

FCC CERTIFICATION  
On Behalf of  
Lan-Tech International Limited

RC Bug  
Model No.: F49

**FCC ID: WFTRCF49**

Prepared for : Lan-Tech International Limited  
Address : Room A206 Building 115, 1<sup>st</sup> Industry Zone LianTang,  
LuoHu District, ShenZhen City, China

Prepared by : ACCURATE TECHNOLOGY CO. LTD  
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Report Number : ATE20081094  
Date of Test : June 16, 2008  
Date of Report : June 20, 2008

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## Test Report Certification

Applicant : Lan-Tech International Limited  
Manufacturer : Lan-Tech International Limited  
EUT Description : RC Bug  
(A) MODEL NO.: F49  
(B) SERIAL NO.: N/A  
(C) POWER SUPPLY: 3.0V DC (“AAA” batteries 2×)

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.235: 2007 & ANSI C63.4: 2003

The device described above is tested by ACCURATE TECHNOLOGY 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 Section 15.235 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO. LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO. LTD.

Date of Test : June 16, 2008

Prepared by :   
(Engineer)

Approved & Authorized Signer :   
(Manager)

## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

EUT : RC Bug

Model Number : F49

Power Supply : 3.0V DC (“AAA” batteries 2×)

Applicant : Lan-Tech International Limited  
Address : Room A206 Building 115, 1<sup>st</sup> Industry Zone LianTang,  
LuoHu District, ShenZhen City, China

Manufacturer : Lan-Tech International Limited  
Address : Room A206 Building 115, 1<sup>st</sup> Industry Zone LianTang,  
LuoHu District, ShenZhen City, China

Date of sample received : June 11, 2008  
Date of Test : June 16, 2008

### 1.2. Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen

: Listed by FCC  
The Registration Number is 752051

: Listed by Industry Canada  
The Registration Number is 5077A-2

: Accredited by China National Accreditation Committee  
for Laboratories  
The Certificate Registration Number is L3193

Name of Firm : ACCURATE TECHNOLOGY CO. LTD  
Site Location : F1, Bldg. A, Changyuan New Material Port, Keyuan Rd.  
Science & Industry Park, Nanshan, Shenzhen, Guangdong  
P.R. China

### 1.3. Measurement Uncertainty

Conducted emission expanded uncertainty = 2.23dB, k=2

Radiated emission expanded uncertainty = 4.12dB, k=2

## 2. MEASURING DEVICE AND TEST EQUIPMENT

**Table 1: List of Test and Measurement Equipment**

Kind of equipment	Manufacturer	Type	S/N	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	03.29.2009
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	03.29.2009
Spectrum Analyzer	Agilent	E7405A	MY45115511	03.29.2009
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	03.31.2009
Loop Antenna	Schwarzbeck	FMZB1516	1516131	03.28.2009
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	03.29.2009
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	12.20.2008
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	10.10.2008
LISN	Rohde&Schwarz	ESH3-Z5	100305	03.29.2009
LISN	Schwarzbeck	NLSK8126	8126431	03.29.2009

### 3. SUMMARY OF TEST RESULTS

<b>FCC Rules</b>	<b>Description of Test</b>	<b>Result</b>
Section 15.207	Conducted Emission	N/A
Section 15.209 Section 15.235(b)	Radiated Emission	Compliant
Section 15.235(a)	Fundamental Radiated Emission	Compliant
Section 15.235(b)	Band Edge	Compliant

