

FCC PART 15.109

MEASUREMENT AND TEST REPORT

FOR

TRENDware International Inc.

20675 Manhattan Place, Torrance, California 90501, USA

FCC ID: S9ZTW100-S4W1CA

Report Concerns: Original Report	Equipment Type: 4-port Cable/DSL Broadband Router
Model:	<u>LKR-604</u>
Report No.:	<u>STR090581101</u>
Test/Witness Engineer:	
Test Date:	<u>2009-06-01 to 2009-06-08</u>
Issue Date:	<u>2009-06-24</u>
Prepared By:	<p>SEM.Test Compliance Service Co., Ltd. 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C. (518101)</p>
Approved & Authorized By:	<p></p> <hr style="width: 20%; margin: 0 auto;"/> <p>Jandy So / PSQ Manager</p>

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: TRENDware International Inc.
 Address of applicant: 20675 Manhattan Place, Torrance, California 90501, USA

Manufacturer: Shenzhen Kingnet Technology Co., Ltd..
 Address of manufacturer: 5/F, Block 4 Science & Technology Industrial Park of Private Enterprise Pingshan, XiLi, Nanshan District, Shenzhen, Guangdong, China, PR

General Description of E.U.T

Items	Description
EUT Description:	4-port Cable/DSL Broadband Router
Trade Name:	/
Model No.:	LKR-604
Adding Model:	TW100-S4W1CA, RFB-100, IP-1000v2, KN-S1060S
Rated Voltage:	DC 5V
Packaging Size:	15.5X10.5X3.0 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. Test is carried out with LKR-604 since the other models listed in this report are different transformer, output voltage and output current, declared by the manufacture.

1.2 Test Standards

The following report is prepared on behalf of the TRENDware International Inc. 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
IBM	Notebook	T22	LV14893
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
Power Cable	1.4	Unshielded	With 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

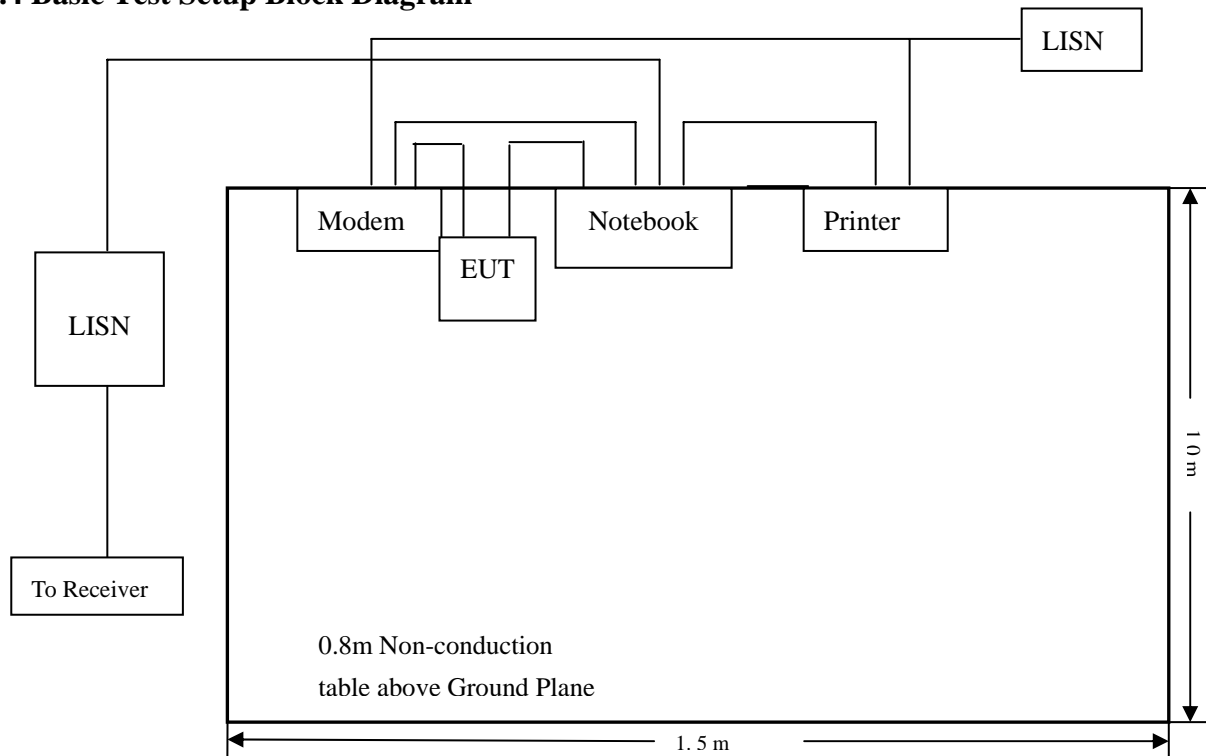
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2008-07-08	2009-07-07
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2008-07-08	2009-07-07
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2008-07-08	2009-07-07
AMN	Rohde & Schwarz	ESH3-Z5	828304/014	2008-07-08	2009-07-07

