

APPLICATION FOR CERTIFICATION
On Behalf of
Technic Star Ltd.

49MHz Basic Monitor

Model Number: 3040/3041

Prepared for : Technic Star Ltd.
Room 2115, Hung To Road No. 1,
Kwun Tong, Hong Kong

Prepared By : Audix Technology (Shenzhen) Co., Ltd.
No. 6, Ke Feng Rd., 52 Block,
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Report Number : ACS-F03162
Date of Test : Jul.21~26, 2003
Date of Report : Jul.30, 2003

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APPENDIX I	(5 pages)
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TEST REPORT DECLARATION

Applicant : Technic Star Ltd.
 Manufacturer : Technic Star Products Factory
 EUT Description : 49MHz Basic Monitor
 (A) MODEL NO. : 3040/3041
 (B) SERIAL NO. : F2003073001
 (C) Power Supply : Adaptor AC Input 120V/60Hz
 Output DC 6V

Test Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Mar. 2003.

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 for radiated and conducted emissions. The test results are contained in this test report and Audix Technology (Shenzhen) Co., Ltd. is assumed full responsibility for the accuracy and completeness of tests. Also, this report shows that EUT is technically compliant with 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 :

Jul.21~26, 2003

Elsa Wu

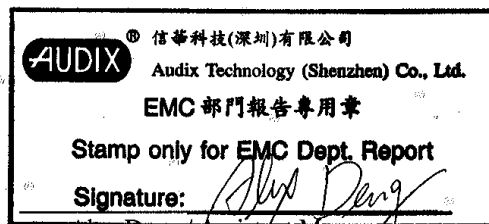
Elsa Wu / Assistant

Prepared by :

Lake Wang

Lake Wang / Supervisor

Reviewer :



Approved & Authorized Signer :

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	49MHz Basic Monitor This report is about transmitter FCC ID and the receiver FCC DOC report please refer to AUDIX Number ACS-F03161.
Model Number	:	3040/3041
Applicant	:	Technic Star Ltd. Room 2115, Hung To Road No.1, Kwun Tong, Hong Kong
Manufacturer	:	Technic Star Products Factory Xiang Jiao Tang Industrial Area 2, Xue Xiang Buji, Shenzhen, China
Power Adapter	:	M/N:KU28-6-200D Unshielded, Undetachable 1.8m
Date of Test	:	Jul.21~26, 2003

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
		Certificated by VCCI, Japan Jan.01, 2002
EMC Lab.	:	Certificated by DATech, German Feb. 02, 1999
		Certificated by NVLAP, USA NVLAP Code: 200372-0 Mar. 31, 2003

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. Test Uncertainty

Conducted Emission Uncertainty = $\pm 2.66\text{dB}$

Radiated Emission Uncertainty = $\pm 4.26\text{dB}$

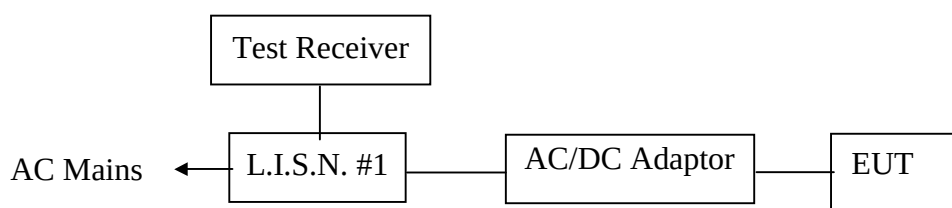
2. POWER LINE CONDUCTED EMISSION TEST

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	May.31, 03	1 Year
2.	L.I.S.N. #1	Kyoritsu	KNW-407	8-541-4	May.31, 03	1 Year
3.	L.I.S.N. #2	R&S	ESH2-Z5	834066/011	May.31, 03	1 Year
4.	Terminator	EMCO	50Ω	No. 1	May.31, 03	1 Year
5.	Terminator	EMCO	50Ω	No. 2	May.31, 03	1 Year
6.	RF Cable	FUJIKURA	RG-55/U	LISN Cable	Feb. 22, 03	1/2 Year
7.	Coaxial Switch	Anritsu	MP59B	M74389	May.29, 03	1/2 Year
8.	PC	N/A	586ATXS	N/A	N/A	N/A
9.	Printer	HP	Laserjet2100	SGGJ092351	N/A	N/A

2.2. Block Diagram of Test Setup



(EUT: 49MHz Basic Monitor)

2.3. Power Line Conducted Emission Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150KHz ~ 500KHz	66 ~ 56*	56 ~ 46*
500KHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

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. 49MHz Basic Monitor (EUT)

Model Number	:	3040/3041
Serial Number	:	F2003073001
Manufacturer	:	Technic Star Products Factory

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 (TX Channel A/TX Channel B) 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 AC/DC Adapter. The AC/DC Adapter 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 ANSI / IEEE Standard 213-1987 on Conducted Emission Test.

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

The frequency range from 150KHz 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.

