

FCC PART 15.109



MEASUREMENT AND TEST REPORT

FOR

Launch Tech Co., Ltd.

**Launch Industrial Park, North of Wuhe Rd., Banxuegang, Longgang,
Shenzhen, China**

FCC ID: XUJ01DIAGUN

Report Concerns: Original Report	Equipment Type: AUTOMOTIVE DIAGNOSIS COMPUTER
Model:	<u>X431 DIAGUN</u>
Report No.:	<u>STR09118021I-2</u>
Test/Witness Engineer:	
Test Date:	<u>2009-10-16 to 2009-11-20</u>
Issue Date:	<u>2009-11-25</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:	 <hr/> 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: Launch Tech Co., Ltd.
Address of applicant: Launch Industrial Park, North of Wuhe Rd., Banxuegang, Longgang, Shenzhen, China

Manufacturer: Launch Tech Co., Ltd.
Address of manufacturer: Launch Industrial Park, North of Wuhe Rd., Banxuegang, Longgang, Shenzhen, China

General Description of E.U.T

Items	Description
EUT Description:	AUTOMOTIVE DIAGNOSIS COMPUTER
Trade Name:	LAUNCH
Model No.:	X-431 DIAGUN
Rated Voltage:	DC 3.7V
Frequency range:	2402MHz-2480MHz
Number of channels:	79
Channel Separation:	1MHz
Type of Antenna:	Integral Antenna
Size:	13.5X7.7X2.2cm

Note: 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 Launch Tech 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
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
USB Cable 1	1.20	Shielded	Without Core
USB Cable 2	1.20	Shielded	Without Core
Power Cable	1.60	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	2009-08-12	2010-08-11
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2009-08-12	2010-08-11
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2009-08-12	2010-08-11
AMN	Rohde & Schwarz	ESH3-Z5	828304/014	2009-08-12	2010-08-11

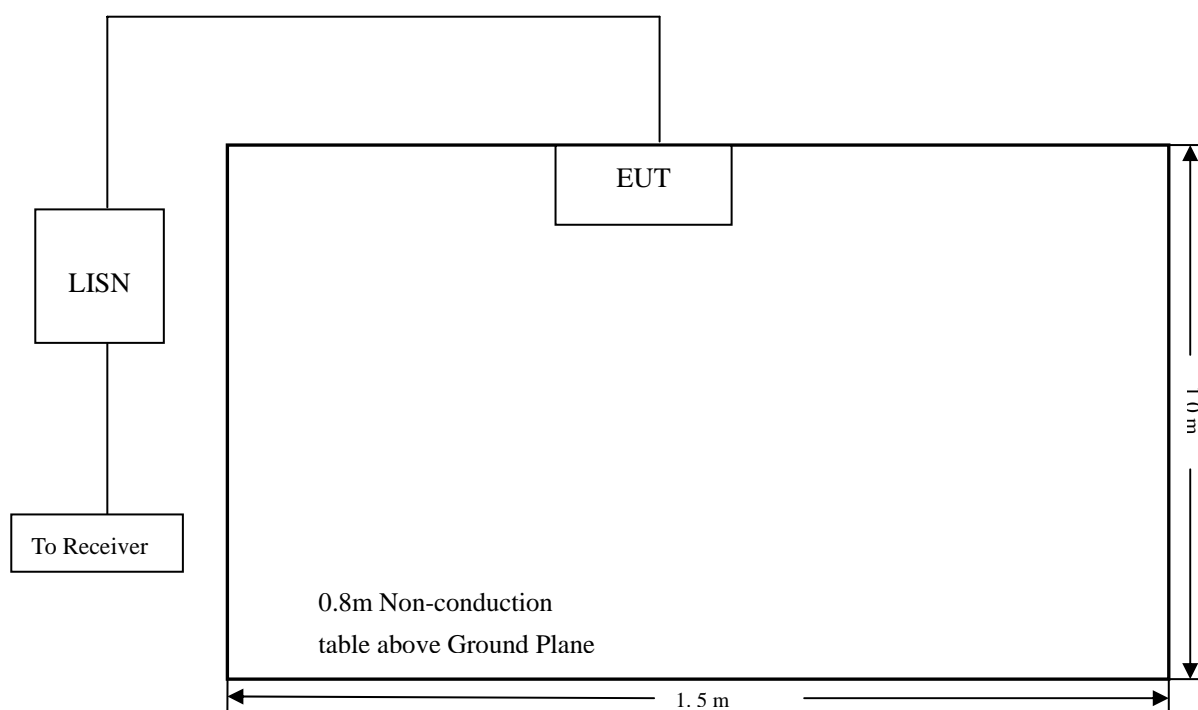
3.3 Test Procedure

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 dB μ V at 0.15 MHz in the Neutral mode, Connect to PC, Pk detector, 0.15-30MHz