## 4. RADIATED EMISSION FOR FCC PART 15 SECTION 15.235(B)

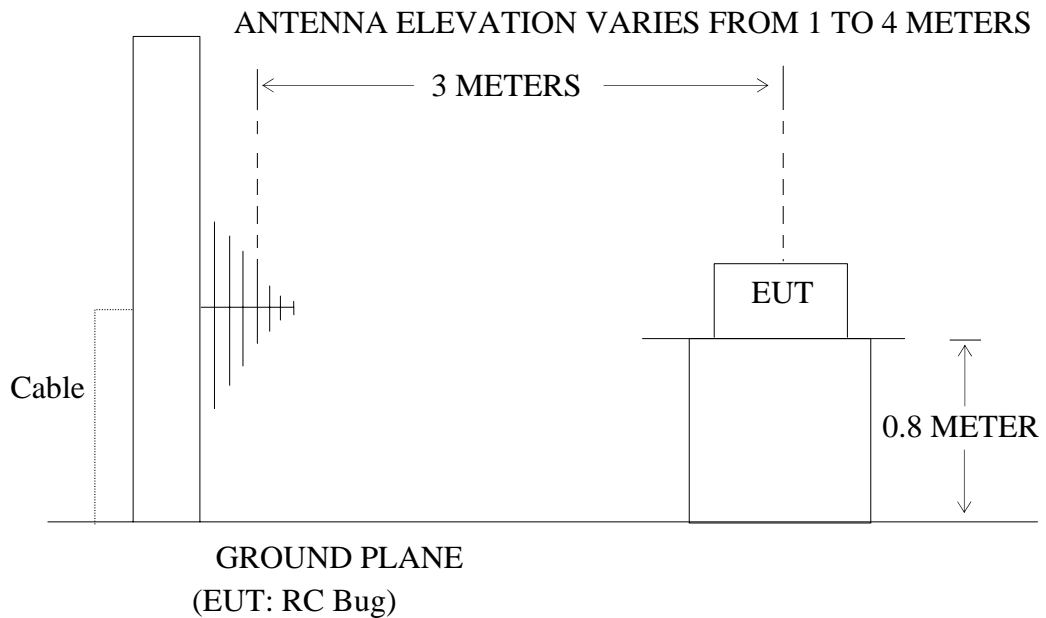
### 4.1. Block Diagram of Test Setup

#### 4.1.1. Block diagram of connection between the EUT and simulators



(EUT: RC Bug)

#### 4.1.2. Anechoic Chamber Test Setup Diagram



### 4.2. The Field Strength of Radiation Emission Measurement Limits

4.2.1. The field strength of any emissions appearing between the band edges and up to 10kHz above and below the band edges shall not exceed the general radiated emission limits in section 15.209. The field strength of any emissions removed by more than 10KHz from the band edges shall not exceed the general radiated emission limits in section 15.209.

Radiation Emission Measurement Limits According to Section 15.209(a)

Frequency (MHz)	Limit,		The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with
	Field Strength of Quasi-peak Value (microvolts/m)	Field Strength of Quasi-peak Value (dB $\mu$ V/m)	
30 - 88	100	40	

88 - 216	150	43.5	Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.
216 - 960	200	46	
Above 960	500	54	

### 4.3. Configuration of EUT on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

#### 4.3.1. RC Bug (EUT)

Model Number : F49  
Serial Number : N/A  
Manufacturer : Lan-Tech International Limited

### 4.4. Operating Condition of EUT

4.4.1. Setup the EUT and simulator as shown as Section 4.1.

4.4.2. Turn on the power of all equipment.

4.4.3. Let the EUT work in TX modes(on) measure it.

### 4.5. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 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 polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to FCC Part 15 Subpart C on radiated emission measurement.

The bandwidth of test receiver (R&S ESI26) is set at 120KHz in 30-1000MHz. The frequency range from 30MHz to 1000MHz is checked.

The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.



#### 4.6. The Field Strength of Radiation Emission Measurement Results

##### **PASS.**

The frequency range 30MHz to 1000MHz is investigated.

