ECMG
Worldwide Certification Solutions
EMC Compliance Management Group
670 National Avenue, Mountain View, CA 94043
Tel. (650) 988-0900 Fax (650) 988-6647
www.ecmg-global.com

NVLAP
NVLAP Lab code: 200068-0
ISO/IEC 17025:1999, ISO 9002:1994

FCC CERTIFICATION RADIO MEASUREMENT TECHNICAL REPORT

On Model Name: UHF Reader

Model Numbers : RFS2312 / RFS2314

Trademark : Raifu

FCC ID : UAWRAIFU200691501

Prepared for Jiangsu Raifu Intelligent Tech. Co., Ltd.

According to FCC Part 15 (2006), Subpart C

Test Report #: *JIA-0608-0576SH-FCC*

Prepared by: *Chris Huang*

Reviewed by: *Harry Zhao*

QC Manager: *Paul Chen*

Test Report Released by: Paul J. Chen *2006, September 25*

Paul Chen *Date*

Test Location

Tests performed at EMC Compliance Management Group (China) in a Certified ANSI Semi-Anechoic Chamber and Shielded Room performed testing.

Test Site Location:	*Jiangsu Electronic Products Supervision & Inspection Institute No 107 Ge lane ZhongQiao WuXi JiangSu, China*
Tel:	*86-510-85140038*
Fax:	*86-510-85140037*
Registration Number:	*399439*

Accreditation Bodies

EMC Compliance Management Group is a fully accredited Test Laboratory for ITE, ISM and Telecommunications Products.

In compliance with the site registration requirements of Section 2.948 of the FCC Rules to perform EMI measurements for the general public.

Accredited by the National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code # 200068-0.

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Opinions and Interpretations

This test report relates to the abovementioned equipment under test (EUT). Without the permission of EMC Compliance Management Group Test Lab this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark on this or similar products. The manufacturer has sole responsibility of continued compliance of the device.

Statement of Measurement Uncertainty

The data and results referenced in the document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities that can account for a nominal measurement error. Furthermore, component and process variability of devices similar to that tested may result in additional deviation.

Administrative Data

Test Sample : UHF Reader

Model Numbers : RFS2312 / RFS2314

Models Tested : RFS2312 / RFS2314

Trade Mark : Raifu

Date Tested : 2006, September 12

Applicant : Jiangsu Raifu Intelligent Tech. Co., Ltd.
Sanbao Tech Park, 1 Huangzhuang Road,
Maqun Tech Park, Qixia District, Nanjing,
China

Telephone : 86-25-84356665

Fax : 86-25-84356669

Manufacturer : Jiangsu Raifu Intelligent Tech. Co., Ltd.
Sanbao Tech Park, 1 Huangzhuang Road,
Maqun Tech Park, Qixia District, Nanjing,
China

EUT Description

Jiangsu Raifu Intelligent Tech. Co., Ltd. Model numbers RFS2312 / RFS2314 (referred to as the EUT in this test report) are UHF Readers. RFS2312 has 2 antennas while RFS2314 has 4 antennas.
The antennas will be panel antennas, and the EUT must be professionally installed.
The new models RFS2312/RFS2314 are identical to the models RFS2212/RFS2214 that have got FCC certificate under ID UAWRAIFU200691501 except for the differences below:

RFS2312/RFS2314 add an ethernet port on the EUT, to communicate with PC. This doesn't influence the RF characteristic. So only radiated emissions and AC line conducted emissions were tested.

Type of Deriver

Model RFS 2312 and RFS 2314 are identical except the antenna ports: the RFS 2312 has 2 antenna ports and the RFS 2314 has 4 antenna ports, the only difference is the antenna switch.

Test Summary

The Electromagnetic Compatibility requirements on TAT-E for this test are stated below. All results listed in this report relate exclusively to this above-mentioned model as the Equipment Under Test. This report confers no approval or endorsement upon any other component, host or subsystem used in the test set-up.

EMC Test Items *Reference FCC Part 15 (2006), Subpart C*			
Specification	***Description***	***Test Results***	***Remark***
FCC Part 15.209	*Radiated Emission Limits*	*Compliance*	*Attachment 1*
FCC Part 15.207	*Conducted Limits*	*Compliance*	*Attachment 2*

Test Mode Justification

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.

Antenna Statement

Statement:
The antenna must be professionally installed. Only panel antenna described in the EUT description will be used with the reader.
Professional installers will be provided with antenna installation instructions.

EUT Exercise Software

Software "Reader 2200" was used in during the test.

Equipment Modification

Any modifications installed previous to testing by Jiangsu Raifu Intelligent Tech. Co., Ltd. will be incorporated in each production model sold or leased in United States.

There were no modifications installed by EMC Compliance Management Group (China) test personnel.

Test System Details

EUT	
Model Numbers:	**RFS2312 / RFS2314**
Models Tested:	**RFS2312 / RFS2314**
Trademark::	**Raifu**
Serial Number:	**Engineering Sample**
Input Voltage:	**120V~ 60Hz**
Description:	**UHF Reader**
Manufacturer:	**Jiangsu Raifu Intelligent Tech. Co., Ltd.**

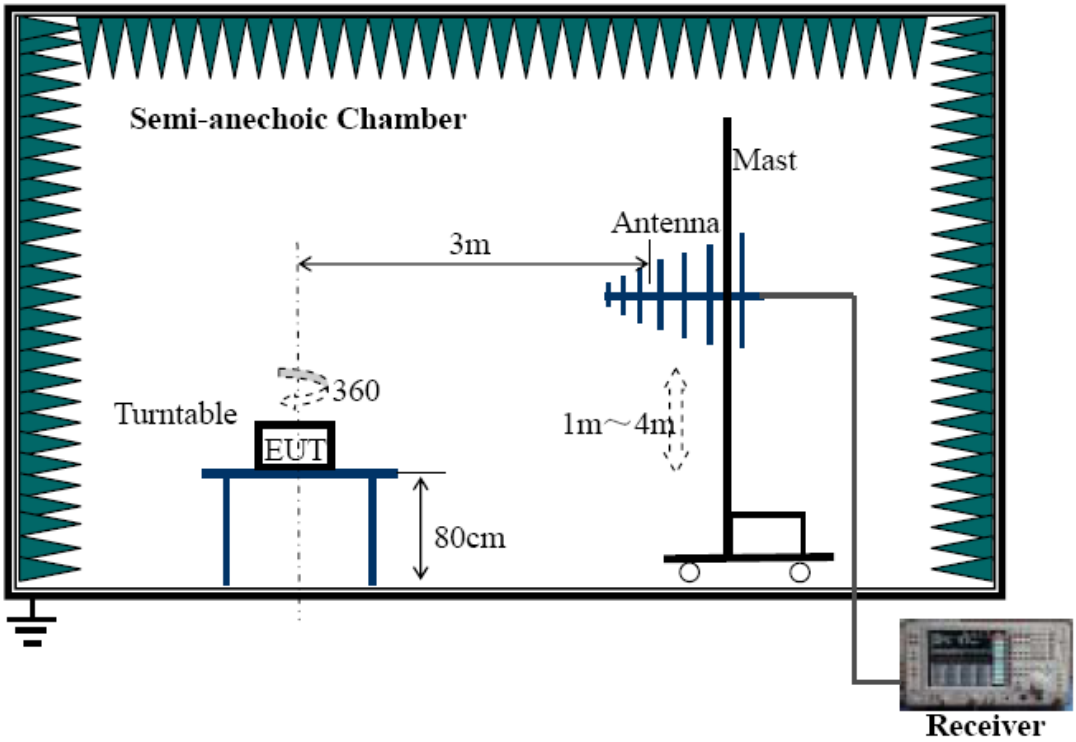
Support Equipment

Description	Model Number	Serial Number	Manufacturer	Power Cable Description (Meters)
PC	OPTIPLEX™ GX60SD	CN21003298	DELL	1.5m Unshielded
MONITOR	M782	CNS1382004	DELL	1.8m Unshielded
KEYBOARD	SK-8110	C4739-60101	DELL	N/A
MOUSE	M-S69	C4737-60001	DELL	N/A

