



# FCC RF Test Report

**Product Name: WCDMA Digital Mobile Phone**

**Model Number: HUAWEI G610-U15**

**Report No: SYBH(Z-RF)013062013-2004**

**FCC ID: QISG610-U15**

**Reliability Laboratory of Huawei Technologies Co., Ltd.**

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## Notice

1. The laboratory has Passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.
2. The laboratory has Passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01.
3. The laboratory has been listed by the US Federal Communications Commission to perform electromagnetic emission measurements. The site recognition number is 97456.
4. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-1 and 6369A-3.
5. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
6. The test report is invalid if there is any evidence of erasure and/or falsification.
7. The test report is only valid for the test samples.
8. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.



**Applicant:** Huawei Technologies Co., Ltd.  
**Address:** Administration Building, Headquarters of Huawei Technologies Co., Ltd.,  
Bantian, Longgang District, Shenzhen, 518129, P.R.C

**Date of Receipt Sample:** 2013-06-29  
**Start Date of Test:** 2013-06-30  
**End Date of Test:** 2013-07-07

**Test Result:** Pass

<b>Approved by Senior Engineer:</b>	2013-07-23	Dai Linjun	
	Date	Name	Signature

<b>Prepared by:</b>	2013-07-23	Guo Xingxing	
	Date	Name	Signature



### Modification Record

No.	Last Report No.	Modification Description
		First Report



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## 1 General Information

### 1.1 **Applied Standard**

Applied Rules: 47 CFR FCC Part 2, Subpart J 2012  
47 CFR FCC Part 15, Subpart C 2012

Test Method: FCC KDB 558074 D01 DTS Meas Guidance v03r01  
ANSI C63.10-2009, American National Standard for Testing Unlicensed  
Wireless Devices.

### 1.2 **Test Location**

Test Location 1: Reliability Laboratory of Huawei Technologies Co., Ltd.  
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd.,  
Bantian, Longgang District, Shenzhen, 518129, P.R.C

### 1.3 **Test Environment Condition**

Ambient Temperature: 19.5to 25 °C  
Ambient Relative Humidity: 40 to 55 %  
Atmospheric Pressure: Not applicable



## 2 Test Summary

Test Item	FCC Part No.	Requirements	Test Result	Verdict (NOTE 2)
DTS (6 dB) Bandwidth	15.247(a)(2)	$\geq 500$ kHz.	Appendix A	Pass
Maximum Peak Conducted Output Power	15.247(b)(3)	For directional gain: $< 30$ dBm – (G[dBi] – 6 [dB]), peak; Otherwise: $< 30$ dBm, peak.	Appendix B	Pass
Maximum Power Spectral Density Level	15.247(e)	For directional gain: $< 8$ dBm/3 kHz – (G[dBi] – 6 [dB]), peak. Otherwise: $< 8$ dBm/3 kHz, peak.	Appendix C	Pass
Band Edges Compliance	15.247(d)	$< -20$ dB/100 kHz if total peak power $\leq$ power limit.	Appendix D	Pass
Unwanted Emissions into Non-Restricted Frequency Bands			Appendix E	Pass
Unwanted Emissions into Restricted Frequency Bands (Radiated)	15.247(d) 15.209 (NOTE 1)	FCC Part 15.209 field strength limit;	Appendix F	Pass
AC Power Line Conducted Emissions	15.207	FCC Part 15.207 conducted limit;	Appendix G	Pass



### 3 Description of the Equipment under Test (EUT)

#### 3.1 General Description

WCDMA Digital Mobile Phone HUAWEI G610-U15 is subscriber equipment in the WCDMA/GSM system. HUAWEI G610-U15 supports GSM/GPRS/EDGE 850/1800/1900 and WCDMA850/1900. The Mobile Phone implements such functions as RF signal receiving/transmitting, UMTS and GSM protocol processing, voice, video, MMS service, GPS etc. Externally it provides micro SD card interface, earphone port (to provide voice service). It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

#### 3.2 EUT Identity

NOTE: Unless otherwise noted in the report, the functional boards installed in the units shall be selected from the below list, but not means all the functional boards listed below shall be installed in one unit.