Date of Test:	<u>June 16, 2008</u>	Temperature:	<u>25°C</u>
EUT:	<u>RC Bug</u>	Humidity:	<u>52%</u>
			<u>3.0V DC (“AAA” batteries</u>
Model No.:	<u>F49</u>	Power Supply:	<u>2×)</u>
Test Mode:	<u>TX</u>	Test Engineer:	<u>Andy</u>

Polarization	Frequency (MHz)	Reading(dBμV/m) QP	Factor Corr.( dB)	Result(dBμV/m) QP	Limits(dBμV/m) QP	Margin(dBμV/m) QP
Horizontal	35.8379	7.75	16.49	24.24	40.0	-15.76
Horizontal	149.5650	12.46	14.53	26.99	43.5	-16.51
Horizontal	448.7420	7.65	21.44	29.09	46.0	-16.91
Horizontal	739.2136	8.32	26.01	34.33	46.0	-11.67
Vertical	35.8342	6.91	17.89	24.80	40.0	-15.20
Vertical	128.8780	9.20	14.94	24.14	43.5	-19.36

Note:

1. The spectral diagrams in appendix 1 display the measurement of peak values with corrected factors counted.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain

## 5. FUNDAMENTAL RADIATED EMISSION FOR FCC PART 15

### SECTION 15.235(A)

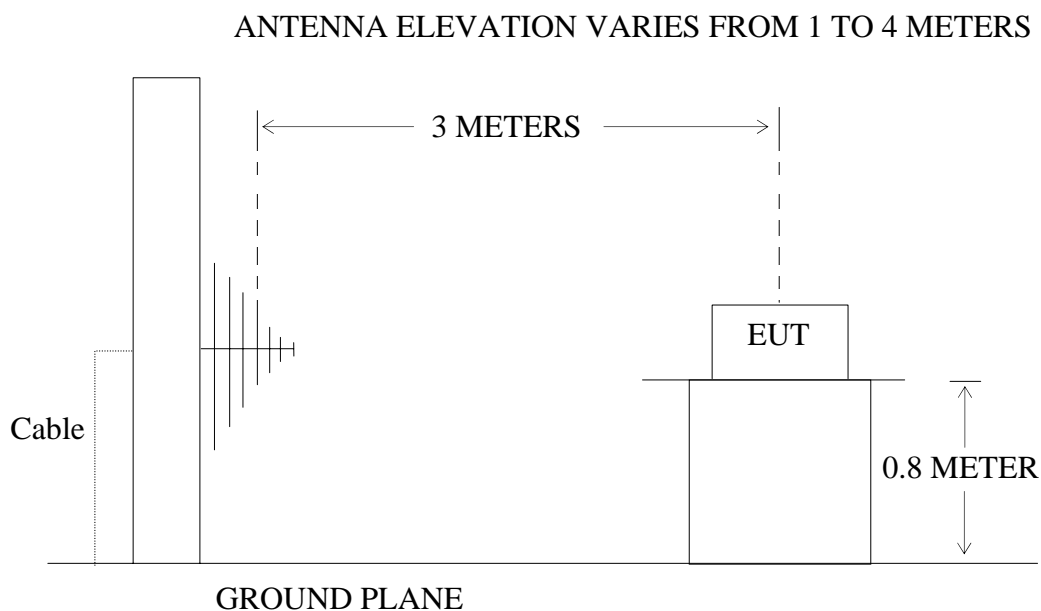
#### 5.1. Block Diagram of Test Setup

##### 5.1.1. Block diagram of connection between the EUT and simulators



(EUT: RC Bug)

##### 5.1.2. Anechoic Chamber Test Setup Diagram



(EUT: RC Bug)

#### 5.2. The Emission Limit For Section 15.235(a)

5.2.1 The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emission apply.

### 5.3.EUT Configuration on Measurement

The following equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

#### 5.3.1. RC Bug (EUT)

Model Number : F49  
Serial Number : N/A  
Manufacturer : Lan-Tech International Limited

### 5.4.Operating Condition of EUT

5.4.1.Setup the EUT and simulator as shown as Section 4.1.

5.4.2.Turn on the power of all equipment.

5.4.3.Let the EUT work in TX mode (On) measure it.

### 5.5.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 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 polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to FCC Part 15 Subpart C on radiated emission measurement.

The bandwidth of test receiver (R&S ESI26) is set at 120KHz in 30-1000MHz.