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:	52%
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:

-7.81 dBµV at 0.15 MHz in the Neutral mode, Pk detector, 0.15-30MHz

3.8 Conducted Emissions Test Data

LINE CONDUCTED EMISSIONS				FCC 15 CLASS B	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dBµV	QP/Ave/Pk	Line/Neutral	dBµV	dB
0.150	58.18	Pk	Neutral	66.00	-7.81
0.154	56.14	Pk	Line	66.00	-9.63
0.210	43.26	Ave	Neutral	53.20	-9.94
4.378	34.27	Ave	Neutral	46.00	-11.72
4.722	33.03	Ave	Line	46.00	-12.96
0.634	32.36	Ave	Line	46.00	-13.64
0.210	38.43	Ave	Line	53.20	-14.76
0.634	30.87	Ave	Neutral	46.00	-15.12
2.118	29.74	Ave	Neutral	46.00	-16.26
0.986	29.23	Ave	Line	46.00	-16.76
3.950	38.41	Pk	Neutral	56.00	-17.58
8.390	32.40	Ave	Line	50.00	-17.59
4.722	38.05	Pk	Line	56.00	-17.94
6.070	31.45	Ave	Neutral	50.00	-18.54
0.430	38.66	Pk	Neutral	57.24	-18.58
0.494	37.33	Pk	Line	56.00	-18.76

