

SAFEMARK SYSTEMS LP

Transmitter

Model Number: TX

Prepared for : SYNAPSIS INDUSTRIAL CO., LTD.
2101 PARK CENTER DRIVE, SUITE 125 ORLANDO,
FL 32835

Prepared By : Shenzhen Most Electronic Co., Ltd.
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Report Number : MT-E0511457
Date of Test : Jan. 17 ~ Feb. 08, 2006
Date of Report : Feb. 08, 2006

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TEST REPORT DECLARATION

Applicant : SAFEMARK SYSTEMS LP

Manufacturer : SAFEGUARD SECURITY INDUSTRIAL CO LTD.

EUT Description : Transmitter

(A) MODEL NO. : TX

(B) SERIAL NO. : E2006010036

(C) POWER SUPPLY : DC 12V

Test Procedure Used:


FCC Rules and Regulations Part 15 Subpart C Apr, 2004.


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 SHENZHEN MOST ELECTRONIC CO., LTD.

This report must not be used by the applicant to claim product endorsement by NVLAP or any agency of the U.S. Government.

Date of Test : Jan. 17 ~ Feb. 08, 2006

Prepared by : 
Mike Wang / Assistant

Reviewer : 
Amy Zhu / Assistant Manager

Approved & Authorized Signer : 



1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	Transmitter
Model No.	:	TX
Applicant	:	SYNAPSIS INDUSTRIAL CO., LTD. 2101 PARK CENTER DRIVE, SUITE 125 ORLANDO, FL 32835
Manufacturer	:	SAFEGUARD SECURITY INDUSTRIAL CO LTD. 7/F, KIN ON COMM. BLDG. 49-51 JERVOIS ST. SHEUNG WAN , HONG KONG
Date of Test	:	Jan. 17 ~ Feb. 08, 2006

1.2. Test Facility

Site Description

- 3m Anechoic Chamber : Certificated by FCC, USA
Registration Number: 90454
Aug. 15, 2003
- 3m & 10m Anechoic Chamber : Certificated by FCC, USA
Registration Number: 794232
Mar. 15, 2004
- EMC Lab. : Certificated by DATech, German
Registration Number: DAT-P-091/99-01
Feb. 02, 2004
- Certificated by NVLAP, USA
NVLAP Code: 200372-0
Mar. 31, 2004
- Certificated by Nemko, Norway
Aut. No.: ELA135
April. 22, 2004
- Certificated by Industry Canada
Registration Number: IC 5183
Jul. 28, 2004
- 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

No.	Item	Uncertainty	Remark
1.	Uncertainty for Conducted Emission Test	1.22dB	
2.	Uncertainty for Radiated Emission Test	3.14dB	3m Chamber
3.	Uncertainty for Radiated Emission Test	3.18dB	10m Chamber
4.	Uncertainty for Power Clamp Test	1.38dB	

2. POWER LINE CONDUCTED EMISSION TEST

According to Paragraph (f) of FCC Part 15 section 15.107, Tests to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

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 Test Receiver	HP	85422E	3625A00181	May 16, 05	1 Year
2.	Test Receiver	Rohde & Schwarz	ESVS20	830350/005	May 16, 05	1 Year
3.	Amplifier	HP	8447D	2944A07794	Mar.15, 05	1/2 Year
4.	Bilog Antenna	Schaffner	CBL6111C	2598	Jan. 12, 05	1 Year
5.	Computer	N/A	N/A	N/A	N/A	N/A
6.	Printer	HP	Laserjet6P	SGCF019673	N/A	N/A
7.	FR Cable	MIYAZAKI	5D-2W	3# Chamber No.1	Jul.29, 05	1/2 Year
8.	FR Cable	MIYAZAKI	5D-2W	3# Chamber No.2	Jul.29, 05	1/2 Year
9.	FR Cable	FUJIKURA	RG-55/U	3# Chamber No.3	Jul.29, 05	1/2 Year
10.	FR Cable	FUJIKURA	RG-55/U	3# Chamber No.4	Jul.29, 05	1/2 Year
11.	Coaxial Switch	Anritsu	MP59B	M74389	Jul.29, 05	1/2 Year

