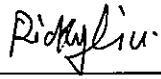
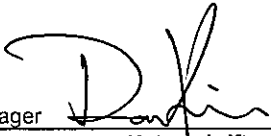


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<i>Test Report No.:</i>			
Auftraggeber: <i>Client:</i>	Seikaku Technical Group Limited. Offshore Chambers, P.O. Box. 217 Apia, Samoa		
Gegenstand der Prüfung: <i>Test item:</i>	Wireless Microphone		
Bezeichnung: <i>Identification:</i>	Refer to Model List in Clause 3.	FCC ID: <i>FCC ID</i>	H38-UPUL-MODAU-BP
Wareneingangs-Nr.: <i>Receipt No.:</i>	173028719	Eingangsdatum: <i>Date of receipt:</i>	28.12.2007
Prüfart: <i>Testing location:</i>	TÜV Rheinland (Guangdong) Ltd. EMC Laboratory Guangzhou Auto Market, Yuan Gang Section of Guangshan Road, Guangzhou 510650 P. R. China	Listed test laboratory according to FCC rules section 2.948 for measuring devices under Parts 74	
Prüfgrundlage: <i>Test specification:</i>	ANSI C63.4: 2003 FCC "Rules and Regulations", Part 74: 01, Oct., 1997 Subpart H, Section 74.861 FCC "Rules and Regulations", Part 15: 20, Sep., 2007 Subpart C, section 15.207		
Prüfresultat: <i>Test Result:</i>	Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The test item passed the test specification(s).</i>		
Prüflaboratorium: <i>Testing Laboratory:</i>	TÜV Rheinland (Guangdong) Ltd.		
geprüft / tested by:		kontrolliert / reviewed by:	
27. Mar., 2008	Ricky Liu Project Manager		31. Mar. 2008
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>
			Dave Xie Project Manager
			
			Datum <i>Date</i>
			Name/Stellung <i>Name/Position</i>
			Unterschrift <i>Signature</i>
Sonstiges / Other Aspects:			
Abkürzungen: P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet			
Abbreviations: P(ass) = passed F(ail) = failed N/A = not applicable N/T = not tested			
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>			

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TEST SUMMARY

5.1 CONDUCTED EMISSION FOR FCC PART 15 PER SECTION 15.207(A)

RESULT: Pass

5.2 POWER OUTPUT MEASUREMENT FOR FCC PART 74 PER SECTION 74.861(E)(1)

RESULT: Pass

5.3 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT FOR FCC PART 74 PER SECTION 74.861(E)(6)(III)

RESULT: Pass

5.4 MODULATION CHARACTERISTICS MEASUREMENT

RESULT: Pass

5.5 OCCUPIED BANDWIDTH FOR FCC PART 74 PER SECTION 74.861(E)(3), 74.861(E)(5) AND 74.861(E)(6)

RESULT: Pass

5.6 FREQUENCY TOLERANCE FOR FCC PART 74 PER SECTION 74.861(E)(4)

RESULT: Pass

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix 1: Test result

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Guangdong) Ltd. EMC Laboratory

Guangzhou Auto Market, Yuan Gang Section of Guangshan Road
Guangzhou 510650

P. R. China

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2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Kind of Equipment	Type	Manufacturer	S/N	Calibrated until	Calibrated Interval
EMI Test Receiver	ESCI-3	Rohde & Schwarz	100216	05.Dec.2007	1 year
Spectrum Analyzer	FSP30	Rohde & Schwarz	100286	24.Aug.2008	1 year
Trilog-Broadband Antenna	VULB9168	SCHWARZBECK MESS-ELEKTRONIK	210	08.May.2009	2 year
Double-Ridged Waveguide Horn Antenna	HF906	Rohde & Schwarz	100385	18.Jul.2009	2 year
Double-Ridged Waveguide Horn Antenna	HF906	Rohde & Schwarz	100407	08.May.2009	2 year
Pre-amplifier	AFS42- 00101800- 25-S-42	MITEQ	1101599	31.Jul.2009	2 year
Band Reject Filter	BRM50702	Micro-Tronics	023	15.Feb.2008	2 year
Standard Gain Horn Antenna	3160-09	EMCO	21642	N/A	2 year
Standard Gain Horn Antenna	3160-09	EMCO	21645	N/A	2 year
Pre-amplifier	AFS33- 18002650- 30-8P-44	MITEQ	1108282	31.Jul.2009	2 year
3m Anechoic Chamber	N/A	Albatross Project GmbH	N/A	16.Apr.2008	2 year
EMI Test Receiver	ESCS30	Rohde & Schwarz	100316	02.Apr.2008	1 year
Two-Line V-Network	ESH3-Z5	Rohde & Schwarz	100308	02.Apr. 2008	1 year
Pulse Limiter	ESH3-Z2	Rohde & Schwarz	100701	01.Mar.2008	1 year

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2.3 Trace ability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

Uncertainty for conducted emissions measurements is ± 2.51 dB.

Uncertainty for radiated emissions measurements is ± 4.9 dB (30MHz-1GHz), ± 4.84 dB (>1GHz).

The reported expanded uncertainty is based on a standard uncertainty multiply by a coverage factor $k=2$, providing a level of confidence of approximately 95%.

2.6 Location of original data

The original copies of all test data taken during actual testing were attached at Appendix 1 of this report and delivered to the applicant. A copy has been retained in the TUV Rheinland (Guangzhou) file for certification follow-up purposes.

2.7 Status of facility used for testing

TÜV Rheinland (Guangdong) Ltd. EMC Laboratory; Guangzhou Auto Market, Yuan Gang Section of Guangshan Road, Guangzhou 510650, P. R. China is listed on the US Federal Communications Commission list of facilities approved to perform measurements, the register no. 833845

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3 General Product Information

The submitted samples are wireless microphones operating within the frequency range of 740 MHz to 769 MHz. They are powered by 2X "AA" batteries and can be charged by a supplied AC/DC charger while it is not working. Refer to the following table for the list of all the models.

Model List:

UP-8P	UL-8P	MOD-16P	MOD-800P	AU-800P
---	---	MOD-16LV	MOD-800LV	AU-800LV
---	---	MOD-16HS	MOD-800HS	AU-800HS
UP-88P	UL-88P	---	---	---
UP-8G	UL-8G	MOD-16G	MOD-800G	AU-800G
UP-88G	UL-88G	---	---	---

All the 4 models in the column 4 of above table use identical circuit design, PCB layout and electronic component.

MOD-800P is the wireless transmitter itself without any microphone pickup.

MOD-800LV is the wireless transmitter MOD-800P plus a lavalier Microphone pickup.

MOD-800HS is the wireless transmitter MOD-800P plus a headset Microphone pickup.

MOD-800G is the wireless transmitter MOD-800P plus a cable to be connected to an electric guitar or a bass.

All the models in every same row of above table are identical except model names.

UP-8P and UP-88P only differ in the outside enclosure.

UP-8G and UP-88G only differ in the outside enclosure too. UP-8G is the wireless transmitter UP-8P plus a cable to be connected to an electric guitar or a bass.

Based on above information, all necessary tests are performed on the MOD-800P/AU-800P with Modulation Characteristics tests are performed on both MOD-800HS/AU-800HS and MOD-800LV/AU-800LV respectively. (AU series and MOD series are identical except models names.)

Necessary tests are perform on three operation frequencies of their frequency range, which are low channel 740.125 MHz, mid channel 754.525 MHz and high channel 768.725 MHz.

3.1 Product Function and Intended Use

For details, refer to technical document and the user manual.

3.2 Ratings and System Details

Frequency range	:	740 – 769 MHz
Nominal Operating frequencies	:	Refer to the Frequency List below
RF output power	:	3.31mW
Type of antenna	:	Integral antenna
FCC ID:		H38-UPUL-MODAU-BP
Power supply	:	DC 3V (battery 2x : “AA” type or rechargeable)
Frequency Response	:	30Hz-15kHz
Frequency Stability	:	0.005%
Emission designator	:	112KF3E
Ports	:	Charge port DC 9V
Protection Class	:	III

Frequency Range and Channel List

	Group1	Group2	Group3	Group4	Group5	Group6	Group7	Group8	Group9	Group10	Group11	Group12
1	740.125	740.325	740.525	740.725	740.925	741.125	741.325	741.525	741.725	741.925	742.125	742.325
2	742.525	742.725	742.925	743.125	743.325	743.525	743.725	743.925	744.125	744.325	744.525	744.725
3	744.925	745.125	745.325	745.525	745.725	745.925	746.125	746.325	746.525	746.725	746.925	747.125
4	747.325	747.525	747.725	747.925	748.125	748.325	748.525	748.725	748.925	749.125	749.325	749.525
5	749.725	749.925	750.125	750.325	750.525	750.725	750.925	751.125	751.325	751.525	751.725	751.925
6	752.125	752.325	752.525	752.725	752.925	753.125	753.325	753.525	753.725	753.925	754.125	754.325
7	754.525	754.725	754.925	755.125	755.325	755.525	755.725	755.925	756.125	756.325	756.525	756.725
8	756.925	757.125	757.325	757.525	757.725	757.925	758.125	758.325	758.525	758.725	758.925	759.125
9	759.325	759.525	759.725	759.925	760.125	760.325	760.525	760.725	760.925	761.125	761.325	761.525
10	761.725	761.925	762.125	762.325	762.525	762.725	762.925	763.125	763.325	763.525	763.725	763.925
11	764.125	764.325	764.525	764.725	764.925	765.125	765.325	765.525	765.725	765.925	766.125	766.325
12	766.525	766.725	766.925	767.125	767.325	767.525	767.725	767.925	768.125	768.325	768.525	768.725

Refer to the technical document and user manual for further information.

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3.3 Independent Operation Modes

The basic operation modes are:

Transmitting, Charging

For further information refer to User Manual

3.4 Submitted Documents

Block Diagram
Circuit Diagram
Components List
PCB layout
FCC label
User Manual
Photo document

4 Test Set-up and Operation Mode

4.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Refer to Test set-up in chapter 5.

4.3 Special Accessories and Auxiliary Equipment

The product has been tested together with Linear AC/DC Adaptor with following rating:

Input : AC 120V 60Hz
Output : DC 9V/ 300mA
Protection class : II

4.4 Countermeasures to achieve EMC Compliance

The test sample, which has been tested, contained the noise suppression parts as described in the technical document. No additional measures were employed to achieve compliance.

4.5 Test set-up

Diagram 1 of Measurement Equipment Configuration for Testing Radiated Emission

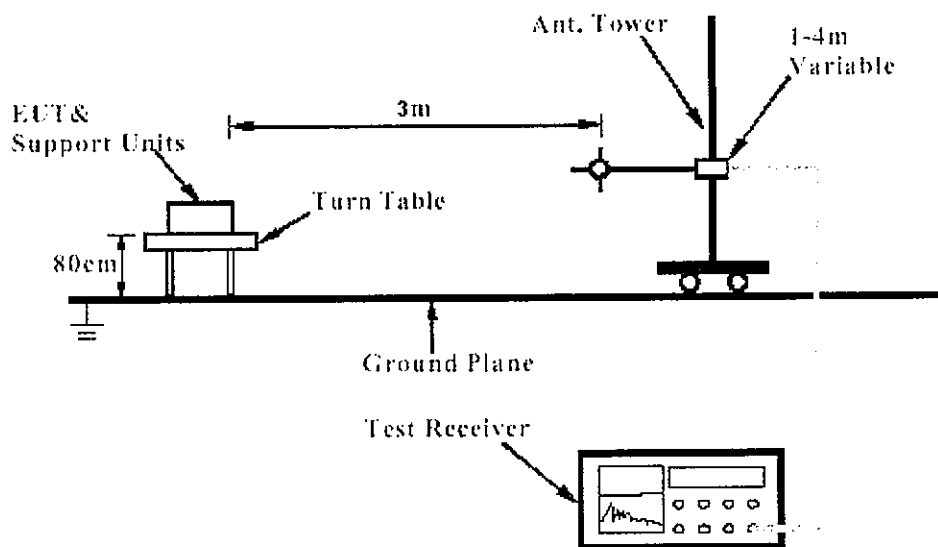


Diagram 2 of Measurement Equipment Configuration for Substitution Method

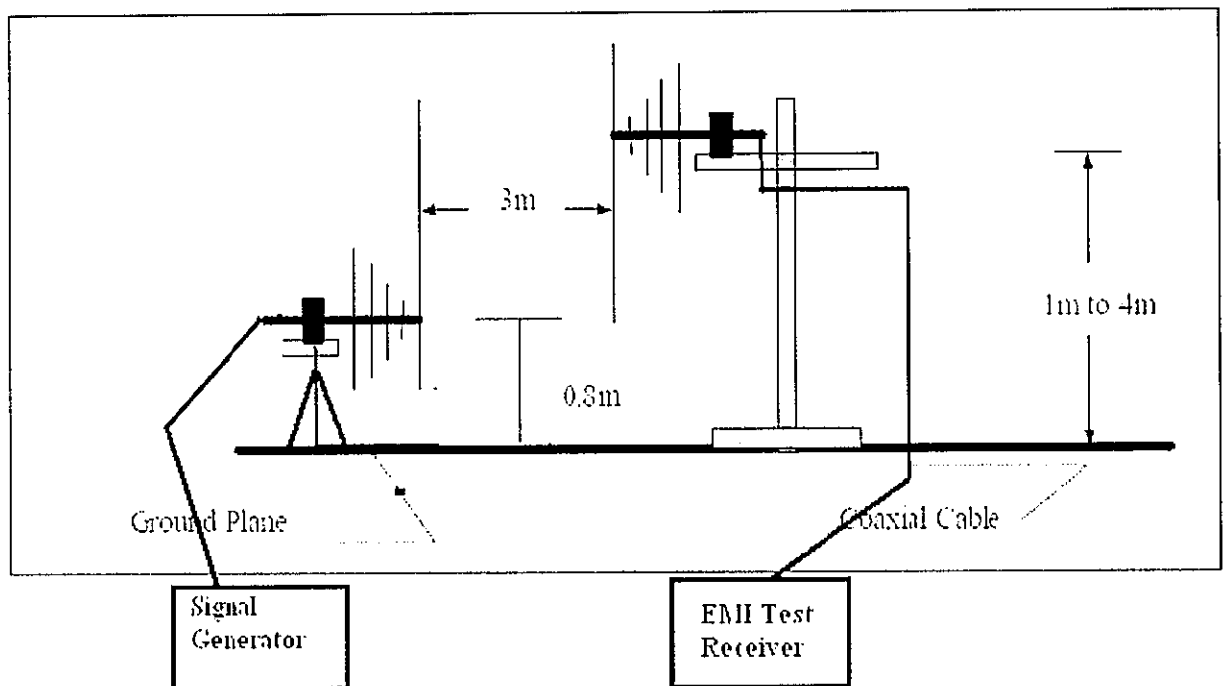


Diagram 3 of Measurement Equipment Configuration for Testing Modulation Characteristics measurement

