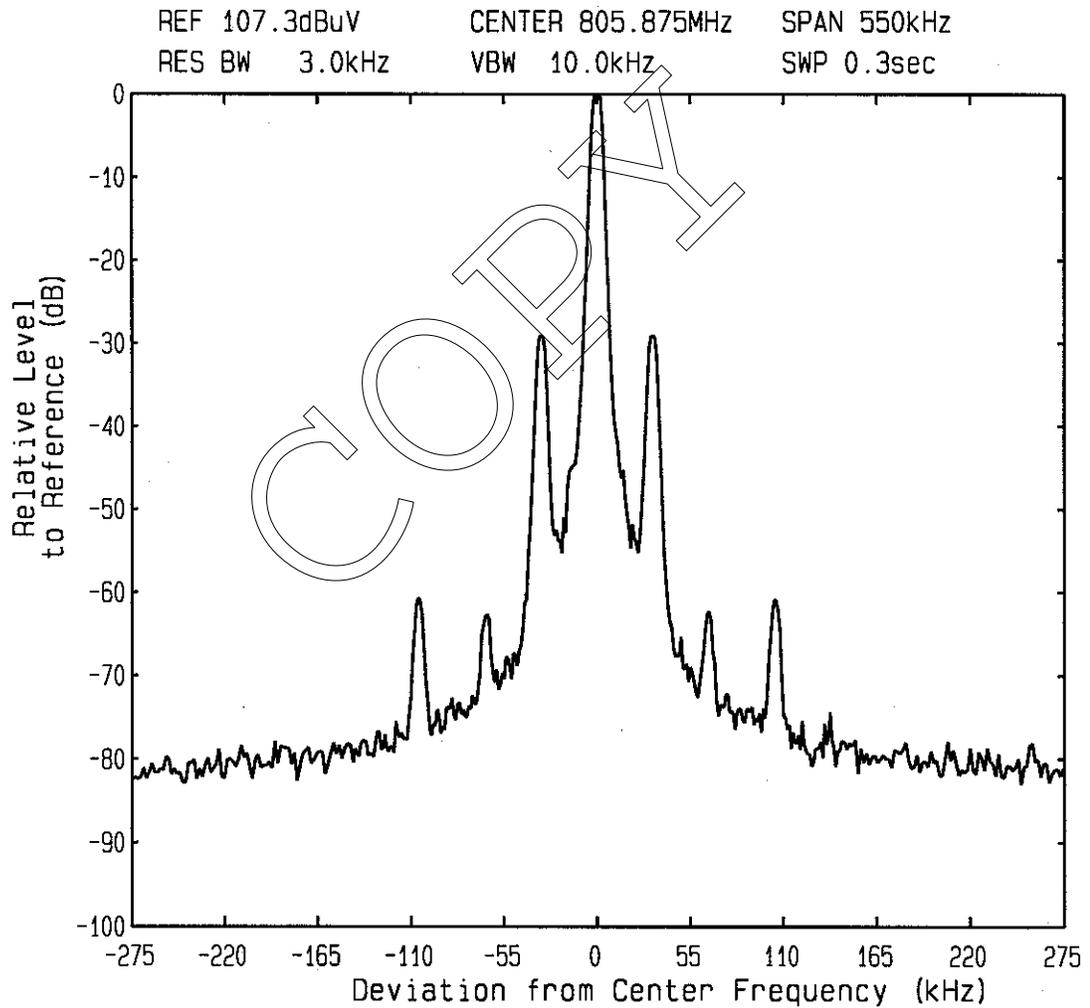
Emission Limitation

FCC ID : AK8WRT822B

Model : WRT-822B

Mode of EUT : Transmit

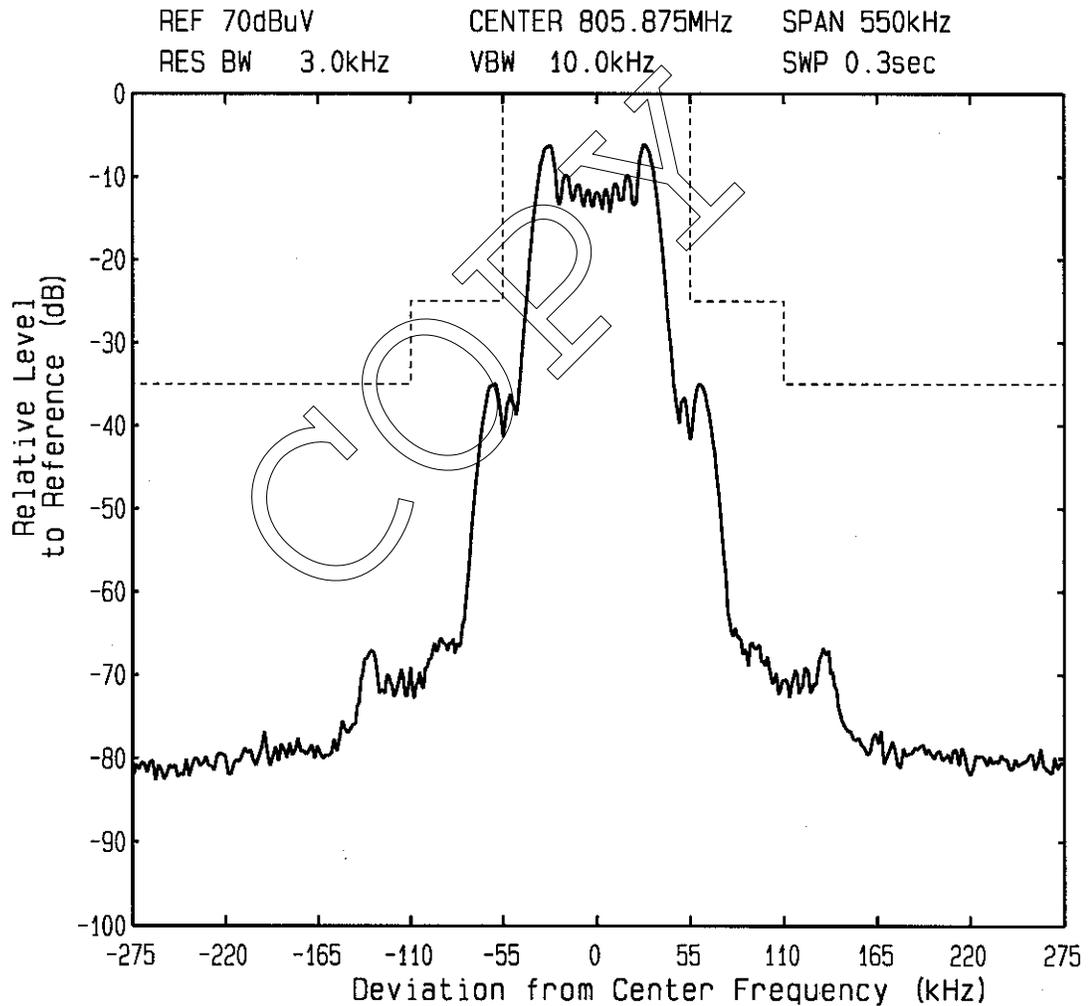
Reference Carrier Level



Emission Limitation

FCC ID : AK8WRT822B
Model : WRT-822B

Mode of EUT : Transmit
External Signal : 2.5 kHz, -30.6 dBV





2.5 Frequency Stability Measurement

Date : March 17, 2000

Ambient Temp. (°C)	Frequency (MHz)	Transmitting Frequency (MHz)	Maximum Tolerance(%)
-30	566.125	566.117443	-0.001335
	686.125	686.120046	-0.000722
	805.875	805.864327	-0.001324
-20	566.125	566.121814	-0.000563
	686.125	686.125377	+0.000055
	805.875	805.870379	-0.000573
-10	566.125	566.124560	-0.000078
	686.125	686.127598	+0.000379
	805.875	805.874163	-0.000104
0	566.125	566.126038	+0.000183
	686.125	686.128203	+0.000467
	805.875	805.876472	+0.000183
+10	566.125	566.126188	+0.000210
	686.125	686.127894	+0.000422
	805.875	805.876725	+0.000214
+20	566.125	566.125945	+0.000167
	686.125	686.126871	+0.000273
	805.875	805.876413	+0.000175
+30	566.125	566.125382	+0.000067
	686.125	686.125395	+0.000058
	805.875	805.875498	+0.000062
+40	566.125	566.124565	-0.000077
	686.125	686.123416	-0.000231
	805.875	805.874158	-0.000104
+50	566.125	566.124231	-0.000136