3. RADIATED EMISSION TEST

3.1. Test Equipment

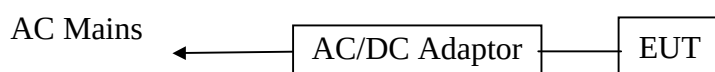
The following test equipments are used during the radiated emission Test :

3.1.1. For Anechoic Chamber

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Spectrum	HP	85422E	3625A00181	May.31, 03	1 Year
2.	Test Receiver	Rohde & Schwarz	ESVS10	834468/011	May.31, 03	1 Year
3.	Amplifier	HP	8447D	2944A07794	Mar.19, 03	1/2 Year
4.	Bilog Antenna	Schaffner	CBL6111C	2598	Jan. 14, 03	1 Year
5.	PC	N/A	586ATX3	N/A	N/A	N/A
6.	Printer	HP	Laserjet6P	SGCF019673	N/A	N/A
7.	RF Cable	MIYAZAKI	5D-2W	3# Chamber No.1	Feb. 03, 03	1/2 Year
8.	RF Cable	MIYAZAKI	5D-2W	3# Chamber No.2	Feb. 03, 03	1/2 Year
9.	RF Cable	FUJIKURA	RG-55/U	3# Chamber No.3	Feb. 03, 03	1/2 Year
10.	RF Cable	FUJIKURA	RG-55/U	3# Chamber No.4	Feb. 03, 03	1/2 Year
11.	Coaxial Switch	Anritsu	MP59B	M73989	May.29, 03	1/2 Year

3.2. Block Diagram of Test Setup

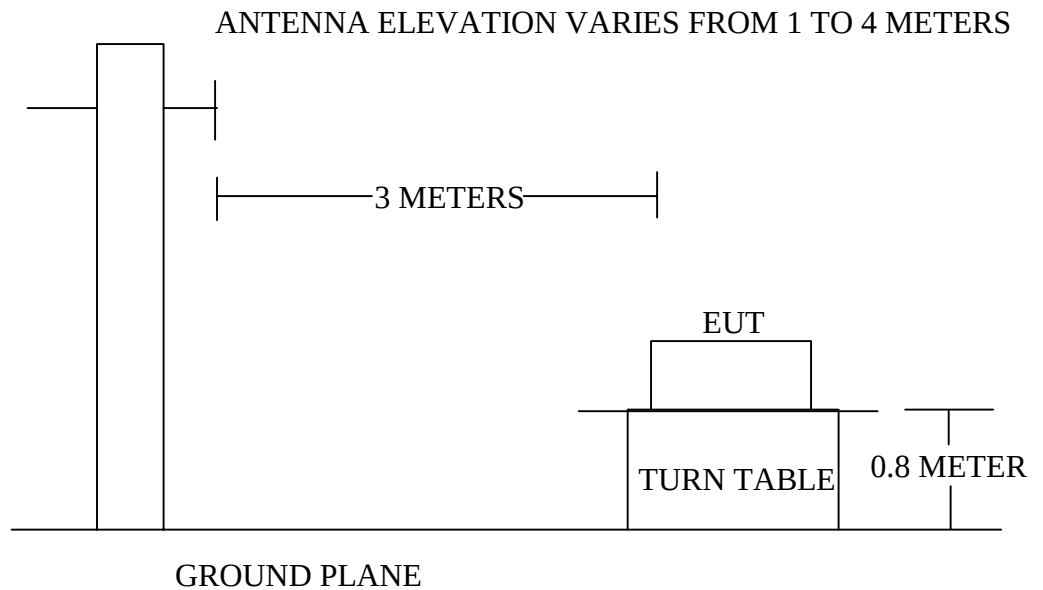
3.2.1. Block Diagram of connection between EUT and simulators



(EUT: 49MHz Basic Monitor)

3.2.2. Anechoic Chamber Setup Diagram

ANTENNA TOWER



3.3. Radiated Emission Limit (Class B)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0

- Remark :
- (1) Emission level $\text{dB}\mu\text{V} = 20 \log$ 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 Test

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

3.4.1. 49MHz Basic Monitor (EUT)

Model Number : 3040/3041
Serial Number : F2003073001
Manufacturer : Technic Star Products Factory

3.5. Operating Condition of EUT

3.5.1. Setup the EUT as shown in Section 3.2..

3.5.2. Let the EUT work in test modes (TX Channel A/TX Channel B) and test it.

3.6. Test Procedure

The 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. The EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 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 is set on Test. 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 Test.

The bandwidth of the EMI test receiver (R&S ESVS20) is set at 120KHz.

The frequency range from 30MHz to 1000MHz is checked.

The test modes (TX Channel A/TX Channel B) is tested in Anechoic Chamber and all the scanning waveforms are attached in Appendix II.

3.7. Radiated Emission Test Results

PASS.

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

Date of Test :	Jul.26, 2003	Temperature :	24°C
EUT :	49MHz Basic Monitor	Humidity :	53%
Model No. :	3040/3041	Test Mode :	TX Channel A
Test Engineer:	Seco		

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Over Limits dBμV/m	Limits dBμV/m	Remark
49.831	7.12	1.36	69.24	77.73	-2.27	80.00	QP

Remark: 1. All readings are QP values.

2. Emission Level = Antenna Factor + Meter Reading+Cable Loss

Reviewer: Cake Wang

Date of Test :	<u>Jul.26, 2003</u>	Temperature :	<u>24°C</u>
EUT :	<u>49MHz Basic Monitor</u>	Humidity :	<u>53%</u>
Model No. :	<u>3040/3041</u>	Test Mode :	<u>TX Channel B</u>
Test Engineer:	<u>Seco</u>		

Frequency	Antenna	Cable	Meter Reading	Emission Level	Over	Limits	
MHz	Factor	Loss	Horizontal	Horizontal	Limits		Remark
	dB/m	dB	dBμV	dBμV/m	dBμV/m	dBμV/m	
49.890	7.10	1.36	68.59	77.06	-2.94	80.00	QP

Remark: 1. All readings are QP values.

