

FCC TEST REPORT  
for  
Radio Systems Corporation

Wireless Transmitter  
Model No.:300-1070

Prepared for : Radio Systems Corporation  
Address : 10427 Electric Ave., Knoxville, TN 37932 USA  
Tel: +1 865-218-1557  
Fax: +1 865-218-1557

Prepared By : Anbotek Compliance Laboratory Limited  
Address : 1/F, 1 /Build, SEC Industria 1 Park, No. 4 Qianhai Road,  
Nanshan District, Shenzhen, 518054, China  
Tel: (86) 755-26014771  
Fax: (86) 755-26014772

Report Number : 201202668F  
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APPENDIX I (External Photos) (2 Pages)

APPENDIX II (Internal Photos) (2 Pages)

## TEST REPORT VERIFICATION

Applicant : Radio Systems Corporation  
Manufacturer : Goldenregent Electronics Industrial Ltd.  
EUT : Wireless Transmitter  
Model No. : 300-1070  
Rating : DC 24V via AC/DC Adapter  
Trade Mark : PetSafe

## Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C 15.207&15.209-2010 & FCC / ANSI C63.4-2009

The device described above is tested by Anbotek Compliance Laboratory Limited To determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both radiated and conducted emissions. The measurement results are contained in this test report and Anbotek Compliance Laboratory Limited 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 Anbotek Compliance Laboratory Limited

Date of Test :

Feb. 03~15, 2012

Well Wang

Prepared by :

(Engineer/ Well Wang)

Reviewer :

Jerry Du

(Project Manager/ Jerry Du)

Approved & Authorized Signer :

Henry Yang

(Manager/ Henry Yang)

## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

Description	: Wireless Transmitter
Model Number	: 300-1070
Test Power Supply	: 120V~, 60Hz for Adapter
Adapter	: SWITCH MODE POWER SUPPLY Model No.: ITC-24V1.5C Input: 100V-240V~, 50/60Hz, 1.0A max Output: 24V $\overline{\text{---}}$ 1.5A CE, FCC, C-TICK, ETL
Frequency	: 18.7KHz
Applicant	: Radio Systems Corporation
Address	: 10427 Electric Ave., Knoxville, TN 37932 USA
Manufacturer	: Goldenregent Electronics Industrial Ltd.
Address	: Huangjinhu Management District, Qishi Town, Dongguan City, Guangdong Province, China
Date of Sample received	: Feb. 03, 2012
Date of Test	: Feb. 03~15, 2012

## 1.2. Description of Test Facility

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

### **CNAS - LAB Code: L3503**

Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

### **FCC-Registration No.: 752021**

Anbotek Compliance Laboratory Limited, 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 752021, August 20, 2010

### **IC-Registration No.: 8058A-1**

Anbotek Compliance Laboratory Limited., 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 8058A-1, August 30, 2010

### **Test Location**

All Emissions tests were performed

Anbotek Compliance Laboratory Limited. at 1/F, 1 /Build, SEC Industrial Park, No. 4 Qianhai Road, Nanshan District, Shenzhen, 518054, China