3.2. Block Diagram of Test Setup

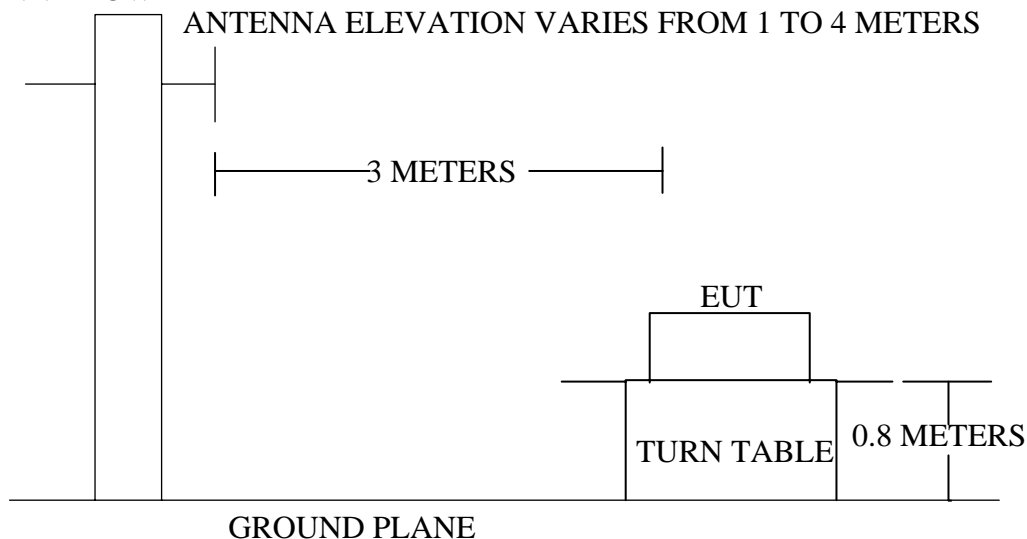
3.2.1. Block diagram of connection between the EUT and simulators



(EUT: SAFE)

3.2.2. In Anechoic Chamber

ANTENNA TOWER



3.3. Radiated Emission Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	
316.845 Fundamental	3	75.6 $\text{dB}(\mu\text{V})/\text{m}$ (Fundamental) 46 $\text{dB}(\mu\text{V})/\text{m}$ (Spurious)	

- Remark :
- (1) Emission level $(\text{dB})\mu\text{V} = 20 \log \text{Emission level } \mu\text{V}/\text{m}$
 - (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. Transmitter (EUT)

Model Number : TX
 Serial Number : E2006010036
 Manufacturer : SAFEGUARD SECURITY INDUSTRIAL CO LTD.

3.4.2. Support Equipment : As Tested Supporting System Detail, in Section 1.2..

3.5. Operating Condition of EUT

1. Setup the EUT as shown in Section 3.2..
2. Let the EUT work in test mode (Running) and test 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 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 are set on 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 mode (Running) is tested in Anechoic Chamber, and all the scanning waveforms are attached in Appendix I.

3.7. Radiated Emission Test Result

PASS.

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

Date of Test :	Jan. 17, 2006	Temperature :	26
EUT :	Transmitter	Humidity :	58%
Model No. :	TX	Test Mode :	Running
Test Engineer:	MARIO		

Polarization	Frequency MHz	Emission Level dB μ V/m	Over Limits dB μ V/m	Limits dB μ V/m
Horizontal	316.845	25.18	-50.42	75.60
Vertical	316.845	20.21	-55.39	75.60

Remark: 1. All readings are Quasi-Peak values.