##### 3.2.1 Board

Board		
Serial Number	Hardware Version	Software Version
157NAC1982900112	HD1G610M Ver.C	V100R001C00B101

##### 3.2.2 Sub-Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
AC/DC Adapter	HW-050100U2W(02220432)	Huawei Technologies Co., Ltd.	Input voltage: ~100-240V Output voltage:  5V/1A
Rechargeable Li-ion	HB505076RBC	Huawei Technologies Co., Ltd.	Rated capacity: 2150mAh Nominal Voltage:  +3.8V



### 3.3 Technical Description

Characteristics	Description			
IEEE 802.11 WLAN Mode Supported	<input checked="" type="checkbox"/> 802.11b (20 MHz channel bandwidth), <input checked="" type="checkbox"/> 802.11g (20 MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11n (20 MHz channel bandwidth), <input type="checkbox"/> 802.11n (40 MHz channel bandwidth)			
TX/RX Operating Range	2412-2462 MHz band	$f_c = 2407 \text{ MHz} + N * 5 \text{ MHz}$ , where: - $f_c$ = "Operating Frequency" in MHz, - $N$ = "Channel Number" with the range from 1 to 11 for the 20 MHz channel bandwidth		
Data Rate	802.11b	1 Mbps, 2 Mbps, 5.5 Mbps, 11 Mbps		
	802.11g	6 Mbps, 9 Mbps, 12 Mbps, 18 Mbps, 24 Mbps, 36 Mbps, 48 Mbps, 54 Mbps		
	802.11n (SISO)	MCS 0 to MCS 7		
Modulation Type	DBPSK/DQPSK/CCK (DSSS), BPSK/QPSK/16QAM/64QAM (OFDM).			
Emission Designator	9M77G1D (for 802.11b mode), 16M5G7D (for 802.11g mod), 17M8G7D (for 802.11n mode)			
TX Power Control	<input checked="" type="checkbox"/> Supported, <input type="checkbox"/> Not Supported			
Standby Mode	<input type="checkbox"/> Supported, <input checked="" type="checkbox"/> Not Supported			
Equipment Type	<input type="checkbox"/> Stand-alone equipment, <input type="checkbox"/> Plug-in radio device, <input checked="" type="checkbox"/> Combined equipment			
Antenna	Description	Isotropic Antenna		
	Type	<input type="checkbox"/> External, <input checked="" type="checkbox"/> Integrated		
	Ports	<input checked="" type="checkbox"/> Ant 1, <input type="checkbox"/> Ant 2, <input type="checkbox"/> Ant 3		
	Smart System	<input checked="" type="checkbox"/> SISO (for 802.11b/g/n), <input type="checkbox"/> MIMO (for 802.11n): 2 Tx & 2 Rx, <input type="checkbox"/> Diversity (for 802.11b/g) :       Tx &       Rx		
	Gain	-2.3 dBi (per antenna port, max.)		
	Remark	When the EUT is put into service, the practical maximum antenna gain should NOT exceed the value as described above.		
Power Supply	Type	<input checked="" type="checkbox"/> AC/DC Adapter	<input type="checkbox"/> PoE:	<input type="checkbox"/> Other:



## 4 General Test Conditions / Configurations

### 4.1 Test Modes

NOTE: Worst cases for each IEEE 802.11 mode are selected to perform tests.

Test Mode	Test Modes Description
11B	IEEE 802.11b with data rate of 11 Mbps using SISO mode.
11G	IEEE 802.11g with data rate of 54 Mbps using SISO mode.
11N20	IEEE 802.11n with data date of MCS7 and bandwidth of 20 MHz using SISO mode.



## 4.2 EUT Configurations

### 4.2.1 General Configurations

Configuration	Description
Test Antenna Ports	Until otherwise specified, <ul style="list-style-type: none"><li>- All TX tests are performed at all TX antenna ports of the EUT, and</li><li>- All RX tests are performed at all RX antenna ports of the EUT.</li></ul>
Multiple RF Sources	Other than the tested RF source of the EUT, other RF source(s) are disabled or shutdown during measurements.

### 4.2.2 Customized Configurations

Test Mode	RF Ch.	Antenna Port	TX Freq. [MHz]	RX Freq. [MHz]	Ch. BW [MHz]
11B	L	Ant 1	Ch No. 1 / 2412 MHz	---	20
11B	M	Ant 1	Ch No. 6 / 2437 MHz	---	20
11B	H	Ant 1	Ch No. 11 / 2462 MHz	---	20
11G	L	Ant 1	Ch No. 1 / 2412 MHz	---	20
11G	M	Ant 1	Ch No. 6 / 2437 MHz	---	20
11G	H	Ant 1	Ch No. 11 / 2462 MHz	---	20
11N20	L	Ant 1	Ch No. 1 / 2412 MHz	---	20
11N20	M	Ant 1	Ch No. 6 / 2437 MHz	---	20
11N20	H	Ant 1	Ch No. 11 / 2462 MHz	---	20



### 4.3 Test Environments

NOTE: The values used in the test report may be stringent than the declared.