2. Emission Level = Antenna Factor + Meter Reading+Cable Loss

Reviewer:

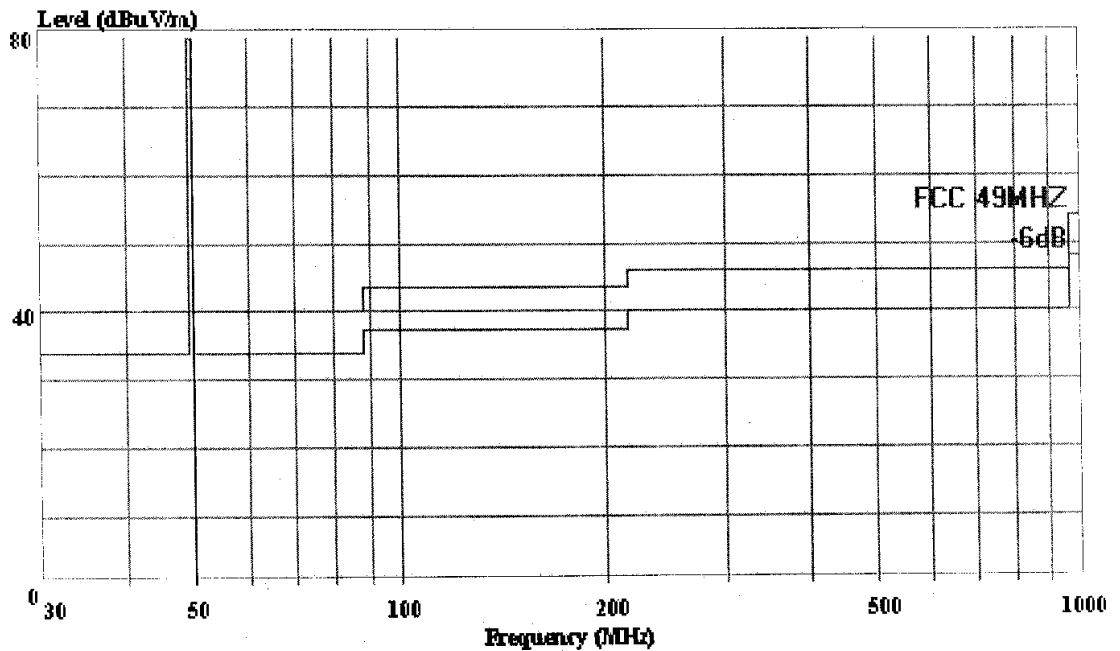
Cahe Wang



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Data#: 361 File#: Technic star.EMI Date: 2003-07-26 Time: 09:32:05



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

Trace:

Ref Trace:

Condition: FCC 49MHZ 3m 2598FACTOR VERTICAL
EUT : 49MHz Basic Monitor
M/N : 3040/3041
Power : Adaptor AC Input 120V/60Hz Output DC6V
Test Engineer: Seco
Memo : TX Channel A
: Temp:24' Humi:53%

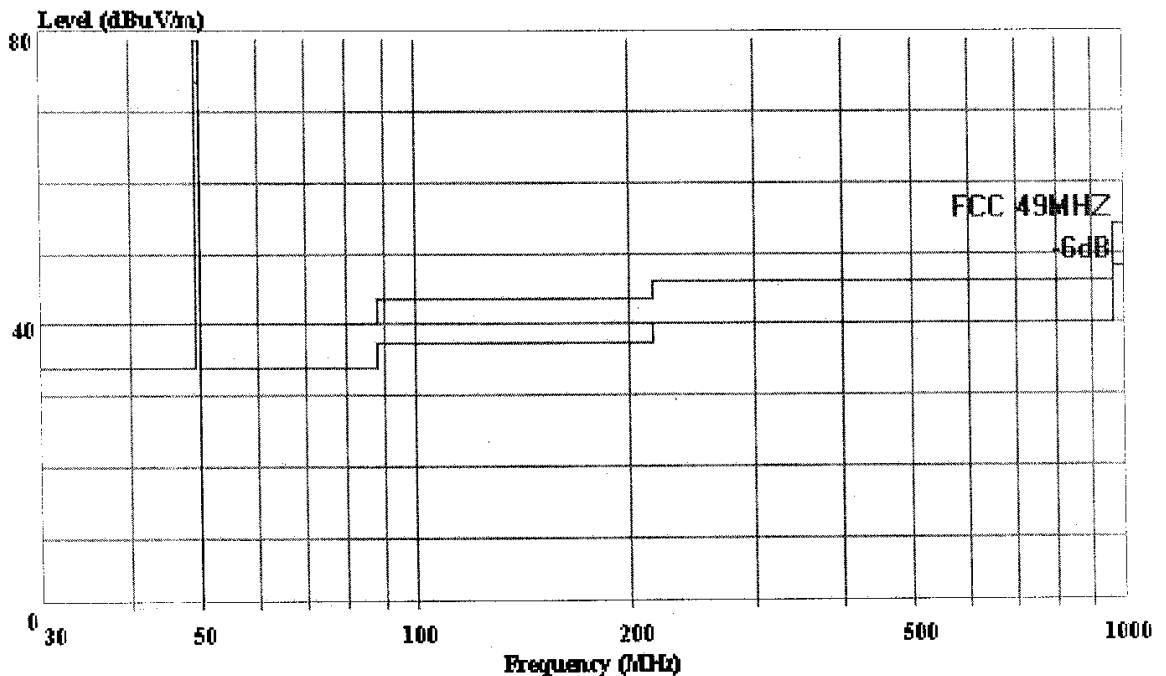
Page: 1

		Limit	Over	Read	Probe	Cable	
Freq	Level	Line	Limit	Level	Factor	Loss	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	
1 !	49.831	77.73	80.00	-2.27	69.24	7.12	1.36 QP



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Data#: 362 File#: Technic star.EMI Date: 2003-07-26 Time: 09:36:52



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

Trace:

Ref Trace:

Condition: FCC 49MHZ 3m 2598FACTOR VERTICAL
EUT : 49MHz Basic Monitor
M/N : 3040/3041
Power : Adaptor AC Input 120V/60Hz Output DC6V
Test Engineer: Seco
Memo : TX Channel B
: Temp:24' Humi:53%

Page: 1

		Limit	Over	Read	Probe	Cable	
Freq	Level	Line	Limit	Level	Factor	Loss	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	
1 !	49.890	77.06	80.00	-2.94	68.59	7.10	1.36 QP

4. BANDWIDTH TEST

4.1. Test Equipment

The following test equipments are used during the bandwidth test:

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4407B	MY41440292	Jun 22, 03	1 Y
2.	Antenna	EMCO	3115	9607-4877	Dec 02, 02	1.5 Y
3.	Print				N/A	N/A

4.2. Test Standard

The test completeness FCC 15C (2).

