

FCC PART 15.109 MEASUREMENT AND TEST REPORT FOR

SHENZHEN TENDA TECHNOLOGY CO., LTD.

**3F, MOSO INDUSTRIAL BUILDING, NO. 1031, LIMING ROAD XILI TOWN,
NANSHAN DISTRICT, SHENZHEN, China.**

FCC ID: V7TTEL9901G

Report Concerns: Original Report	Equipment Type: 10/100/1000 Mbps Network Interface Card
Model:	<u>TEL9901G</u>
Report No.:	<u>STR09088010I</u>
Test/Witness Engineer:	<i>Susan Su</i>
Test Date:	<u>2009-08-03 to 2009-08-04</u>
Issue Date:	<u>2009-08-07</u>
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Approved & Authorized By:	 <hr style="width: 20%; margin: 0 auto;"/> Jandy So / PSQ Manager

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by SEM.Test Compliance Service Co., Ltd.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: SHENZHEN TENDA TECHNOLOGY CO., LTD.
 Address of applicant: 3F, MOSO INDUSTRIAL BUILDING, NO. 1031, LIMING ROAD XILI TOWN, NANSHAN DISTICT, SHENZHEN, China.

Manufacturer: SHENZHEN TENDA TECHNOLOGY CO., LTD.
 Address of manufacturer: 3F, MOSO INDUSTRIAL BUILDING, NO. 1031, LIMING ROAD XILI TOWN, NANSHAN DISTICT, SHENZHEN, China.

General Description of E.U.T

Items	Description
EUT Description:	10/100/1000 Mbps Network Interface Card
Trade Name:	Tenda
Model No.:	TEL9901G
Rated Voltage:	/
Packaging Size:	12.2X12.0X2.1 cm
For more information refer to the circuit diagram form and the user's manual.	

The test data is gathered from a production sample, provided by the manufacturer.

1.2 Test Standards

The following report is prepared on behalf of the SHENZHEN TENDA TECHNOLOGY CO., LTD. in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15.107, and 15.109 rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which results in lowering the emission/immunity, should be checked to ensure compliance has been maintained.

1.3 Related Submittal(s)/Grant(s)

No Related Submittal(s).

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in

the range of 9 kHz to 40 GHz.

The equipment under test (EUT) was configured to measure its highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the Operating Instructions.

1.5 Test Facility

FCC – Registration No.: **994117**

SEM.Test Compliance Services Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 994117.

Industry Canada (IC) Registration No.: **7673A**

The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

1.6 EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the system components. The test software, provided by the customer, is started while the EUT is on to simulate the normal work. under the Windows XP terminal.

1.7 Accessories Equipment List and Details

Manufacturer	Description	Model	Serial Number
Lenovo	Display	LXM-L17AAB	4M0233274805856
Lenovo	Host	M2620V	N/A
Lenovo	Mouse	M028UOL	23-095827 077
Lenovo	Keyboard	LXB-CH0507	07G00501394D
TP-LINK	Modem	TM-EC5658V	KT99CTQC-508
Lenovo	Printer	3110	OD65133711480

1.8 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

2. SUMMARY OF TEST RESULTS

Description of Test	Result
§15.107 (a) Conducted Emission	Compliant
§15.109(a) Radiated Emission	Compliant

3. §15.107 (a)- CONDUCTED EMISSION

3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 1.5 dB.