-13.54 dB μ V at 0.88MHz in the Neutral mode, Charging, Pk detector, 0.15-30MHz

3.8 Conducted Emissions Test Data

Connect to PC

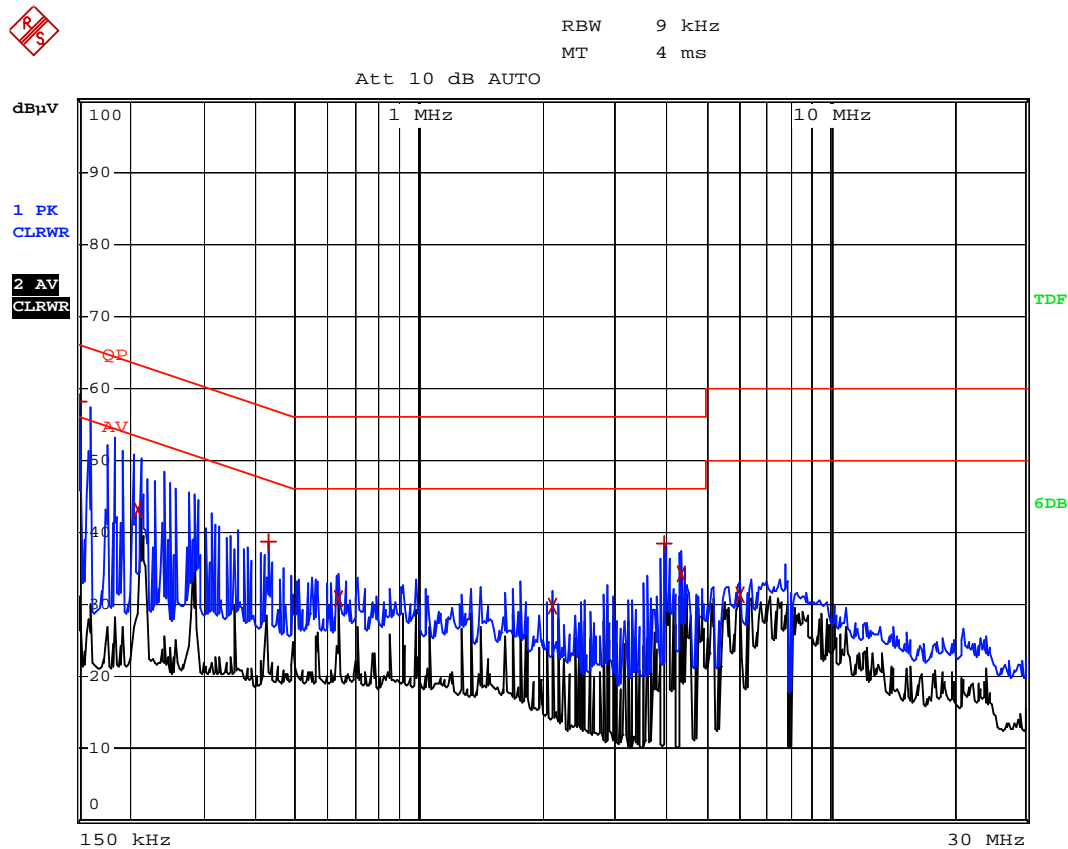
LINE CONDUCTED EMISSIONS				FCC 15 CLASS B	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Pk	Line/Neutral	dB μ V	dB
0.150	58.18	Pk	Neutral	66.00	-7.81
0.154	56.14	Pk	Line	66.00	-9.63
0.210	43.26	Ave	Neutral	53.20	-9.94
4.378	34.27	Ave	Neutral	46.00	-11.72
4.722	33.03	Ave	Line	46.00	-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