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

3. The bandwidth of the RBW is set at 120KHz and VBW is set at 300KHz.

Reviewer : 



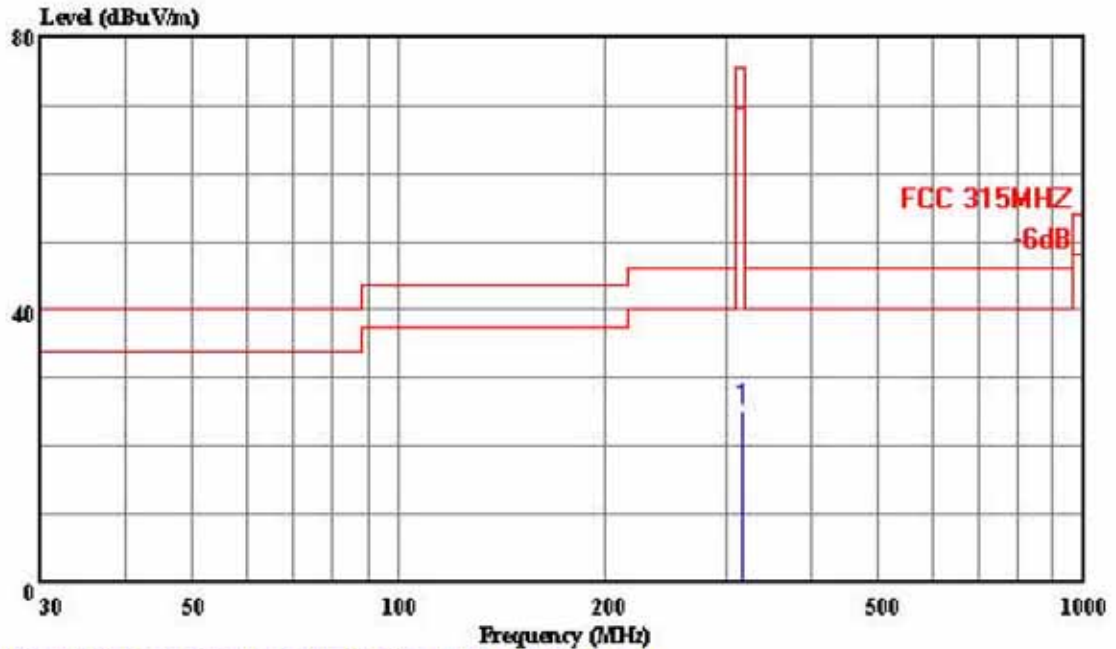
AUDIX TECHNOLOGY (SHENZHEN) CO., LTD.

Shenzhen Science & Ind. Park

Tel: 0755-26639495~7

Fax: 0755-26632877

Data#: 2 File#: Safemark.EMI Date: 2006-01-17 Time: 01:28:04



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

Trace:

Ref Trace:

Condition: FCC 315MHZ 3m 2598FACTOR HORIZONTAL

EUT : Transmitter

M/N : TX

Test Spec : DC 12V

Test Engineer: THOMAX

OP Condition : TX 315MHz

Comment : Temp:23' Humi:54%

Memo :

Page: 1

	Freq	Level	Over Limit	Limit Line	Read Level	Cable Loss	Probe Factor
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB
1	316.845	25.18	-50.42	75.60	7.38	4.08	13.72