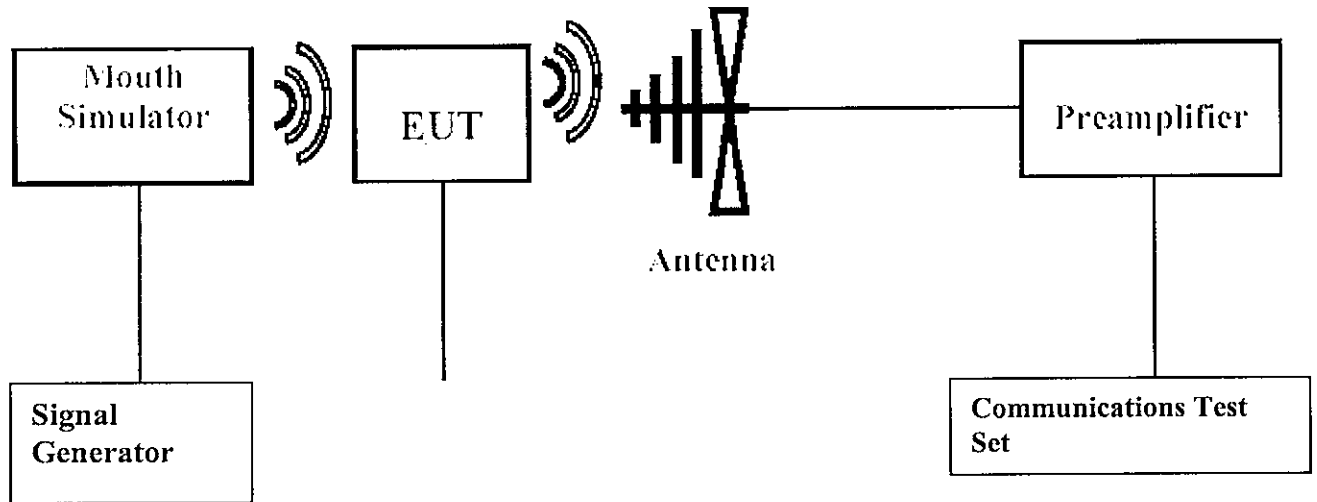
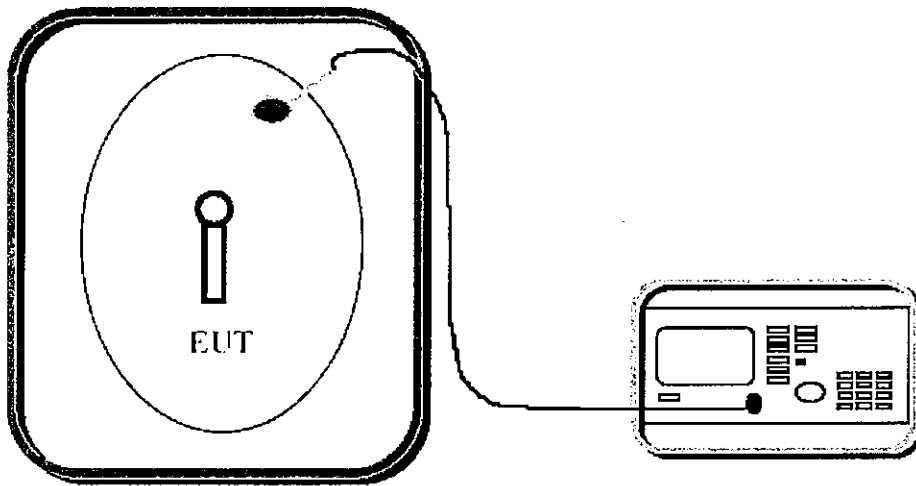
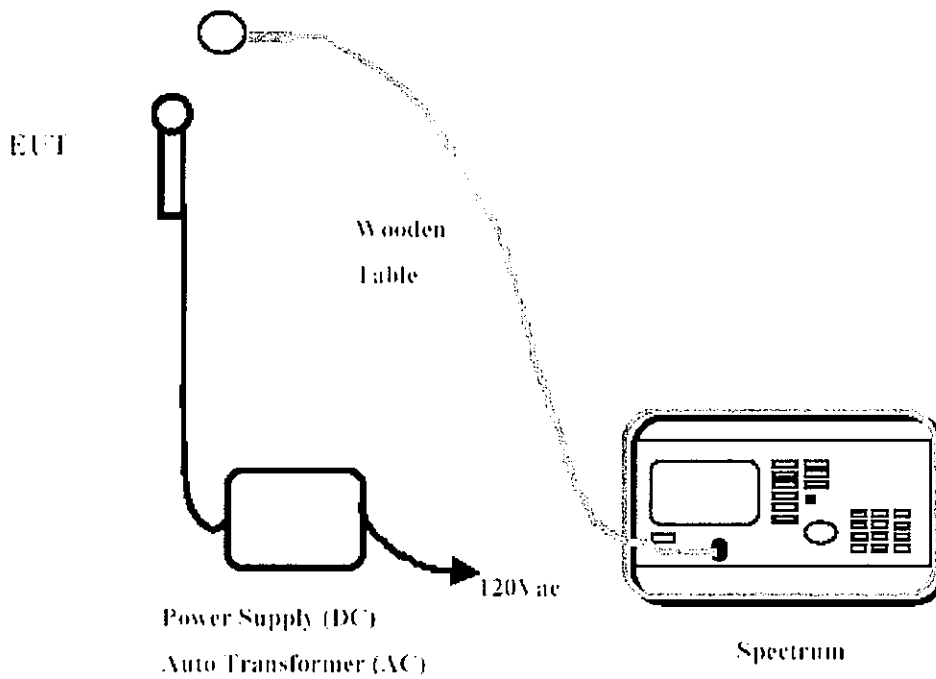


Diagram 4 of Measurement Equipment Configuration for Testing Frequency Tolerance



Chamber

Spectrum



Spectrum

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5 Test Results EMISSION

5.1 Conducted Emission for FCC Part 15 Per Section 15.207(a)

RESULT:

Pass

Date of testing	:	27.04.2008
Test specification	:	FCC Part 15 Per Section 15.207(a)
Limits	:	FCC Part 15 Per Section 15.207(a)
Test procedure	:	Procedure specified in ANSI C63.4 were followed
Deviations from Standard Test procedures	:	None
Kind of test site	:	Shielded room
Operation mode	:	B: Charging (AC 120V, 60Hz)
Temperature	:	20°C
Humidity	:	45%

Measurement procedure:

1. Place the EUT as specified in ANSI C63.4 Clause 7.2.1
2. Plug the LISN to a correct power source (pay attention to: AC/DC, voltage, frequency).
4. Connect the EUT to LISN and choose N or L1 on the LISN.
5. Connect ESCS30 and LISN via a 50-ohm coaxial cable and a pulse limiter then begin exploratory measurement as specified in ANSI C63.4 Clause 7.2.3
6. Make final measurement as specified in ANSI C63.4 Clause 7.2.4
7. Switch to the other line on the LISN and repeat step 4 to 6.

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Table 2: Disturbance Voltage on AC Mains (L1 line)

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Line
0.290000	33.1	1000.000	9.000	L1
0.295000	32.9	1000.000	9.000	L1
0.565000	19.4	1000.000	9.000	L1

(continuation of the "Final Measurement Detector 1" table from column 6 ...)

Frequency (MHz)	Corr (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.290000	10.0	27.4	60.5	
0.295000	10.0	27.5	60.4	
0.565000	10.0	36.6	56.0	

Table 3: Disturbance Voltage on AC Mains (N line)

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Line
0.275000	32.9	1000.000	9.000	N
0.480000	28.1	1000.000	9.000	N

(continuation of the "Final Measurement Detector 1" table from column 6 ...)

Frequency (MHz)	Corr (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.275000	10.0	28.1	61.0	
0.480000	10.0	28.3	56.3	

The spectral diagrams in Appendix 1 display the exploratory measurement of un-weighted peak values and average values.

For disturbance measured with value far below the limit, no final measurement was performed.

If the result of the measurement with the Quasi Peak detector is below the Average limit, the measurement with Average Detector may be omitted.

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5.2 Power output measurement for FCC part 74 Per Section 74.861(e)(1)

RESULT:

Pass

Date of testing	:	11.04.2007
Test specification	:	FCC Part 2 Per Section 2.1046(a)
Limits	:	FCC Part 74 Per Section 74.861(e)(1)
Deviations from Standard Test procedures	:	None
Kind of test site	:	3m Anechoic Chamber
Operation mode	:	Transmitting (unmodulated)
Temperature	:	20°C
Humidity	:	55%

Measurement procedure:

1. The EUT was placed on an 80cm high turntable in the anechoic chamber.
2. For radiated power output of the EUT, the measuring antenna was raised and lowered to obtain a maximum reading on the spectrum analyzer with the test antenna polarized vertically and horizontally. The turntable was rotated 360 to further searching the maximum reading on the spectrum analyzer. Then the max value on spectrum was recorded.
3. The EUT was removed and replaced with a substitute dipole antenna. The length of the antenna was adjusted to a half-wave of transmitting frequency measured. The centre of the dipole antenna was placed approximately at the same location as the centre place of the EUT in step 1 and 2.
4. The dipole antenna was connected to a signal generator with a coaxial cable.
5. The signal generator is tuned to the transmitting frequency with the substitute antenna polarized both vertically and horizontally, the output level of the signal generator output was then adjusted to get a maximum reading in the spectrum with the same value recorded in the step 2.
6. The input RF power in the dipole antenna was calculated from the coaxial cable loss and the signal generator output level obtained in step 5. This value was regarded as final result and recorded in following table 2.

Note: While in Step 2, the EUT was placed in 3 orthogonal planes to find a maximum reading.

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Table 4: Measurement Result of output power on frequencies 740.125MHz, 753.125MHz and 768.725MHz

Channel	Freq. (MHz)	Polarization (V/H)	Transmit power (dBm)	Transmit power (mW)	Limit (mW)
Low	740.125	V	4.438	2.78	250
	740.125	H	5.097	3.23	250
Mid	755.525	V	4.193	2.63	250
	754.525	H	4.848	3.05	250
High	768.725	V	4.671	2.93	250
	768.725	H	5.204	3.31	250

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz at frequency below 1GHz.

The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz at frequency above 1GHz.

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5.3 Spurious Radiation Measurement for FCC Part 74 Per Section 74.861(e)(6)(iii)

RESULT:

Pass

Date of testing	:	11.04.2007
Test specification	:	FCC Part 2 Per Section 2.1053(a) and 2.1057
Limits	:	FCC Part 74 Per Section 74.861(e)(6)(iii)
Deviations from Standard Test procedures	:	None
Kind of test site	:	3m Anechoic Chamber
Operation mode	:	Transmitting (unmodulated)
Temperature	:	22°C
Humidity	:	50%

Measurement procedure:

1. The EUT was turned on and placed on the top of a rotatable table 0.8 meters above the ground with 3-orthogonal XYZ direction and be kept close enough to the measurement receiving antenna (especially for the measurement frequency range above 1 GHz). The table was then rotated 360 degrees to detect the suspected emission frequency points. The position of the worst radiation case with both horizontal and vertical receiving antenna polarization was then recorded together with the suspected emission frequency points above-mentioned.
2. The EUT was then set 3 meters away from the receiving antenna, which was mounted on a variable-height antenna tower.
3. For each suspected emission frequency point recorded in step 1, the EUT was arranged to its worst case that the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to read the maximum emission.
4. The EUT was removed and be replaced with substitute antenna correspondent to the suspected frequency point mentioned in Step 3 (if necessary, characteristic frequency of the antenna is adjusted to a half-wave of the suspected frequency point). The substitute antenna was then connected to a signal generator with a coaxial cable and its center is placed approximately at the same location as the centre place of the EUT in Step 3.
5. The signal generator is tuned to the suspected frequency point mentioned in Step 3 with the substitute antenna polarized both vertically and horizontally, the output level of the signal generator output was then adjusted to get a maximum reading in the spectrum with the same value recorded in the step 3.
6. For each suspected frequency point, the input RF power in the substitute antenna was calculated from the coaxial cable loss, antenna factor and the signal generator output level obtained in step 5. This value was regarded as final result and recorded in following table 4, table 5 and table 6.