Charging by adapter

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
0.88	32.46	AV	Neutral	46	-13.54
0.19	46.31	QP	Line	64.04	-17.73
0.69	35.69	QP	Line	56	-20.31
0.16	44.30	QP	Neutral	65.46	-21.16
2.13	34.62	QP	Neutral	56	-21.38
3.19	23.85	AV	Line	46	-22.15
0.59	33.49	QP	Neutral	56	-22.51
0.61	23.46	AV	Neutral	46	-22.54
0.64	23.22	AV	Line	46	-22.78
1.89	32.46	QP	Line	56	-23.54
0.16	30.76	AV	Line	55.46	-24.70
3.33	20.10	AV	Neutral	46	-25.90

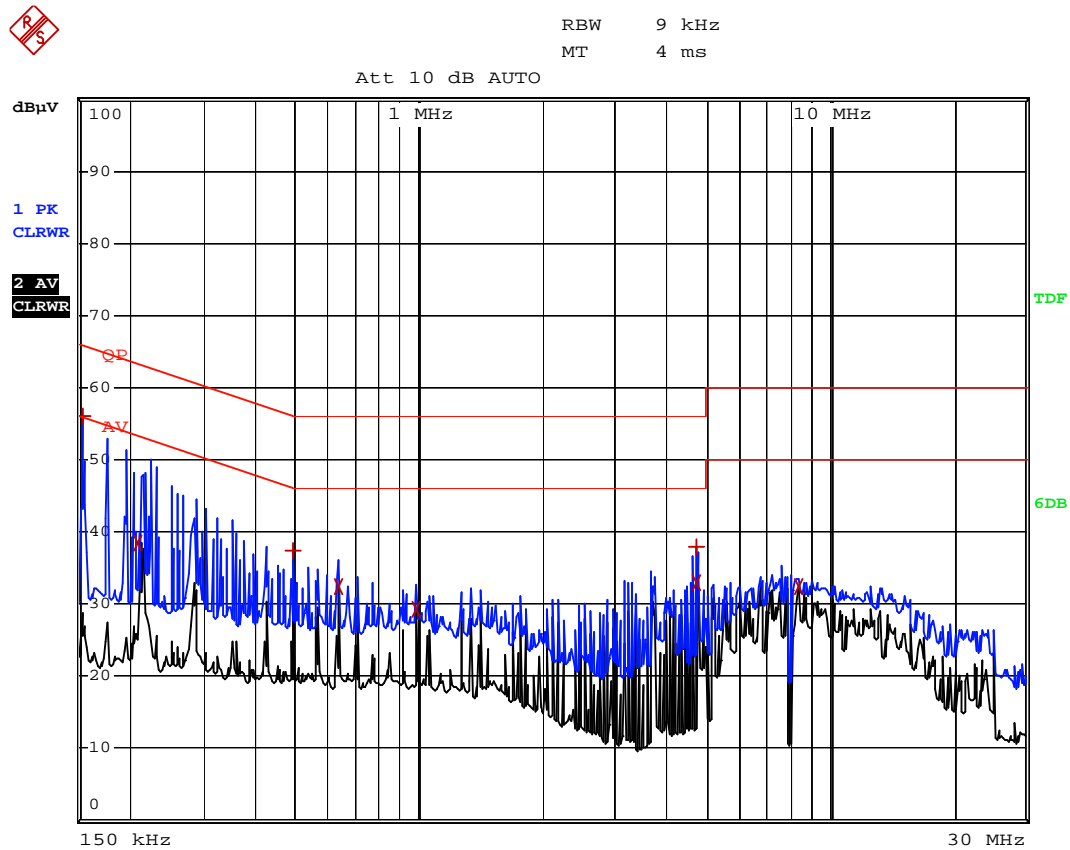
Plot of Conducted Emissions Test Data

Conducted Disturbance
EUT: AUTOMOTIVE DIAGNOSIS COMPUTER
M/N: X-431 DIAGUN
Operating Condition: Connect to PC
Test Specification: N
Comment: AC 120V/60Hz connect to PC, USB 5V