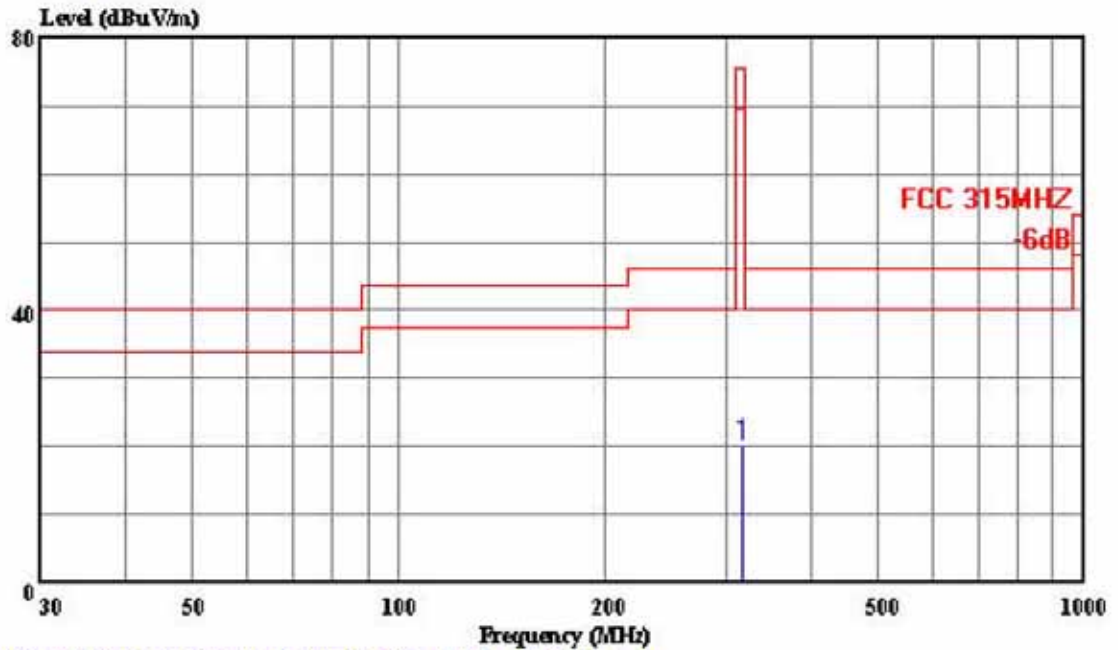
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Shenzhen Science & Ind. Park

Tel: 0755-26639495~7

Fax: 0755-26632877

Data#: 4 File#: Safemark.EMI Date: 2006-01-17 Time: 01:31:24



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

Trace:

Ref Trace:

Condition: FCC 315MHZ 3m 2598FACTOR VERTICAL

EUT : Transmitter

M/N : TX

Test Spec : DC 12V

Test Engineer: THOMAX

OP Condition : TX 315MHz

Comment : Temp:23' Humi:54%

Memo :

Page: 1

	Freq	Level	Over Limit	Limit Line	Read Level	Cable Loss	Probe Factor
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB
1	316.845	20.21	-55.39	75.60	3.19	4.08	12.94

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	May 16, 05	1 Year
2.	Antenna	EMCO	3115	9607-4877	May 16, 05	1 Year

4.2. Test Standard

The test completeness FCC 15C (231).

4.3. Bandwidth Limit:

$(0.0025 \times 315\text{MHz} = 787\text{KHz})$

$315.240 - 314.720 = 520\text{KHz} < 787\text{KHz}$

The minimum 26dB bandwidth shall be at least 10KHz.

