

**FCC PART 15 SUBPART C MEASUREMENT AND TEST REPORT**

**For**

**CIPA USA Inc.**

**3350 Griswold Road Port Huron, MI 48060**

**E.U.T.: RV Leveler**

**Model Name: 03001**

**Brand Name: CIPA**

**FCC ID: WEX03001**

**Report Number: NTC1412753F**

**Test Date(s): December 19, 2014 to January 05, 2015**

**Report Date(s): January 06, 2015**

**Prepared by**

**Dongguan Nore Testing Center Co., Ltd.**

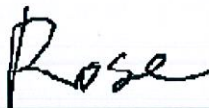
**Building D, Gaosheng Science and Technology Park, Hongtu Road,  
Nancheng District, Dongguan City, Guangdong, China**

**Tel: +86-769-22022444**

**Fax: +86-769-22022799**

**Prepared By**

**Approved & Authorized Signer**



**Rose Hu / Engineer**



**Sunm Lv / Q.A. Director**

**Note: This test report is for the customer shown above and their specific product only. It may not be duplicated or used in part without prior written consent from Dongguan Nore Testing Center Co., Ltd. The test results referenced from this report are relevant only to the sample tested.**

## Table of Contents

<b>1. GENERAL INFORMATION .....</b>	<b>3</b>
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST .....	3
1.2 RELATED SUBMITTAL(S) / GRANT (S).....	4
1.3 TEST METHODOLOGY .....	4
1.4 EQUIPMENT MODIFICATIONS .....	4
1.5 SUPPORT DEVICE .....	4
1.6 TEST FACILITY AND LOCATION.....	4
1.7 SUMMARY OF TEST RESULTS.....	4
<b>2. SYSTEM TEST CONFIGURATION.....</b>	<b>6</b>
2.1 EUT CONFIGURATION .....	6
2.2 SPECIAL ACCESSORIES.....	6
2.3 DESCRIPTION OF TEST MODES .....	6
2.4 EUT EXERCISE .....	6
<b>3. RADIATED EMISSION TEST .....</b>	<b>7</b>
3.1 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	7
3.2 MEASUREMENT PROCEDURE .....	8
3.3 LIMIT.....	9
3.4 MEASUREMENT RESULTS .....	10
<b>4. 20DB BANDWIDTH.....</b>	<b>12</b>
4.1 MEASUREMENT PROCEDURE .....	12
4.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	12
4.3 MEASUREMENT RESULTS.....	12
<b>5. BAND EDGE .....</b>	<b>14</b>
5.1 MEASUREMENT PROCEDURE .....	14
5.2 LIMIT.....	14
5.3 MEASUREMENT RESULTS.....	14
<b>6. ANTENNA APPLICATION .....</b>	<b>15</b>
6.1 ANTENNA REQUIREMENT .....	15
6.2 MEASUREMENT RESULTS.....	15
<b>7. TEST EQUIPMENT LIST.....</b>	<b>16</b>

## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment under Test

This device is a RV leveler. It's powered by DC 9V battery. For more details features, please refer to User's Manual.

Manufacturer	: Sheng Qi Electronic Technology Co., Ltd.
Address	: 4/F A, Xinchun Road, Guangming Industrial, Dongcheng District, Dongguan City, Guangdong Province, China
Product name	: RV Leveler
Model name	: 03001
Power Supply	: DC 9V battery
Operation Frequency	: 915MHz
Modulation Type	: FSK
Number of channel	: 1
Antenna Type	: PCB
Antenna Gain	: 0dBi (declaration by manufacturer)
<b>Note</b>	: None

## **1.2 Related Submittal(s) / Grant (s)**

This submittal(s) (test report) is intended for FCC ID: WEX03001 filing to comply with Section 15.249 of the FCC Part 15 (2014), Subpart C Rule.

## **1.3 Test Methodology**

The radiated emission measurement was performed according to the procedures in ANSI C63.4 (2009). Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters.

