



卓時檢測  
TIMEWAY TESTING LABORATORY



ISO/IEC17025 Accredited Lab.

Report No: FCC 1101241-01

File reference No: 2011-02-22

Applicant: Rainkine Thompson Ltd

Product: RTL LINX1+ vehicle telematics unit

Brand Name: RTL

Model No: RTL LINX1+

Test Standards: FCC Part 15 Subpart B: 2010

Test result: It is herewith confirmed and found to comply with the requirements set up by ANSI C63.4&FCC Part 15 regulations for the evaluation of electromagnetic compatibility

Approved By

*Jack Chung*

Jack Chung

Manager

Dated: Feb 22, 2011

**Results appearing herein relate only to the sample tested**

**The technical reports is issued errors and omissions exempt and is subject to withdrawal at**

**SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD**

East 5/Block 4, Anhua Industrial Zone, No.8, Tairan Rd. Chegongmiao, FuTian District, Shenzhen, CHINA.

Tel (755) 83448688 Fax (755) 83442996



### **Special Statement:**

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

#### **CNAS-LAB Code: L2292**

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of testing Laboratories.

#### **FCC-Registration No.: 899988**

The 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. Registration No.: 899988.

#### **IC- Registration No.: IC5205A-01**

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration IC No.: 5205A-01.

#### **VCCI- Registration No.: R-3015 and C-3332**

The EMC Laboratory has been registered and fully described in a report filed with the (VCCI) Voluntary Control Council for Interference. The acceptance letter from the VCCI is maintained in our files. Registration IC No.: R-3015 and C-3332



Test Report Conclusion  
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## 1.0 General Details

### 1.1 Test Lab Details

Name : SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD  
Address: East 5/Block 4, Anhua Industrial Zone, No.8,Tairan Rd. CheGongMiao, FuTian District, Shenzhen, CHINA.  
Telephone: (755) 83448688  
Fax: (755) 83442996

### 1.2 Applicant Details

Applicant: Rainkine Thompson Ltd  
Address: 44a Lower Market Street, Broadbottom, Cheshire, SK14 6AA, UK  
  
Telephone: +44 (0) 1457767309  
Fax: +44 1457 762247

### 1.3 Description of EUT

Product: RTL LINX1+ vehicle telematics unit  
Manufacturer: Cwlinux Ltd.  
Address: Unit 138, 13/F, Weswick Comm. Bldg., 147-151 Queen's Road East, Wanchai, Hong Kong, China.  
Brand Name: RTL  
Model Number: RTL LINX1+  
Additional Model Number: --  
Rating: Input: 12VDC  
Remark: --

### 1.4 Submitted Sample: 1 Sample

### 1.5 Test Duration

2011-01-19 to 2011-02-22

### 1.6 Test Uncertainty

Conducted Emissions Uncertainty =3.6dB  
Radiated Emissions Uncertainty =4.7dB

### 1.7 Test Engineer

The sample tested by

A handwritten signature in black ink that reads 'Terry Tang'.

Print Name: Terry Tang



## 2.0 List of Measurement Equipment

### 2.1 Conducted Emission Test

Name	Model No.	Serial No.	Manufacturer	Calibration Date	Calibration Cycle
EMI Test Receiver	ESH3	860905/006	RS	2010.4.26	1 Year
Spectrum Analyzer	ESA-L1500A	US37451154	HP	2010.4.26	1 Year
PULSE LIMITER	ESH3-Z2	100281	RS	2010.4.26	1 Year
LISN	ESH3-Z5	100294	RS	2010.4.26	1 Year
LISN	ESH3-Z5	100253	RS	2010.4.26	1 Year
LISN	LS16C	10010947251	AFJ	2010-5-14	1 Year
LISN (Three Phase)	NSLK 8126	8126453	Schwarebeck	2010-5-14	1 Year

