



EMI TEST REPORT

JQA APPLICATION NO. : 400-00298

Model No. : WRT-847B

Type of Equipment : UHF Synthesized Transmitter Unit

Regulations Applied : CFR 47 FCC Rules and Regulations Part 74

FCC ID : AK8WRT847B

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 : July 21, 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.

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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.

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, 2001)

1.2.2 Description of the Equipment Under Test (EUT) :

- | | |
|--------------------------------------|--------------------------------------|
| 1) Type of Equipment | : UHF Synthesized Transmitter Unit |
| 2) Product Type | : Prototype |
| 3) Category | : Broadcast Transmitter held to face |
| 4) EUT Authorization | : Certification |
| 5) FCC ID | : AK8WRT847B |
| 6) Trade Name | : SONY |
| 7) Model No. | : WRT-847B |
| 8) Operating Frequency Range | : 470.125 MHz - 805.875 MHz |
| 9) Highest Frequency Used in the EUT | : 805.875 MHz |
| 10) Bandwidth | : 110 kHz |
| 11) RF Output Power | : 50/10 mW selectable |
| 12) Serial No. | : 1132/1131/1133 |
| 13) Date of Manufacture | : July, 2000 |
| 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)

- 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

- Anechoic Chamber No. 2 (3 meters)
 - Anechoic Chamber No. 3 (3 meters)

Validation of Site Attenuation :

- 1) Last Confirmed Date :March, 2000
- 2) Interval :1 year

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<input type="checkbox"/> - Test Receiver	ESH-2	Rohde & Schwarz	880370/016	Sep. 1999	1 Year
<input type="checkbox"/> - Test Receiver	ESV	Rohde & Schwarz	872148/039	May 2000	1 Year
<input type="checkbox"/> - Test Receiver	ESV310	Rohde & Schwarz	826148/002	June 2000	1 Year
<input checked="" type="checkbox"/> - Test Receiver	ESVP	Rohde & Schwarz	881487/004	May 2000	1 Year
<input type="checkbox"/> - Test Receiver	ESVP	Rohde & Schwarz	881487/005	May 2000	1 Year
<input checked="" type="checkbox"/> - Antenna	KBA-511A	Kyoritsu Electrical	0-170-1	Nov. 1999	1 Year
<input checked="" type="checkbox"/> - Antenna	KBA-511A	Kyoritsu Electrical	0-201-13	Nov. 1999	1 Year
<input checked="" type="checkbox"/> - Antenna	KBA-611	Kyoritsu Electrical	0-147-14	Nov. 1999	1 Year
<input checked="" type="checkbox"/> - Antenna	KBA-611	Kyoritsu Electrical	0-210-5	Nov. 1999	1 Year
<input type="checkbox"/> - Biconical Antenna	BBA9106	Schwarzbeck	VHA91031150	May 2000	1 Year
<input type="checkbox"/> - Biconical Antenna	BBA9106	Schwarzbeck	11905078E0	May 2000	1 Year
<input type="checkbox"/> - Log-Periodic Antenna	UHALP9107	Schwarzbeck	11905079E0	May 2000	1 Year
<input type="checkbox"/> - Log-Periodic Antenna	UHALP9107	Schwarzbeck	11905110	May 2000	1 Year
<input checked="" type="checkbox"/> - RF Cable	5D-2W	Fujikura	155-21-001E0	Feb. 2000	1 Year
<input type="checkbox"/> - RF Cable	5D-2W	Fujikura	155-21-002E0	Feb. 2000	1 Year
<input checked="" type="checkbox"/> - Power Meter	436A	Hewlett Packard	1725A01930	May 2000	1 Year
<input checked="" type="checkbox"/> - Power Sensor	8482A	Hewlett Packard	1650A00140	May 2000	1 Year
<input checked="" type="checkbox"/> - Signal Generator	6061A	Gigatronics	5130593	Mar. 2000	1 Year

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

- 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

- 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
<input type="checkbox"/> - Spectrum Analyzer	8563E	Hewlett Packard	3221A00201	May 2000	1 Year
<input type="checkbox"/> - Spectrum Analyzer	8560E	Hewlett Packard	3240A00189	Sep. 1999	1 Year
<input checked="" type="checkbox"/> - Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	Apr. 2000	1 Year
<input checked="" type="checkbox"/> - RF Pre-selector	85685A	Hewlett Packard	2648A00522	Apr. 2000	1 Year
<input type="checkbox"/> - Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	June 2000	1 Year
<input type="checkbox"/> - RF Pre-selector	85685A	Hewlett Packard	2091A00933	June 2000	1 Year
<input checked="" type="checkbox"/> - Log-Periodic Antenna	HL 025	Rohde & Schwarz	340182/015	Nov. 1999	1 Year
<input type="checkbox"/> - RF Amplifier	DBP-0102N5334272B	DBS Microwave Inc.	012	Jun. 1999	1 Year
<input checked="" type="checkbox"/> - RF Amplifier	WJ-6882-814	Watkins-Johnson	0414	June 2000	1 Year
<input type="checkbox"/> - RF Amplifier	WJ-5315-556	Watkins-Johnson	106	June 2000	1 Year
<input type="checkbox"/> - RF Amplifier	WJ-5320-307	Watkins-Johnson	645	June 2000	1 Year
<input checked="" type="checkbox"/> - RF Cable(10m)	S 04272B	Suhner	155-21-011E0	May 2000	1 Year
<input type="checkbox"/> - RF Cable(2m)	SUCOFLEX 104	Suhner	155-21-012E0	May 2000	1 Year
<input type="checkbox"/> - RF Cable(1m)	SUCOFLEX 104	Suhner	155-21-013E0	May 2000	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. 2000	1 Year
<u> </u> - Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	June 2000	1 Year
<u> x </u> - Function Generator	3325A	Hewlett Packard	2512A21776	May 2000	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 2000	1 Year
<u> x </u> - Attenuator	355D	Hewlett Packard	219-10782	May 2000	1 Year
<u> </u> - Attenuator	49-10-43	Weinschel	KA319	May 2000	1 Year
<u> </u> - Attenuator	49-20-43	Weinschel	KK162	May 2000	1 Year
<u> </u> - Attenuator	49-30-43	Weinschel	KJ988	May 2000	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	May 2000	1 Year
<u> x </u> - Oven	-	Ohnishi Co. Ltd.	-	Aug. 2000	1 Year
<u> x </u> - DC Power Supply	6628A	Hewlett Packard	3224A00284	June 2000	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:

1.6 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 : July 26, 2000

End of testing : August 8, 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 Unit	Sony Corporation	WRT-847B	AK8WRT847B	1132/1131/ 1133

The measurements was carried out with the following supported connected :

Symbol	Item	Manufacturer	Model No.	Serial No.
B	Capsule Unit(Microphone)	Sony Corporation	CU-F780	-

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, 638.125 MHz and 805.875 MHz)

1.7.3 Generating and Operating frequency of EUT

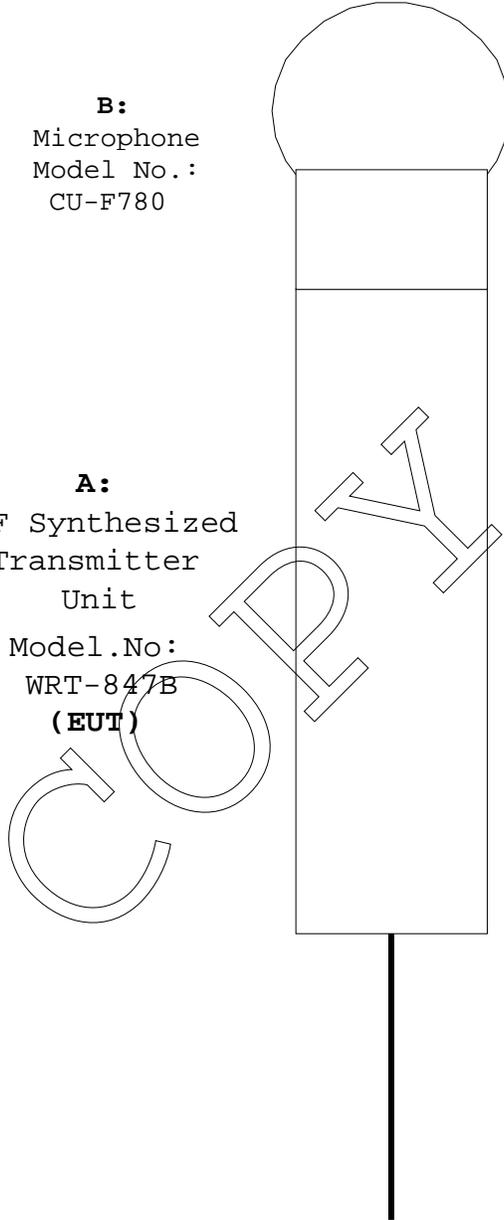
470.125 MHz, 638.125 MHz and 805.875 MHz

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1.8 EUT ARRANGEMENT (DRAWINGS)

B:
Microphone
Model No. :
CU-F780

A:
UHF Synthesized
Transmitter
Unit
Model.No:
WRT-847B
(EUT)



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.

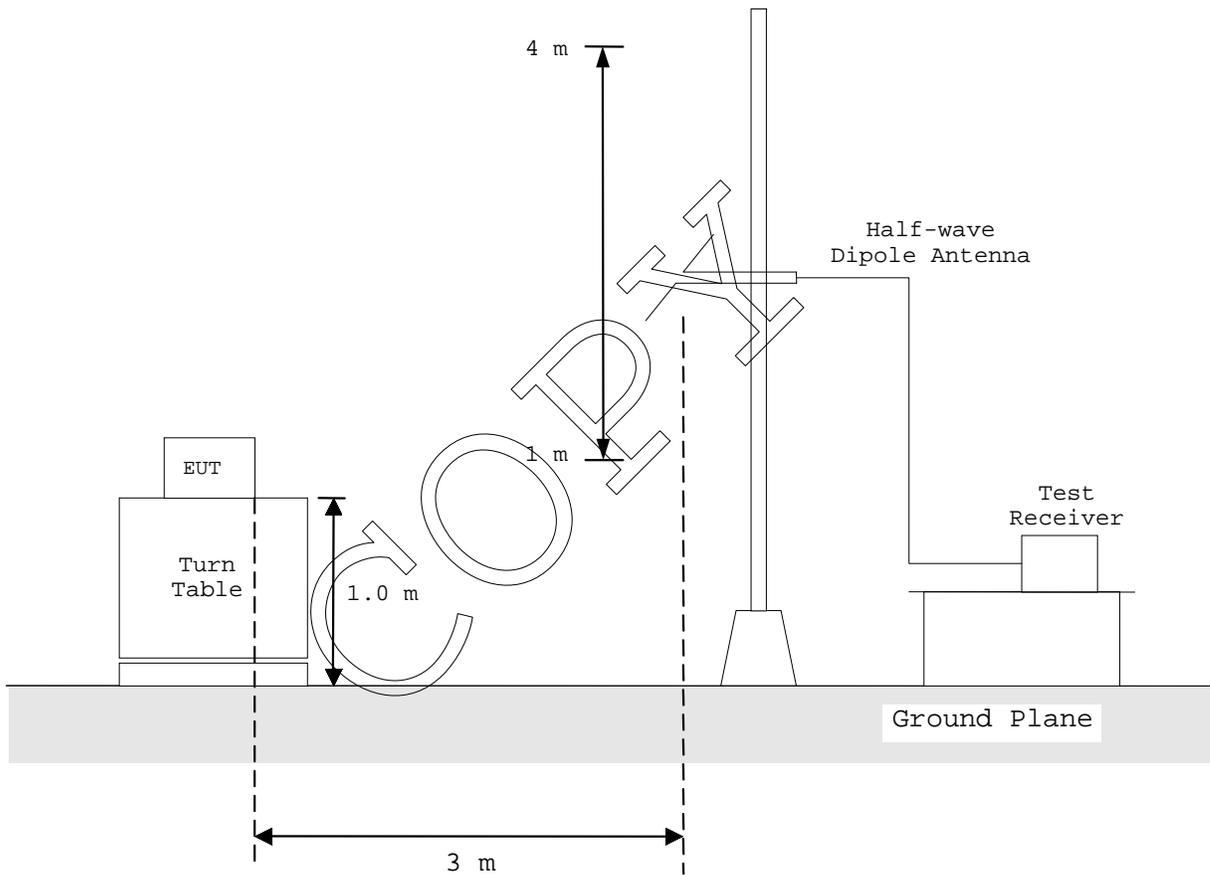
The transmitter was removed and replaced with a half-wave dipole antenna. The center of the half-wave dipole antenna was placed approximately at the same location as the center of the transmitter. (In the case of the lower frequencies, where the half-wave dipole antenna is very long, this will be impossible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



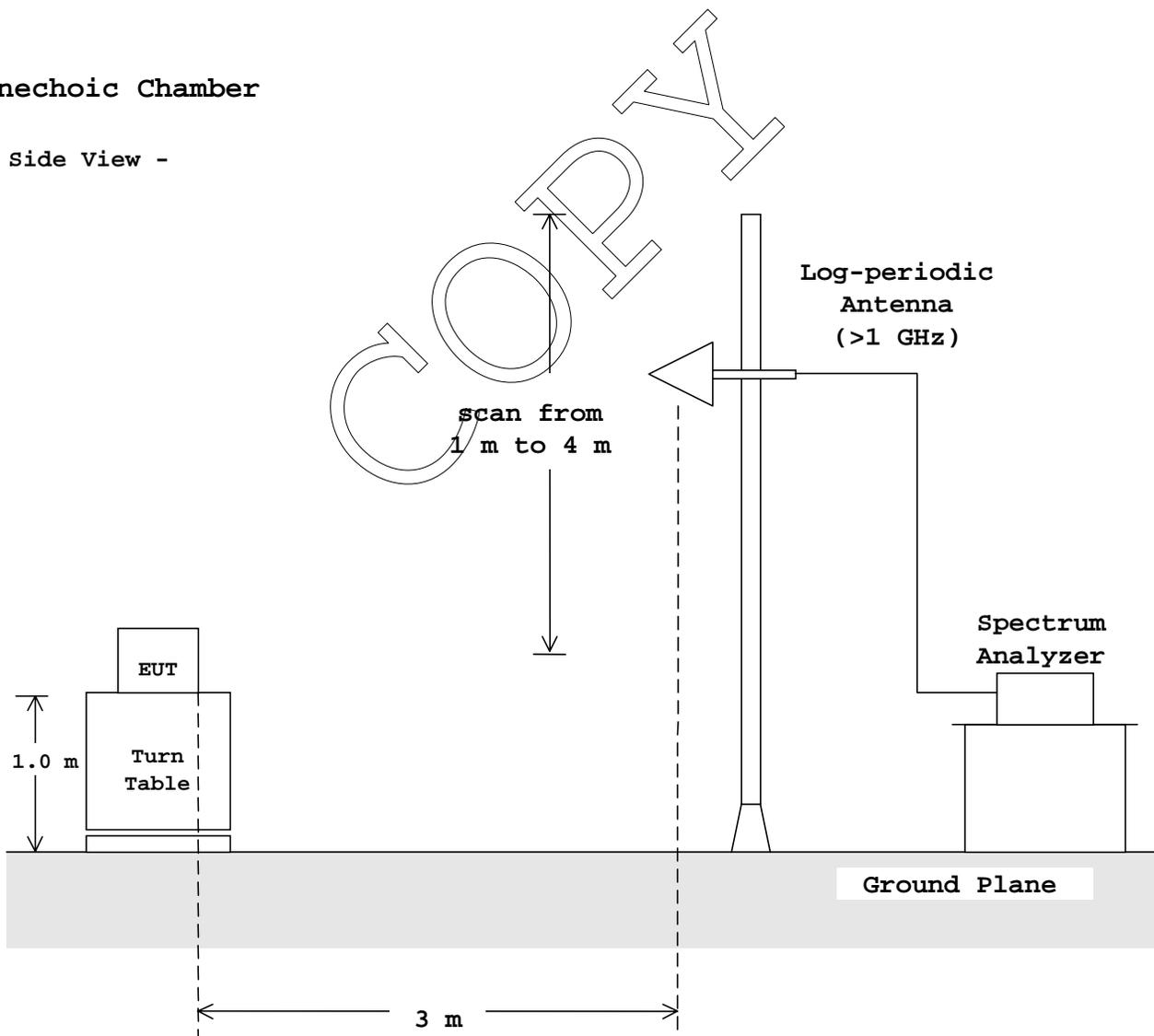
1.9.2 Radiated Emission (Above 1 GHz) :

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

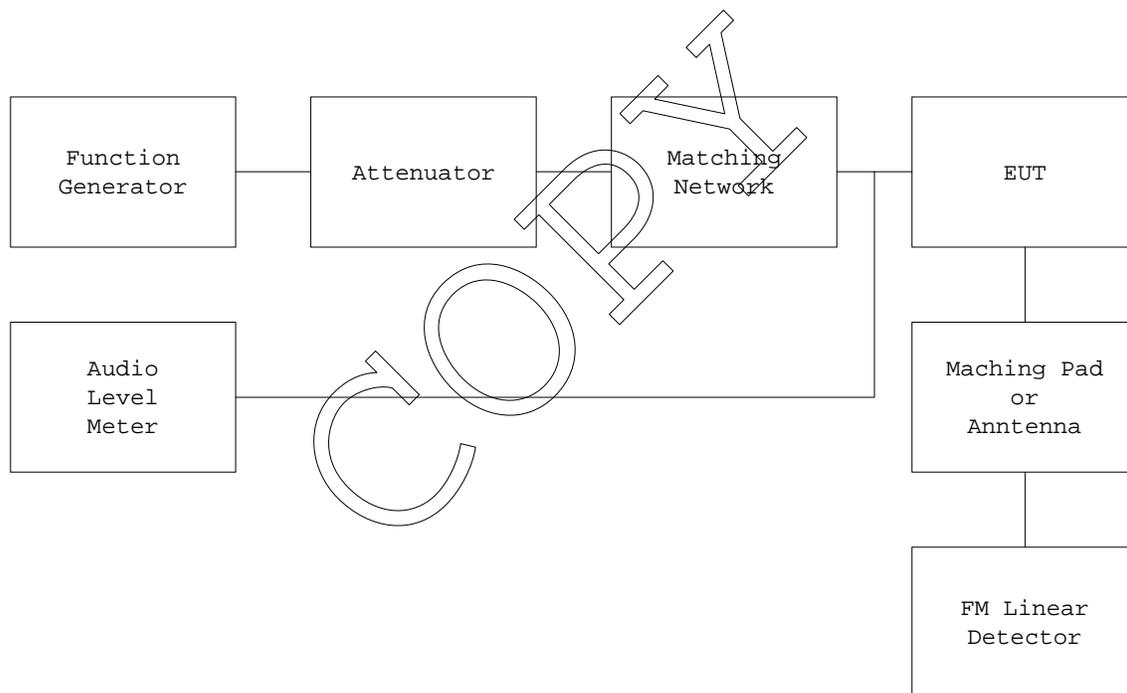
- Side View -



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.

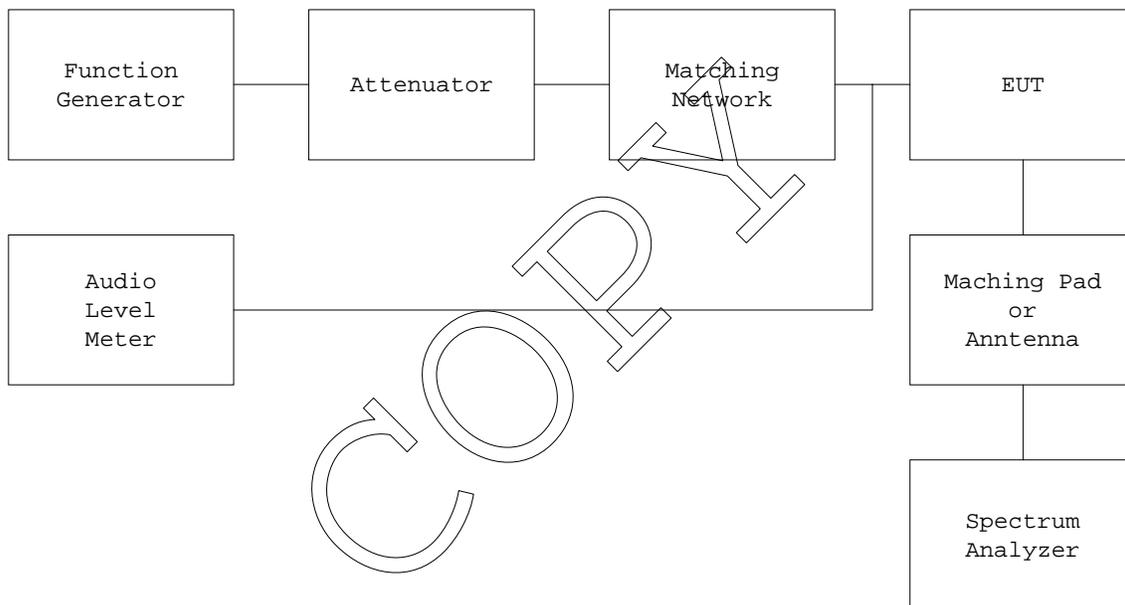
The modulation response was measured up to maximum modulation for each of three tones: 100 Hz, 2500 Hz and 15 kHz. The audio input level was changed from 10% modulation up to maximum rated modulation.



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.

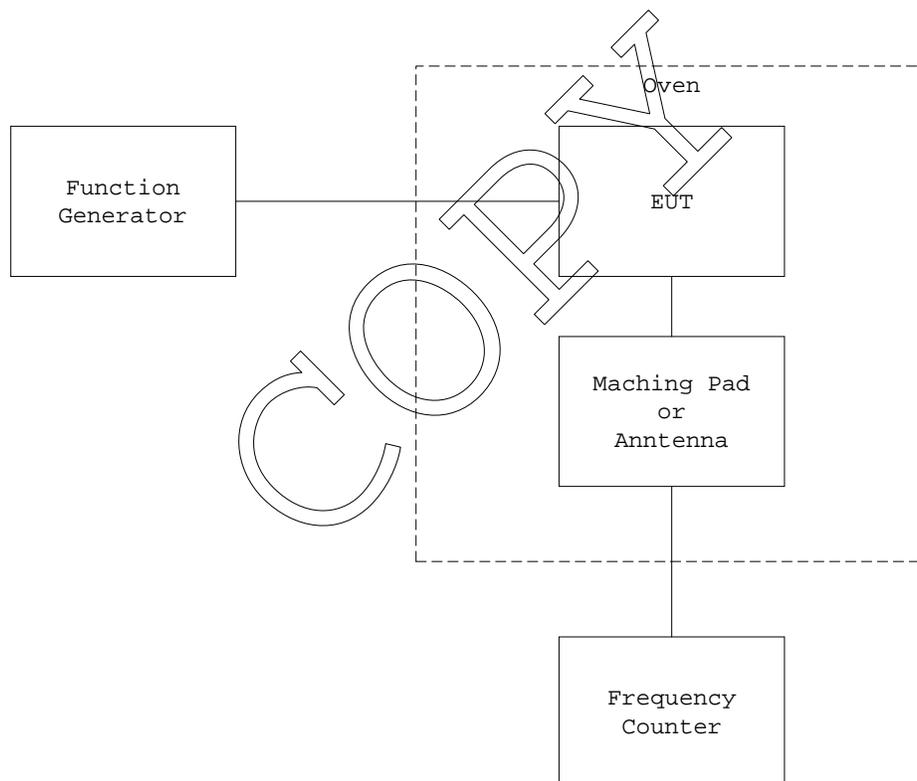
The transmitter was modulated at the input level producing 85% modulation at the maximum response frequency, and with the frequency 2500 Hz.