4.3. Bandwidth Limit

The minimum 6dB bandwidth shall be at least 500KHz.

4.4. Test Procedure



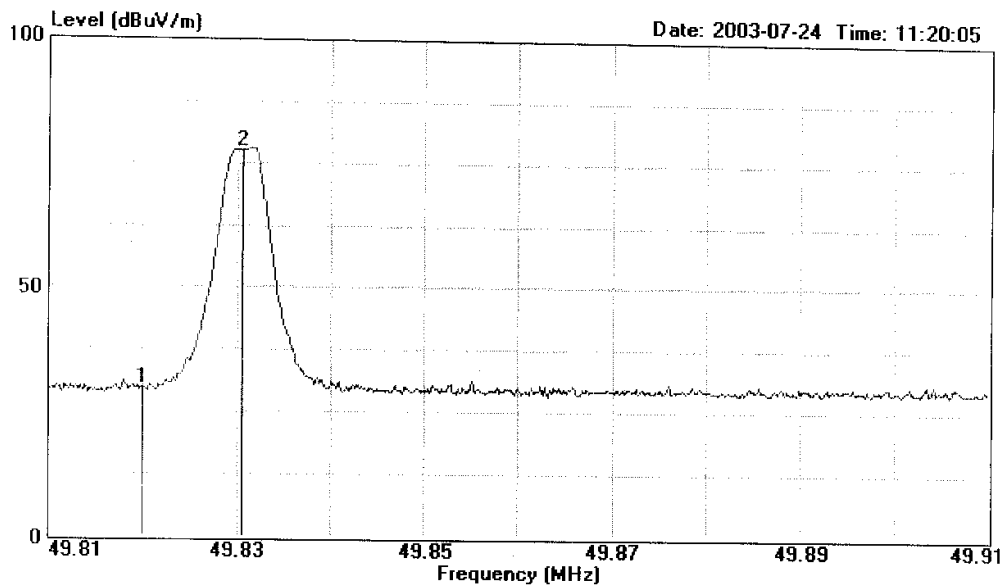
信華科技(深圳)有限公司

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Data#: 36

File#: C:\EMI TEST DATA\T\Technic Star.EMI



Site : 3# Chamber
Condition : 3m VERTICAL
EUT : 49MHz Basic Monitor
M/N : 3040/3041
Power : Adaptor input 120V/60Hz Output DC 6V
Test Engineer : Seco
Memo : TX Channel A

	Freq	Level	Over Limit	Limit Line	Read Level	Cable Loss	Probe Factor	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	
1	49.820	29.90	-----	-----	29.90	0.00	0.00	0.00	
2	49.831	77.73	-----	-----	77.73	0.00	0.00	0.00	

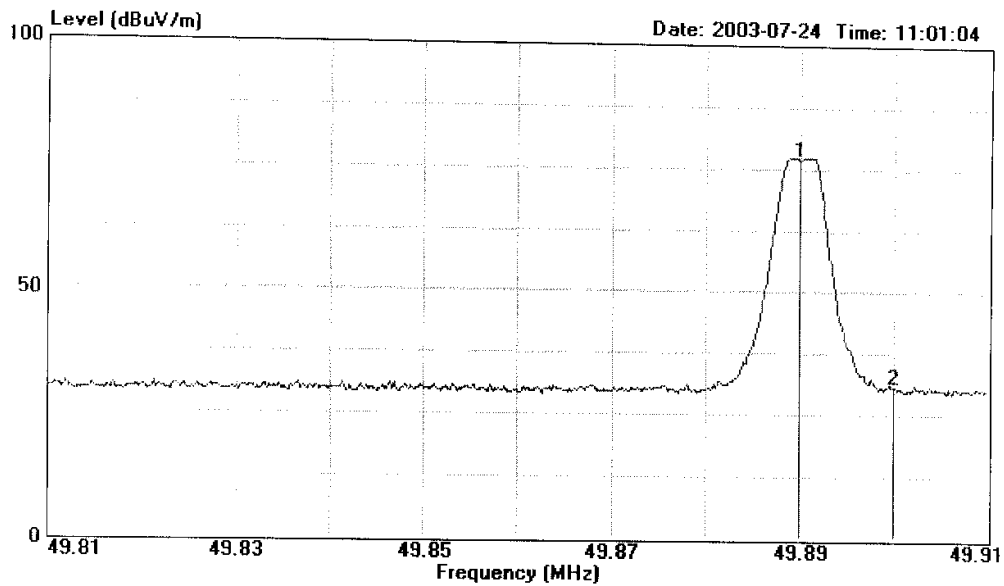


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Data#: 35 File#: C:\EMI TEST DATA\T\Technic Star.EMI



Site : 3# Chamber
Condition : 3m VERTICAL
EUT : 49MHz Basic Monitor
M/N : 3040/3041
Power : Adaptor input 120V/60Hz Output DC 6V
Test Engineer : Seco
Memo : TX Channel B

			Over	Limit	Read	Cable	Probe	Preamp	
	Freq	Level	Limit	Line	Level	Loss	Factor	Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	
1	49.890	77.06	-----	-----	77.06	0.00	0.00	0.00	
2	49.900	30.86	-----	-----	30.86	0.00	0.00	0.00	