## **1.4 Equipment Modifications**

Not available for this EUT intended for grant.

## **1.5 Support Device**

None

## **1.6 Test Facility and Location**

Listed by FCC, August 02, 2011  
The Certificate Registration Number is 665078.  
Listed by Industry Canada, July 01, 2011  
The Certificate Registration Number is 46405-9743.

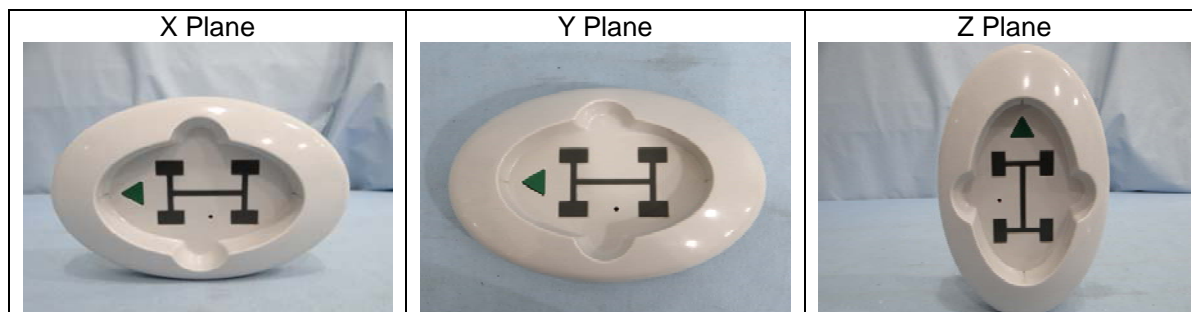
Dongguan NTC Co., Ltd.  
(Full Name: Dongguan Nore Testing Center Co., Ltd.)

Building D, Gaosheng Science and Technology Park, Hongtu Road,  
Nancheng District, Dongguan City, Guangdong, China  
(Full Name: Building D, Gaosheng Science & Technology Park,  
Zhouxi Longxi Road, Nancheng District, Dongguan, Guangdong, China.

## 1.7 Summary of Test Results

FCC Rules	Description Of Test	Result
§15.207	AC Power Conducted Emission	N/A <small>see note 3</small>
§15.249(c)	20dB Bandwidth	Compliant
§15.249(d)	Band edge test	Compliant
§15.249(a)(d), §15.209, §15.205	Radiated Emission	Compliant
§15.203	Antenna Requirement	Compliant

- Note: 1. The EUT has been tested as an independent unit. And continual transmitting in maximum power (The new battery be used during test.)
2. The EUT powered by battery and operating multiple positions, so the EUT shall be performed two or three orthogonal planes. The worst plane is Z.
3. Due to this EUT is powered by battery only, the AC Power Conducted Emission is not applicable.



## **2. System Test Configuration**

### **2.1 EUT Configuration**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### **2.2 Special Accessories**

Not available for this EUT intended for grant.

### **2.3 Description of test modes**

The EUT has been tested under operating condition..