	686.125	686.122110	-0.000421
	805.875	805.873453	-0.000192

Supply Voltage : 3.0VDC
 Specified limit : ±0.005% (§74.861(e)(4))

Ambient Temp. (°C)	Frequency (MHz)	Transmitting Frequency (MHz)	Maximum Tolerance(%)
-30	566.125	566.117440	-0.001335
	686.125	686.120044	-0.000722
	805.875	805.864325	-0.001325
-20	566.125	566.121812	-0.000563
	686.125	686.125375	+0.000055
	805.875	805.870377	-0.000574
-10	566.125	566.124558	-0.000078
	686.125	686.127597	+0.000379
	805.875	805.874160	-0.000104
0	566.125	566.126037	+0.000183
	686.125	686.128202	+0.000467
	805.875	805.876469	+0.000182
+10	566.125	566.126187	+0.000210
	686.125	686.127891	+0.000421
	805.875	805.876724	+0.000214
+20	566.125	566.125942	+0.000166
	686.125	686.126869	+0.000272
	805.875	805.876410	+0.000175
+30	566.125	566.125379	+0.000067
	686.125	686.125391	+0.000057
	805.875	805.875495	+0.000061
+40	566.125	566.124563	-0.000077
	686.125	686.123414	-0.000231
	805.875	805.874156	-0.000105
+50	566.125	566.124230	-0.000136
	686.125	686.122108	-0.000421
	805.875	805.873451	-0.000192

Supply Voltage : 1.9VDC (Battery operating end point, Manufacturer defined)
Specified limit : ±0.005% (§74.861(e)(4))

Tested by : Shigeru Osawa
Shigeru Osawa
Testing Engineer