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)

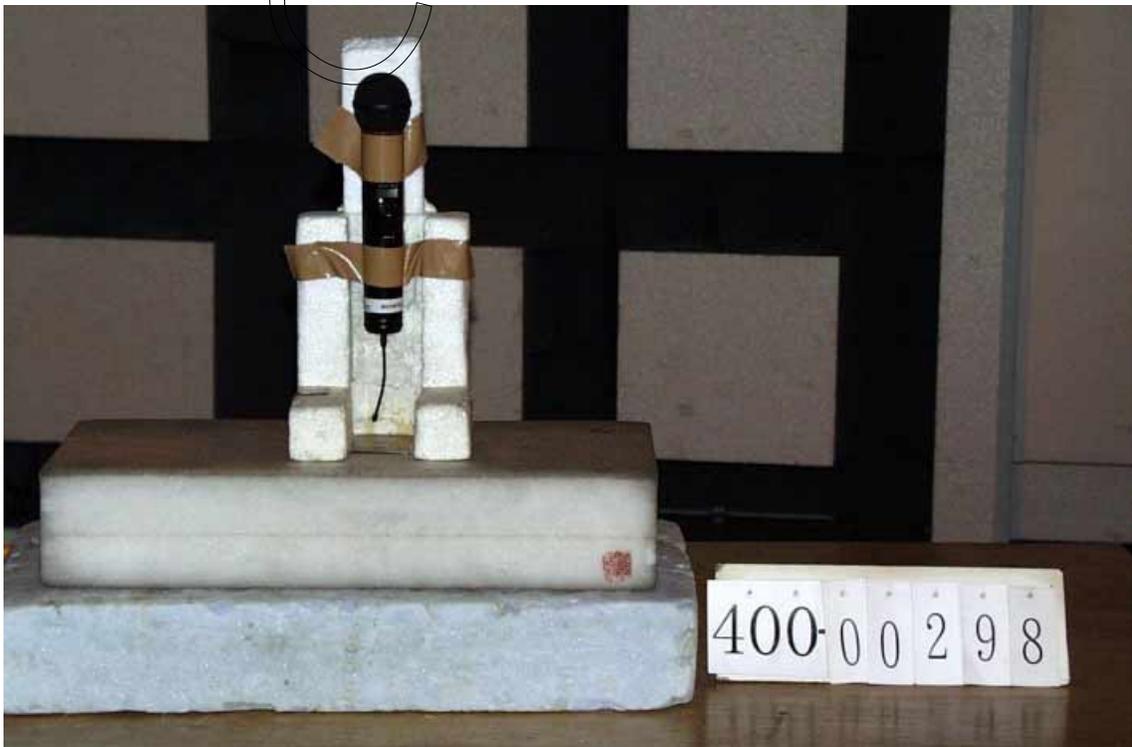


1.10 TEST ARRANGEMENT (PHOTOGRAPHS)

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 : July 26, 2000
 Temp.: 24 °C Humi.: 80 %

Frequency Range: 470.125 MHz - 805.875 MHz

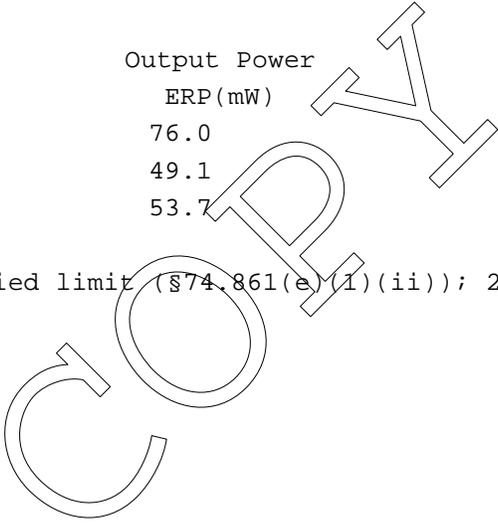
10 mW Setting

Frequency (MHz)	Output Power ERP(mW)
470.125	19.0
638.125	10.3
805.875	12.9

50 mW Setting

Frequency (MHz)	Output Power ERP(mW)
470.125	76.0
638.125	49.1
805.875	53.7

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



Tested by : Shigeru Osawa
 Shigeru Osawa
 Testing Engineer

2.2 Modulation Characteristics

Date : August 5, 2000
Temp. : 25°C Humi. : 60 %

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.

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Tested by :

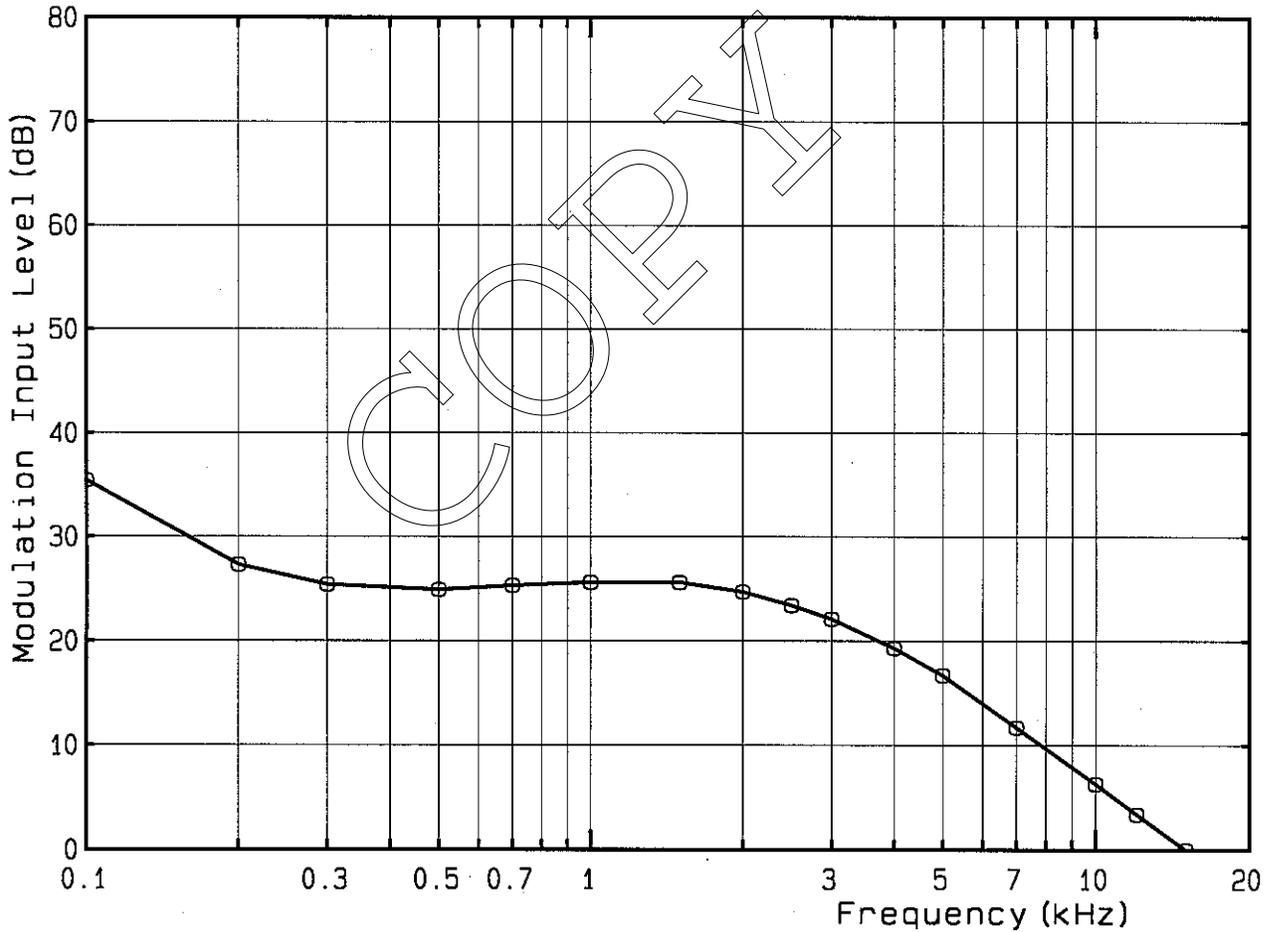
Shigeru Osawa

Shigeru Osawa

Testing Engineer

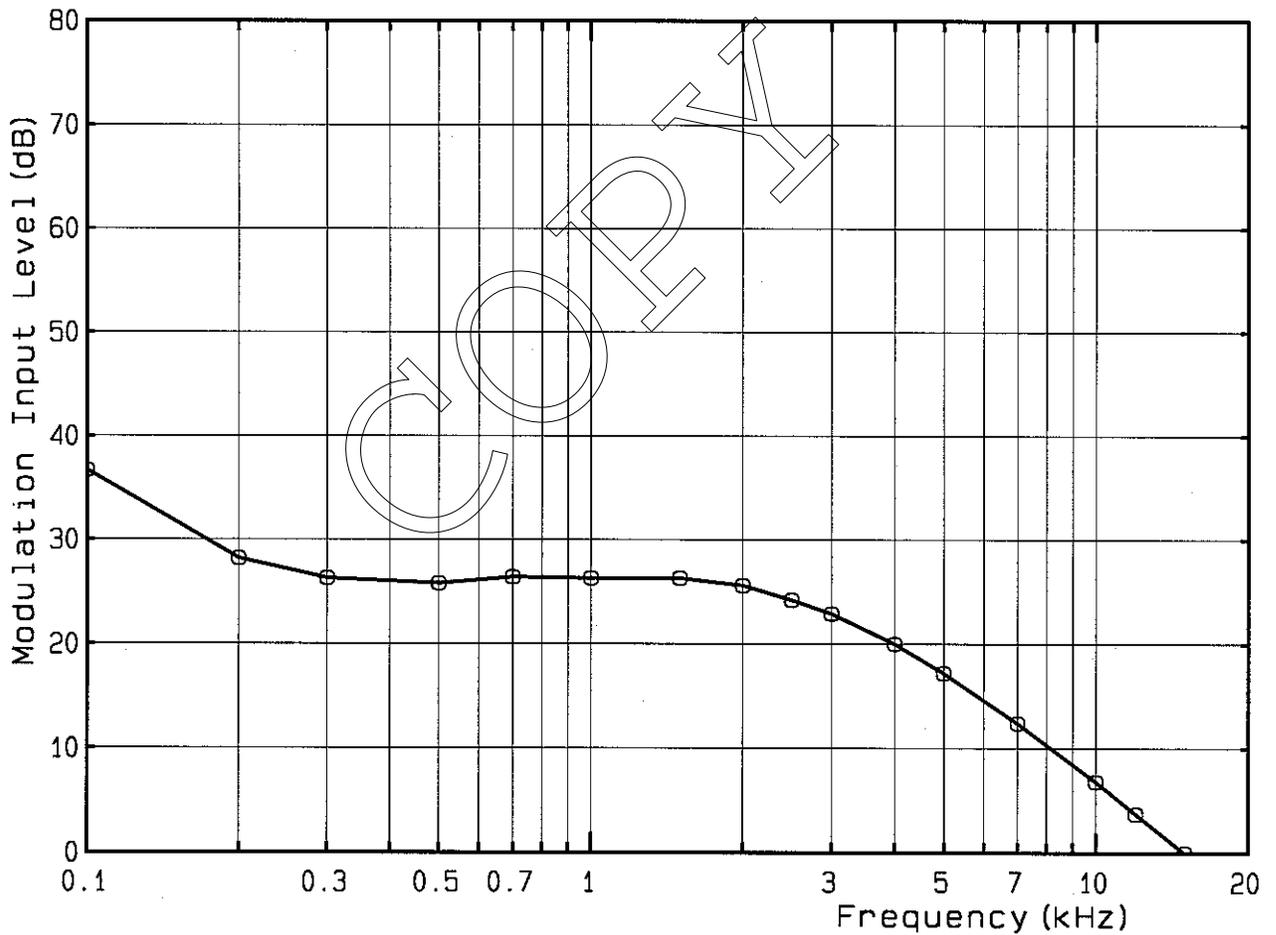
Modulation Frequency Response

FCC ID : AK8WRT847B
Model : WRT-847B
Test Frequency : 470.125 MHz
Test Condition : 10mW Setting
0 dB = -59.3 dBV



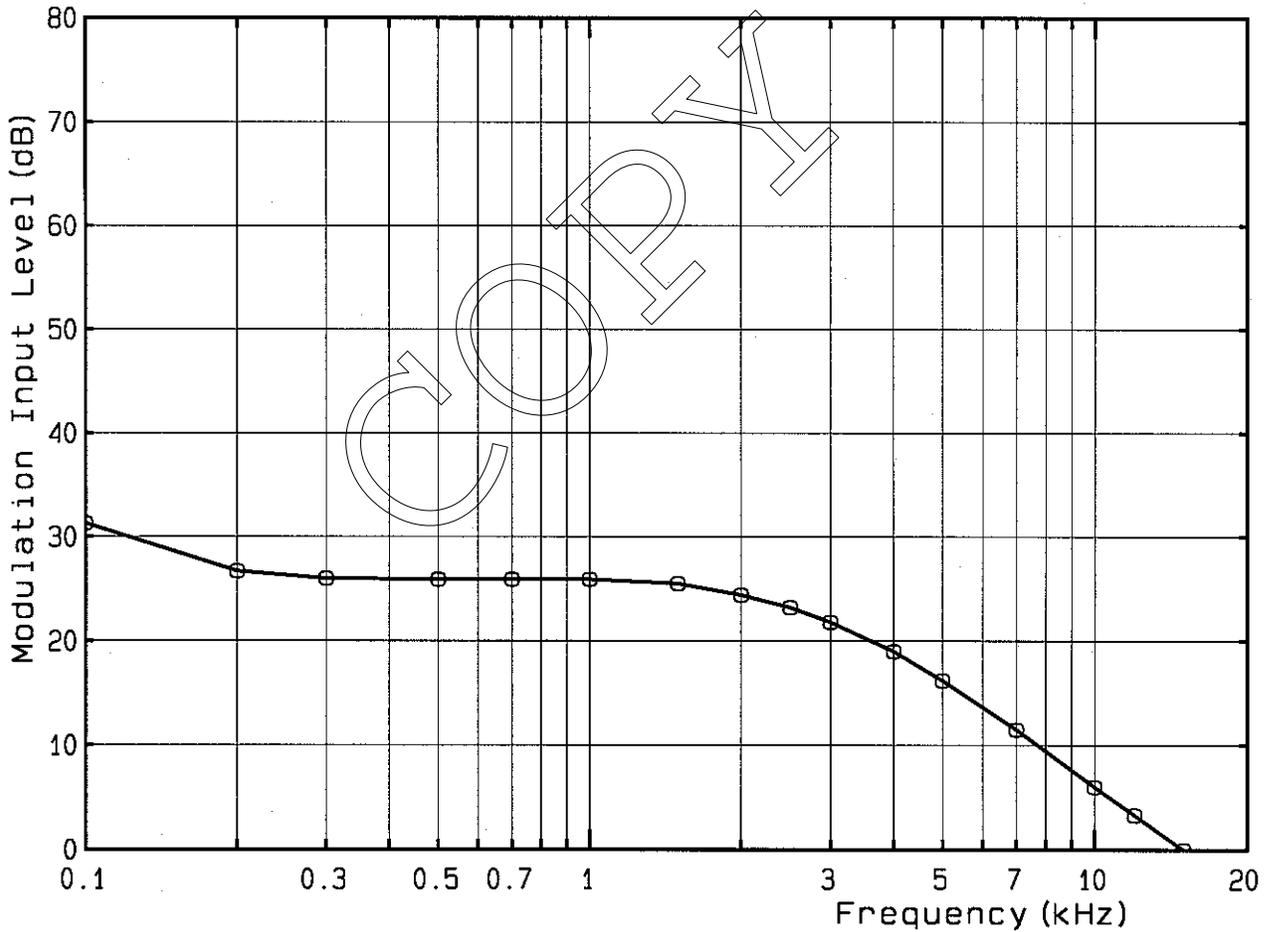
Modulation Frequency Response

FCC ID : AK8WRT847B
Model : WRT-847B
Test Frequency : 470.125 MHz
Test Condition : 50mW Setting
0 dB = -59.4 dBV



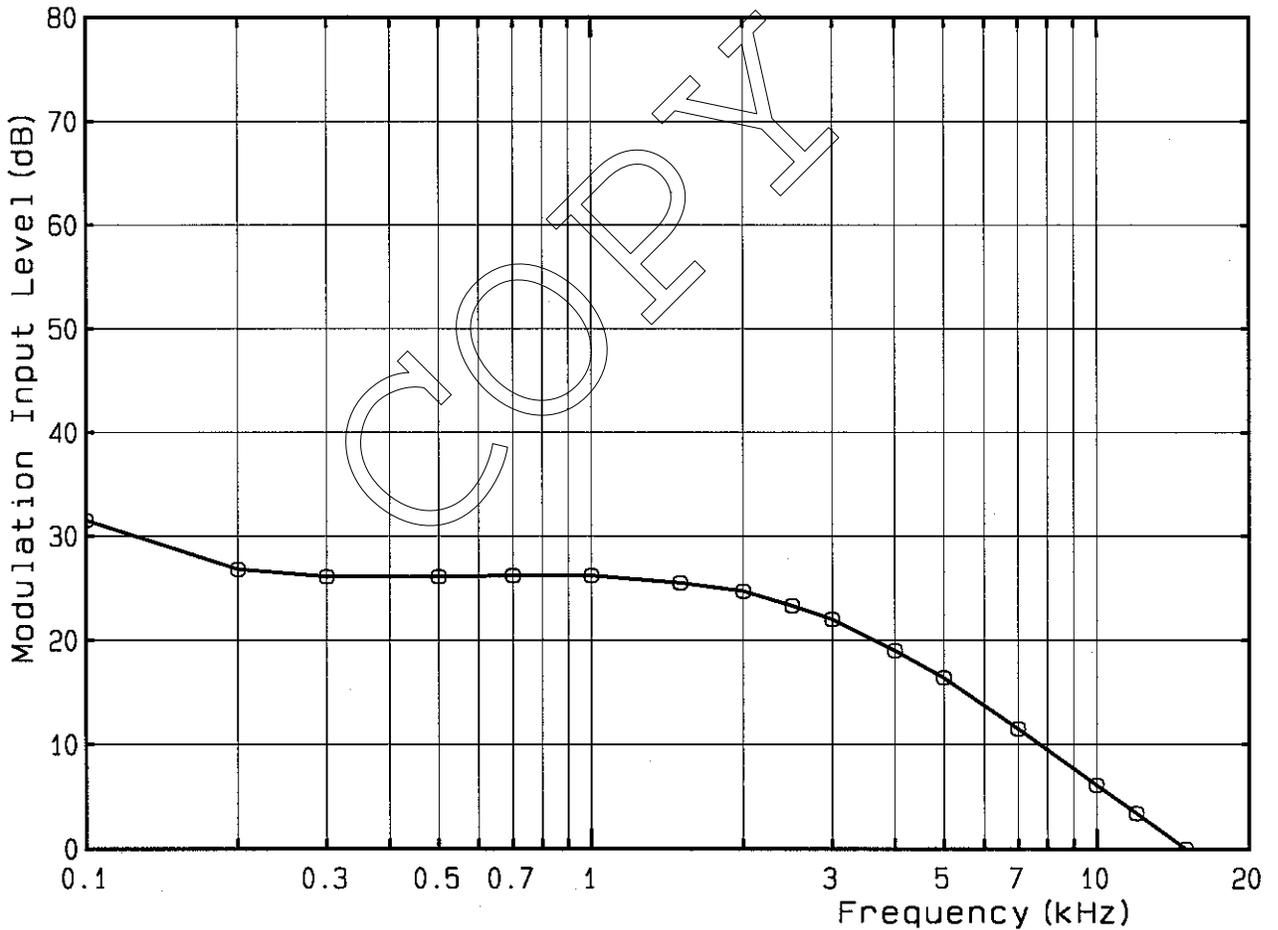
Modulation Frequency Response

FCC ID : AK8WRT847B
Model : WRT-847B
Test Frequency : 638.125 MHz
Test Condition : 10mW Setting
0 dB = -60.2 dBV



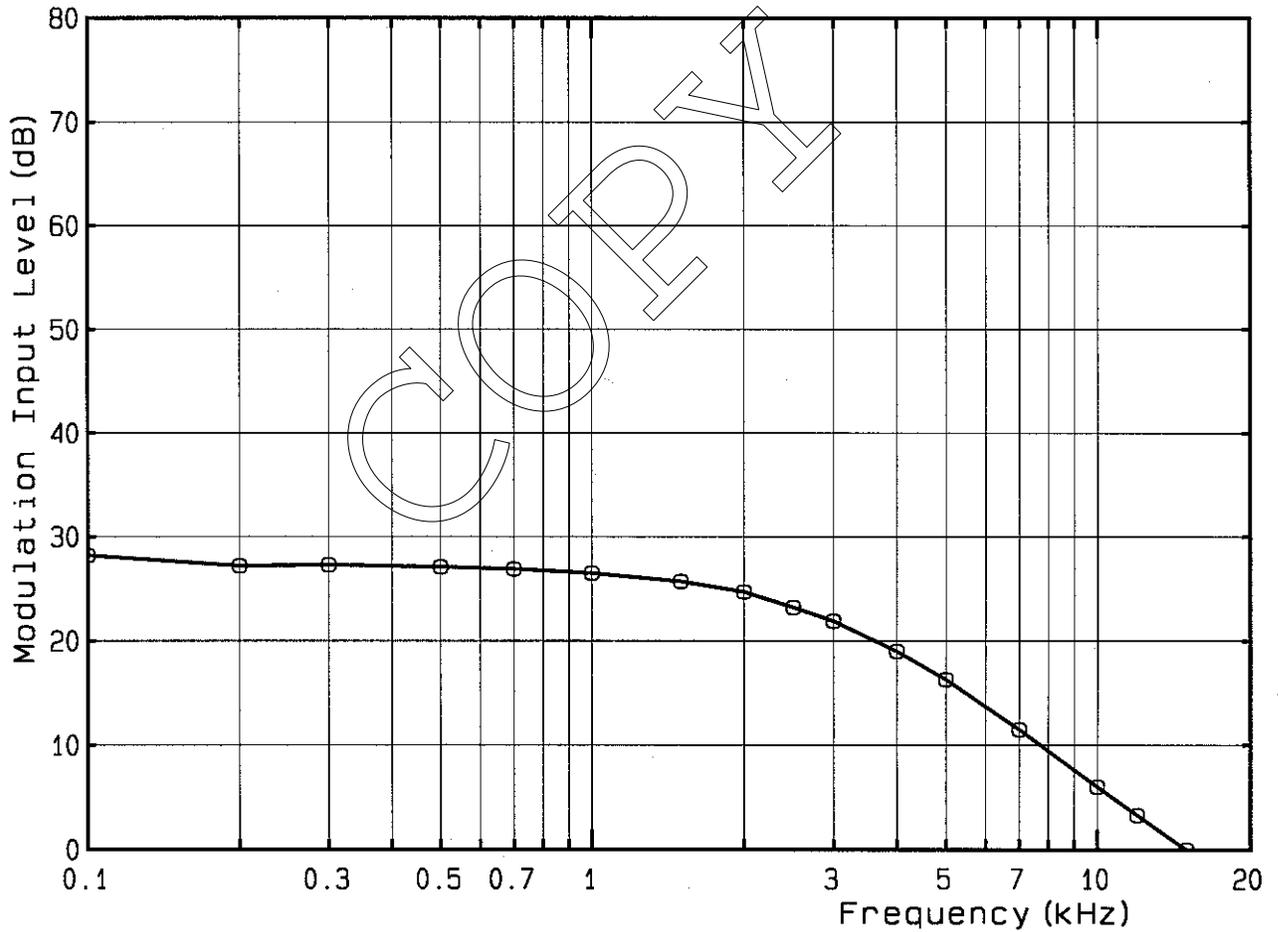
Modulation Frequency Response

FCC ID : AK8WRT847B
Model : WRT-847B
Test Frequency : 638.125 MHz
Test Condition : 50mW Setting
0 dB = -60.6 dBV