Environment Parameter	Selected Values During Tests		
	Temperature	Voltage	Relative Humidity
NTNV	Ambient	3.8 VDC	Ambient

### 4.4 Antenna requirements

**Excerpt from §15.203 of the FCC Rules/Regulations:**

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 shall be considered sufficient to comply with the provisions of this section.”

The antennas of the Huawei Mobile Phone are **permanently attached**.

There are no provisions for connection to an external antenna.

**Conclusion:**

The **Huawei Mobile Phone FCC ID: QISG610-U15** unit complies with the requirement of §15.203.

**Ch. Frequency (MHz)**

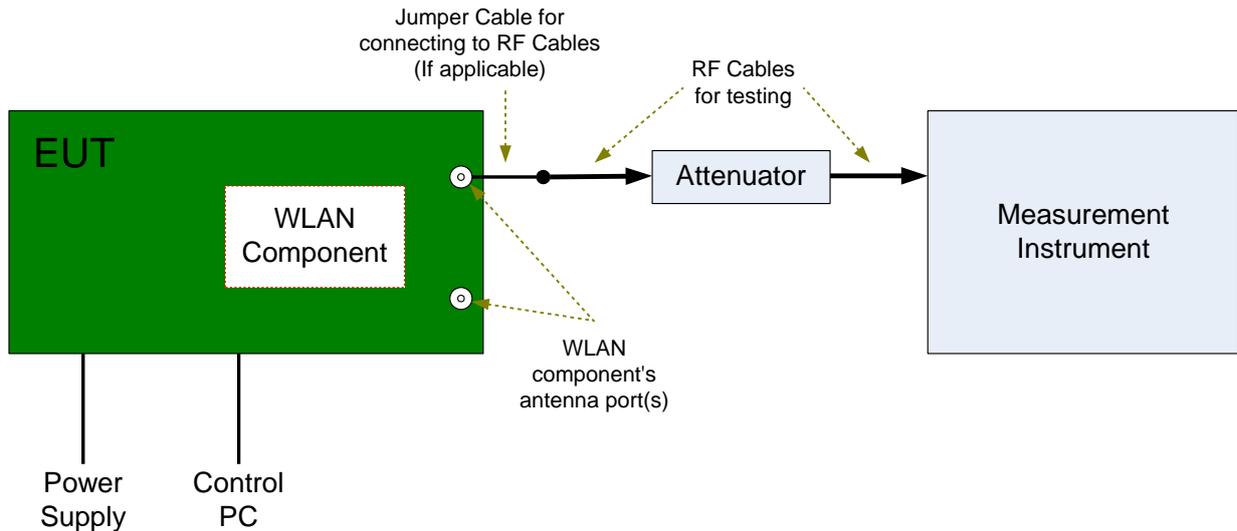
Ch.	Frequency (MHz)
<b>01</b>	<b>2412</b>
.	.
.	.
<b>06</b>	<b>2437</b>
.	.
.	.
<b>11</b>	<b>2462</b>