Plot of Conducted Emissions Test Data

Conducted Disturbance
EUT: AUTOMOTIVE DIAGNOSIS COMPUTER
M/N: X-431 DIAGUN
Operating Condition: Connect to PC
Test Specification: L
Comment: AC 120V/60Hz connect to PC, USB 5V



Conducted Disturbance

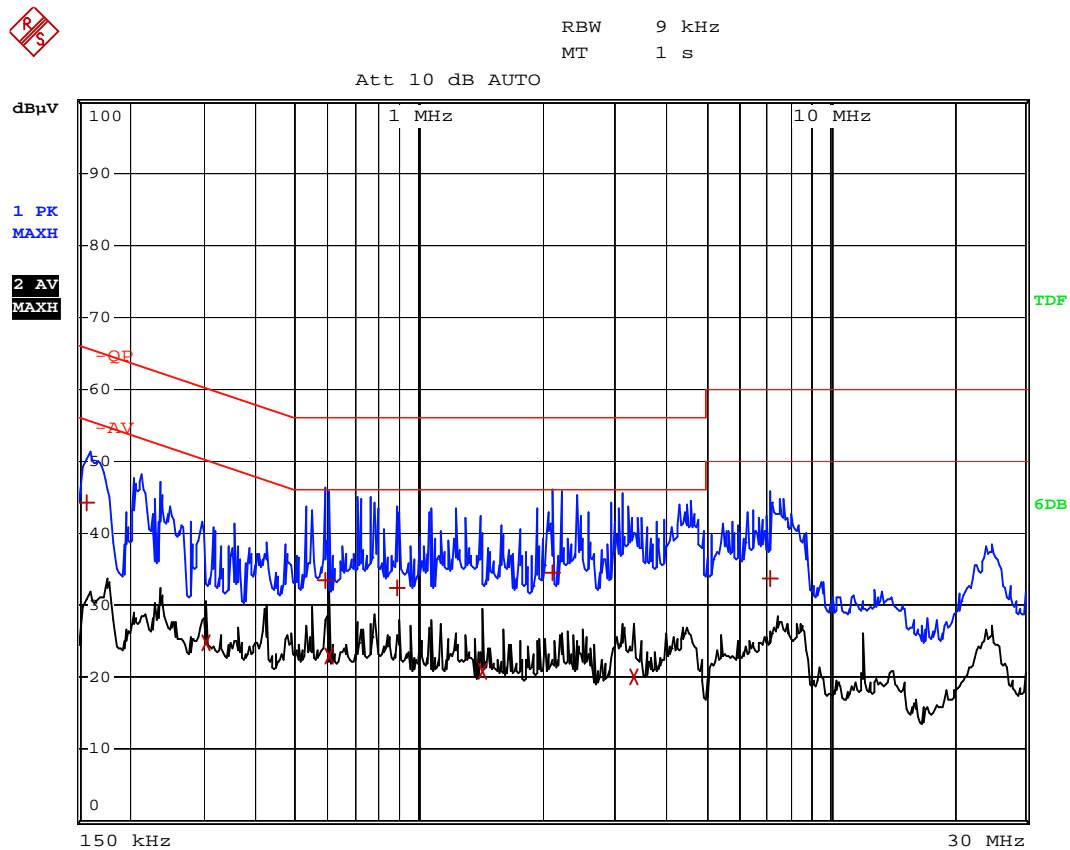
EUT: AUTOMOTIVE DIAGNOSIS COMPUTER

M/N: X-431 DIAGUN

Operating Condition: Charging by adaptor

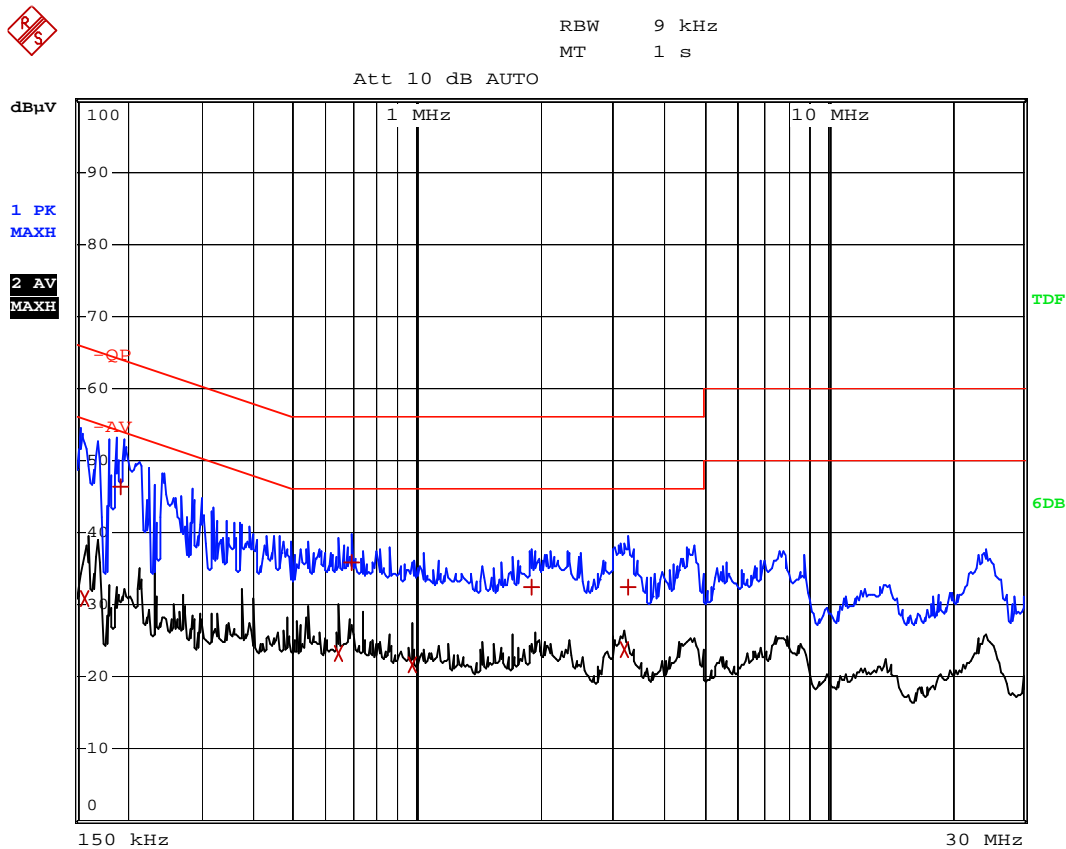
Test Specification: N

Comment: AC 120V/60Hz



Plot of Conducted Emissions Test Data

Conducted Disturbance
EUT: AUTOMOTIVE DIAGNOSIS COMPUTER
M/N: X-431 DIAGUN
Operating Condition: Charging by adaptor