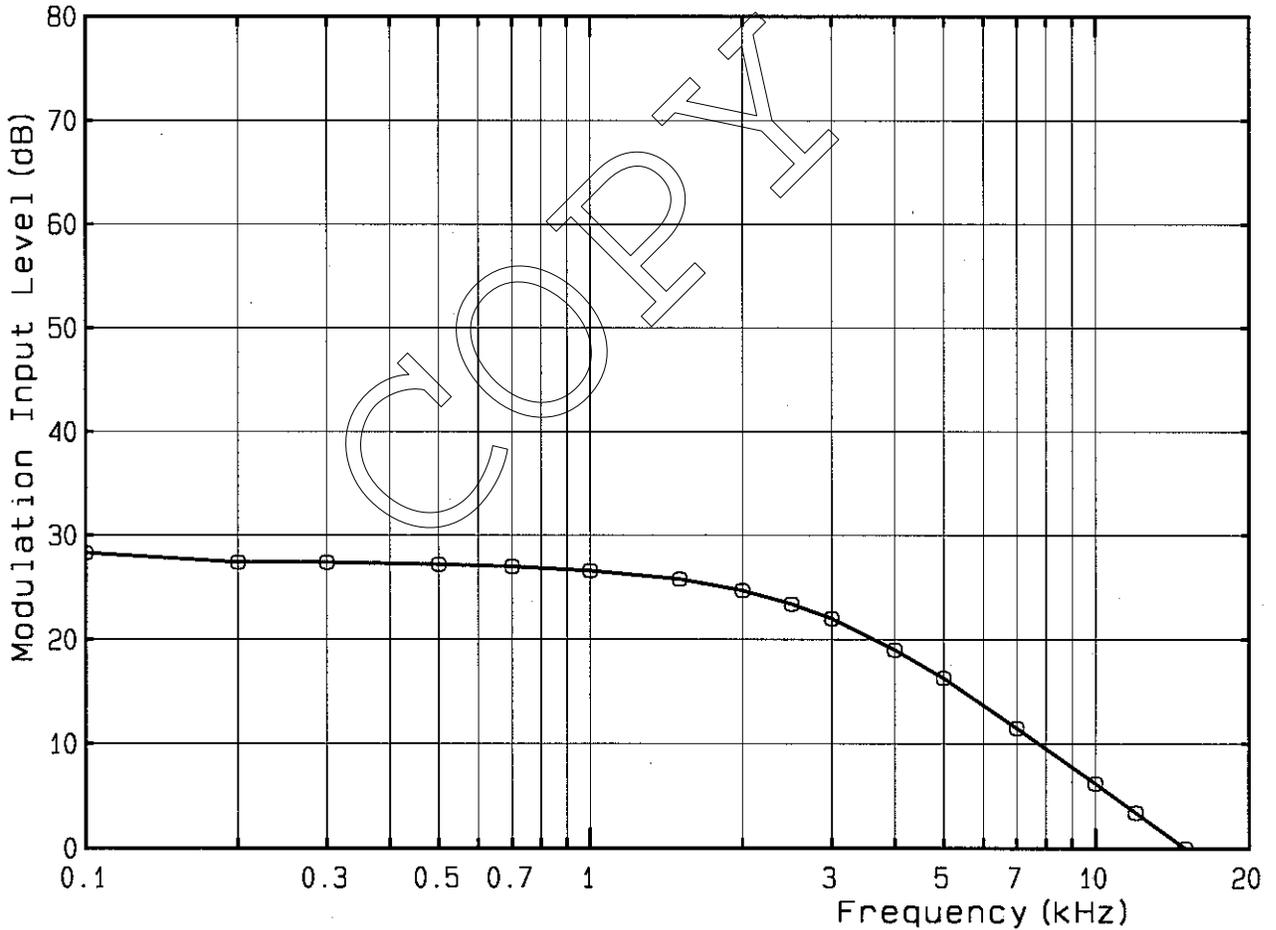
Modulation Frequency Response

FCC ID : AK8WRT847B
Model : WRT-847B
Test Frequency : 805.875 MHz
Test Condition : 10mW Setting
0 dB = -59.4 dBV



Modulation Frequency Response

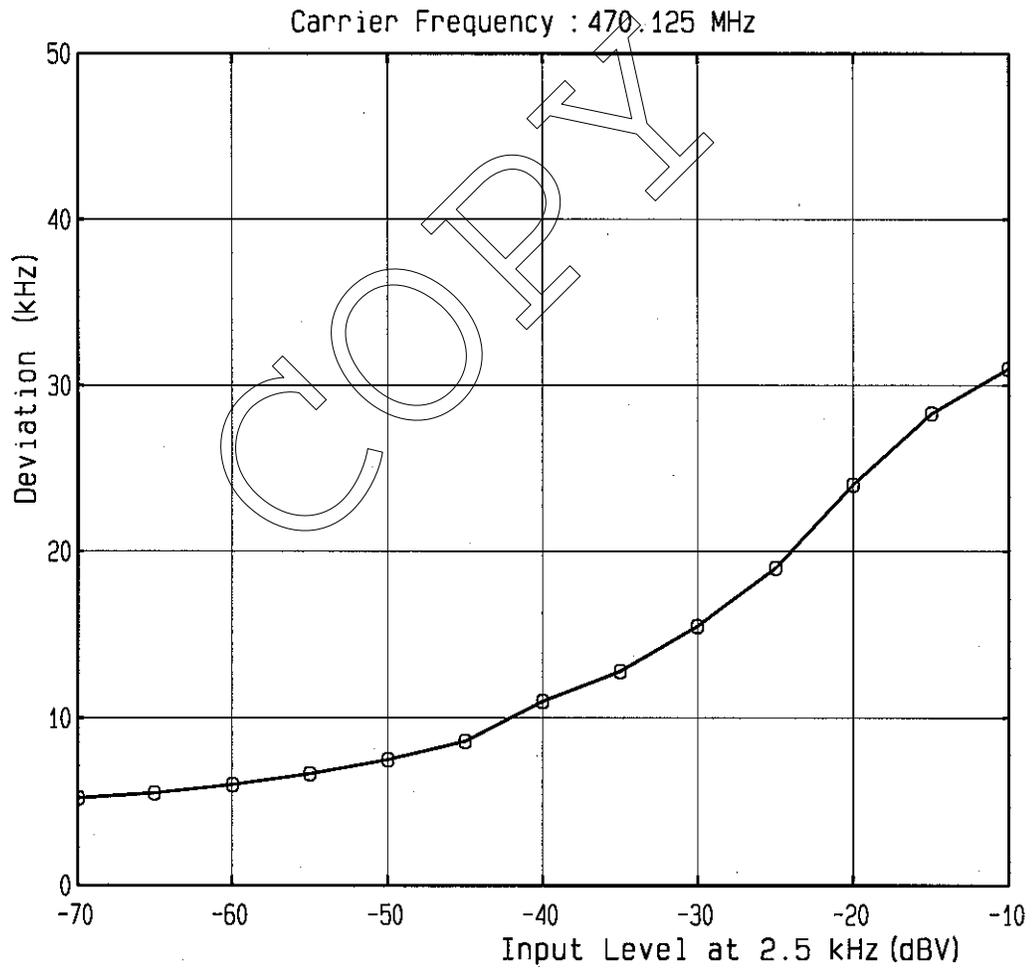
FCC ID : AK8WRT847B
Model : WRT-847B
Test Frequency : 805.875 MHz
Test Condition : 50mW Setting
0 dB = -59.4 dBV



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

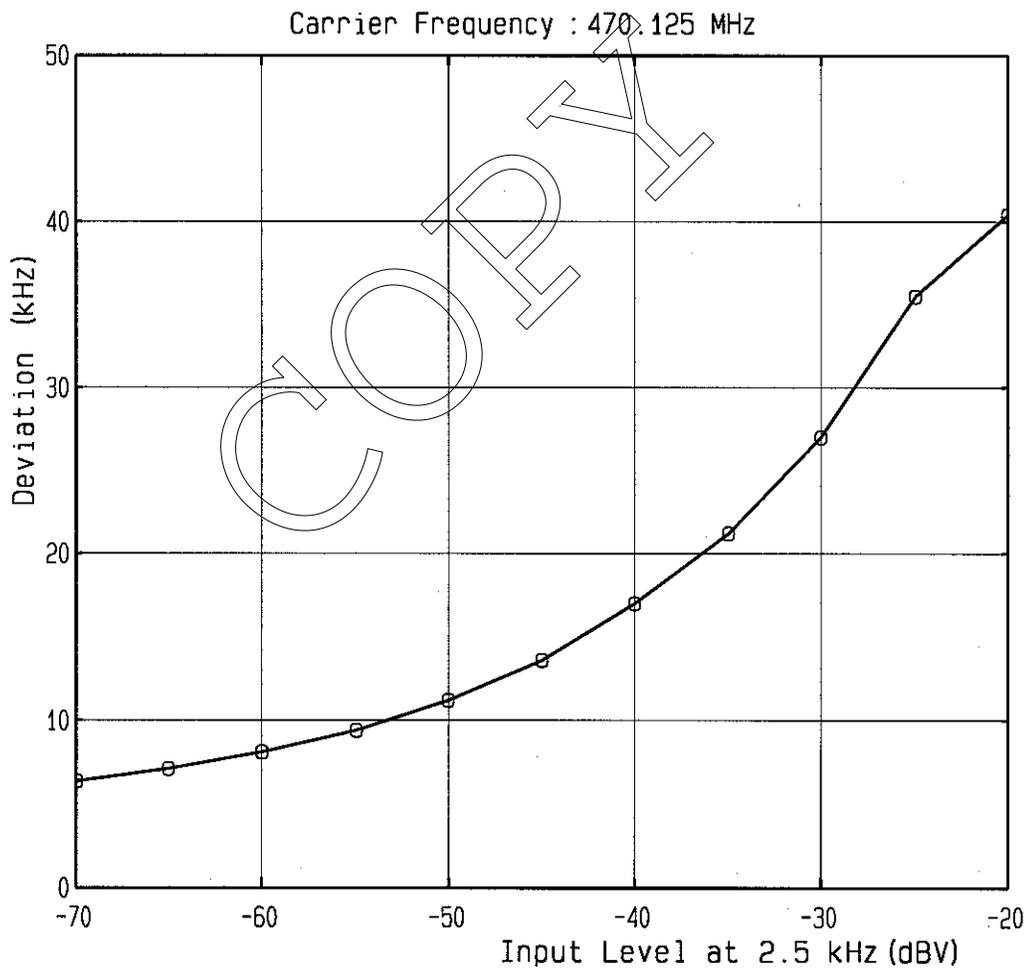
Mode of EUT : Transmit (10mW Setting)
Input Terminal : Microphone (100Hz)
Input Level (85% modulation) :



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

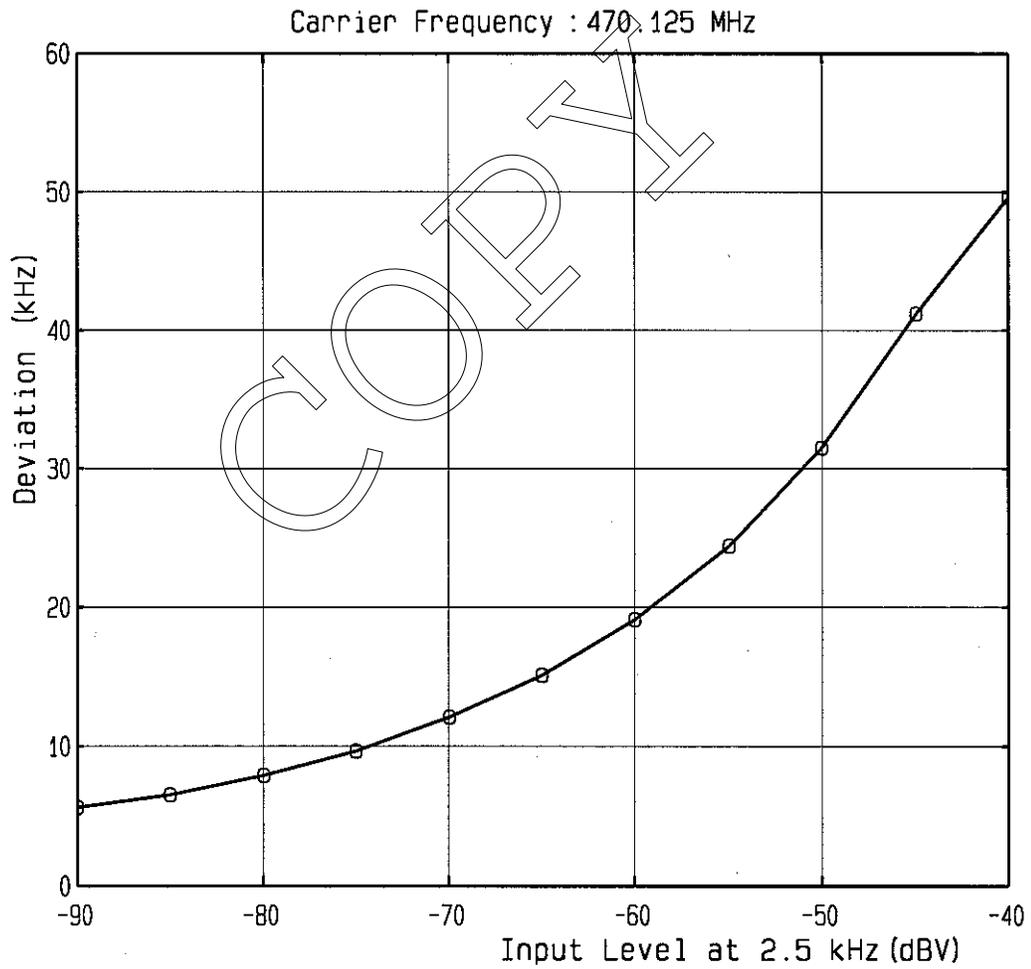
Mode of EUT : Transmit (10mW Setting)
Input Terminal : Microphone (2.5kHz)
Input Level (85% modulation) : -25.8 dBV



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

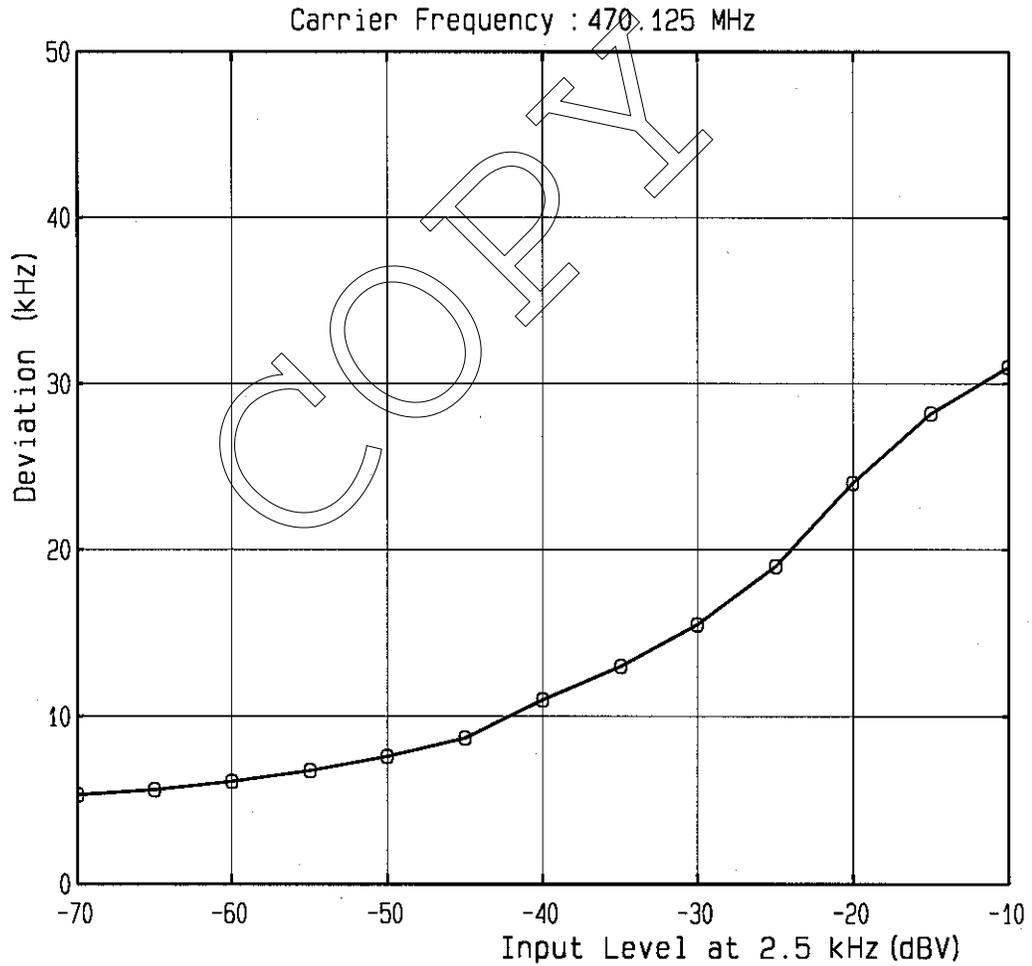
Mode of EUT : Transmit (10mW Setting)
Input Terminal : Microphone (15kHz)
Input Level (85% modulation) : -48.6 dBV



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

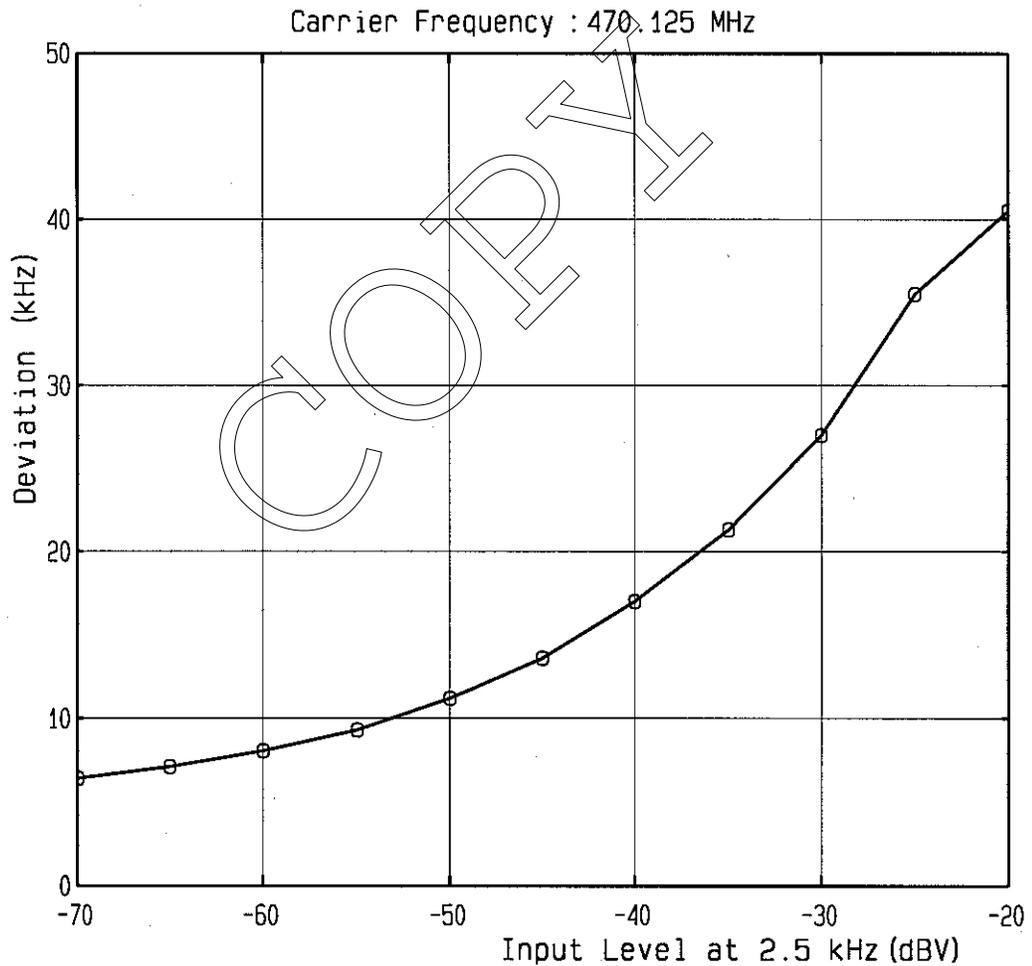
Mode of EUT : Transmit (50mW Setting)
Input Terminal : Microphone (100Hz)
Input Level (85% modulation) :



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

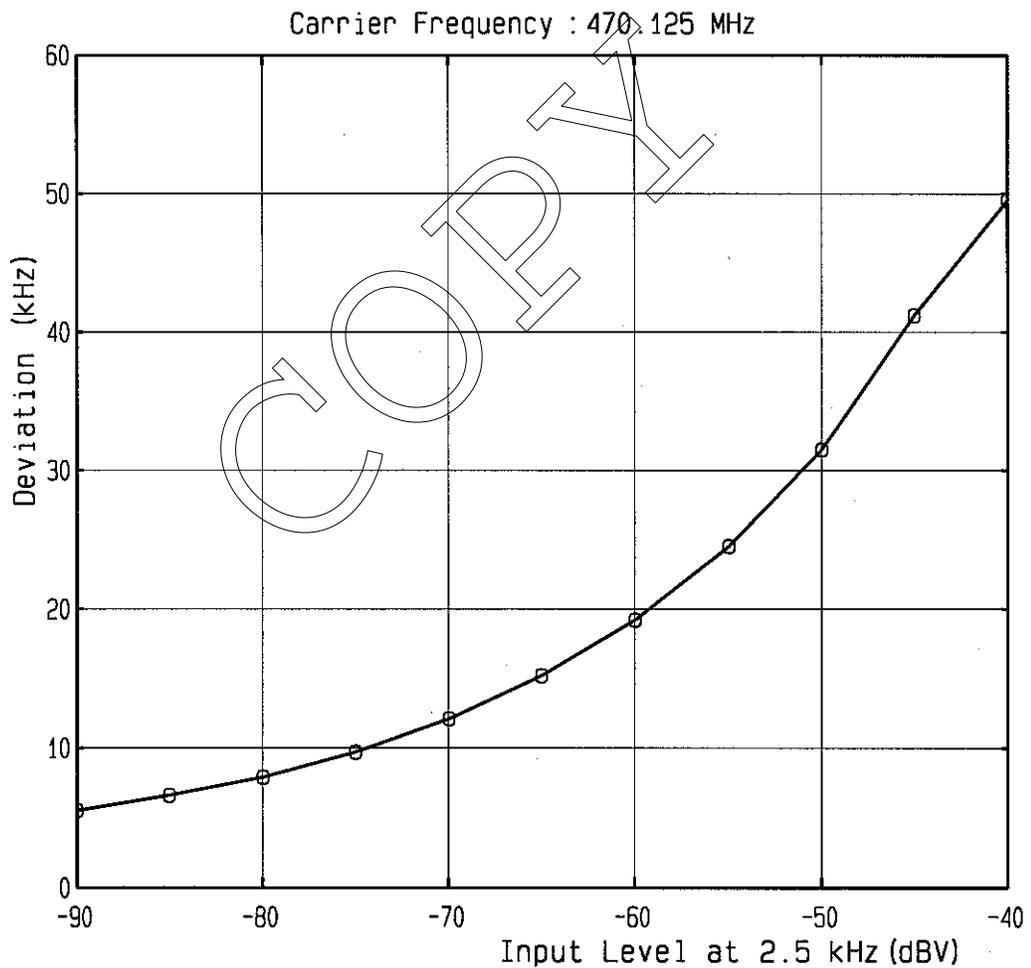
Mode of EUT : Transmit (50mW Setting)
Input Terminal : Microphone (2.5kHz)
Input Level (85% modulation) : -25.8 dBV



