



EMI TEST REPORT

JQA APPLICATION NO. : 400-20396

Model No. : UTX-B1

Type of Equipment : UHF Synthesized Transmitter

Regulations Applied : CFR 47 FCC Rules and Regulations Part 74

FCC ID : AK8UTXB1

Applicant : Sony Corporation

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

Manufacturer : Sony Electronics of Korea Corporation

Address : 974-6, Yangduk-dong, Masan,
Kyoungsangnam-do, 630-728 Korea

Received date of EUT : August 26, 2002

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.

Expiration date of FCC test facility filing : May 27, 2005

- 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, 2003)

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 | : AK8UTXB1 |
| 6) Trade Name | : SONY |
| 7) Model No. | : UTX-B1 |
| 8) Operating Frequency Range | : 758.125 MHz – 805.875 MHz |
| 9) Highest Frequency Used in the EUT | : 805.875 MHz |
| 10) Bandwidth | : 110 kHz |
| 11) RF Output Power | : 30/5 mW selectable |
| 12) Serial No. | : 001/002 |
| 13) Date of Manufacture | : August, 2002 |
| 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, 2002

2) Interval :1 year

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<u> </u> - Spectrum Analyzer	8560E	Hewlett Packard	3240A00189	Nov. 2001	1 Year
<u> </u> - Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	Mar. 2002	1 Year
<u> </u> - RF Pre-selector	85685A	Hewlett Packard	2648A00522	Oct. 2001	1 Year
<u> </u> - Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	Apr. 2002	1 Year
<u> </u> - RF Pre-selector	85685A	Hewlett Packard	2091A00933	Apr. 2002	1 Year
<u> </u> - Test Receiver	ESV	Rohde & Schwarz	872148/039	May 2002	1 Year
<u> x </u> - Test Receiver	ESVS10	Rohde & Schwarz	826148/002	May 2002	1 Year
<u> </u> - Test Receiver	ESVS10	Rohde & Schwarz	832699/001	May 2002	1 Year
<u> x </u> - Antenna	KBA-511	Kyoritsu Electrical	0-170-1	Nov. 2001	1 Year
<u> </u> - Antenna	KBA-511A	Kyoritsu Electrical	0-201-13	Nov. 2001	1 Year
<u> x </u> - Antenna	KBA-611	Kyoritsu Electrical	0-147-14	Nov. 2001	1 Year
<u> x </u> - Antenna	KBA-611	Kyoritsu Electrical	0-210-5	Nov. 2001	1 Year
<u> </u> - Biconical Antenna	BBA9106	Schwarzbeck	VHA91031150	Nov. 2001	1 Year
<u> </u> - Biconical Antenna	BBA9106	Schwarzbeck	11905078E0	Nov. 2001	1 Year
<u> </u> - Log-Periodic Antenna	UHALP9107	Schwarzbeck	11905079E0	Nov. 2001	1 Year
<u> </u> - Log-Periodic Antenna	UHALP9107	Schwarzbeck	11905110	Nov. 2001	1 Year
<u> x </u> - RF Cable	5D-2W	Fujikura	155-21-001E0	Feb. 2002	1 Year
<u> </u> - RF Cable	5D-2W	Fujikura	155-21-002E0	Feb. 2002	1 Year
<u> x </u> - Power Meter	436A	Hewlett Packard	1725A01930	Apr. 2002	1 Year
<u> x </u> - Power Sensor	8482A	Hewlett Packard	1650A00140	Apr. 2002	1 Year
<u> x </u> - Signal Generator	6061A	Gigatronics	5130593	Mar. 2002	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 & 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 :N/A

2) Interval :N/A

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<u> </u> - Spectrum Analyzer	8560E	Hewlett Packard	3240A00189	Nov. 2001	1 Year
<u> </u> - Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	Mar. 2002	1 Year
<u> </u> - RF Pre-selector	85685A	Hewlett Packard	2648A00522	Oct. 2001	1 Year
<u> x </u> - Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	Apr. 2002	1 Year
<u> x </u> - RF Pre-selector	85685A	Hewlett Packard	2091A00933	Apr. 2002	1 Year
<u> x </u> - Log-Periodic Antenna	HL 025	Rohde & Schwarz	340182/015	Jan. 2002	1 Year
<u> </u> - RF Amplifier	DBP-0102N5334272B	DBS Microwave Inc.	012	June 2002	1 Year
<u> x </u> - RF Amplifier	WJ-6882-814	Watkins-Johnson	0414	June 2002	1 Year
<u> x </u> - RF Amplifier	WJ-5315-556	Watkins-Johnson	106	June 2002	1 Year
<u> </u> - RF Amplifier	WJ-5320-307	Watkins-Johnson	645	June 2002	1 Year
<u> x </u> - RF Cable(10m)	S 04272B	Suhner	155-21-011E0	May 2002	1 Year
<u> </u> - RF Cable(2m)	SUCOFLEX 104	Suhner	155-21-012E0	May 2002	1 Year
<u> </u> - RF Cable(1m)	SUCOFLEX 104	Suhner	155-21-013E0	May 2002	1 Year
<u> </u> - RF Cable(1m)	S 04272B	Suhner	155-21-015E0	June 2002	1 Year
<u> </u> Test Receiver	ESI26	Rohde & Schwarz	100043	Aug. 2001	1 Year
<u> </u> - RF Amplifier	JS4-00102600-28-5A	MITEQ	669167	Apr. 2002	1 Year
<u> </u> - RF Cable(4m)	SUCOFLEX 104	Suhner	190630	Dec. 2001	1 Year
<u> </u> - RF Cable(1m)	SUCOFLEX 104	Suhner	182811/4	Dec. 2001	1 Year
<u> </u> - RF Cable(10m)	F130-S1S1-394	MEGA PHASE	10510	Dec. 2001	1 Year

1.3.3 The measurement of the Modulation Characteristics and the Occupied Bandwidth☒ - was performed.☐ - was not applicable.**Used test instruments :**

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
☐ - Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	Mar. 2002	1 Year
☒ - Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	Apr. 2002	1 Year
☒ - Function Generator	3325B	Hewlett Packard	2847A03284	Jul. 2002	1 Year
☒ - FM Linear Detector	MS61A	Anritsu Corp.	M77486	Oct. 2001	1 Year
☒ - Level Meter	ML422C	Anritsu Corp.	M87571	June 2002	1 Year
☒ - Attenuator	355D	Hewlett Packard	219-10782	Apr. 2002	1 Year
☐ - Attenuator	49-10-43	Weinschel	KA319	Apr. 2002	1 Year
☐ - Attenuator	49-20-43	Weinschel	KK162	Apr. 2002	1 Year
☐ - Attenuator	49-30-43	Weinschel	KJ988	Apr. 2002	1 Year

1.3.4 The measurement of the Frequency Stability☒ - was performed.☐ - was not applicable.**Used test instruments :**

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
☒ - Frequency Counter	53131A	Hewlett Packard	3546A11807	May 2002	1 Year
☒ - Oven	-	Ohnishi Co. Ltd.	-	May 2002	1 Year
☒ - DC Power Supply	6628A	Hewlett Packard	3224A00284	June 2002	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;

- 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 : August 30, 2002

End of testing : September 13, 2002

- 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.	FCC ID	Serial No.
A	UHF Synthesized Transmitter	Sony Electronics of Korea Corporation	UTX-B1	AK8UTXB1	001/002

The measurements was carried out with the following supported connected :

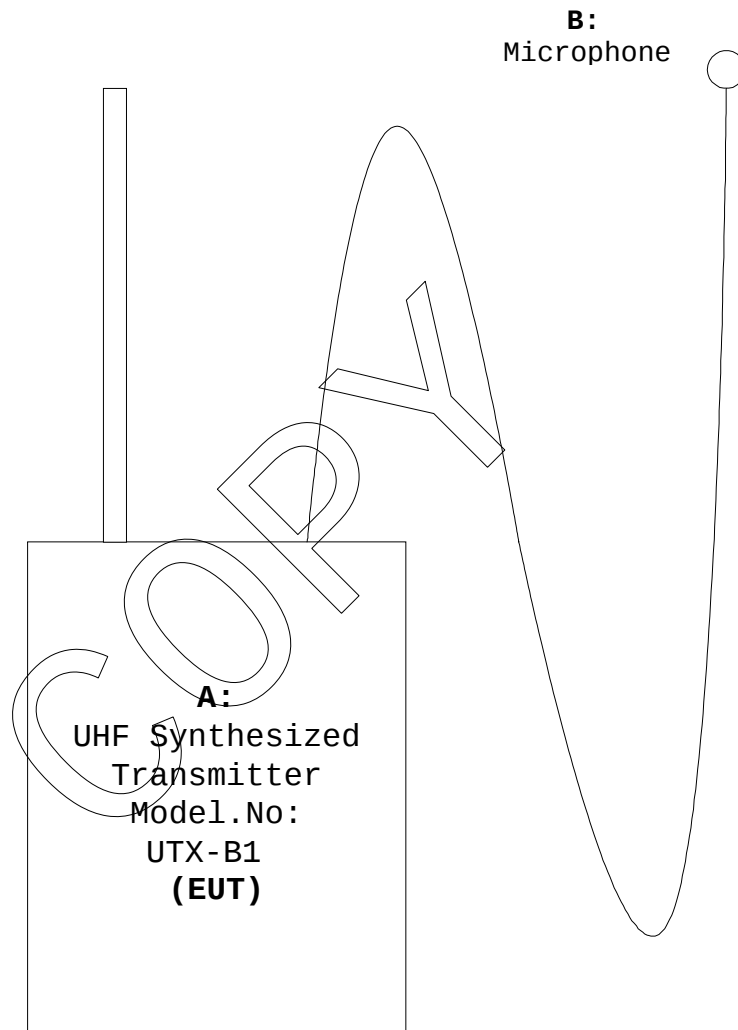
Symbol	Item	Manufacturer	Model No.	Serial No.
B	Microphone(with 1.2 m shielded cable)	Sony Corporation	-	-

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:758.125 MHz, 782.125 MHz and 805.875 MHz)

1.7.3 Generating and Operating frequency of EUT

758.125 MHz, 782.125 MHz and 805.875 MHz

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.

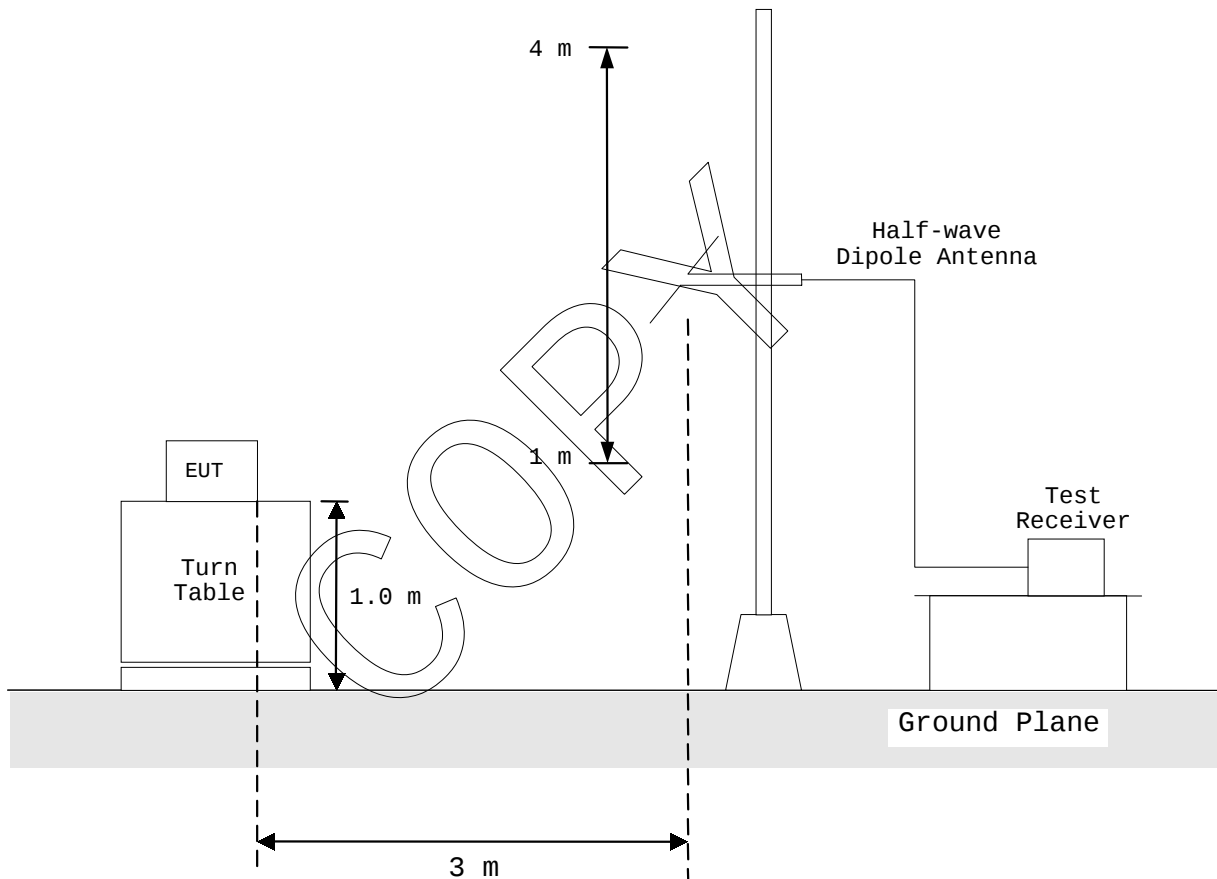
The transmitter was removed and replaced with a half-wave dipole antenna. The center of the half-wave dipole antenna was placed approximately at the same location as the center of the transmitter. (In the case of the lower frequencies, where the half-wave dipole antenna is very long, this will be impossible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



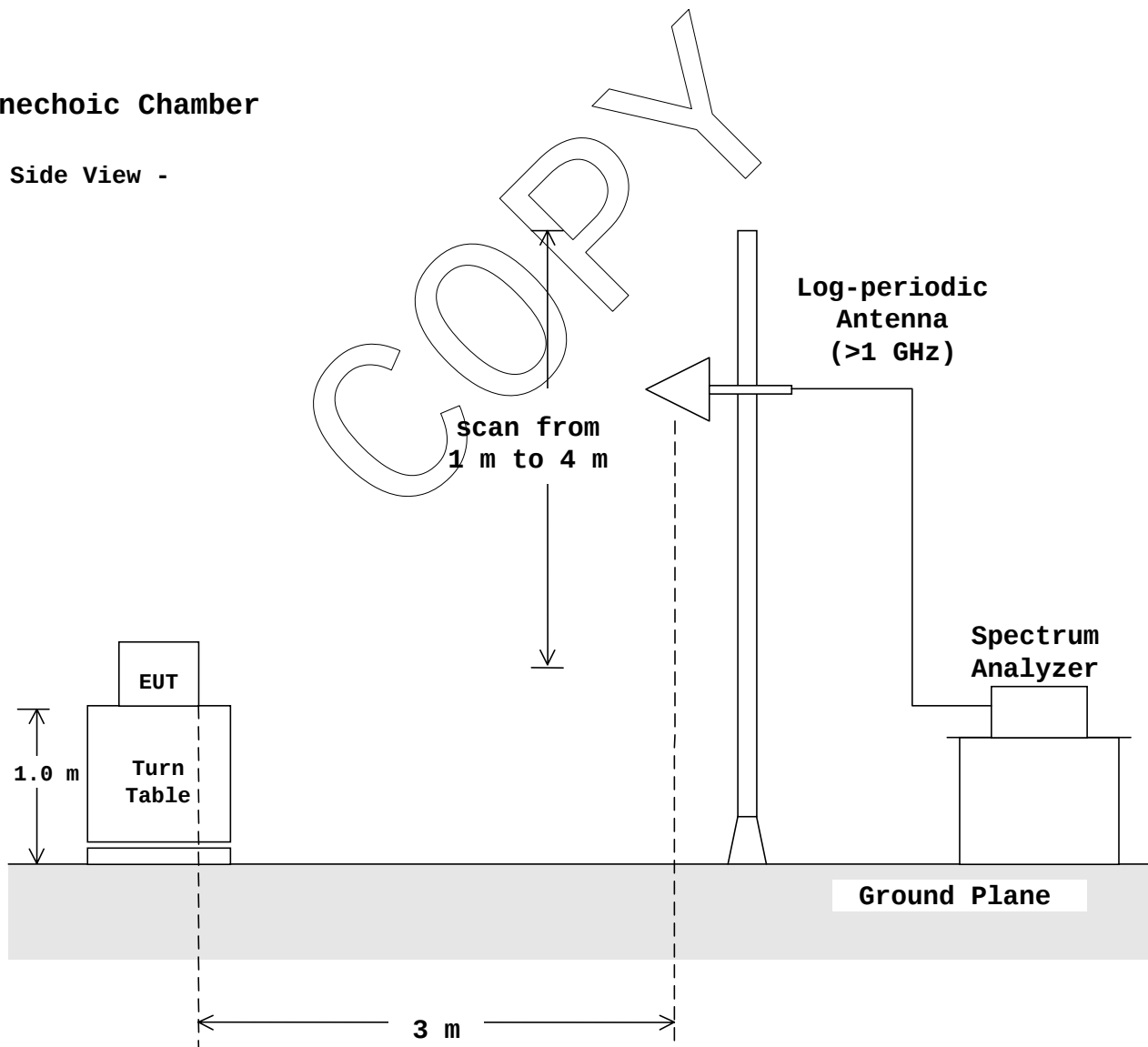
1.9.2 Radiated Emission (Above 1 GHz) :

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

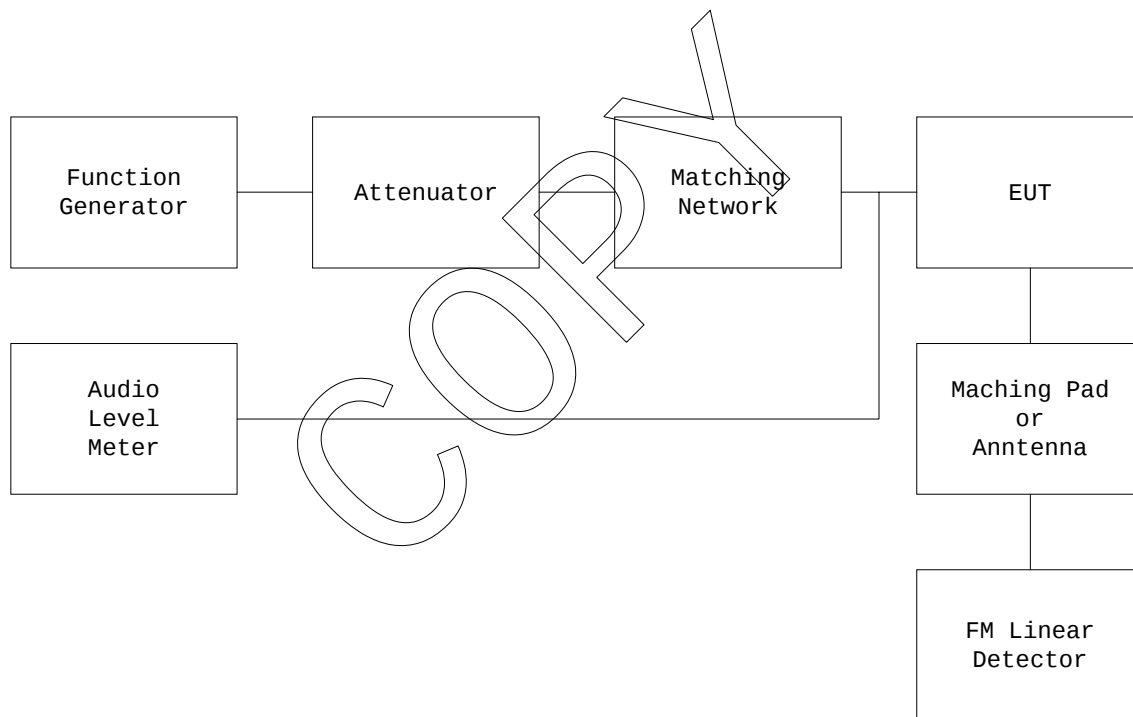
- Side View -



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

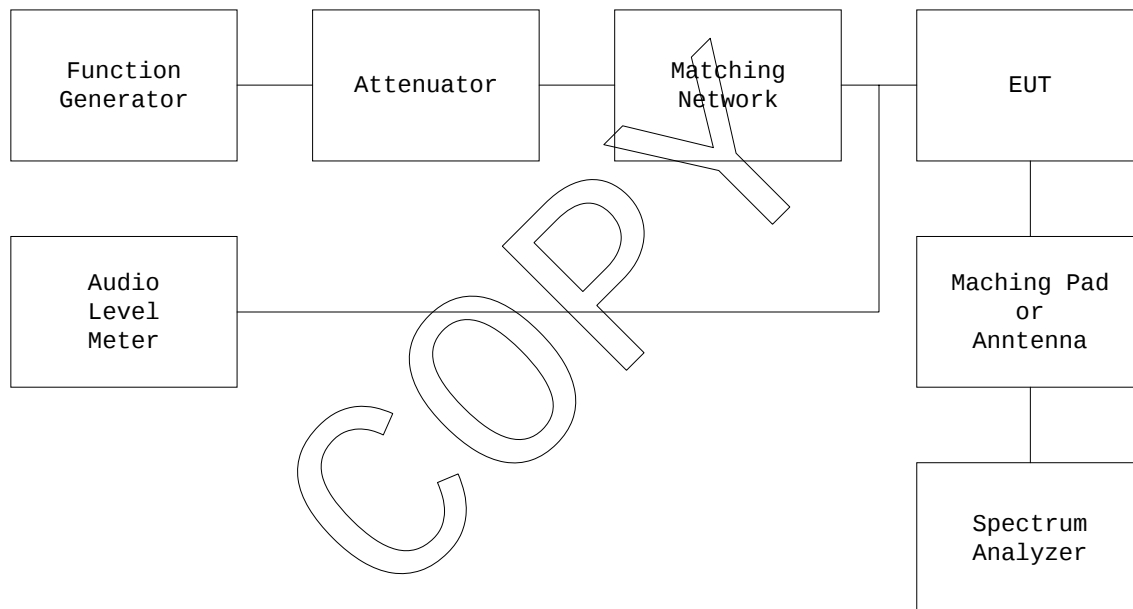
The modulation response was measured up to maximum modulation for each of three tones: 100 Hz, 2500 Hz and 15 kHz. The audio input level was changed from 10% modulation up to maximum rated modulation.



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.

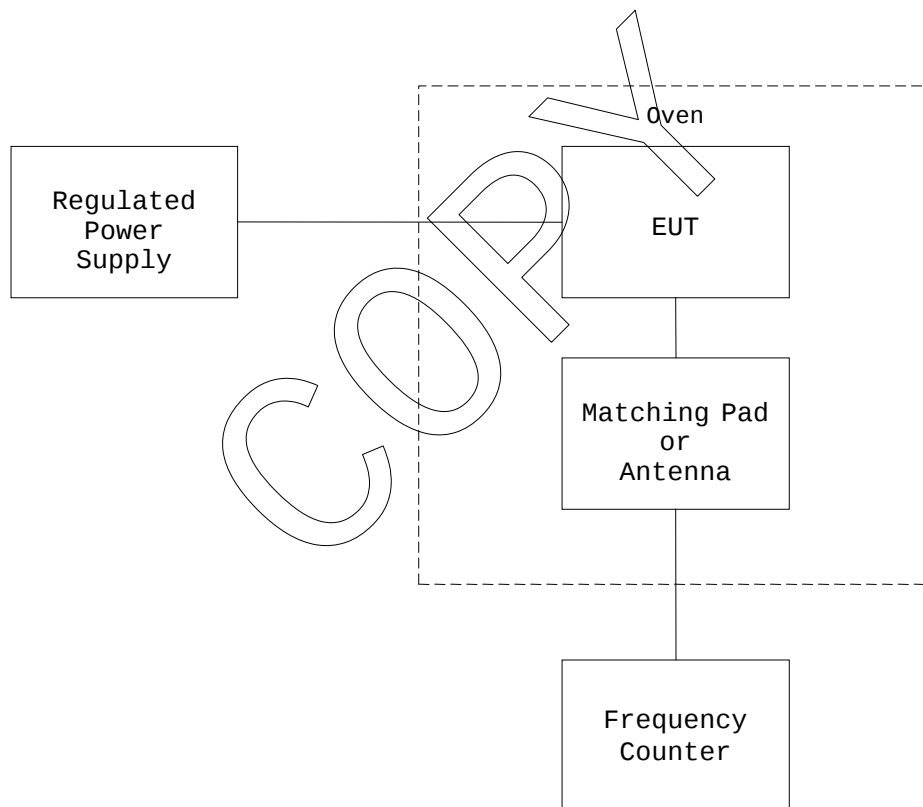
The transmitter was modulated at the input level producing 85% modulation at the maximum response frequency, and with the frequency 2500 Hz.