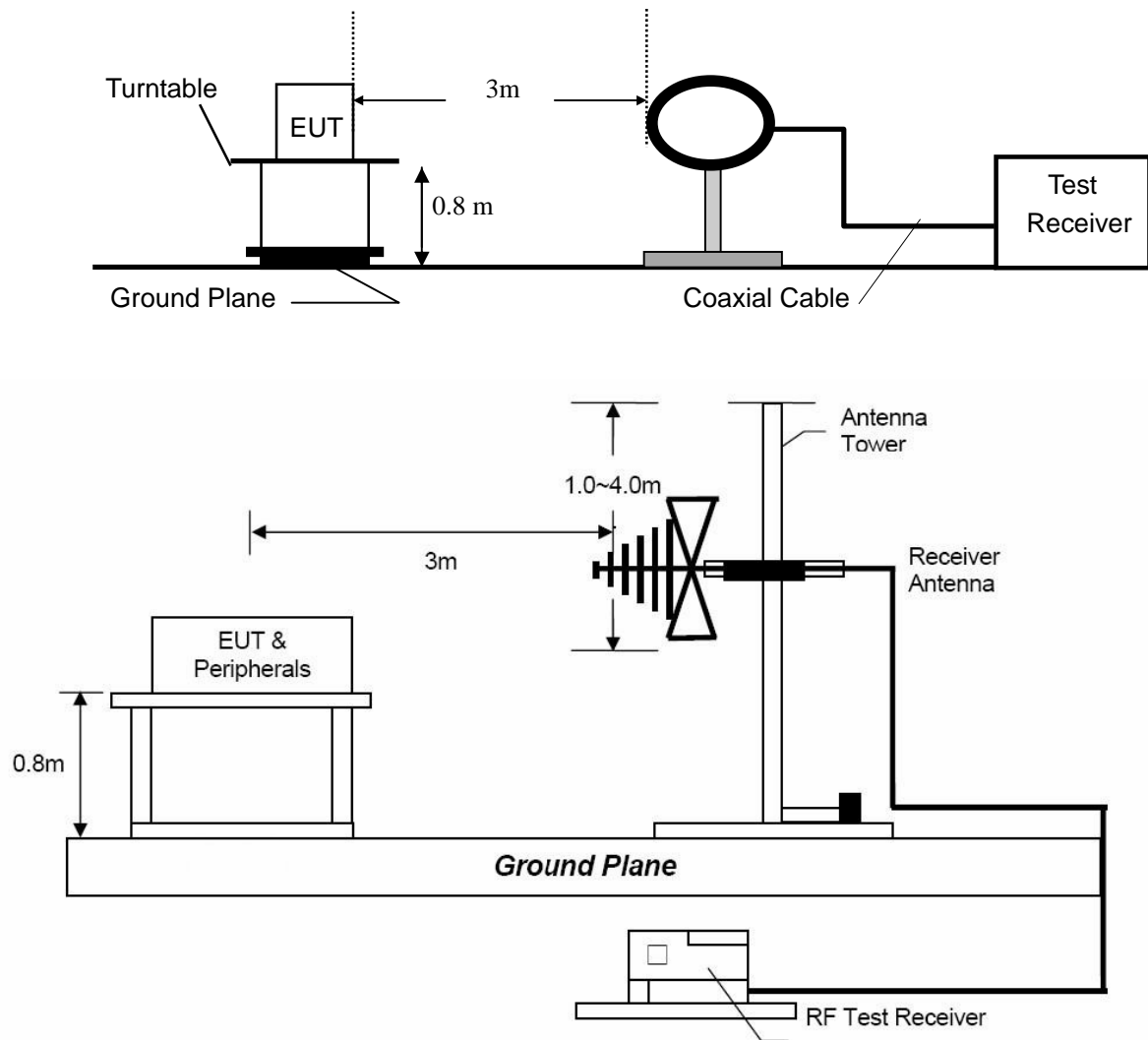
### **2.4 EUT Exercise**

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

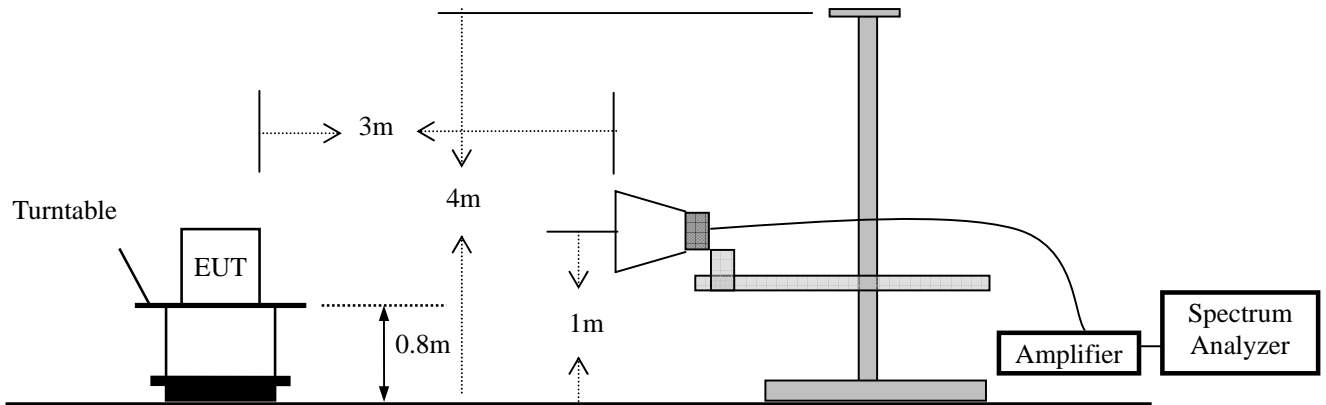
### 3. Radiated Emission Test

#### 3.1 Test SET-UP (Block Diagram of Configuration)

##### 3.1.1 Radiated Emission Test Set-Up, Frequency Below 30MHz



### 3.1.2 Radiated Emission Test Set-Up, Frequency above 1GHz



### 3.2 Measurement Procedure

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.



### 3.3 Limit

Frequency range MHz	Distance Meters	Field Strengths Limit (15.209)	
		$\mu\text{V/m}$	
0.009 ~ 0.490	300	2400/F(kHz)	
0.490 ~ 1.705	30	24000/F(kHz)	
1.705 ~ 30	30	30	
30 ~ 88	3	100	
88 ~ 216	3	150	
216 ~ 960	3	200	
Above 960	3	500	
Frequency range MHz	Distance Meters	Field Strengths Limit (15.249)	
		mV/m (Field strength of fundamental)	$\mu\text{V/m}$ (Field strength of Harmonics)
902 ~ 928	3	50	500
2400 ~ 2483.5	3	50	500
5725 ~ 5875	3	50	500
24000 ~ 2425000	3	250	2500

- Remark : (1) Emission level (dB) $\mu\text{V}$  = 20 log Emission level  $\mu\text{V/m}$   
 (2) The smaller limit shall apply at the cross point between two frequency bands.  
 (3) As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.  