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

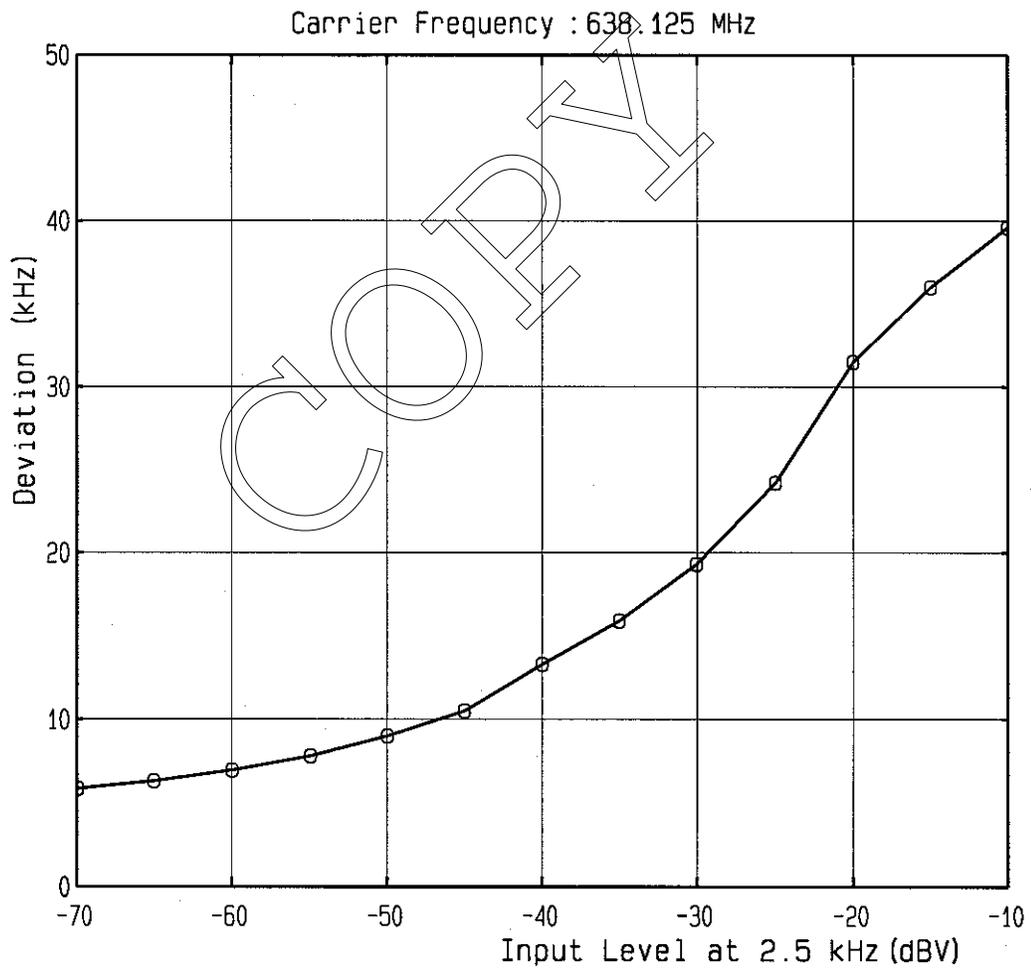
Mode of EUT : Transmit (50mW Setting)
Input Terminal : Microphone (15kHz)
Input Level (85% modulation) : -48.7 dBV



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

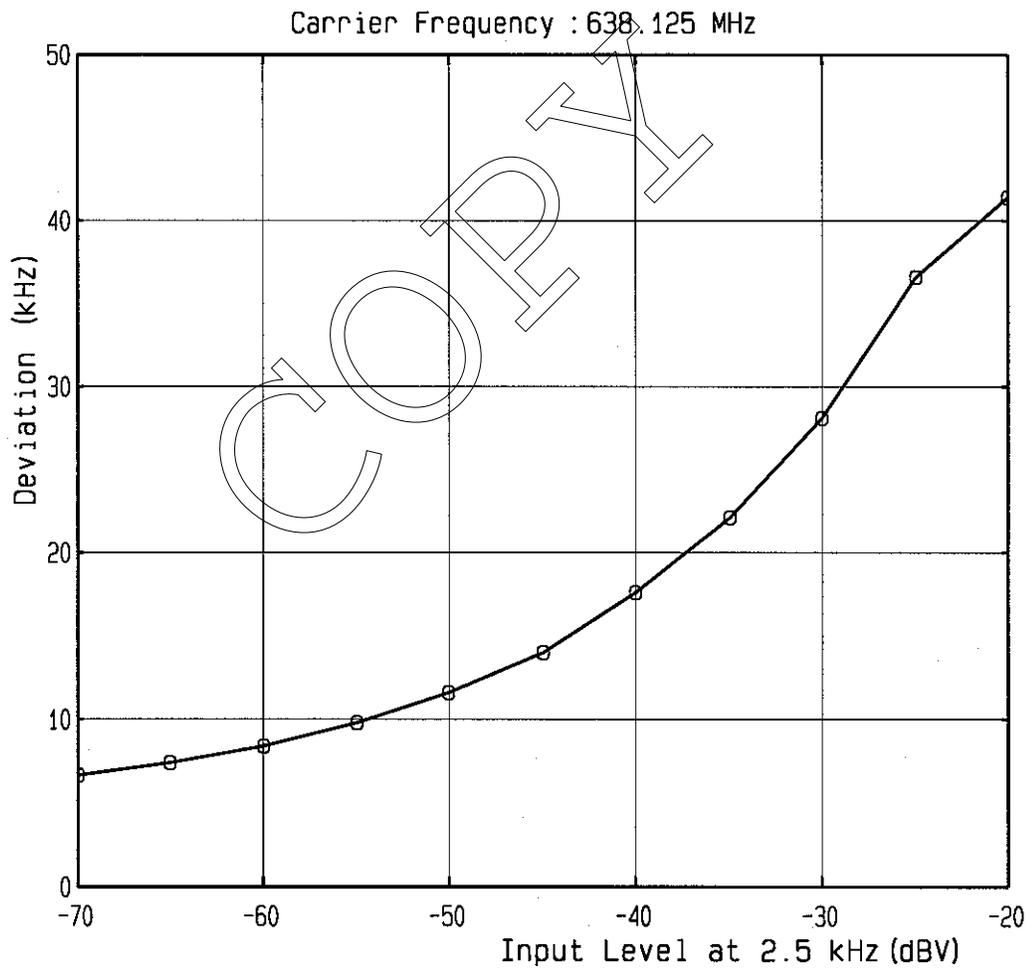
Mode of EUT : Transmit (10mW Setting)
Input Terminal : Microphone (100Hz)
Input Level (85% modulation) : -18.4 dBV



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

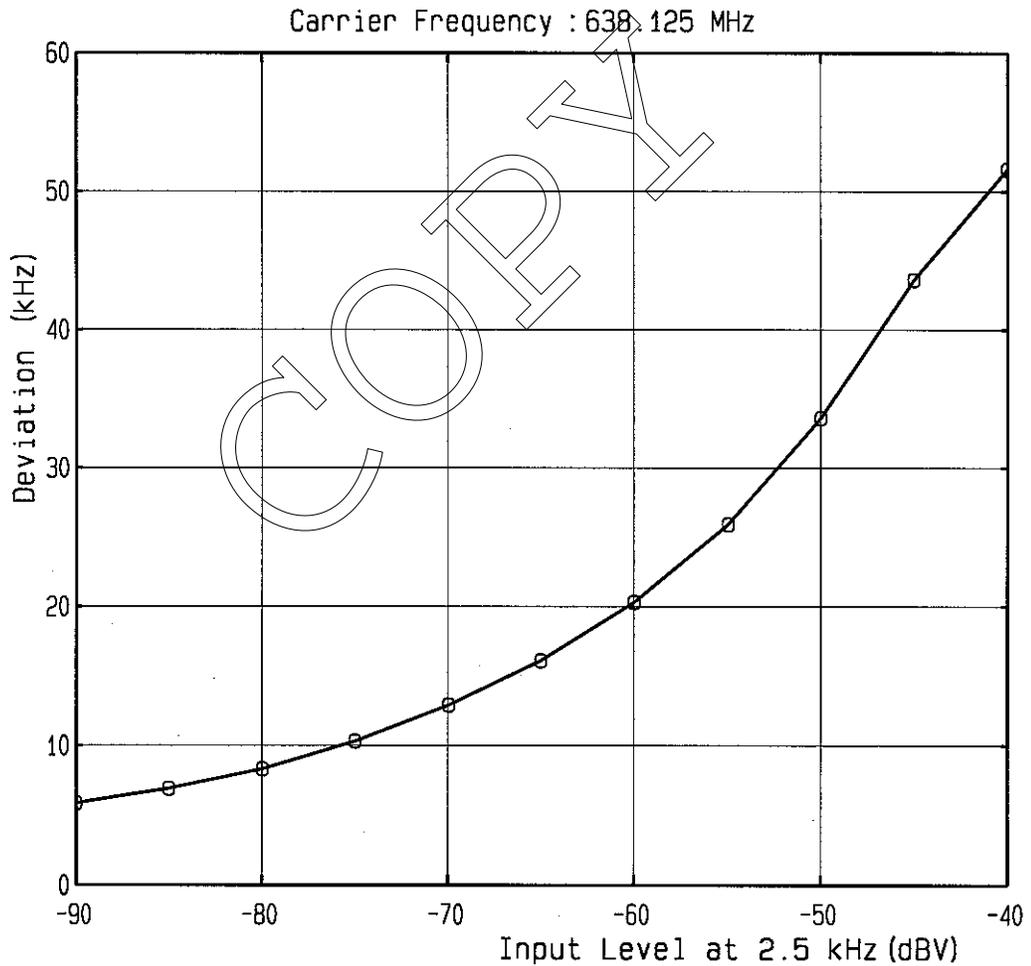
Mode of EUT : Transmit (10mW Setting)
Input Terminal : Microphone (2.5kHz)
Input Level (85% modulation) : -26.5 dBV



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

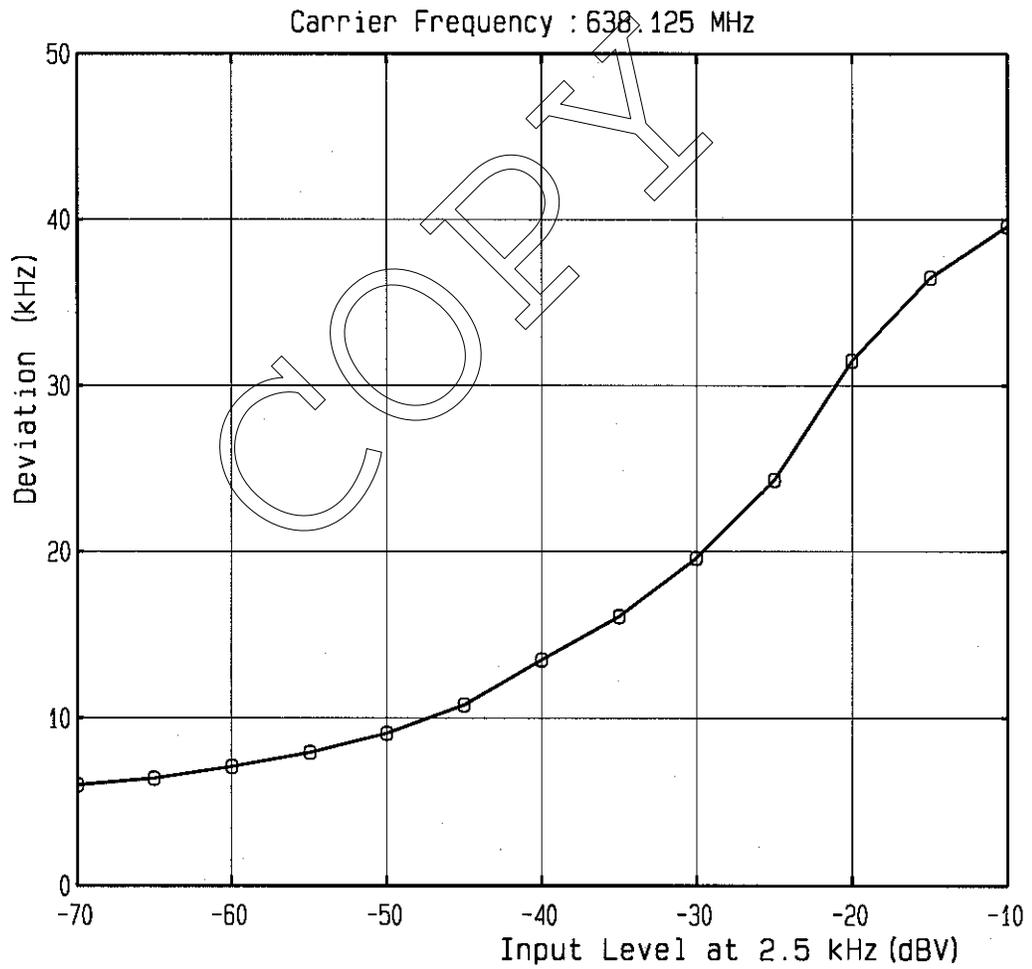
Mode of EUT : Transmit (10mW Setting)
Input Terminal : Microphone (15kHz)
Input Level (85% modulation) : -49.8 dBV



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

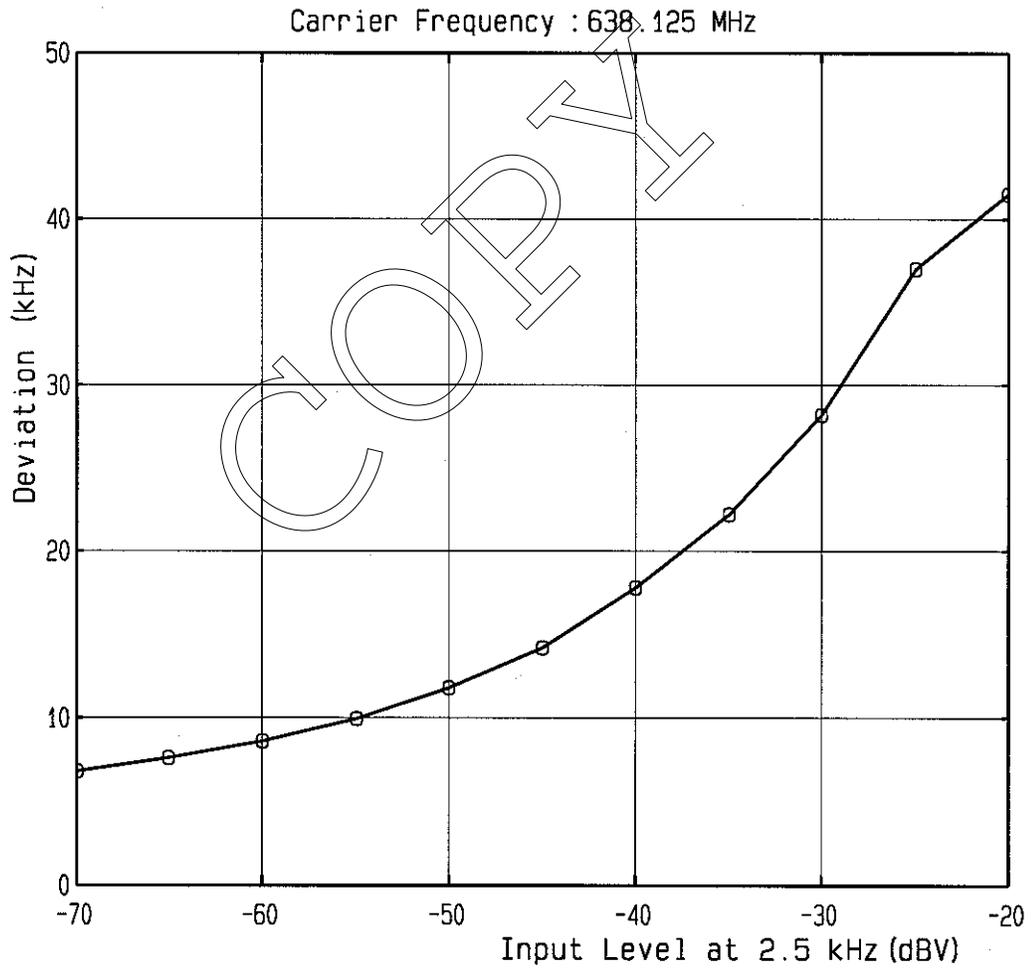
Mode of EUT : Transmit (50mW Setting)
Input Terminal : Microphone (100Hz)
Input Level (85% modulation) : -18.5 dBV



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

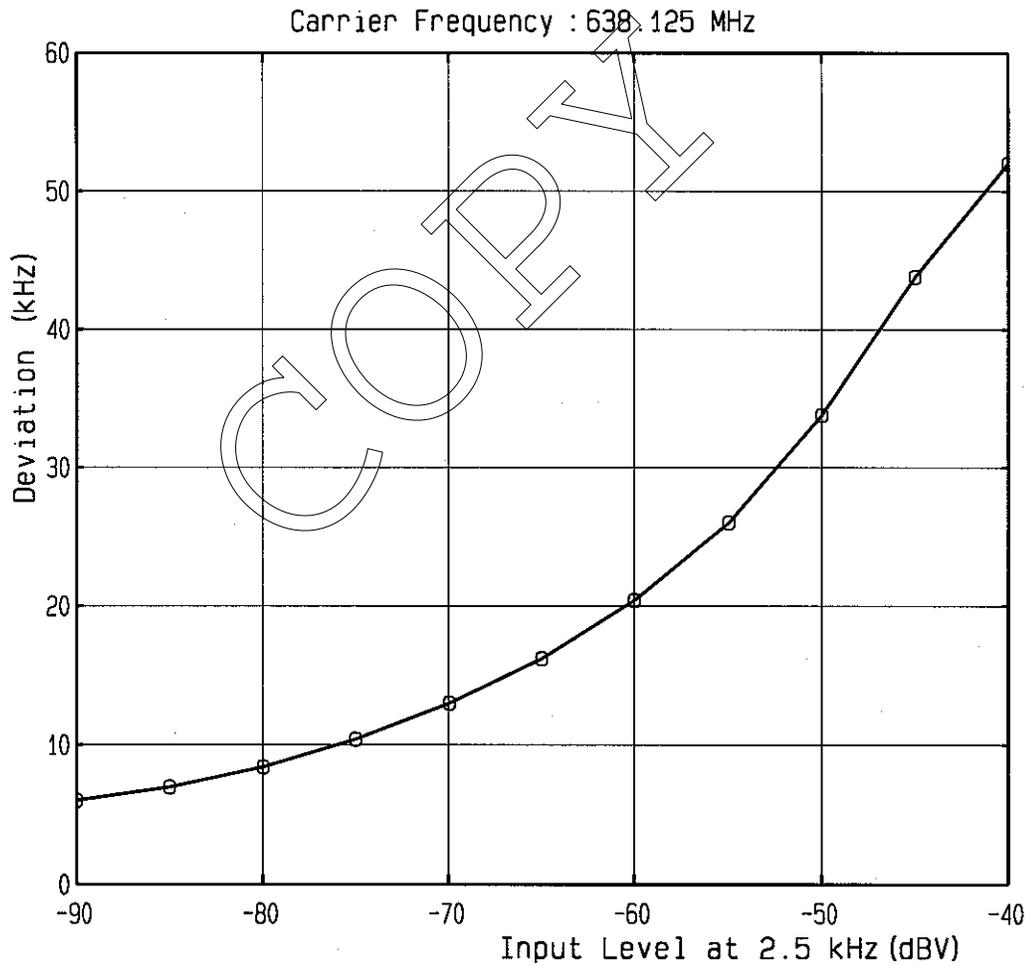
Mode of EUT : Transmit (50mW Setting)
Input Terminal : Microphone (2.5kHz)
Input Level (85% modulation) : -26.6 dBV



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

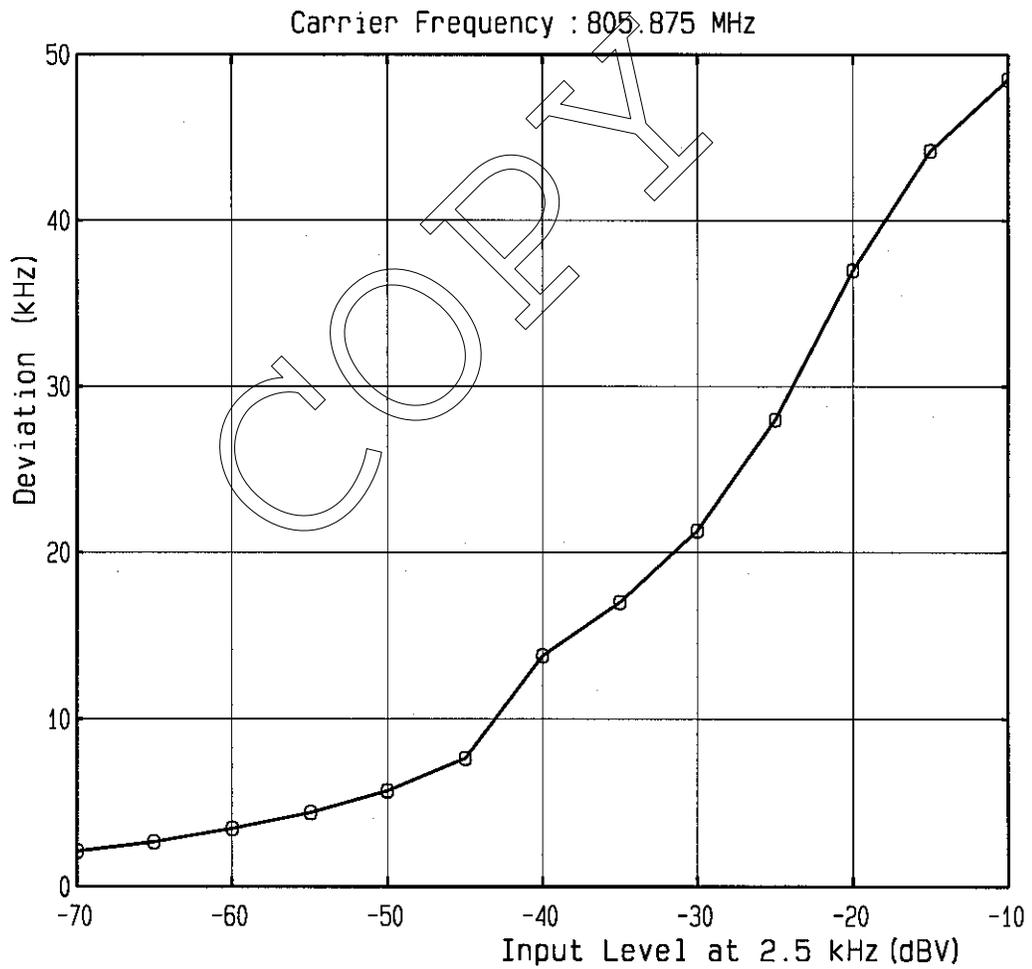
Mode of EUT : Transmit (50mW Setting)
Input Terminal : Microphone (15kHz)
Input Level (85% modulation) : -49.9 dBV



