

APPLICATION FOR CERTIFICATION

On Behalf of
Inventec Electronics (Nanjing) Co.,Ltd

MIVO250

Model : DET2A / DET2B / BASE1A

Prepared for : Inventec Electronics(Nanjing) Co.,Ltd
No 100, Xian-He Street, Nanjing.
210006, P.R.China

Prepared By : Audix Technology (Shenzhen) Co., Ltd.
No. 6 Ke Feng Rd., 52 Block,
Shenzhen Science & Industrial Park,
Nantou, Shenzhen, Guangdong, China

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Report Number : ACS-F01119
Date of Test : July. 30 ~ Aug. 15, 2001
Date of Report : Aug. 21, 2001

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TEST REPORT CERTIFICATION

Applicant : Inventec Electronics(Nanjing) Co.,Ltd
Manufacturer : Inventec Electronics(Nanjing) Co.,Ltd
EUT Description : MIVO250
(A) MODEL NO : DET2A / DET2B / BASE1A
(B) SERIAL NO : N/A
(C) POWER SUPPLY : +9V DC

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C October 1998 & ANSI C63.4-1992

The device described above is tested by AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both radiated and conducted emissions. The measurement results are contained in this test report and AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements. This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX TECHNOLOGY (SHENZHEN) CO., LTD.

Date of Test : July. 30 ~ Aug. 15, 2001

Prepared by :

Tracy Lin
Tracy Lin / Assistant

Reviewer :

Rees Zeng
Rees Zeng / Engineer

Approved & Authorized Signer :

For and on behalf of
AUDIX TECHNOLOGY (SHENZHEN) CO.,LTD.

Alex Deng
Alex Deng Authorized Signatures(s)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	MIVO250 (The EUT include mobile unit and base, the mobile unit can be connected to a telephone cable and use alone, and mobile unit can be use together with base, the base is connected to telephone cable, and use RF energy to communicate information with mobile unit. the two mode were tested and were included in this report)
Model Number	:	DET2A / DET2B / BASE1A
Notebook	:	Manufacturer: Compag M/N: P5985BAA(M-165) S/N: J7DM165P1016
Printer	:	Manufacturer: Compag M/N: IJ600 S/N: IM08DGZ28TYJ Power Cord: Unshielded, Detachable 3.6m Data Cable: Shielded, Detachable 1.8m
Mobile Unit Adaptor	:	Manufacturer: CIDCO M/N: A30950 Input: 120V AC 60Hz 9W Output: DC 9V 500Ma 4.5Va
Base Station Adaptor	:	Manufacturer: CIDCO M/N: A20730W Input: 120V AC 60Hz 5W Output: DC 7.5V 300Ma
PABX	:	Manufacturer: KingDesign M/N: KD8705-A S/N: UU110175483 Power Cord: Shielded, Detachable 1.9m
Applicant	:	Inventec Electronics(Nanjing) Co.,Ltd No 100, Xian-He Street, Nanjing. 210006, P.R.China
Manufacturer	:	Inventec Electronics(Nanjing) Co.,Ltd No 100, Xian-He Street, Nanjing. 210006, P.R.China
Date of Test	:	July. 30 ~ Aug. 15, 2001

1.2. Test Facility

Site Description

3m Anechoic Chamber	:	Certificated by FCC, USA Aug. 24, 2000
3m & 10m Open Site	:	Certificated by FCC, USA Jan. 29, 2001
EMC Lab.		Certificated by VCCI, Japan Oct. 29, 1998
		Certificated by DATech, German Feb. 02, 1999
		Certificated by DNV, Norway May 26, 1999
		Certificated by NVLAP, USA NVLAP Code: 200372-0

Name of Firm	:	Audix Technology (Shenzhen) Co., Ltd.
Site Location	:	No. 6, Ke Feng Rd., 52 Block, Shenzhen Science & Industrial Park, Nantou, Shenzhen, Guangdong, China

1.3. Measurement Uncertainty

Conduction Uncertainty	=	$\pm 2.66\text{dB}$
Radiation Uncertainty	=	$\pm 4.26\text{dB}$

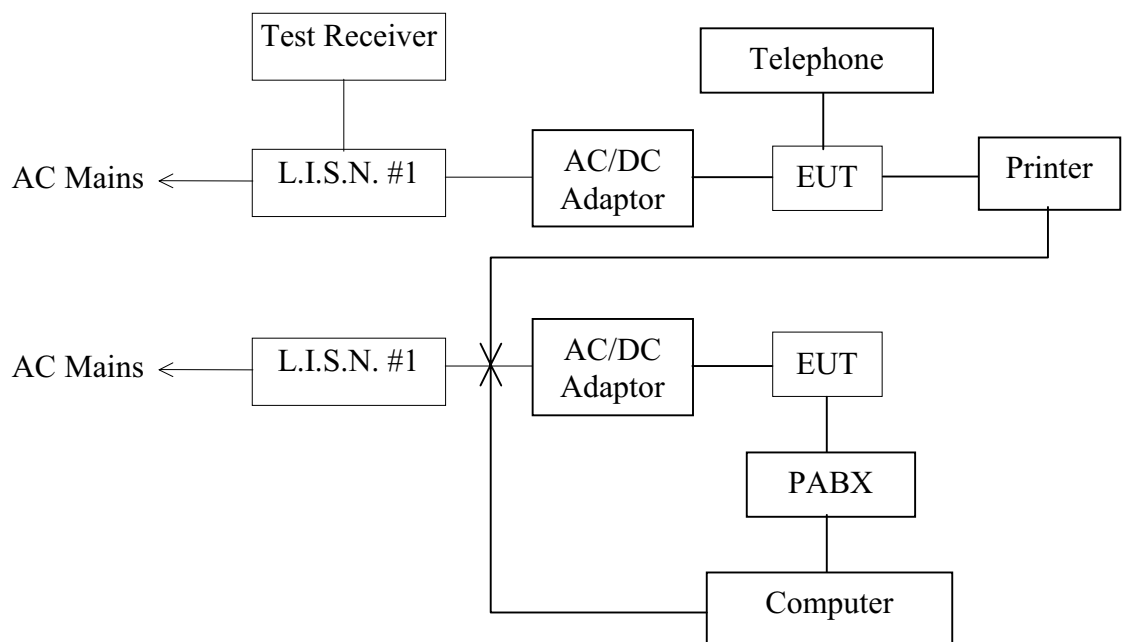
2. POWER LINE CONDUCTED MEASUREMENT

2.1. Test Equipment

The following test equipments are used during the power line conducted emission test:

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESHS20	836600/006	Jun. 03, 01	1 Year
2.	L.I.S.N. #1	Kyoritsu	KNW-407	8-541-4	Jun. 03, 01	1 Year
3.	L.I.S.N. #2	EMCO	3825/2	9006-1660	Jun. 03, 01	1 Year
4.	Terminator	EMCO	50Ω	No. 1	Jun. 03, 01	1 Year
5.	Terminator	EMCO	50Ω	No. 2	Jun. 03, 01	1 Year
6.	RF Cable	FUJIKURA	RG-55/U	LISN Cable	Feb. 27, 01	1/2 Year
7.	Coaxial Switch	Anritsu	MP59B	M73989	Jun. 02, 01	1/2 Year

2.2. Block Diagram of Test Setup



(EUT: MIVO250)

2.3. Power Line Conducted Emission Limit

Frequency MHz	Maximum RF Line Voltage	
	μV	dB(μV)
0.45 ~ 30	250	48

Remarks: RF LINE VOLTAGE (dB(μV)) = 20 log RF LINE VOLTAGE (μV)

2.4. EUT Configuration on Test

The following equipments are installed on RF LINE VOLTAGE Test to meet the Commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

2.4.1. MIVO250 (EUT)

Model Number : DET2A / DET2B / BASE1A,
Serial Number : N/A
Manufacturer : Inventec Electronics(Nanjing) Co.,Ltd

2.5. Operating Condition of EUT

2.5.1. Setup the EUT and simulator as shown on Section 2.2..

2.5.2. Turn on the power of all equipment.

2.5.3. Let the EUT work in test mode (On / Printing) and measure it.

2.6. Test Procedure

The EUT is put on the table which is 0.8m above the ground and away from other metallic surface at least 0.4m. The EUT is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm coupling impedance for the testing equipment; and the peripheral equipment powers form other L.I.S.N.. Please refer to the block diagram of the test setup and photographs. Both sides of AC line(Line & Neutral) are checked for maximum conducted interference. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables must be changed according to FCC part 15 B.

The bandwidth of the field strength meter (R & S Test Receiver ESHS20) is set at 10KHz.

The frequency range from 450KHz to 30MHz is checked.

The details of test modes are as the followings, and the test data please see APPENDIX I.

2.7. Power Line Conducted Emission Test Results

PASS.

The frequency range from 450KHz to 30 MHz is investigated.
All emissions not reported below are too low against the prescribed limits.

As the peak value is too low against the limit, so the Quasi-peak value and average value have been omitted. The scanning waveforms are put in Appendix I.

3. RADIATED EMISSION MEASUREMENT

3.1. Test Equipment

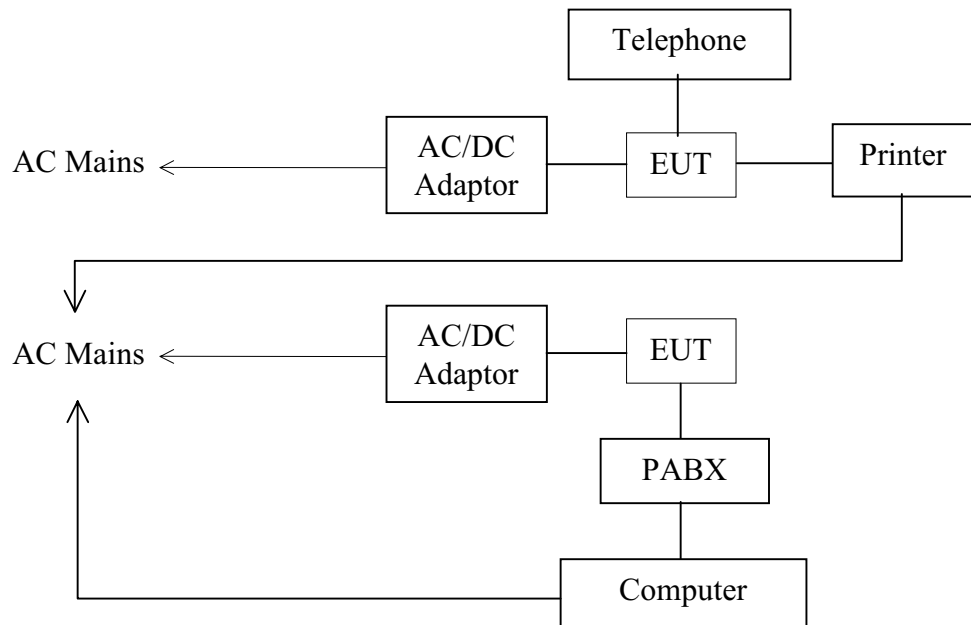
The following test equipments are used during the radiated emission measurement:

3.1.1. For Chamber #3

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	85422E	3625A00181	Jun. 03, 01	1 Year
2.	Test Receiver	Rohde & Schwarz	ESVS20	830350/005	Jun. 03, 01	1 Year
3.	Amplifier	HP	8447D	2944A07794	Jun. 02, 01	1/2 Year
4.	Bilog Antenna	Chase	CBL6112A	2176	Sep. 26, 00	1 Year
5.	Computer	N/A	N/A	N/A	N/A	N/A
6.	Printer	NEC	P3800	568101448	N/A	N/A
7.	Coaxial Switch	Anritsu	MP59B	M20531	Jun. 03, 01	1 Year
8.	FR Cable	MIYAZAKI	5D-2W	3# Chamber No.1	Feb. 27, 01	1/2 Year
9.	FR Cable	MIYAZAKI	5D-2W	3# Chamber No.2	Feb. 27, 01	1/2 Year
10.	FR Cable	FUJIKURA	RG-55/U	3# Chamber No.3	Feb. 27, 01	1/2 Year
11.	FR Cable	FUJIKURA	RG-55/U	3# Chamber No.4	Feb. 27, 01	1/2 Year