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°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)

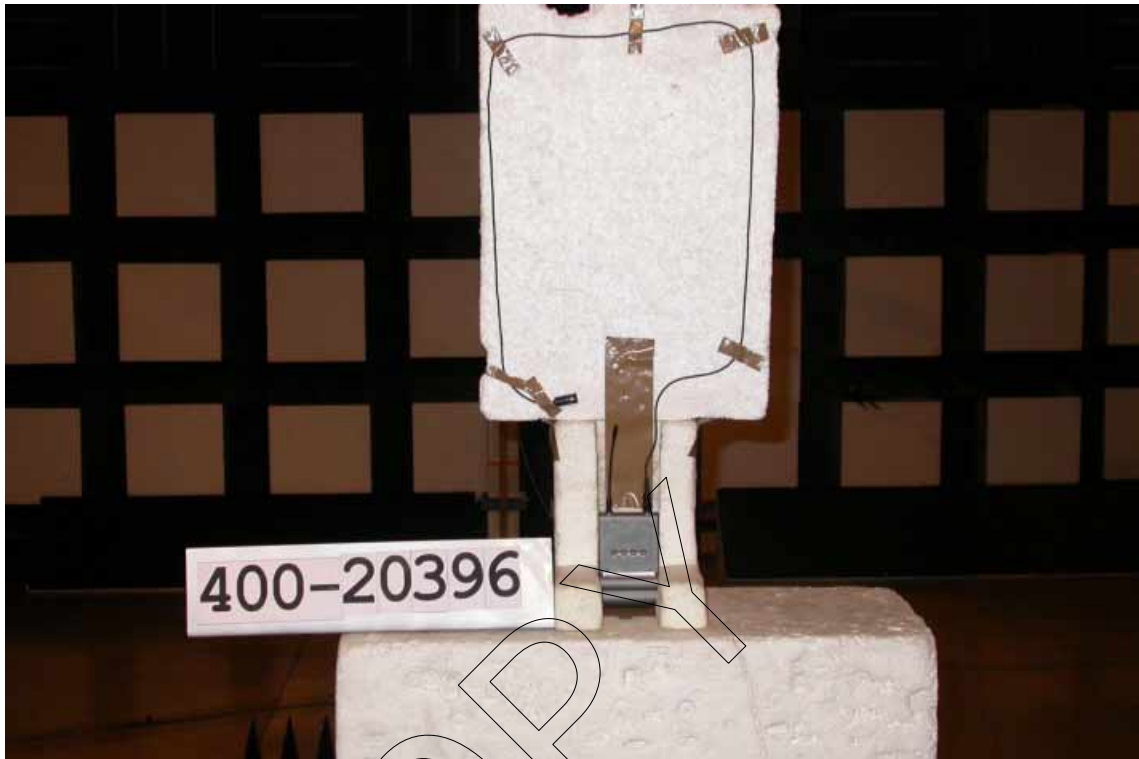


1.10 TEST ARRANGEMENT (PHOTOGRAPHS)

PHOTOGRAPHS OF EUT CONFIGURATION FOR RADIATED EMISSIONS MEASUREMENT

Photograph present configuration with maximum emission







TEST DATA

2.1 RF Power Output

Date : August 30, 2002Temp.: 22 °C Humi.: 76 %

Frequency Range: 758.125 MHz – 805.875 MHz

30 mW Setting

Frequency (MHz)	Output Power ERP(mW)
758.125	37.5
782.125	32.2
805.875	32.9

5 mW Setting

Frequency (MHz)	Output Power ERP(mW)
758.125	9.20
782.125	8.28
805.875	10.40

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

Tested by :

Yoichi Nakajima
Testing Engineer



2.2 Modulation Characteristics

Date : September 10, 2002
Temp.: 24°C Humi.: 74 %

Measurements Results :

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

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

Refer to the attached graphs.

Tested by :

Y. Nakajima
Yoichi Nakajima
Testing Engineer

COPY



Modulation Frequency Response

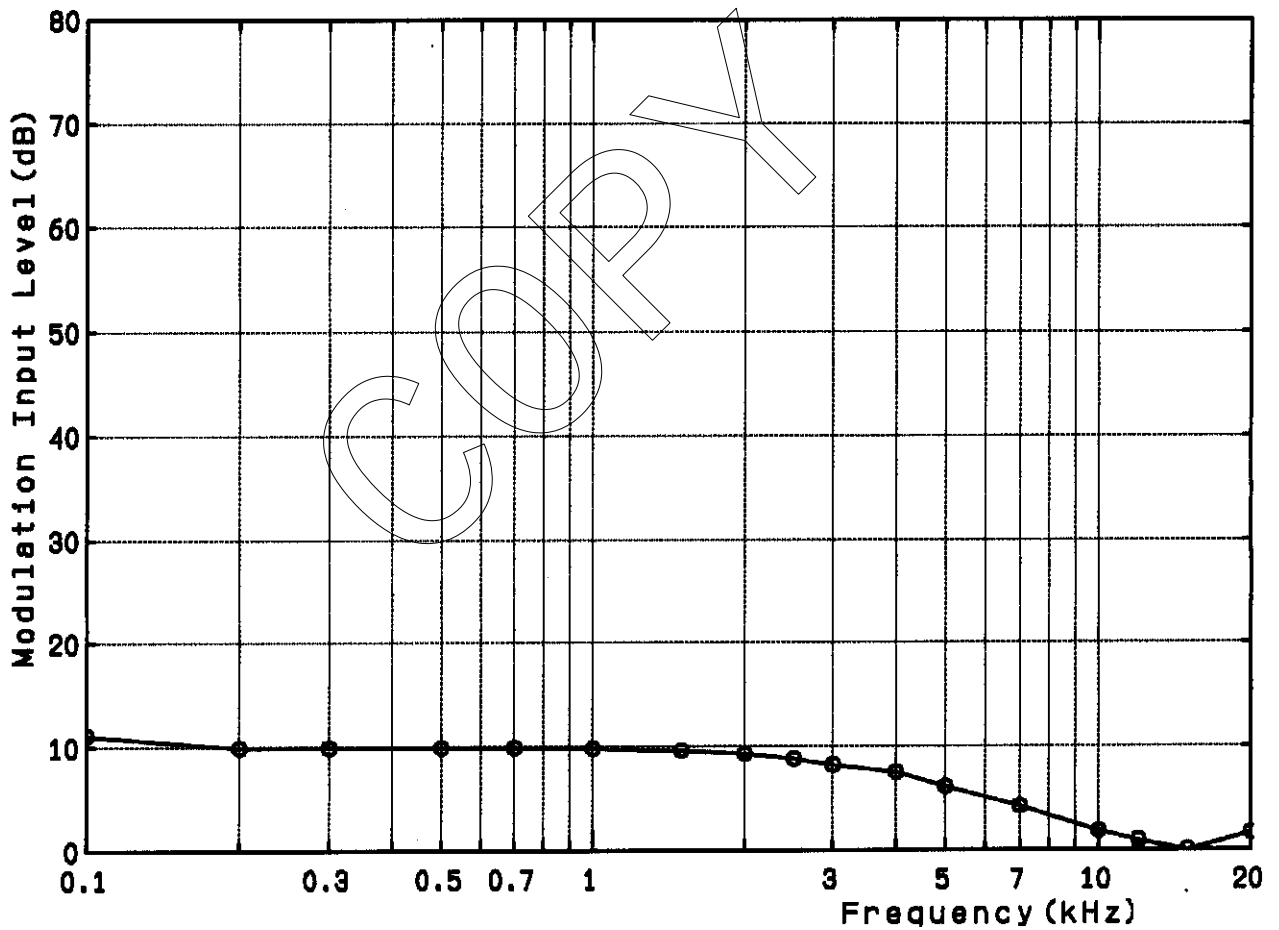
FCC ID : AK8UTXB1

Model : UTX-B1

Test Frequency : 750.125 MHz

Test Condition : 30 mW Setting

0 dB = -48.7 dBV





Modulation Frequency Response

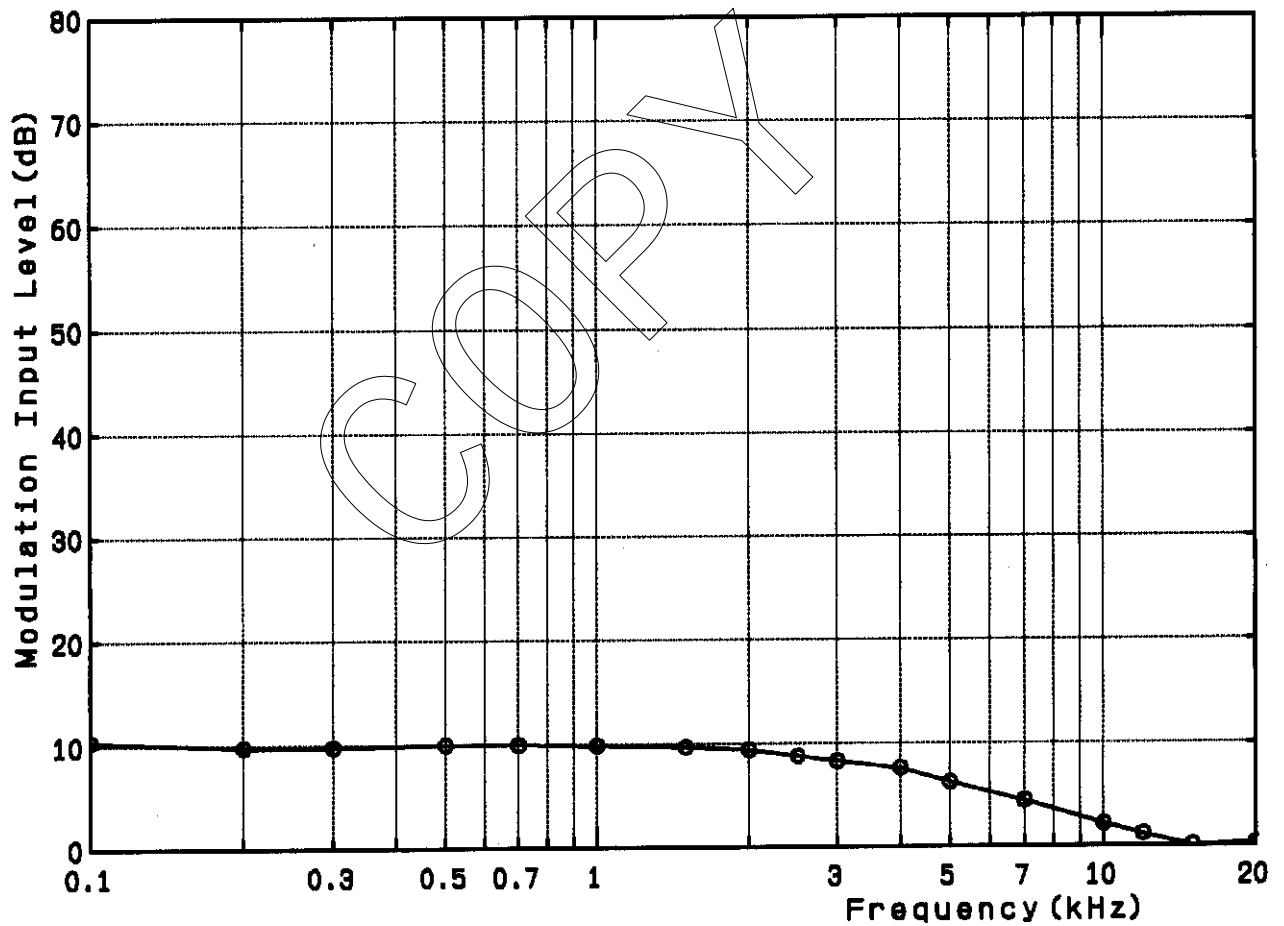
FCC ID : AK8UTXB1

Model : UTX-B1

Test Frequency : 782.125 MHz

Test Condition : 30 mW Setting

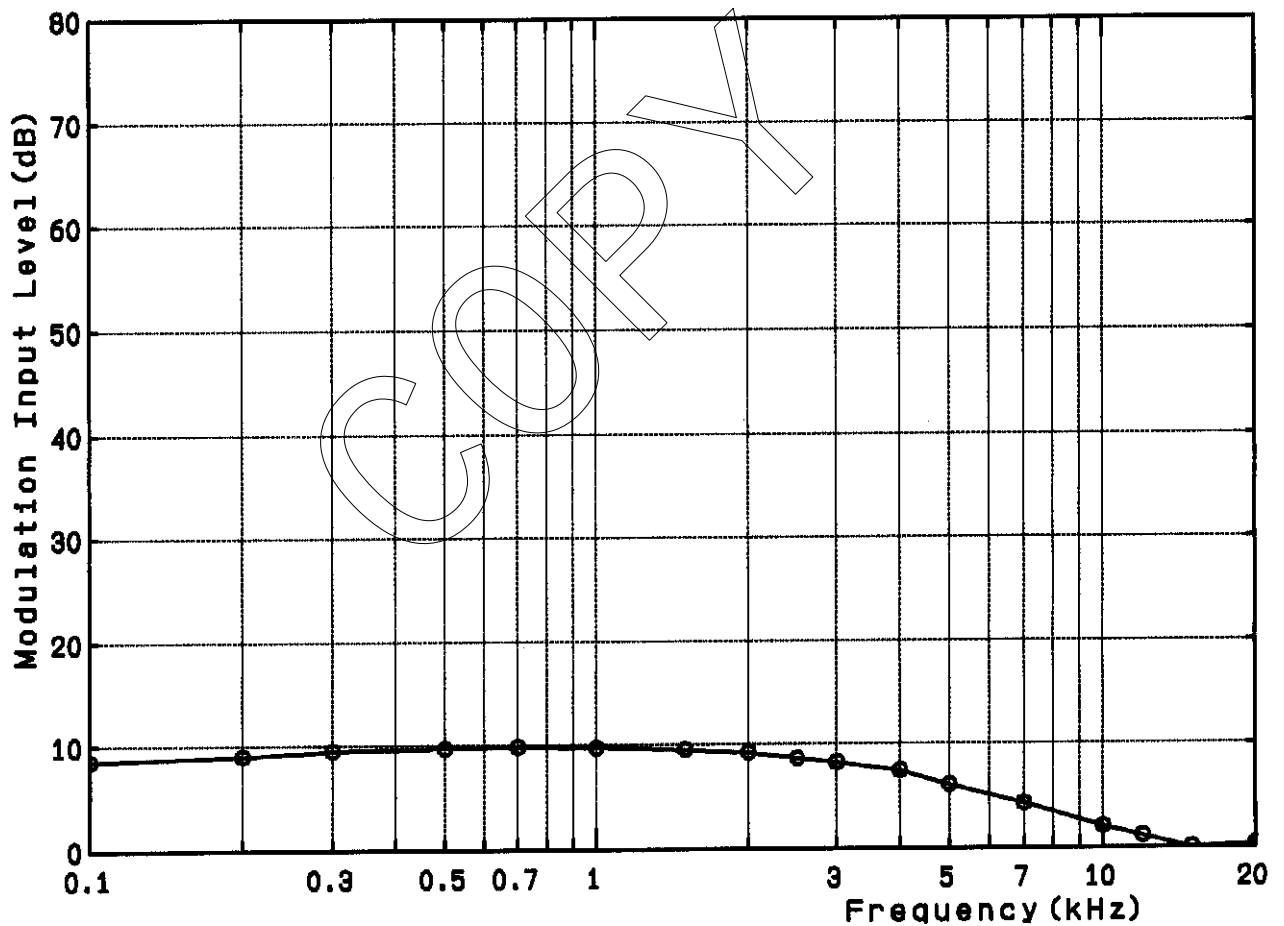
0 dB = -48.8 dBV





Modulation Frequency Response

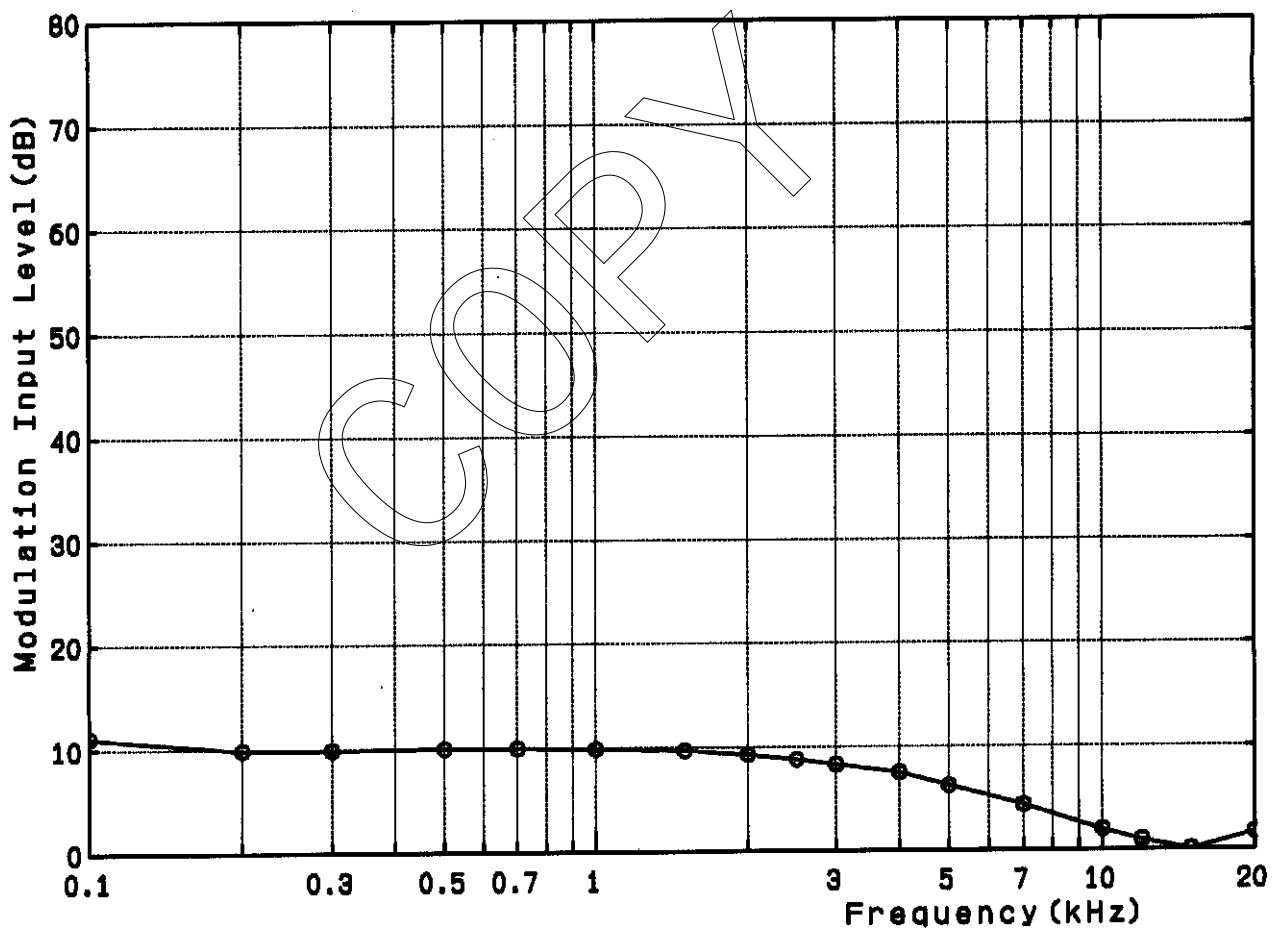
FCC ID : AK8UTXB1
Model : UTX-B1
Test Frequency : 805.875 MHz
Test Condition : 30 mW Setting
0 dB = -45.3 dBV





Modulation Frequency Response

FCC ID : AK8UTXB1
Model : UTX-B1
Test Frequency : 758.125 MHz
Test Condition : 5 mW Setting
0 dB = -48.7 dBV