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

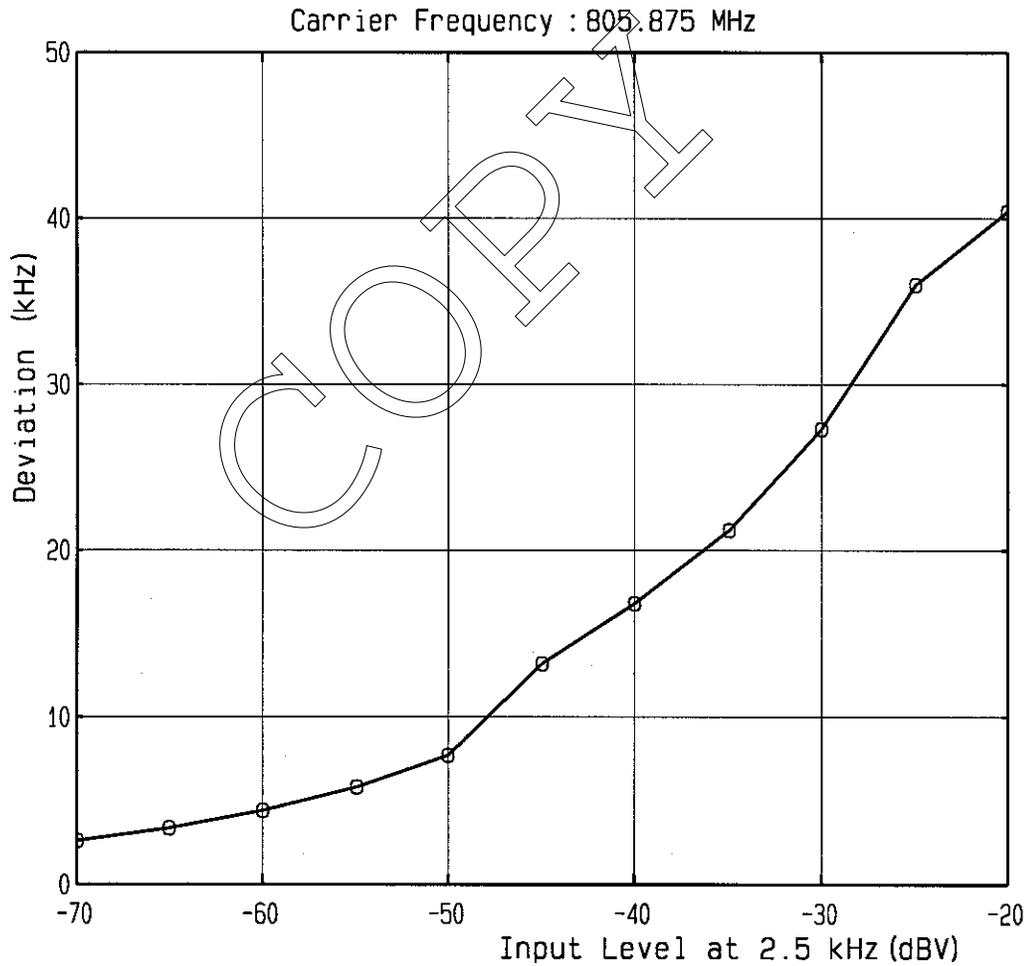
Mode of EUT : Transmit (10mW Setting)
Input Terminal : Microphone (100Hz)
Input Level (85% modulation) : -21.5 dBV



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

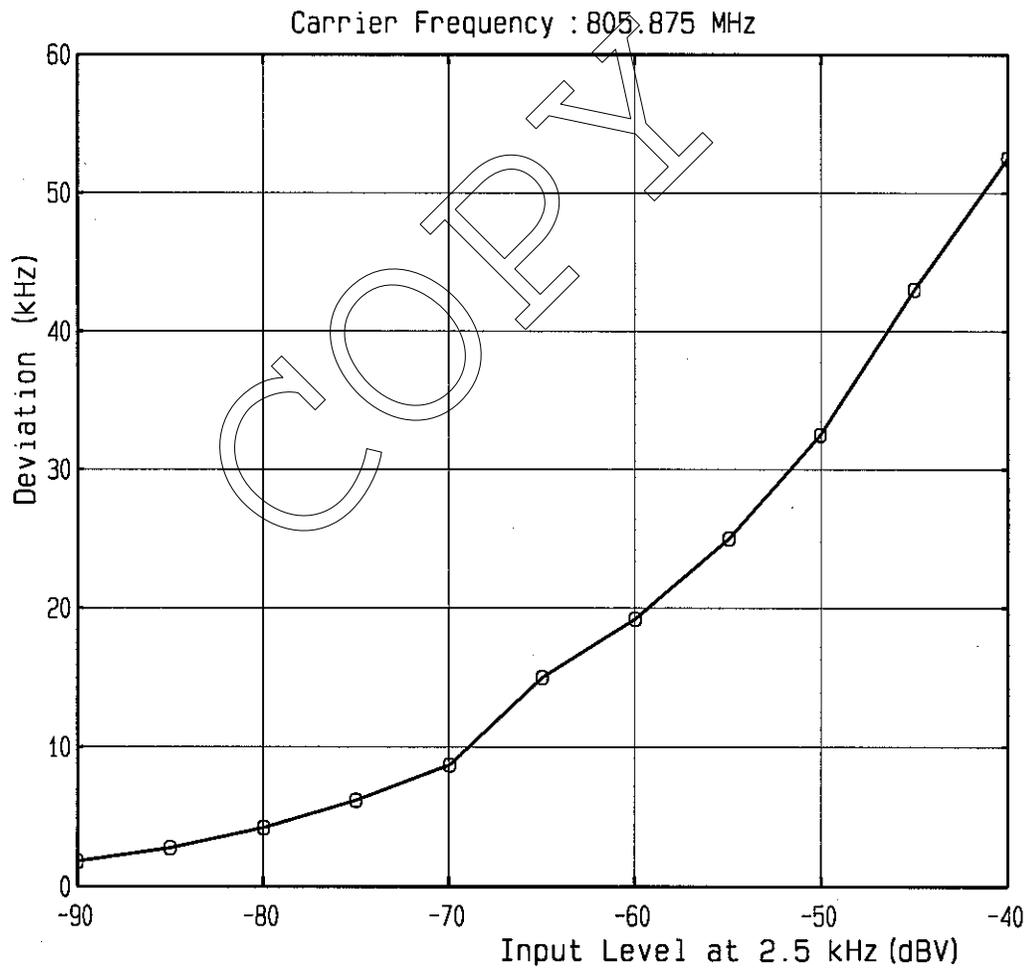
Mode of EUT : Transmit (10mW Setting)
Input Terminal : Microphone (2.5kHz)
Input Level (85% modulation) : -26.0 dBV



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

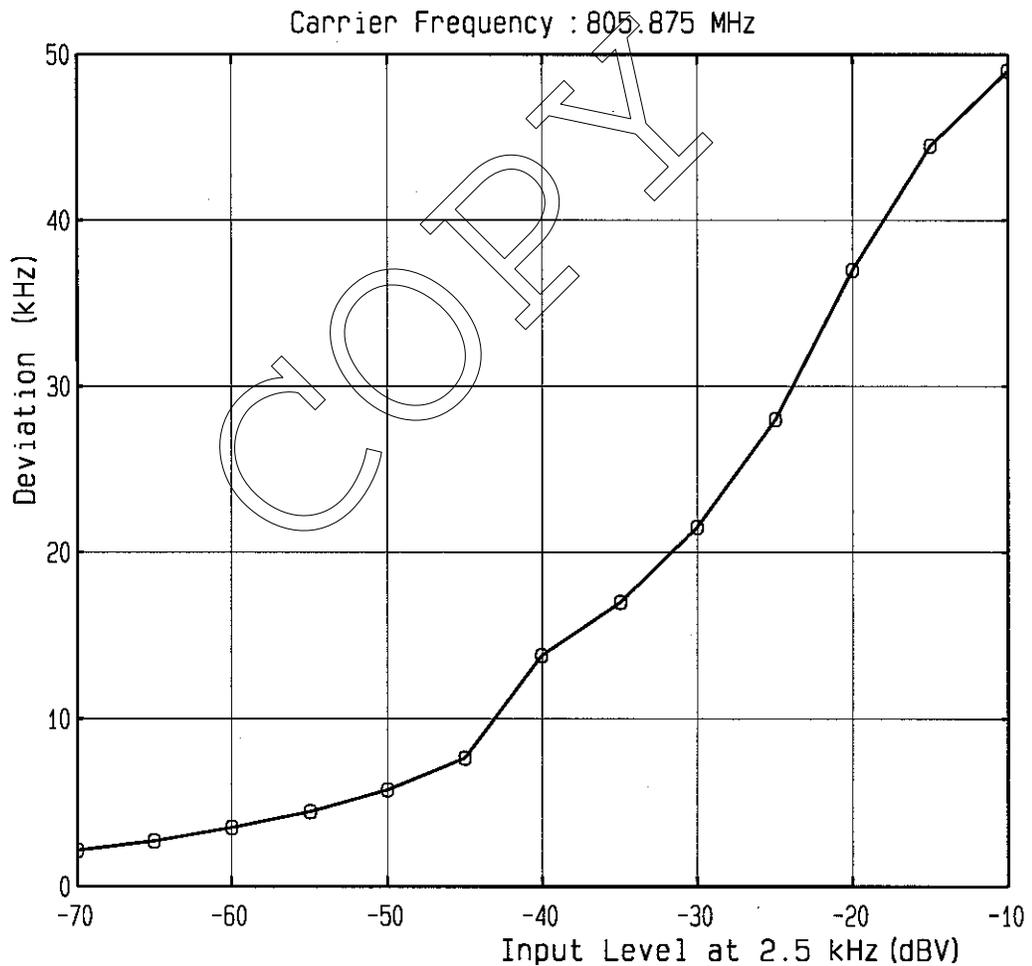
Mode of EUT : Transmit (10mW Setting)
Input Terminal : Microphone (15kHz)
Input Level (85% modulation) : -49.3 dBV



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

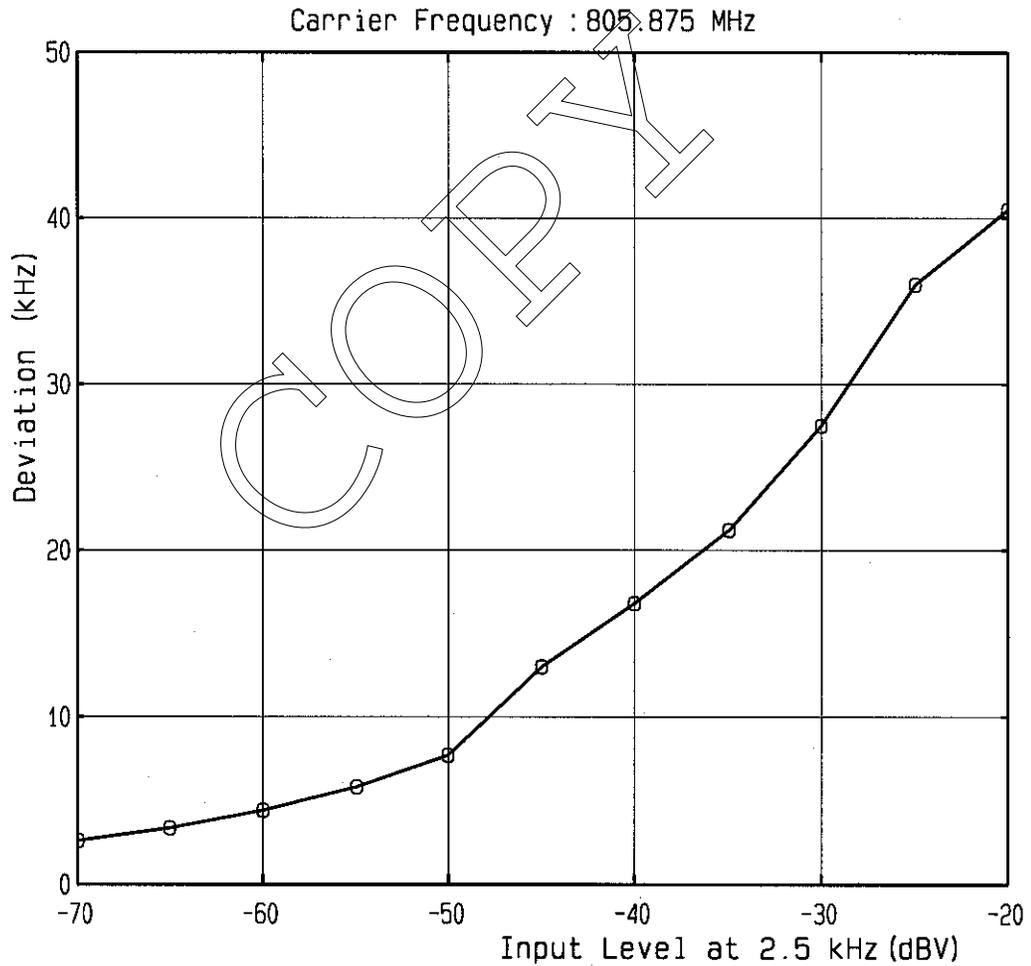
Mode of EUT : Transmit (50mW Setting)
Input Terminal : Microphone (100Hz)
Input Level (85% modulation) : -21.6 dBV



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

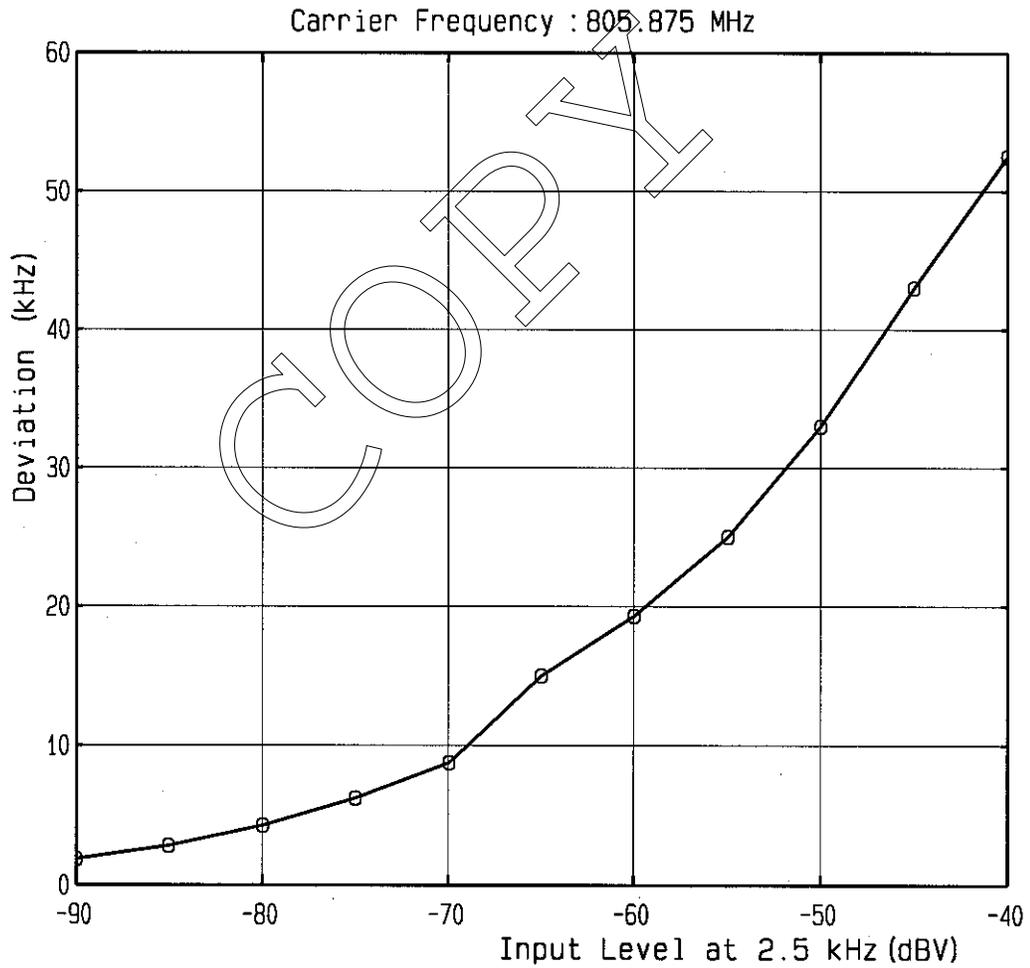
Mode of EUT : Transmit (50mW Setting)
Input Terminal : Microphone (2.5kHz)
Input Level (85% modulation) : -26.0 dBV



Modulation Characteristics

FCC ID : AK8WRT847B
Model : WRT-847B

Mode of EUT : Transmit (50mW Setting)
Input Terminal : Microphone (15kHz)
Input Level (85% modulation) : -49.4 dBV





2.3 Radiated Emissions Measurement

Date : July 26, 2000
 Temp.: 24 °C Humi.: 80 %

Operating Frequency : 470.125 MHz
 Reference Carrier Power(ERP): : 19.0 mW(10 mW setting)
 Distance of Measurement : 3.0 meters

Frequency (MHz)	Substituted Power		Limits (dB)	Attenuation Ratio	
	Horiz. (dBm)	Vert. (dBm)		Horiz. (dB)	Vert. (dB)
940.250	-54.6	-53.8	25.8	67.4	66.6
1410.375	-31.9	-40.1	25.8	44.6	52.8
1880.500	-40.0	-41.1	25.8	52.8	53.9
2350.625	-40.0	-42.8	25.8	52.8	55.6
2820.750	-48.1	-44.9	25.8	60.9	57.7
3290.875	-40.5	-41.9	25.8	53.3	54.7
3761.000	-32.7	-32.5	25.8	45.5	45.3
4231.125	-26.0	-28.9	25.8	38.8	41.7
4710.250	-21.0	-20.7	25.8	33.8	33.5

Operating Frequency : 470.125 MHz
 Reference Carrier Power(ERP): : 76.0 mW(50 mW setting)
 Distance of Measurement : 3.0 meters

Frequency (MHz)	Substituted Power		Limits (dB)	Attenuation Ratio	
	Horiz. (dBm)	Vert. (dBm)		Horiz. (dB)	Vert. (dB)
940.250	-55.1	-52.3	31.8	73.7	71.1
1410.375	-35.4	-41.9	31.8	54.2	60.7
1880.500	-39.0	-40.1	31.8	57.8	58.9
2350.625	-39.3	-40.4	31.8	58.1	59.2
2820.750	-50.2	-50.0	31.8	69.0	68.8
3290.875	-36.5	-37.3	31.8	55.3	56.1
3761.000	-31.2	-32.5	31.8	50.0	51.3
4231.125	-23.8	-24.8	31.8	42.7	43.7
4710.250	-25.5	-25.4	31.8	44.3	44.2



Operating Frequency : 638.125 MHz
 Reference Carrier Power(ERP): : 10.3 mW(10 mW setting)
 Distance of Measurement : 3.0 meters

Frequency (MHz)	Substituted Power		Limits (dB)	Attenuation Ratio	
	Horiz. (dBm)	Vert. (dBm)		Horiz. (dB)	Vert. (dB)
1276.250	-35.2	-37.0	23.1	45.4	47.2
1914.375	-39.6	-43.2	23.1	49.7	53.3
2552.500	-51.4	-53.3	23.1	61.5	63.4
3190.625	-50.6	-48.7	23.1	60.7	58.8
3828.750	-43.2	-46.4	23.1	53.4	56.6
4466.875	-49.0	-49.3	23.1	59.1	59.4
5105.000	-51.3	-52.4	23.1	61.4	62.5
5743.125	<-51.1	<-51.1	23.1	>61.2	>61.2
6381.250	<-49.6	<-49.6	23.1	>59.8	>59.8

Operating Frequency : 638.125 MHz
 Reference Carrier Power(ERP): : 49.1 mW(50 mW setting)
 Distance of Measurement : 3.0 meters

Frequency (MHz)	Substituted Power		Limits (dB)	Attenuation Ratio	
	Horiz. (dBm)	Vert. (dBm)		Horiz. (dB)	Vert. (dB)
1276.250	-34.9	-37.5	29.9	51.8	54.4
1914.375	-39.2	-43.2	29.9	56.1	60.1
2552.500	-50.5	-50.8	29.9	67.4	67.7
3190.625	-46.0	-45.1	29.9	62.9	62.0
3828.750	-40.5	-47.0	29.9	57.4	63.9
4466.875	-49.3	-46.2	29.9	66.2	63.1
5105.000	-42.3	-44.9	29.9	59.2	61.8
5743.125	<-51.1	<-51.1	29.9	>68.0	>68.0
6381.250	<-49.6	<-49.6	29.9	>66.6	>66.6



Operating Frequency : 805.875 MHz
 Reference Carrier Power(ERP): : 12.9 mW(10 mW setting)
 Distance of Measurement : 3.0 meters

Frequency (MHz)	Substituted Power		Limits (dB)	Attenuation Ratio	
	Horiz. (dBm)	Vert. (dBm)		Horiz. (dB)	Vert. (dB)
1611.750	-45.4	-47.4	24.1	56.5	58.5
2417.625	-46.8	-48.8	24.1	57.9	59.9
3223.500	-55.7	-53.4	24.1	66.8	64.5
4029.375	-41.3	-41.5	24.1	52.4	52.6
4835.250	-37.5	-41.3	24.1	48.6	52.4
5641.125	-40.1	-41.5	24.1	51.2	52.6
6447.000	-47.9	-45.6	24.1	59.0	56.7
7252.875	<-47.9	<-47.9	24.1	>59.0	>59.0
8058.750	<-46.5	<-46.5	24.1	>57.6	>57.6

Operating Frequency : 805.875 MHz
 Reference Carrier Power(ERP): : 53.7 mW(50 mW setting)
 Distance of Measurement : 3.0 meters