## 1.3. Measurement Uncertainty

Radiation Uncertainty : Ur = 4.3dB

Conduction Uncertainty : Uc = 3.4dB

## 2. MEASURING DEVICE AND TEST EQUIPMENT

Equipment	Manufacturer	Model #	Serial #	Data of Cal.	Due Data
EMI Test Receiver	Rohde & Schwarz	ESCI	100119	Mar.03, 2011	Mar.02, 2012
EMI Test Receiver	Rohde & Schwarz	ESPI	1101604	Jun.21, 2011	Jun.20, 2012
EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	Sep.22, 2011	Sep.21, 2012
EMI Test Software	SHURPLE ESK1		N/A	N/A	N/A
Spectrum Analyzer	Agilent	E7405A	MY45114970	Jun.21, 2011	Jun.20, 2012
Signal Generator	Rohde & Schwarz	SMR27	100124	Jul.06, 2011	Jul.05, 2012
Signal Generator	Rohde & Schwarz	SML03	102319	Aug.01, 2011	Aug.01, 2012
AC Power Source	Sepcial power system	YF650 N/A		N/A	N/A
Absorbing Clamp	Rohde & Schwarz	MDS21	100218	Apr.30, 2011	Apr.29, 2012
Power Meter	Rohde & Schwarz	NRVD	101287	Jul.19, 2010	Jul.18, 2012
Coaxial Cable	N/A	N/A	N/A	May.31, 2011	May.30, 2012
Coaxial Cable	N/A	N/A	N/A	May.31, 2011	May.30, 2012
Coaxial Cable	N/A	N/A	N/A	May.31, 2011	May.30, 2012
Universal radio Communication tester	Rohde & Schwarz	CMU200	101724	Sep.08, 2010	Sep.07, 2012
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	N/A	N/A	N/A
BiConilog Antenna	ETS-LINDGREN	3142C	00042670	Mar.03, 2011	Mar.02, 2012
BiConilog Antenna	ETS-LINDGREN	3142C	00042673	Mar.03, 2011	Mar.02, 2012
Loop Antenna	ETS-LINGREN	6502	00071730	Mar.03, 2011	Mar.02, 2012
Double-ridged Waveguide horn	ETS-LINDGREN	3117	00035926	Dec.30, 2010	Dec.29, 2012
Double-ridged Waveguide horn	ETS-LINDGREN	3117	00041545	Dec.30, 2010	Dec.29, 2012
Pre-amplifier	CD	PAM0203	804203	Jun.21, 2011	Jun.20, 2012
RF Switch	CD	RSU-M3	706543	Jun.21, 2011	Jun.20, 2012
Thermo-/Hygrometer	N/A	TH01	N/A	May.03, 2011	May.02, 2012
Shielding Room	Zhong Yu Electronic	N/A	N/A	N/A	N/A
3m Semi-Anechoic Chamber	Zhong Yu Electronic	N/A	N/A	Apr.28, 2011	Apr.27, 2012

### 3. Test Procedure

**GENERAL:** This report shall NOT be reproduced except in full without the written approval of Anbotek Compliance Laboratory Limited. The EUT was transmitting a test signal during the testing.

**RADIATION INTERFERENCE:** The test procedure used was ANSI STANDARD C63.4-2009 using a spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100KHz and the video bandwidth was 300KHz up to 1.0GHz and 1.0MHz with a video BW of 3.0MHz above 1.0GHz. The ambient temperature of the EUT was 74.3oF with a humidity of 69%.

**FORMULA OF CONVERSION FACTORS:** The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

**Example:**

Freq (MHz) METER READING + ACF = FS  
33 20 dBuV + 10.36 dB = 30.36 dBuV/m @ 3m

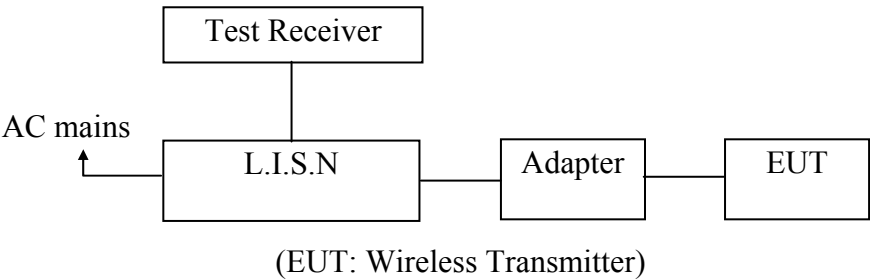
**ANSI STANDARD C63.4-2009 10.1.7 MEASUREMENT PROCEDURES:** The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

## 4. POWER LINE CONDUCTED MEASUREMENT

### 4.1. Block Diagram of Test Setup

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



### 4.2. Power Line Conducted Emission Measurement Limits (FCC Part 15 15.207)

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. \*Decreasing linearly with logarithm of frequency.  
2. The lower limit shall apply at the transition frequencies.