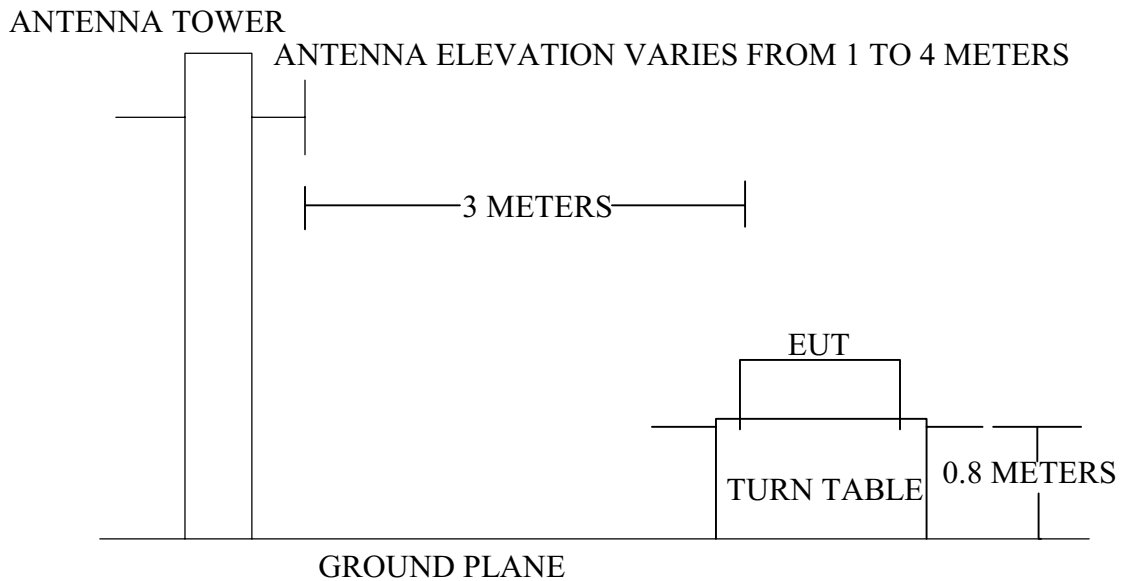
3.2. Block Diagram of Test Setup

3.2.1. diagram of connection between the EUT and simulators



(EUT: MIVO250)

3.2.2. Chamber # 3 Test Setup Diagram



3.3. Radiated Emission Limit (Class B)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
Fundamental Frequency	3	50×10^3	94.0
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0

- Remark :
- (1) Emission level $(\text{dB})\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$
 - (2) The smaller limit shall apply at the cross point between two frequency bands.
 - (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

3.4. EUT Configuration on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

3.4.1. MIVO250 (EUT)

Model Number : DET2A / DET2B / BASE1A
 Serial Number : N/A
 Manufacturer : Inventec Electronics(Nanjing) Co.,Ltd

3.5. Operating Condition of EUT

1. Setup the EUT as shown in Section 3.2.
2. Let the the EUT work in test mode (On / Printing) and measure it.

3.6. Test Procedure

EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-1992 on radiated emission measurement.

The bandwidth of the EMI test receiver (R&S ESVS20) is set at 120KHz in the 30-10000MHz and 1MHz had been set in above 10000MHz Range.

The frequency range from 30MHz to 10000MHz is checked.

The test mode (On / Printing) is tested in Anechoic Chamber and all the scanning waveforms are attached in Appendix II.

3.7. Radiated Emission Noise Measurement Result

PASS.

The frequency range from 30MHz to 1000MHz is investigated.
Please see the following pages.

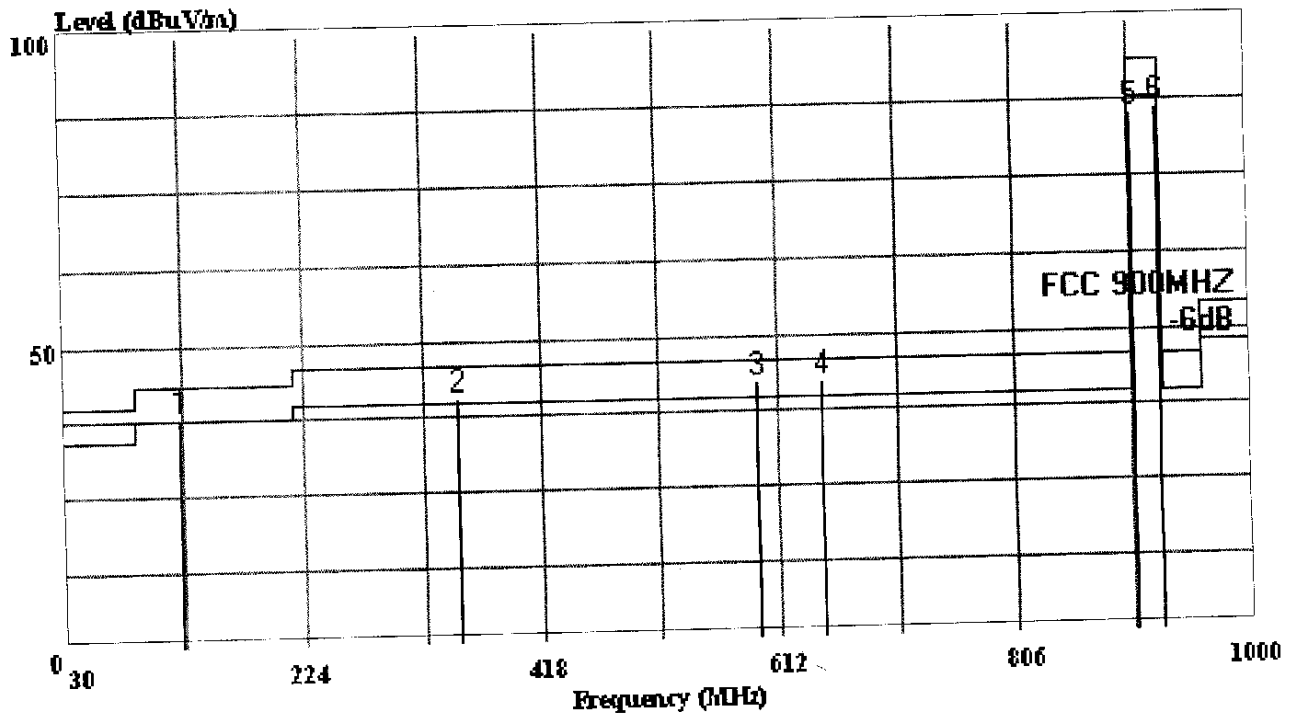


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Data#: 216 File#: Mivo250.EMI