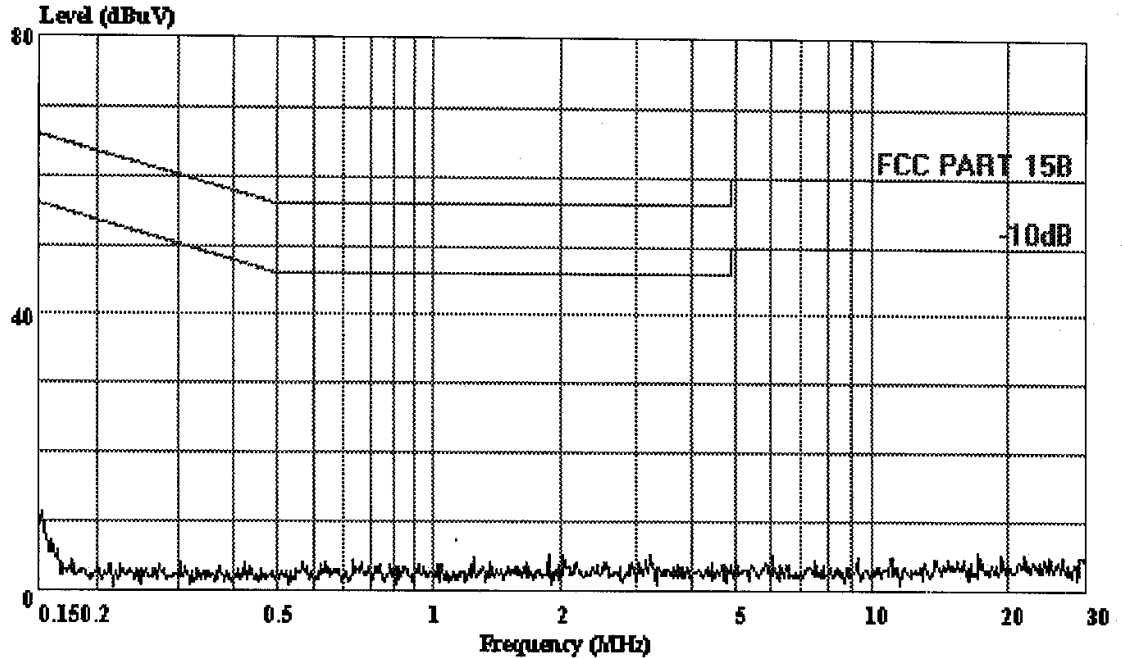
APPENDIX I



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Data#: 5 File#: Technic star.EMI Date: 2003-07-23 Time: 17:22:48



AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. (Audix ATC)

Trace:

Ref Trace:

Condition: FCC PART 15B VA (KNW-407)

EUT : 49MHz Basic Monitor

M/N : 3040/3041

Power : Adaptor AC Input 120V/60Hz Output DC6V

Test Engineer: Seco

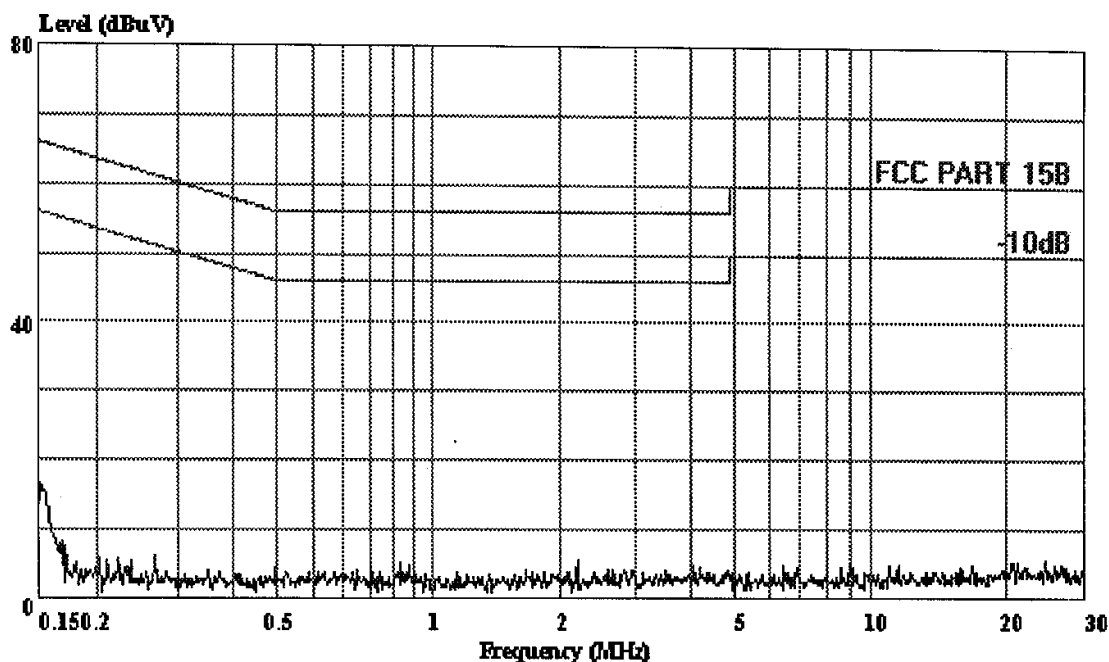
Memo : TX Channel A

: Temp:24.6'C Humi:54%

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AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. (Audix ATC)

Trace:

Ref Trace:

Condition: FCC PART 15B VB (KNW-407)