### 4.3. Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

EUT : Wireless Transmitter  
Model Number : 300-1070  
Applicant : Radio Systems Corporation

### 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 test mode (ON) and measure it.



#### 4.5. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.4-2009 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9KHz.

The frequency range from 150KHz to 30MHz is checked.

The test result are reported on Section 4.6.

#### 4.6. Power Line Conducted Emission Measurement Results

**PASS.**

The frequency range from 150KHz to 30 MHz is investigated.

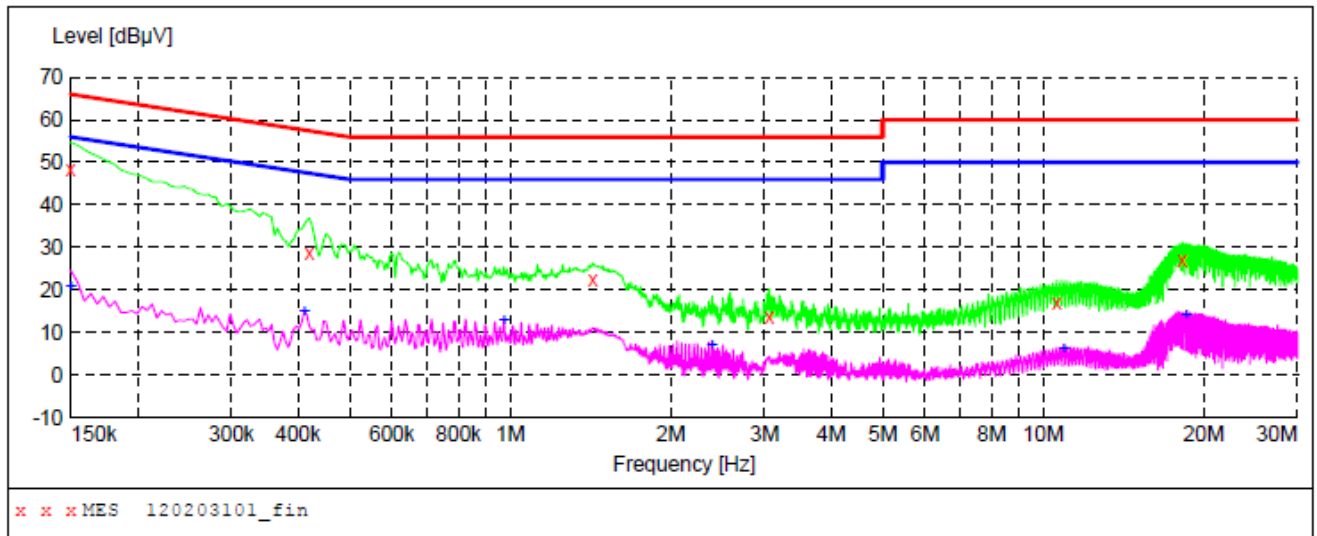
The test curves are shown in the following pages.

**CONDUCTED EMISSION TEST DATA**

EUT: Wireless Transmitter M/N: 300-1070  
 Operating Condition: ON  
 Test Site: 1# Shielded Room  
 Operator: Well. Wang  
 Test Specification: 120V~, 60Hz for Adapter  
 Comment: Live Line  
 Tem:22.2 Hum:60%

**SCAN TABLE: "Voltage (150K~30M) FIN"**

Short Description: 150K-30M Disturbance Voltages

**MEASUREMENT RESULT: "120203101\_fin"**

2/3/2012 5:09PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	48.40	10.1	66	17.6	QP	L1	GND
0.420000	28.70	10.1	57	28.7	QP	L1	GND
1.427500	22.50	10.3	56	33.5	QP	L1	GND
3.065500	13.50	10.4	56	42.5	QP	L1	GND
10.612000	16.80	10.6	60	43.2	QP	L1	GND
18.235000	27.00	10.8	60	33.0	QP	L1	GND