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

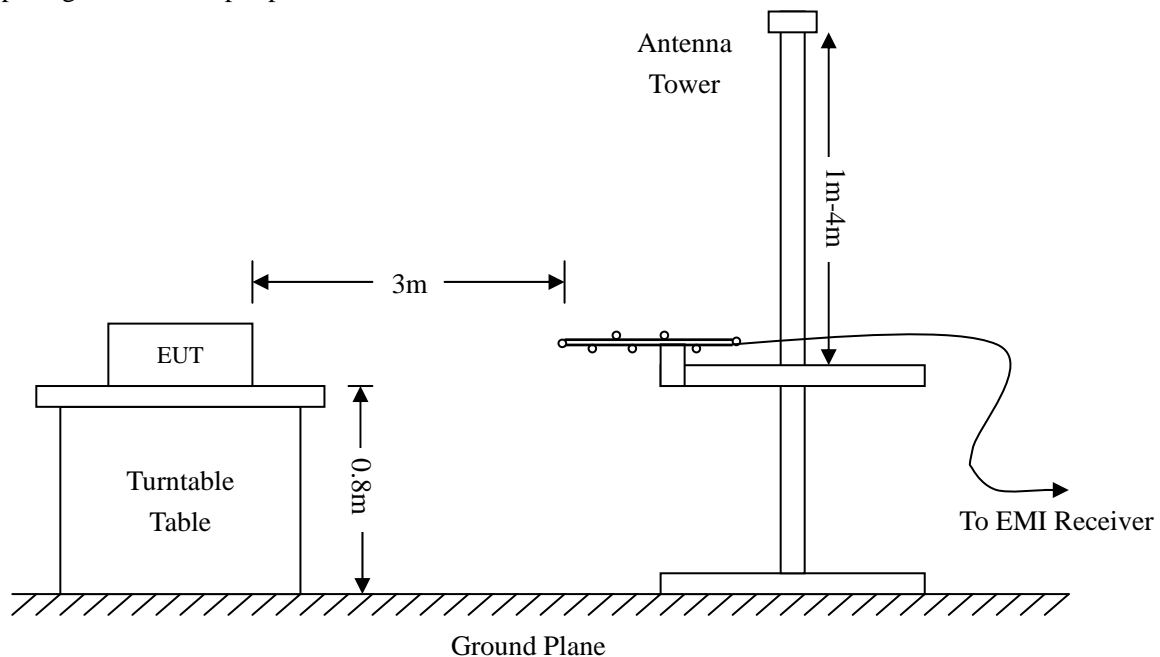
Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2009-08-12	2010-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2009-08-12	2010-08-11
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2009-07-21	2010-07-20
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2009-07-21	2010-07-20
RF Switch	EM	EMSW18	SW060023	2009-08-12	2010-08-11
Amplifier	Agilent	8447F	3113A06717	2009-08-12	2010-08-11
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2009-08-12	2010-08-11
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	25498514	2009-08-12	2010-08-11