Plot of Conducted Emissions Test Data

Conducted Disturbance

EUT: 4-port Cable/DSL Broadband Router

M/N: LKR-604

Operating Condition: Linking

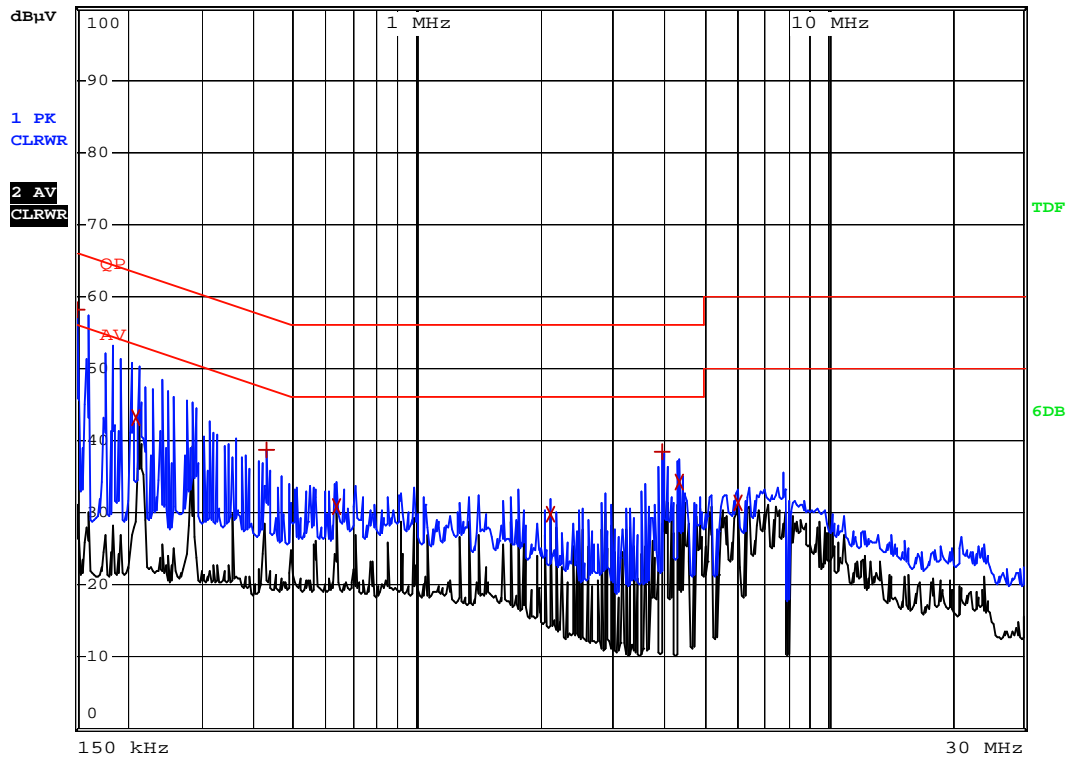
Test Specification: N

Comment: AC 120V/60Hz connect to PC



RBW 9 kHz
MT 4 ms

Att 10 dB AUTO



Date: 6.NOV.2008 16:25:20

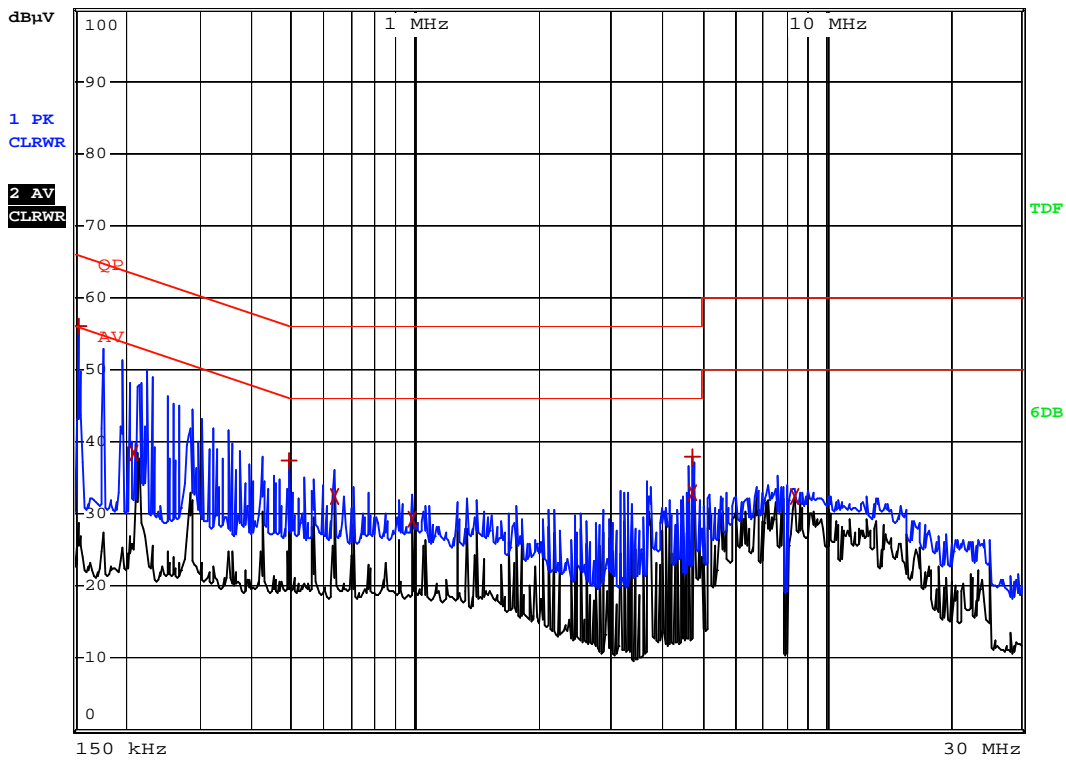
Plot of Conducted Emissions Test Data

Conducted Disturbance
EUT: 4-port Cable/DSL Broadband Router
M/N: LKR-604
Operating Condition: Linking
Test Specification: L
Comment: AC 120V/60Hz connect to PC



REW 9 kHz
MT 4 ms

Att 10 dB AUTO



Date: 6.NOV.2008 16:28:27