**MEASUREMENT RESULT: "120203101\_fin2"**

2/3/2012 5:09PM

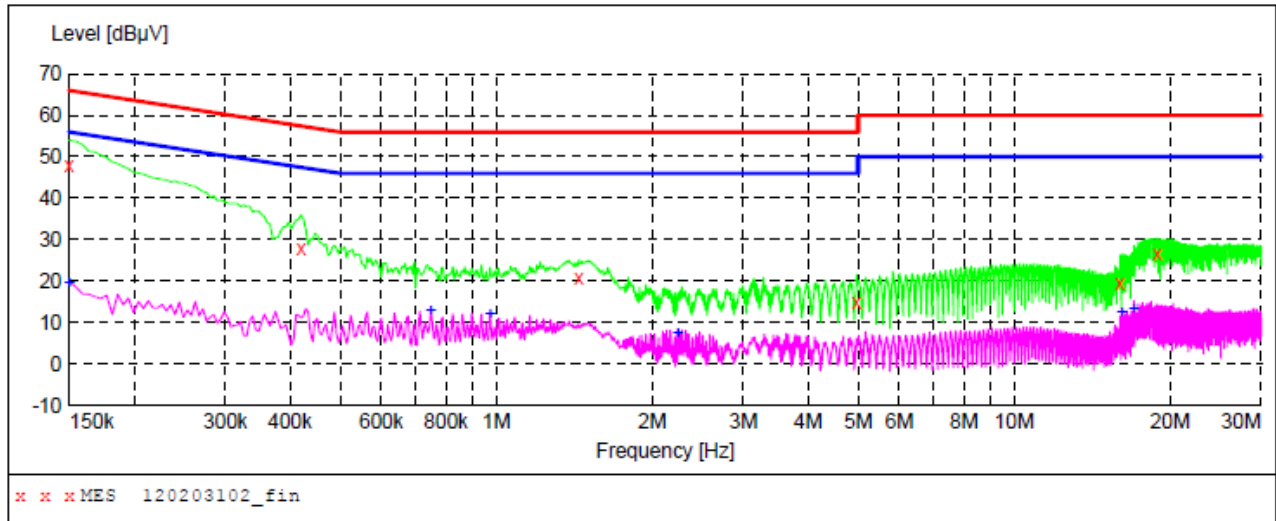
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	20.60	10.1	56	35.4	AV	L1	GND
0.411000	15.00	10.1	48	32.6	AV	L1	GND
0.973500	12.80	10.2	46	33.2	AV	L1	GND
2.395000	7.00	10.3	46	39.0	AV	L1	GND
10.936000	6.10	10.6	50	43.9	AV	L1	GND
18.577000	14.10	10.8	50	35.9	AV	L1	GND

**CONDUCTED EMISSION TEST DATA**

EUT: Wireless Transmitter M/N: 300-1070  
 Operating Condition: ON  
 Test Site: 1# Shielded Room  
 Operator: Well. Wang  
 Test Specification: 120V~, 60Hz for Adapter  
 Comment: Neutral Line  
 Tem:22.2 Hum:60%

**SCAN TABLE: "Voltage(150K~30M)FIN"**

Short Description: 150K-30M Disturbance Voltages

**MEASUREMENT RESULT: "120203102\_fin"**

2/3/2012 5:13PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	47.90	10.1	66	18.1	QP	N	GND
0.420000	27.70	10.1	57	29.7	QP	N	GND
1.445500	20.60	10.3	56	35.4	QP	N	GND
4.964500	14.90	10.5	56	41.1	QP	N	GND
16.012000	19.70	10.7	60	40.3	QP	N	GND
18.914500	26.40	10.8	60	33.6	QP	N	GND

**MEASUREMENT RESULT: "120203102\_fin2"**

2/3/2012 5:13PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	19.70	10.1	56	36.3	AV	N	GND
0.748500	12.80	10.1	46	33.2	AV	N	GND
0.973500	12.00	10.2	46	34.0	AV	N	GND
2.246500	7.50	10.3	46	38.5	AV	N	GND
16.156000	12.30	10.7	50	37.7	AV	N	GND
17.029000	13.40	10.7	50	36.6	AV	N	GND