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 -6dB μ V means the emission is 6dB μ 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:	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:

-3.73 dB μ V at 63.1857MHz in the Vertical polarization, 30 MHz to 1 GHz, 3Meters

Plot of Radiation Emissions Test Data

Radiated Disturbance

EUT: AUTOMOTIVE DIAGNOSIS COMPUTER

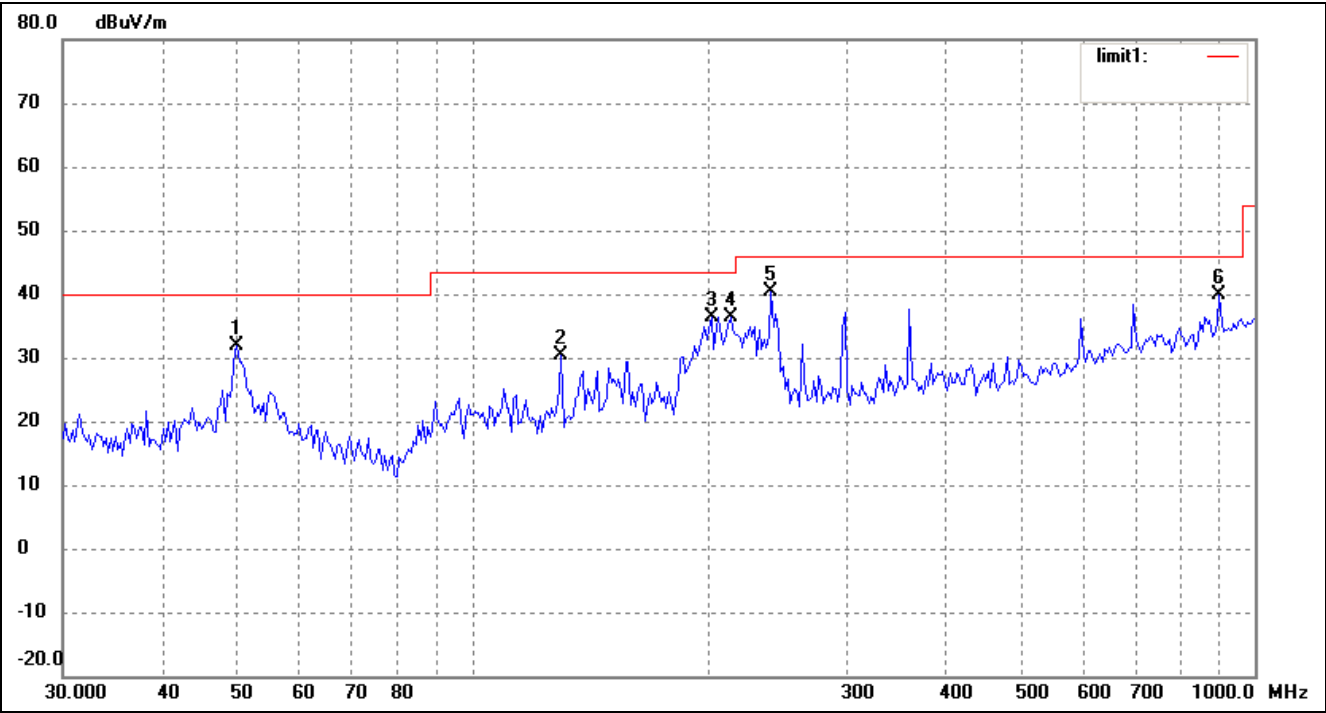
M/N: X-431 DIAGUN