Modulation Frequency Response

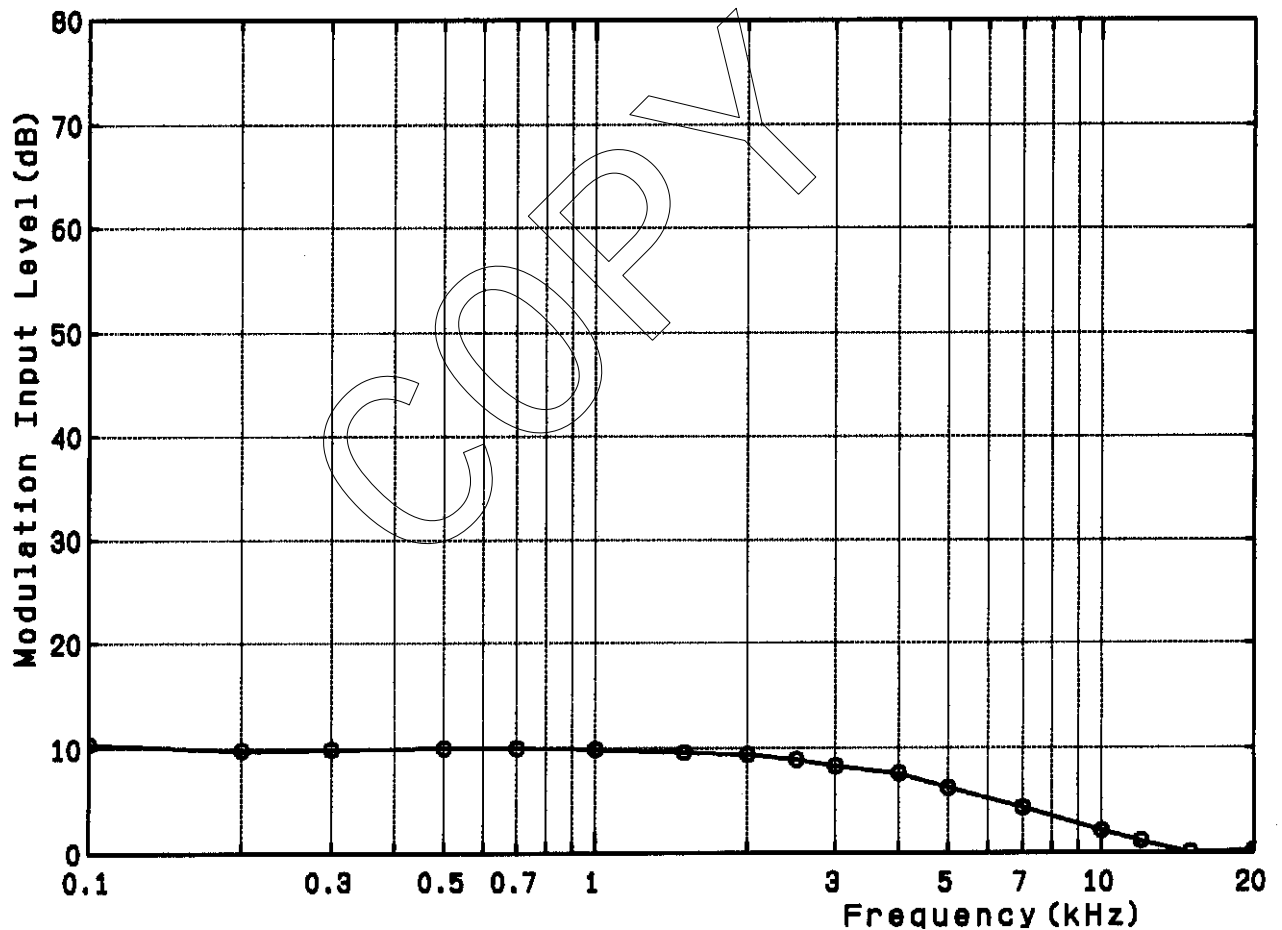
FCC ID : AK8UTXB1

Model : UTX-B1

Test Frequency : 782.125 MHz

Test Condition : 5 mW Setting

0 dB = -48.8 dBV



Modulation Frequency Response

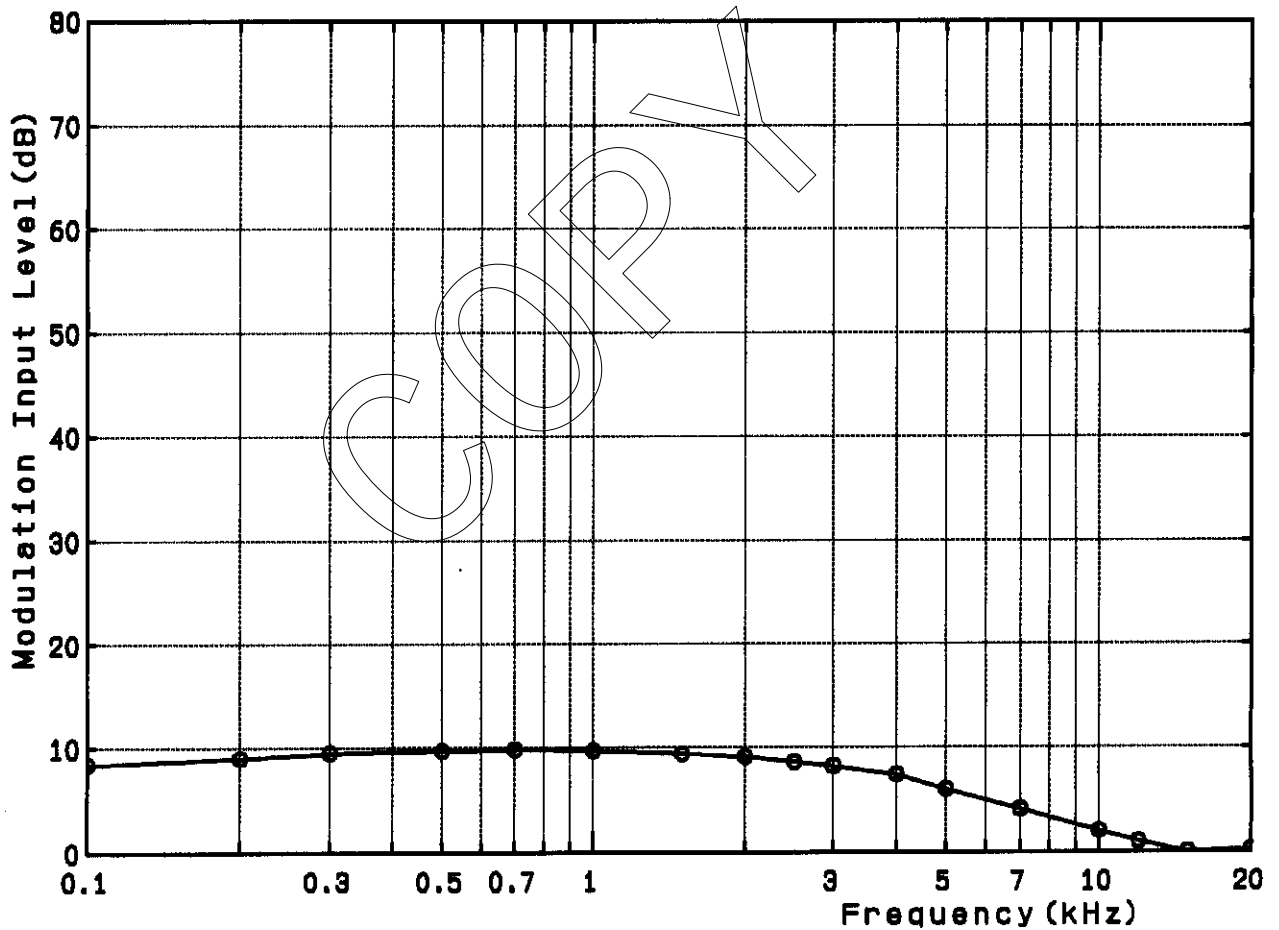
FCC ID : AK8UTXB1

Model : UTX-B1

Test Frequency : 805.875 MHz

Test Condition : 5 mW Setting

0 dB = -45.2 dBV



Modulation Characteristics

FCC ID : AK8UTXB1

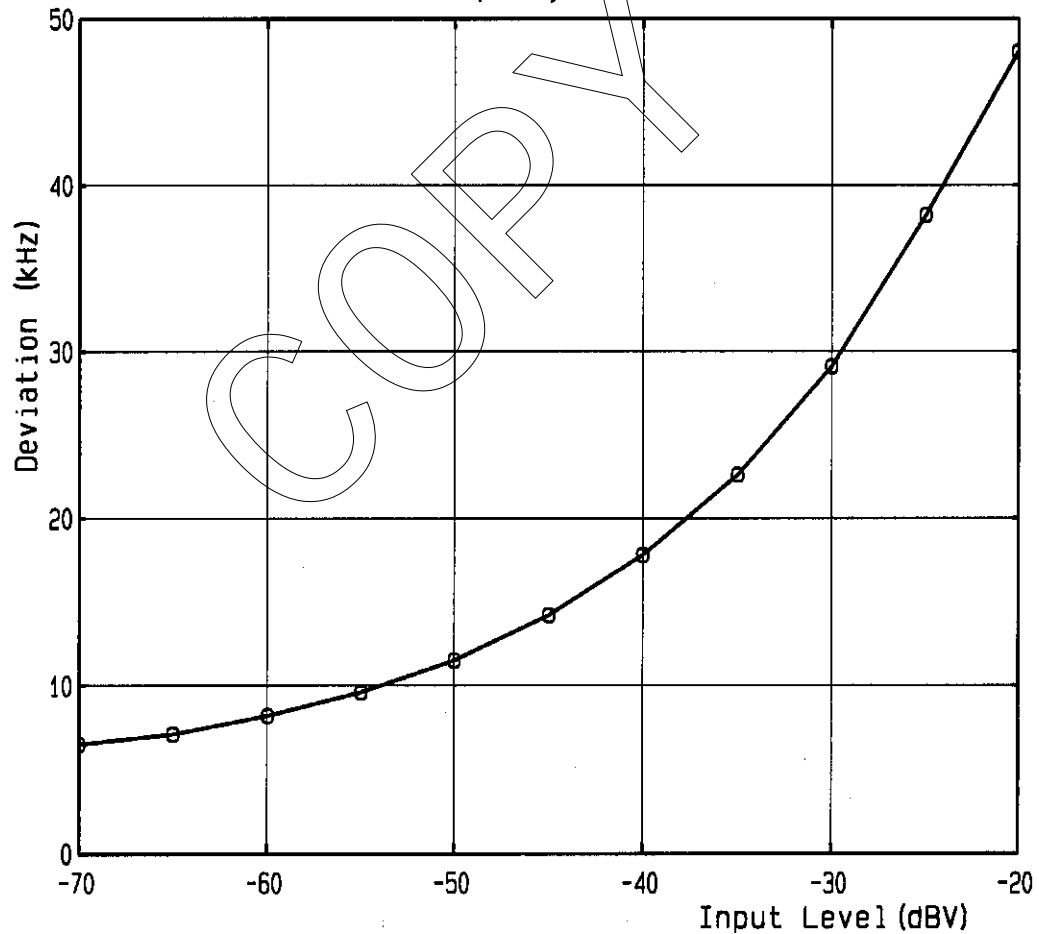
Model : UTX-B1

Mode of EUT : Transmit (30mW Setting)

Input Terminal : Microphone (100Hz)

Input Level (85% modulation) : -27.2 dBV

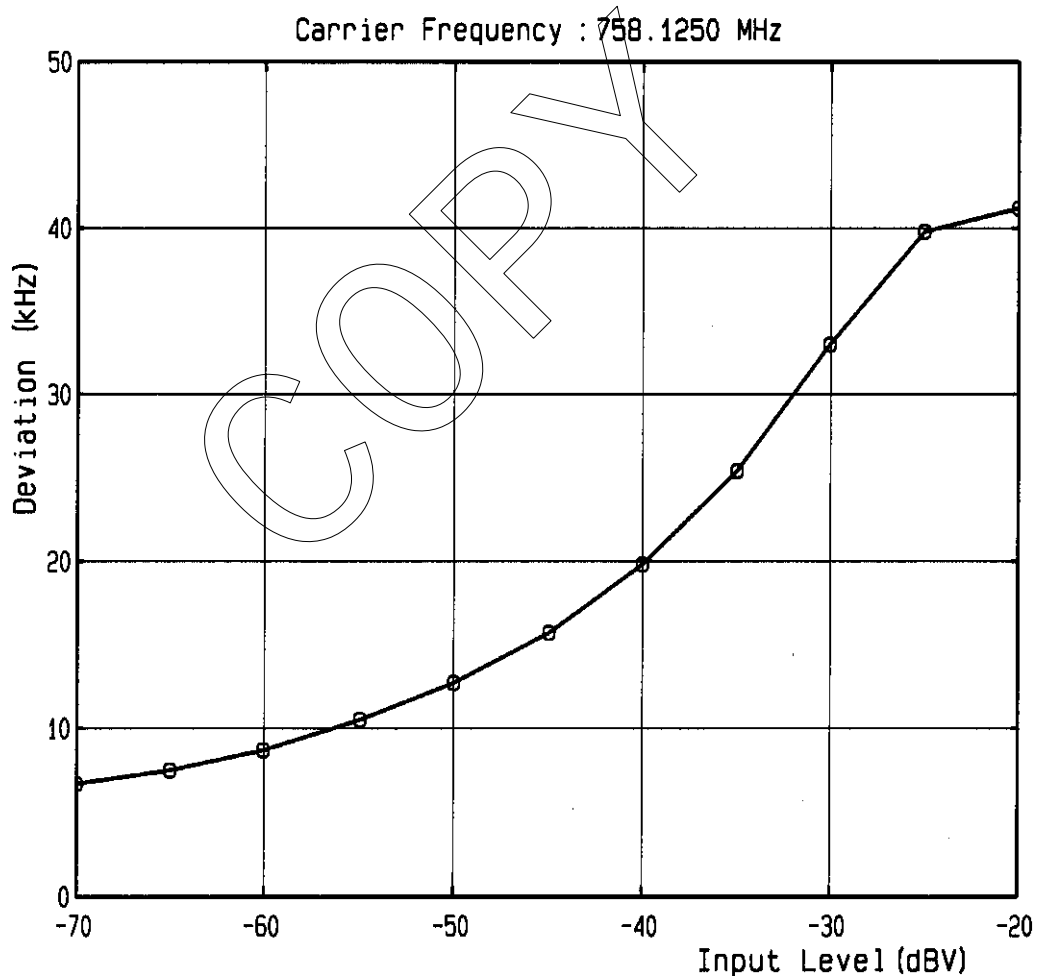
Carrier Frequency : 758.1250 MHz



Modulation Characteristics

FCC ID : AK8UTXB1
 Model : UTX-B1

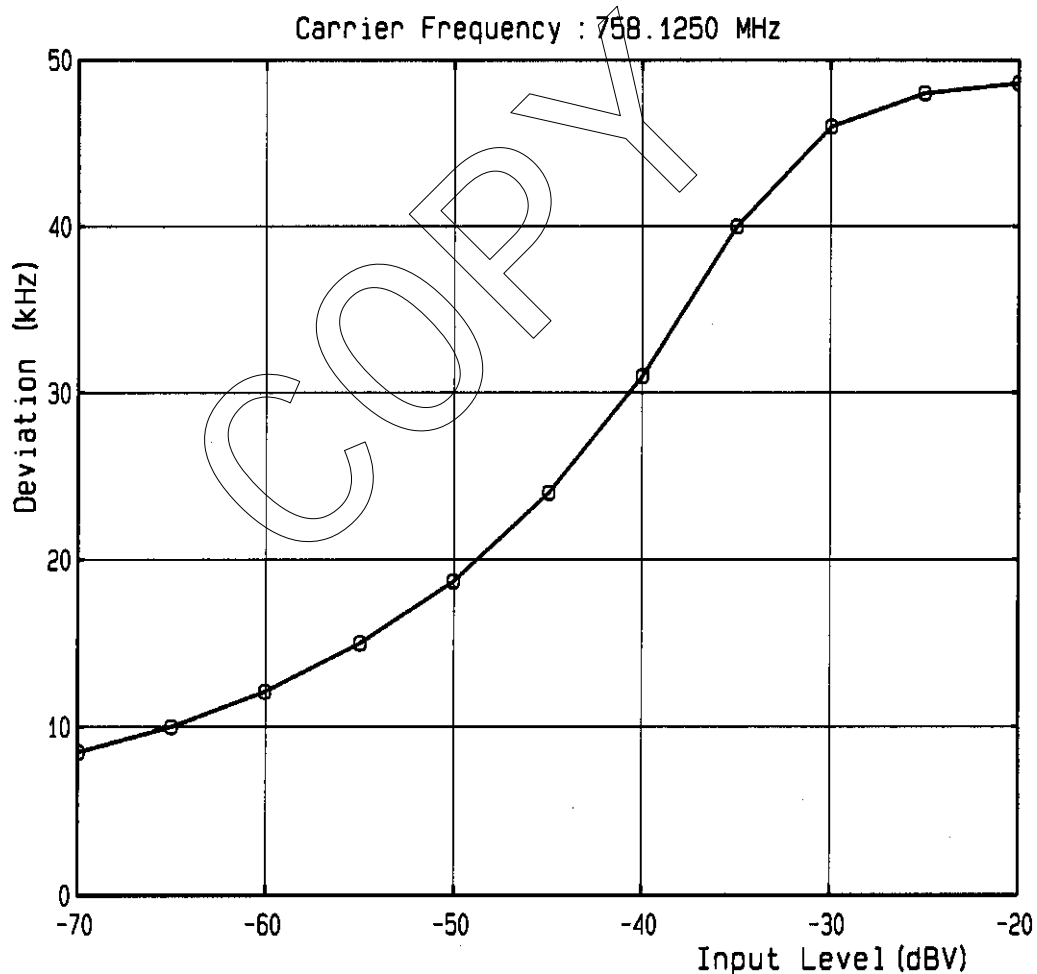
Mode of EUT : Transmit (30mW Setting)
 Input Terminal : Microphone (2.5kHz)
 Input Level (85% modulation) : -29.4 dBV



Modulation Characteristics

FCC ID : AK8UTXB1
 Model : UTX-B1

Mode of EUT : Transmit (30mW Setting)
 Input Terminal : Microphone (15kHz)
 Input Level (85% modulation) : -38.3 dBV



Modulation Characteristics

FCC ID : AK8UTXB1

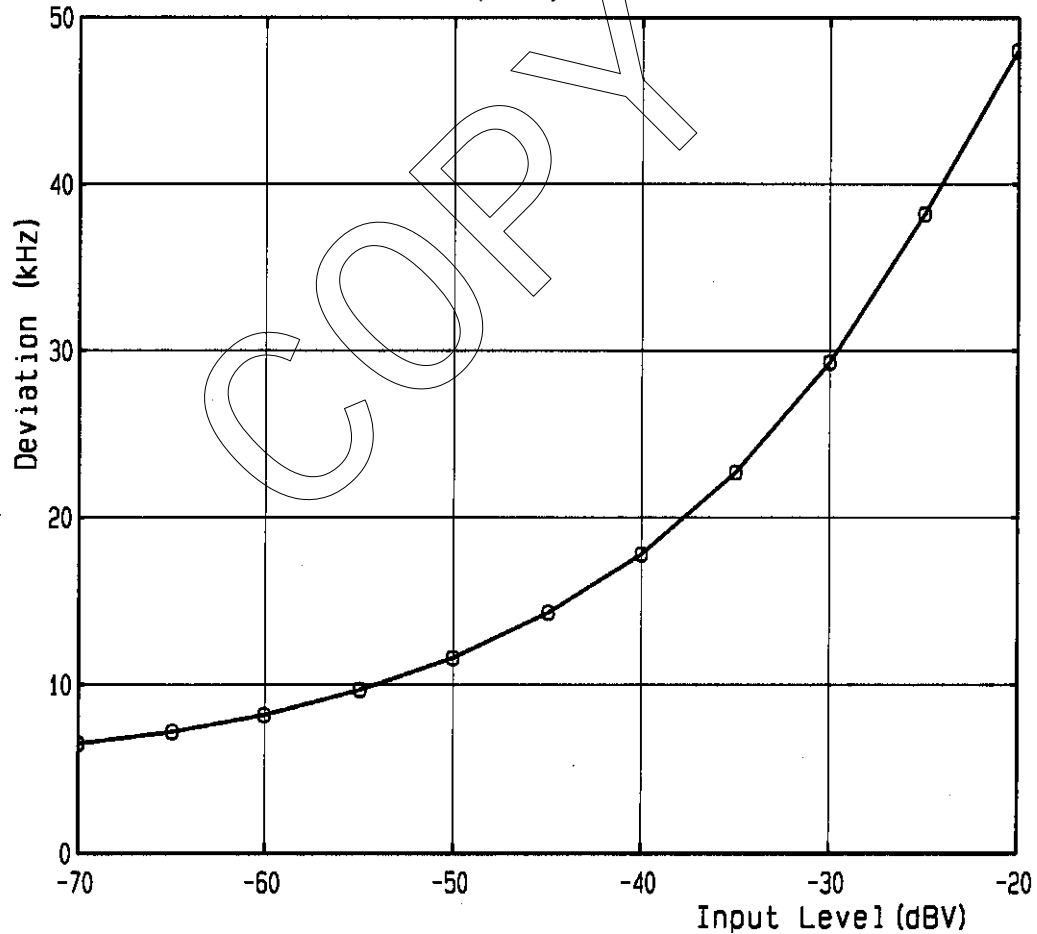
Model : UTX-B1

Mode of EUT : Transmit (5mW Setting)

Input Terminal : Microphone (100Hz)

Input Level (85% modulation) : -27.2 dBV

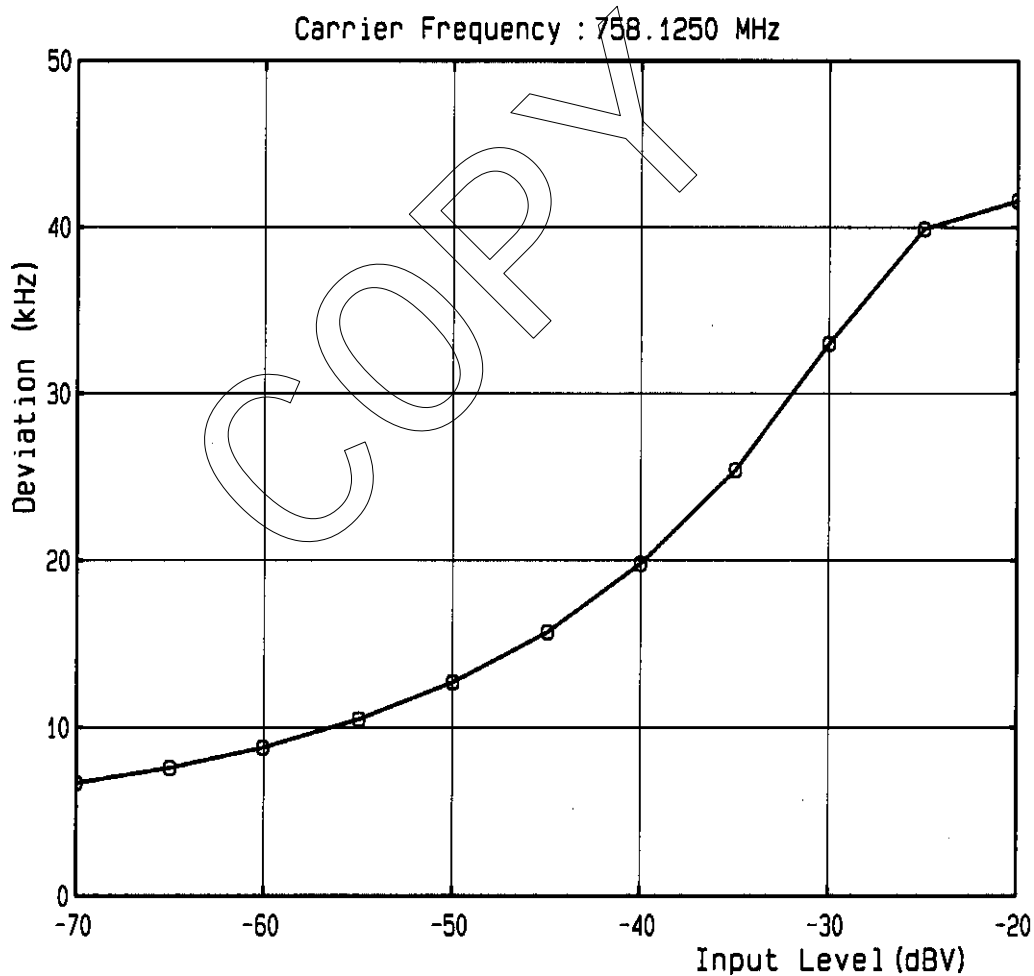
Carrier Frequency : 758.1250 MHz



Modulation Characteristics

FCC ID : AK8UTXB1
 Model : UTX-B1

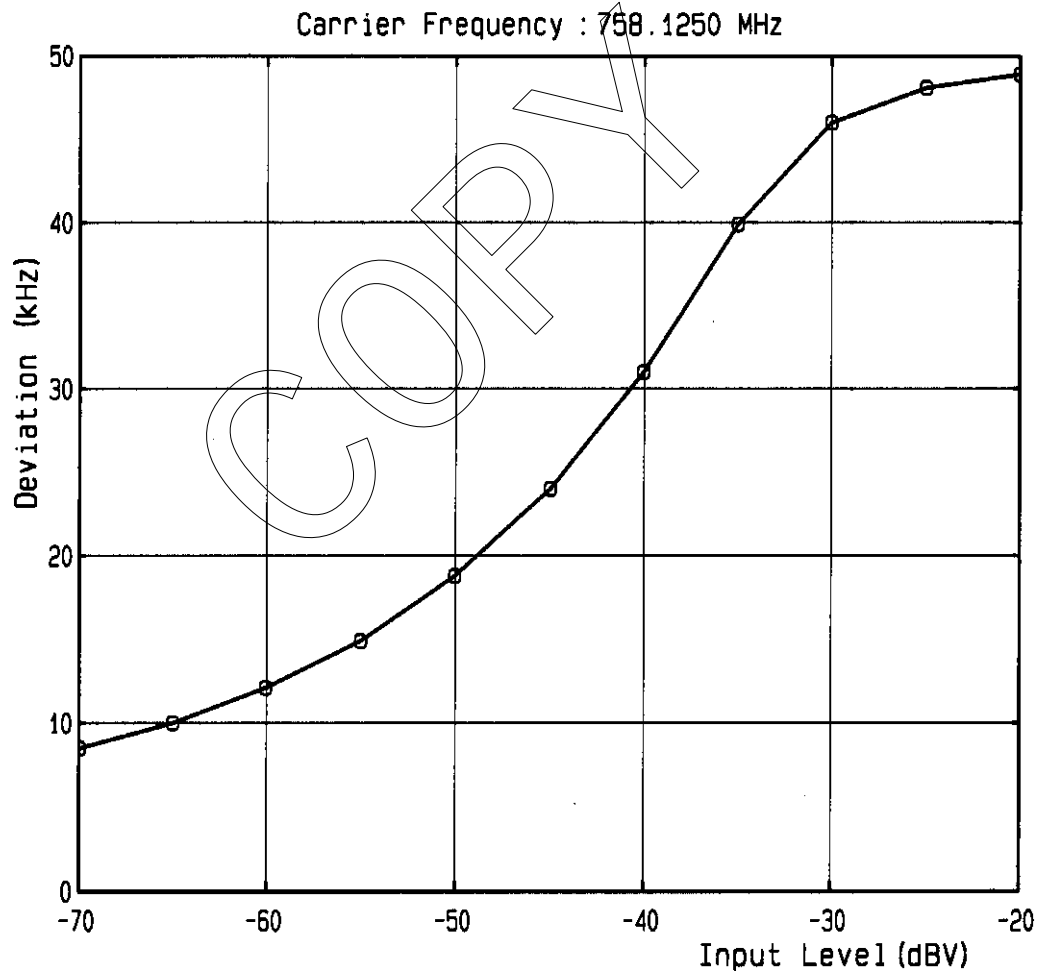
Mode of EUT : Transmit (5mW Setting)
 Input Terminal : Microphone (2.5kHz)
 Input Level (85% modulation) : -29.4 dBV