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To determine the Limit for Spurious Emissions the following method was used:

Maximum output power in watts:

Maximum output power in Watt: 0.00331W (see table 2)

The emission must be reduced by:

$$43+10*\text{Log}(0.00331) = 18.198 \text{ dB}$$

Therefore, the Emission Limit equals:

$$10*\text{Log}(0.00331*1000) - 18.198\text{dB} = -13\text{dBm}$$

While testing, the EUT was placed in 3 orthogonal planes and the maximum reading was recorded in the following tables.

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz at frequency below 1GHz.

The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz at frequency above 1GHz.

Table 5: Spurious Emission: EUT operated on Bottom frequency (740.125MHz)

Freq. (MHz)	Polarization (V/H)	Transmit power (dBm)	Limit (dBm)
1476.954	H	-41.47	-13
4436.874	H	-38.68	-13
5180.361	H	-37.80	-13
5923.874	H	-29.14	-13
6667.334	H	-37.09	-13
7410.822	H	-30.29	-13
1476.954	V	-32.13	-13
2220.441	V	-47.40	-13
2963.928	V	-51.25	-13
4436.874	V	-37.16	-13
5180.361	V	-39.61	-13
5923.874	V	-32.46	-13
6667.334	V	-38.04	-13
7410.822	V	-38.44	-13

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Table 6: Spurious Emission: EUT operated on Bottom frequency (754.525MHz)

Freq. (MHz)	Polarization (V/H)	Transmit power (dBm)	Limit (dBm)
1505.010	V	-30.61	-13
2262.525	V	-44.11	-13
4521.042	V	-40.10	-13
5278.557	V	-43.24	-13
6036.072	V	-35.37	-13
6793.587	V	-34.66	-13
7551.102	V	-41.39	-13
1505.010	H	-39.82	-13
3777.555	H	-46.47	-13
4521.042	H	-38.13	-13
5278.557	H	-41.39	-13
6036.072	H	-32.33	-13
6793.587	H	-33.72	-13
7551.102	H	-31.66	-13

Table 7: Spurious Emission: EUT operated on Bottom frequency (768.725MHz)

Freq. (MHz)	Polarization (V/H)	Transmit power (dBm)	Limit (dBm)
3847.695	H	-40.97	-13
4619.238	H	-36.65	-13
5376.753	H	-41.99	-13
6148.296	H	-39.94	-13
6919.839	H	-32.46	-13
7691.383	H	-32.81	-13
3676.152	V	-50.96	-13
3847.695	V	-45.36	-13
4619.238	V	-35.44	-13
5376.753	V	-43.62	-13
6148.296	V	-36.54	-13
6919.839	V	-33.07	-13
7691.383	V	-39.24	-13

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5.4 Modulation Characteristics measurement

RESULT:

Pass

Date of testing : 11.04.2007
Test specification : FCC Part 2 Per Section 2.1047(a) and (b)
Limits : FCC Part 2 Per Section 2.1047(a) and (b)
Deviations from Standard Test procedures : None
Operation mode : Transmitting
Temperature : 22°C
Humidity : 65%

Measurement procedure:

Audio frequency response:

- 1) Configure the EUT as shown in Diagram 3.
- 2) Adjust the audio input for 20% of rated system deviation at 1 kHz using this level as a reference (0 dB).
- 3) Vary the Audio frequency from 200 Hz to 20 kHz and record the frequency deviation.

Modulation limit:

- 1). Configure the EUT as shown in Diagram 3, adjust the audio input for 60% of rated system deviation at 1kHz using this level as a reference (0dB) and vary the input level from -30db to +20dB. Record the frequency deviation obtained as a function of the input level.
- 2). Repeat step 1 with input frequency changing to 500Hz, 800Hz, 1kHz, 2.5kHz, 5kHz, 10kHz and 15kHz in sequence.

Refer to appendix 1 for the plotted test result.

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5.5 Occupied Bandwidth for FCC Part 74 Per Section 74.861(e)(3), 74.861(e)(5) and 74.861(e)(6)

RESULT:

Pass

Date of testing	:	11.04.2007
Test specification	:	FCC Part 2 Per Section 2.1049(c)1
Limits	:	FCC Part 74 Per Section 74.861(e)(3), 74.861(e)(5) and 74.861(e)(6)
Deviations from Standard Test procedures	:	None
Operation mode	:	Transmitting (modulated)
Temperature	:	22°C
Humidity	:	50%

Measurement procedure:

1. Connect the EUT as diagram 3.
2. Plot the unmodulated chart shows on spectrum.
3. According to the result of Modulation Characteristics, set the output of the signal generator to 100Hz, 500Hz, 1 kHz, 5 kHz, 10 kHz, increase the amplitude of the signal, until maximum modulation is shown on the spectrum analyzer.
4. The Occupied Bandwidth was measured in appendix 1 of this report.

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Table 8: Maximum Deviation

Model Name	MOD-800LV	MOD-800HS
Reading:	43.2kHz	55.3Hz
Limit:	± 75kHz	

Table 9: Operation Bandwidth (Bn)

Model Name	MOD-800LV		MOD-800HS	
Parameter:	M	D	M	D
Reading	0.5kHz	43.2kHz	0.5kHz	55.3kHz
Bn:	87.4kHz		111.6kHz	
Max. Bn	111.6kHz			
Limit:	200kHz			
Emission Designator:	112KF3E			
<p>$B_n = 2M + 2D * K$ Bn: operation bandwidth M: Max. Modulation Frequency D: Peak Frequency Deviation K=1</p>				

Refer for appendix 1 for measurements.

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5.6 Frequency tolerance for FCC Part 74 Per Section 74.861(e)(4)

RESULT:

Pass

Date of testing	:	25.04.2007
Test specification	:	FCC Part 2 Per Section 2.1055
Limits	:	FCC Part 74 Per Section 74.861(e)(4)
Deviations from Standard Test procedures	:	None
Test procedure	:	Procedure specified in ANSI C63.4 were followed
Operation mode	:	Transmitting (unmodulated)
Temperature	:	-30°C to 50°C
Humidity	:	50%

Measurement procedure:

A. Frequency stability versus environmental temperature

1. Setup the configuration as diagram 4 in section 4.5 for frequency measured inside an environment chamber and install new battery in the EUT.
2. Turn on EUT and set spectrum analyzer center frequency to the EUT operating frequency. Set spectrum analyzer Resolution Bandwidth to 1 kHz and Video Resolution Bandwidth to 1 kHz and Frequency Span to 50kHz. Record this frequency as reference frequency.
3. Set the temperature of chamber to 50 . Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. While maintaining a constant temperature inside the chamber, turn the EUT on and measure the EUT operating frequency.
4. Repeat step 2 with a 10 decreased per stage until the lowest temperature -30 is measured, record all measured frequencies on each temperature step.

B. Frequency stability versus input voltage

1. Setup the configuration as diagram 4 for frequencies measurement at temperature range from 15 to 25 . Otherwise, an environment chamber set for a temperature of 20 shall be used.
2. Set spectrum analyzer center frequency to the EUT operating frequency. Set spectrum analyzer Resolution Bandwidth to 1 kHz and Video Resolution Bandwidth to 1 kHz. Record this frequency as reference frequency.
3. Set the supply voltage to the nominal voltage of the EUT.
4. Turn the EUT on and measure the EUT operating frequency
5. Repeat step 4 with decreased supply voltage, record all measured frequencies on each voltage step.
6. Stop the test until the lowest voltage specified by the manufacturer is reached or the EUT case to emission radio signal.

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Table 10: the measurement of Frequency tolerance (temperature)

Test condition	Power supply	Low Frequency (MHz) (740.125)	Mid Frequency (MHz) (754.525)	High Frequency (MHz) (768.725)
-30°C	New batteries	740.1266	754.5270	768.7270
-20°C	New batteries	740.1256	754.5252	768.7254
-10°C	New batteries	740.1262	754.5256	768.7258
0°C	New batteries	740.1274	754.5276	768.7278
10°C	New batteries	740.1282	754.5284	768.7284
20°C	New batteries	740.1286	754.5286	768.7286
30°C	New batteries	740.1284	754.5284	768.7286
40°C	New batteries	740.1282	754.5284	768.7284
50°C	New batteries	740.1284	754.5286	768.7286
Frequency Error:		0.0036	0.0036	0.0036
Frequency Error rate:		0.0005%	0.0005%	0.0005%
Frequency Tolerance Limit:		0.005%		

Table 11: the measurement of Frequency tolerance (supply voltage)

Temperature: 25°C

Test condition (Power supply)	Low Frequency (MHz) (740.125)	Mid Frequency (MHz) (754.525)	High Frequency (MHz) (768.725)
3V	740.1282	754.5286	768.7286
2.8V	740.1284	754.5284	768.7286
2.6V	740.1282	754.5282	768.7286
2.4V	740.1284	754.5284	768.7284
2.2V	740.1284	754.5284	768.7286
2.1V	740.1284	754.5282	768.7286
Frequency Error:	0.0034	0.0036	0.0036
Frequency Error rate:	0.0005%	0.0005%	0.0005%
Frequency Tolerance Limit:	0.005%		

The equipment remains on channel when the power source was reduced below the lower extreme test voltage limit until zero. The EUT ceases to function below the voltage at DC 2.0V.

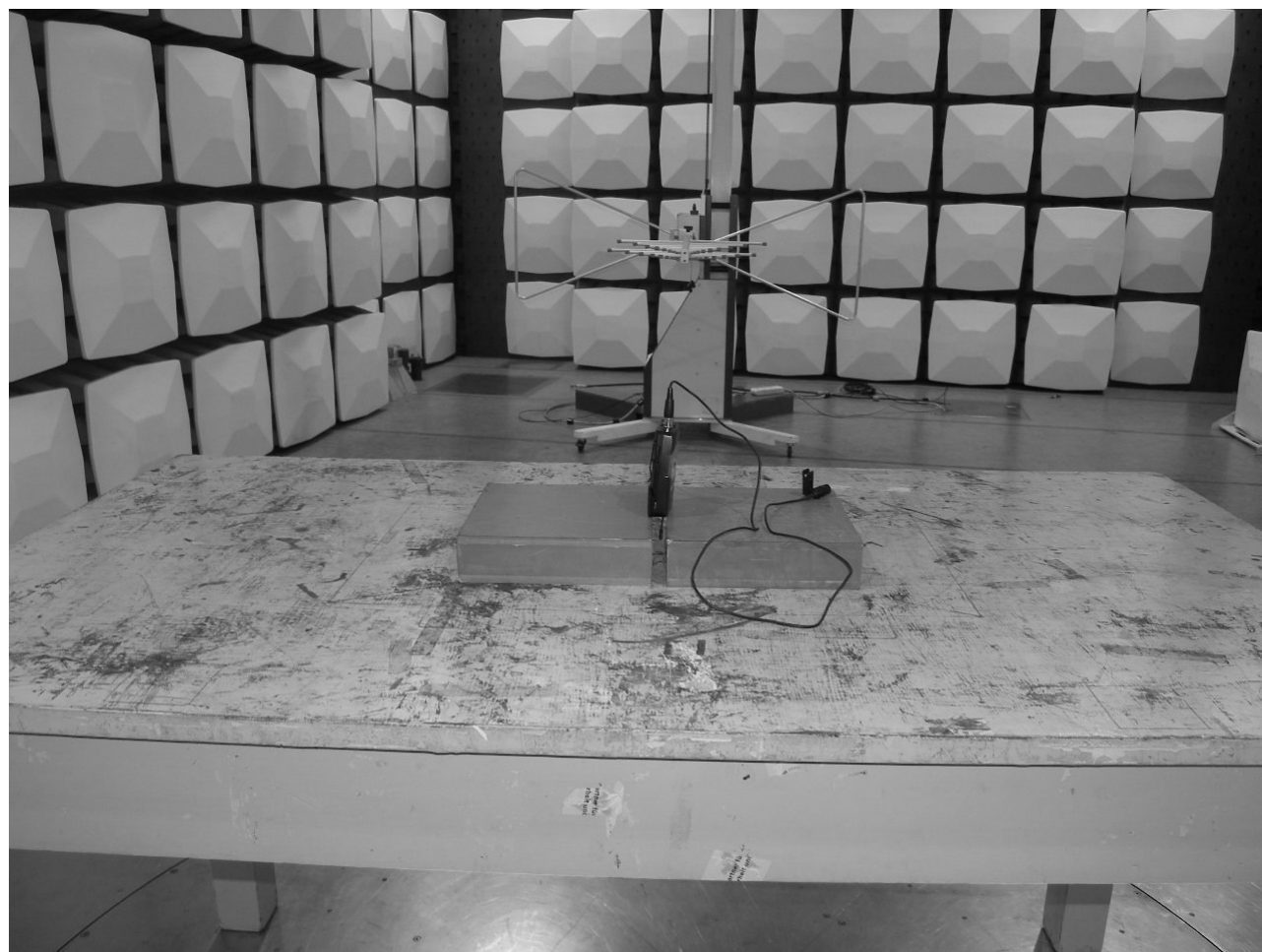
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6 Photographs of the Test Set-Up

Photograph 1: Set-up for Radiation Measurement Below 1GHz



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Photograph 2: Set-up for Radiation Measurement above 1GHz



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Photograph 3: Set-up for Conducted Emission of AC mains