### 2.2 Radiated electromagnetic disturbance test

Name	Model No.	Serial No.	Manufacturer	Calibration Date	Calibration Cycle
EMI Test Receiver	ESVD	100008	RS	2010.4.26	1 Year
Coaxial Switch	MP59B	M70585	ANRITSU	N/A	N/A
Spectrum Analyzer	8595E	3441A00893	HP	2010.4.26	1 Year
Amplifier	8447D	2727A05017	HP	2010.4.26	1 Year
Bilog Antenna	VULB9163	9163/340	Schwarebeck	2010.4.26	1 Year
Horn Antenna	BBHA 9120D	9120D-631	Schwarebeck	2010.7.03	1 Year

### 2.3 Auxiliary Equipment

Name	Model No.	Serial No.	Manufacturer	Cable	Calibration Cycle
Mouse	OM860XC	HM0509	BIGCOW	Data cable of 1.5m length	FCC DOC
Keyboard	SK-8115	CN-0DJ313-71616-04J-06S4	DELL	Data cable of 2.0m length	FCC DOC
Earphone	DT-301	--	--	Data cable of 2.0m length	--
PC	R400	R8-825ER	Lenovo	--	FCC DOC

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### **3.0 Technical Details**

#### **3.1 Investigations Requested**

Perform Electromagnetic Interference [EMI] tests for FCC Requirement.

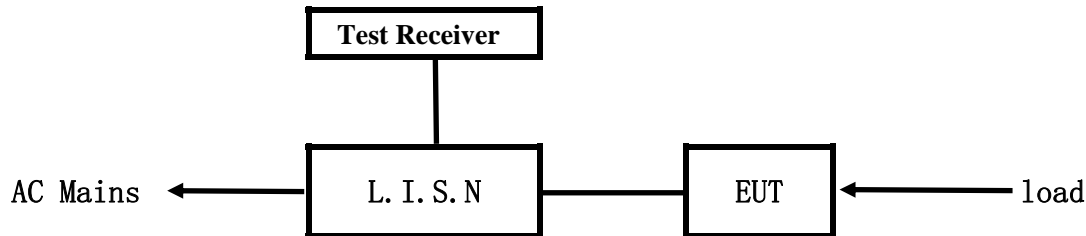
#### **3.2 Test Standards**

**FCC Part 15 Subpart B: 2010**



#### 4.0 Conducted Power line Test

##### 4.1 Schematics of the test



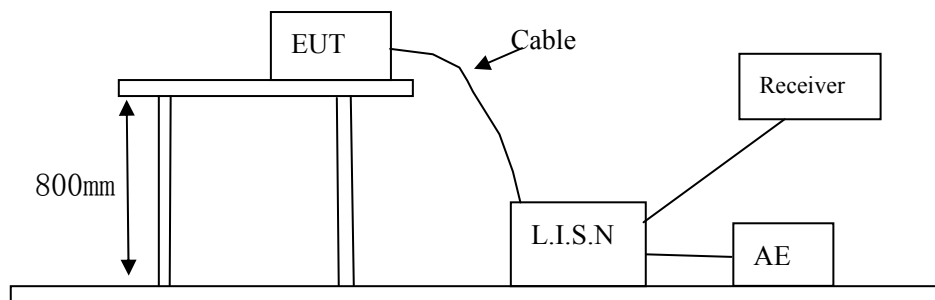
EUT: Equipment Under Test

##### 4.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2003. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4-2003. Cables and peripherals were moved to find the maximum emission levels for each frequency.