## 5. RADIATED EMISSION MEASUREMENT

### 5.1. Radiated Emission Limits

Frequency (MHz)	Field Strength Limitation		Field Strength Limitation at 3m Measurement Dist	
	(uV/m)	Dist	(uV/m)	(dBuV/m)
0.009 – 0.490	2400 / F(KHz)	300m	$10000 * 2400/F(KHz)$	$20\log 2400/F(KHz) + 80$
0.490 – 1.705	24000 / F(KHz)	30m	$100 * 24000/F(KHz)$	$20\log 24000/F(KHz) + 40$
1.705 – 30.00	30	30m	$100 * 30$	$20\log 30 + 40$
30.0 – 88.0	100	3m	100	$20\log 100$
88.0 – 216.0	150	3m	150	$20\log 150$
216.0 – 960.0	200	3m	200	$20\log 200$
Above 960.0	500	3m	500	$20\log 500$

Note:

- (1) The tighter limit shall apply at the boundary between two frequency range.
- (2) Limitation expressed in dBuV/m is calculated by  $20\log$  Emission Level (uV/m).
- (3) If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula of  $Ld1 = Ld2 * (d2/d1)^2$ .

Example:

F.S Limit at 30m distance is 30uV/m , then F.S Limitation at 3m distance is adjusted as

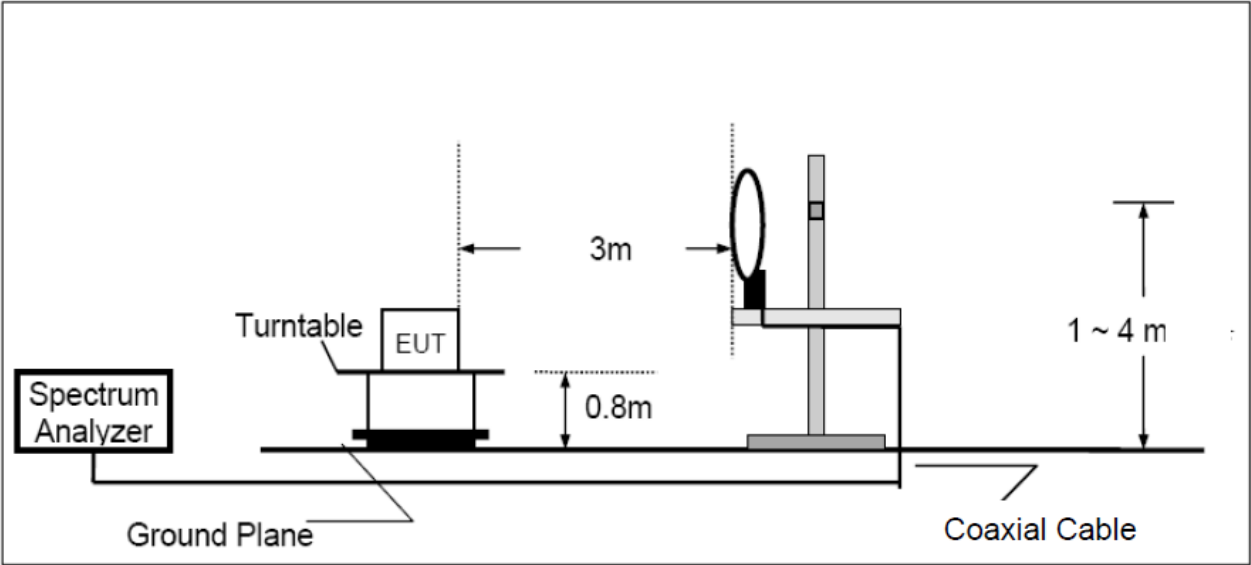
$$Ld1 = L1 = 30uV/m * (10)^2 = 100 * 30 uV/m$$