Date: 2001-07-30 Time: 08:52:44



AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. (#3 Chamber)

Ref Trace:

Trace:

Condition: FCC 900MHz 3m 2176FACTOR HORIZONTAL
EUT: : MIVO 250
M/N: : DET2A
Power: : DC 9V Adapter input: 120V/60Hz
Test Engineer: : Chris Du
Memo: : Wireless modem on and printing

Page: 1

	Freq	Level	Limit	Over	Read	Probe	Cable	Preamb	
	MHz	dBuV/m	Line	Limit	Level	Factor	Loss	Factor	Factor
			dBuV/m	dB	dBuV	dB	dB	dB	dB
1 !	124.090	38.22	43.50	-5.28	19.62	15.65	2.95	18.60	0.00
2 !	350.230	40.77	46.00	-5.23	15.65	20.60	4.52	25.12	0.00
3 !	594.790	42.45	46.00	-3.55	12.95	24.18	5.32	29.50	0.00
4 !	649.250	42.21	46.00	-3.79	12.77	23.99	5.45	29.44	0.00
5	903.560	85.13	94.00	-8.87	52.59	26.59	5.95	32.54	0.00
6	926.150	86.06	94.00	-7.94	53.31	26.77	5.98	32.75	0.00

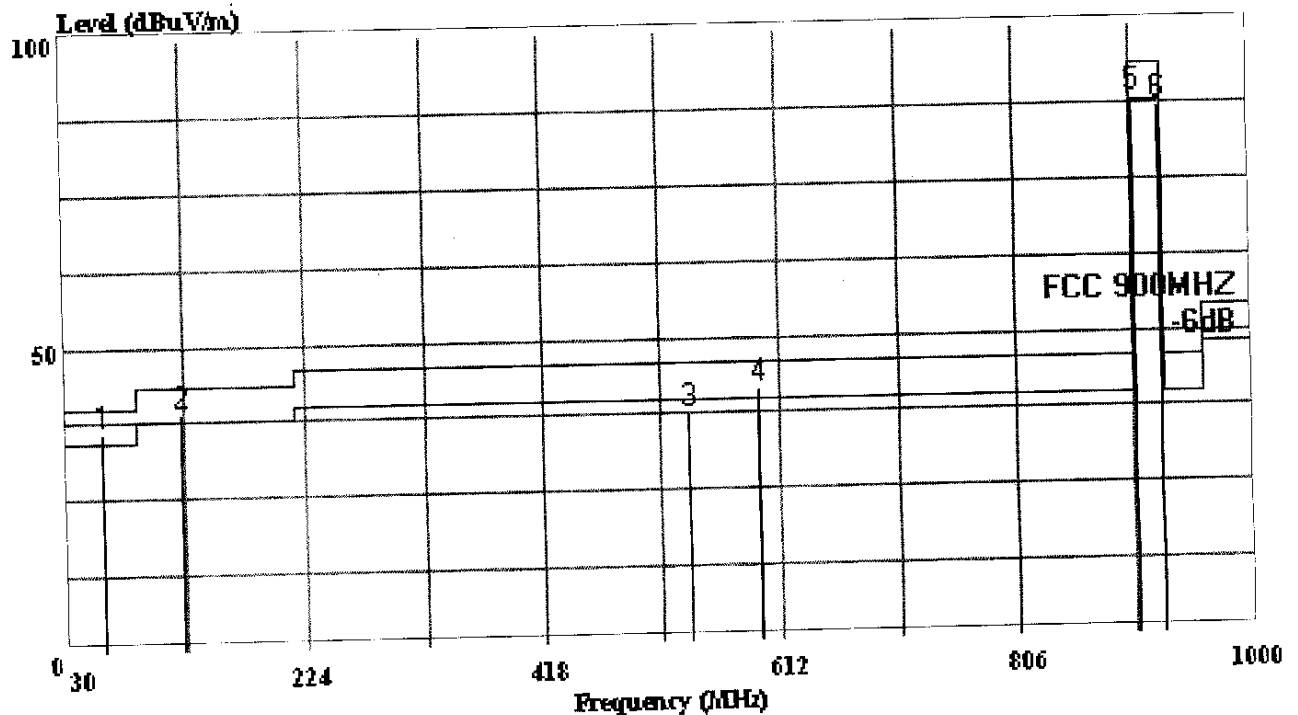


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Data#: 217 File#: Mivo250.EMI

Date: 2001-07-30 Time: 08:59:46



AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. (#3 Chamber)

Ref Trace:

Trace:

Condition: FCC 900MHz 3m 2176FACTOR VERTICAL

EUT: : MIVO 250

M/N: : DET2A

Power: : DC 9V Adapter input: 120V/60Hz

Test Engineer:: Chris Du

Memo: : Wireless modem on and printing

Page: 1

			Limit	Over	Read	Probe	Cable		Preamplifier
	Freq	Level	Line	Limit	Level	Factor	Loss	Factor	Factor
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB	dB
1 !	59.460	35.87	40.00	-4.13	19.41	14.64	1.82	16.46	0.00
2 !	124.680	38.94	43.50	-4.56	19.15	16.84	2.95	19.79	0.00
3	536.940	37.64	46.00	-8.36	9.17	23.31	5.16	28.47	0.00
4 !	594.280	41.36	46.00	-4.64	11.70	24.35	5.31	29.66	0.00
5 !	904.260	88.12	94.00	-5.88	55.70	26.48	5.95	32.42	0.00
6	926.210	87.15	94.00	-6.85	54.18	26.98	5.98	32.97	0.00