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

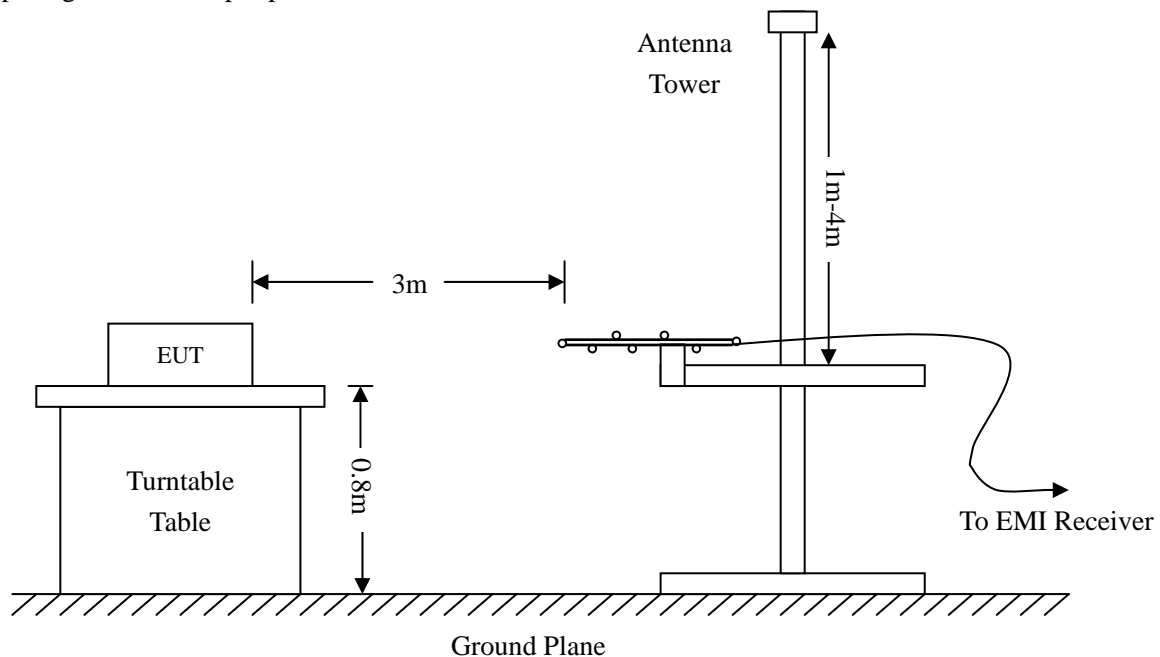
Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2008-07-08	2009-07-07
Positioning Controller	C&C	CC-C-1F	N/A	2008-07-08	2009-07-07
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2008-07-08	2009-07-07
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2008-07-08	2009-07-07
RF Switch	EM	EMSW18	SW060023	2008-07-08	2009-07-07
Amplifier	Agilent	8447F	3113A06717	2008-07-08	2009-07-07
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2008-07-08	2009-07-07
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	25498514	2008-07-08	2009-07-07