3.2 Test Equipment List and Details

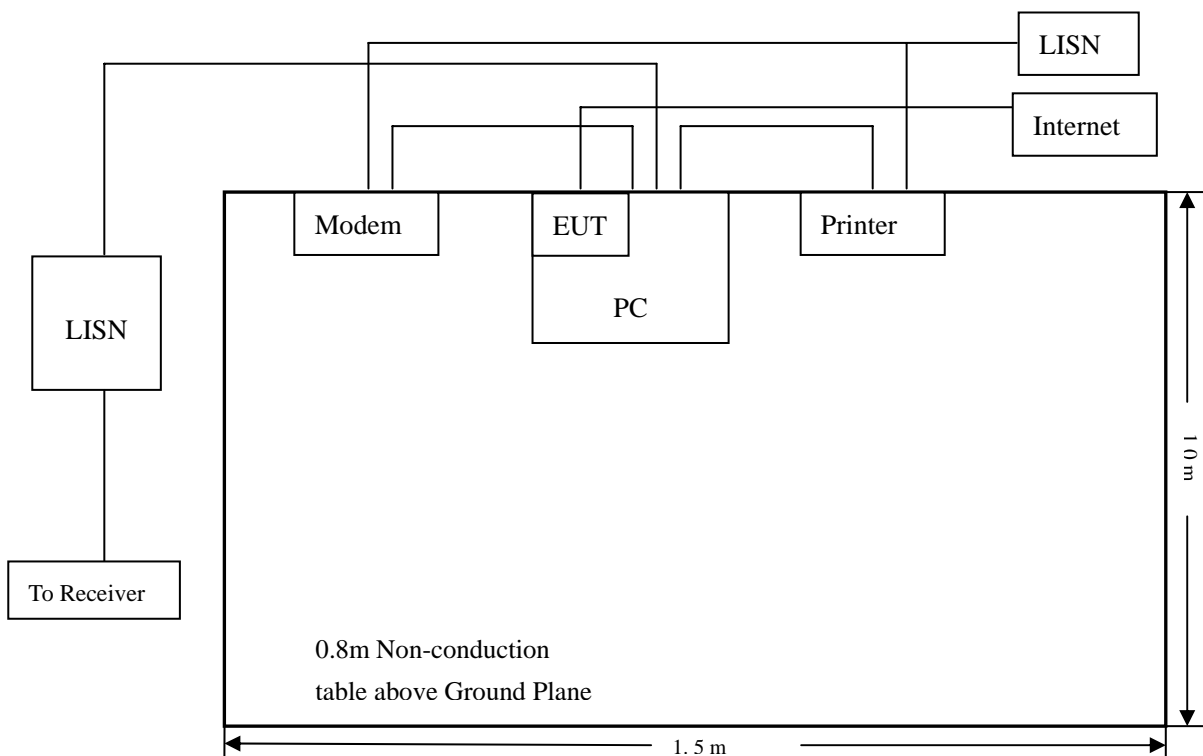
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2009-07-08	2010-07-07
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2009-07-08	2010-07-07
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2009-07-08	2010-07-07
AMN	Rohde & Schwarz	ESH3-Z5	828304/014	2009-07-08	2010-07-07

3.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.107 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.

3.4 Basic Test Setup Block Diagram



3.5 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	48 %
ATM Pressure:	1012 mbar

3.6 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

- Start Frequency 150 kHz
- Stop Frequency..... 30 MHz
- Sweep Speed Auto
- IF Bandwidth..... 10 kHz
- Quasi-Peak Adapter Bandwidth 9 kHz
- Quasi-Peak Adapter Mode Normal

3.7 Summary of Test Results/Plots

According to the data in section 3.8, the EUT complied with the FCC 15B Conducted margin for a Class B device, with the *worst* margin reading of:

-9.28 dBµV at 0.338 MHz in the Neutral mode, Ave detector, 0.15-30MHz

3.8 Conducted Emissions Test Data

LINE CONDUCTED EMISSIONS				FCC 15 CLASS B	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Pk	Line/Neutral	dB μ V	dB
0.338	39.96	Ave	Neutral	49.24	-9.28
0.166	44.69	Ave	Line	55.15	-10.46
0.434	35.78	Ave	Neutral	47.17	-11.39
0.434	35.37	Ave	Line	47.16	-11.79
0.382	45.85	Pk	Neutral	58.23	-12.38
0.318	47.35	Pk	Neutral	59.75	-12.40
0.210	50.65	Pk	Line	63.20	-12.55
1.550	32.86	Ave	Neutral	45.99	-13.13
6.286	46.70	Pk	Line	59.99	-13.29
0.434	43.81	Pk	Line	57.17	-13.36
4.958	42.47	Pk	Neutral	56.05	-13.58
7.842	36.33	Ave	Line	49.99	-13.66
1.542	42.23	Pk	Neutral	56.00	-13.77
5.786	45.92	Pk	Neutral	59.99	-14.07
1.550	31.05	Ave	Line	45.99	-14.95
4.982	40.85	Pk	Line	55.99	-15.14
8.150	34.63	Ave	Neutral	49.99	-15.36
4.970	30.43	Ave	Neutral	45.99	-15.56
4.026	30.08	Ave	Line	45.99	-15.91
18.042	42.98	Pk	Neutral	59.99	-17.01
17.666	32.20	Ave	Neutral	50.00	-17.80
1.550	36.97	Pk	Line	55.99	-19.02