## 5.6. The Emission Measurement Result

**PASS.**

Date of Test:	<u>June 16, 2008</u>	Temperature:	<u>25°C</u>
EUT:	<u>RC Bug</u>	Humidity:	<u>52%</u>
Model No.:	<u>F49</u>	Power Supply:	<u>3.0V DC (“AAA” batteries 2×)</u>
Test Mode:	<u>TX</u>	Test Engineer:	<u>Andy</u>

**Fundamental Radiated Emissions**

Test conditions		Fundamental Frequency	
		49.860MHz	
T <sub>nom</sub> (25°C)	Unit	(dBμV/m)/( μ V/m) AV	(dBμV/m)/( μ V/m) PEAK
	Vertical	41.2/114.8	45.49/188.1
	Horizontal	45.7/192.8	49.82/309.7
limit		80/10,000	100/100,000
Note: Measurement was performed with modulated signal with average detector and peak detector.			

The spectral diagrams in appendix 1.

## 6. BAND EDGES FOR FCC PART 15 SECTION 15.235(B)

### 6.1. The Requirement For Section 15.235(b)

6.1.1. The field strength of any emission appearing between the band edges and up to 10kHz above and below the band edges shall be attenuated at least 26dB below the level of the unmodulated carrier or to the general limits in Section 15.209,

Radiation Emission Measurement Limits According to Section 15.209(a)

Frequency (MHz)	Limit,		The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.
	Field Strength of Quasi-peak Value (microvolts/m)	Field Strength of Quasi-peak Value (dB $\mu$ V/m)	
30 - 88	100	40	
88 - 216	150	43.5	
216 - 960	200	46	
Above 960	500	54	

### 6.2. Configuration of EUT on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

#### 6.2.1. RC Bug (EUT)

Model Number : F49  
 Serial Number : N/A  
 Manufacturer : Lan-Tech International Limited

### 6.3. Operating Condition of EUT

6.3.1. Setup the EUT and simulator as shown as Section 6.1.

6.3.2. Turn on the power of all equipment.

6.3.3. Let the EUT work in TX modes(on) measure it.

### 6.4. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 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 polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to FCC Part 15 Subpart C on radiated emission measurement.

The bandwidth of test receiver (R&S ESI26) is set at 200Hz.

The frequency range from 49.81MHz to 49.82MHz, from 49.90MHz to 49.91MHz are checked.

The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

## 6.5. The Field Strength of Radiation Emission Measurement Results

### PASS.

The frequency range from 49.81MHz to 49.82MHz, from 49.90MHz to 49.91MHz are checked. Because it is difficult to find out emission of unmodulated carrier. We test to comply to the general limits in Section 15.209.

Date of Test:	<u>June 16, 2008</u>	Temperature:	<u>25°C</u>
EUT:	<u>RC Bug</u>	Humidity:	<u>52%</u>
			<u>3.0V DC (“AAA” batteries</u>
Model No.:	<u>F49</u>	Power Supply:	<u>2×)</u>
Test Mode:	<u>TX</u>	Test Engineer:	<u>Andy</u>

Polarization	Frequency (MHz)	Reading(dBμV/m)	Factor	Result(dBμV/m)	Limits(dBμV/m)	Margin(dBμV/m)
		QP	Corr.( dB)	QP	QP	QP
Horizontal	49.8199	23.71	13.02	36.73	40	-3.27
Horizontal	49.9006	23.83	12.99	36.82	40	-3.18
Vertical	49.8190	22.76	13.98	36.74	40	-3.26
Vertical	49.9001	22.82	13.97	36.79	40	-3.21