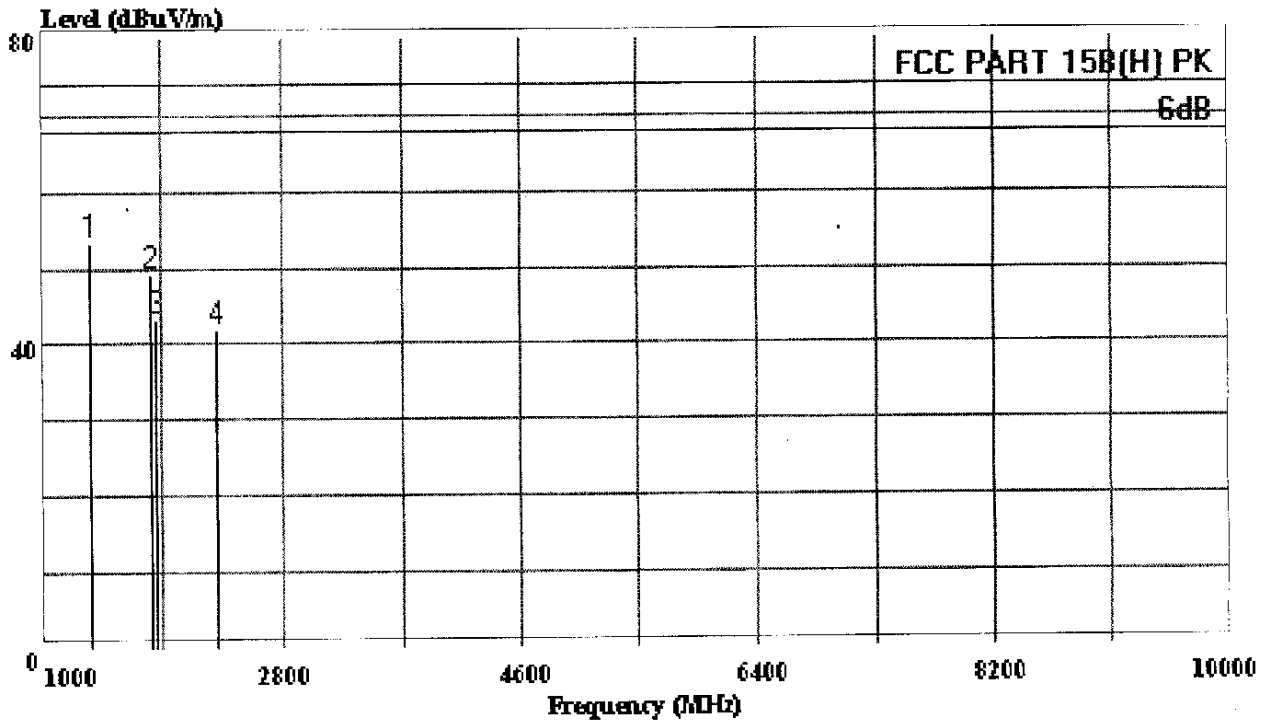
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Data#: 3

File#: inventec.emi

Date: 2001-08-15 Time: 15:13:22



AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. (1# Chamber)

Trace:

Ref Trace:

Condition: FCC PART 15B(H) PK 3m 3115FACTOR HORIZONTAL

EUT: : MIVO 250

M/N: : DET2A

Power: : DC 9V Adaptor Input: 120V/60Hz

Memo: : wireless modem on and printing

Operator:: RICHZHY

Page: 1

	Freq	Level	Limit	Over	Read	Probe	Cable	Preamp	
	MHz	dBuV/m	Line	Limit	Level	Factor	Loss	Factor	Remark
			dBuV/m	dB	dBuV	dB	dB	dB	
1	1350.911	53.44	74.00	-20.56	58.91	26.19	3.77	35.43	Peak
2	1804.241	49.02	74.00	-24.98	51.15	28.34	4.74	35.20	Peak
3	1846.216	43.24	74.00	-30.76	45.03	28.59	4.81	35.19	Peak
4	2307.941	41.97	74.00	-32.03	41.59	29.85	5.55	35.02	Peak

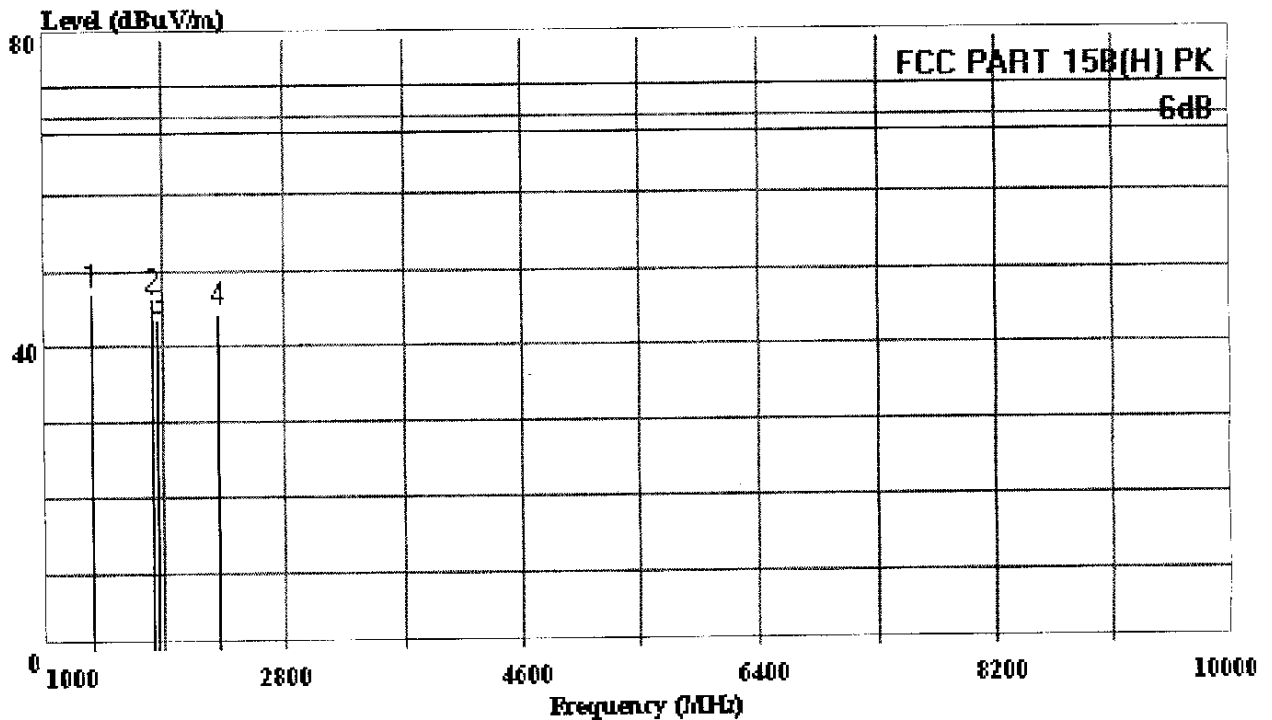


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Data#: 7 File#: inventec.emi