Test Voltage: 120V~, 60Hz

Block diagram of Test setup



##### 4.3 Power line conducted Emission Limit

Frequency(MHz)	Class A Limits dB(μV)		Class B Limits dB(μV)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ~ 0.50	79.00	66.00	66.00~56.00*	56.00~46.00*
0.50 ~ 5.00	73.00	60.00	56.00	46.00
5.00 ~ 30.00	73.00	60.00	60.00	50.00

- Notes:
- \*decreasing linearly with logarithm of frequency.
  - The tighter limit shall apply at the transition frequencies

##### 4.4 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

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**A: Conducted Emission on Live Terminal (150kHz to 30MHz)**

**EUT Operating Environment**

Temperature: 25°C      Humidity: 75%RH      Atmospheric Pressure: 101 KPa

**EUT set Condition: --**

**Equipment Level: Class B**

**Results: N/A**

Please refer to following diagram for individual

Frequency (MHz)	Line	Reading(dBμV)		Limit(dBμV)	
		Quasi-peak	Average	Quasi-peak	Average
	Live				
	Live				
	Live				
	Live				
	Live				





**B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)**

**EUT Operating Environment**

Temperature: 25°C      Humidity: 75%RH      Atmospheric Pressure: 101 KPa

**EUT set Condition: --**

**Equipment Level: Class B**

**Results: N/A**

Please refer to following diagram for individual

Frequency (MHz)	Line	Reading(dBμV)		Limit(dBμV)	
		Quasi-peak	Average	Quasi-peak	Average
	Neutral				
	Neutral				
	Neutral				
	Neutral				
	Neutral				
	Neutral				

**Note: Due to DC Operation, this test item not applicable.**



## 5.0 Radiated Disturbance Test

### 5.1 Schematics of the test

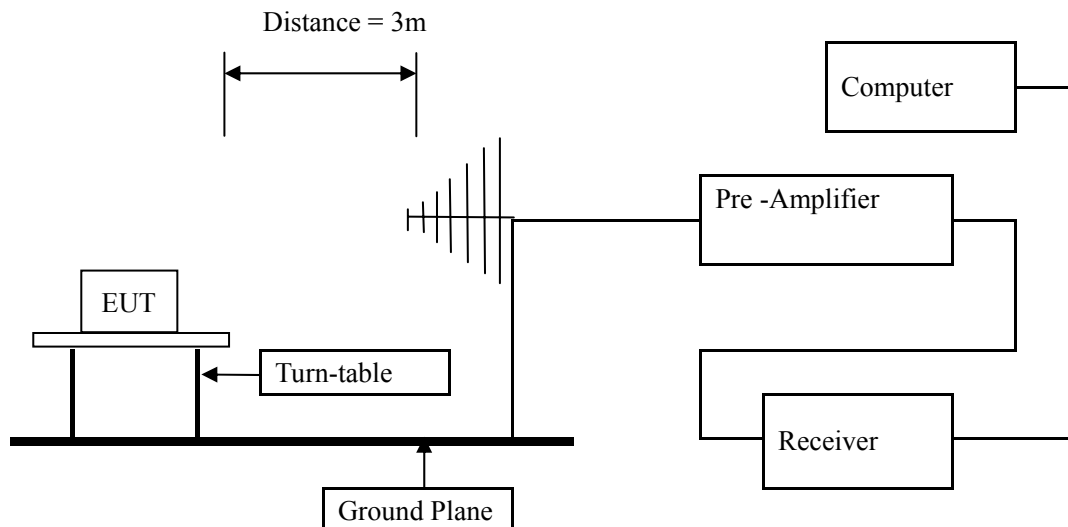


### 5.2 Test Method and test Procedure:

The EUT was tested according to ANSI C63.4 –2003, The frequency spectrum from 30MHz to 1GHz was investigated. All reading from 30MHz to 1GHz are quasi-peak 0 values with a resolution bandwidth of 120KHz. All readings are above 1GHz, peak values with a resolution bandwidth of 1MHz. Measurements were made at 3 meters.