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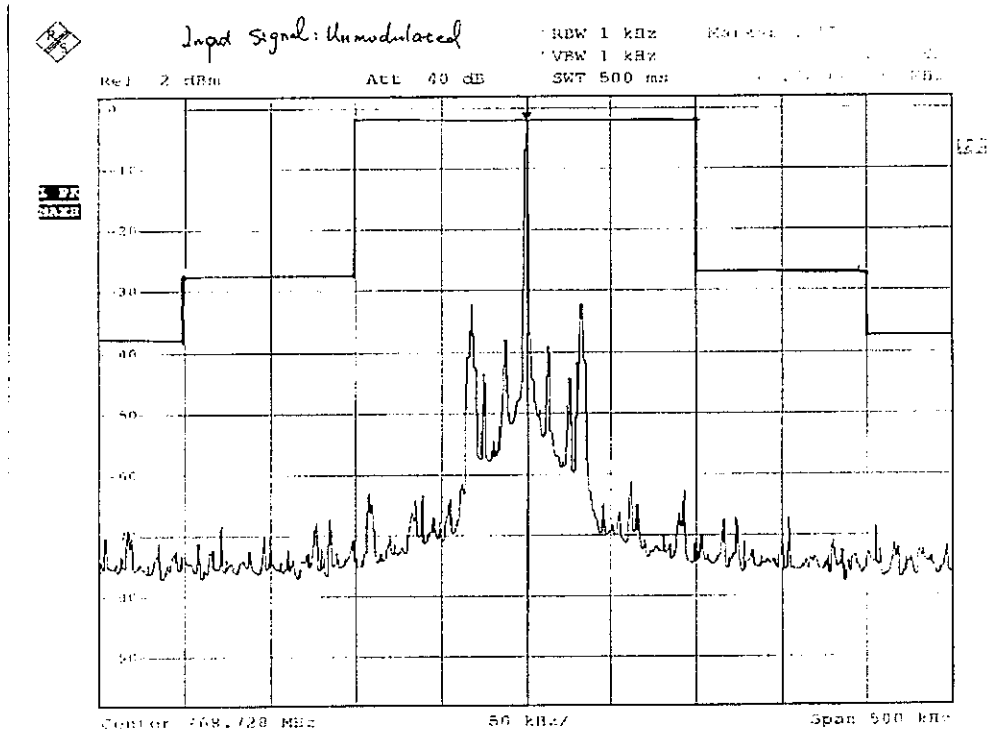
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Occupied Bandwidth:

High Channel(Page 1-7), Mid channel(Page 8-14), Low Channel(Page 15-21)



down 3dB

Date: 29.APR.2007 18:17:39

Mod-800?

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Input Signal: 100Hz

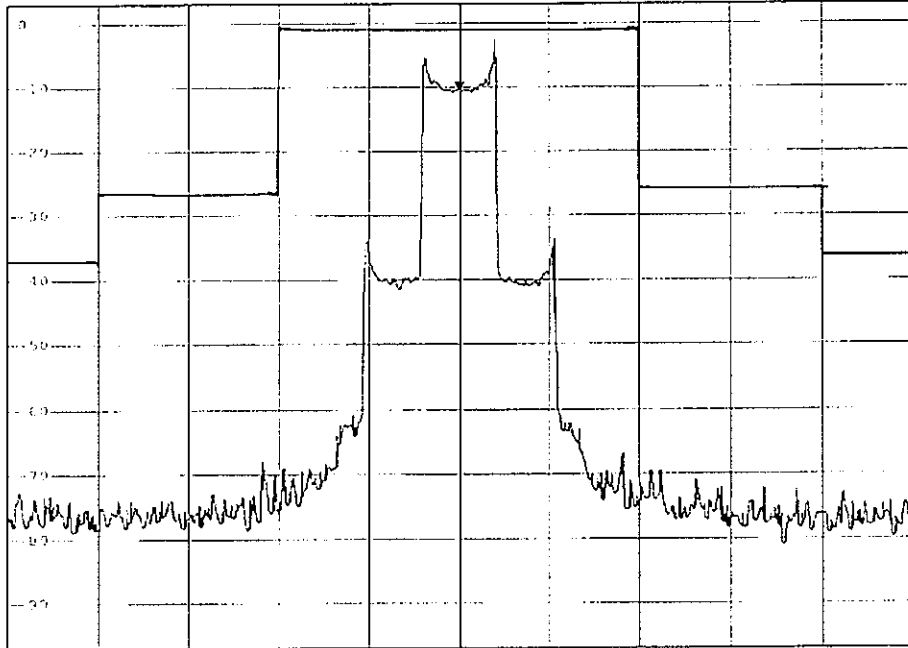
*RBW 1 kHz Marker 1.00
*VBW 1 kHz 100.000 MHz
SWT 500 ms 100.000 MHz

Ref 3 dBm

Att 40 dB

SWT 500 ms

1.00
VIEW



Center 769.726 MHz

50 kHz

Span 500 kHz

Mod-Sweep

Power 2dB

Date: 29.APR.2007 16:18:21

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Input Signal: 500 Hz

FRW 1 kHz

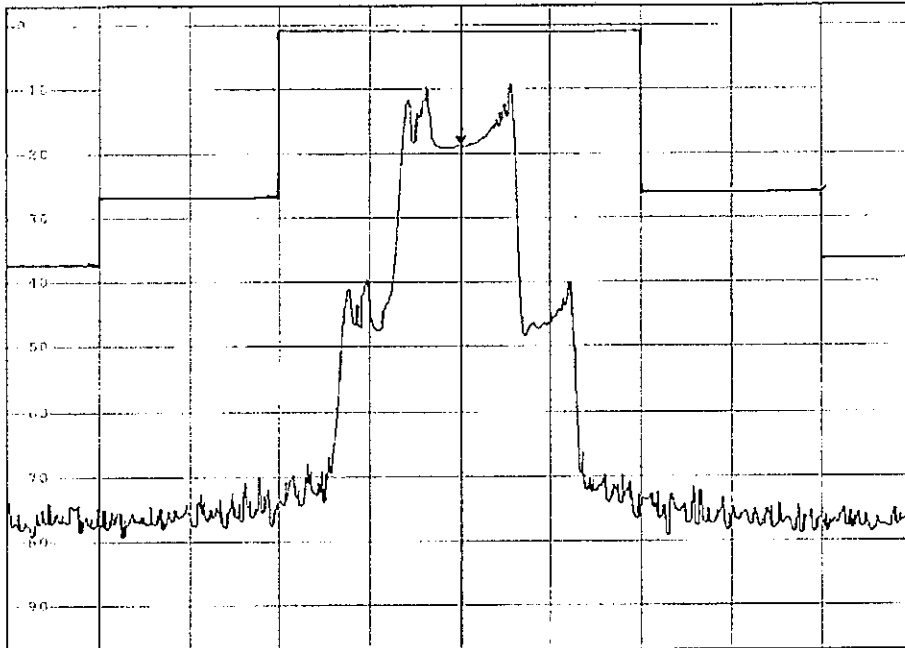
VBW 1 kHz

SWT 500 ms

Ref: 3 dBm

Att: 40 dB

LF
VIEW



Center 768.728 MHz

50 kHz

Span 500 kHz

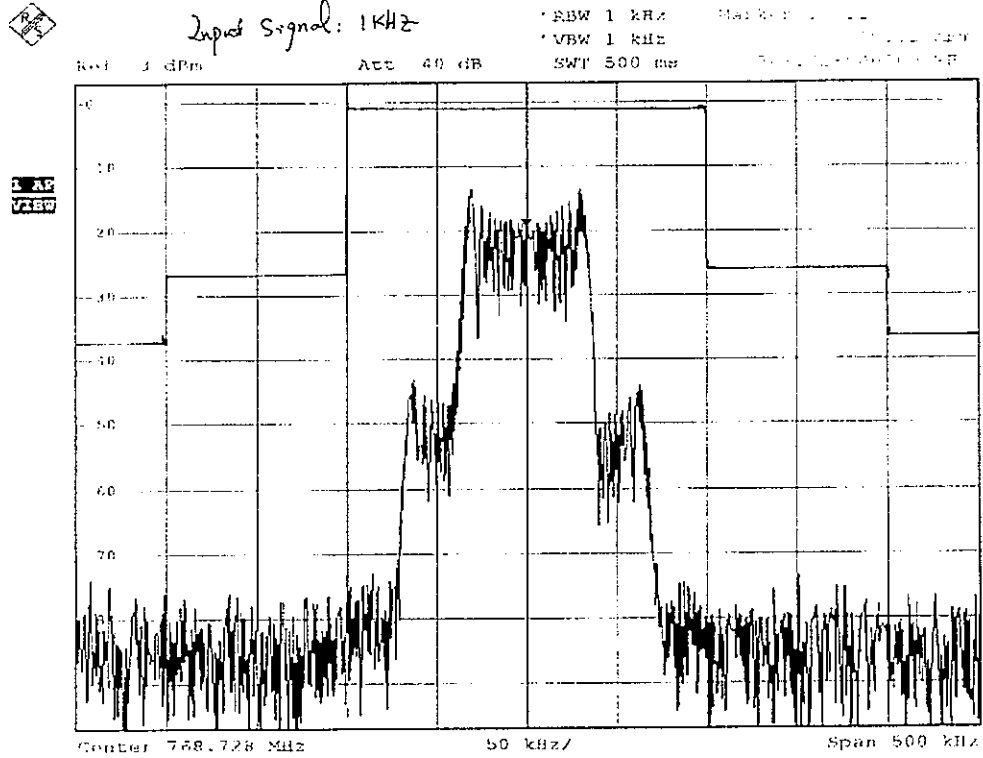
down 3dB

Date: 29.APR.2007 18:19:03

MOD-820p

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Item: 008

Mod - 800P

Date: 29.APR.2007 18:24:12

Prüfbericht - Nr.: 16010008 001

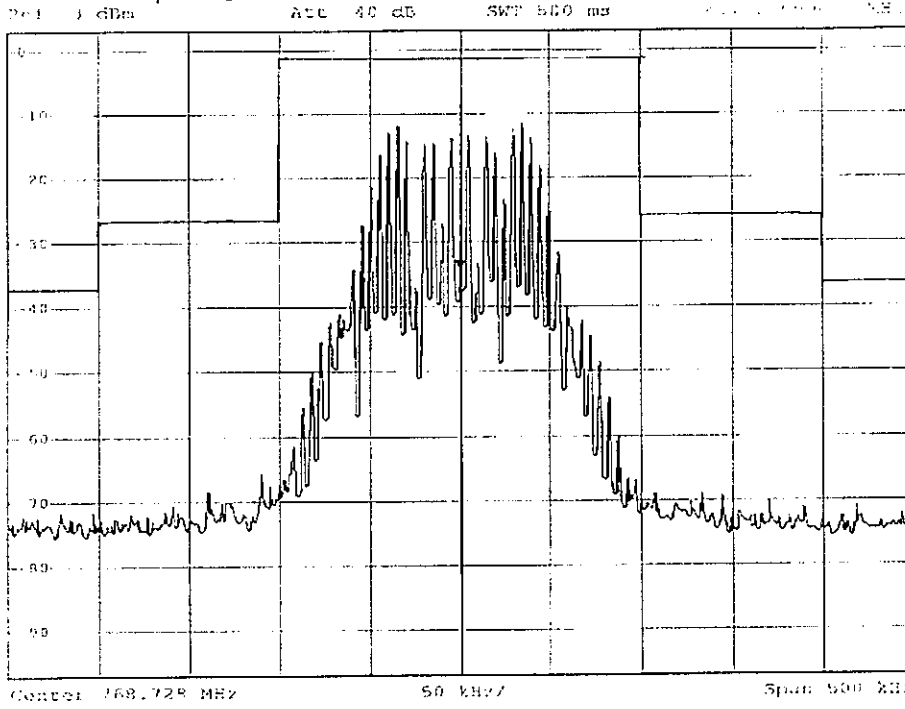
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Test Report no.:



Input Signal: 5KHz

RBW 1 kHz
VBW 1 kHz
SWT 500 ms



down 3dB

Date: 29.APR.2007 18:23:26

MOD-800P

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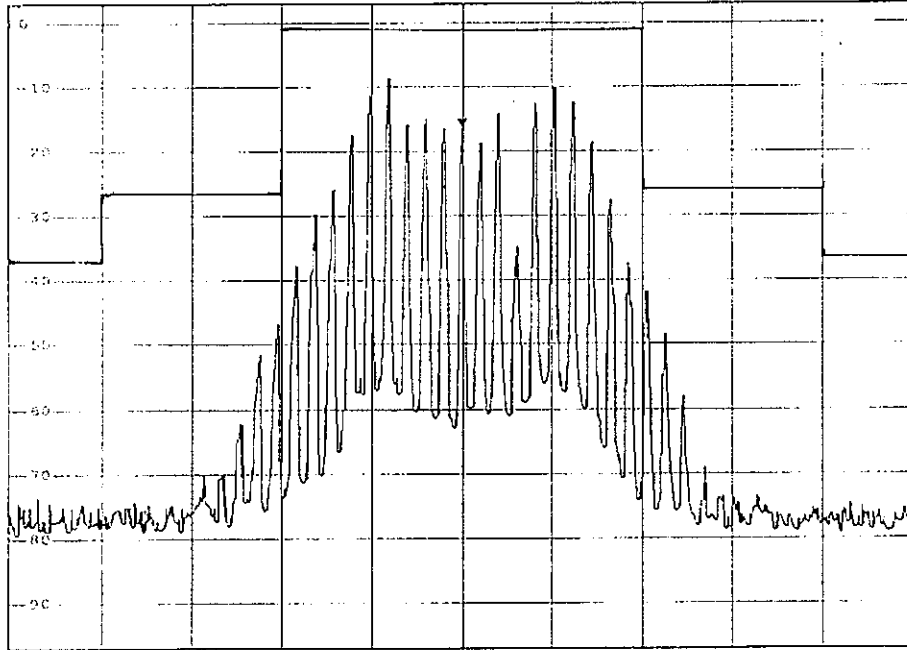
Input signal: 10k Hz