Cable Description

Description	From	To	Length (Meters)	Shielded (Y/N)	Ferrite Loaded (Y/N)
VGA CABLE	MONITOR	PC	1.5	Y	Y (x2)
KEYBOARD CABLE	KEYBOARD	PC	1.8	N	N
MOUSE CABLE	MOUSE	PC	1.8	N	N

Configuration of Tested System

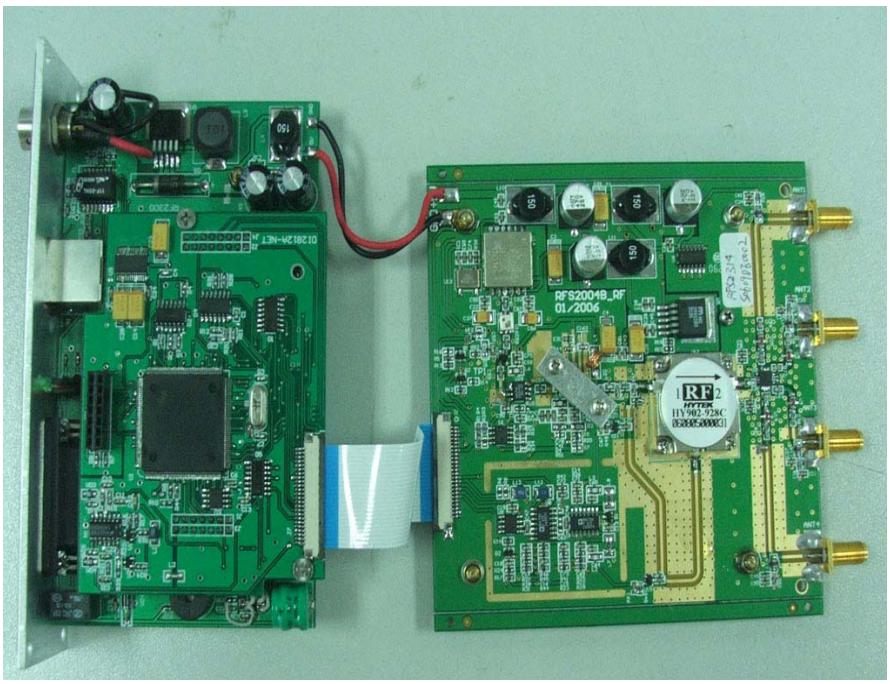


EUT Sample Photos of RFS2314 / RFS2312

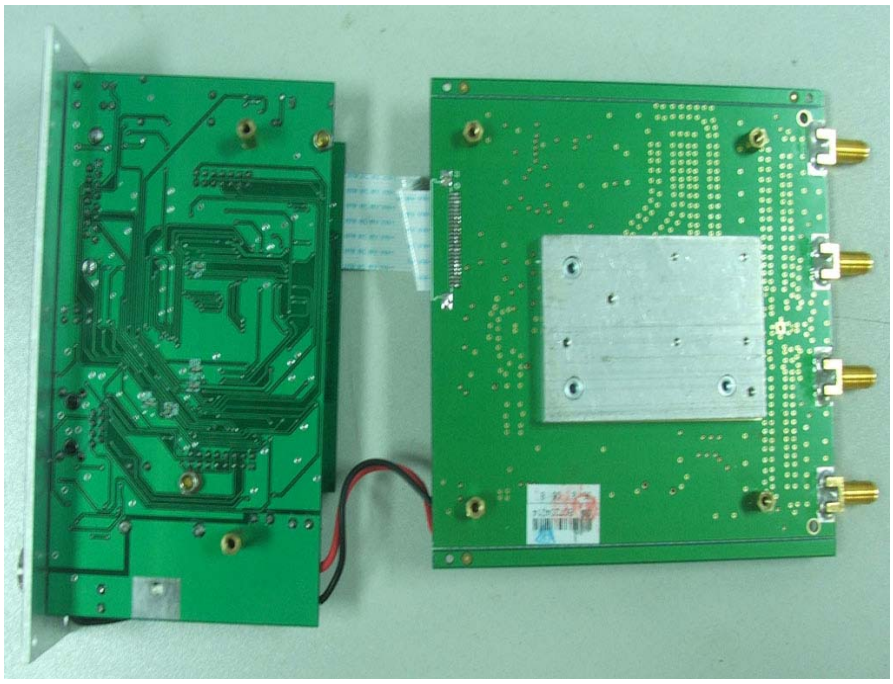
RFS2314

Front View

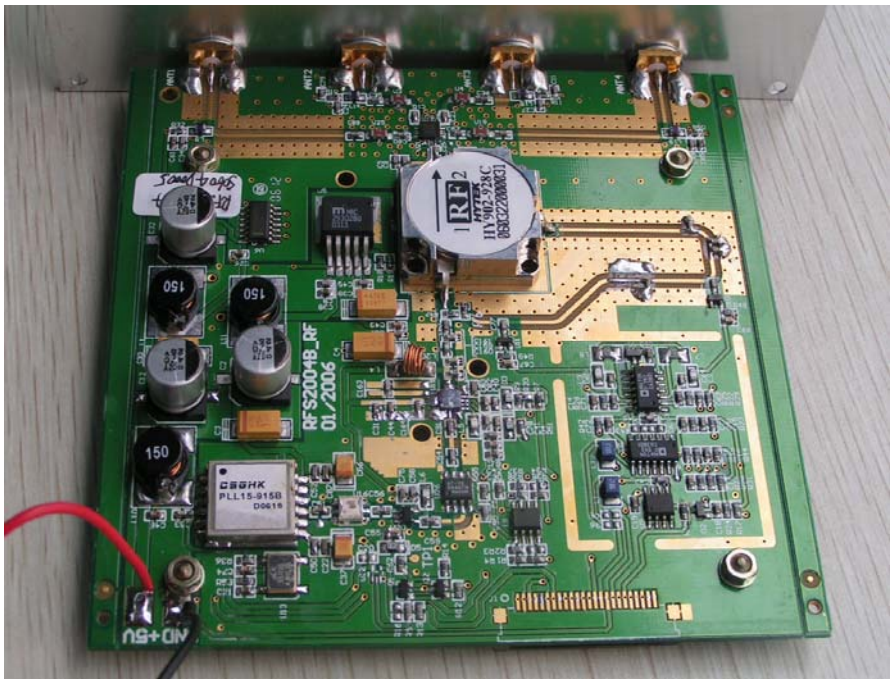
Rear View



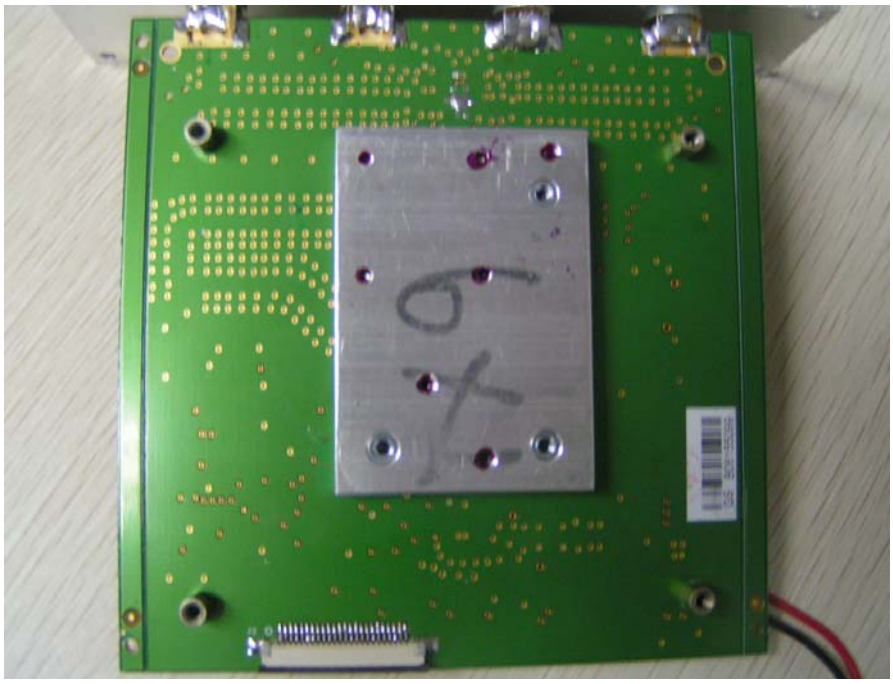
Uncovered View #1



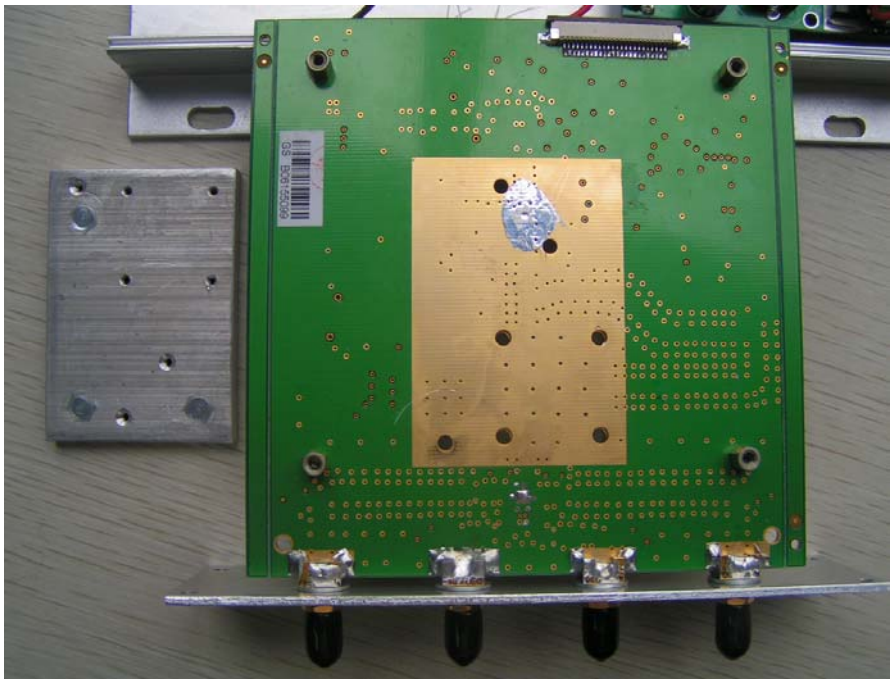
Uncovered View #2



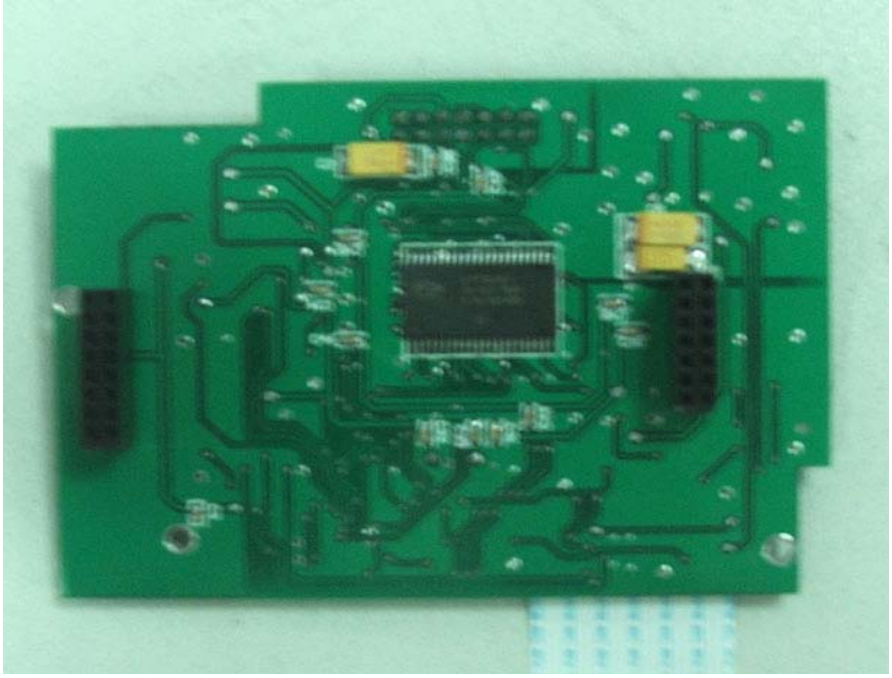
Main Board #1 Front View



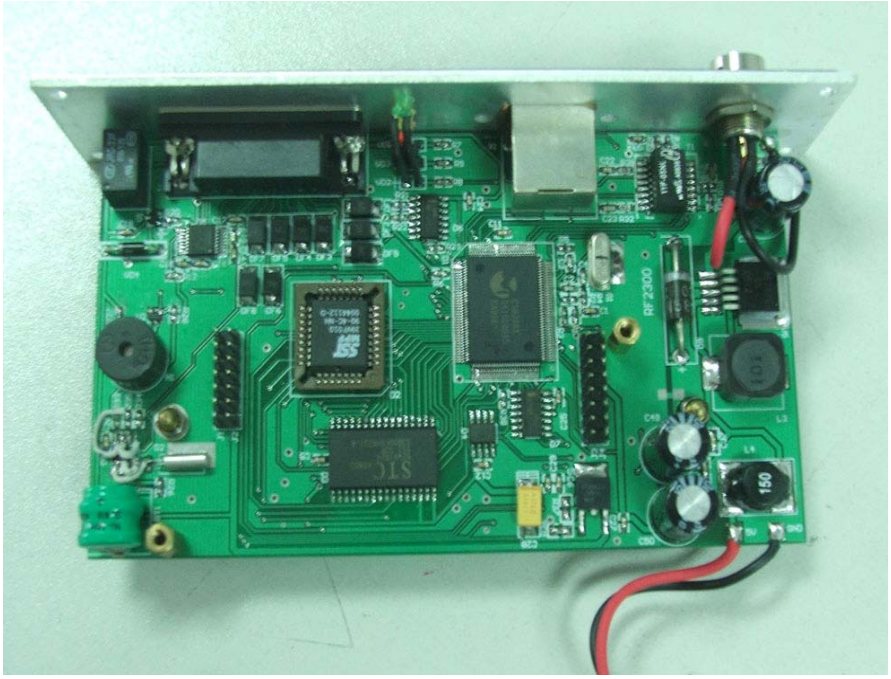
Main Board #1 Rear View



Main Board #1 Screw Holder Removed View



Little Board of Main Board #2 Rear View



Main Board #2 View

Panel antenna Front View

Panel antenna Rear View

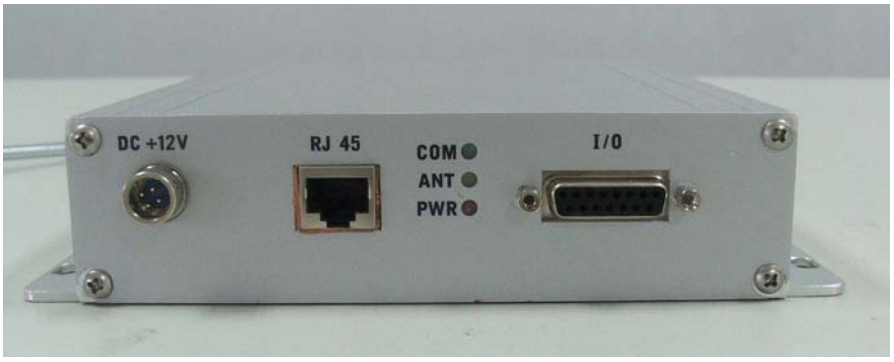
Power Adapter Front View

Power Adapter Rear View

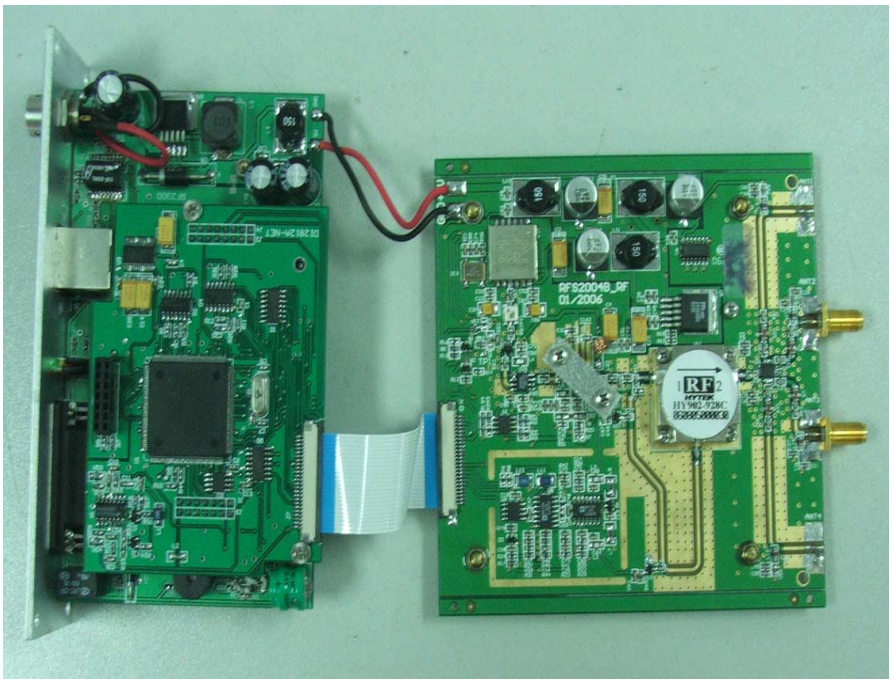
Power Adapter – Label View

RFS2312

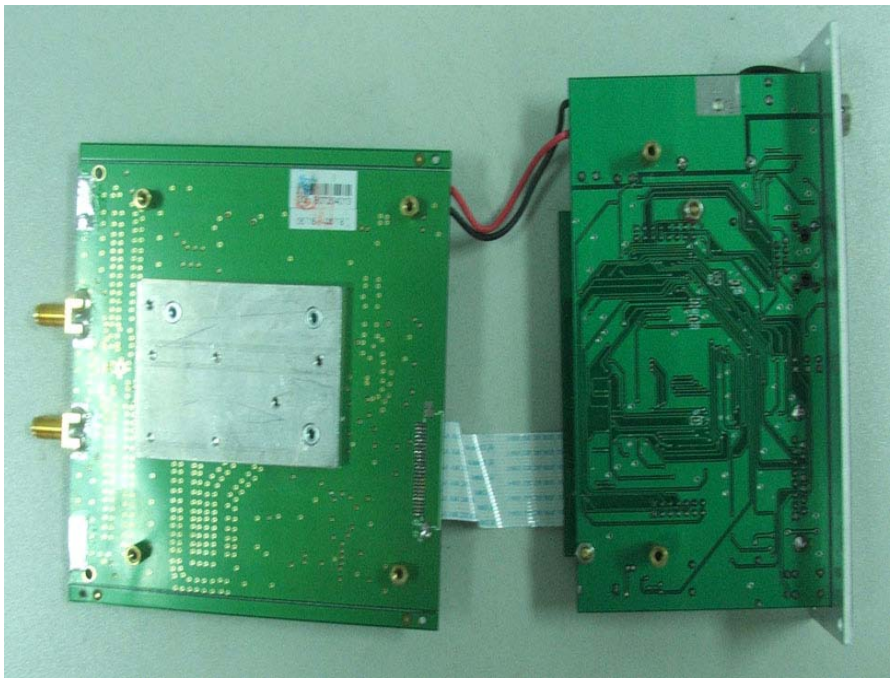
Front View



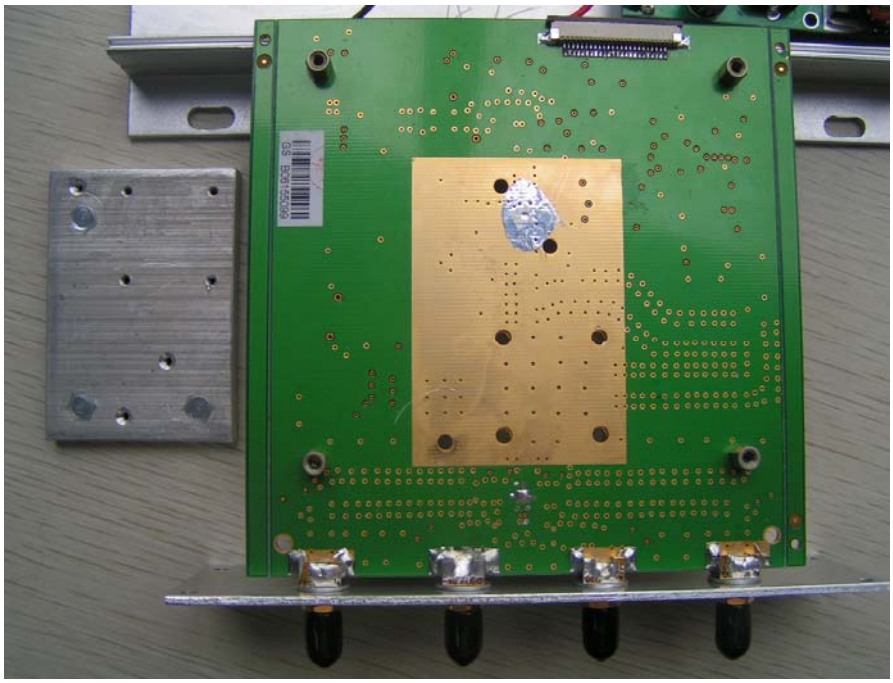
Rear View



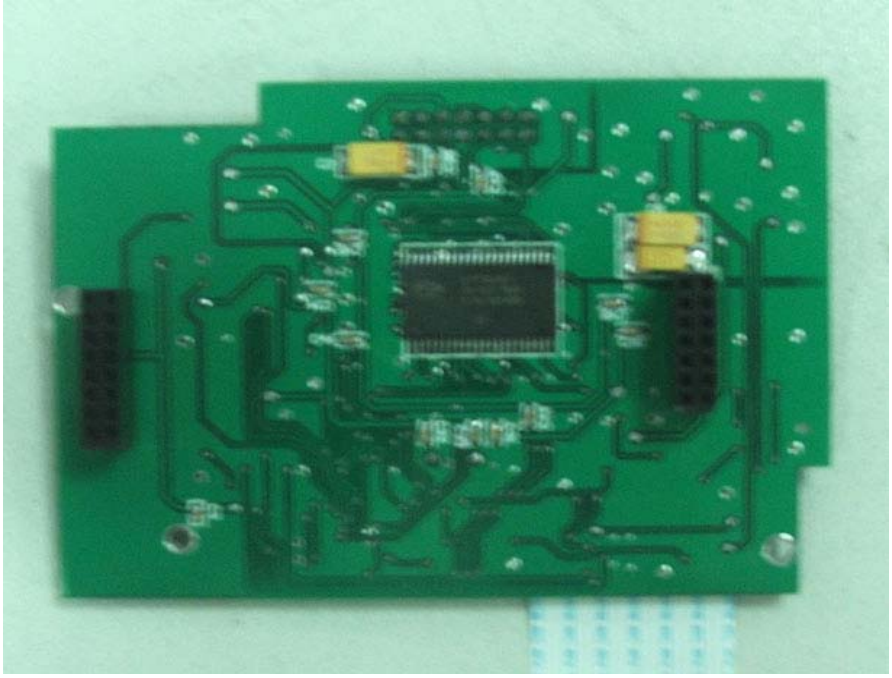
Uncovered View #1



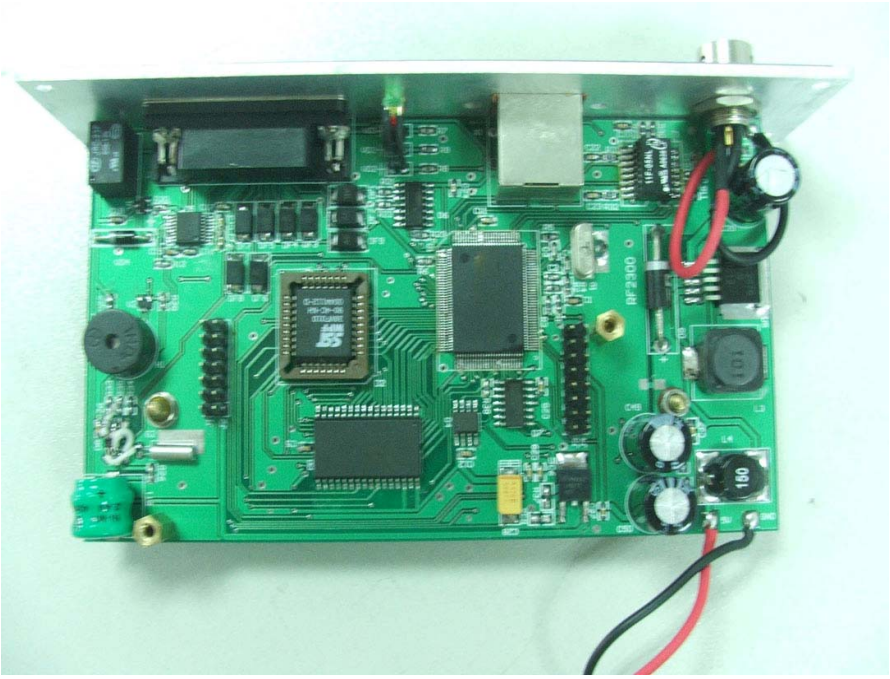
Uncovered View #2



Main Board #1 Screw Holder Removed View



Little Board of Main Board #2 Rear View



Main Board #2 View

ATTACHMENT 1 –FIELD STRENGTH OF FUNDAMENTAL AND SPURIOUS EMISSIONS

CLIENT:	Jiangsu Raifu Intelligent Tech. Co., Ltd.	**TEST STANDARD:**	FCC Part 15.209 FCC Part 15.205
MODEL NUMBERS:	RFS2312 / RFS2314	**PRODUCT:**	UHF Reader
MODEL TESTED:	RFS2312 / RFS2314		