Test Voltage: 120V~, 60Hz

#### Block diagram of Test setup



### 5.3 Radiated Emission Limit

Frequency Range (MHz)	Distance (m)	Field strength (dB $\mu$ V/m)
30-88	3	40.00
88-216	3	43.50
216-960	3	46.00
Above 960	3	54.00

Note: The lower limit shall apply at the transition frequencies

### 5.4 Test result

The frequency spectrum from 30MHz to 1GHz was investigated. All reading from 30MHz to 1GHz are quasi-peak values with a resolution bandwidth of 120kHz. All readings are above 1GHz, peak values with a resolution bandwidth of 1MHz. Measurements were made at 3 meters.

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**A: Radiated Disturbance (30MHz----1000MHz)**

**EUT Operating Environment**

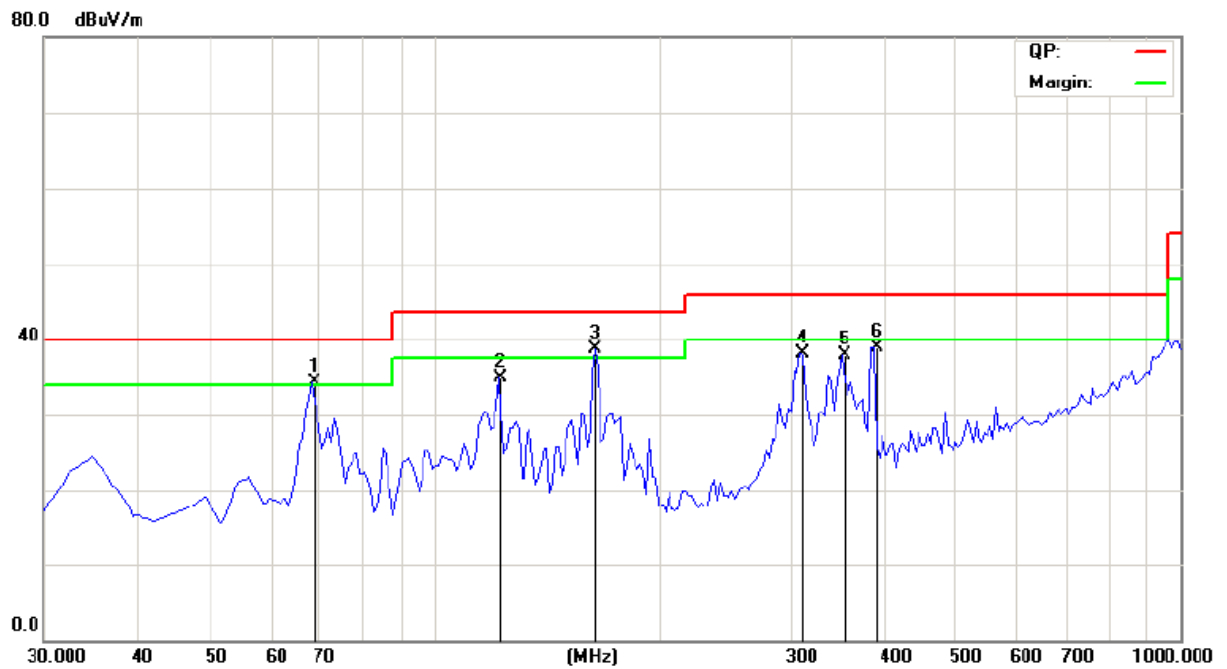
Temperature: 25°C Humidity: 75%RH Atmospheric Pressure: 101 KPa

**EUT set Condition: Working**

**Equipment Level: Class B**

**Results: Pass**

Please refer to following diagram for individual



Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
68.800	34.25	H	40.00
122.150	34.82	H	43.50
164.330	38.70	H	43.50
311.300	38.01	H	46.00
354.950	37.85	H	46.00
388.900	38.90	H	46.00

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**B: Radiated Disturbance (30MHz----1000MHz)**