Operating Condition: Running with Program

Test Specification: Horizontal & Vertical

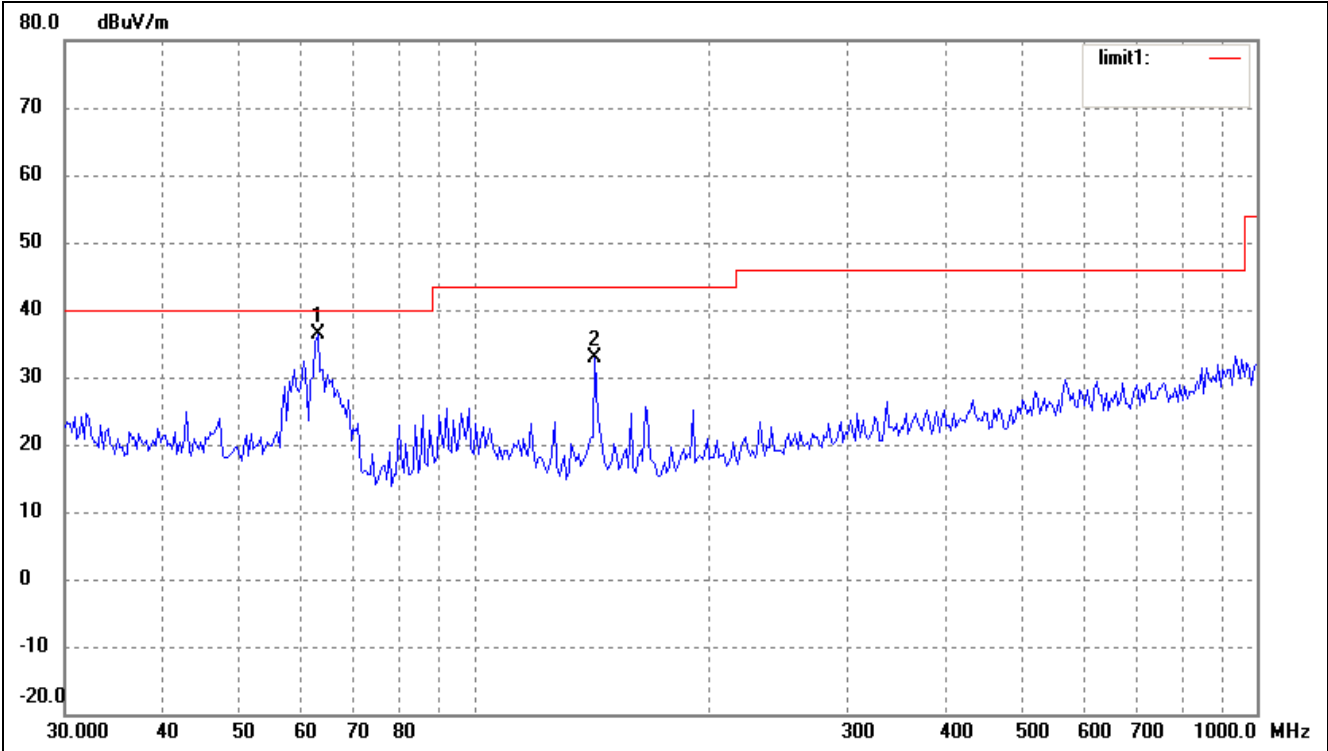
Comment: AC 120V/60Hz connect to PC, USB 5V

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	190.4411	32.81	5.66	38.47	43.50	-5.03	223	203	QP
2	142.7692	33.69	3.24	36.93	43.50	-6.57	360	200	peak
3	63.1857	28.98	5.92	34.90	40.00	-5.10	205	104	QP

Vertical



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