SERIAL NO.:	Engineering Sample	**EUT DESIGNATION:**	RF Equipment
TEMPERATURE:	21°C	**HUMIDITY:**	53%RH
ATM PRESSURE:	101.6 kPa	**GROUNDING:**	No Grounding
TESTED BY:	Shi Xiting	**DATE OF TEST:**	2006, September 18

SETUP METHOD:	ANSI C63.4 : 2003
TEST PROCEDURE:	a. The EUT was placed on a rotatable table with 0.8 meters above ground. b. The EUT was set 3 meters from the interference-receiving antenna, which was mounted on the top of a variable height antenna tower. c. The antenna was varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna were set to make measurement. d. For each suspected emission the EUT was arranged to its worst case and then change the antenna tower height (from 1m to 4m) and turn table (from 0 degree to 360 degree) to find the maximum reading. e. If the emission level of the EUT in peak mode was 20 dB lower than the specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be tested using the quasi-peak method in about six maximal points and the results will be reported. f. Broadband antenna (Calibrated antenna) was used as receiving antenna below 1000MHz. Horn antenna were used as receiving antenna above 1000MHz. g. The bandwidth is 120 kHz below 1000 MHz, and 1 MHz above 1000 MHz Explanation of the Correction Factor are given as follows: FS= RA + AF + CF - AG - DC Where: FS = Field Strength RA = Receiver Amplitude AF = Antenna Factor CF = Cable Attenuation Factor AG = Amplifier Gain DC = Duty Cycle Correction Factor

CONTINUE ON THE NEXT PAGE…

TESTED RANGE:	30MHz to 10,000MHz
TEST VOLTAGE:	120V / 60Hz