Frequency (MHz)	Substituted Power		Limits (dB)	Attenuation Ratio	
	Horiz. (dBm)	Vert. (dBm)		Horiz. (dB)	Vert. (dB)
1611.750	-43.5	-45.7	30.3	60.8	63.0
2417.625	-33.9	-41.6	30.3	51.2	58.9
3223.500	-38.8	-38.6	30.3	56.1	55.9
4029.375	-43.2	-42.4	30.3	60.5	59.7
4835.250	-51.2	<-53.4	30.3	68.5	>70.7
5641.125	-41.2	-43.8	30.3	58.5	61.1
6447.000	<-49.5	-49.2	30.3	>66.8	66.5
7252.875	<-47.9	<-47.9	30.3	>65.2	>65.2
8058.750	<-46.5	<-46.5	30.3	>63.8	>63.8

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 :

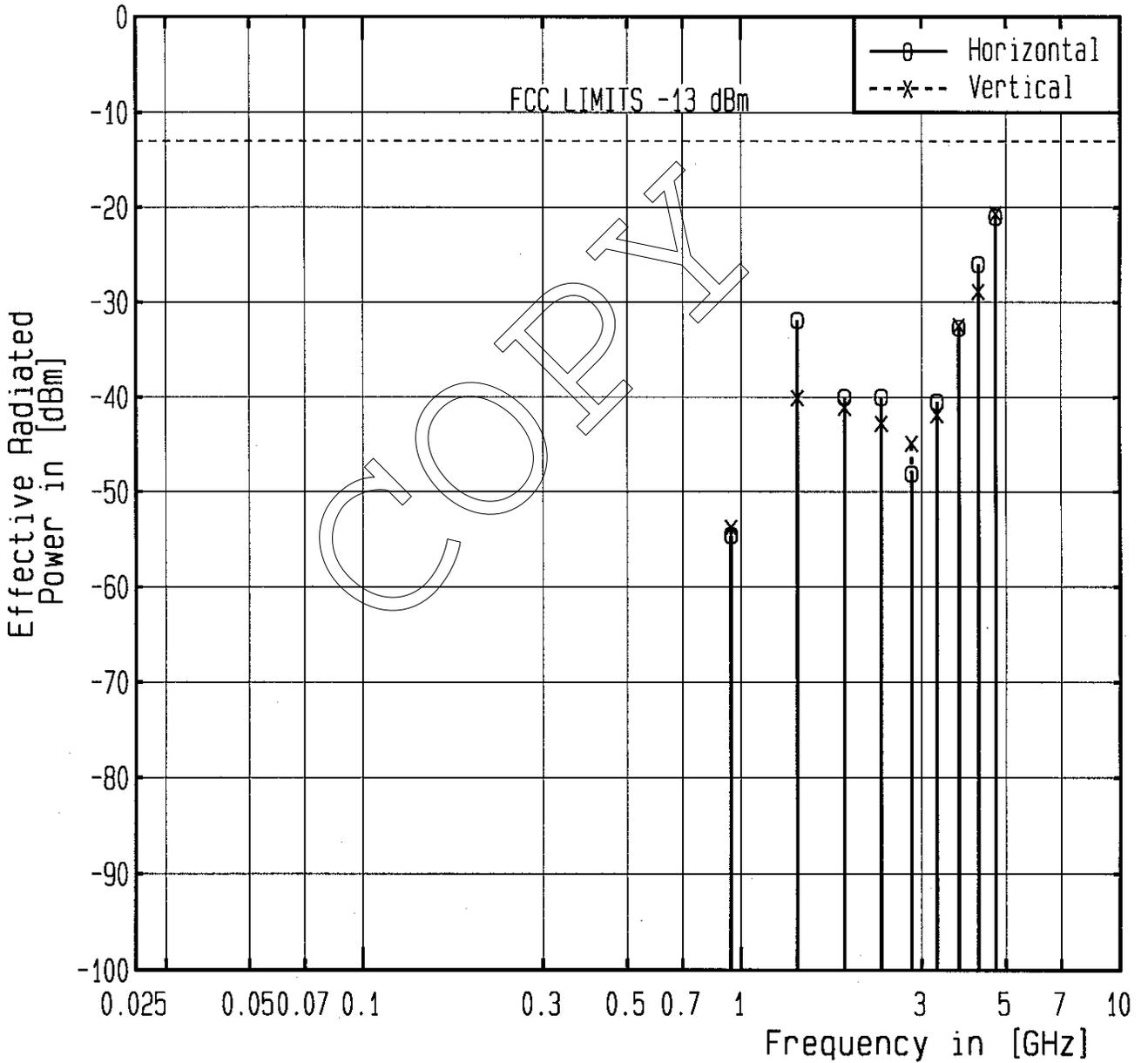
Shigeru Osawa

Shigeru Osawa

Testing Engineer

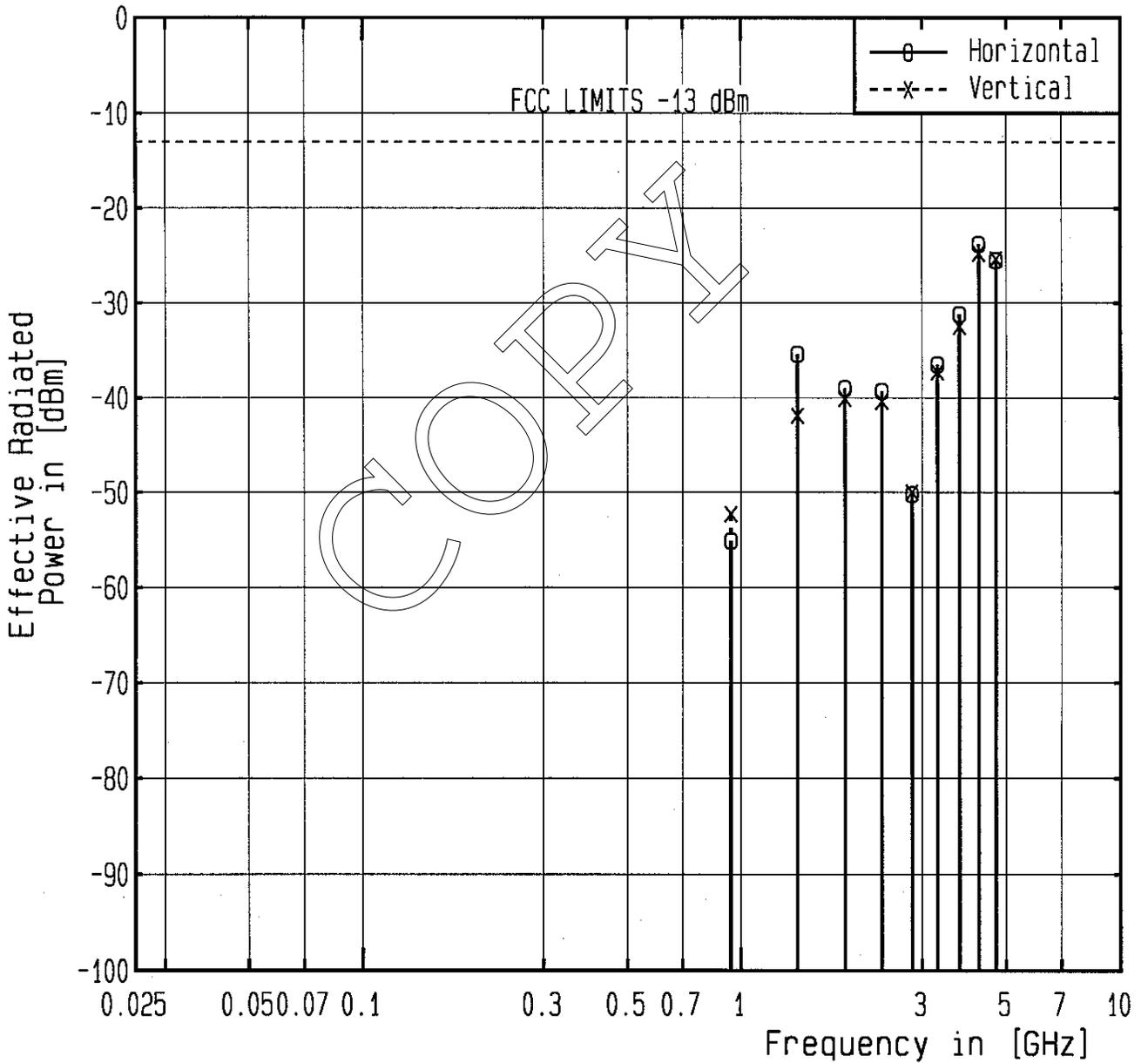
Radiated Spurious Emissions

FCC ID : AK8WRT847B
Serial No. :
Carrier : 19.00 [mW] at 470.125 [MHz]



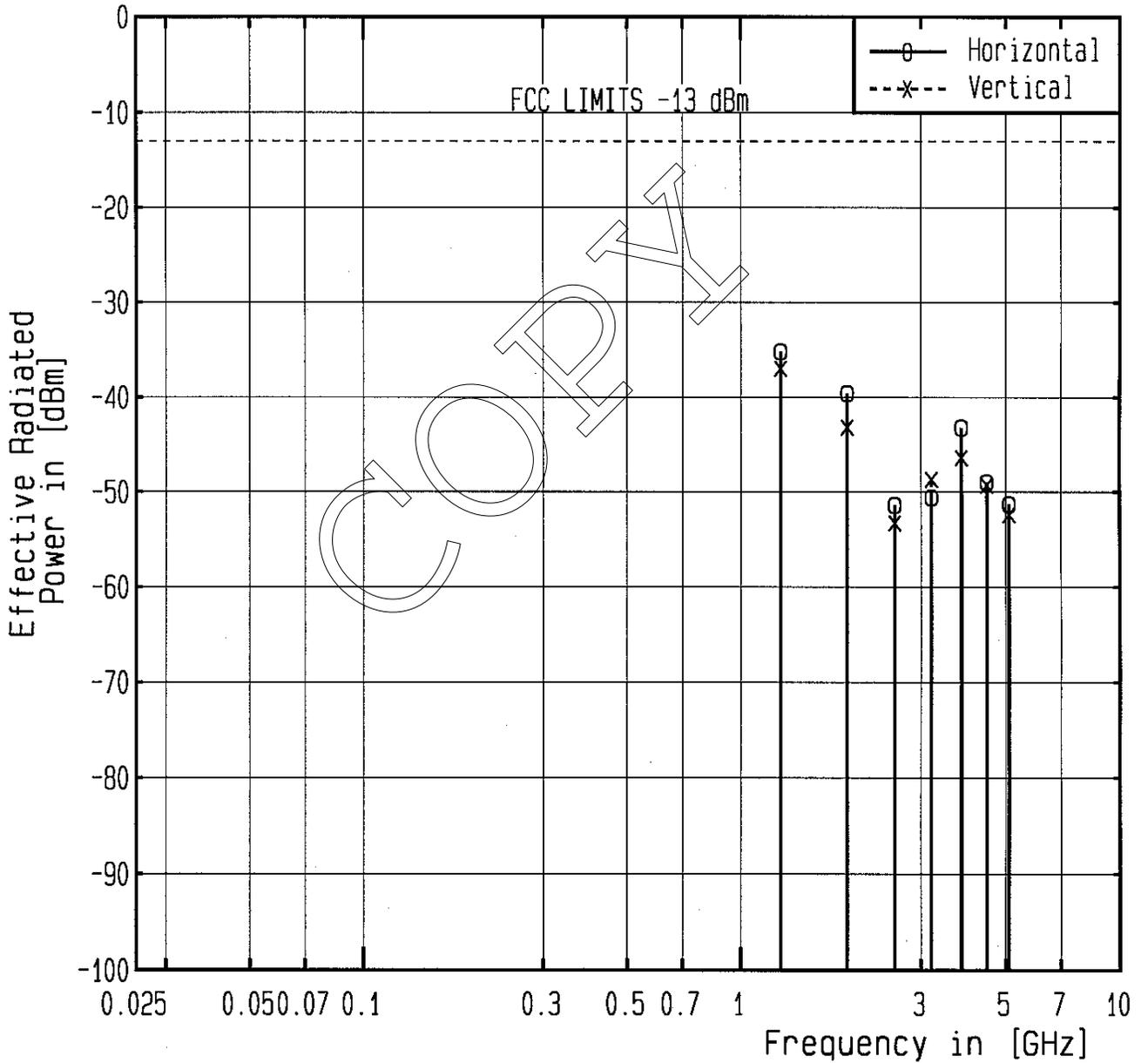
Radiated Spurious Emissions

FCC ID : AK8WRT847B
Serial No. :
Carrier : 76.00 [mW] at 470.125 [MHz]



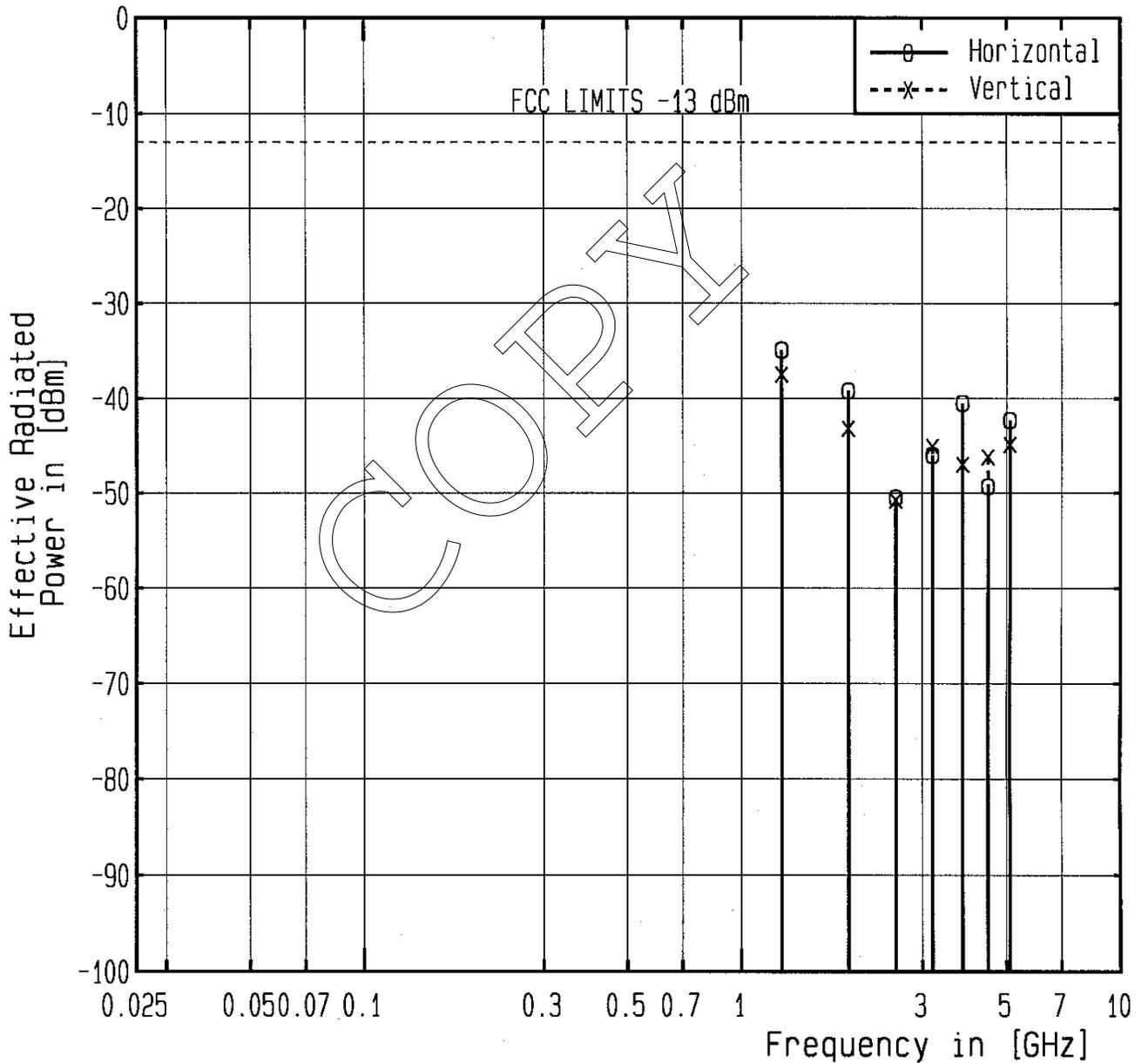
Radiated Spurious Emissions

FCC ID : AK8WRT847B
Serial No. :
Carrier : 10.30 [mW] at 638.125 [MHz]



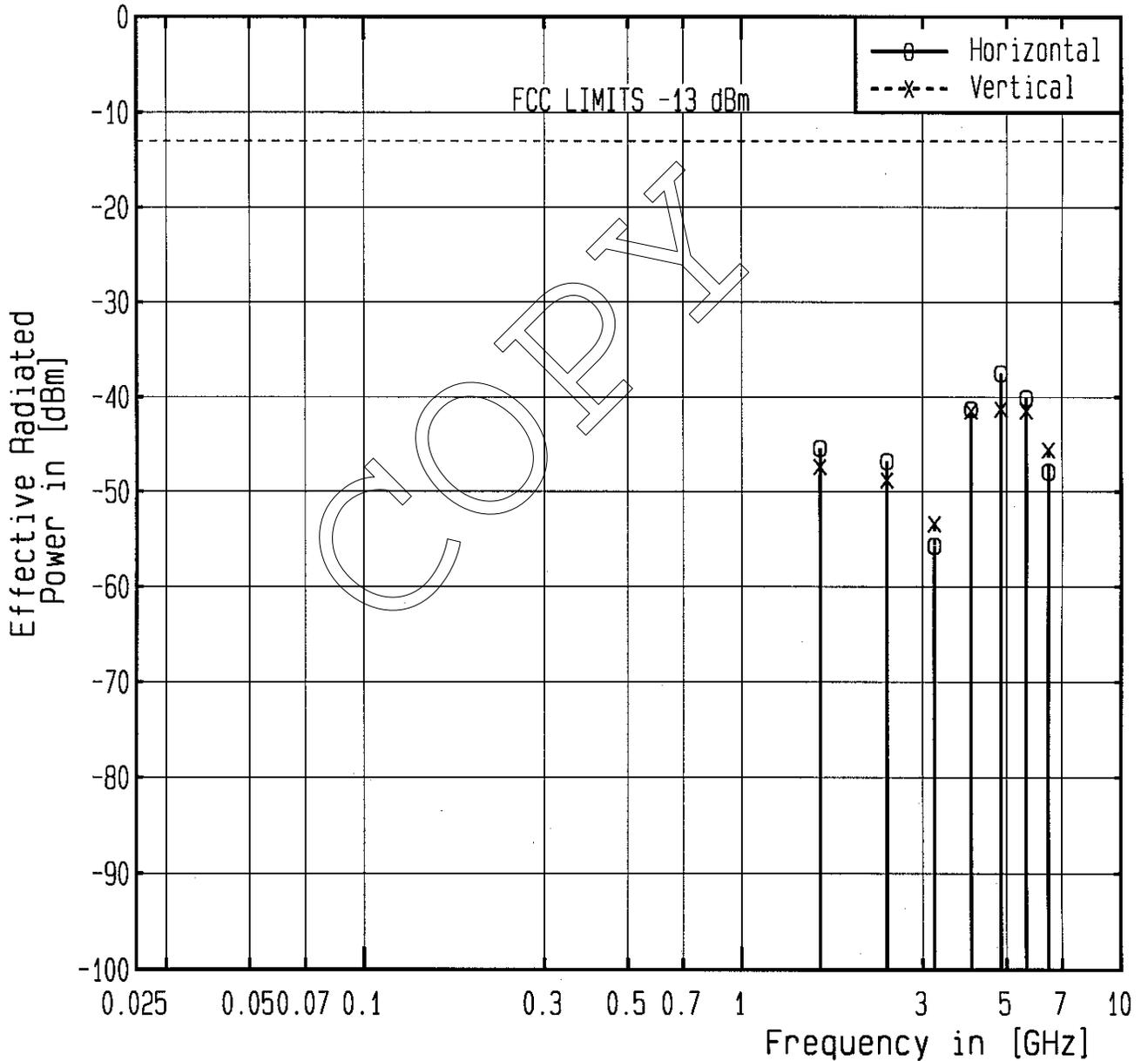
Radiated Spurious Emissions

FCC ID : AK8WRT847B
Serial No. :
Carrier : 49.10 [mW] at 638.125 [MHz]



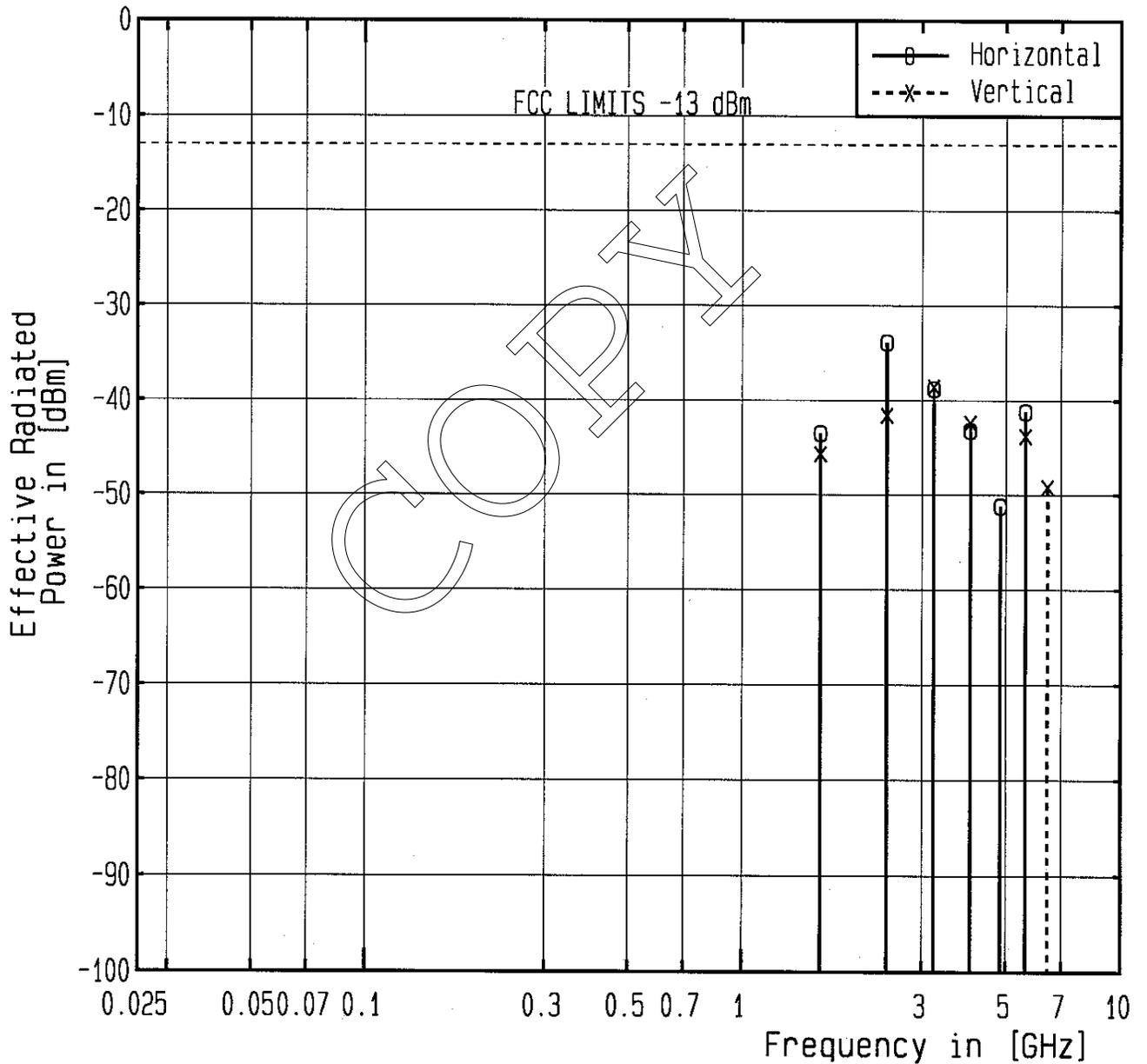
Radiated Spurious Emissions

FCC ID : AK8WRT847B
Serial No. :
Carrier : 12.90 [mW] at 805.875 [MHz]