### 5.2. Test Procedure

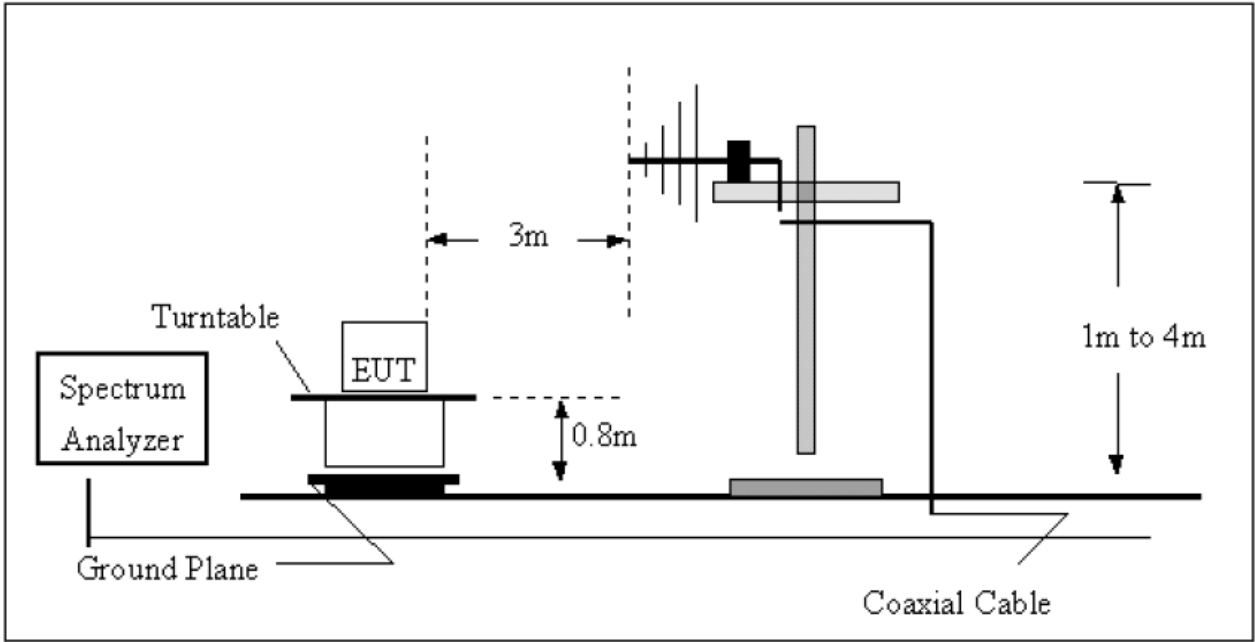
- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

5.3. Test Setup

(A) Radiated Emission Test Set-Up, Frequency below 30MHz



(B) Radiated Emission Test Set-Up, Frequency 30-1000MHz



#### 5.4. Test Results (Below 30MHz)

Freq.(KHz)	Reading at 3m (dBuV/m)	Factor (dB) Cable loss	Result at 3m (dBuV/m)	Field Strength Limit (uV/m)	Required Measurement Distance (m)	Limitation Converted 3m dist. (dBuV/m)	Over Limit (dB)	Detector (PK/AV)
18.70	80.56	16.00	96.56	128.34	300.00	122.17	-25.61	PK
37.40	49.17	15.60	64.77	64.17	300.00	116.15	-51.38	PK
56.10	47.50	15.30	62.80	42.78	300.00	112.62	-49.82	PK
74.80	43.35	14.80	58.15	32.09	300.00	110.13	-51.98	PK
93.50	42.65	14.50	57.15	25.67	300.00	108.19	-51.04	PK
112.20	38.57	13.95	54.52	21.39	300.00	106.60	-52.08	PK
130.90	--	--	--	--	--	--	--	--
149.60	--	--	--	--	--	--	--	--
168.30	--	--	--	--	--	--	--	--
187.00	--	--	--	--	--	--	--	--

Remark:

(1) Spectrum Setting:

9 KHz – 150 KHz, RBW= 1 KHz, VBW=1 KHz, Sweep time = 200 ms.

150 K Hz – 30 MHz, RBW= 9 KHz, VBW=9 KHz, Sweep time = 200 ms.

(2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.