Plot of Conducted Emissions Test Data

Conducted Disturbance

EUT: 10/100/1000 Mbps Network Interface Card

M/N: TEL9901G

Operating Condition: Running with Program

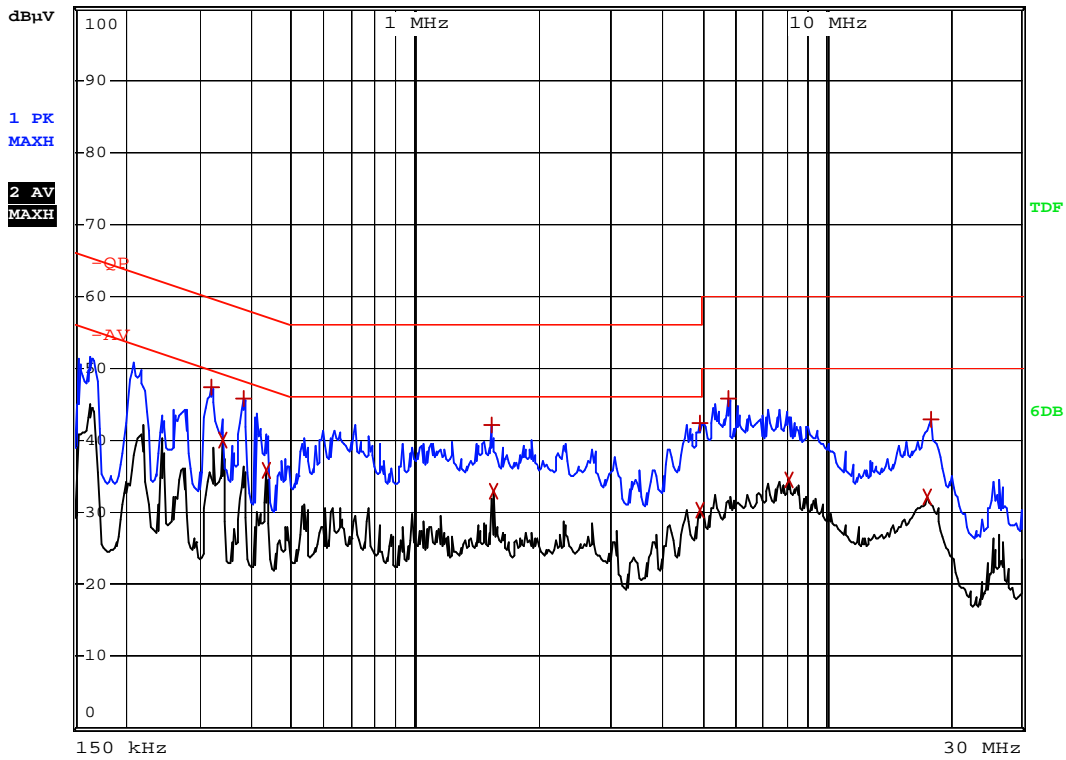
Test Specification: N

Comment: AC 120V/60Hz;