RBW 1 kHz
VBW 1 kHz
SWT 500 ms

Ref 3.0dBm

Att 40 dB

1 PR
VIEW



Center: 768.728 MHz

50 kHz/

Span 500 kHz

View: 1 PR

MOD-800P

Date: 29.APR.2007 18:25:13



Prüfbericht - Nr.: 16010008 001

Test Report no.:

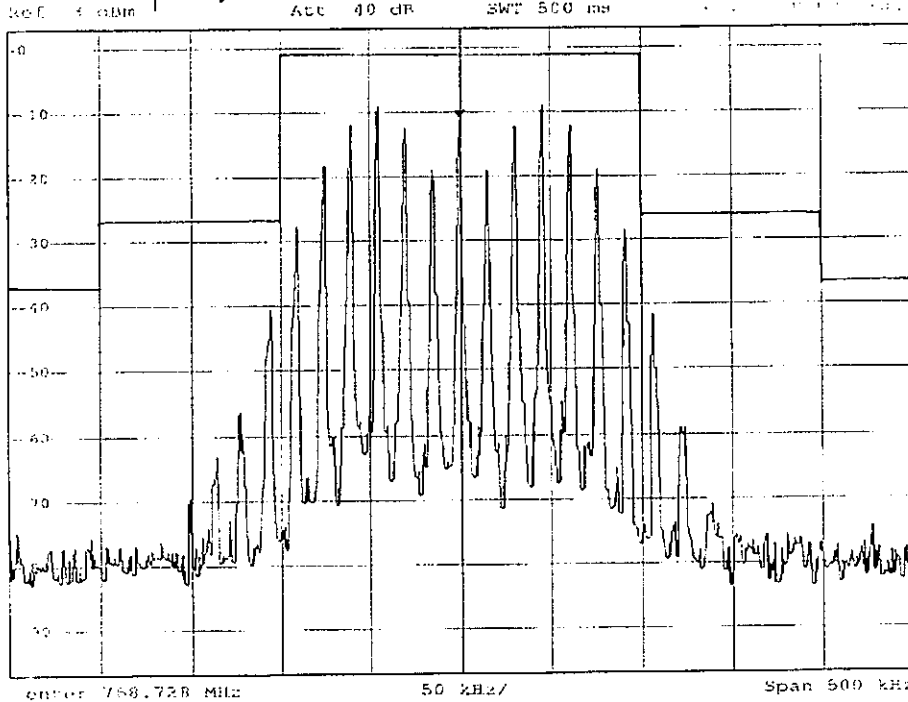
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Input signal: 15 kHz

RBW 1 kHz
VBW 1 kHz
SWT 500 Hz



down: 3dB

A10D-Sweep

Date: 29.APR.2007 18:25:54

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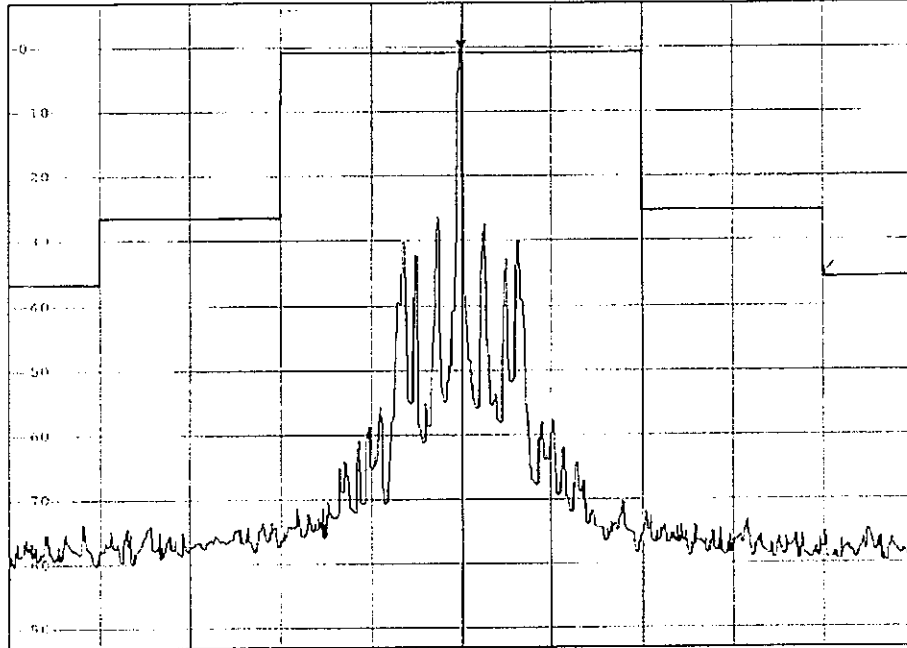
Input Signal: Unmodulated

RBW 1 kHz
VBW 1 kHz
SWT 500 us

Ref 7 dBm

Att 40 dB

REF
VIEW



Center 754.528 MHz

50 kHz

Span 500 kHz

Gain 3dB

Date: 7.MAY.2007 10:44:50

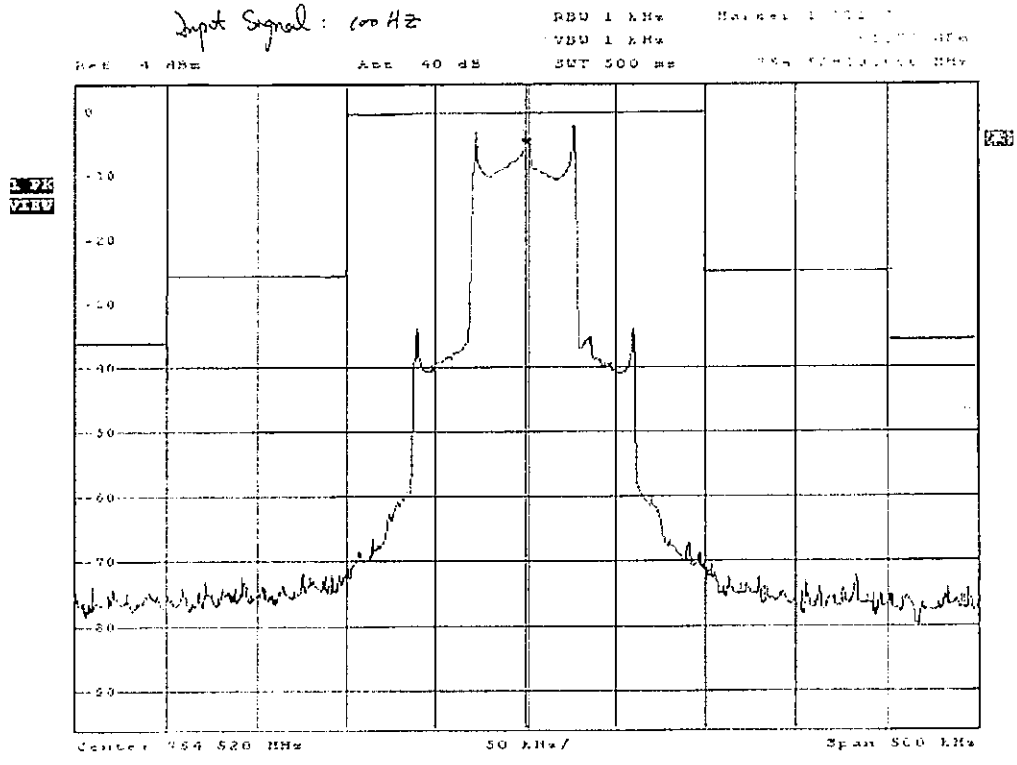
Mod-800p

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Date: 7.MAY.2007 11:09:15

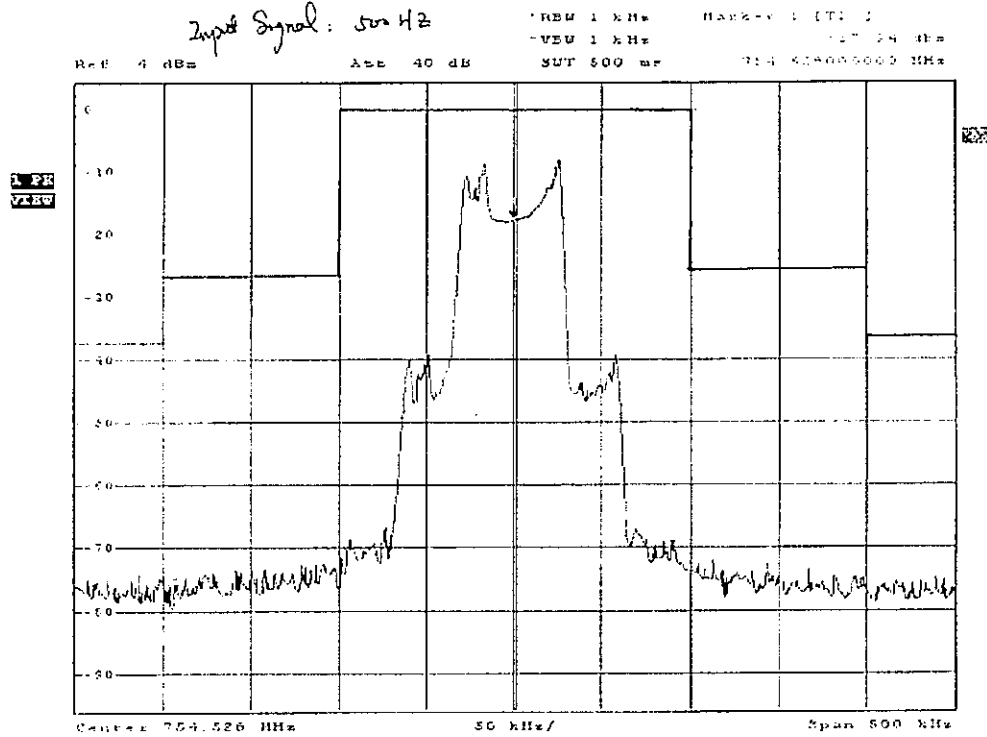
Mod-Susp

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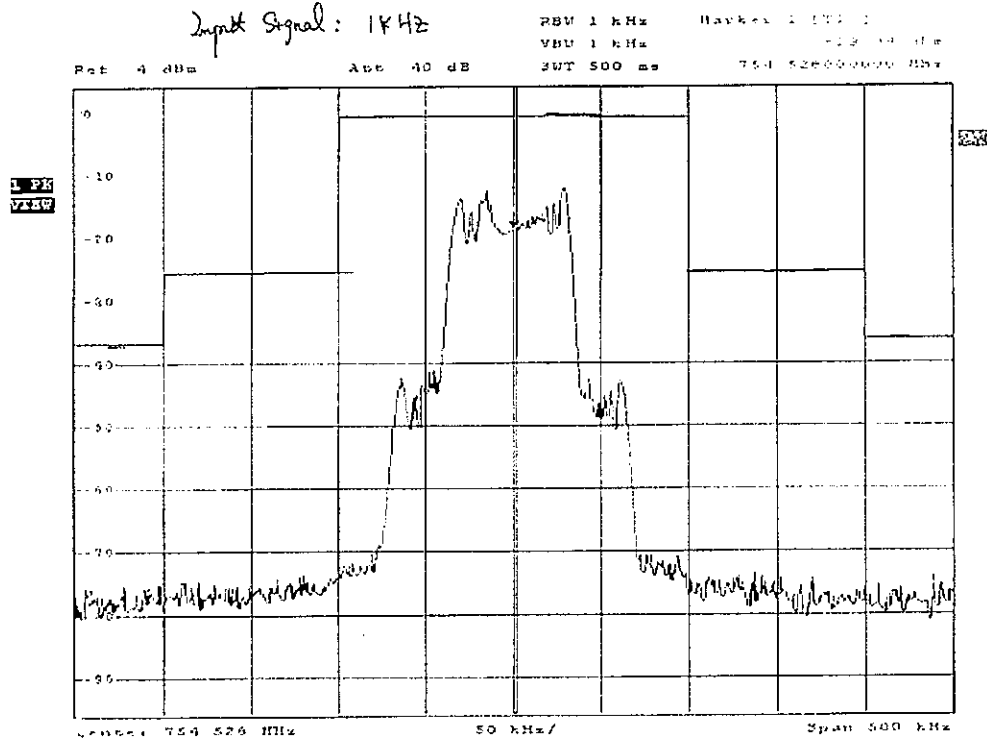
Date: 7.MAY.2007 11:11:20