Date: 2001-08-15 Time: 15:11:56



AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. (1# Chamber)

Trace:

Ref Trace:

Condition: FCC PART 15B(H) PK 3m 3115FACTOR VERTICAL

EUT: : MIVO 250

M/N: : DET2A

Power: : DC 9V Adaptor Input: 120V/60Hz

Memo: : wireless modem on and printing

Operator:: RICHZHY

Page: 1

	Freq	Level	Limit	Over	Read	Probe	Cable	Preamp	
	MHz	dBuV/m	Line	Limit	Level	Factor	Loss	Factor	Remark
1	1350.911	47.26	74.00	-26.74	52.73	26.19	3.77	35.43	Peak
2	1804.241	46.37	74.00	-27.63	48.50	28.34	4.74	35.20	Peak
3	1846.216	43.56	74.00	-30.44	45.35	28.59	4.81	35.19	Peak
4	2307.941	44.61	74.00	-29.39	44.23	29.85	5.55	35.02	Peak



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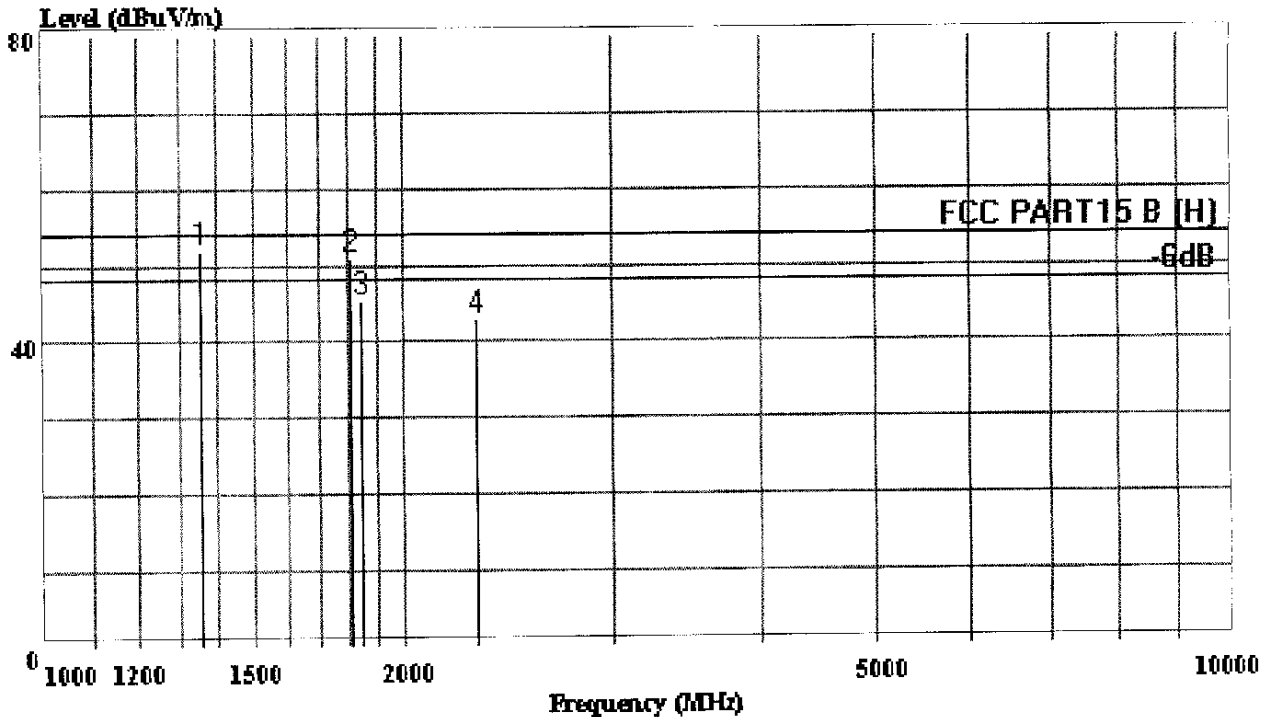
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Data#: 4

File#: inventec.emi

Date: 2001-08-15 Time: 16:13:12



AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. (1# Chamber)

Trace:

Ref Trace:

Condition: FCC PART15 B (H) 3m 3115FACTOR HORIZONTAL

EUT: : MIVO 250

M/N: : DET2A

Power: : DC 9V Adaptor Input: 120V/60Hz

Memo: : wireless modem on and printing

Operator:: RICHZHY

Page: 1

	Freq	Level	Limit	Over	Read	Probe	Cable	Preamp	
	MHz	dBuV/m	Line	Limit	Level	Factor	Loss	Factor	Remark
			dBuV/m	dB	dBuV	dB	dB	dB	
1 !	1354.125	51.87	54.00	-2.13	57.28	26.21	3.80	35.41	Averag
2 !	1805.506	51.07	54.00	-2.93	53.17	28.36	4.74	35.20	Averag
3	1845.983	45.28	54.00	-8.72	47.04	28.61	4.82	35.18	Averag
4	2306.859	43.10	54.00	-10.90	42.71	29.86	5.55	35.02	Averag