The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain

# APPENDIX I (Test Curves)




**ACCURATE TECHNOLOGY CO., LTD.**

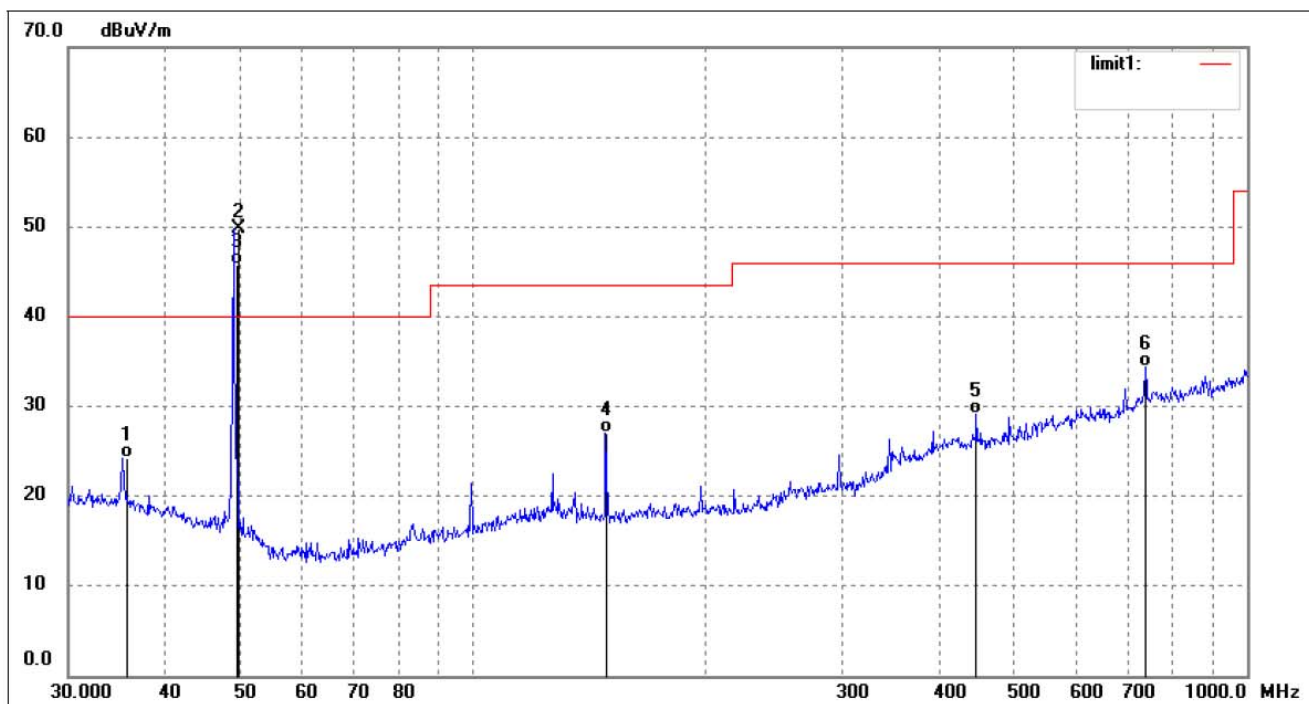
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http://www.atc-lab.com

Job No.:	RTTE #168	Polarization:	Horizontal
Standard:	FCC Class B 3M Radiated	Power Source:	DC 3V
Test item:	Radiation Test	Date:	2008-6-16
Temp.( ° C)/Hum.(%RH):	25° C/52%RH	Time:	11/07/41
EUT:	RC Bug	Test By:	Feng
Model:	F49	Distance:	3m
Manufacturer:	Lan-Tech		
Note:	Sample No.:082166	Report No.:	ATE20081094