TEST STATUS:	Keep Tx in continuous transmission mode, modulated, all antenna ports were connected by panel antenna
RESULTS:	The EUT meets the requirements of field strength test. The test results relate only to the equipment under test provided by client.
CHANGES OR MODIFICATIONS:	There were no modifications installed by EMC Compliance Management Group (China) test personnel.
M. UNCERTAINTY:	Freq. ± 2x10-7 x Center Freq., Amp ± 2.6 dB

For Model RFS2312
On Channel 1
Test Results (30MHz~1GHz)

Horizontal								
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected QP Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Angle of Turner (degree)**	**Height of Tower (cm)**
1	137.52	11.1	1.0	25.7	43.5	-17.8	0.0	297.0
2	225.53	9.3	1.5	36.8	46.0	-9.2	0.0	135.9
3	651.37	19.2	2.7	38.2	46.0	-7.8	0.0	132.8
4	902.60	20.3	3.7	111.5	---	---	178.9	163.4
Vertical								
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected QP Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Angle of Turner (degree)**	**Height of Tower (cm)**
1	166.50	9.5	1.2	22.1	43.5	-21.4	11.1	126.0
2	258.54	13.0	1.5	41.3	46.0	-4.7	176.6	146.7
3	651.37	19.2	2.7	33.5	46.0	-12.5	0.0	100.0
4	902.60	20.3	3.7	114.4	---	---	176.2	100.0
Note: All readings are quasi-peak unless stated otherwise, using a QP bandwidth of 120kHz, with a 30 ms sweep time. A video filter was not used.								

For Model RFS2312
On Channel 1
Test Results (1GHz~10GHz)

Horizontal									
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected AV Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Corrected PK Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**