EUT : 49MHz Basic Monitor

M/N : 3040/3041

Power : Adaptor AC Input 120V/60Hz Output DC6V

Test Engineer: Seco

Memo : TX Channel A

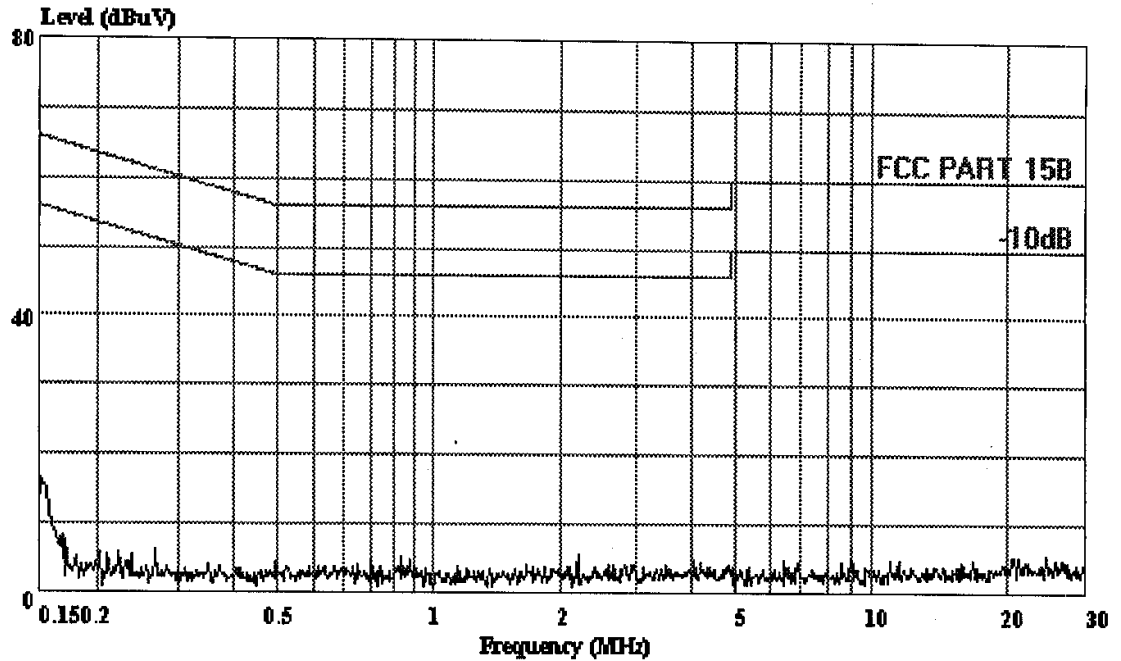
: Temp:24.6'C Humi:54%



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Data#: 8 File#: Technic star.EMI Date: 2003-07-23 Time: 17:40:35



AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. (Audix ATC)

Trace:

Ref Trace:

Condition: FCC PART 15B VA (KNW-407)

EUT : 49MHz Basic Monitor

M/N : 3040/3041

Power : Adaptor AC Input 120V/60Hz Output DC6V

Test Engineer: Seco

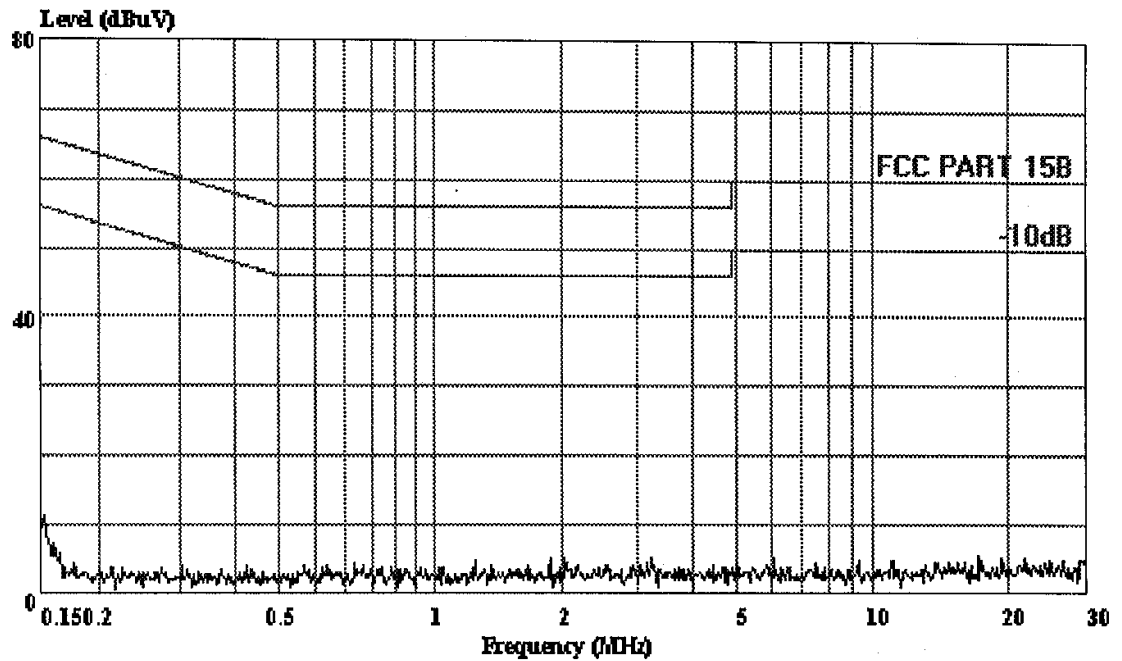
Memo : TX Channel B

: Temp:24.6'C Humi:54%

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Data#: 7 File#: Technic star.EMI Date: 2003-07-23 Time: 17:30:40



AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. (Audix ATC)

Trace:

Ref Trace:

Condition: FCC PART 15B VB (KNW-407)
 EUT : 49MHz Basic Monitor
 M/N : 3040/3041
 Power : Adaptor AC Input 120V/60Hz Output DC6V
 Test Engineer: Seco
 Memo : TX Channel B
 : Temp:24.6'C Humi:54%