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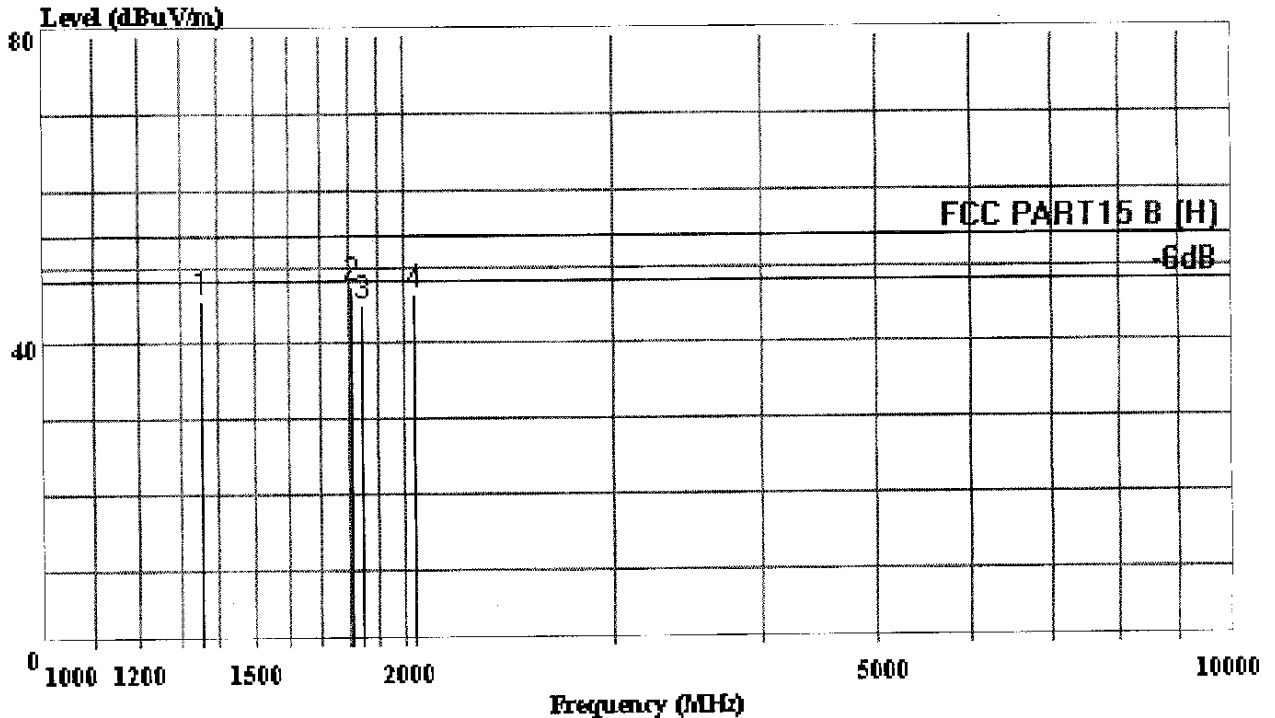
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File#: inventec.emi

Date: 2001-08-15 Time: 16:19:26



AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. (1# Chamber)

Trace:

Ref Trace:

Condition: FCC PART15 B (H) 3m 3115FACTOR VERTICAL

EUT: : MIVO 250

M/N: : DET2A

Power: : DC 9V Adaptor Input: 120V/60Hz

Memo: : wireless modem on and printing

Operator:: RICHZHY

Page: 1

	Freq	Level	Limit	Over	Read	Probe	Cable	Preamp	
	MHz	dBuV/m	Line	Limit	Level	Factor	Loss	Factor	Remark
			dBuV/m	dB	dBuV	dB	dB	dB	
1	1354.125	45.67	54.00	-8.33	51.08	26.21	3.79	35.42	Averag
2	1803.987	47.61	54.00	-6.39	49.73	28.34	4.74	35.20	Averag
3	1846.210	45.12	54.00	-8.88	46.90	28.59	4.81	35.19	Averag
4	2037.453	46.32	54.00	-7.68	46.83	29.46	5.14	35.11	Averag

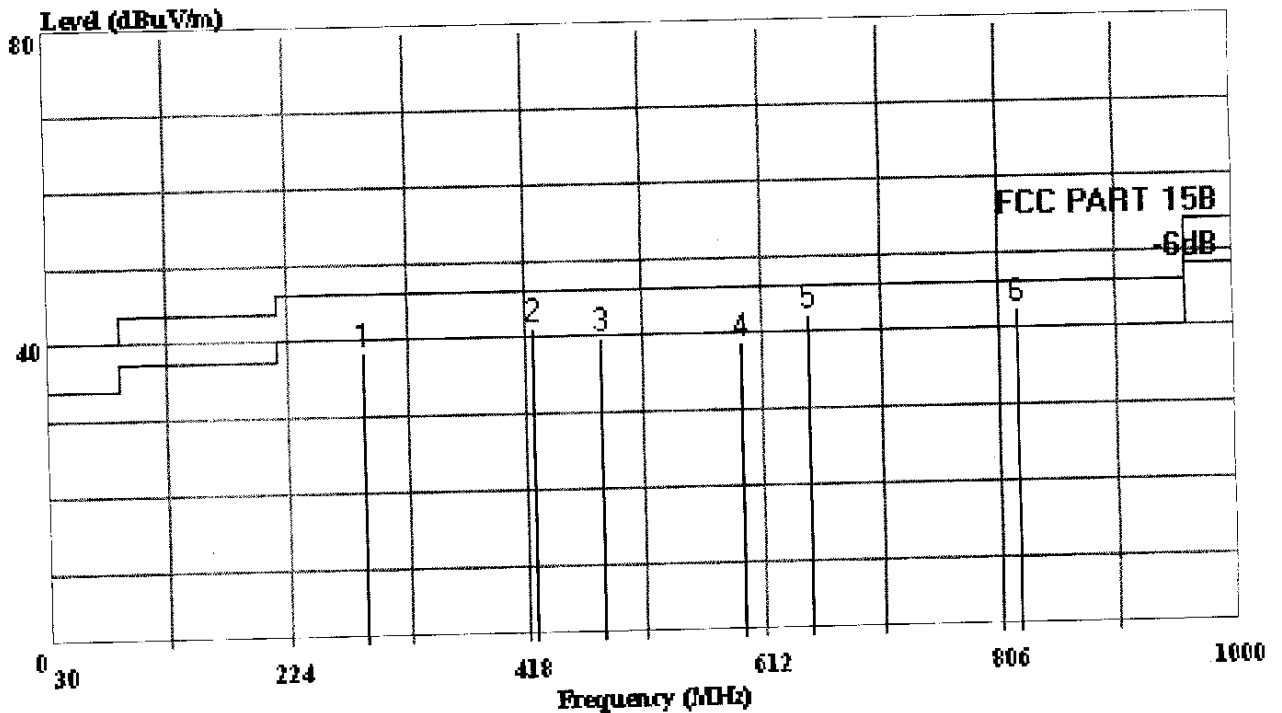


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Data#: 220 File#: Mivo250.EMI