1	1118.74	25.2	5.0	33.6	54.0	-20.4	41.1	74.0	-32.9
2	1905.09	29.7	6.9	38.9	54.0	-15.1	43.2	74.0	-30.8
3	2089.14	31.5	8.3	41.1	54.0	-12.9	53.9	74.0	-20.1
Vertical									
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected AV Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Corrected PK Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**
1	1119.25	25.2	5.0	36.7	54.0	-17.3	43.1	74.0	-30.9
2	1904.78	29.7	6.9	41.9	54.0	-12.1	45.3	74.0	-28.7
3	2089.14	31.5	8.3	42.8	54.0	-11.2	48.0	74.0	-26.0

Note: All readings are average and peak unless stated otherwise, using a bandwidth of 1000kHz, with a 30 ms sweep time. A video filter was not used.

For Model RFS2312
On Channel 32
Test Results (30MHz~1GHz)

Horizontal								
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected QP Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Angle of Turner (degree)**	**Height of Tower (cm)**
1	79.03	7.0	0.7	32.9	40.0	-7.1	17.8	129.0
2	258.53	13.0	1.5	34.7	46.0	-11.3	138.7	331.2
3	335.55	13.8	1.7	33.4	46.0	-12.6	0.0	173.3
4	914.98	20.3	3.7	109.5	---	---	139.0	154.0
Vertical								
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected QP Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Angle of Turner (degree)**	**Height of Tower (cm)**
1	38.98	12.9	0.4	33.8	40.0	-6.2	287.0	153.0
2	236.53	10.5	1.5	30.1	46.0	-15.9	241.3	100.0
3	308.04	13.2	1.6	32.1	46.0	-13.9	95.0	100.0
4	914.98	20.3	3.7	113.1	---	---	309.8	114.4
Note: All readings are quasi-peak unless stated otherwise, using a QP bandwidth of 120kHz, with a 30 ms sweep time. A video filter was not used.								