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 -6dBμV means the emission is 6dBμV 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:	54%
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:

-2.18 dBμV at 124.9249MHz in the Horizontal polarization, 30 MHz to 1 GHz, 3Meters

Plot of Radiation Emissions Test Data

Radiated Disturbance

EUT: 4-port Cable/DSL Broadband Router

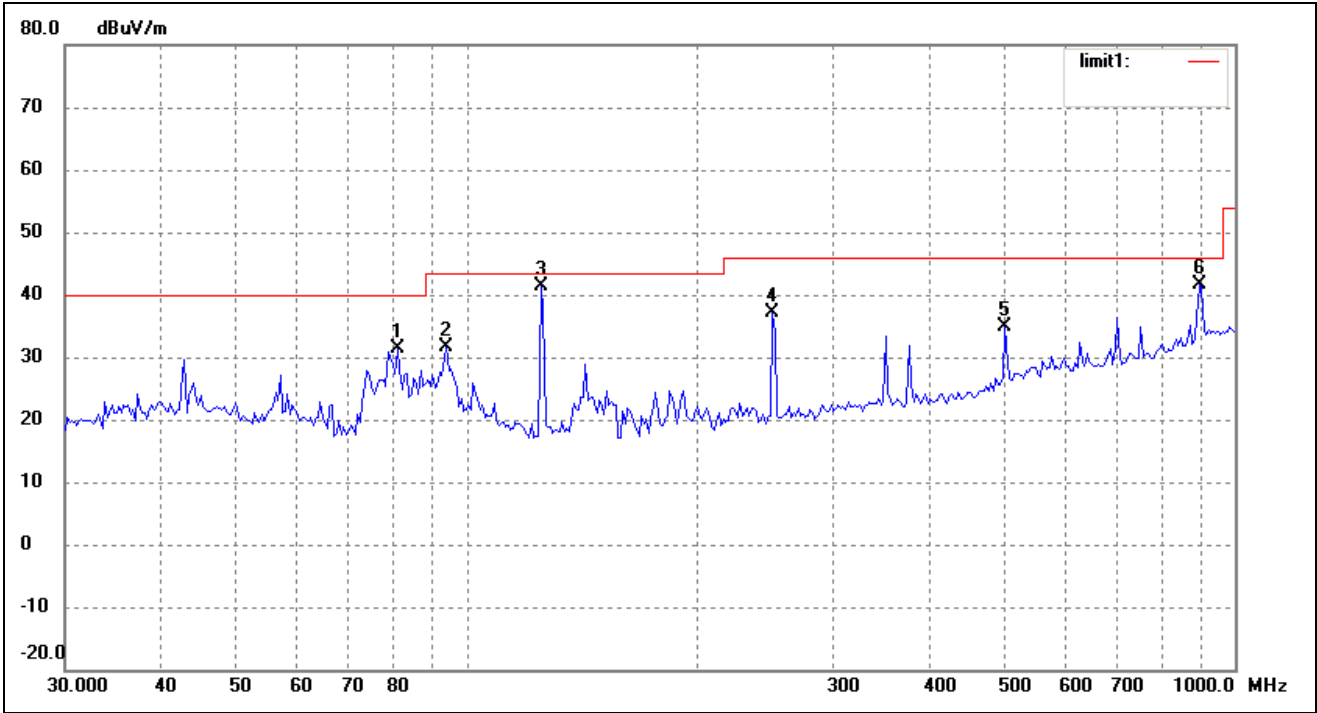
M/N: LKR-604

Operating Condition: Linking

Test Specification: Horizontal & Vertical

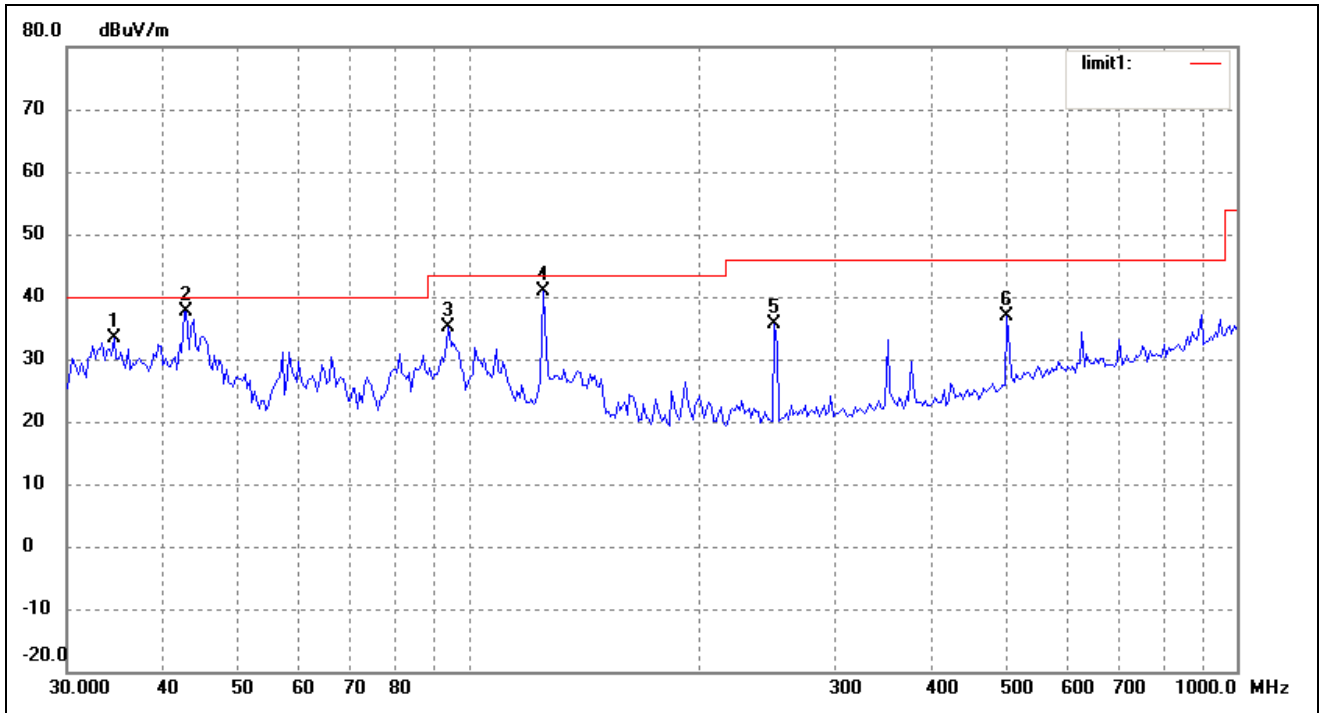
Comment: AC 120V/60Hz connect to PC

Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	81.3740	27.75	3.63	31.38	40.00	-8.62	223	200	QP
2	94.3137	24.33	7.34	31.67	43.50	-11.83	360	200	peak
3	124.9249	36.75	4.57	41.32	43.50	-2.18	205	250	QP
4	250.4859	29.53	7.69	37.22	46.00	-8.78	236	100	Peak
5	502.2473	21.81	12.97	34.78	46.00	-11.22	360	100	peak
6	899.9577	22.74	18.80	41.54	46.00	-4.46	260	200	QP

Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	34.5270	26.87	6.60	33.47	40.00	-6.53	220	100	QP
2	42.9305	29.66	7.97	37.63	40.00	-2.37	360	200	QP
3	94.3137	27.86	7.34	35.20	43.50	-8.30	23	100	QP
4	124.9249	36.21	4.57	40.78	43.50	-2.72	36	200	QP
5	250.4859	27.82	7.69	35.51	46.00	-10.49	21	100	Peak
6	502.2473	23.86	12.97	36.83	46.00	-9.17	0	100	peak

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