Date: 2001-07-30 Time: 10:24:44



AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. (#3 Chamber)

Ref Trace:

Trace:

Condition: FCC PART 15B 3m 2176FACTOR HORIZONTAL

FUT: : MIVO 250

M/N: : DET2B

Power: : DC 9V Adapter input: 120V/60Hz

Test Engineer:: Chris Du

Memo: : Wired modem on and printing

Page: 1

	Freq	Level	Limit	Over	Read	Probe	Cable	Preamp	
	MHz	dBuV/m	Line	Limit	Level	Factor	Loss	Factor	Factor
			dBuV/m	dB	dBuV	dB	dB	dB	dB
1	285.120	38.46	46.00	-7.54	16.54	17.71	4.20	21.91	0.00
2 !	425.360	41.36	46.00	-4.64	14.32	22.23	4.81	27.04	0.00
3	479.854	39.86	46.00	-6.14	12.17	22.70	4.99	27.69	0.00
4	594.526	38.93	46.00	-7.07	9.45	24.17	5.31	29.48	0.00
5 !	649.524	42.10	46.00	-3.90	12.66	23.99	5.45	29.44	0.00
6 !	821.687	42.69	46.00	-3.31	10.72	26.17	5.80	31.97	0.00



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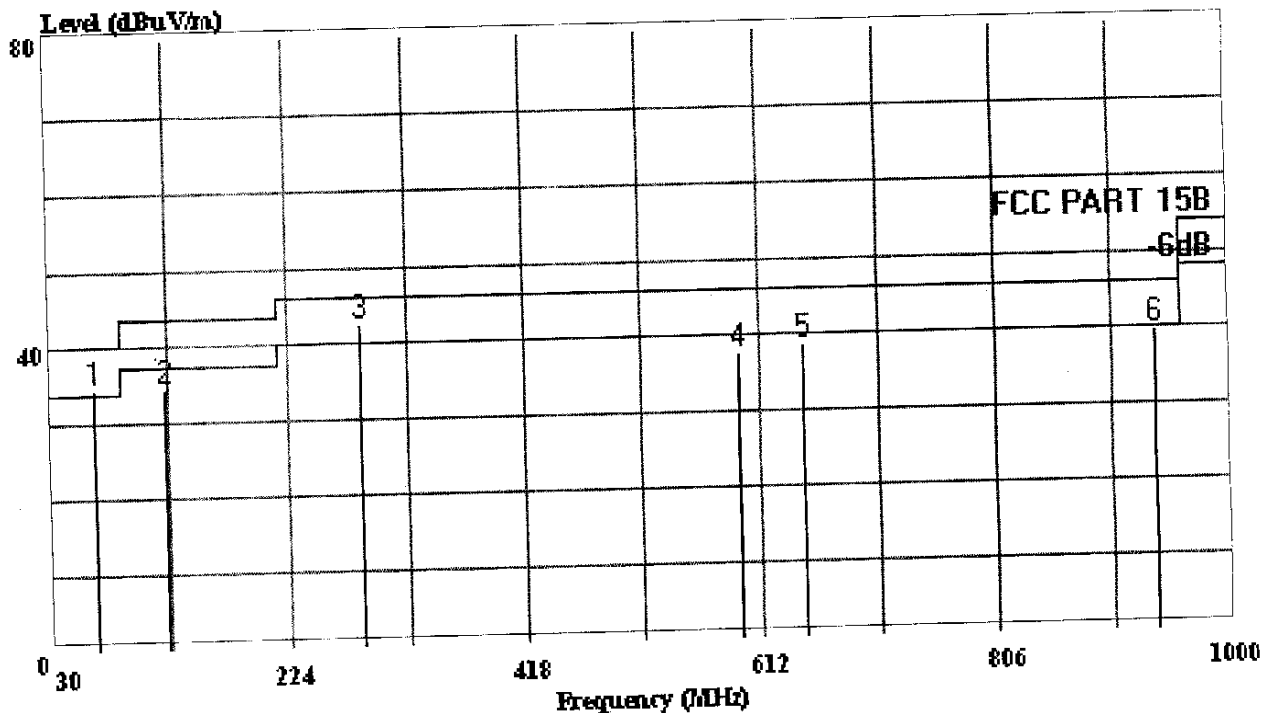
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Data#: 221 File#: Mivo250.EMI

Date: 2001-07-30 Time: 10:32:44



AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. (#3 Chamber)

Ref Trace:

Trace:

Condition: FCC PART 15B 3m 2176FACTOR VERTICAL

EUT: : MIVO 250

M/N: : DET2B

Power: : DC 9V Adapter input: 120V/60Hz

Test Engineer: : Chris Du

Memo: : Wired modem on and printing

Page: 1

			Limit	Over	Read	Probe	Cable	Preamb	
	Freq	Level	Line	Limit	Level	Factor	Loss	Factor	Factor
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB	dB
1 !	65.874	34.54	40.00	-5.46	18.07	14.51	1.97	16.47	0.00
2	124.068	34.79	43.50	-8.71	15.00	16.86	2.94	19.79	0.00
3 !	284.563	42.63	46.00	-3.37	19.42	19.01	4.20	23.21	0.00
4	594.631	37.84	46.00	-8.16	8.15	24.37	5.32	29.69	0.00
5	649.256	38.94	46.00	-7.06	8.48	25.01	5.45	30.46	0.00
6	938.264	39.86	46.00	-6.14	6.58	27.27	6.00	33.27	0.00