For Model RFS2312
On Channel 32
Test Results (1GHz~10GHz)

Horizontal									
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected AV Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Corrected PK Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**
1	1487.50	27.8	6.1	36.5	54.0	-17.5	47.1	74.0	-26.9
2	2287.94	31.3	8.0	38.5	54.0	-15.5	47.9	74.0	-26.1
3	5789.30	34.8	12.6	40.4	54.0	-13.6	51.2	74.0	-22.8
Vertical									
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected AV Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Corrected PK Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**
1	1176.29	25.3	4.7	40.1	54.0	-13.9	50.1	74.0	-23.9
2	1587.28	28.1	6.2	44.3	54.0	-9.7	53.9	74.0	-20.1
3	2012.28	30.4	7.7	42.9	54.0	-11.1	52.6	74.0	-21.4
Note: All readings are average and peak unless stated otherwise, using a bandwidth of 1000kHz, with a 30 ms sweep time. A video filter was not used.									

For Model RFS2312
On Channel 63
Test Results (30MHz~1GHz)

Horizontal								
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected QP Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Angle of Turner (degree)**	**Height of Tower (cm)**
1	167.99	9.4	1.2	28.7	43.5	-14.8	209.1	152.2
2	285.49	12.6	1.5	31.0	46.0	-15.0	22.6	200.6
3	604.92	18.6	2.5	33.8	46.0	-12.2	36.9	129.6
4	927.01	20.4	3.7	115.4	---	---	155.4	127.6
Vertical								
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected QP Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Angle of Turner (degree)**	**Height of Tower (cm)**
1	200.42	8.6	1.5	29.4	43.5	-14.1	105.4	122.5
2	321.67	13.6	1.6	28.8	46.0	-17.2	256.8	126.4
3	536.77	18.1	2.3	32.2	46.0	-13.8	29.5	119.2
4	927.01	20.4	3.7	114.8	---	---	129.0	132.8
Note: All readings are quasi-peak unless stated otherwise, using a QP bandwidth of 120kHz, with a 30 ms sweep time. A video filter was not used.								

For Model RFS2312
On Channel 63
Test Results (1GHz~10GHz)

Horizontal									
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected AV Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Corrected PK Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**
1	1322.10	26.7	5.6	36.8	54.0	-17.2	44.5	74.0	-29.5
2	2345.33	31.4	8.0	38.6	54.0	-15.4	44.8	74.0	-29.2
3	4356.72	32.7	10.6	41.6	54.0	-12.4	50.5	74.0	-23.5
Vertical									
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected AV Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Corrected PK Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**
1	1833.98	28.8	7.0	36.7	54.0	-17.3	45.2	74.0	-28.8
2	2109.73	31.0	7.8	38.9	54.0	-15.1	45.6	74.0	-28.4
3	2784.98	31.8	8.4	42.1	54.0	-11.9	51.1	74.0	-22.9

Note: All readings are average and peak unless stated otherwise, using a bandwidth of 1000kHz, with a 30 ms sweep time. A video filter was not used.

For Model RFS2314
On Channel 1
Test Results (30MHz~1GHz)

Horizontal								
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected QP Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Angle of Turner (degree)**	**Height of Tower (cm)**
1	185.93	8.7	1.4	28.4	43.5	-15.1	234.6	167.8
2	235.84	10.5	1.5	31.2	46.0	-14.8	211.9	177.5
3	567.29	18.6	2.3	33.5	46.0	-12.5	185.4	193.3
4	902.60	20.3	3.7	113.6	---	---	128.5	176.5
Vertical								
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected QP Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Angle of Turner (degree)**	**Height of Tower (cm)**
1	43.27	11.8	0.4	31.6	40.0	-8.4	19.4	112.6
2	276.58	12.6	1.5	29.4	46.0	-16.6	308.5	100.9
3	533.66	18.1	2.3	34.6	46.0	-11.4	209.6	132.4
4	902.60	20.3	3.7	112.1	---	---	125.7	100.4
Note: All readings are quasi-peak unless stated otherwise, using a QP bandwidth of 120kHz, with a 30 ms sweep time. A video filter was not used.								

For Model RFS2314
On Channel 1
Test Results (1GHz~10GHz)

Horizontal									
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected AV Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Corrected PK Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**
1	1844.28	31.2	7.0	37.3	54.0	-16.4	42.1	74.0	-31.9
2	2944.67	32.0	8.5	38.6	54.0	-14.8	42.7	74.0	-31.3
3	5896.24	33.1	11.2	41.1	54.0	-13.2	45.9	74.0	-28.1
Vertical									
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected AV Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Corrected PK Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**
1	1844.28	31.2	7.0	36.9	54.0	-17.1	42.8	74.0	-31.2
2	2944.67	32.0	8.5	40.4	54.0	-13.6	44.9	74.0	-29.1
3	5896.24	33.1	11.2	43.1	54.0	-10.9	48.9	74.0	-25.1
Note: All readings are average and peak unless stated otherwise, using a bandwidth of 1000kHz, with a 30 ms sweep time. A video filter was not used.									

For Model RFS2314
On Channel 32
Test Results (30MHz~1GHz)

Horizontal								
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected QP Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Angle of Turner (degree)**	**Height of Tower (cm)**
1	54.33	6.3	0.5	30.1	40.0	-9.9	126.5	115.7
2	311.98	13.3	1.5	29.8	46.0	-16.2	203.2	189.9
3	456.87	16.3	2.0	32.2	46.0	-13.8	76.8	200.8
4	914.99	20.3	3.7	113.6	---	---	128.5	176.5
Vertical								
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected QP Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Angle of Turner (degree)**	**Height of Tower (cm)**
1	30.87	17.7	0.3	31.7	40.0	-8.3	287.3	200.7
2	264.36	13.0	1.5	29.3	46.0	-16.7	29.5	112.2
3	784.39	19.8	3.4	33.6	46.0	-12.4	309.9	100.7
4	914.99	20.3	3.7	112.1	---	---	127.9	100.4
Note: All readings are quasi-peak unless stated otherwise, using a QP bandwidth of 120kHz, with a 30 ms sweep time. A video filter was not used.								

For Model RFS2314
On Channel 32
Test Results (1GHz~10GHz)

Horizontal									
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected AV Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Corrected PK Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**
1	1322.45	26.7	5.6	35.4	54.0	-18.6	43.5	74.0	-30.5
2	2345.31	31.4	8.0	37.6	54.0	-16.4	43.4	74.0	-30.6
3	4356.46	32.7	10.6	40.8	54.0	-13.2	51.8	74.0	-22.2
Vertical									
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected AV Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Corrected PK Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**
1	1322.47	26.7	5.6	36.1	54.0	-17.9	43.8	74.0	-30.2
2	2109.73	31.0	7.8	37.3	54.0	-16.7	44.9	74.0	-29.1
3	2784.98	31.8	8.4	41.8	54.0	-12.2	50.7	74.0	-23.3
Note: All readings are average and peak unless stated otherwise, using a bandwidth of 1000kHz, with a 30 ms sweep time. A video filter was not used.									