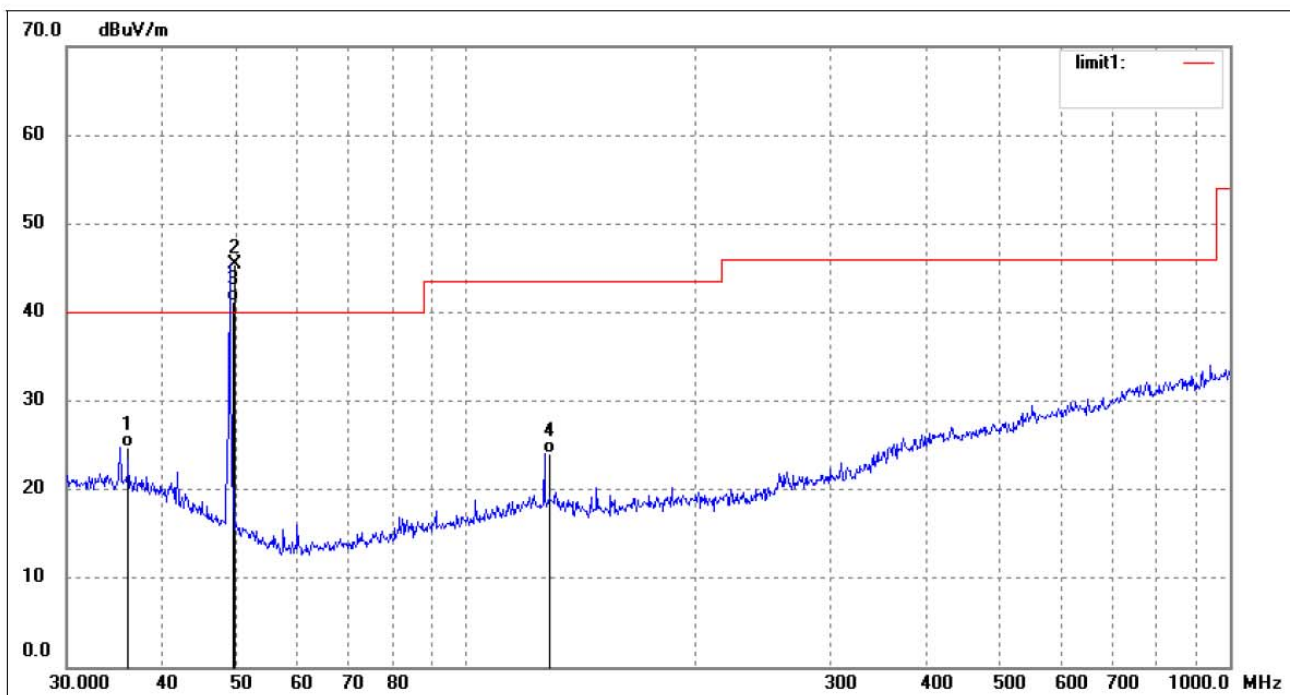
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	35.8379	7.75	16.49	24.24	40.00	-15.76	QP	
2	49.8580	35.84	13.98	49.82	100.00	-50.18	peak	
3	49.8580	31.72	13.98	45.70	80.00	-34.30	AVG	
4	149.5650	12.46	14.53	26.99	43.50	-16.51	QP	
5	448.7420	7.65	21.44	29.09	46.00	-16.91	QP	
6	739.2136	8.32	26.01	34.33	46.00	-11.67	QP	



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 http://www.atc-lab.com

<b>Job No.:</b>	<b>RTTE #119</b>	<b>Polarziation:</b>	<b>Vertical</b>
<b>Standard:</b>	<b>FCC Class B 3M Radiated</b>	<b>Power Source:</b>	<b>DC 3V</b>
<b>Test item:</b>	<b>Radiation Test</b>	<b>Date:</b>	<b>2008-6-16</b>
<b>Temp.( ° C)/Hum.(%RH):</b>	<b>25° C/52%RH</b>	<b>Time:</b>	<b>11/26/18</b>
<b>EUT:</b>	<b>RC Bug</b>	<b>Test By:</b>	<b>Feng</b>
<b>Model:</b>	<b>F49</b>	<b>Distance:</b>	<b>3m</b>
<b>Manufacturer:</b>	<b>Lan-Tech</b>		
<b>Note:</b>	<b>Sample No.:082166</b>	<b>Report No.:ATE20081094</b>	



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	35.8342	6.91	17.89	24.80	40.00	-15.20	QP	
2	49.8580	32.49	13.00	45.49	100.00	-54.51	peak	
3	49.8580	28.20	13.00	41.20	80.00	-38.80	AVG	
4	128.8780	9.20	14.94	24.14	43.50	-19.36	QP	