Modulation Characteristics

FCC ID : AK8UTXB1
 Model : UTX-B1

Mode of EUT : Transmit (5mW Setting)
 Input Terminal : Microphone (15kHz)
 Input Level (85% modulation) : -38.1 dBV



Modulation Characteristics

FCC ID : AK8UTXB1

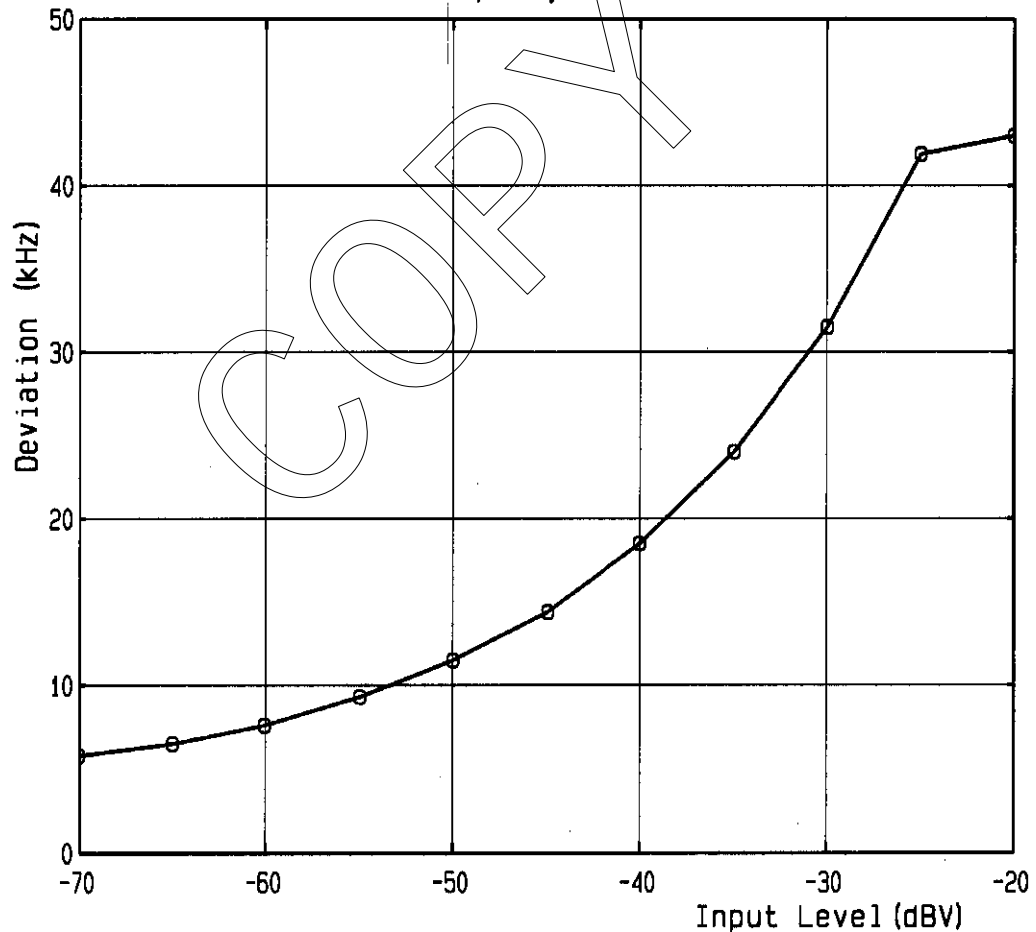
Model : UTX-B1

Mode of EUT : Transmit (30mW Setting)

Input Terminal : Microphone (100Hz)

Input Level (85% modulation) : -28.5 dBV

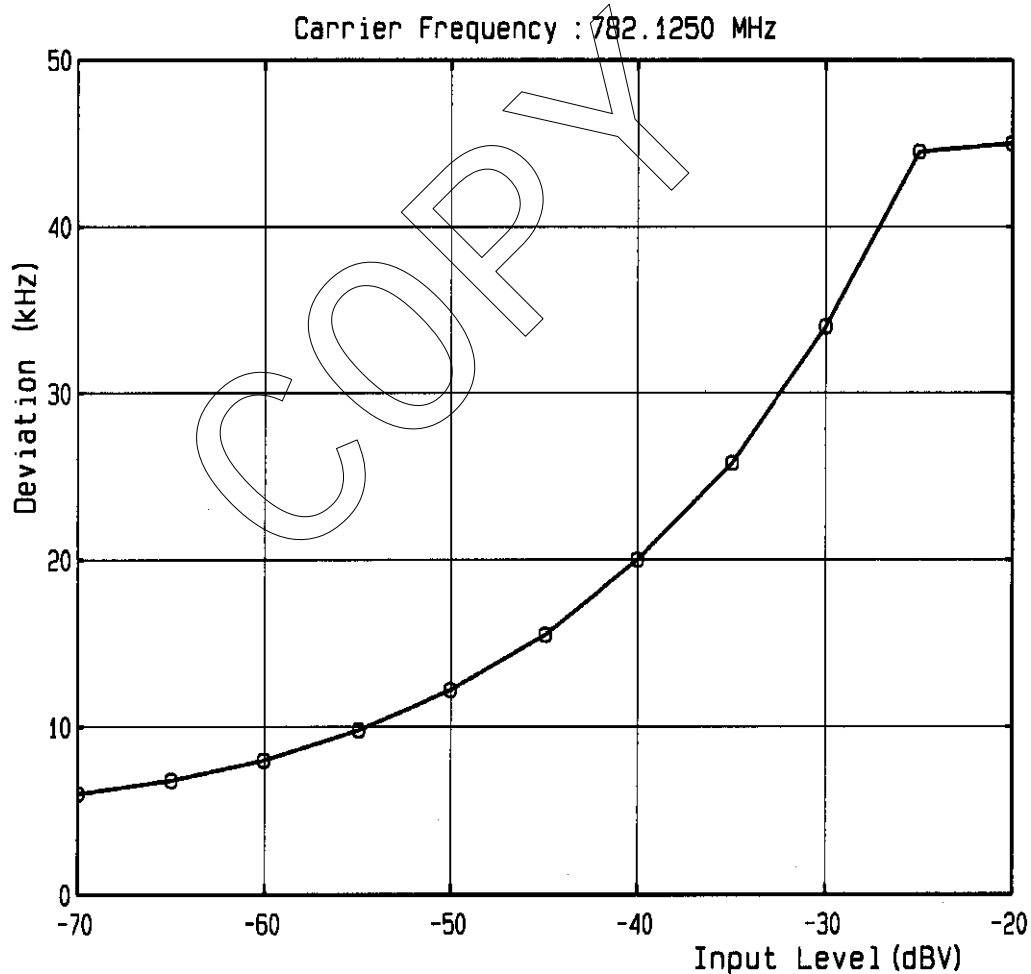
Carrier Frequency : 782.1250 MHz



Modulation Characteristics

FCC ID : AK8UTXB1
 Model : UTX-B1

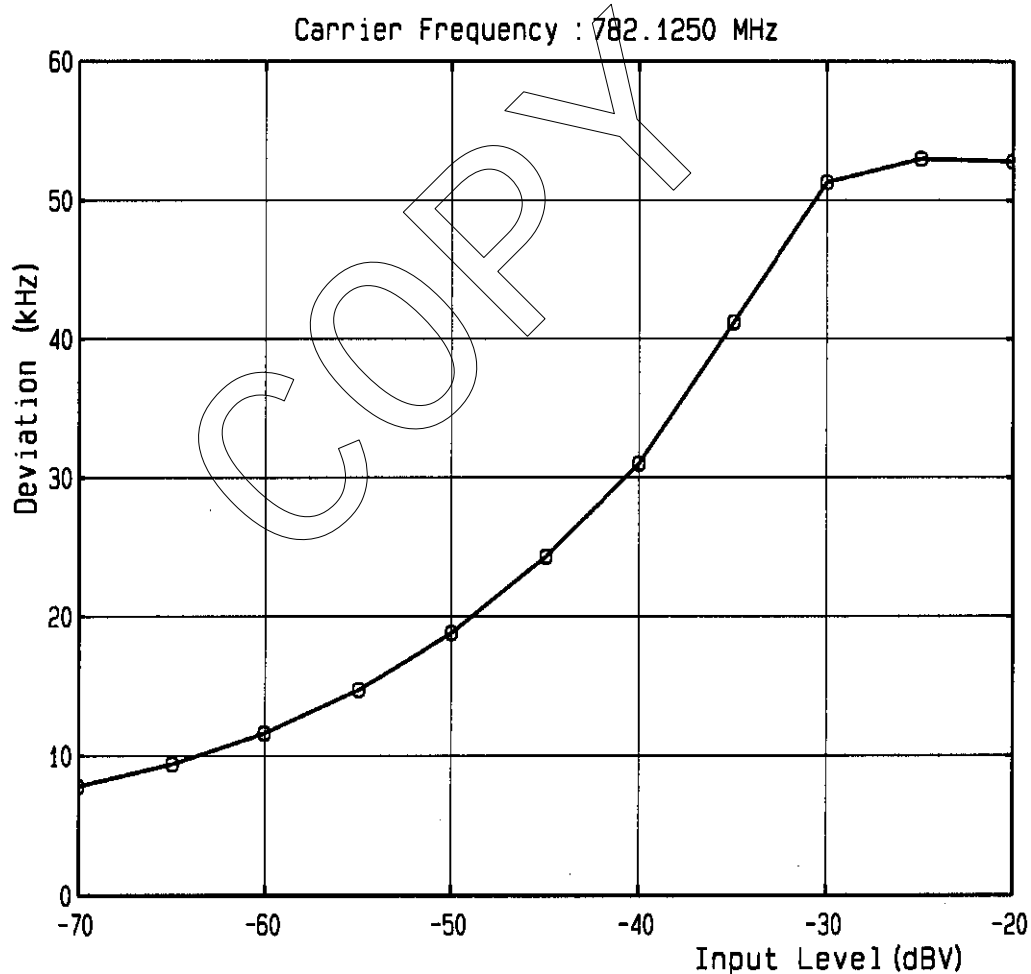
Mode of EUT : Transmit (30mW Setting)
 Input Terminal : Microphone (2.5kHz)
 Input Level (85% modulation) : -29.9 dBV



Modulation Characteristics

FCC ID : AK8UTXB1
 Model : UTX-B1

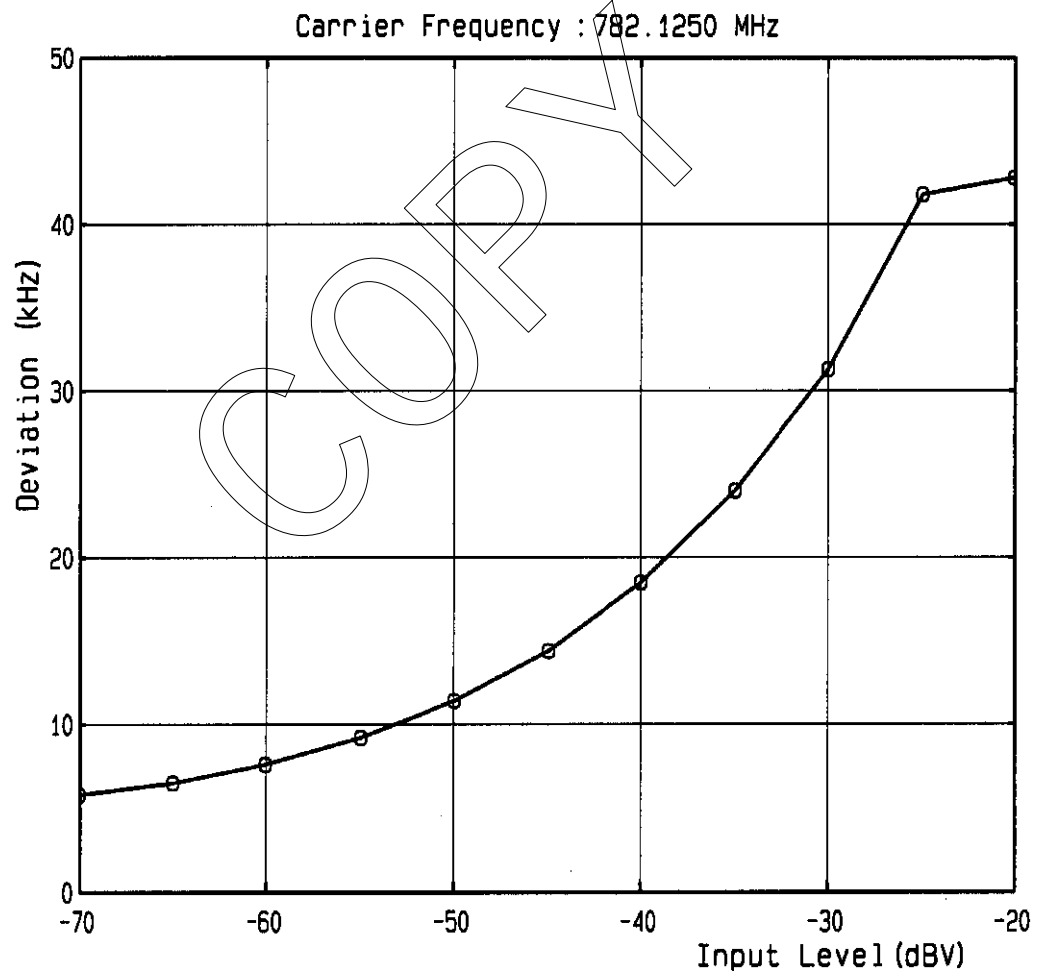
Mode of EUT : Transmit (30mW Setting)
 Input Terminal : Microphone (15kHz)
 Input Level (85% modulation) : -38.6 dBV



Modulation Characteristics

FCC ID : AK8UTXB1
 Model : UTX-B1

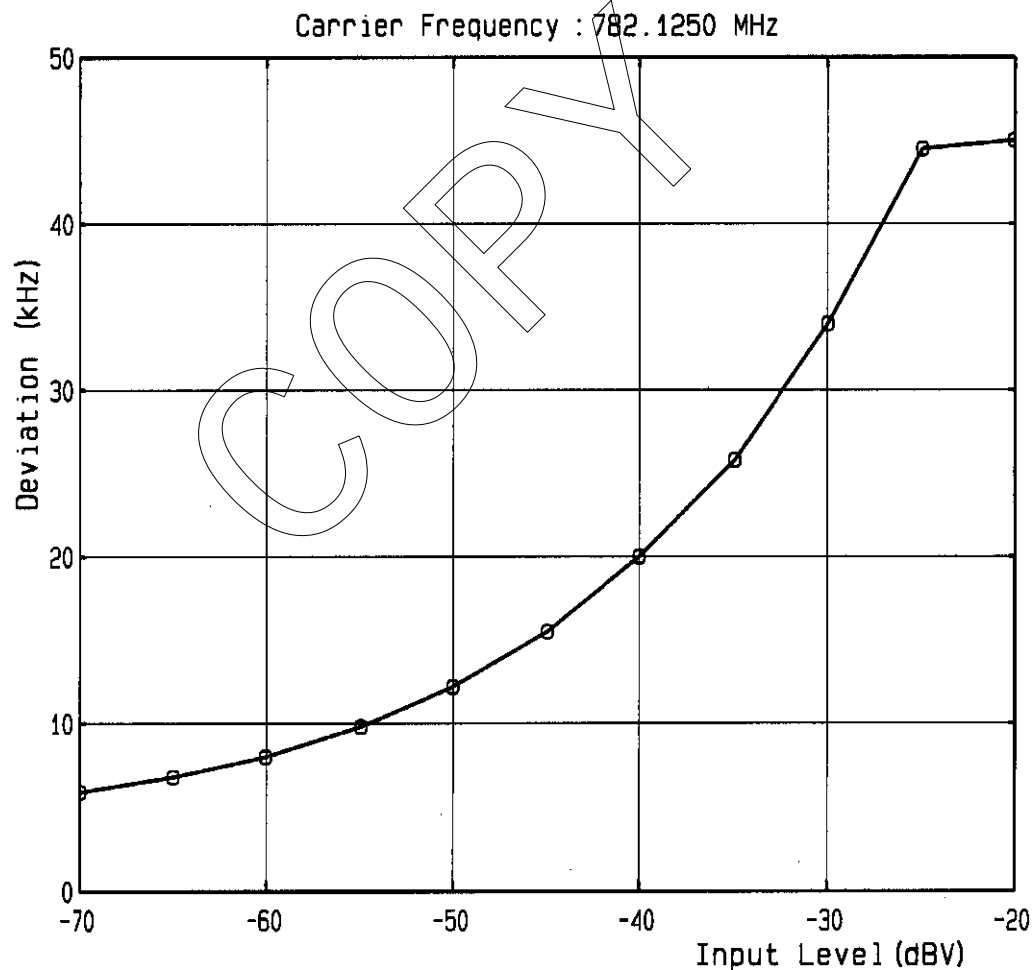
Mode of EUT : Transmit (5mW Setting)
 Input Terminal : Microphone (100Hz)
 Input Level (85% modulation) : -28.5 dBV



Modulation Characteristics

FCC ID : AK8UTXB1
 Model : UTX-B1

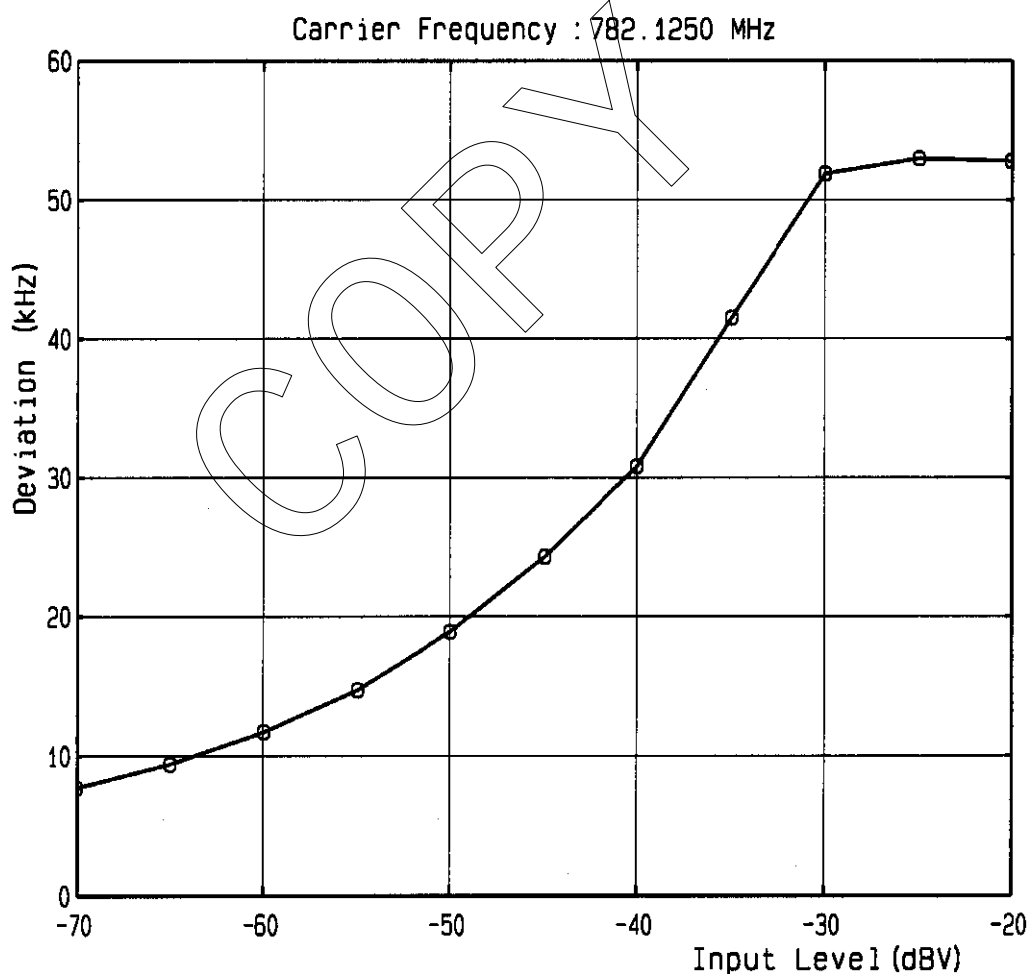
Mode of EUT : Transmit (5mW Setting)
 Input Terminal : Microphone (2.5kHz)
 Input Level (85% modulation) : -29.9 dBV



Modulation Characteristics

FCC ID : AK8UTXB1
 Model : UTX-B1

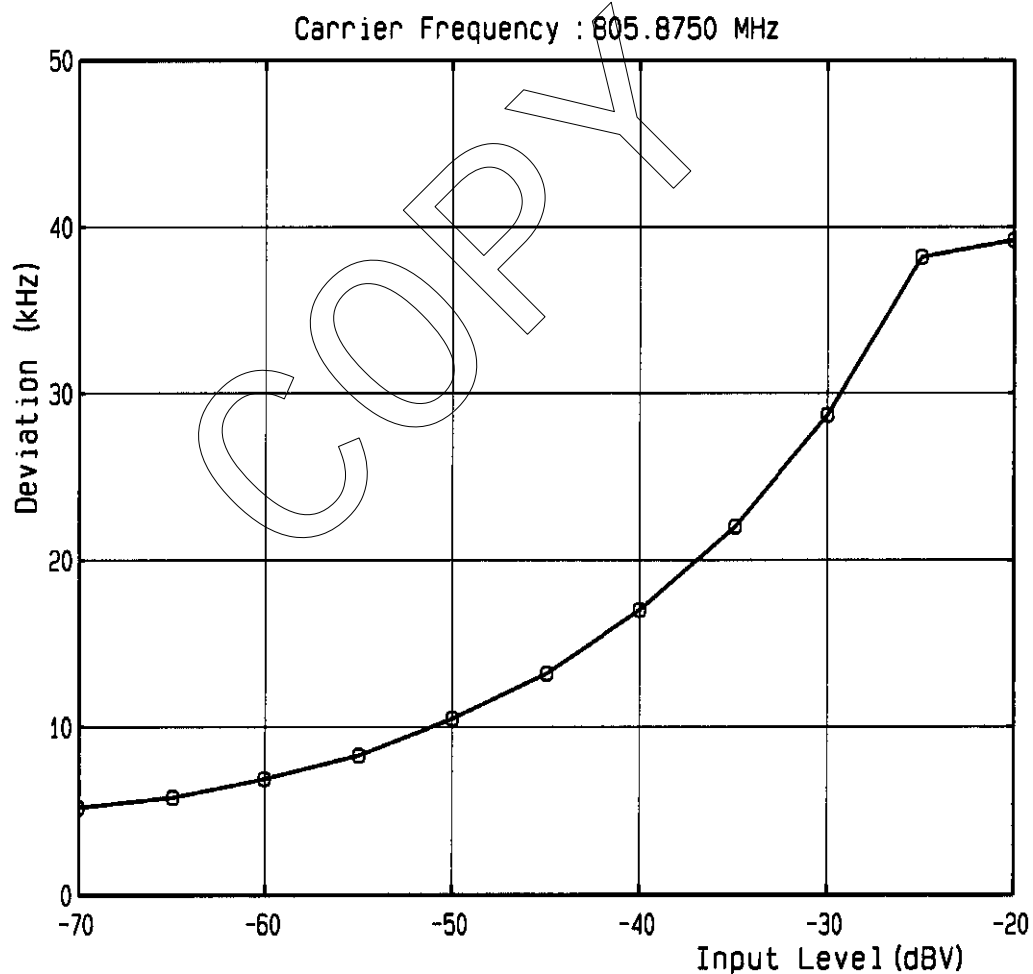
Mode of EUT : Transmit (5mW Setting)
 Input Terminal : Microphone (15kHz)
 Input Level (85% modulation) : -38.6 dBV