For Model RFS2314
On Channel 63
Test Results (30MHz~1GHz)

Horizontal								
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected QP Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Angle of Turner (degree)**	**Height of Tower (cm)**
1	100.98	10.2	0.7	32.8	43.5	-10.7	184.3	123.7
2	213.65	8.7	1.5	33.5	43.5	-10.0	227.6	100.9
3	409.88	15.7	1.8	34.8	46.0	-11.2	57.8	145.8
4	927.00	20.4	3.7	114.9	---	---	209.5	128.9
Vertical								
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected QP Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Angle of Turner (degree)**	**Height of Tower (cm)**
1	204.32	8.6	1.5	29.7	43.5	-13.8	206.5	209.2
2	367.89	14.6	1.7	31.2	46.0	-14.8	37.8	100.7
3	587.56	18.6	2.4	33.8	46.0	-12.2	43.2	107.5
4	927.00	20.4	3.7	113.0	---	---	178.6	105.4
Note: All readings are quasi-peak unless stated otherwise, using a QP bandwidth of 120kHz, with a 30 ms sweep time. A video filter was not used.								

For Model RFS2314
On Channel 63
Test Results (1GHz~10GHz)

Horizontal									
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected AV Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Corrected PK Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**
1	1078.28	24.5	5.3	31.8	54.0	-22.2	43.2	74.0	-30.8
2	1769.80	30.8	6.9	33.8	54.0	-20.2	44.8	74.0	-29.2
3	2145.63	31.1	7.9	36.5	54.0	-17.5	47.6	74.0	-26.4
Vertical									
Signal	**Frequency (MHz)**	**Antenna Factor (dB)**	**Cable Factor (dB)**	**Corrected AV Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**	**Corrected PK Level dB(uV/m)**	**3 Meter Limits dB(uV/m)**	**Margin (dB)**
1	1077.69	24.5	5.3	32.4	54.0	-21.6	43.2	74.0	-30.8
2	1687.62	30.7	6.9	33.5	54.0	-20.5	43.9	74.0	-30.1
3	2145.35	31.1	7.9	35.8	54.0	-18.2	48.9	74.0	-25.1
Note: All readings are average and peak unless stated otherwise, using a bandwidth of 1000kHz, with a 30 ms sweep time. A video filter was not used.									

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4440A	US45303119	03/20/06	03/19/07
Bilog Antenna	CHASE	CBL6112	117.0800.20	02/17/06	02/16/07
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	513	03/20/06	03/19/07
Anechoic Chamber	LINDGREN	FACT-3	601	01/10/06	01/10/07
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.					

SIGNED BY: Shi-xiting

ENGINEER

REVIEWED BY: Hanyzhao

SENIOR ENGINEER

Radiated Emissions Test Set-up (Below 1GHz)

Radiated Emissions Test Set-up (Above 1GHz)

ATTACHMENT 2 – CONDUCTED EMISSION TEST RESULTS

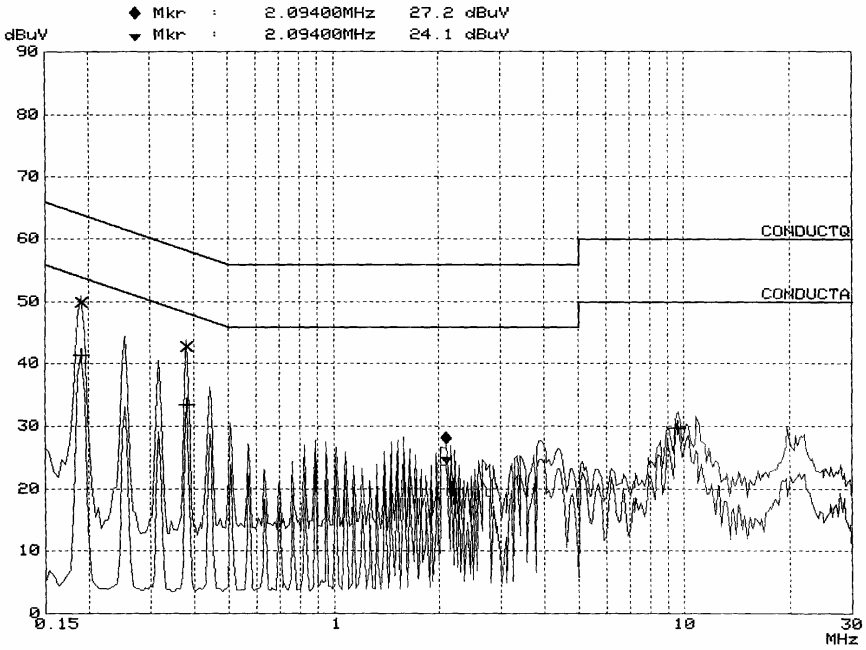
CLIENT:	Jiangsu Raifu Intelligent Tech. Co., Ltd.	**TEST STANDARD:**	FCC 15.107/207
MODEL NUMBERS:	RFS2312 / RFS2314	**PRODUCT:**	UHF Reader
MODEL TESTED:	RFS2312 / RFS2314		
SERIAL NO.:	Engineering Sample	**EUT DESIGNATION:**	RF Equipment
TEMPERATURE:	21°C	**HUMIDITY:**	53%RH
ATM PRESSURE:	101.6 kPa	**GROUNDING:**	No Grounding
TESTED BY:	Shi Xiting	**DATE OF TEST:**	2006, September 18

SETUP METHOD:	ANSI C63.4 : 2003, FCC 15.107/207
TEST PROCEDURE:	a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface. b. Connect EUT to the power mains through a line impedance stabilization network (LISN) c. The LISN provides 50ohm coupling impedance for the measuring instrument d. Both sides of AC line were checked for maximum conduced interference. e. The frequency range from 150KHz to 30MHz was searched.. f. Set the test-receiver system to Peak Detect Function and Specified bandwidth. g. If the emission level of the EUT in peak mode was 20 dB lower than the specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be tested using the quasi-peak method in about six maximal points and the results will be reported.
TESTED RANGE:	0.15MHz-30MHz
TEST VOLTAGE:	120V / 60Hz
TEST STATUS:	Keep Tx in continuous transmission mode, modulated, other antenna ports were terminated by 50ohm impendence.
RESULTS:	The EUT meets the requirements of test reference for Conducted Emissions on line L by 14.0 dB of Quasi-Peak detector and 12.5 dB of Average Detector. The EUT meets the requirements of test reference for Conducted Emissions on line N by 14.3 dB of Quasi-Peak detector and 13.8 dB of Average Detector. The test results relate only to the equipment under test provided by client.

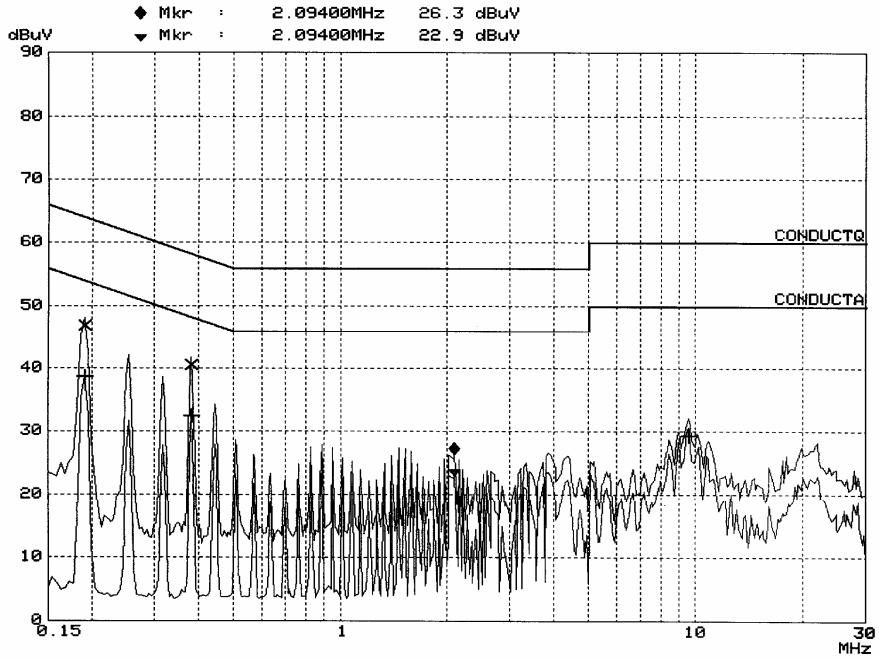
CONTINUE ON TO THE NEXT PAGE…

CHANGES OR MODIFICATIONS:	There were no modifications installed by EMC Compliance Management Group (China) test personnel.
M. UNCERTAINTY:	Freq. ± 2x10-7 x Center Freq., Amp ± 2.6 dB