**EUT Operating Environment**

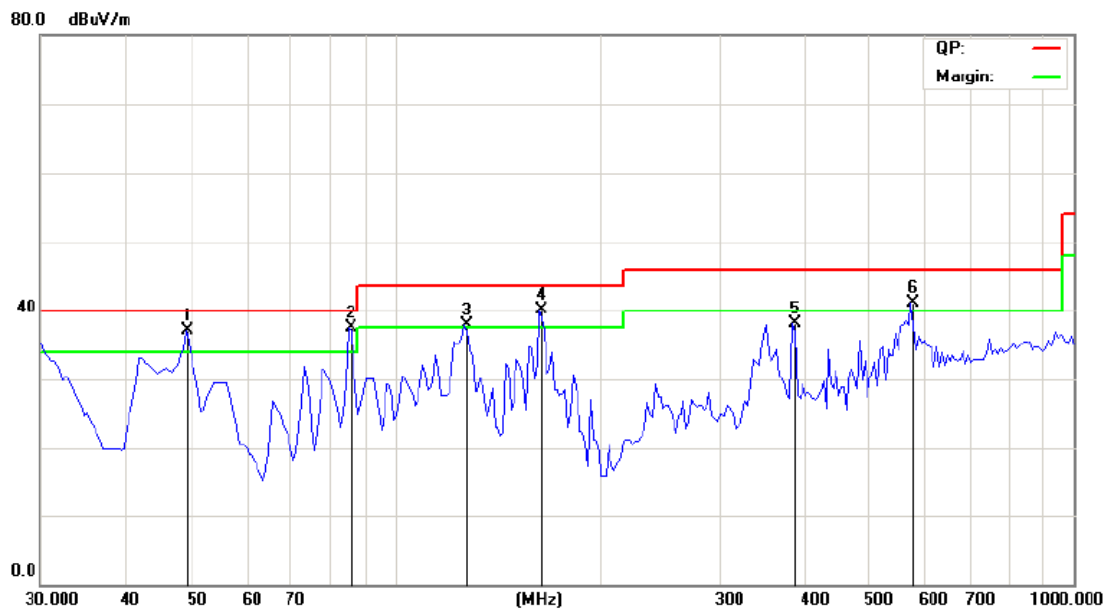
Temperature: 25°C Humidity: 75%RH Atmospheric Pressure: 101 KPa

**EUT set Condition: Working**

**Equipment Level: Class B**

**Results: Pass**

Please refer to following diagram for individual



Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
49.400	37.04	V	40.00
85.775	37.59	V	40.00
127.000	37.82	V	43.50
163.375	40.16	V	43.50
386.475	38.11	V	46.00
580.475	41.10	V	46.00

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C: Radiated Disturbance (1000MHz---6000MHz)

EUT Operating Environment

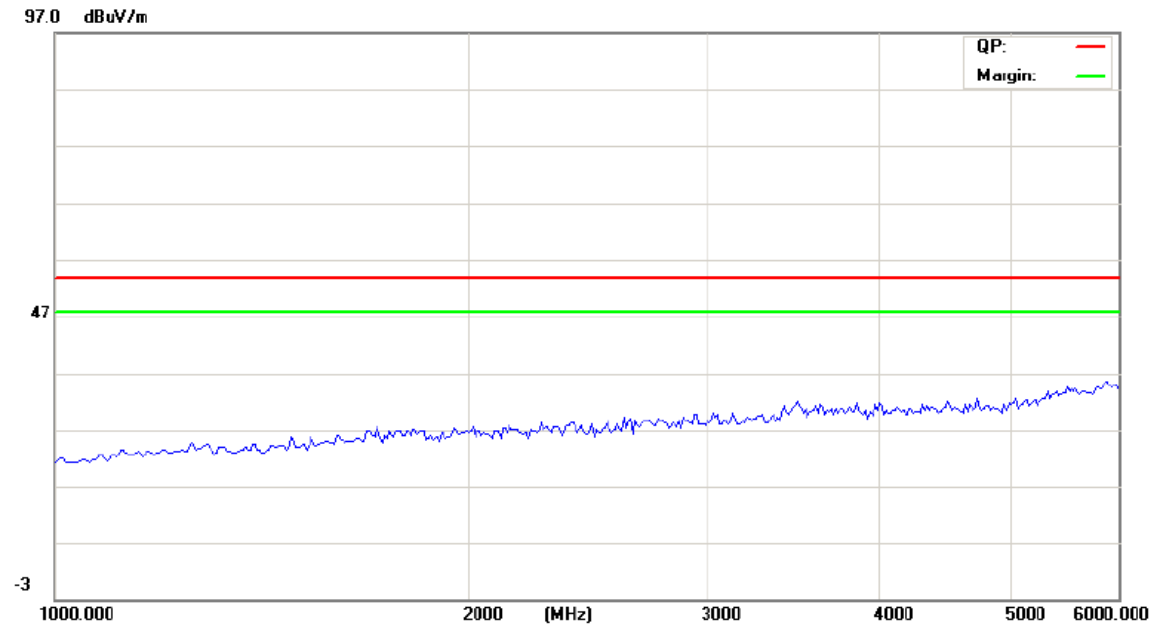
Temperature: 25°C      Humidity: 75%RH      Atmospheric Pressure: 101 KPa