Modulation Characteristics

FCC ID : AK8UTXB1
 Model : UTX-B1

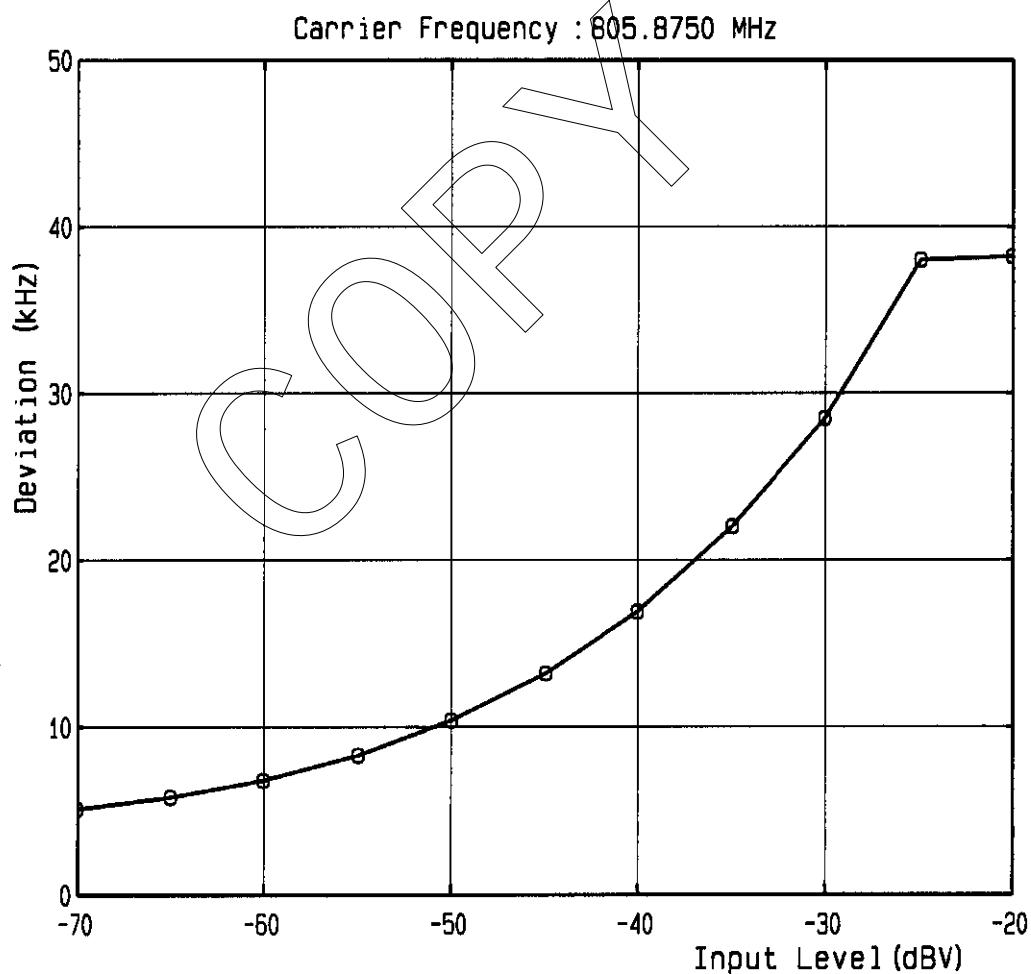
Mode of EUT : Transmit (30mW Setting)
 Input Terminal : Microphone (100Hz)
 Input Level (85% modulation) : -27.1 dBV



Modulation Characteristics

FCC ID : AK8UTXB1
 Model : UTX-B1

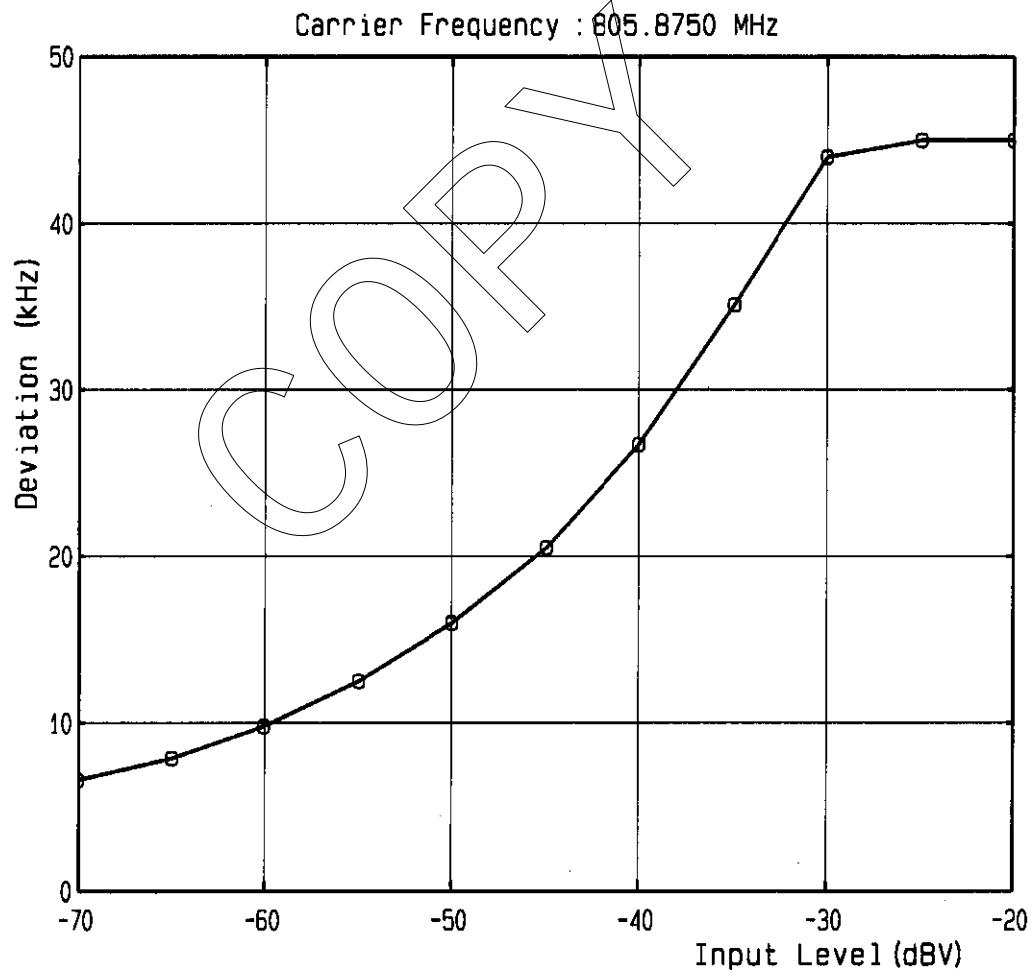
Mode of EUT : Transmit (30mW Setting)
 Input Terminal : Microphone (2.5kHz)
 Input Level (85% modulation) : -26.9 dBV



Modulation Characteristics

FCC ID : AK8UTXB1
 Model : UTX-B1

Mode of EUT : Transmit (30mW Setting)
 Input Terminal : Microphone (15kHz)
 Input Level (85% modulation) : -35.6 dBV



Modulation Characteristics

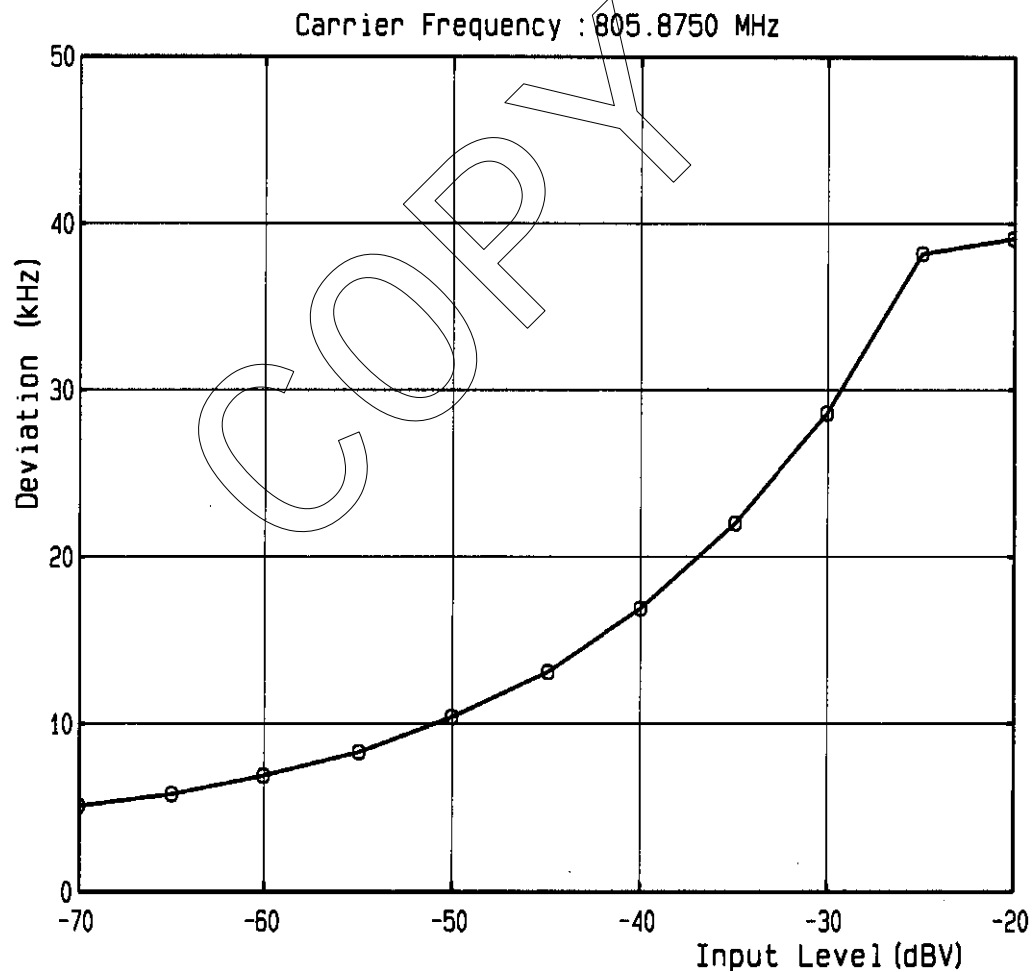
FCC ID : AK8UTXB1

Model : UTX-B1

Mode of EUT : Transmit (5mW Setting)

Input Terminal : Microphone (100Hz)

Input Level (85% modulation) : -27.1 dBV



Modulation Characteristics

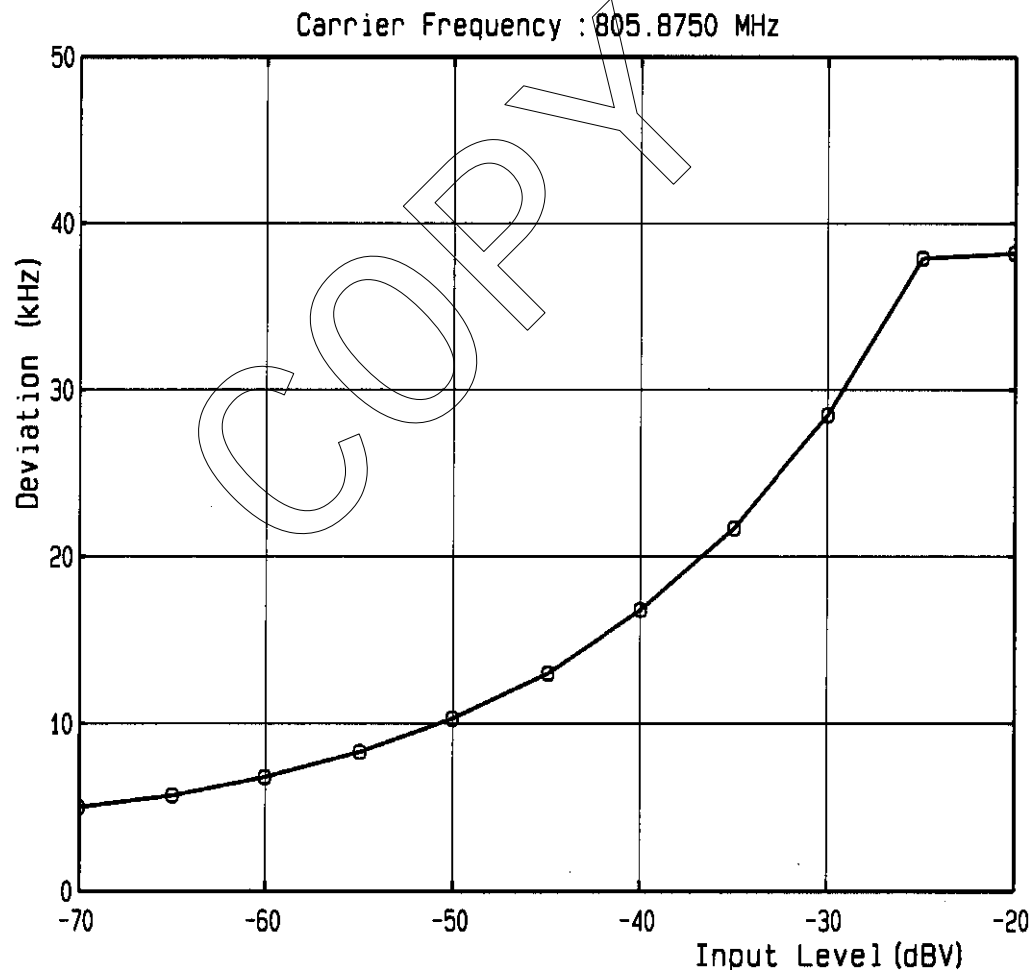
FCC ID : AK8UTXB1

Model : UTX-B1

Mode of EUT : Transmit (5mW Setting)

Input Terminal : Microphone (2.5kHz)

Input Level (85% modulation) : -26.9 dBV



Modulation Characteristics

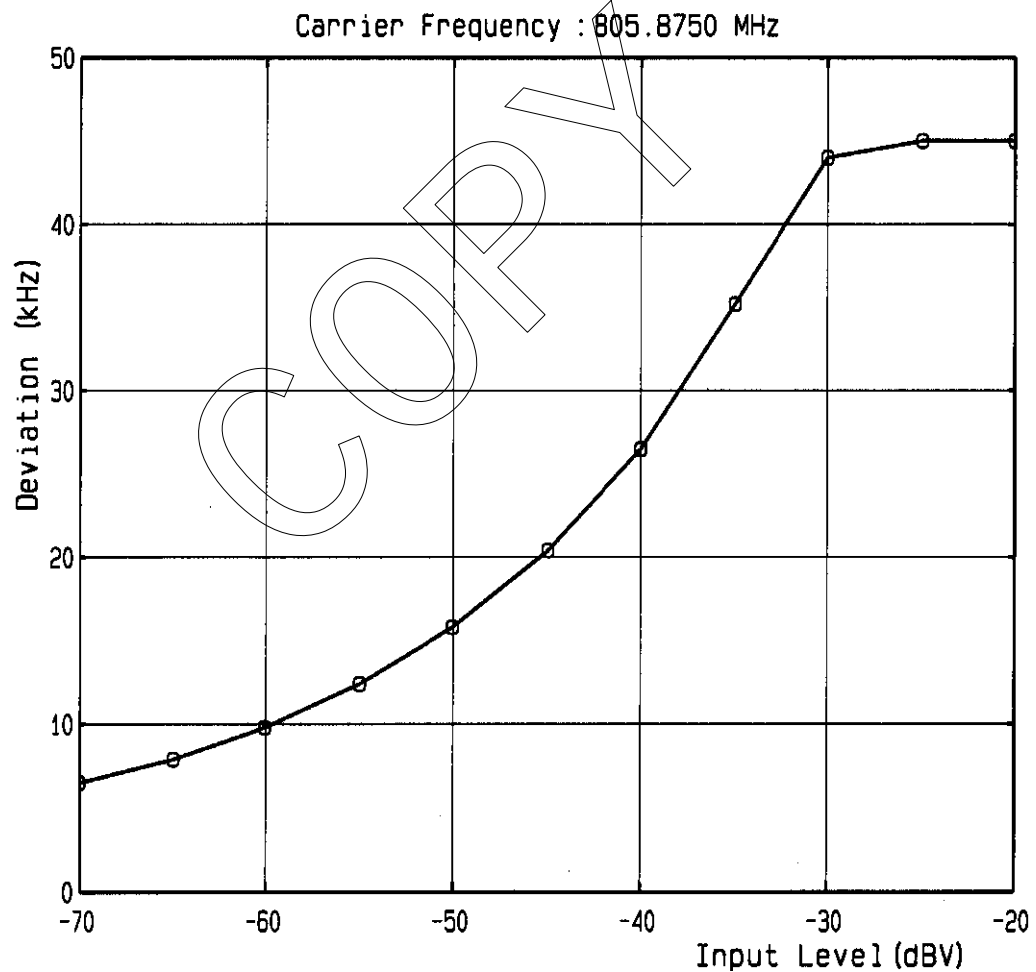
FCC ID : AK8UTXB1

Model : UTX-B1

Mode of EUT : Transmit (5mW Setting)

Input Terminal : Microphone (15kHz)

Input Level (85% modulation) : -35.5 dBV



2.3 Radiated Emissions Measurement

Date : September 2, 2002

Temp.: 21 °C Humi.: 74 %

Operating Frequency : 758.125 MHz
Reference Carrier Power(ERP): : 37.5 mW(30 mW setting)
Distance of Measurement : 3.0 meters

Frequency (MHz)	Substituted Power		Limits (dB)	Attenuation Ratio	
	Horiz. (dBm)	Vert. (dBm)		Horiz. (dB)	Vert. (dB)
1516.250	-54.9	-56.2	28.7	70.6	71.9
2274.375	-39.2	-39.2	28.7	55.0	55.0
3032.500	-48.0	-48.6	28.7	63.7	64.3
3790.625	-46.2	-45.8	28.7	61.9	61.5
4548.750	-50.5	-51.4	28.7	66.3	67.2
5306.875	<-52.2	<-52.2	28.7	>67.9	>67.9
6065.000	<-50.3	<-50.3	28.7	>66.1	>66.1
6823.125	<-48.7	<-48.7	28.7	>64.5	>64.5
7581.250	<-47.3	<-47.3	28.7	>63.0	>63.0

Operating Frequency : 758.125 MHz
Reference Carrier Power(ERP): : 9.20 mW(5 mW setting)
Distance of Measurement : 3.0 meters

Frequency (MHz)	Substituted Power		Limits (dB)	Attenuation Ratio	
	Horiz. (dBm)	Vert. (dBm)		Horiz. (dB)	Vert. (dB)
1516.250	-48.8	-46.5	22.6	58.4	56.1
2274.375	-38.4	-38.7	22.6	48.1	48.4
3032.500	-34.7	-37.5	22.6	44.3	47.1
3790.625	-54.6	-55.3	22.6	64.2	64.9
4548.750	-51.2	-50.0	22.6	60.9	59.7
5306.875	-52.0	-50.7	22.6	61.6	60.3
6065.000	<-50.3	<-50.3	22.6	>60.0	>60.0
6823.125	<-48.7	<-48.7	22.6	>58.4	>58.4
7581.250	<-47.3	<-47.3	22.6	>56.9	>56.9



Operating Frequency : 782.125 MHz
Reference Carrier Power(ERP): : 32.2 mW(30 mW setting)
Distance of Measurement : 3.0 meters

Frequency (MHz)	Substituted Power		Limits (dB)	Attenuation Ratio	
	Horiz. (dBm)	Vert. (dBm)		Horiz. (dB)	Vert. (dB)
1564.250	-51.3	-50.9	28.1	66.4	66.0
2346.375	-43.1	-46.4	28.1	58.2	61.5
3128.500	-48.8	-50.2	28.1	63.8	65.2
3910.625	-48.9	-49.8	28.1	63.9	64.8
4692.750	<-53.8	<-53.8	28.1	>68.9	>68.9
5474.875	<-51.7	<-51.7	28.1	>66.8	>66.8
6257.000	<-49.9	<-49.9	28.1	>65.0	>65.0
7039.125	<-48.3	<-48.3	28.1	>63.4	>63.4
7821.250	<-46.9	<-46.9	28.1	>61.9	>61.9

Operating Frequency : 782.125 MHz
Reference Carrier Power(ERP): : 8.28 mW(5 mW setting)
Distance of Measurement : 3.0 meters

Frequency (MHz)	Substituted Power		Limits (dB)	Attenuation Ratio	
	Horiz. (dBm)	Vert. (dBm)		Horiz. (dB)	Vert. (dB)
1564.250	-52.3	-53.7	22.2	61.5	62.9
2346.375	-38.9	-40.5	22.2	48.1	49.7
3128.500	-49.7	-51.2	22.2	58.8	60.3
3910.625	<-56.2	<-56.2	22.2	>65.3	>65.3
4692.750	<-53.8	<-53.8	22.2	>63.0	>63.0
5474.875	-49.9	-48.8	22.2	59.1	58.0
6257.000	<-49.9	<-49.9	22.2	>59.1	>59.1
7039.125	<-48.3	<-48.3	22.2	>57.5	>57.5
7821.250	<-46.9	<-46.9	22.2	>56.0	>56.0



Operating Frequency : 805.875 MHz
Reference Carrier Power(ERP): : 32.9 mW(30 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	-50.4	-53.3	28.2	65.6	68.5
2417.625	-42.0	-45.8	28.2	57.2	61.0
3223.500	-43.7	-45.1	28.2	58.8	60.2
4029.375	-50.5	-48.4	28.2	65.6	63.5
4835.250	<-53.4	<-53.4	28.2	>68.6	>68.6
5641.125	<-51.3	<-51.3	28.2	>66.5	>66.5
6447.000	<-49.5	<-49.5	28.2	>64.7	>64.7
7252.875	<-47.9	<-47.9	28.2	>63.0	>63.0
8058.750	<-46.5	<-46.5	28.2	>61.6	>61.6

Operating Frequency : 805.875 MHz
Reference Carrier Power(ERP): : 10.4 mW(5 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	-52.1	-53.2	23.2	62.3	63.4
2417.625	-49.6	-54.8	23.2	59.8	65.0
3223.500	-49.1	-49.3	23.2	59.2	59.4
4029.375	-52.2	-53.2	23.2	62.3	63.3
4835.250	<-53.4	<-53.4	23.2	>63.6	>63.6
5641.125	-50.6	-48.7	23.2	60.8	58.9
6447.000	<-49.5	<-49.5	23.2	>59.7	>59.7
7252.875	<-47.9	<-47.9	23.2	>58.0	>58.0
8058.750	<-46.5	<-46.5	23.2	>56.6	>56.6