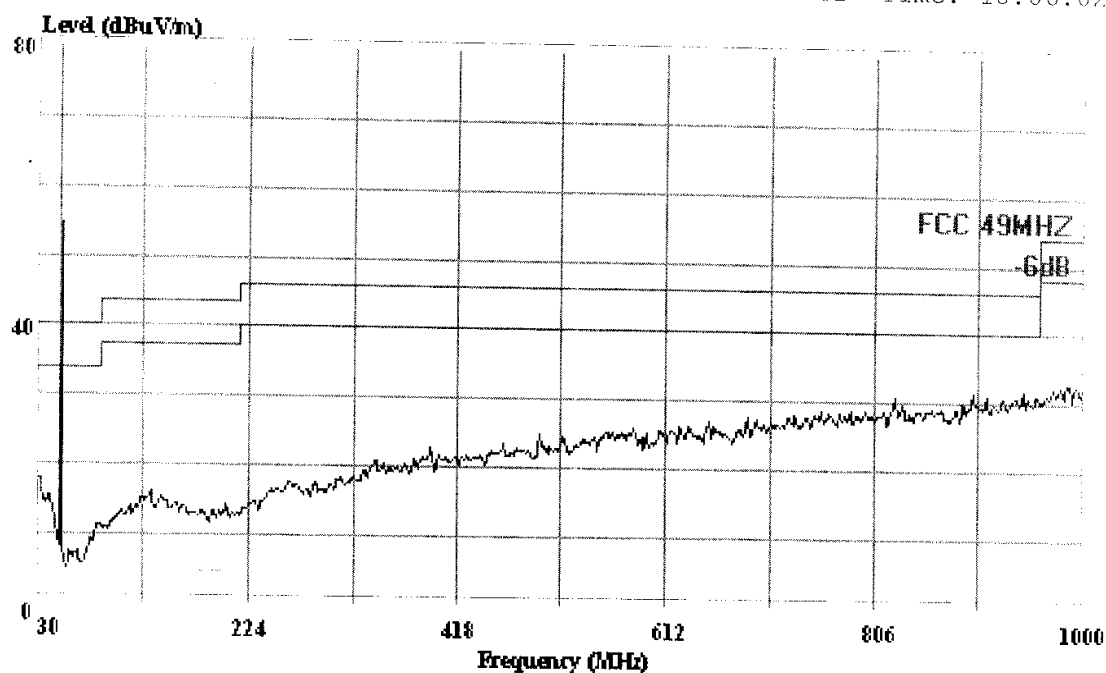
APPENDIX II



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Data#: 30 File#: Technic star.EMI Date: 2003-07-21 Time: 18:06:02



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

Trace:

Ref Trace:

Condition: FCC 49MHZ 3m 2598FACTOR HORIZONTAL
EUT : 49MHz Basic Monitor
M/N : 3040/3041
Power : Adaptor input 120V/60Hz output DC 6V
Test Engineer: Seco
Memo : TX Channel A
: Temp:24' Humi:54%



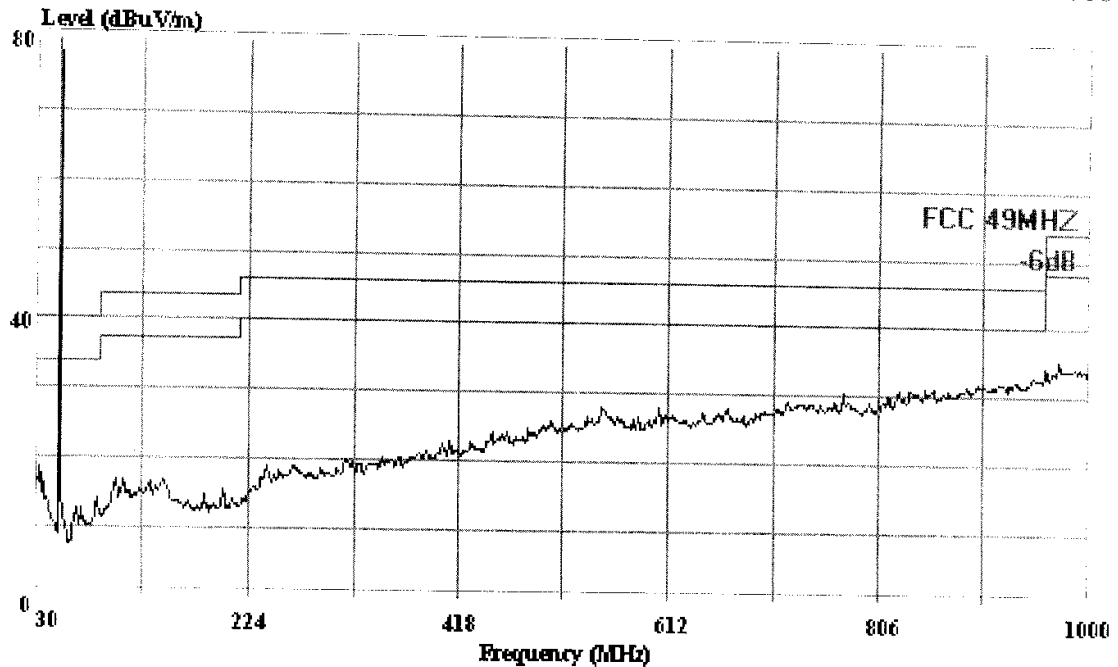
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Data#: 40 File#: Technic star.EMI Date: 2003-07-21 Time: 18:04:55



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

Trace:

Ref Trace:

Condition: FCC 49MHZ 3m 2598FACTOR VERTICAL

EUT : 49MHz Basic Monitor

M/N : 3040/3041

Power : Adaptor input 120V/60Hz output DC 6V

Test Engineer: Seco

Memo : TX Channel A

: Temp:24' Humi:54%



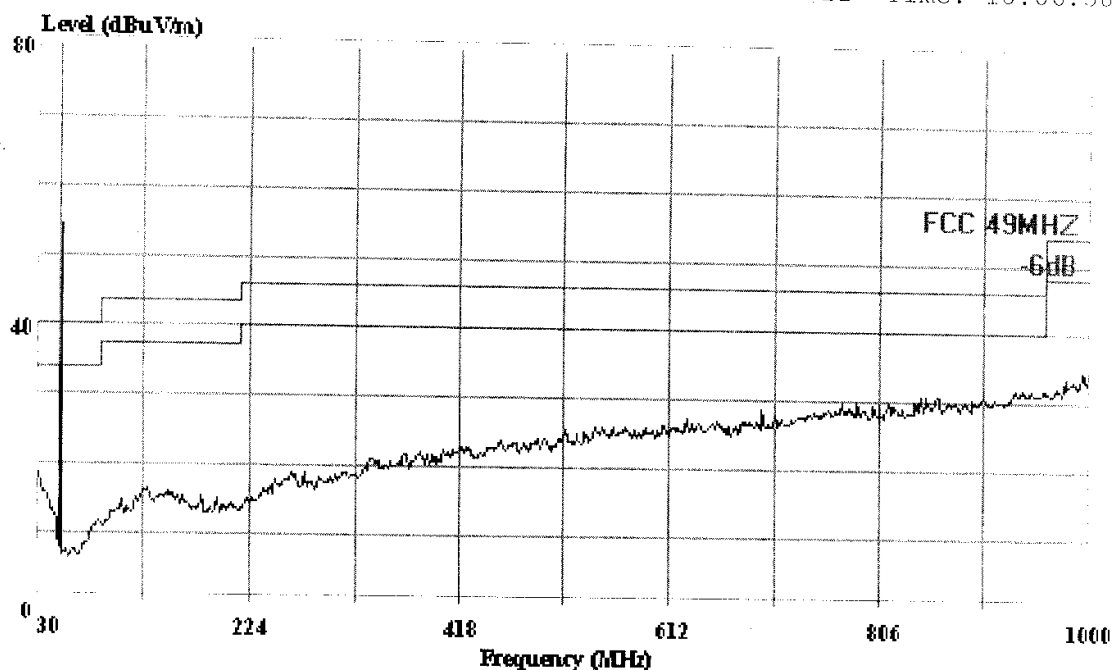
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Data#: File#: Technic star.EMI Date: 2003-07-21 Time: 18:06:58



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

Trace:

Ref Trace:

Condition: FCC 49MHZ 3m 2598FACTOR HORIZONTAL

EUT : 49MHz Basic Monitor

M/N : 3040/3041

Power : Adaptor input 120V/60Hz output DC 6V

Test Engineer: Jimmv

Memo : TX Channel B

: Temp:24' Humi:54%

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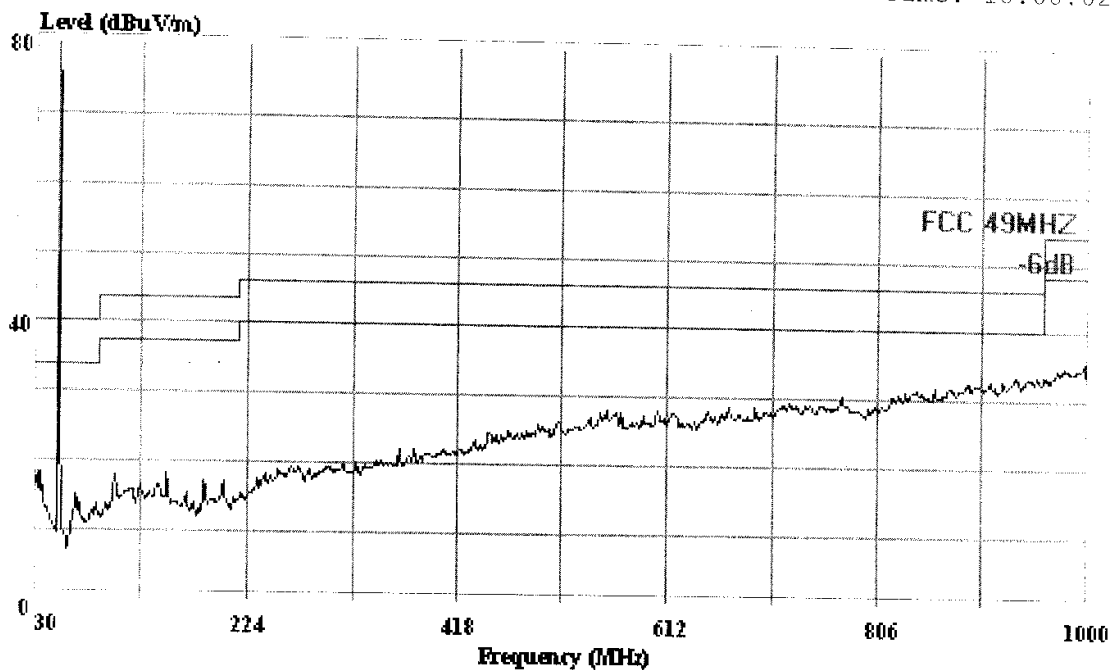
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Data#: File#: Technic star.EMI Date: 2003-07-21 Time: 18:08:02



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

Trace:

Ref Trace:

Condition: FCC 49MHZ 3m 2598FACTOR VERTICAL

EUT : 49MHz Basic Monitor

M/N : 3040/3041

Power : Adaptor input 120V/60Hz output DC 6V

Test Engineer: Seco

Memo : TX Channel B

: Temp:24' Humi:54%