 (4) The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.

### 3.4 Measurement Results

Operation Mode: TX  
Frequency Range: 9KHz~1GHz  
Test Result: PASS  
Measured Distance: 3m  
Test Date : Jan. 03, 2015

Temperature : 21 °C  
Humidity : 46 %  
Test By: Sance

Freq. (MHz)	Ant.Pol. H/V	Reading Level (dBuV)	Factor (dB/m)	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Note
54.2500	V	30.67	-16.25	14.42	40.00	-25.58	QP
96.9300	V	27.87	-16.03	11.84	43.50	-31.66	QP
<b>915.0000</b>	<b>V</b>	<b>91.30</b>	<b>-1.93</b>	<b>89.37</b>	<b>94.00</b>	<b>-4.63</b>	<b>QP</b>
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96.9300	H	31.06	-16.03	15.03	43.50	-28.47	QP
108.5700	H	30.73	-15.86	14.87	43.50	-28.63	QP
<b>915.0000</b>	<b>H</b>	<b>87.81</b>	<b>-1.93</b>	<b>85.88</b>	<b>94.00</b>	<b>-8.12</b>	<b>QP</b>
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Other emissions are lower than 10dB below the allowable limit.

**Note:**

- (1) Emission Level= Reading Level + Factor
- (2) Factor= Antenna Gain + Cable Loss – Amplifier Gain
- (3) Measurement uncertainty:  $\pm 3.4$ dB
- (4) Loop antenna used for the emission below 30MHz.
- (5) Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 10dB below the permissible limits.