EUT set Condition: Working

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
--	--	H	--

-The test data shows much less than the limit, no necessary take down the results.

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**D: Radiated Disturbance (1000MHz---6000MHz)**

**EUT Operating Environment**

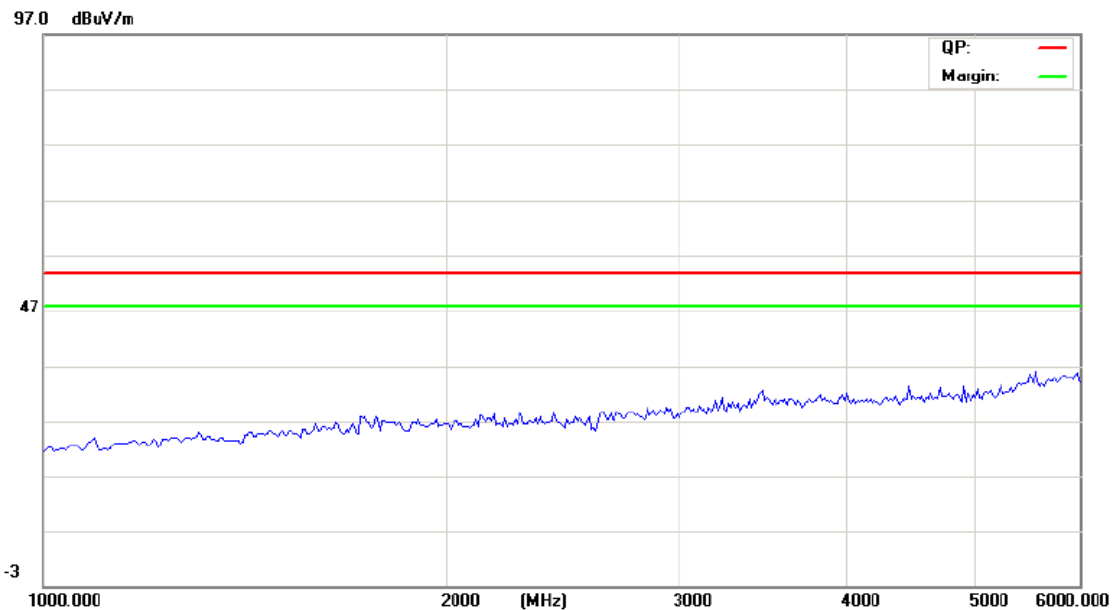
Temperature: 25°C      Humidity: 75%RH      Atmospheric Pressure: 101 KPa

**EUT set Condition: Working**

**Equipment Level: Class B**

**Results: Pass**

Please refer to following diagram for individual



Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
--	--	V	--

-The test data shows much less than the limit, no necessary take down the results.