For Model RFS2312



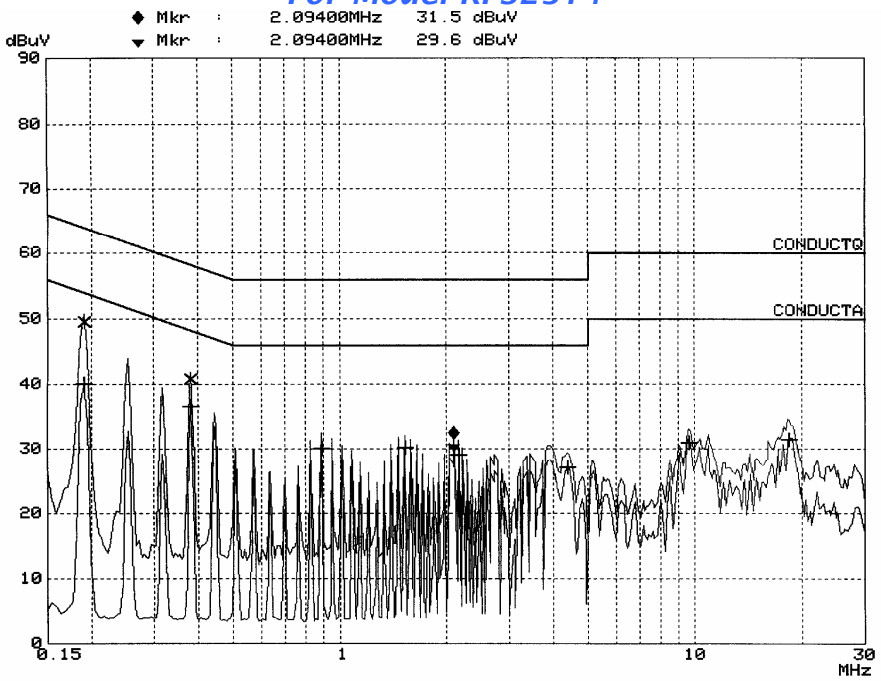
Line L Conducted Emission Graph



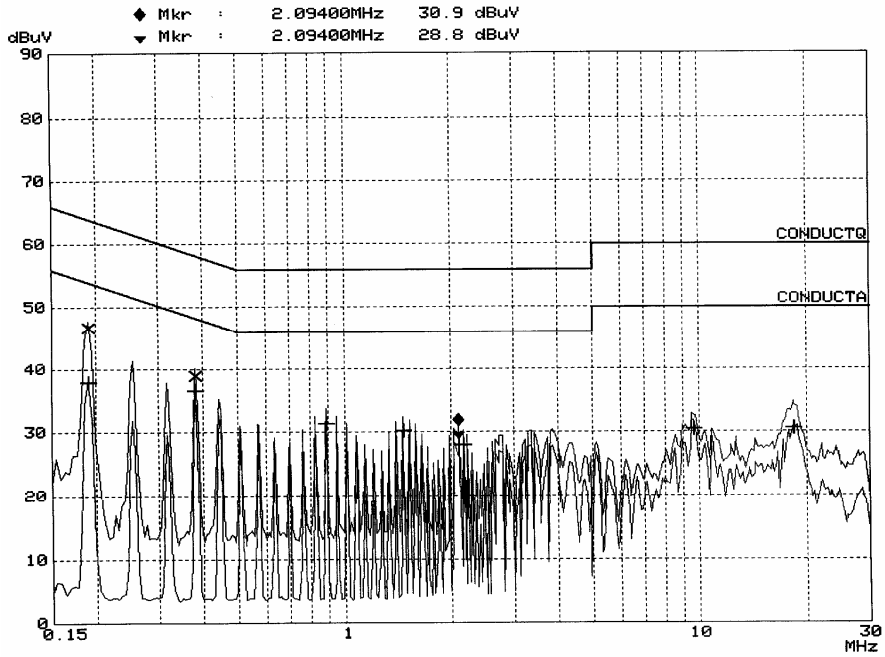
Line N Conducted Emission Graph

Line L (Hot Lead)								
Signal	**Frequency (MHz)**	**Corrected QP Level (d**	**Limits QP (dBuV)**	**Margin QP (dB)**	**Frequency (MHz)**	**Corrected AVE Level (dBuV)**	**Limits AVE (dBuV)**	**Margin AVE (dB)**
1	0.1905	49.9	63.9	-14.0	0.1905	41.4	53.9	-12.5
2	0.3795	42.7	58.2	-15.5	0.3795	33.5	48.2	-14.7
3	9.5720	31.5	60.0	-28.5	9.5720	29.8	50.0	-20.1
Line N (Neutral Lead)								
Signal	**Frequency (MHz)**	**Corrected QP Level (dBuV)**	**Limits QP (dBuV)**	**Margin QP (dB)**	**Frequency (MHz)**	**Corrected AVE Level (dBuV)**	**Limits AVE (dBuV)**	**Margin AVE (dB)**
1	0.1905	47.0	63.9	-16.9	0.1905	38.7	53.9	-15.2
2	0.3795	40.6	58.2	-17.6	0.3795	32.5	48.2	-15.7
3	9.5720	31.2	60.0	-28.8	9.5720	29.3	50.0	-20.6
Note: All readings are using a bandwidth of 9 kHz, with a 30 ms sweep time. A video filter was not used.								

For Model RFS2314



Line L Conducted Emission Graph



Line N Conducted Emission Graph

Line L (Hot Lead)								
Signal	**Frequency (MHz)**	**Corrected QP Level (dBuV)**	**Limits QP (dBuV)**	**Margin QP (dB)**	**Frequency (MHz)**	**Corrected AVE Level (dBuV)**	**Limits AVE (dBuV)**	**Margin AVE (dB)**
1	0.1905	49.6	63.9	-14.3	0.1905	40.1	53.9	-13.8
2	0.3795	40.8	58.2	-17.4	0.3795	36.6	48.2	-11.6
3	18.3290	34.0	60.0	-26.0	18.3290	31.6	50.0	-18.4
Line N (Neutral Lead)								
Signal	**Frequency (MHz)**	**Corrected QP Level (dBuV)**	**Limits QP (dBuV)**	**Margin QP (dB)**	**Frequency (MHz)**	**Corrected AVE Level (dBuV)**	**Limits AVE (dBuV)**	**Margin AVE (dB)**
1	0.1905	46.7	63.9	-17.3	0.1905	38.0	53.9	-15.9
2	0.3795	38.9	58.2	-19.3	0.3795	36.6	48.2	-11.6
3	18.3290	34.5	60.0	-25.5	18.3290	30.6	50.0	-19.4
Note: All readings are using a bandwidth of 9 kHz, with a 30 ms sweep time. A video filter was not used.								

Test Equipment	Model	Manufacturer	Serial No.	Last Cal.	Cal. Due
EMI receiver (9k-30M)	ESCS30	R&S	1102.4500.30	02/26/06	02/25/07
LISN	ESH3-Z5	R&S	831.5518.52	02/26/06	02/25/07
Shielded Room	P-22	China	---	02/20/06	02/19/07
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.					

SIGNED BY: Shi-xiting

ENGINEER

REVIEWED BY: Hanyzhao

SENIOR ENGINEER

FOR MODEL RFS2312

Conducted Emission Test Set-up - Front View

Conducted Emission Test Set-up - Front View