(3) The Log-Bicon Antenna will use to test frequency range from 30MHz to 1000MHz and the Loop Antenna will use to test frequency below 30MHz.

(4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table

#### 5.5. Test Results (Between 30-1000MHz)

Pass

The test curves are shown in the following pages.


**Anbotek Compliance Laboratory Limited**

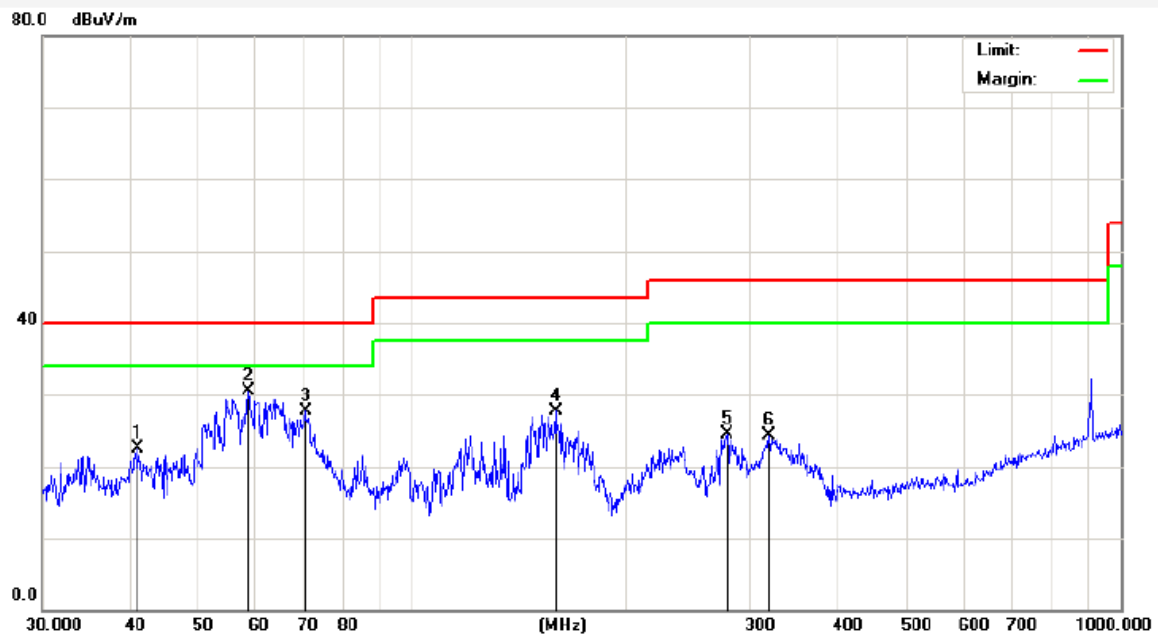
 1/F, 1 /Building, SEC Industrial Park, No.4 Qianhai Road,  
 Nanshan District, Shenzhen, 518054, China

Tel: (86)755-26014771

Fax: (86)755-26014772

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<b>Job No.:</b>	<b>AT1202608F</b>	<b>Polarization:</b>	<b>Horizontal</b>
<b>Standard:</b>	<b>(RE)FCC PART15 C _3m</b>	<b>Power Source:</b>	<b>120V~, 60Hz</b>
<b>Test item:</b>	<b>Radiation Test</b>	<b>Date:</b>	<b>2012/02/04</b>
<b>Temp.(C)/Hum.(%RH):</b>	<b>24.3( C)/55%RH</b>	<b>Time:</b>	<b>13:07:19</b>
<b>EUT:</b>	<b>Wireless Transmitter</b>	<b>Test By:</b>	<b>Well Wang</b>
<b>Model:</b>	<b>300-1070</b>	<b>Distance:</b>	<b>3m</b>