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#### **6.0 FCC Label**

**This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.**

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

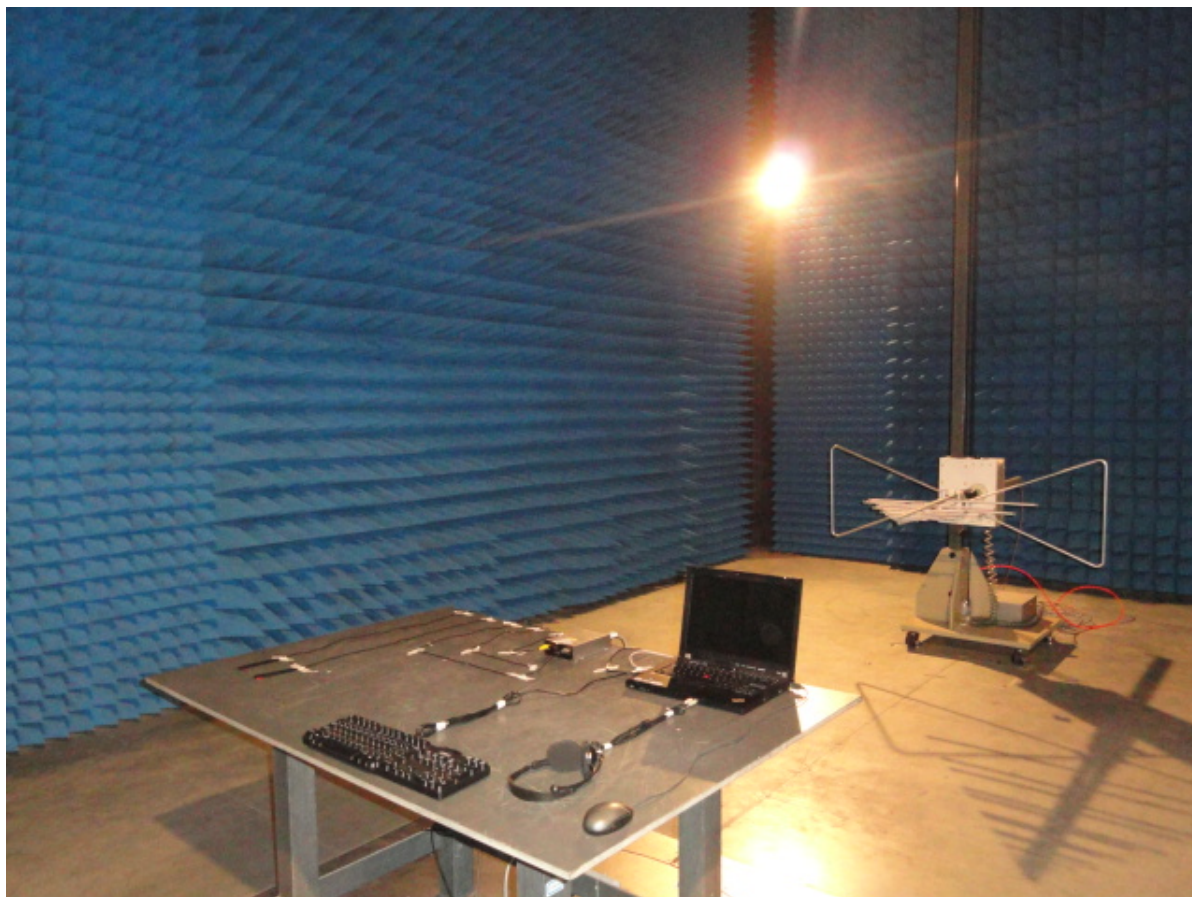
**Mark Location: On the product body**



7.0 Photo of testing

7.1 Conducted test View—N/A

7.2 Radiated emission test view--



**-End of the report-**

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