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 :

Y. Nakajima

Yoichi Nakajima

Testing Engineer

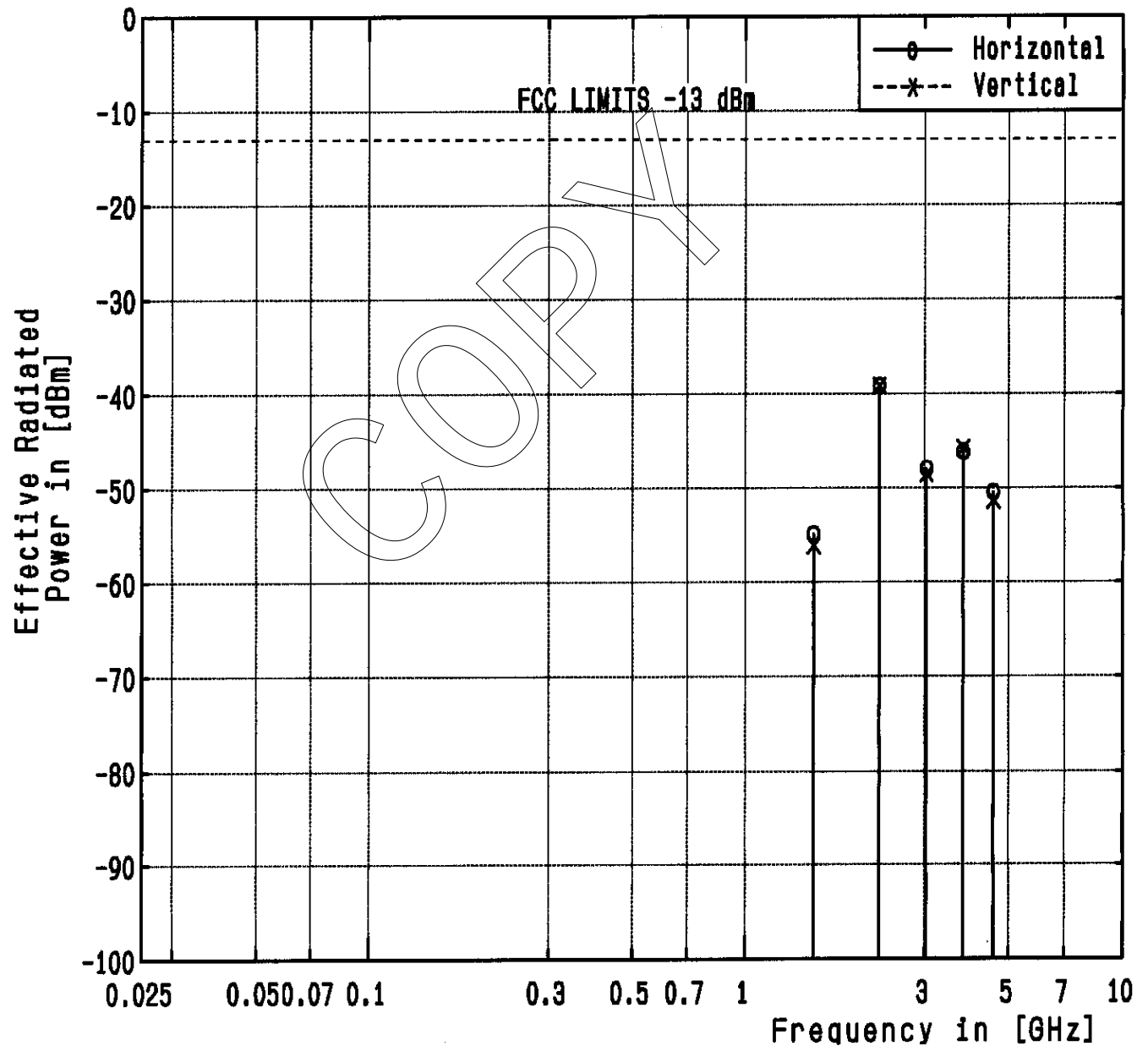


Radiated Spurious Emissions

FCC ID : AK8UTXB1

Serial No. :

Carrier : 37.50 [mW] at 758.125 [MHz]

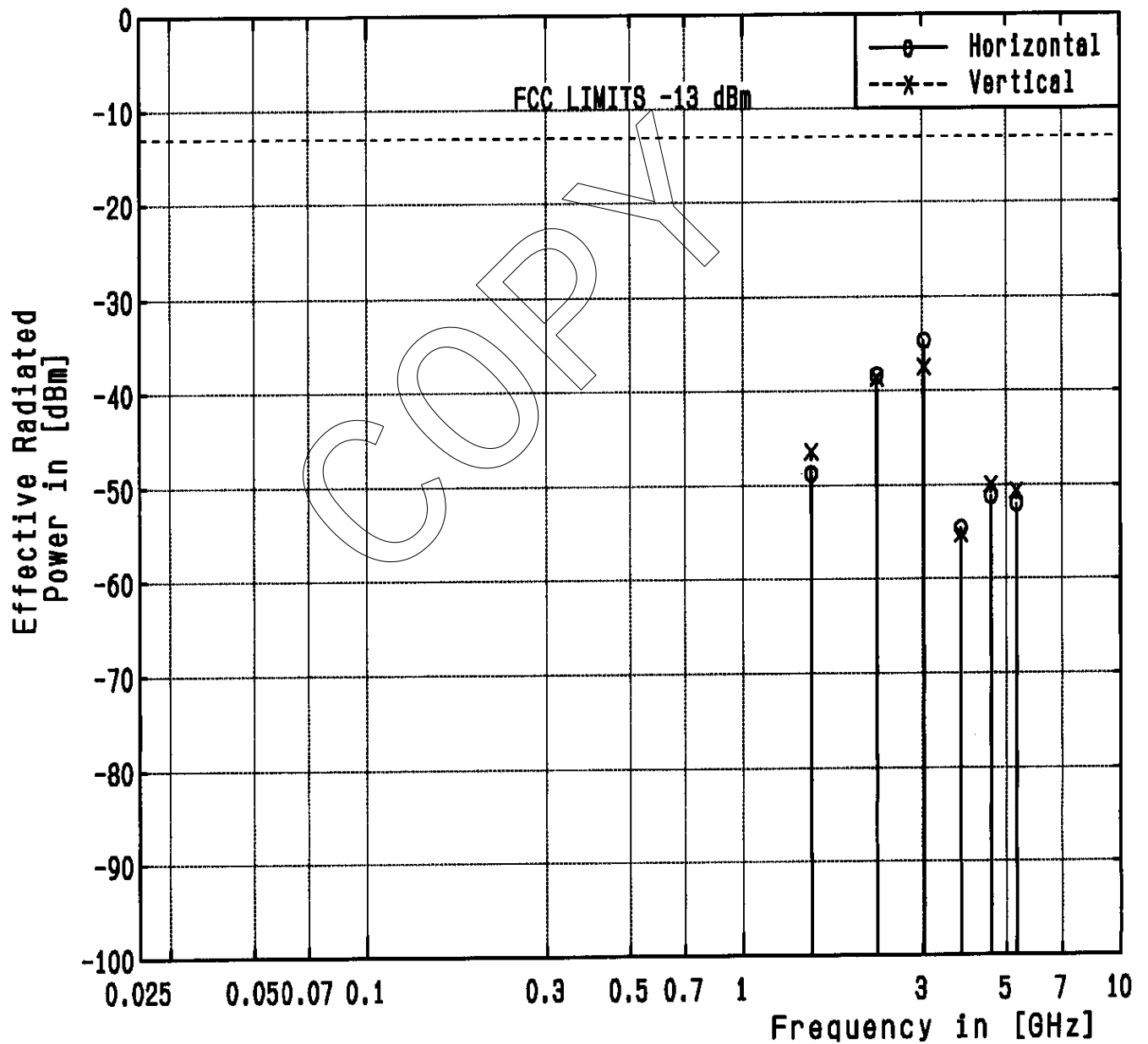


Radiated Spurious Emissions

FCC ID : AK8UTXB1

Serial No. :

Carrier : 9.20 [mW] at 758.125 [MHz]



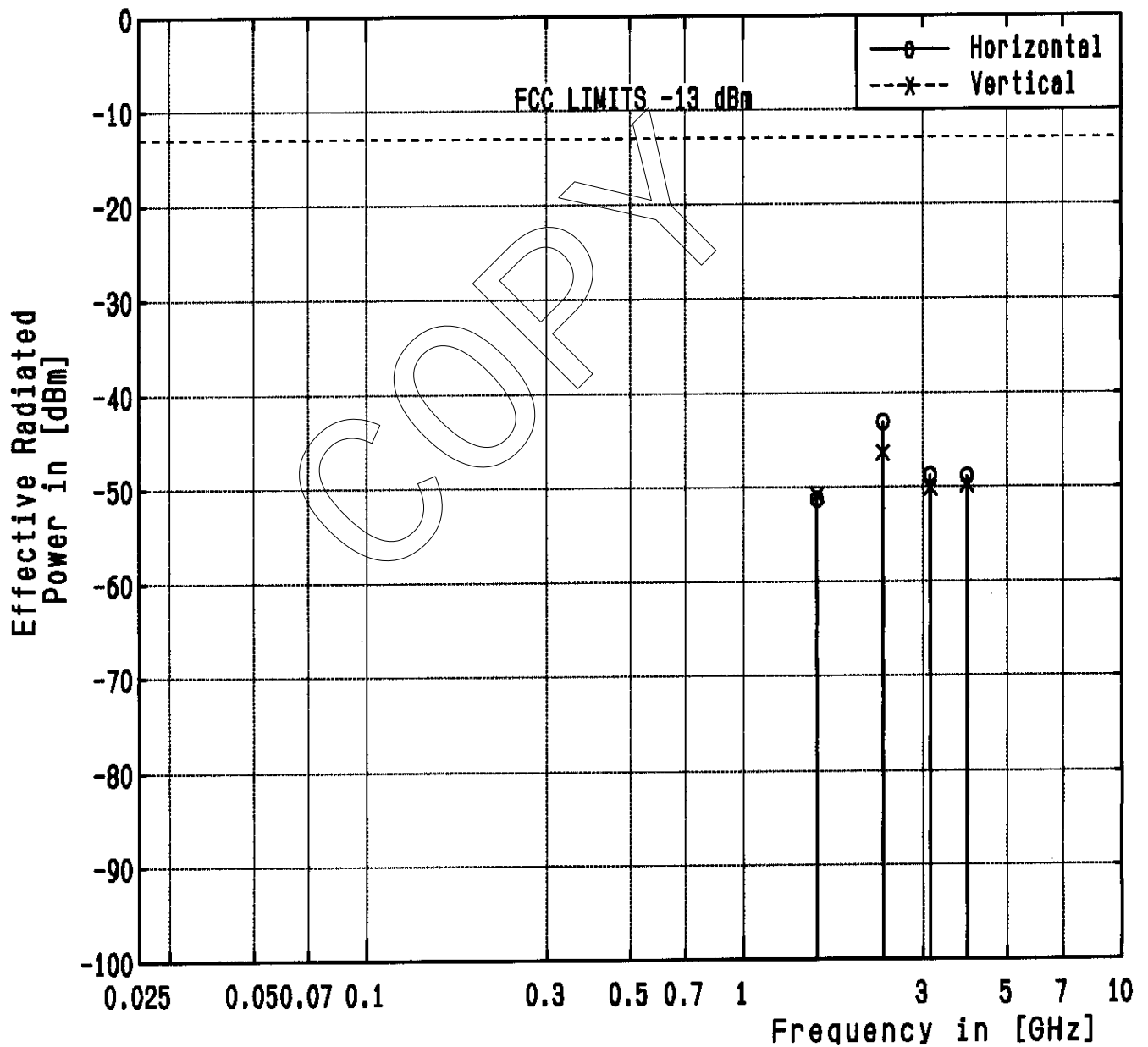


Radiated Spurious Emissions

FCC ID : AK8UTXB1

Serial No. :

Carrier : 32.21 [mW] at 782.125 [MHz]

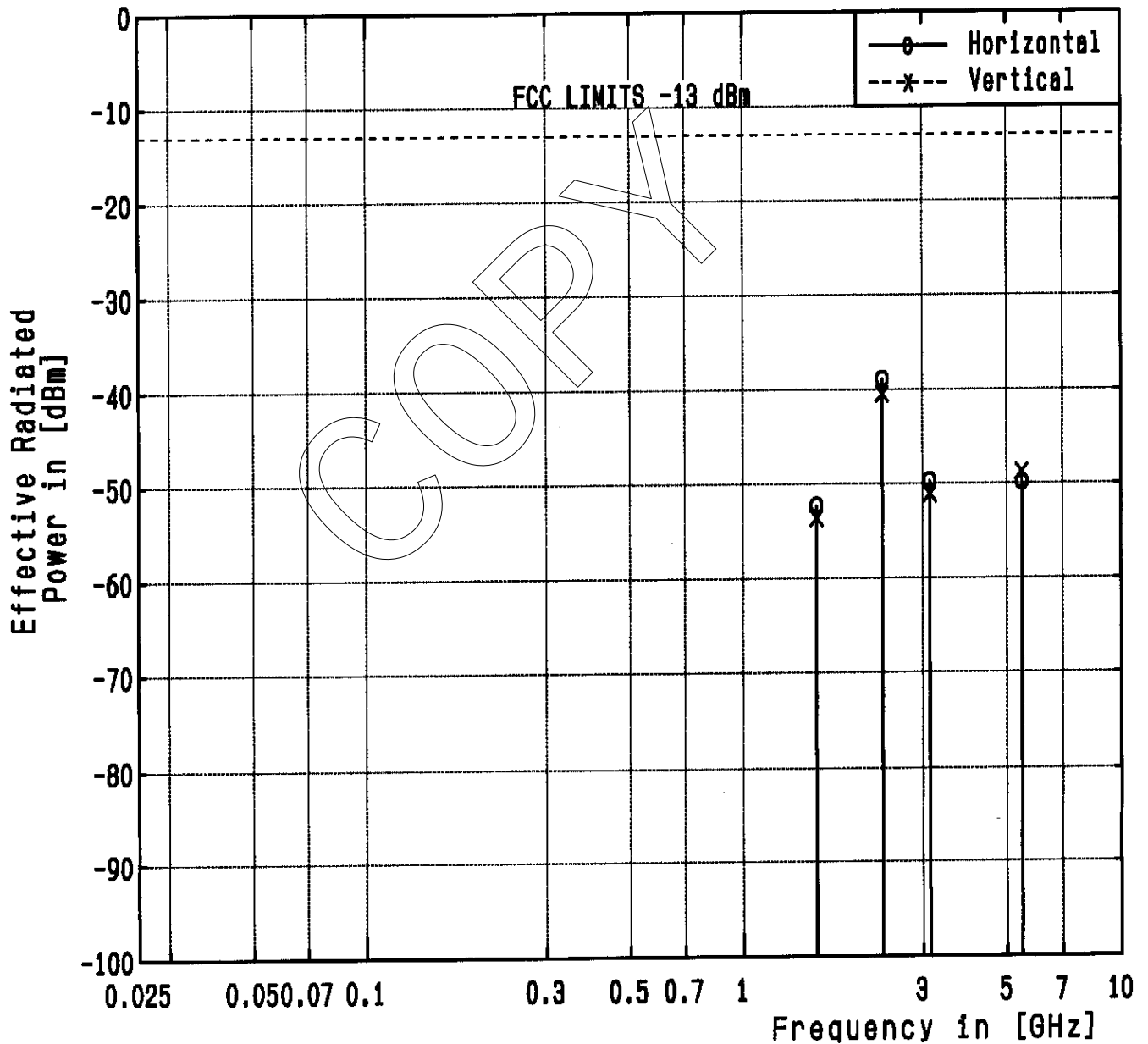


Radiated Spurious Emissions

FCC ID : AK8UTXB1

Serial No. :

Carrier : 8.28 [mW] at 782.125 [MHz]



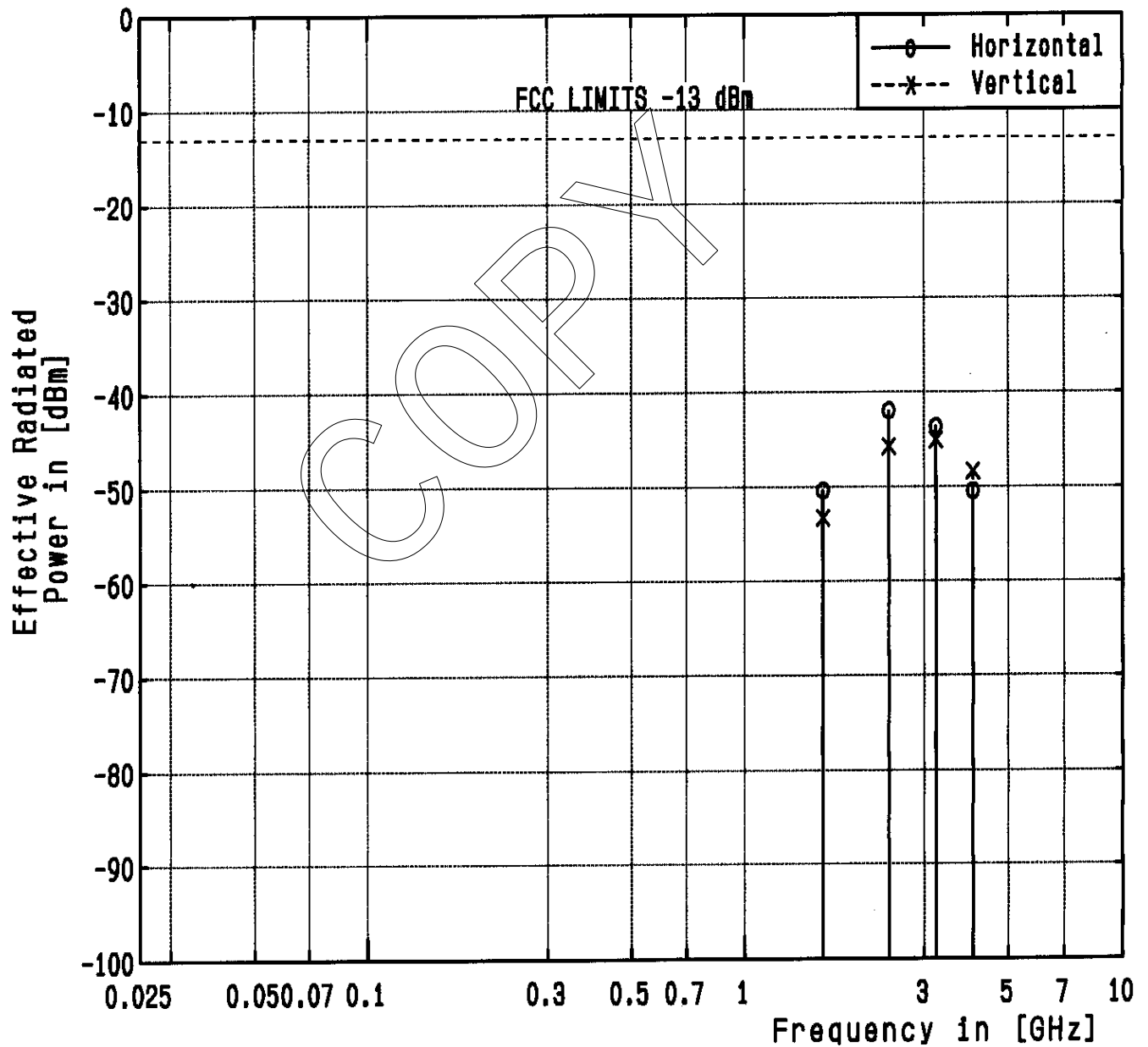


Radiated Spurious Emissions

FCC ID : AK8UTXB1

Serial No. :

Carrier : 32.89 [mW] at 805.875 [MHz]

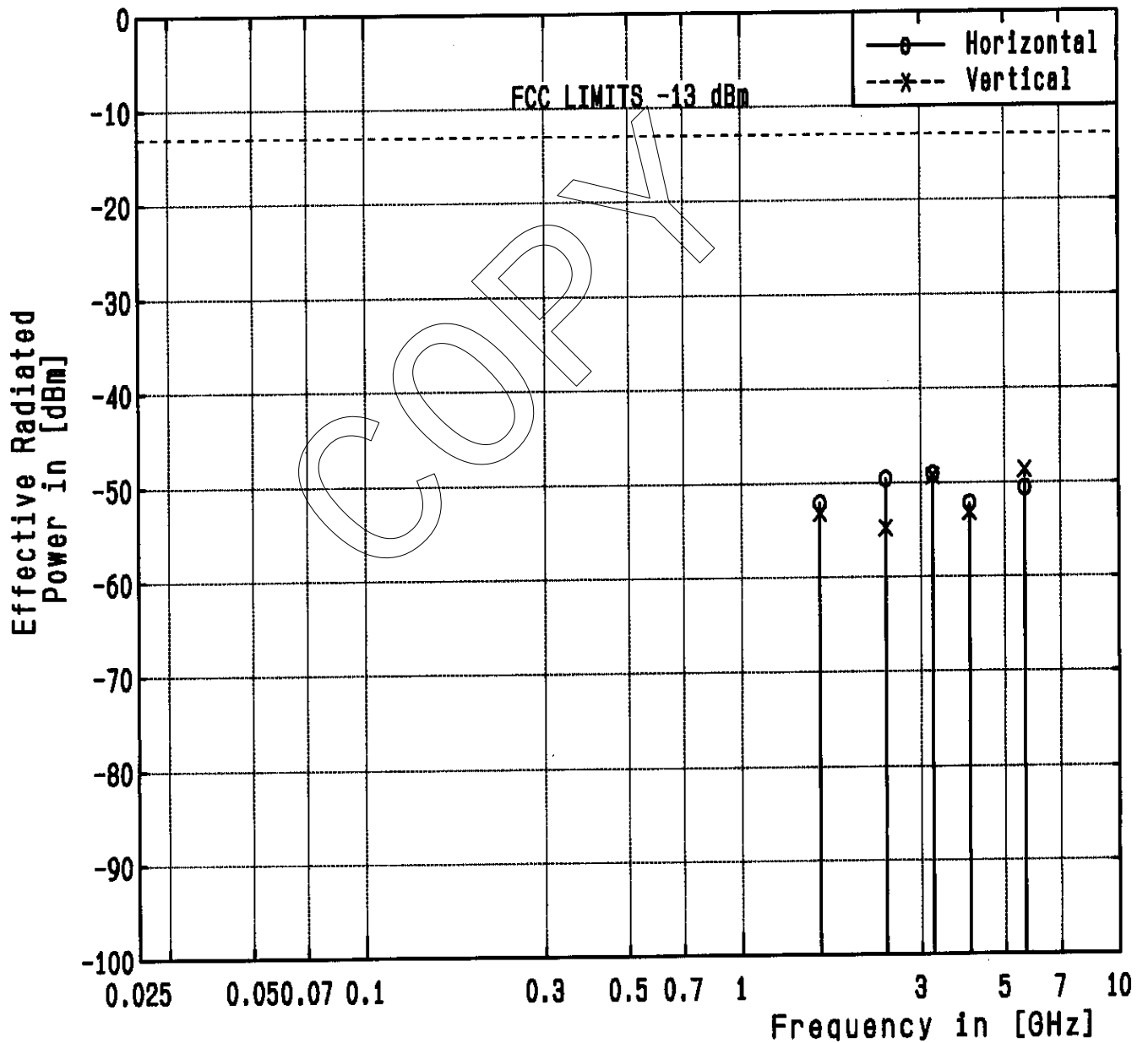


Radiated Spurious Emissions

FCC ID : AK8UTXB1

Serial No. :