**Note:** ON


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	40.9881	47.28	-24.82	22.46	40.00	-17.54	peak			
2	58.6126	55.79	-25.35	30.44	40.00	-9.56	peak			
3	70.5836	57.15	-29.43	27.72	40.00	-12.28	peak			
4	159.2251	59.27	-31.52	27.75	43.50	-15.75	peak			
5	278.0668	51.22	-26.80	24.42	46.00	-21.58	peak			
6	318.8170	48.12	-23.90	24.22	46.00	-21.78	peak			



**Anbotek Compliance Laboratory Limited**

1/F, 1 /Building, SEC Industrial Park, No.4 Qianhai Road,  
Nanshan District, Shenzhen, 518054, China

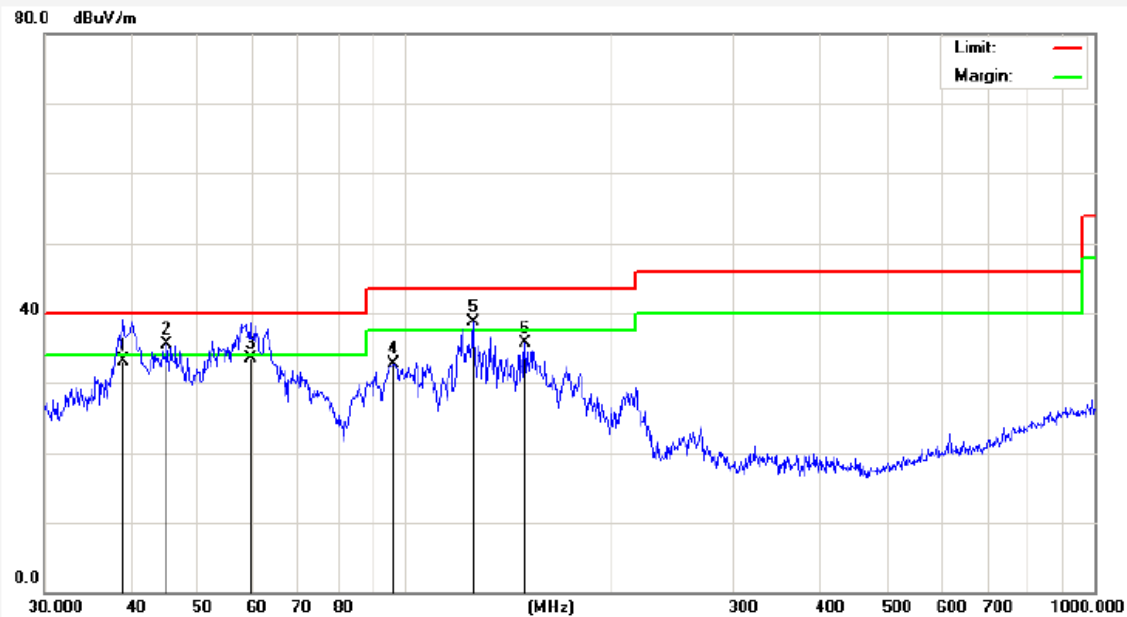
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Fax: (86)755-26014772

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Job No.:	AT1202608F	Polarziation:	Vertical
Standard:	(RE)FCC PART15 C _3m	Power Source:	120V~, 60Hz
Test item:	Radiation Test	Date:	2012/02/04
Temp.(C)/Hum.(%RH):	24.3( C)/55%RH	Time:	13:04:15
EUT:	Wireless Transmitter	Test By:	Well Wang
Model:	300-1070	Distance:	3m

Note: ON



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	39.0245	58.29	-25.10	33.19	40.00	-6.81	QP	100	0	
2	45.2165	60.20	-24.74	35.46	40.00	-4.54	peak			
3	59.6493	59.00	-25.41	33.59	40.00	-6.41	QP	100	360	
4	96.0986	57.55	-24.84	32.71	43.50	-10.79	peak			
5	125.4457	64.58	-25.83	38.75	43.50	-4.75	peak			
6	149.4857	62.65	-26.98	35.67	43.50	-7.83	peak			