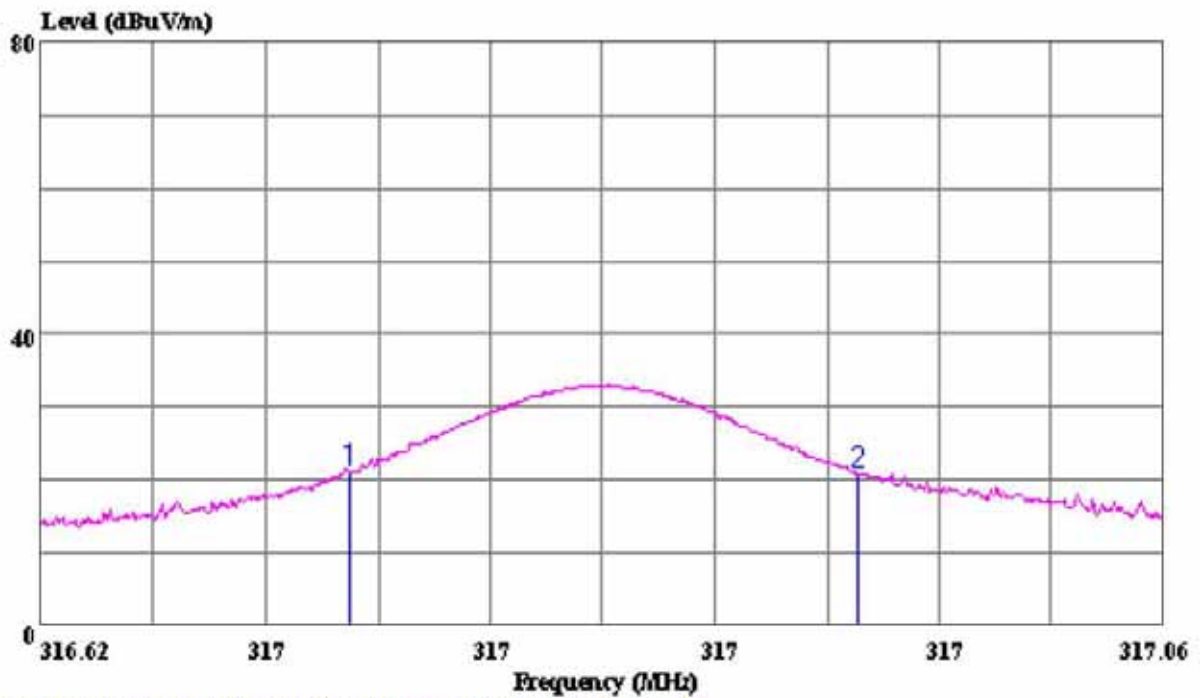


AUDIX TECHNOLOGY (SHENZHEN) CO., LTD.

Shenzhen Science & Ind. Park
 Tel: 0755-26639495~7
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Data#: 10 File#: Safemark.EMI

Date: 2006-02-08 Time: 15:51:47



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

Trace: 9

Ref Trace:

Condition: 3m
 EUT : Transmitter
 M/N : TX
 Test Spec : DC 12V
 Test Engineer: THOMAX
 OP Condition : RX 315MHz
 Comment : Temp:23' Humi:54%
 Memo :

Page: 1

	Freq	Level	Over	Limit	Read	Cable	Probe
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor
			dB	dBuV/m	dBuV	dB	dB
1	316.741	21.18	-----	-----	21.18	0.00	0.00
2	316.941	20.78	-----	-----	20.78	0.00	0.00

APPENDIX I



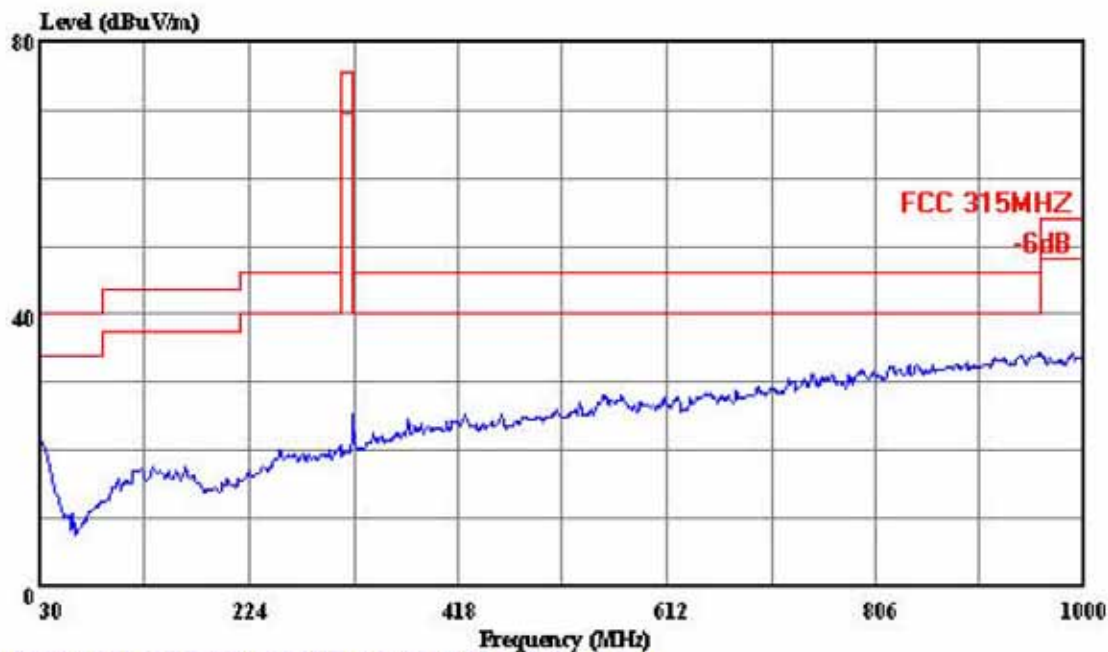
AUDIX TECHNOLOGY (SHENZHEN) CO., LTD.