Operation Mode: TX  
Frequency Range: 1-10GHz  
Test Result: PASS  
Measured Distance: 3m  
Test Date : Jan. 03, 2015  
Temperature : 21 °C  
Humidity : 46 %  
Test By: Sance

Freq. (MHz)	Ant.Pol. H/V	Reading Level (dBuV)	Factor (dB/m)	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Note
1830.000	V	47.10	5.96	53.06	74.00	-20.94	Peak
1830.000	V	--	--	--	54.00	--	AVG
2745.000	V	41.66	8.72	50.38	74.00	-23.62	Peak
2745.000	V	--	--	--	54.00	--	AVG
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1830.000	H	41.85	5.96	47.81	74.00	-26.19	Peak
1830.000	H	--	--	--	54.00	--	AVG
2745.000	H	44.40	8.72	53.12	74.00	-20.88	Peak
2745.000	H	--	--	--	54.00	--	AVG
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- Note:**
- (1) All Readings are Peak Value.
  - (2) Emission Level= Reading Level + Factor
  - (3) Factor= Antenna Gain + Cable Loss – Amplifier Gain
  - (4) Data of measurement within this frequency range shown “ ---” in the table above means there is no emission can be found.
  - (5) Measurement uncertainty:  $\pm 3.7\text{dB}$ .
  - (6) Horn antenna used for the emission over 1000MHz.
  - (7) Data of measurement within this frequency range shown “ --” in the table above means due to the PK results are all lower than the AV Limit, the AV measurement is not required for this case.

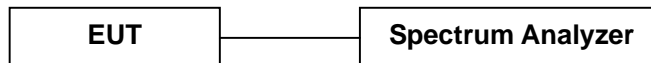
## 4. 20dB Bandwidth

### 4.1 Measurement Procedure

Maximum 20dB RF Bandwidth, FCC Rule 15.249:

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RBW was chosen so that the display was a result of the hopping channel modulation. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. Use the spectrum 20dB down delta function to measure the bandwidth.

### 4.2 Test SET-UP (Block Diagram of Configuration)

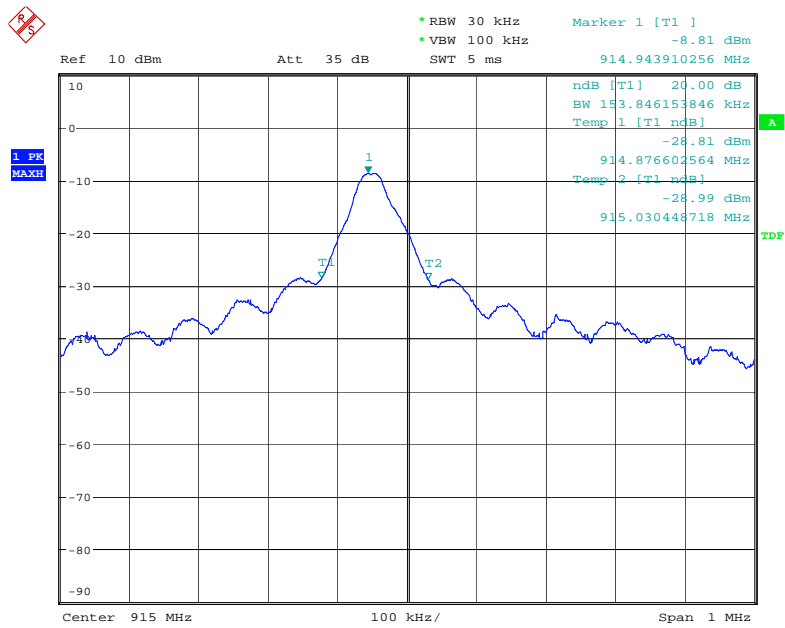


### 4.3 Measurement Results

Refer to attached data chart.