Radiated Spurious Emissions

FCC ID : AK8WRT847B
Serial No. :
Carrier : 53.70 [mW] at 805.875 [MHz]



2.4 Occupied Bandwidth Measurement

Date : August 5, 2000
Temp.: 25°C Humi.: 60 %

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

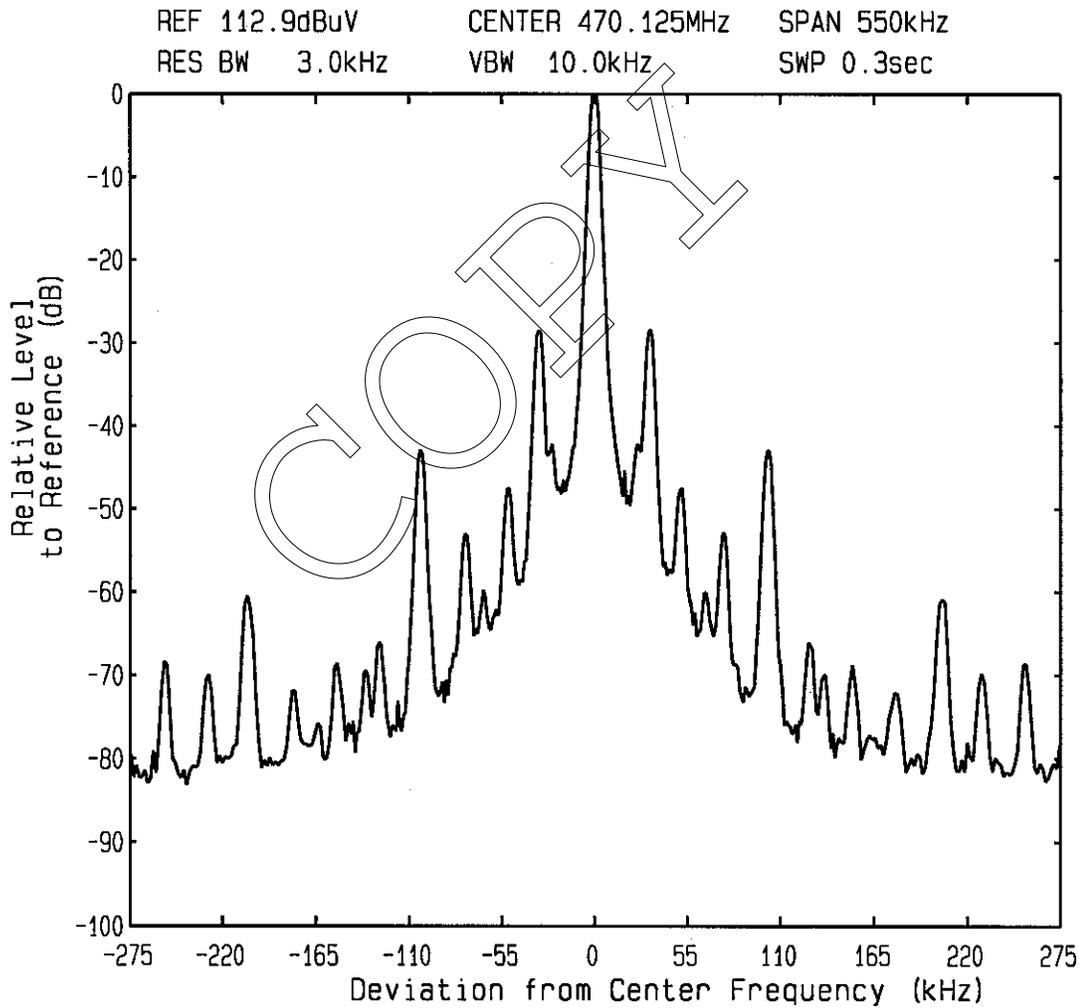
Shigeru Osawa

Testing Engineer

Emission Limitation

FCC ID : AK8WRT847B
Model : WRT-847B

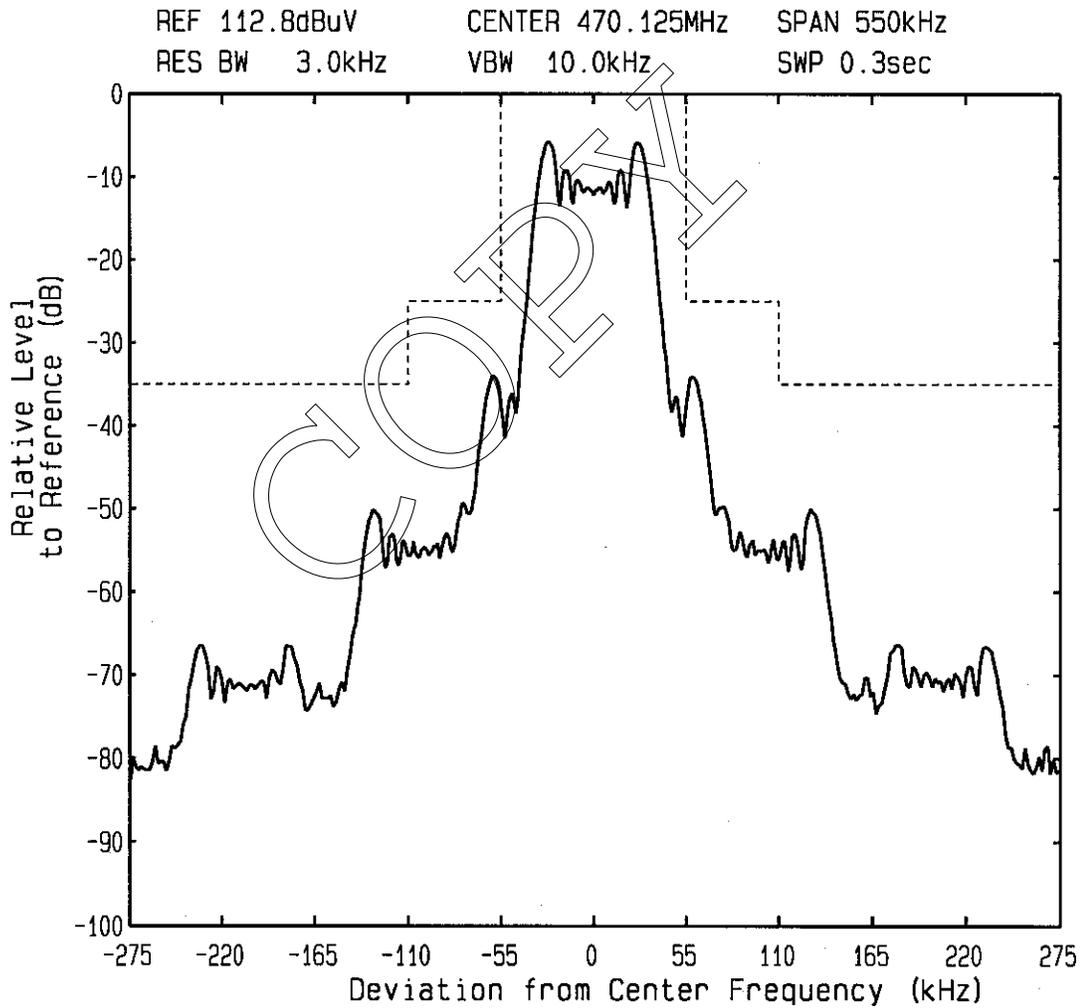
Mode of EUT : Transmit (10mW Setting)
Reference Carrier Level



Emission Limitation

FCC ID : AK8WRT847B
Model : WRT-847B

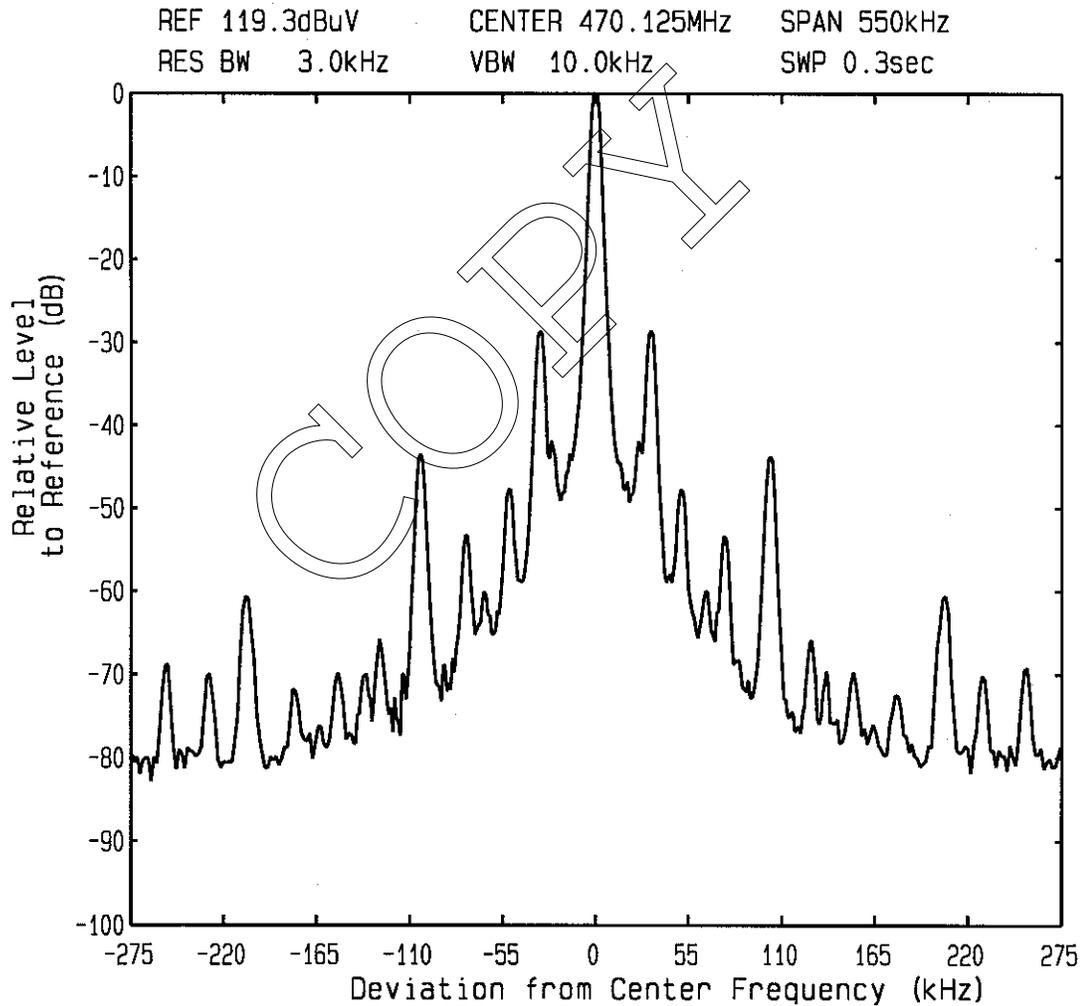
Mode of EUT : Transmit (10mW Setting)
2.5 kHz, -25.8dBV



Emission Limitation

FCC ID : AK8WRT847B
Model : WRT-847B

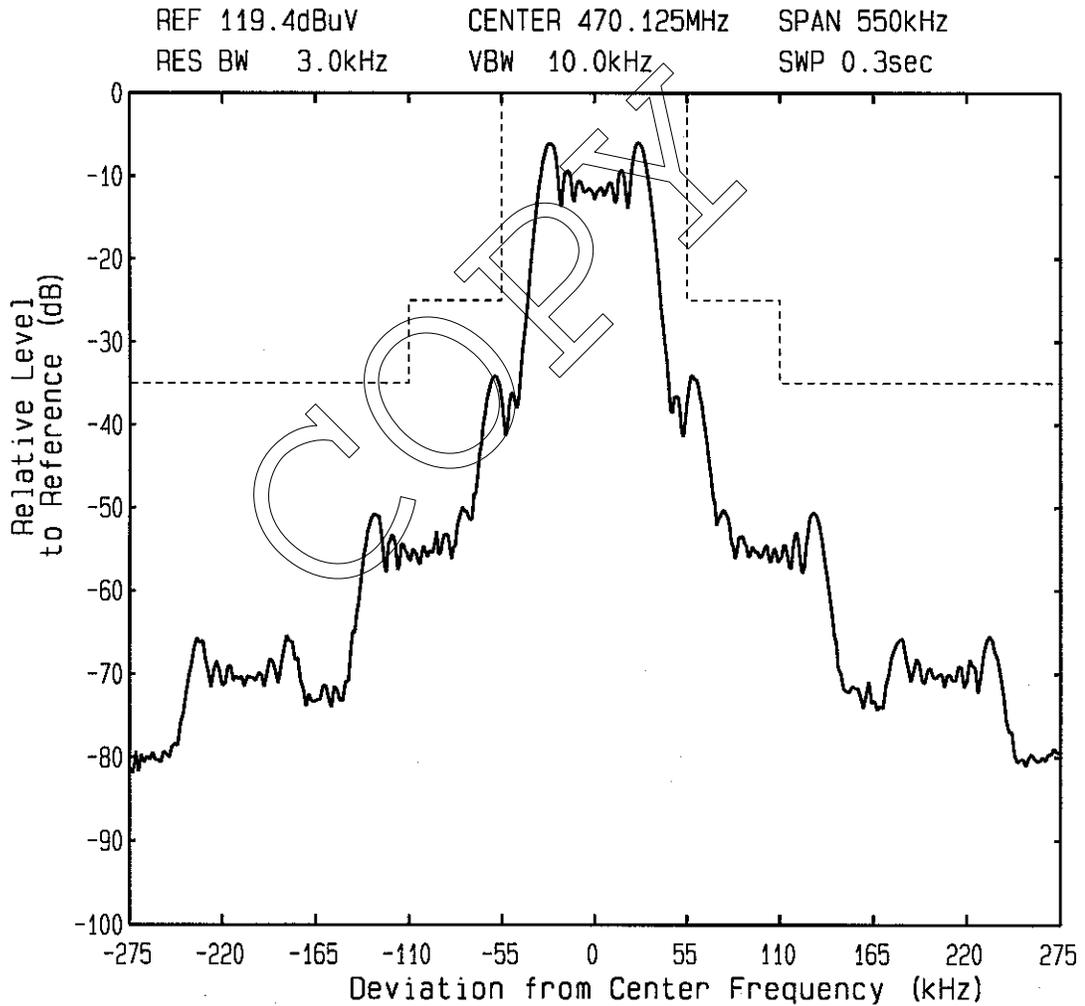
Mode of EUT : Transmit (50mW Setting)
Reference Carrier Level



Emission Limitation

FCC ID : AK8WRT847B
Model : WRT-847B

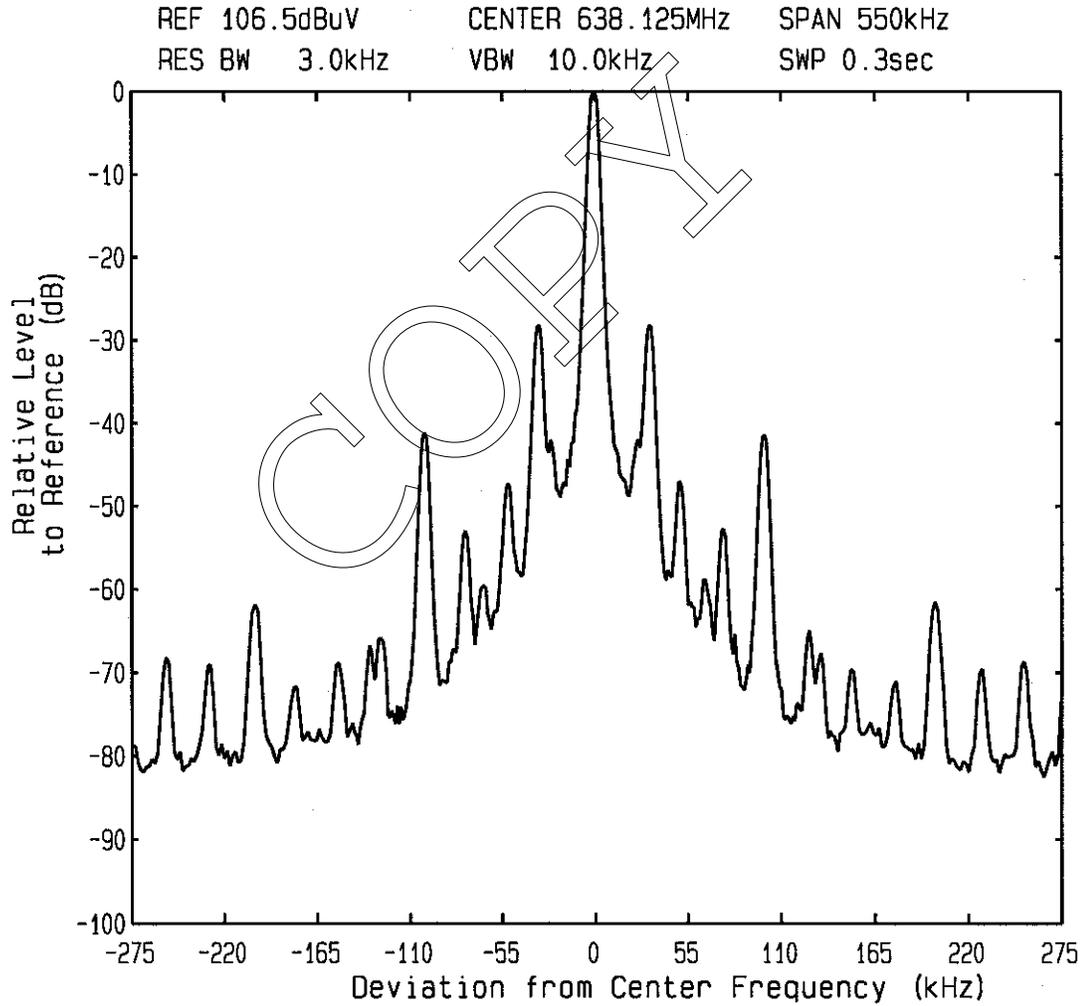
Mode of EUT : Transmit (50mW Setting)
2.5 kHz, -25.8 dBV



Emission Limitation

FCC ID : AK8WRT847B
Model : WRT-847B

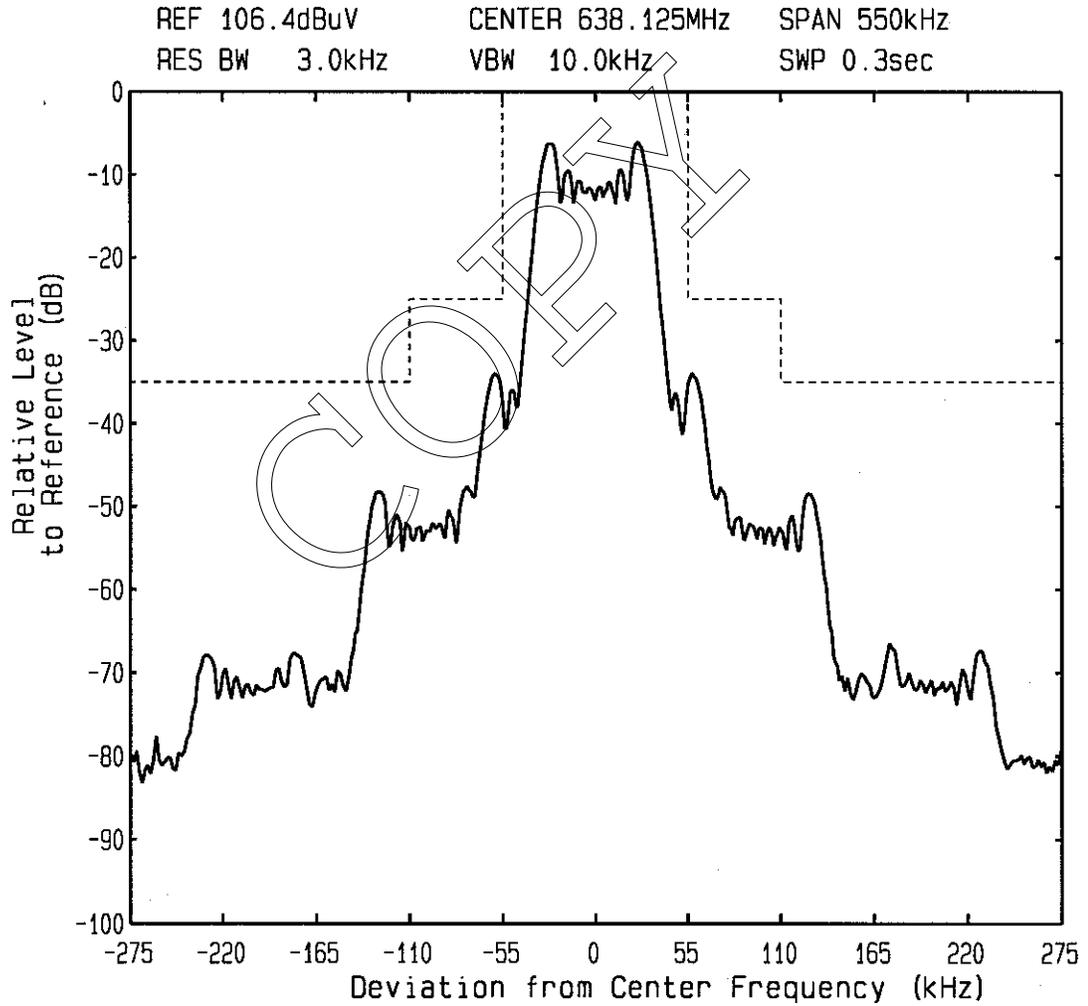
Mode of EUT : Transmit (10mW Setting)
Reference Carrier Level