MOD-800P

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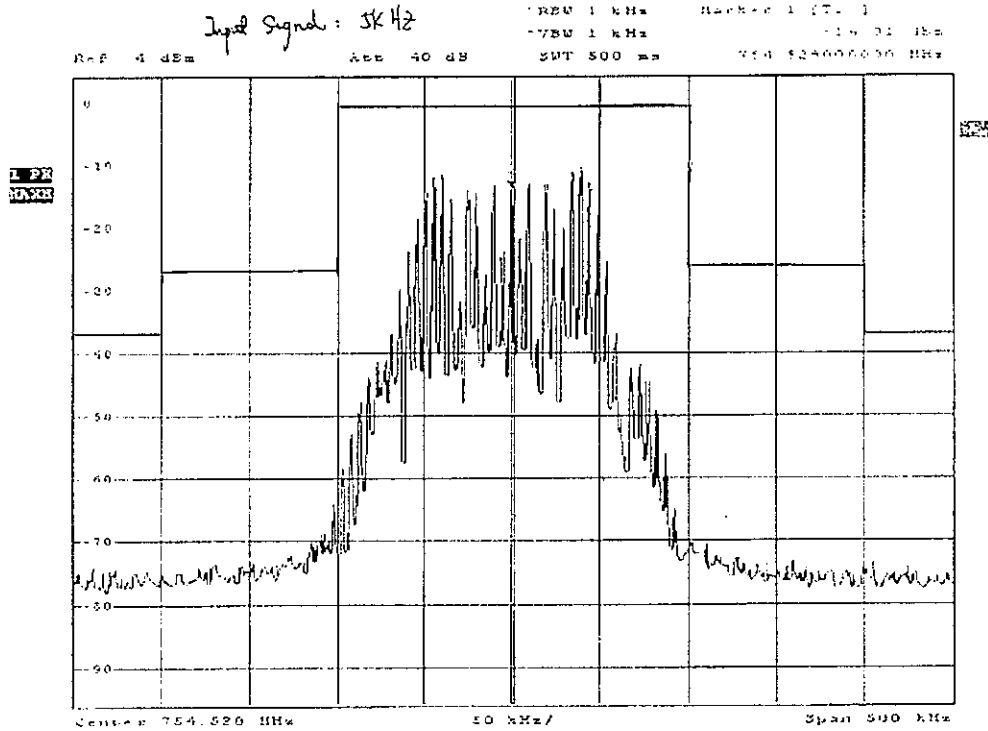


Date: 7 MAY 2007 11:17:07

MOD - 800P

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DATE: 7.MAY.2007 11:18:58

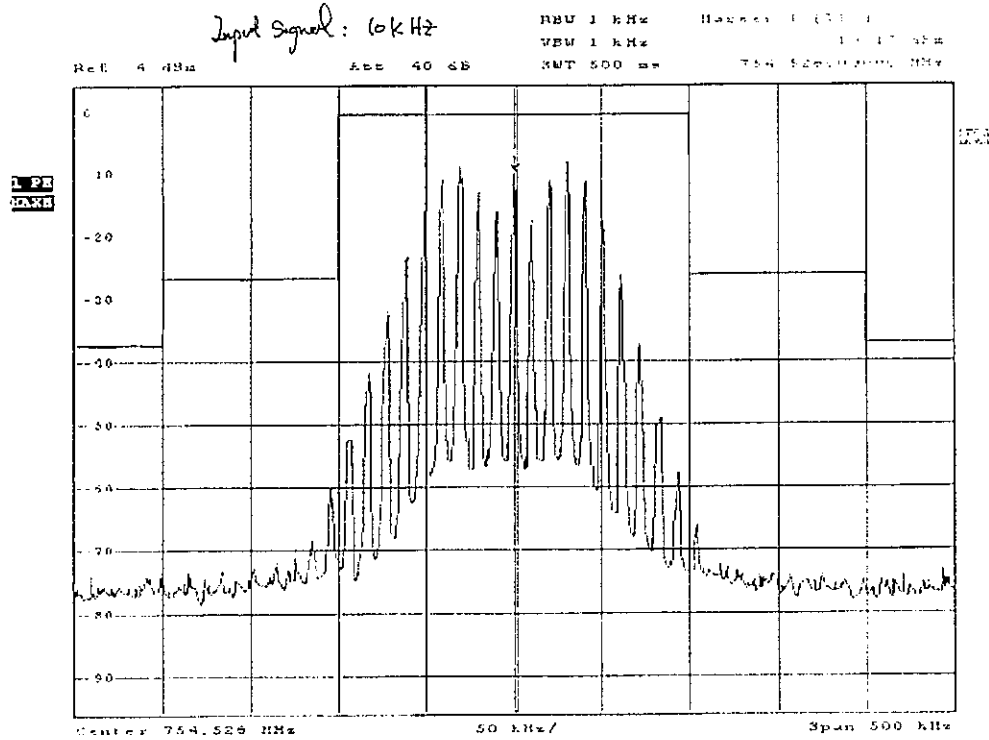
MOD-800P

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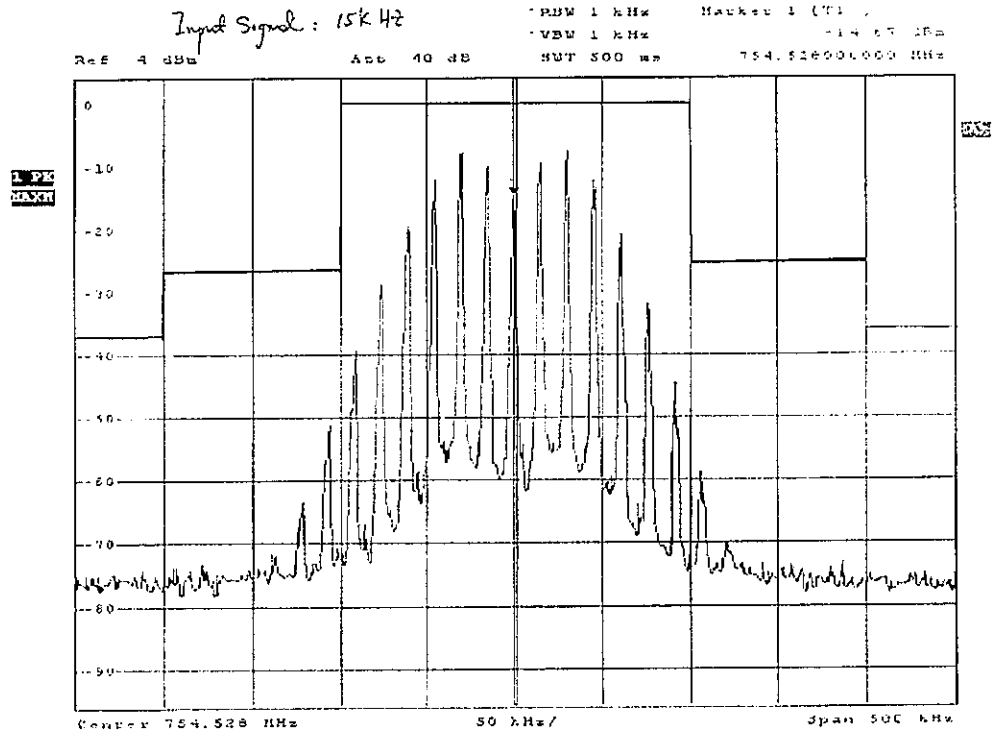
Date: 7.MAY.2007 11:19:47

MOD-800P

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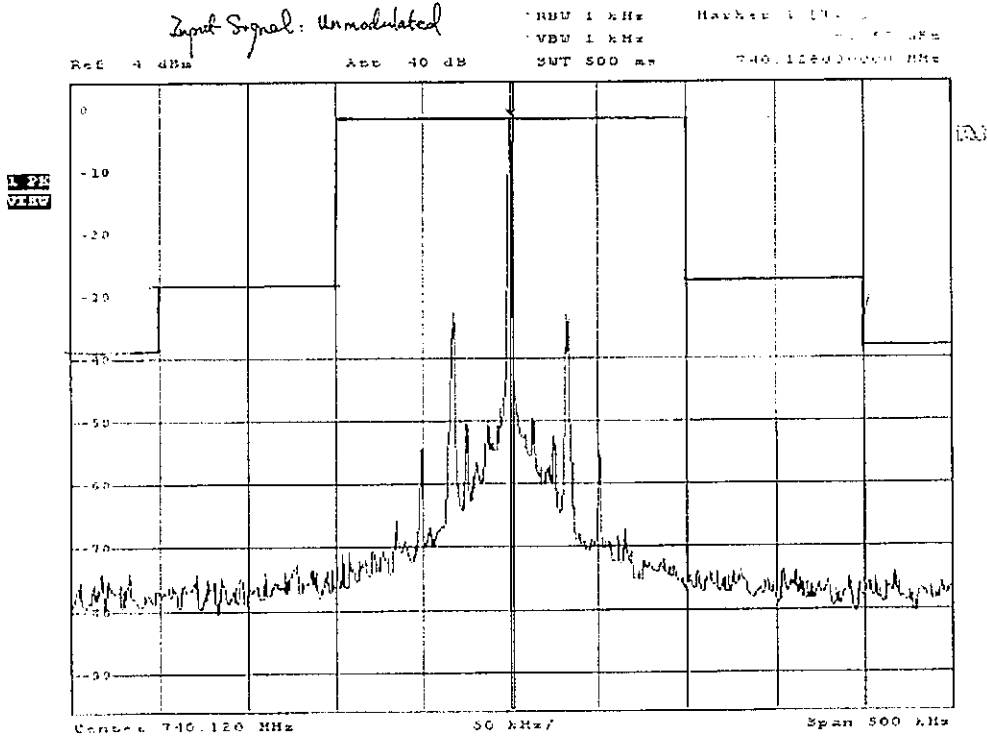
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MOD-800P

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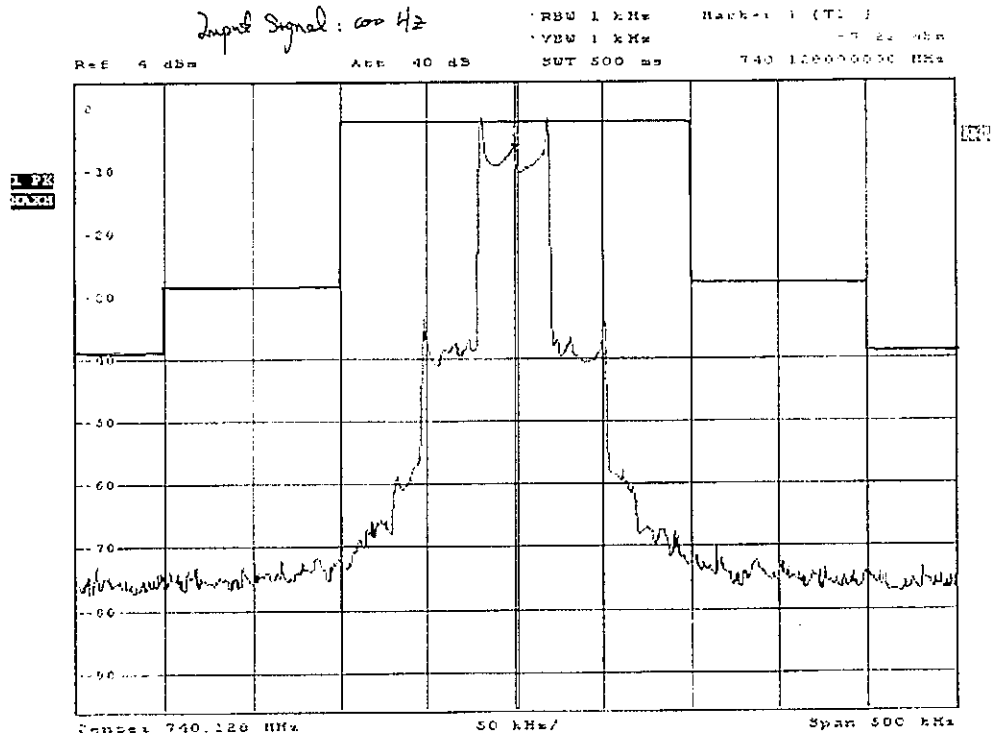


Date: 7.MAY.2007 11:23:14

Mod-800P

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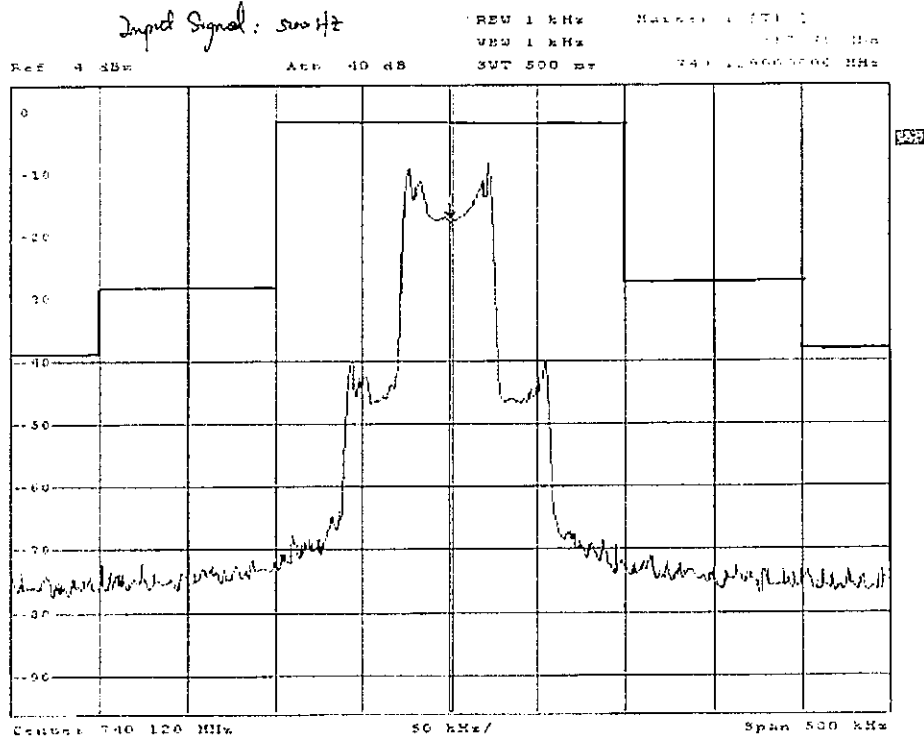