Carrier : 10.40 [mW] at 805.875 [MHz]





2.4 Occupied Bandwidth Measurement

Date : September 11, 2002
Temp.: 25°C Humi.: 69 %

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 :

Y. Nakajima
Yoichi Nakajima
Testing Engineer

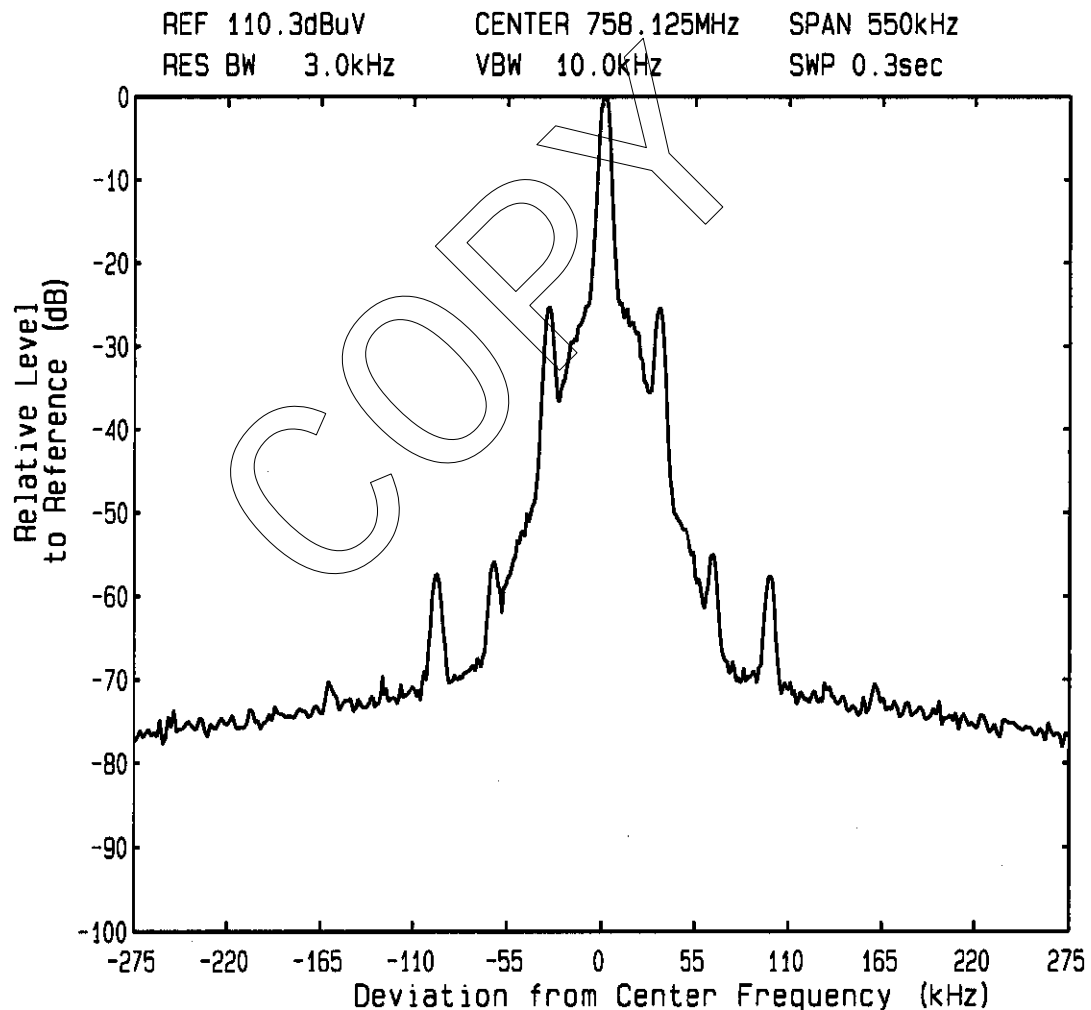
Emission Limitation

FCC ID : AK8UTXB1

Model : UTX-B1

Mode of EUT : Transmit (30mW Setting)

Reference Carrier Level



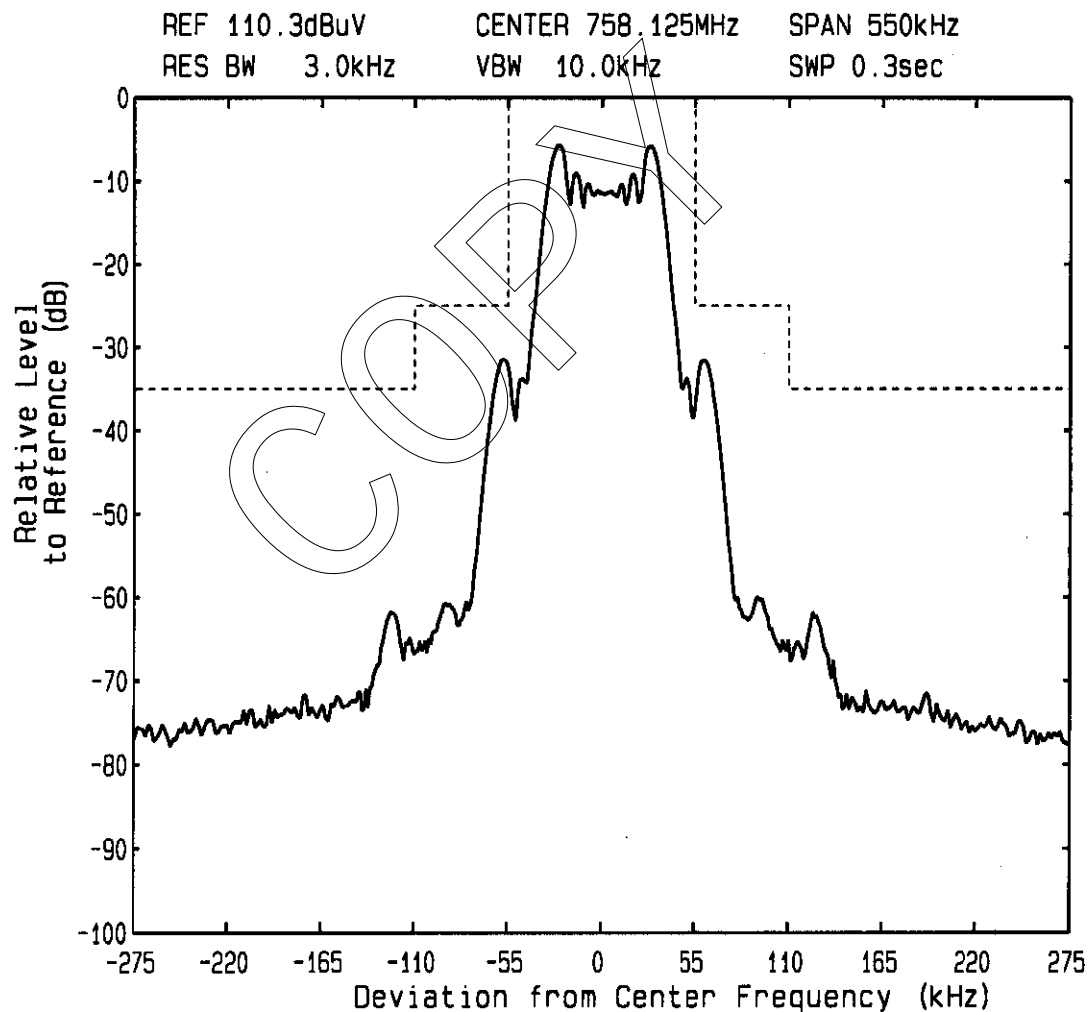
Emission Limitation

FCC ID : AK8UTXB1

Model : UTX-B1

Mode of EUT : Transmit (30mW Setting)

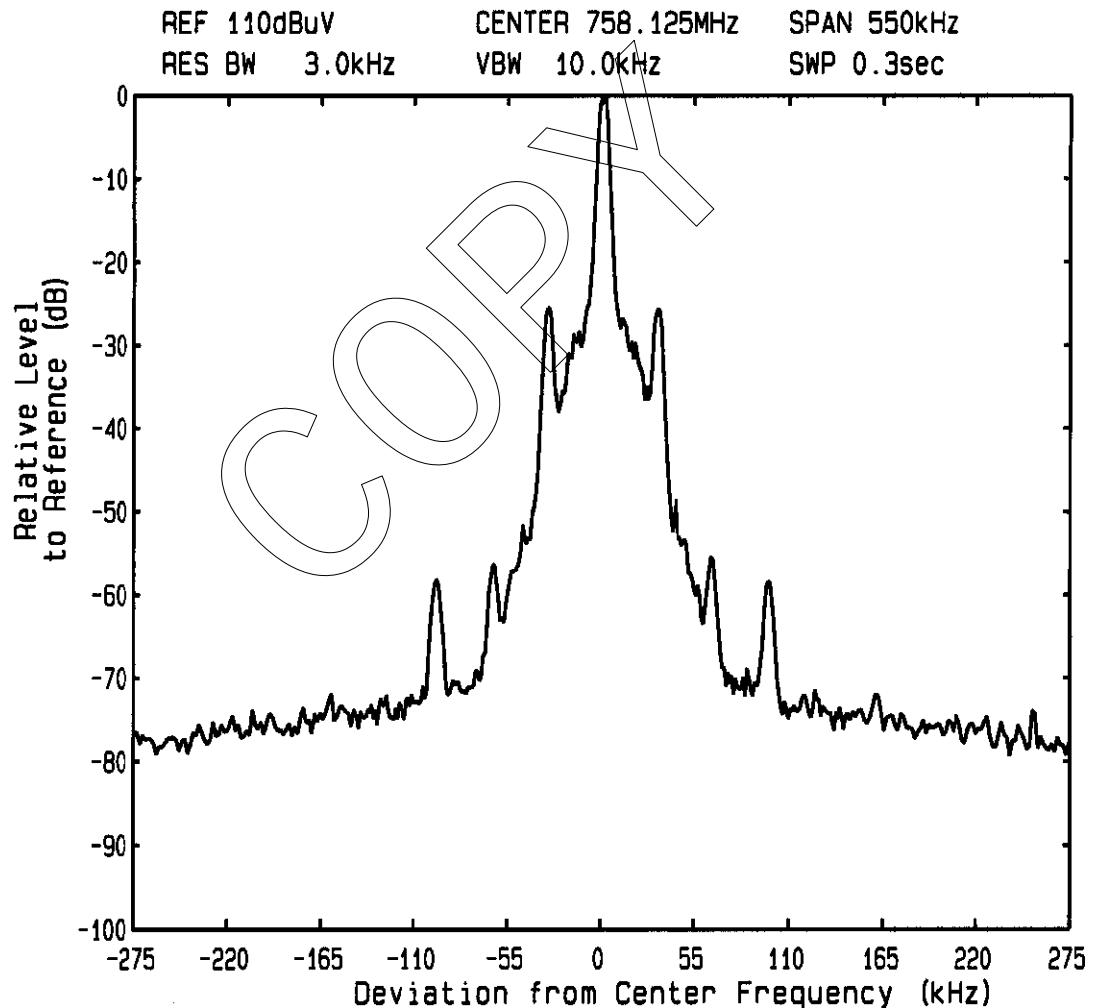
2.5 kHz, -29.4 dBV



Emission Limitation

FCC ID : AK8UTXB1
 Model : UTX-B1

Mode of EUT : Transmit (5mW Setting)
 Reference Carrier Level



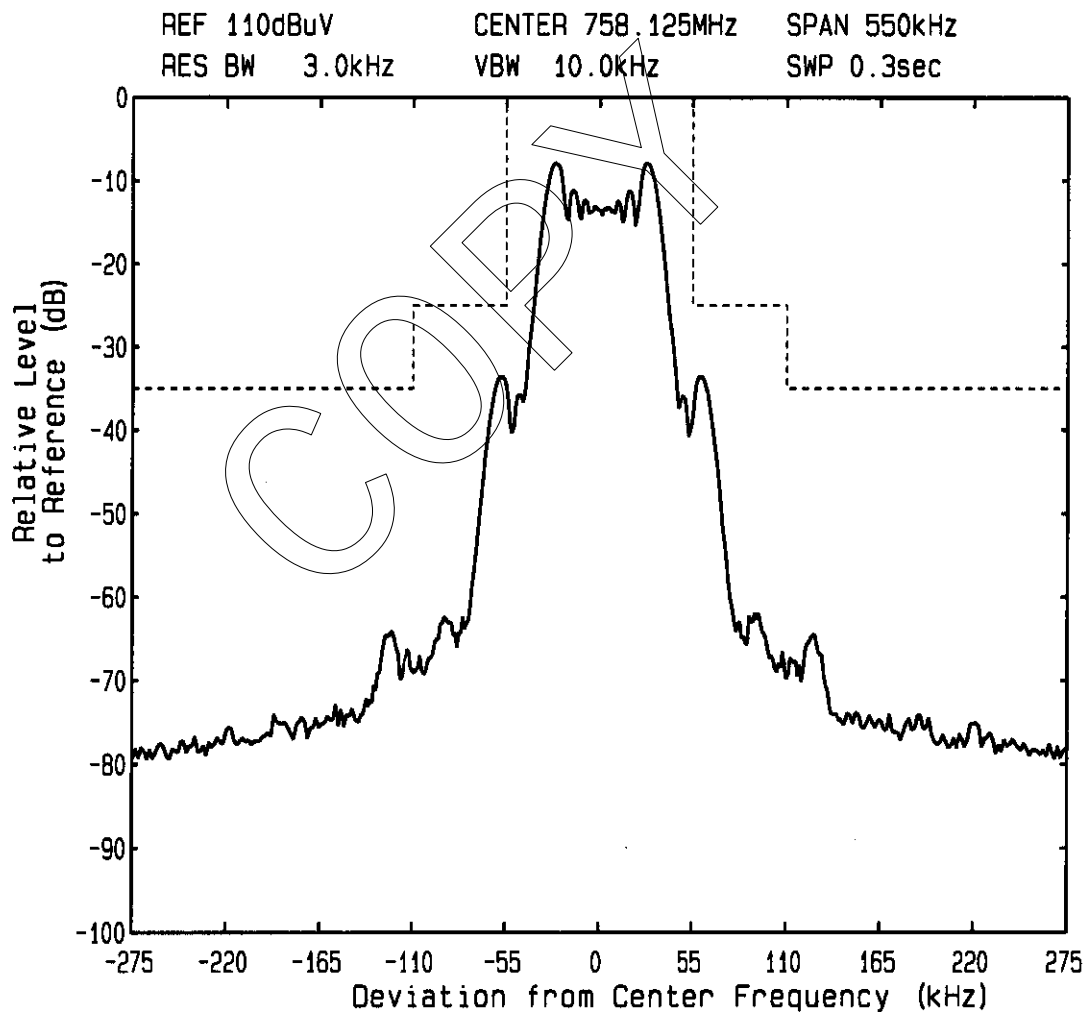
Emission Limitation

FCC ID : AK8UTXB1

Model : UTX-B1

Mode of EUT : Transmit (5mW Setting)

2.5 kHz, -29.4dBV





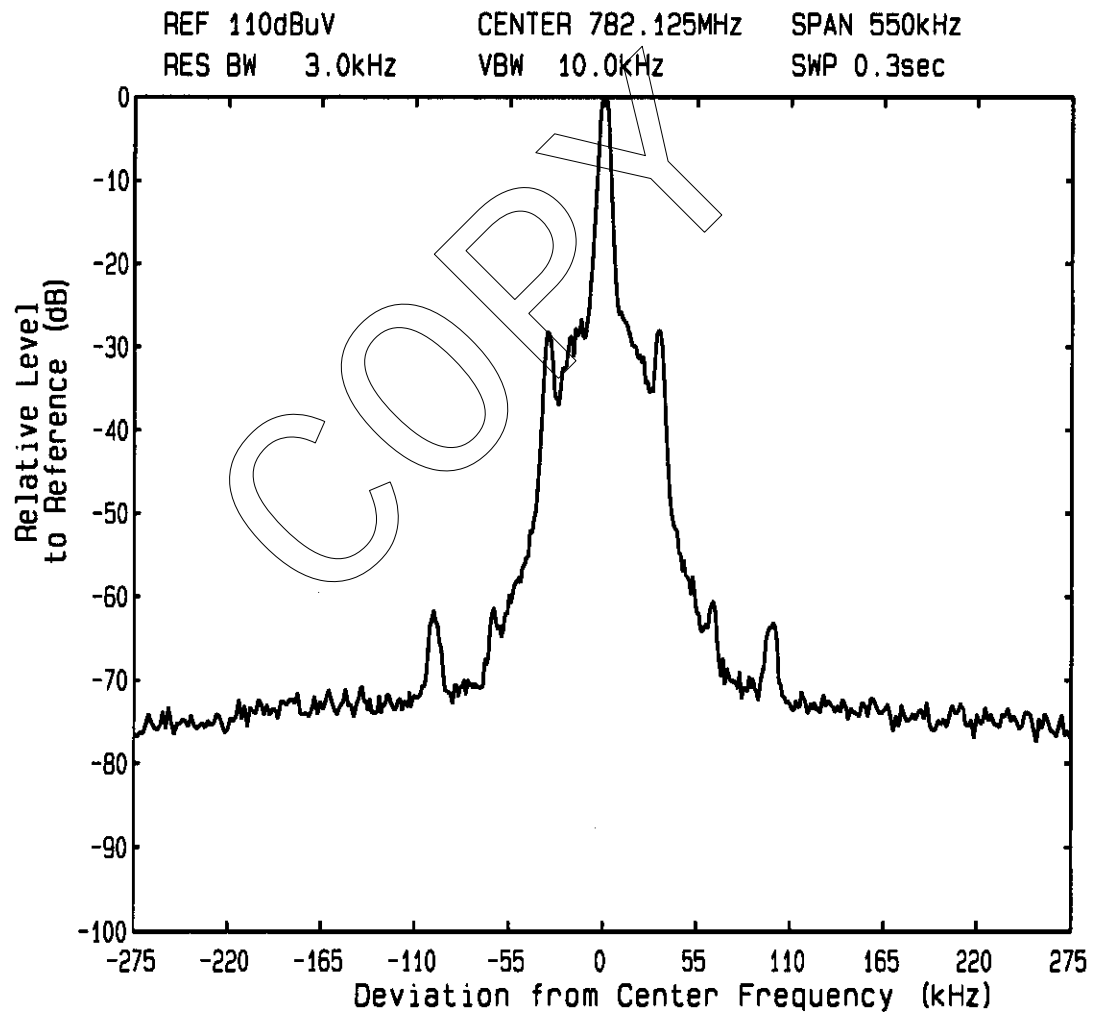
Emission Limitation

FCC ID : AK8UTXB1

Model : UTX-B1

Mode of EUT : Transmit (30mW Setting)

Reference Carrier Level



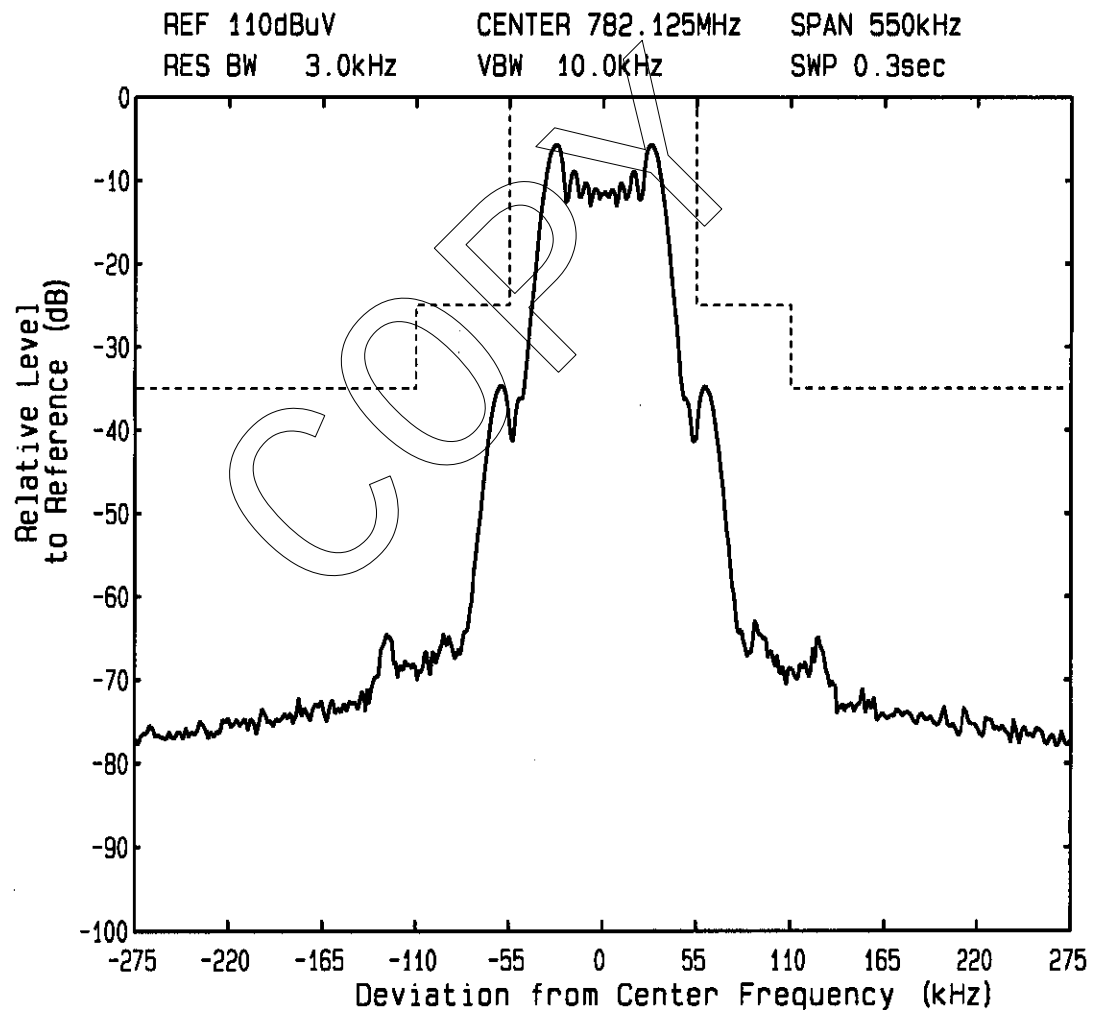
Emission Limitation

FCC ID : AK8UTXB1

Model : UTX-B1

Mode of EUT : Transmit (30mW Setting)