Emission Limitation

FCC ID : AK8WRT847B
Model : WRT-847B

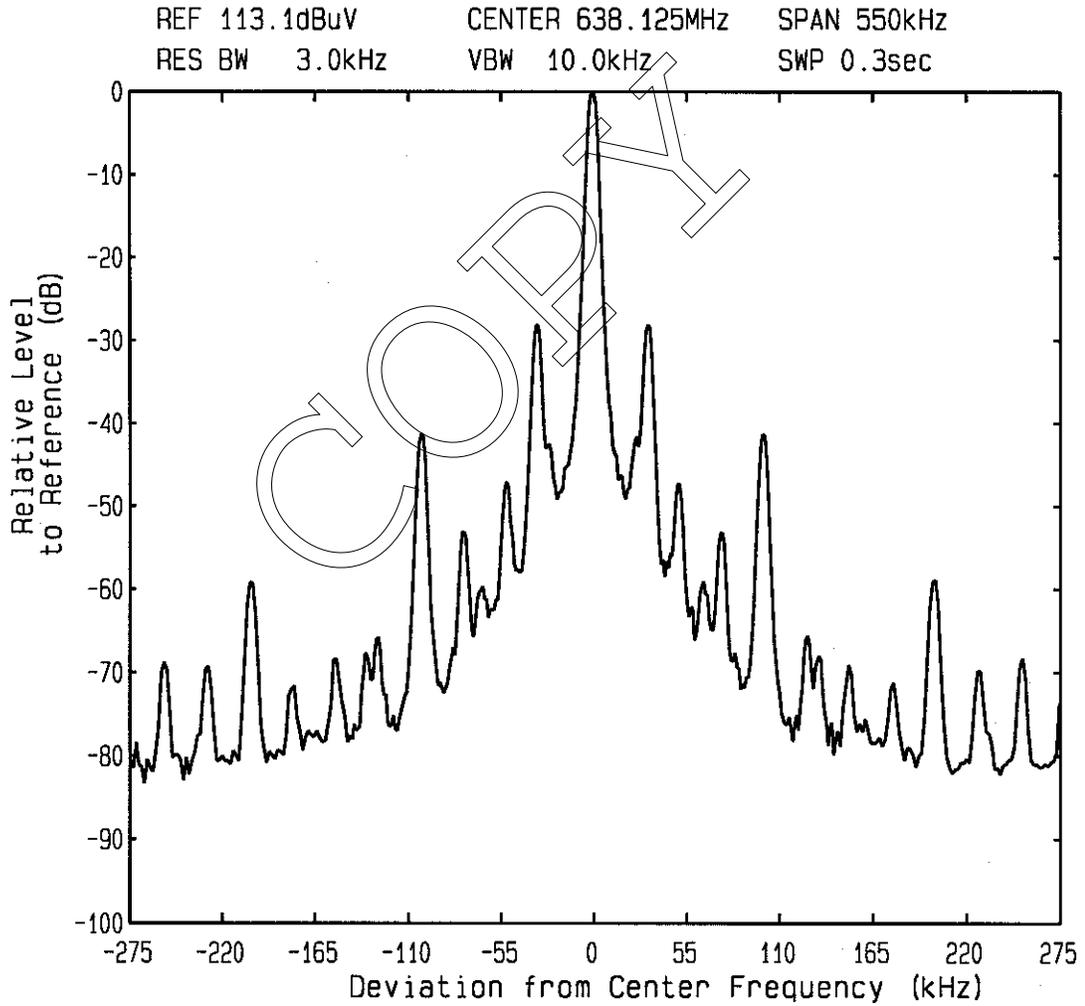
Mode of EUT : Transmit (10mW Setting)
2.5 kHz, -26.5 dBV



Emission Limitation

FCC ID : AK8WRT847B
Model : WRT-847B

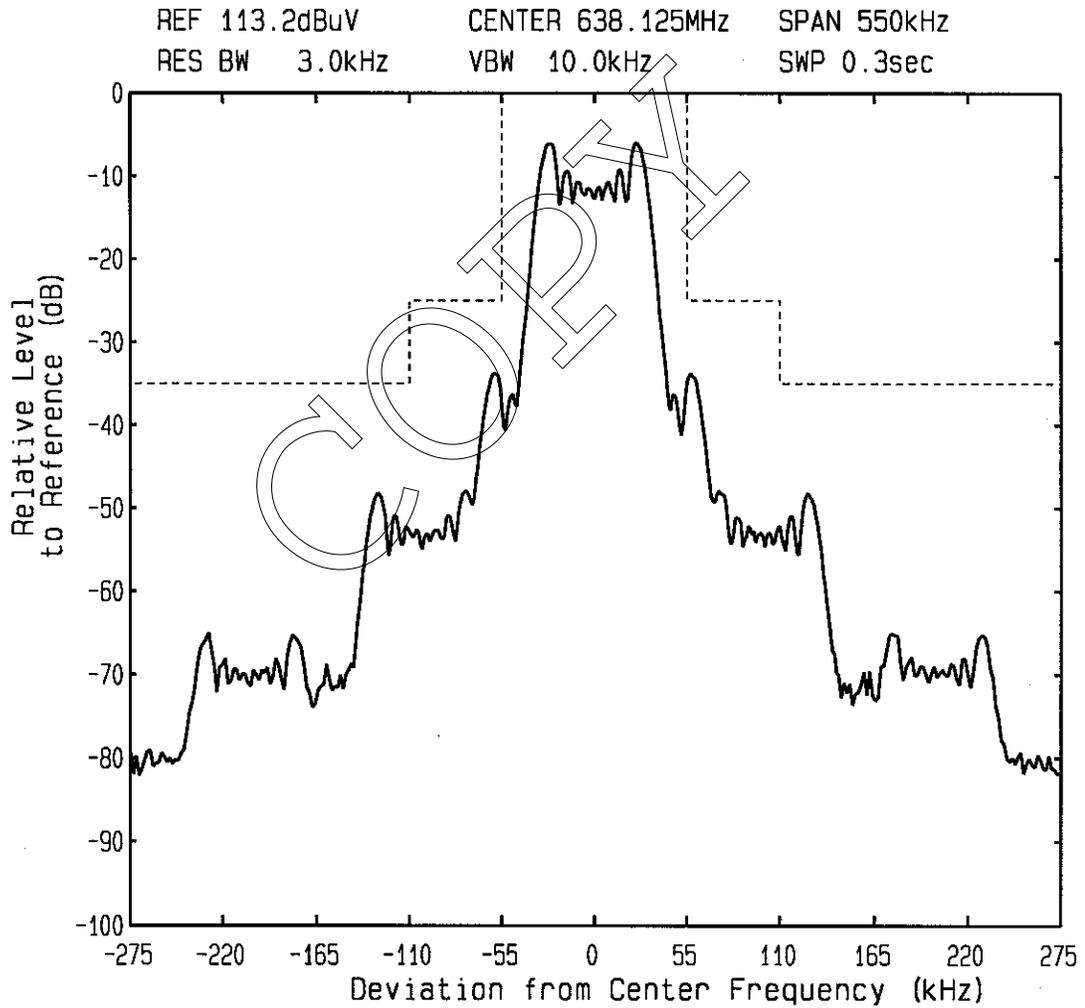
Mode of EUT : Transmit (50mW Setting)
Reference Carrier Level



Emission Limitation

FCC ID : AK8WRT847B
Model : WRT-847B

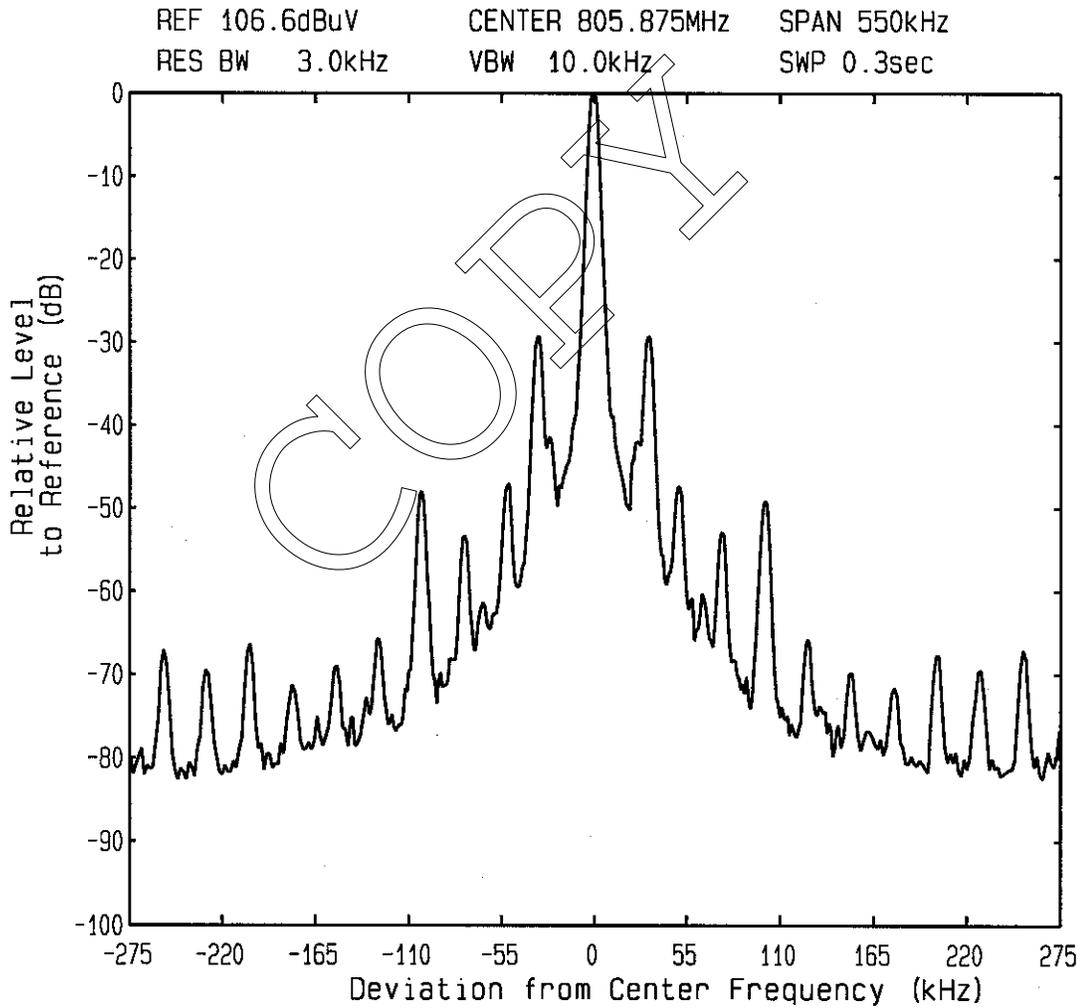
Mode of EUT : Transmit (50mW Setting)
2.5 kHz, -26.6 dBV



Emission Limitation

FCC ID : AK8WRT847B
Model : WRT-847B

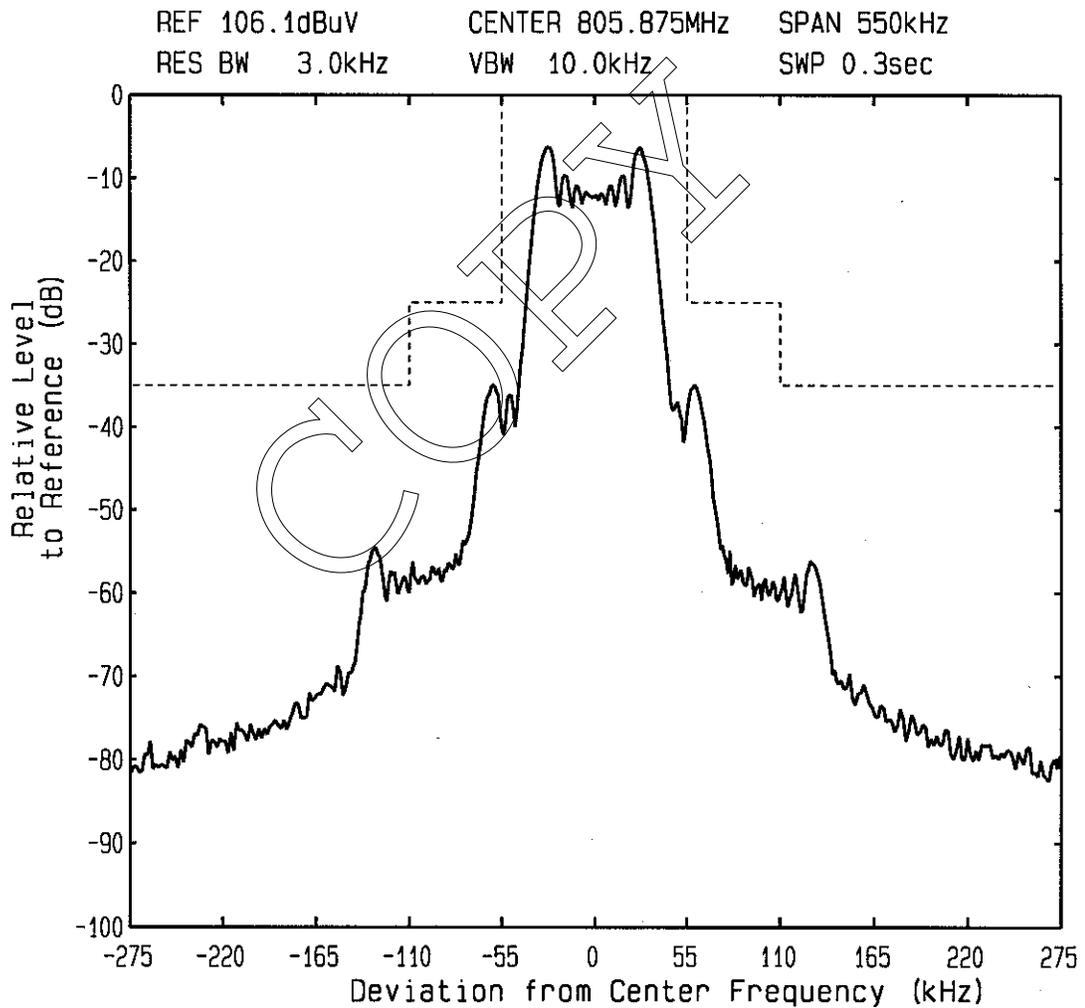
Mode of EUT : Transmit (10mW Setting)
Reference Carrier Level



Emission Limitation

FCC ID : AK8WRT847B
Model : WRT-847B

Mode of EUT : Transmit (10mW Setting)
2.5 kHz, -26.0 dBV



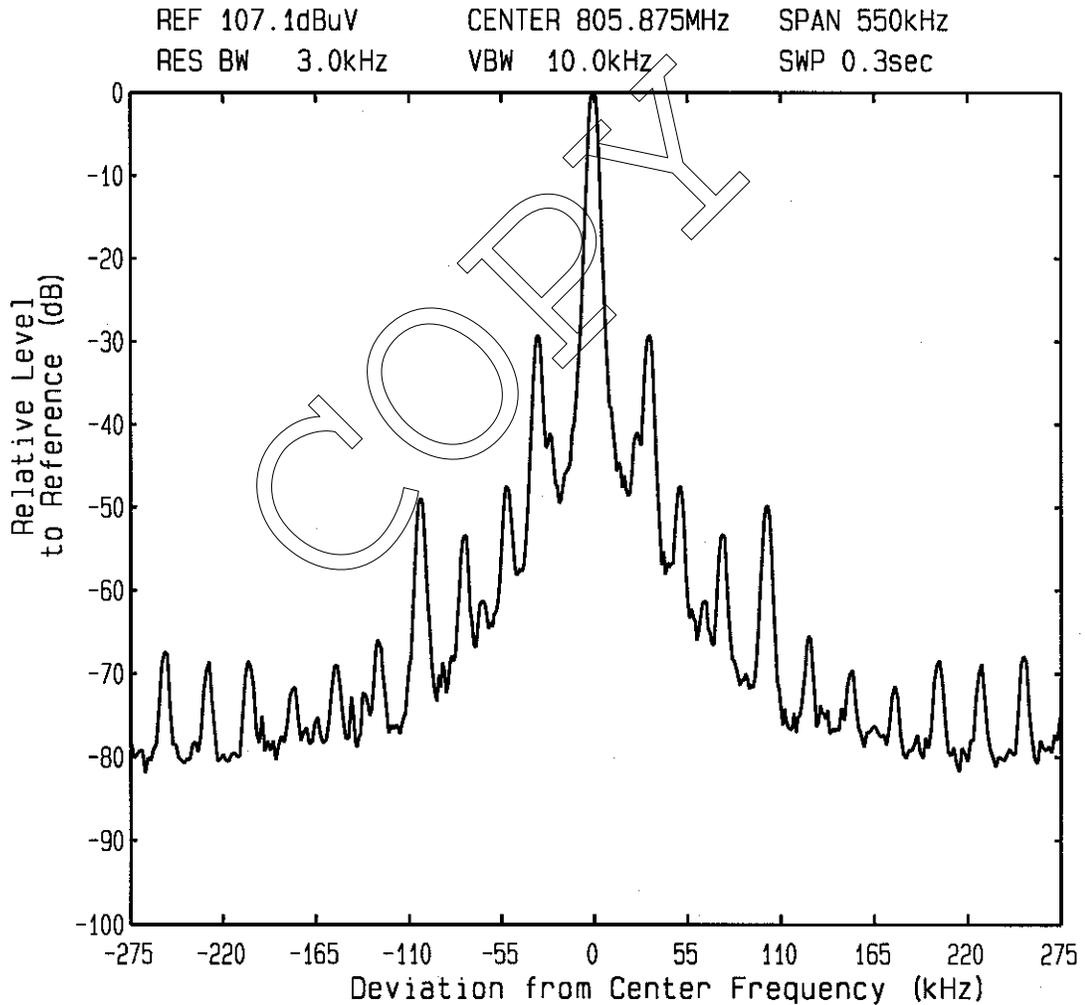
Emission Limitation

FCC ID : AK8WRT847B

Model : WRT-847B

Mode of EUT : Transmit (50mW Setting)

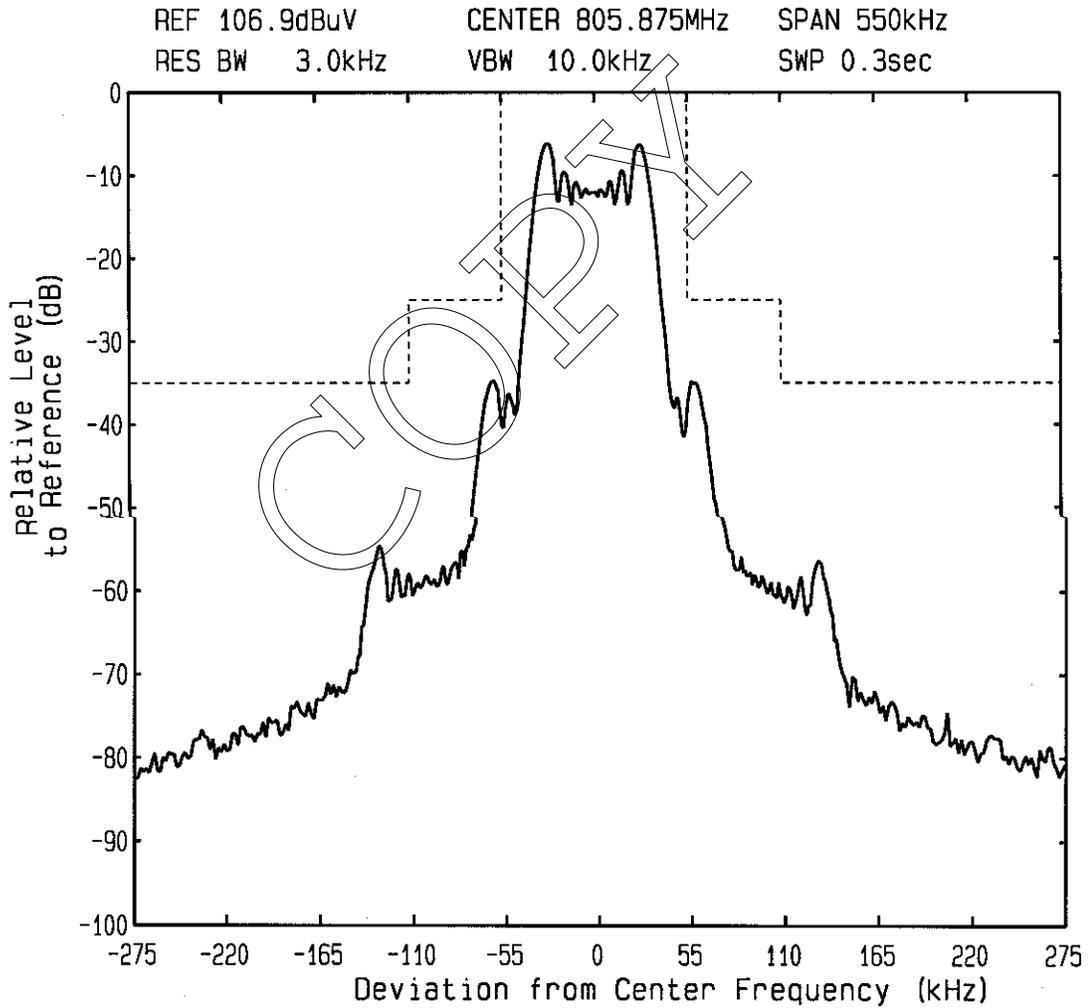
Reference Carrier Level



Emission Limitation

FCC ID : AK8WRT847B
Model : WRT-847B

Mode of EUT : Transmit (50mW Setting)
2.5 kHz, -26.0 dBV





2.5 Frequency Stability Measurement

Date : August 8, 2000
 Temp.: 24°C Humi.: 80 %

Ambient Temp. (°C)	Frequency (MHz)	Transmitting Frequency (MHz)	Maximum Tolerance(%)
-30	470.125	470.119535	-0.001162
	638.125	638.118990	-0.000942
	805.875	805.860745	-0.001769
-20	470.125	470.122655	-0.000499
	638.125	638.123010	-0.000312
	805.875	805.867016	-0.000991
-10	470.125	470.124565	-0.000093
	638.125	638.125486	+0.000076
	805.875	805.870644	-0.000541
0	470.125	470.125554	+0.000118
	638.125	638.126411	+0.000221
	805.875	805.873476	-0.000189
+10	470.125	470.125713	+0.000152
	638.125	638.126453	+0.000158
	805.875	805.874611	-0.000048
+20	470.125	470.125648	+0.000138
	638.125	638.126009	+0.000158
	805.875	805.875191	+0.000024
+30	470.125	470.125431	+0.000092
	638.125	638.125189	+0.000030
	805.875	805.875324	+0.000040
+40	470.125	470.125118	+0.000025
	638.125	638.124308	-0.000108
	805.875	805.875500	+0.000062
+50	470.125	470.124916	-0.000018
	638.125	638.123768	-0.000193
	805.875	805.875983	+0.000122

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

Ambient Temp. (°C)	Frequency (MHz)	Transmitting Frequency (MHz)	Maximum Tolerance(%)
-30	470.125	470.119594	-0.001150
	638.125	638.118990	-0.000942
	805.875	805.860760	-0.001767
-20	470.125	470.122697	-0.000490
	638.125	638.123012	-0.000312
	805.875	805.867213	-0.000966
-10	470.125	470.124607	-0.000084
	638.125	638.125490	+0.000070
	805.875	805.870994	-0.000497
0	470.125	470.125573	+0.000122
	638.125	638.126412	+0.000221
	805.875	805.873478	-0.000189
+10	470.125	470.125733	+0.000156
	638.125	638.126452	+0.000228
	805.875	805.874613	-0.000048
+20	470.125	470.125663	+0.000141
	638.125	638.126010	+0.000158
	805.875	805.875193	+0.000024
+30	470.125	470.125447	+0.000095
	638.125	638.125194	+0.000030
	805.875	805.875325	+0.000040
+40	470.125	470.125159	+0.000034
	638.125	638.124309	-0.000108
	805.875	805.875502	+0.000062
+50	470.125	470.124958	-0.000009
	638.125	638.123789	-0.000190
	805.875	805.876104	+0.000137

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