RBW:	30KHz	VBW:	100KHz
Spectrum Detector:	PK	Test By:	Sance
Test Date :	Jan. 05, 2015	Temperature :	21 °C
Test Result:	PASS	Humidity :	45 %

Channel frequency (MHz)	20dB Down BW(kHz)
915	153.85



Date: 5.JAN.2015 13:55:19

## 5. Band Edge

### 5.1 Measurement Procedure

Out of Band Conducted Emissions, FCC Rule 15.249:

The transmitter output is connected to spectrum analyzer. The resolution bandwidth is set to 100KHz, and the video bandwidth set to 300KHz.

### 5.2 Limit

15.249 In any 100KHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

### 5.3 Measurement Results

Please see below test table.  
For Radiated Emission

Freq. (MHz)	Ant.Pol. H/V	Reading Level (dBuV)	Factor (dB/m)	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Note
900.950	V	44.04	-2.14	41.90	46.00	-4.10	QP
928.050	V	42.89	-1.69	41.20	46.00	-4.80	QP
900.960	H	41.64	-2.14	39.50	46.00	-6.50	QP
928.060	H	35.99	-1.69	34.30	46.00	-11.70	QP

**Note:** (1) Emission Level= Reading Level + Factor  
(2) Factor= Antenna Gain + Cable Loss – Amplifier Gain

## **6. Antenna Application**

### **6.1 Antenna requirement**

According to of FCC part 15C section 15.203 and 15.240:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Systems operating in the 902~928MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

### **6.2 Measurement Results**

The antenna is integrated on the main PCB and no consideration of replacement, and the best case gain of the antenna is 0dBi. So, the antenna is consider meet the requirement.

## 7. Test Equipment List

Description	Manufacturer	Model Number	Serial Number	Characteristics	Calibration Date	Calibration Due Date
Test Receiver	Rohde & Schwarz	ESCI7	100837	9KHz~7GHz	Nov. 24, 2014	Nov. 23, 2015
Antenna	Schwarzbeck	VULB9162	9162-010	30MHz~7GHz	Nov. 27, 2014	Nov. 26, 2015
Positioning Controller	UC	UC 3000	N/A	0~360° , 1-4m	N/A	N/A
Single Phase Power Line Filter	SAEMC	PF201A-32	110210	32A	N/A	N/A
3 Phase Power Line Filter	SAEMC	PF401A-200	110318	200A	N/A	N/A
DC Power Filter	SAEMC	PF301A-200	110245	200A	N/A	N/A
Cable	Huber+Suhner	CBL2-NN-1M	22390001	9KHz~7GHz	Nov. 08, 2014	Nov. 07, 2015
Cable	Huber+Suhner	SF-104	MY16572/4	9KHz~25GHz	Nov. 08, 2014	Nov. 07, 2015
Power Amplifier	HP	HP 8447D	1145A00203	100KHz~1.3GHz	Nov. 08, 2014	Nov. 07, 2015
Horn Antenna	Schwarzbeck	BBHA9170	9170-372	15GHz~26.5GHz	Oct.24, 2014	Oct.23, 2015
Horn Antenna	Com-Power	AH-118	071078	1GHz~18GHz	Nov. 06, 2014	Nov. 05, 2015
Loop antenna	Daze	ZA30900A	0708	9KHz~30MHz	Oct.11, 2014	Oct.10, 2015
Spectrum Analyzer	Rohde & Schwarz	FSU26	200409/026	20Hz~26.5GHz	Sep. 02, 2014	Sep. 01, 2015
Pre-Amplifier	Agilent	8449B	3008A02964	1GHz~26.5GHz	Nov. 04, 2014	Nov. 03, 2015
L.I.S.N.	Rohde & Schwarz	ENV 216	101317	9KHz~30MHz	Nov. 08, 2014	Nov. 07, 2015

---End of report---