RBW 9 kHz
MT 5 ms

Att 10 dB AUTO



Plot of Conducted Emissions Test Data

Conducted Disturbance

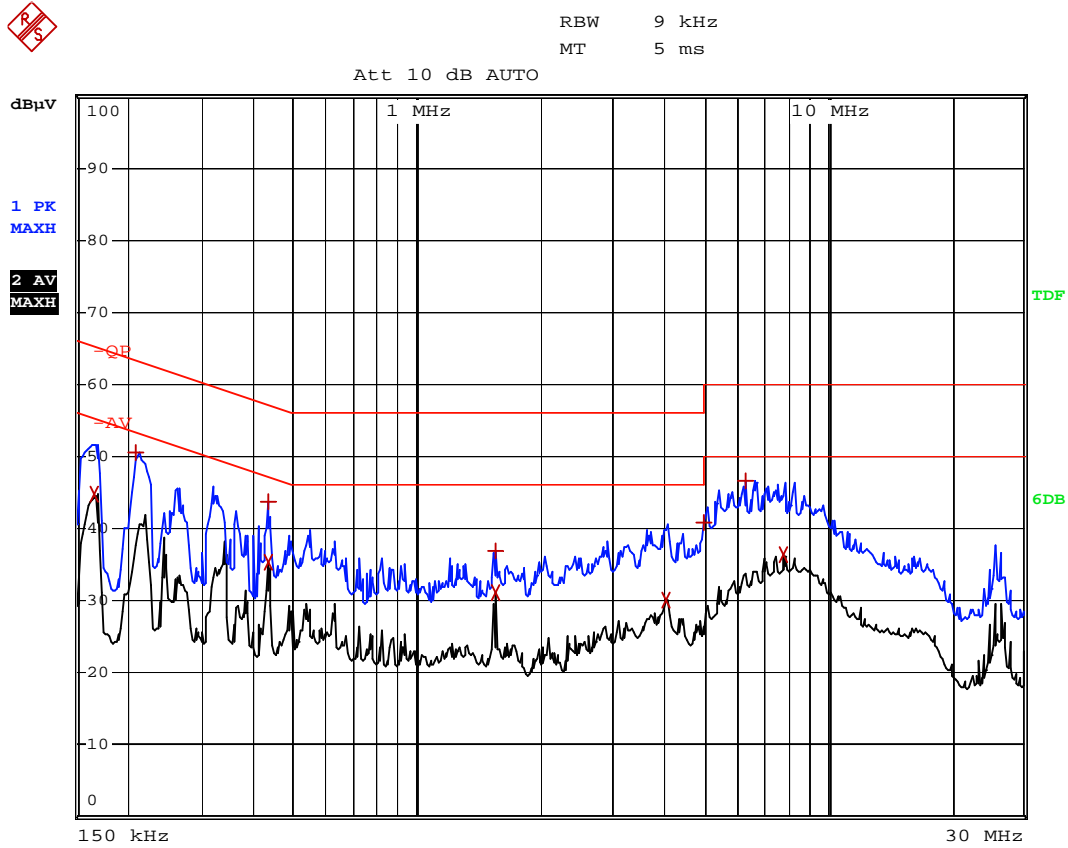
EUT: 10/100/1000 Mbps Network Interface Card

M/N: TEL9901G

Operating Condition: Running with Program

Test Specification: L

Comment: AC 120V/60Hz;



4. §15.109(a)- RADIATED EMISSION

4.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 3.0 dB.

4.2 Test Equipment List and Details

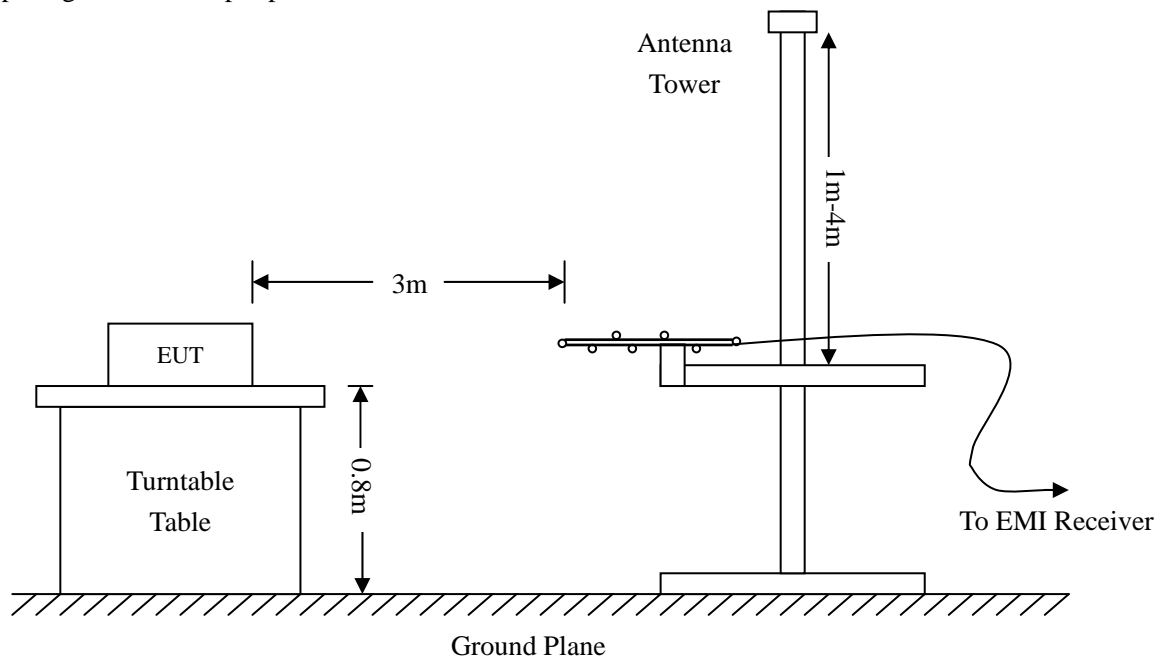
Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2009-07-08	2010-07-07
Positioning Controller	C&C	CC-C-1F	N/A	2009-07-08	2010-07-07
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2009-07-08	2010-07-07
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2009-07-08	2010-07-07
RF Switch	EM	EMSW18	SW060023	2009-07-08	2010-07-07
Amplifier	Agilent	8447F	3113A06717	2009-07-08	2010-07-07
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2009-07-08	2010-07-07
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	25498514	2009-07-08	2010-07-07