2.5 kHz, -29.9 dBV



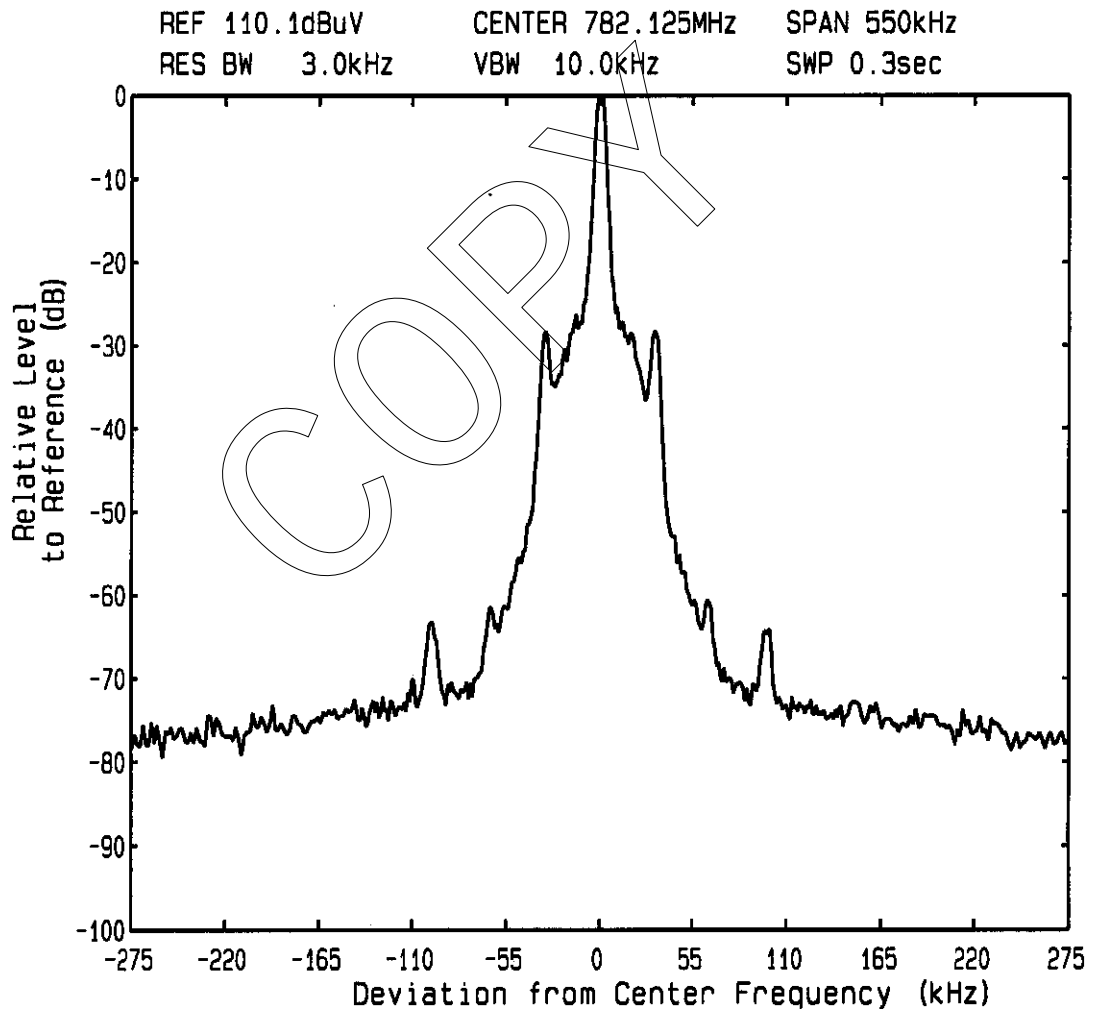
Emission Limitation

FCC ID : AK8UTXB1

Model : UTX-B1

Mode of EUT : Transmit (5mW Setting)

Reference Carrier Level



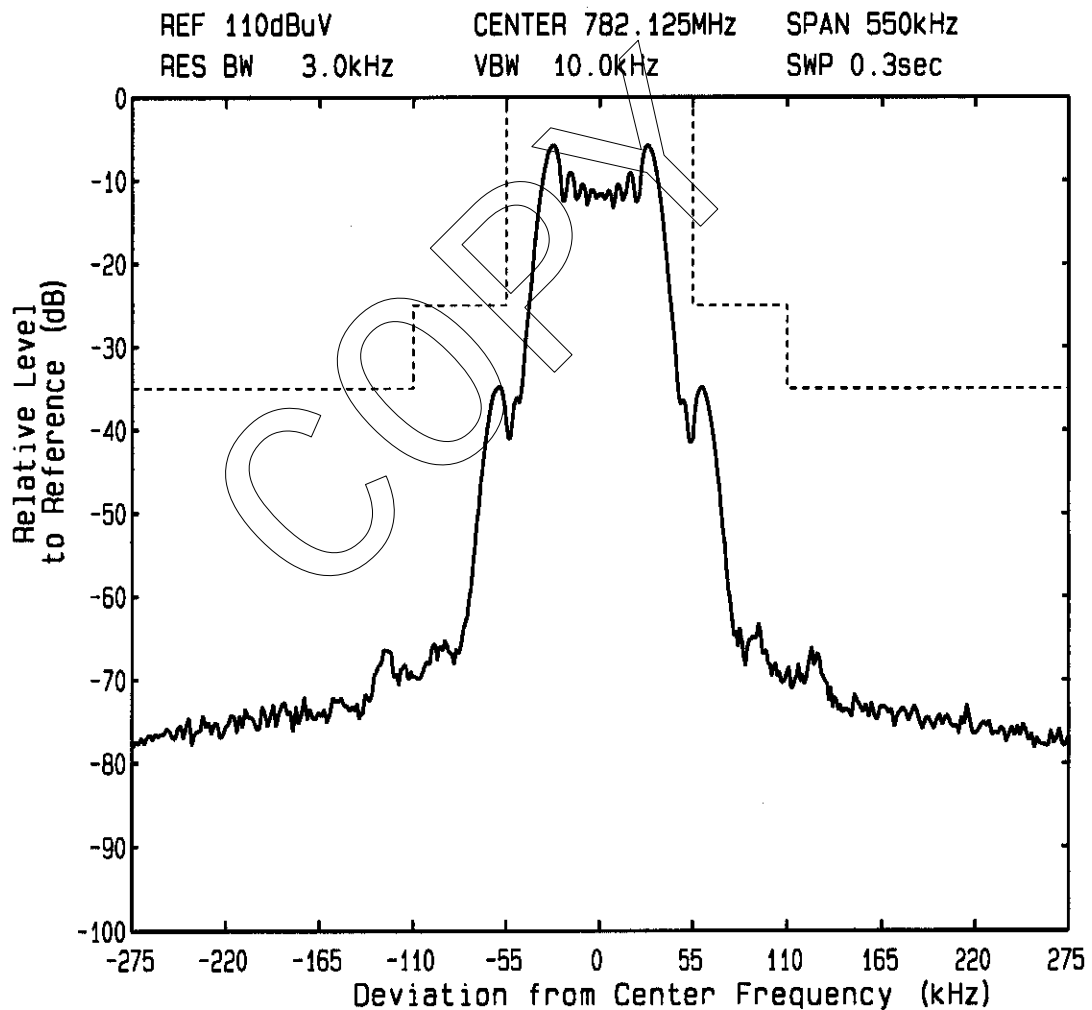
Emission Limitation

FCC ID : AK8UTXB1

Model : UTX-B1

Mode of EUT : Transmit (5mW Setting)

2.5 kHz, -29.9 dBV





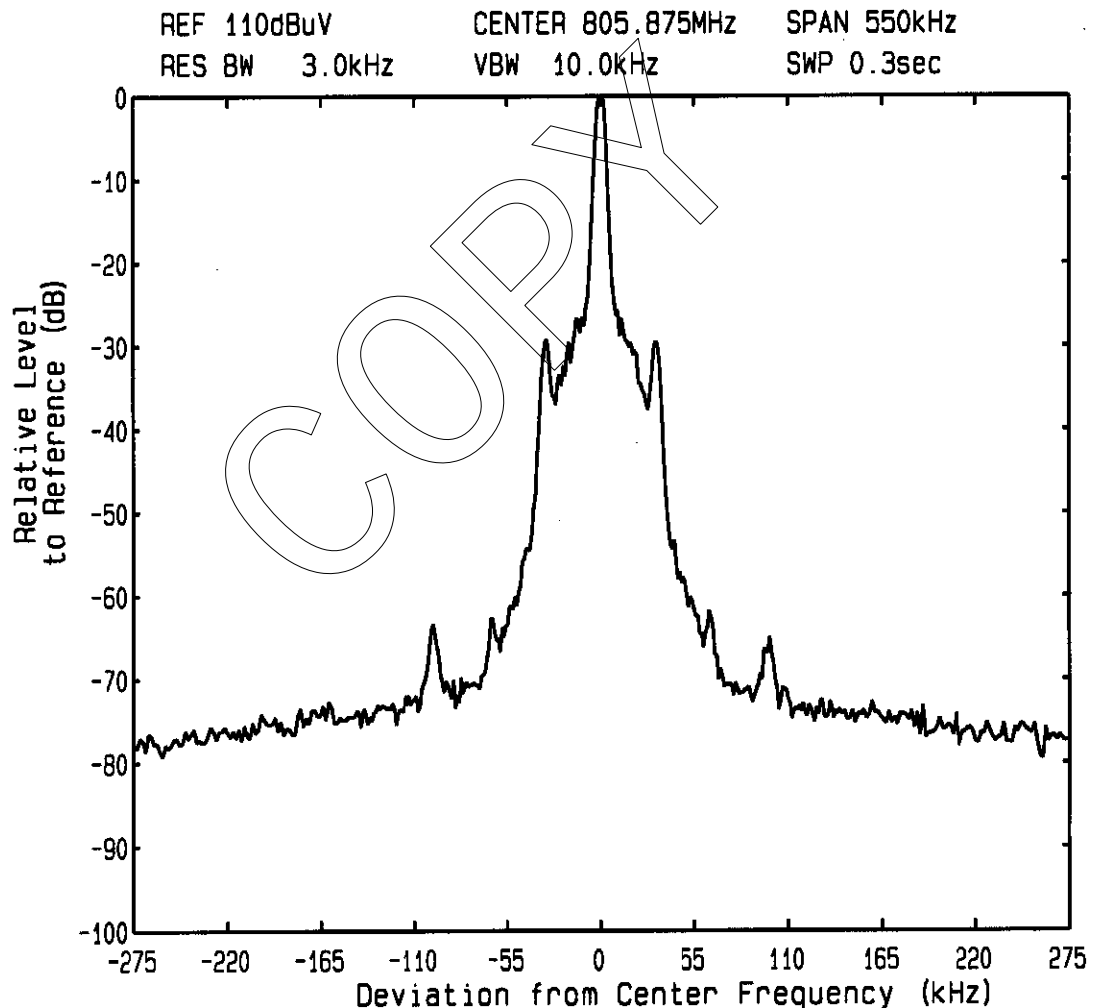
Emission Limitation

FCC ID : AK8UTXB1

Model : UTX-B1

Mode of EUT : Transmit (30mW Setting)

Reference Carrier Level



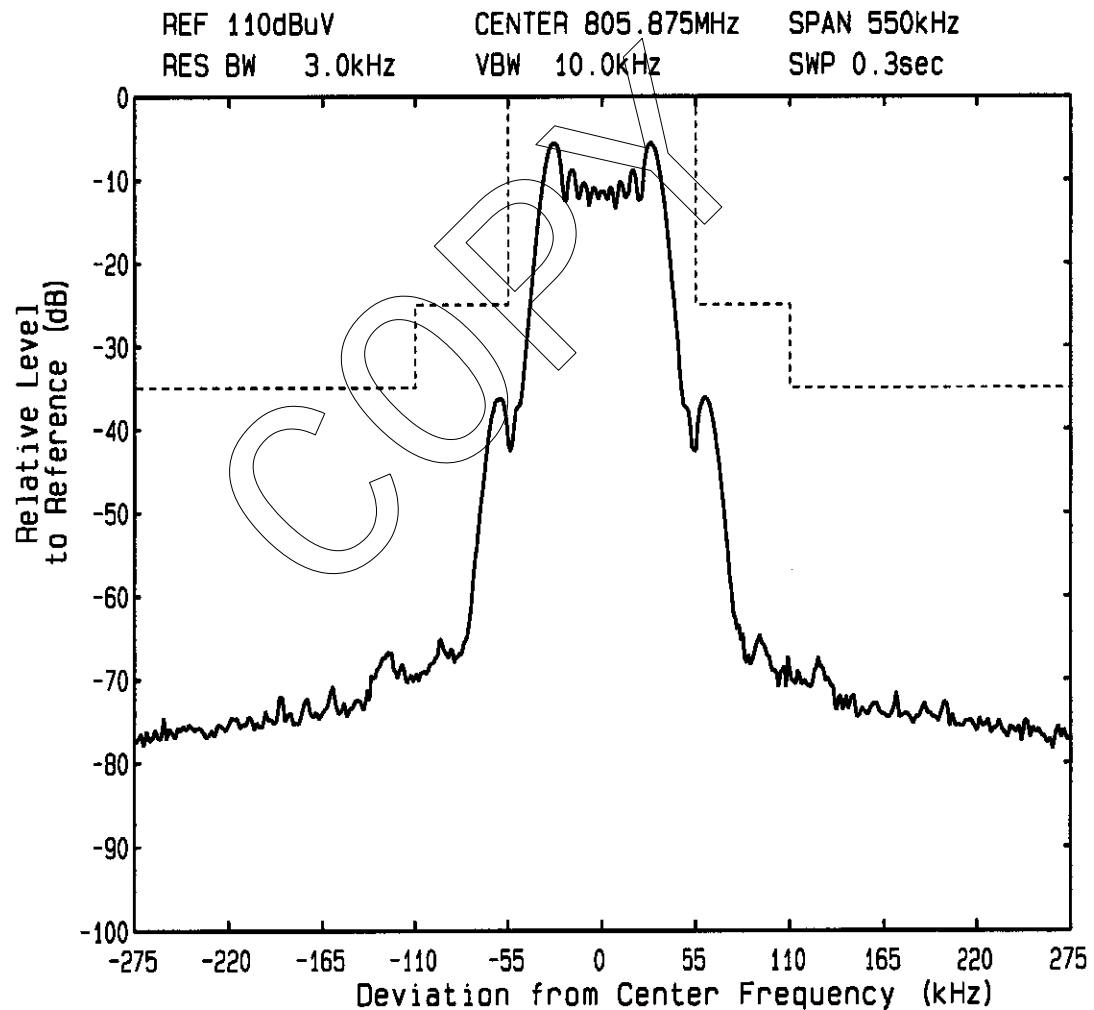
Emission Limitation

FCC ID : AK8UTXB1

Model : UTX-B1

Mode of EUT : Transmit (30mW Setting)

2.5 kHz, -26.9 dBV





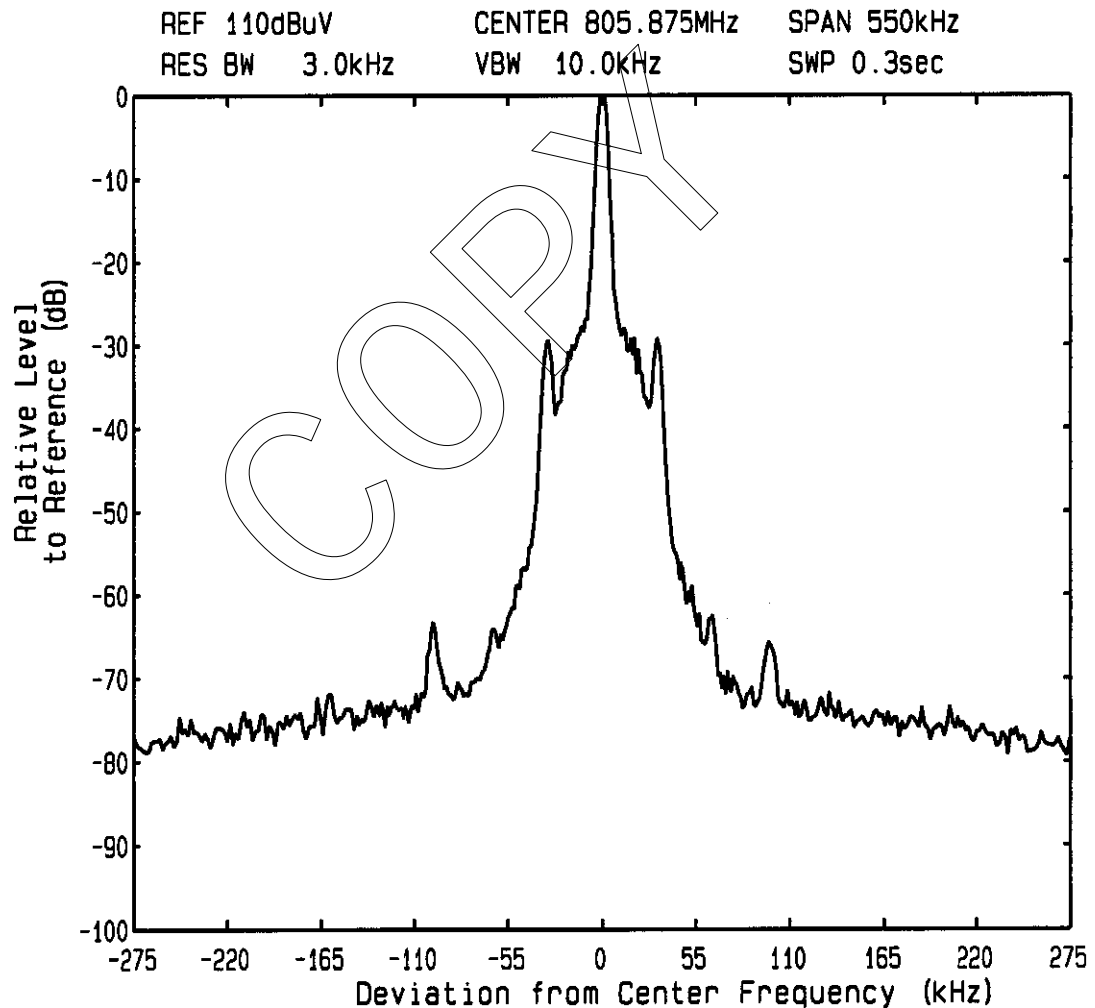
Emission Limitation

FCC ID : AK8UTXB1

Model : UTX-B1

Mode of EUT : Transmit (5mW Setting)

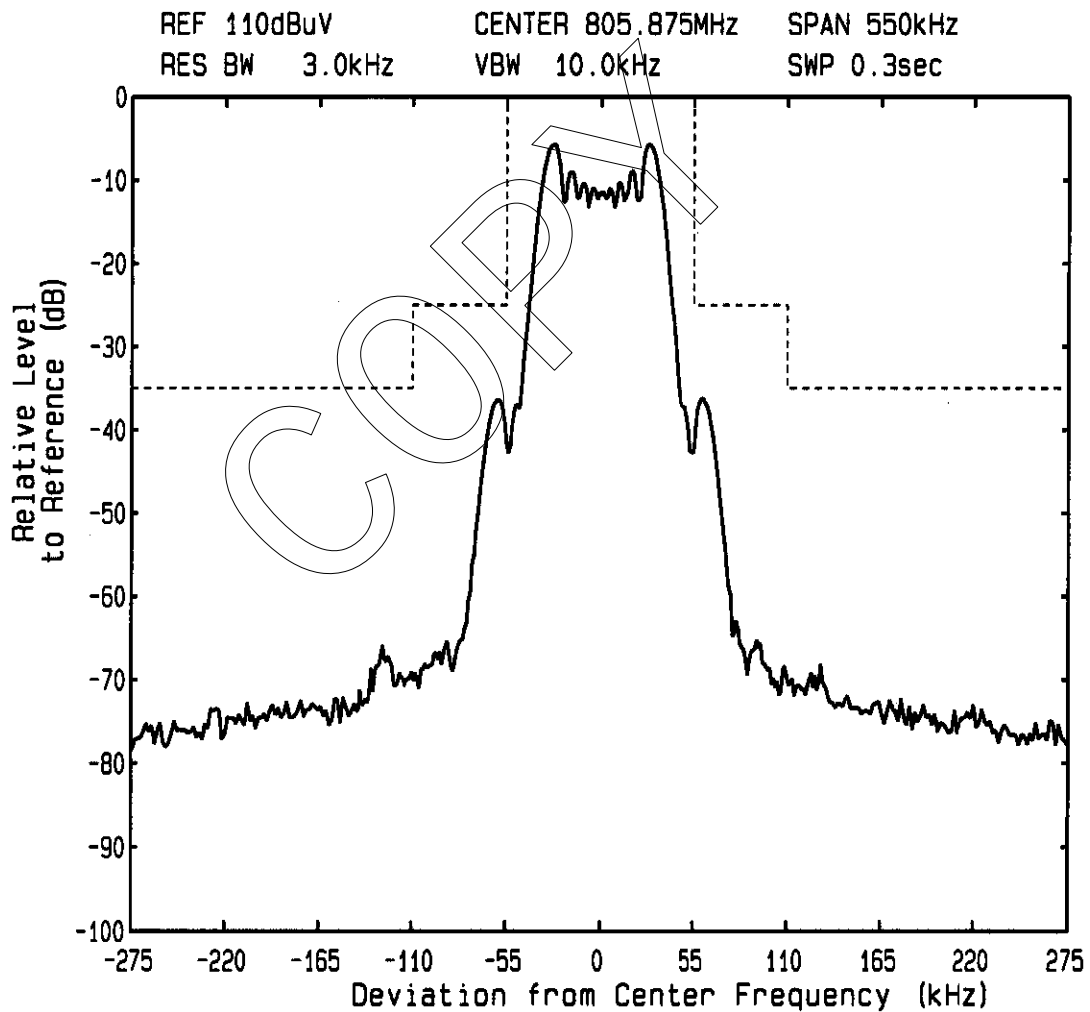
Reference Carrier Level



Emission Limitation

FCC ID : AK8UTXB1
 Model : UTX-B1

Mode of EUT : Transmit (5mW Setting)
 2.5 kHz, -26.9 dBV





2.5 Frequency Stability Measurement

Date : September 13, 2002

Temp.: 26°C Humi.: 67 %

Ambient Temp. (°C)	Frequency (MHz)	Transmitting Frequency (MHz)	Maximum Tolerance(%)
-30	758.125	758.096591	-0.003747
	782.125	782.111164	-0.001769
	805.875	805.860487	-0.001801
-20	758.125	758.105236	-0.002607
	782.125	782.117807	-0.000920
	805.875	805.867027	-0.000989
-10	758.125	758.112054	-0.001708
	782.125	782.121805	-0.000409
	805.875	805.871439	-0.000442
0	758.125	758.117391	-0.001004
	782.125	782.124288	-0.000091
	805.875	805.874040	-0.000119
+10	758.125	758.120420	-0.000604
	782.125	782.125221	+0.000028
	805.875	805.875385	+0.000023
+20	758.125	758.123406	-0.000210
	782.125	782.125362	+0.000046
	805.875	805.875432	+0.000054
+30	758.125	758.126399	+0.000185
	782.125	782.124894	-0.000014
	805.875	805.875090	+0.000112
+40	758.125	758.128847	+0.000507
	782.125	782.124431	-0.000073
	805.875	805.874466	-0.000057
+50	758.125	758.132204	+0.000950
	782.125	782.124326	-0.000086
	805.875	805.874357	-0.000080

Supply Voltage : 3.0VDC

Specified limit : $\pm 0.005\%$ (§74.861(e)(4))



Ambient Temp. (°C)	Frequency (MHz)	Transmitting Frequency (MHz)	Maximum Tolerance(%)
-30	758.125	758.096681	-0.003735
	782.125	782.111161	-0.001769
	805.875	805.860735	-0.001770
-20	758.125	758.105251	-0.002605
	782.125	782.117765	-0.000925
	805.875	805.867182	-0.000970
-10	758.125	758.112147	-0.001695
	782.125	782.121703	-0.000422
	805.875	805.871476	-0.000437
0	758.125	758.117312	-0.001014
	782.125	782.124171	-0.000106
	805.875	805.874174	-0.000103
+10	758.125	758.120390	-0.000608
	782.125	782.125229	+0.000029
	805.875	805.875387	+0.000048
+20	758.125	758.123357	-0.000217
	782.125	782.125341	+0.000044
	805.875	805.875430	+0.000053
+30	758.125	758.126017	+0.000134
	782.125	782.124920	-0.000010
	805.875	805.875079	+0.000010
+40	758.125	758.128258	+0.000430
	782.125	782.124468	-0.000068
	805.875	805.874476	-0.000055
+50	758.125	758.132228	+0.000953
	782.125	782.124315	-0.000088
	805.875	805.874335	-0.000083

Supply Voltage : 2.0VDC (Battery operating end point, Manufacturer defined)
Specified limit : $\pm 0.005\%$ (§74.861(e)(4))

Tested by :

Yoichi Nakajima
Testing Engineer