Date: 7.MAY.2007 11:24:36

MOD-800P

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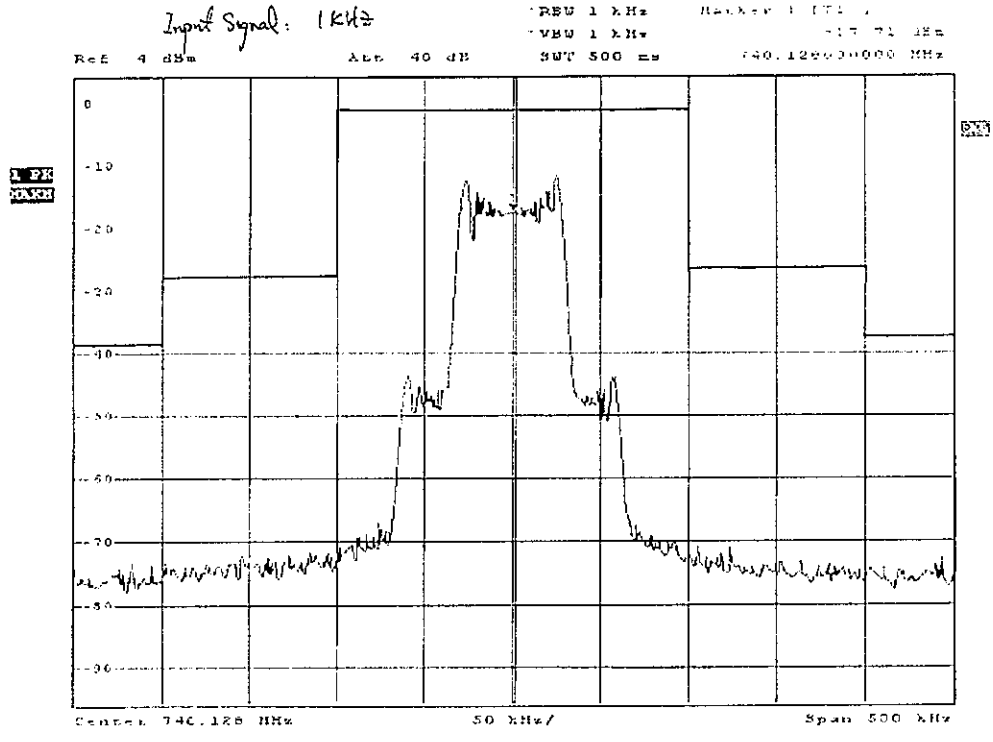
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Date: 7.MAY.2007 11:25:45

MOB-800P

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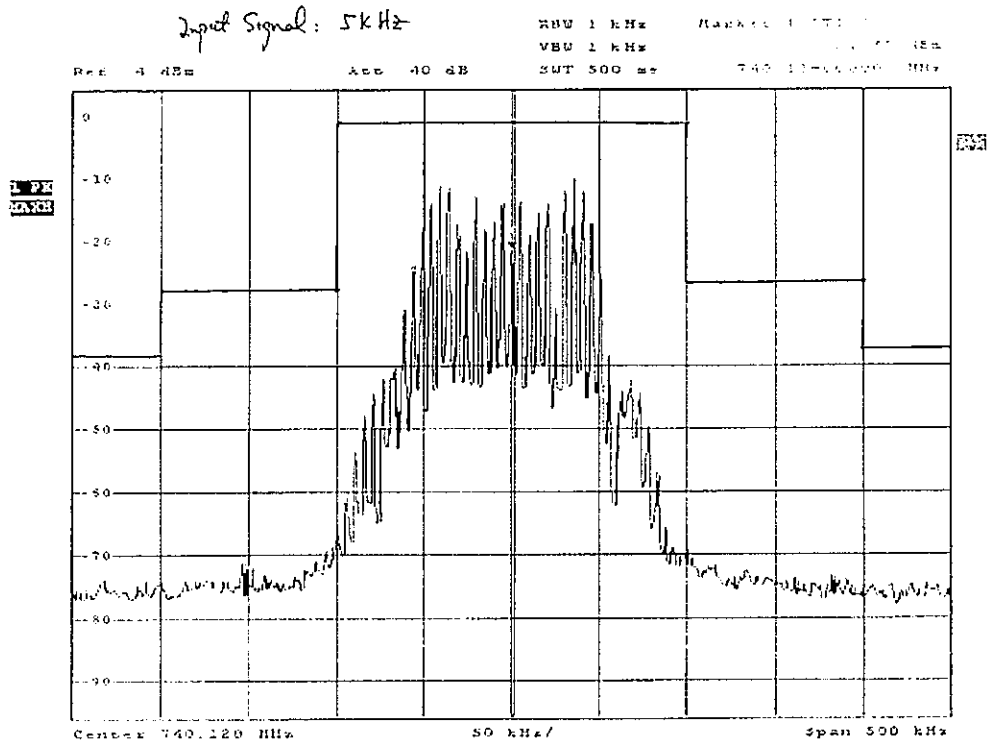
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Date: 7.MAY.2007 11:26:38

MOD-800 P

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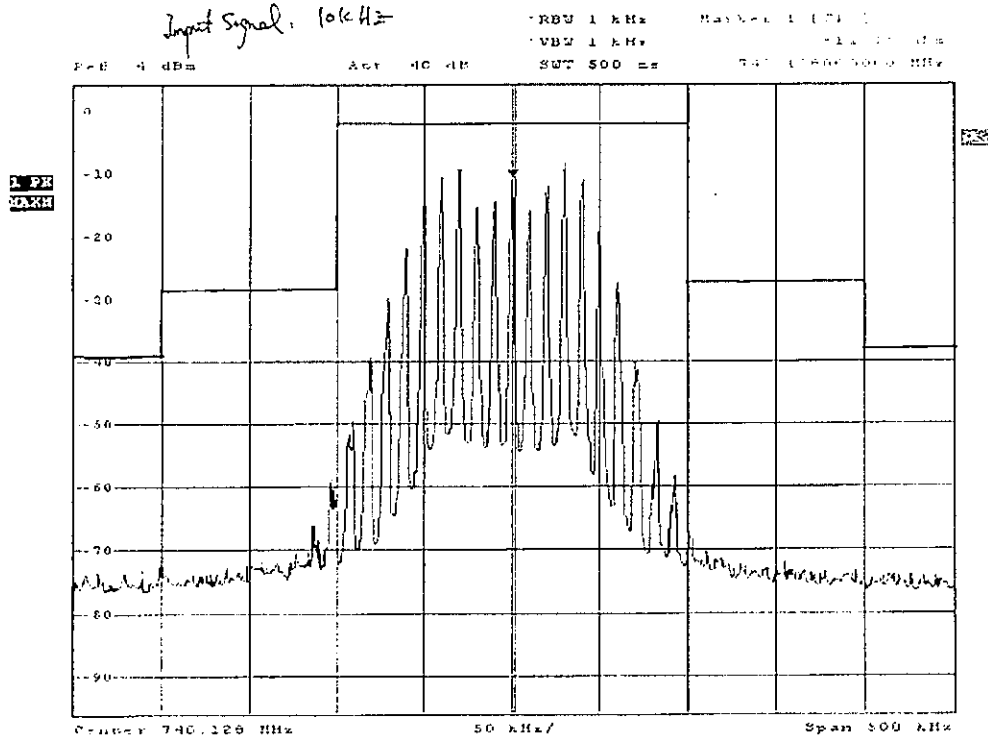


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MOD-800P

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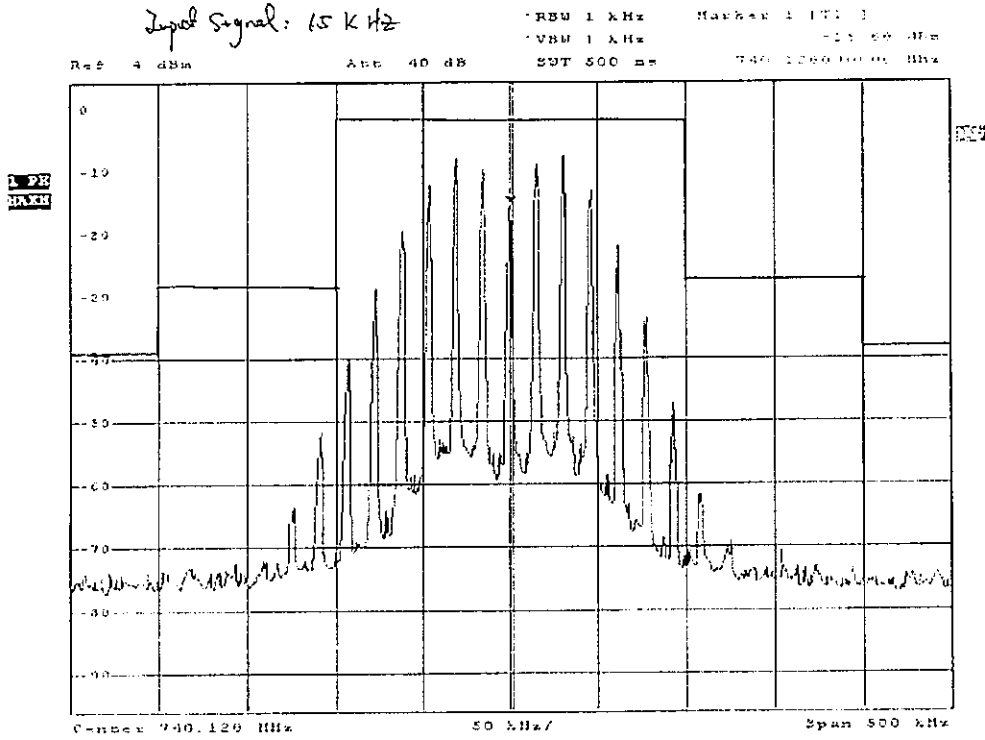


Date: 7.MAY.2007 11:29:27

MOD-8-P

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Date: 7.MAY.2007 11:30:50

Mod-800P

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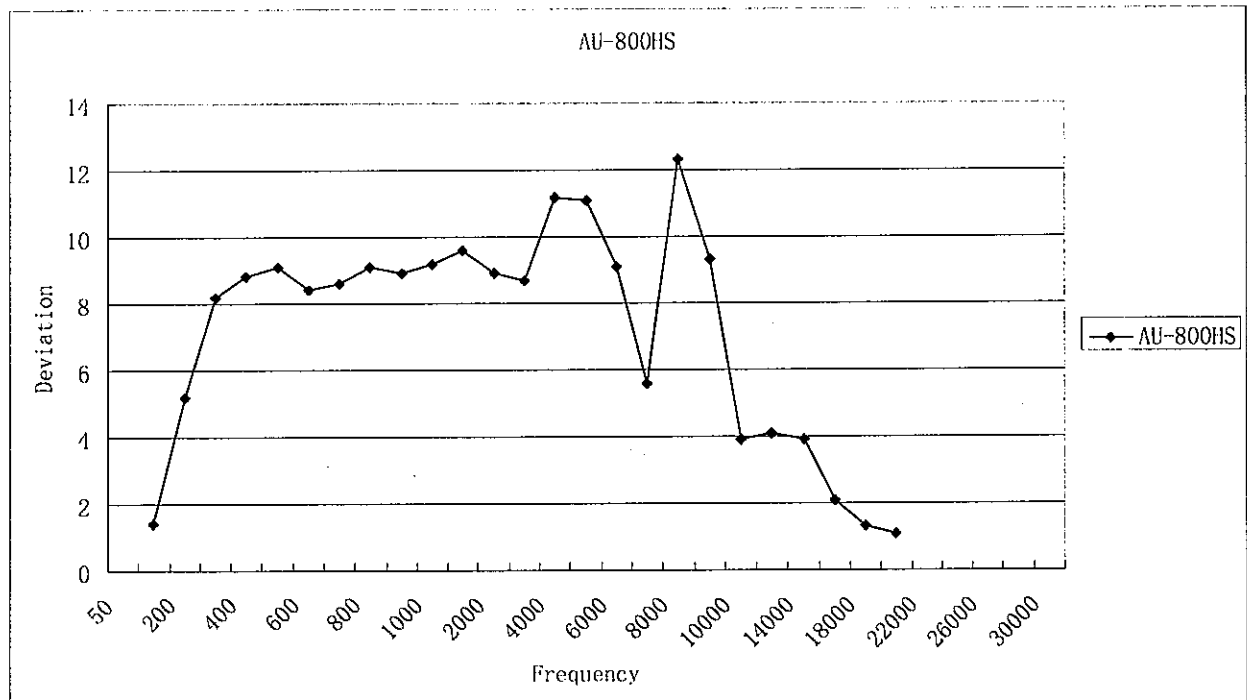
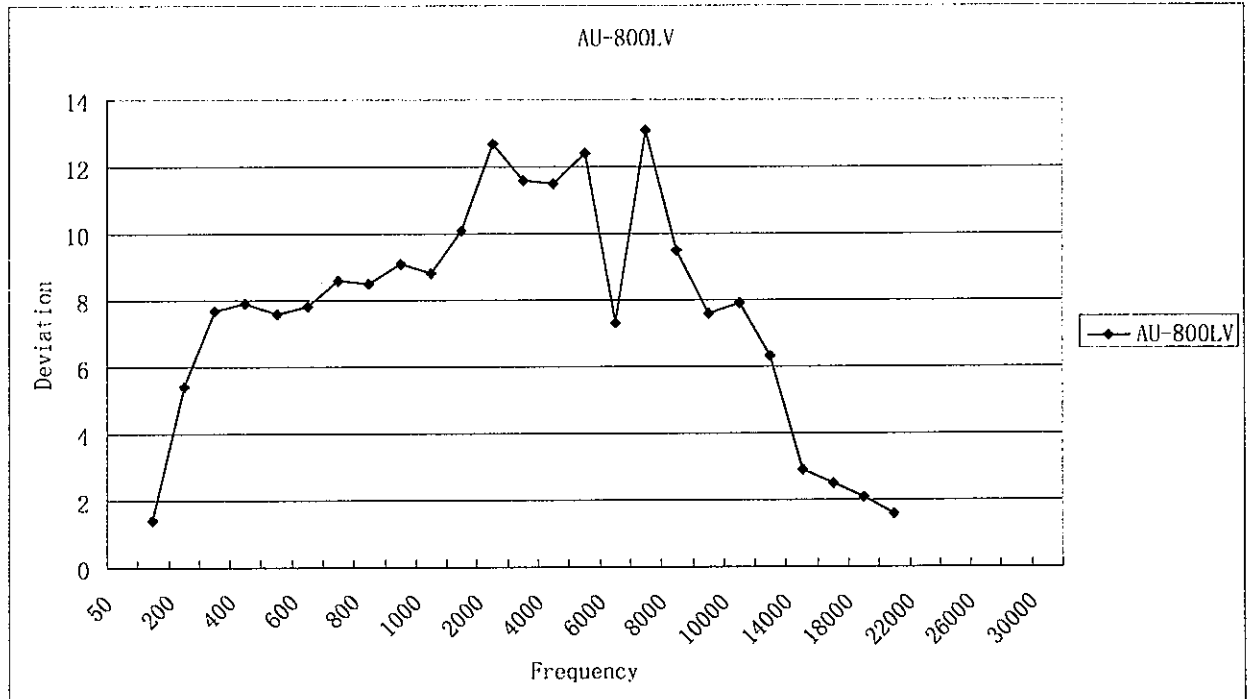
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Modulation characteristics:

Frequency (Hz)	Deviation (kHz)	
	AU-800LV	AU-800HS
200	5.4	5.2
300	7.7	8.2
400	7.9	8.8
500	7.6	9.1
600	7.8	8.4
700	8.6	8.6
800	8.5	9.1
900	9.1	8.9
1000	8.8	9.2
1500	10.1	9.6
2000	12.7	8.9
3000	11.6	8.7
4000	11.5	11.2
5000	12.4	11.1
6000	7.3	9.1
7000	13.1	5.6
8000	9.5	12.3
9000	7.6	9.3
10000	7.9	3.9
12000	6.3	4.1
14000	2.9	3.9
16000	2.5	2.1
18000	2.1	1.3
20000	1.6	1.1



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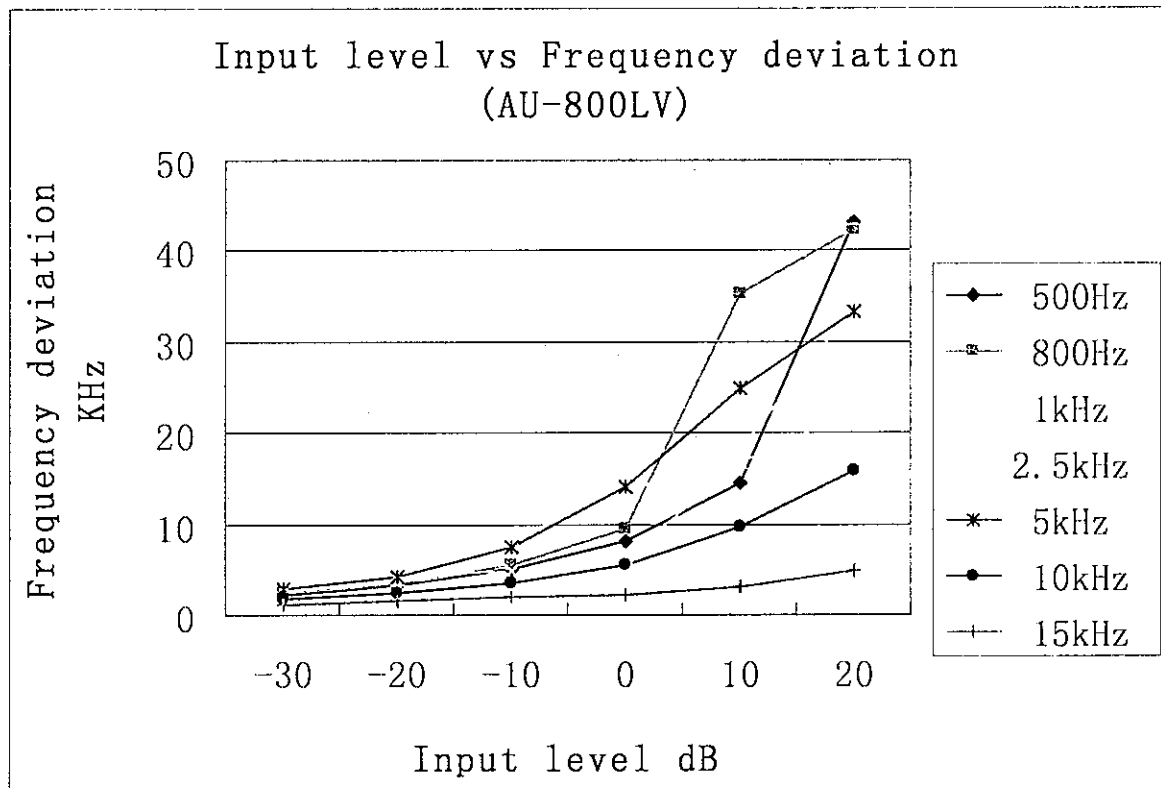
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AU-800LV:

Modulation Level	500Hz	800Hz	1kHz	2.5kHz	5kHz	10kHz	15kHz
-30	2.1	2.4	2.6	2.9	2.8	1.8	1.1
-20	3.2	3.4	3.9	4.4	4.1	2.5	1.5
-10	5.1	5.4	8.4	4.8	7.4	3.6	1.9
0	8.1	9.5	13.5	6.3	14.1	5.6	2.3
10	14.6	35.2	18.2	16.8	24.9	9.6	3.1
20	43.2	42.2	33.6	22.4	33.2	15.8	4.8



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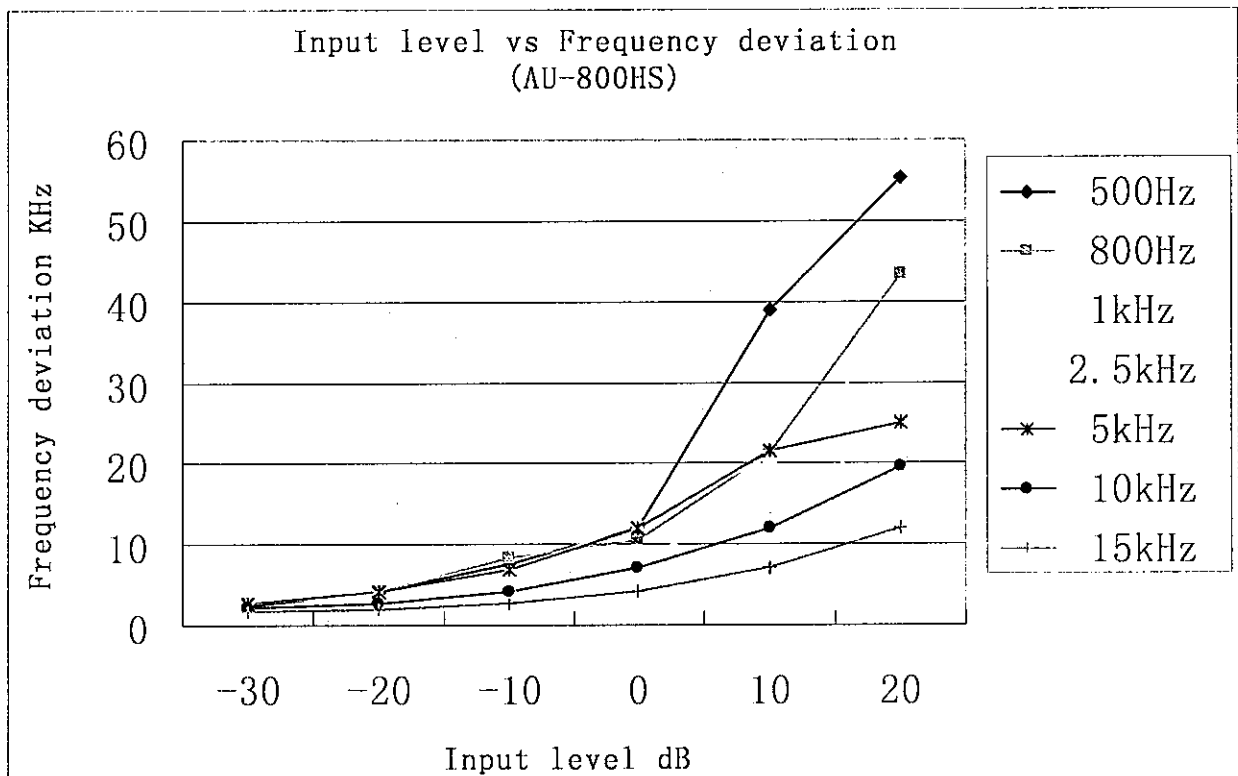
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AU-800HS:

Modulation Level	500Hz	800Hz	1kHz	2.5kHz	5kHz	10kHz	15kHz
-30	2.5	2.7	2.6	2.1	2.6	2.1	1.8
-20	4.1	4.1	3.9	2.5	4.1	2.7	1.9
-10	7.5	8.4	6.8	4.9	6.8	4.2	2.7
0	12.1	10.5	12.5	8.6	11.9	7.2	4.2
10	38.9	21.2	20.9	13.9	21.6	12.1	7.1
20	55.3	43.3	36.3	24.9	25.1	19.5	12.1



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Conducted Emission:

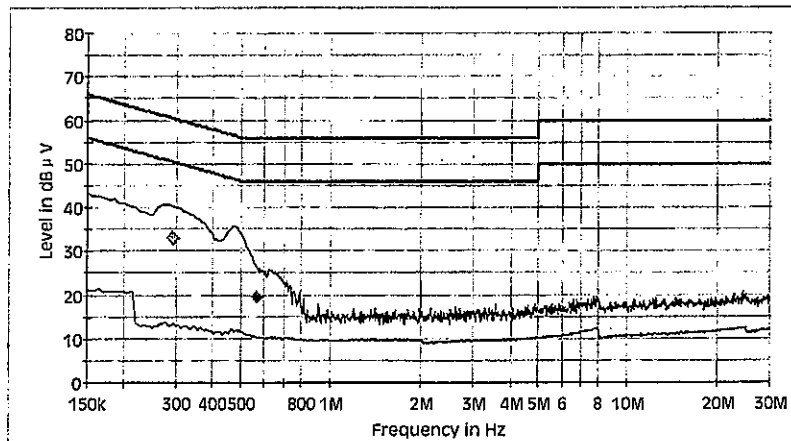
EMC32 Report

Test Information

EUT Name: Wireless Microphone
 Model/Type: AU-800P
 Operating Conditions: B
 Comment: AC 120V 60Hz; L

Hardware Setup: 1phase LISN ESH3-Z5 to ESCS30
 Level Unit: dB μ V

Subrange	Detectors	IF Bandwidth	Step Size	Meas. Time	Receiver
150kHz - 30MHz	Peak; Average	9kHz	4.5kHz	10ms	ESCS 30



2007-4-27

9:41:00

Prüfbericht - Nr.: 16010008 001
 Test Report no.:

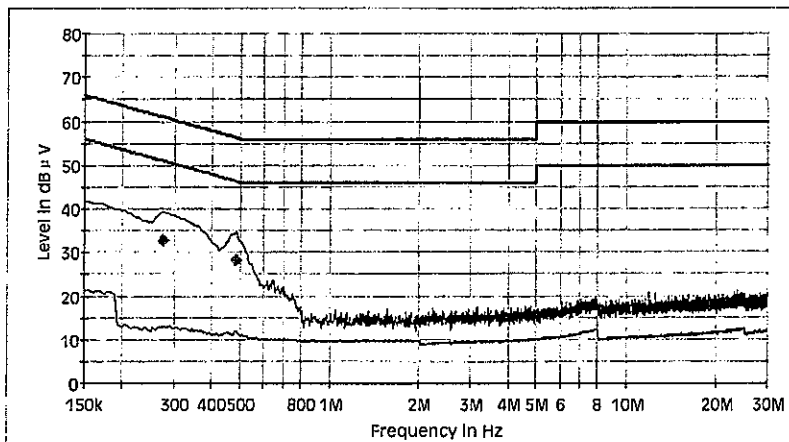
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EMC32 Report

Test Information

EUT Name:	Wireless Microphone
Model/Type:	AU-800P
Operating Conditions:	B
Comment:	AC 120V 60Hz; N
Hardware Setup:	1phase LISN ESH3-Z5 to ESCS30
Level Unit:	dB μ V

Subrange	Detectors	IF Bandwidth	Step Size	Meas. Time	Receiver
150kHz - 30MHz	Peak; Average	9kHz	4.5kHz	10ms	ESCS 30



2007-4-27

9:33:23