Shenzhen Science & Ind. Park

Tel: 0755-26639495~7

Fax: 0755-26632877

Data#: 1 File#: Safemark.EMI Date: 2006-01-17 Time: 01:27:01



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

Trace:

Ref Trace:

Condition: FCC 315MHZ 3m 2598FACTOR HORIZONTAL

EUT : Transmitter

M/N : TX

Test Spec : DC 12V

Test Engineer: THOMAX

OP Condition : TX 315MHz

Comment : Temp:23' Humi:54%

Memo :



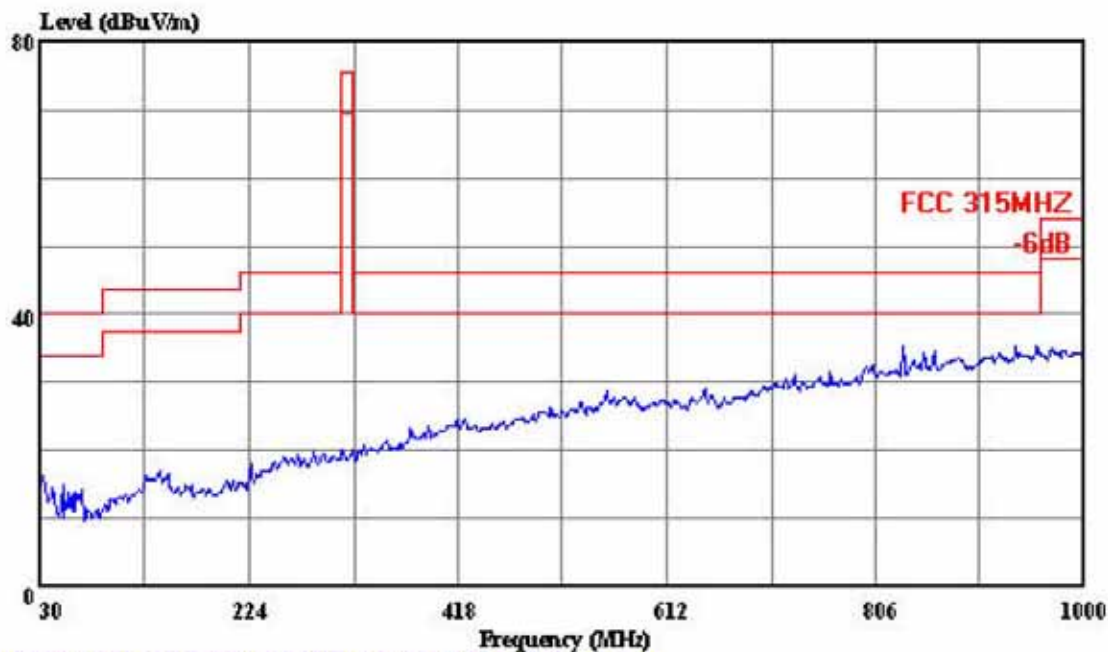
AUDIX TECHNOLOGY (SHENZHEN) CO., LTD.

Shenzhen Science & Ind. Park

Tel: 0755-26639495~7

Fax: 0755-26632877

Data#: 3 File#: Safemark.EMI Date: 2006-01-17 Time: 01:30:47



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

Trace:

Ref Trace:

Condition: FCC 315MHZ 3m 2598FACTOR VERTICAL

EUT : Transmitter

M/N : TX

Test Spec : DC 12V

Test Engineer: THOMAX

OP Condition : TX 315MHz

Comment : Temp:23' Humi:54%

Memo :