4.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.205 and FCC Part 15.109 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



4.4 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency	30 MHz
Stop Frequency.....	1000 MHz
Sweep Speed	Auto
IF Bandwidth.....	10 kHz
Quasi-Peak Adapter Bandwidth	120 kHz
Quasi-Peak Adapter Mode	Normal

4.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of $-6\text{dB}\mu\text{V}$ means the emission is $6\text{dB}\mu\text{V}$ below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15B Limit}$$

4.6 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	49 %
ATM Pressure:	1011 mbar

4.7 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC 15B Class B standards, and had the worst margin of:

-3.37 dB μ V at 912.6953 MHz in the Vertical polarization, 30 MHz to 1 GHz, 3Meters

Plot of Radiation Emissions Test Data

Radiated Disturbance

EUT: 10/100/1000 Mbps Network Interface Card

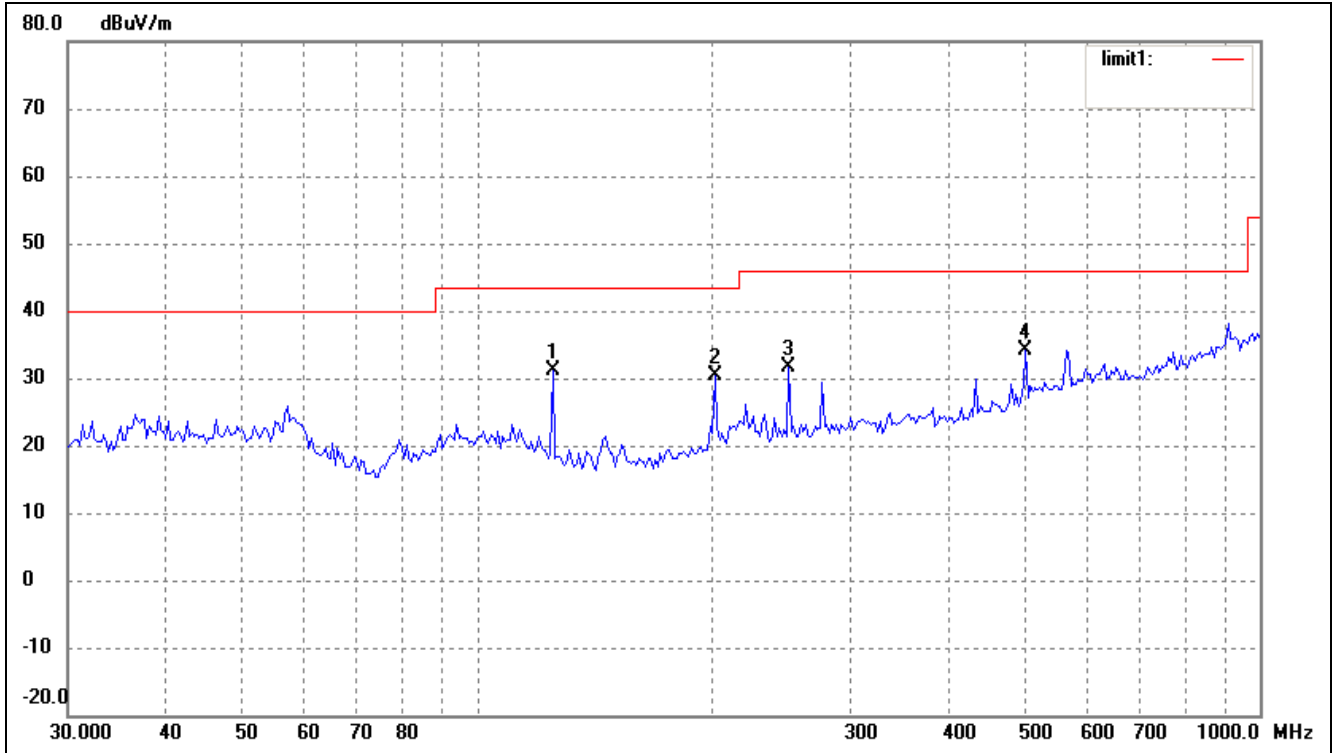
M/N: TEL9901G

Operating Condition: Running with Program

Test Specification: Horizontal & Vertical

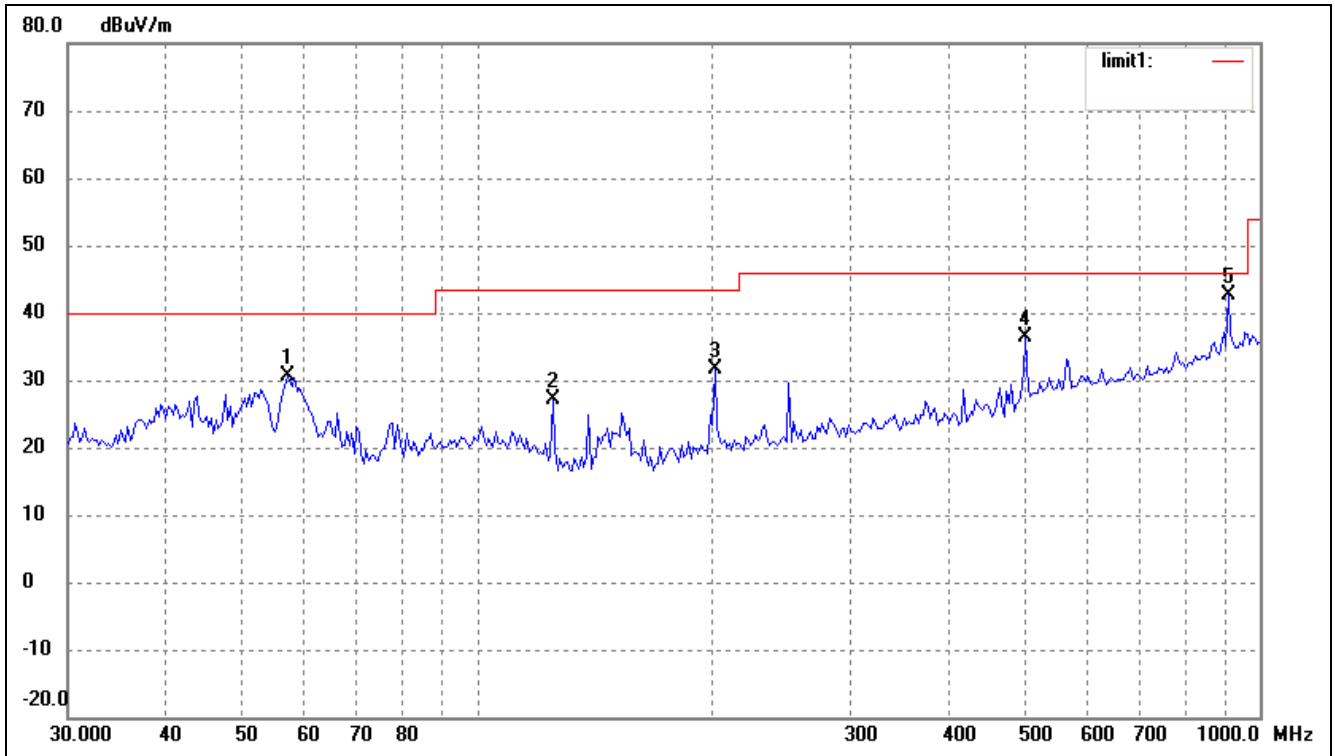
Comment: AC 120V/60Hz;

Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	124.9249	26.53	4.57	31.10	43.50	-12.40	115	100	peak
2	201.4539	24.63	5.73	30.36	43.50	-13.14	329	100	peak
3	250.4859	23.82	7.69	31.51	46.00	-14.49	101	200	peak
4	502.2473	21.20	12.97	34.17	46.00	-11.83	304	100	peak

Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	57.2654	23.23	7.34	30.57	40.00	-9.43	55	100	peak
2	124.9249	22.56	4.57	27.13	43.50	-16.37	48	200	peak
3	201.4539	25.83	5.73	31.56	43.50	-11.94	162	100	peak
4	502.2473	23.41	12.97	36.38	46.00	-9.62	135	100	peak
5	912.6953	23.61	19.02	42.63	46.00	-3.37	327	100	QP

***** END OF REPORT *****