**Frequency/ Channel Operations**

## 4.5 Test Setups

### 4.5.1 Test Setup 1

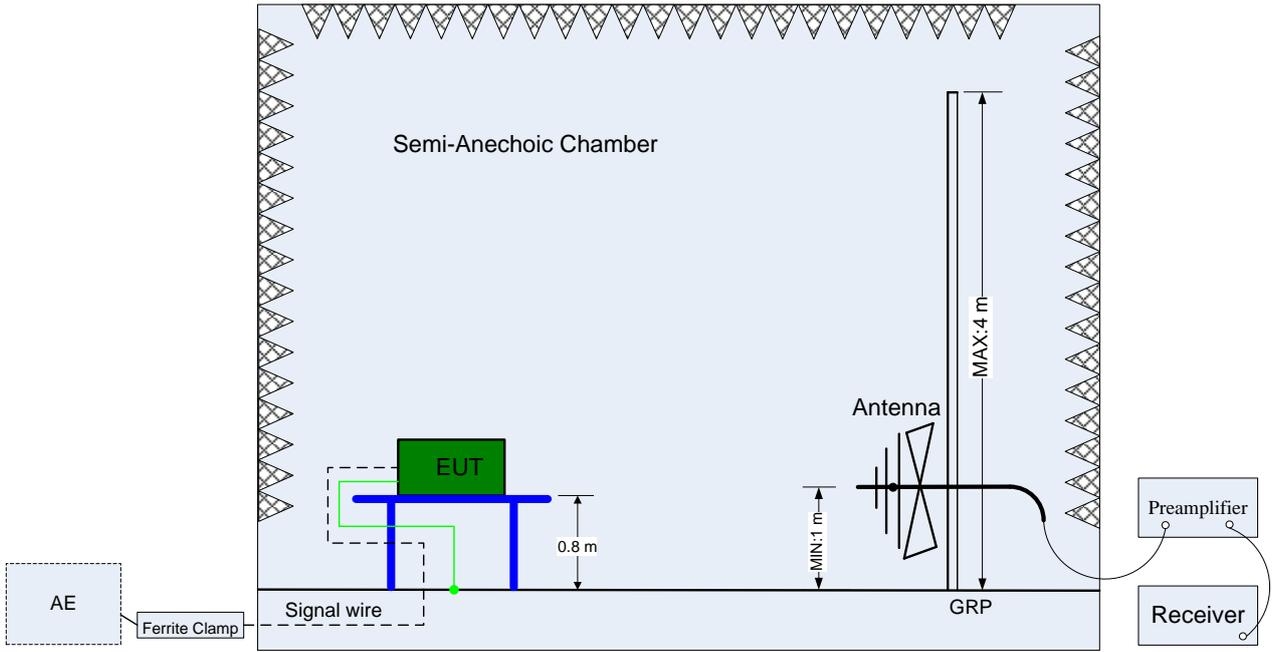
The WLAN component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



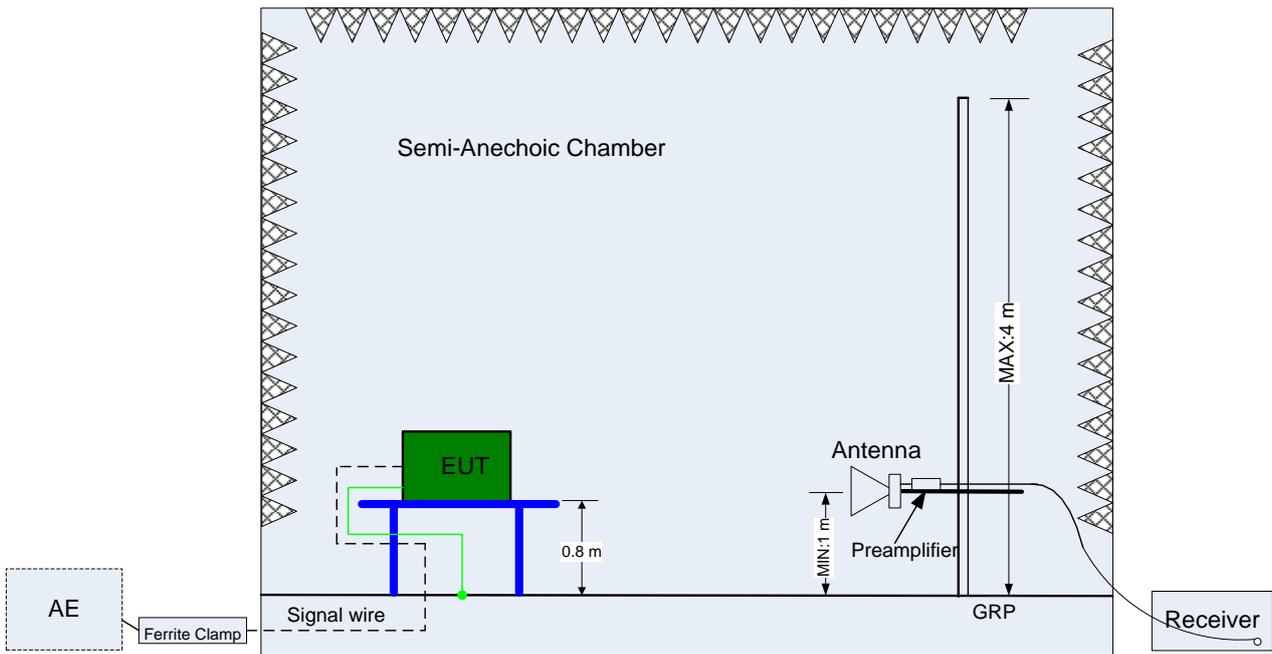
### 4.5.2 Test Setup 2

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.4. The test distance is 3m. The setup is according to ANSI C63.4 and CAN/CSA-CEI/IEC CISPR 22.

The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).



(Below 1 GHz)

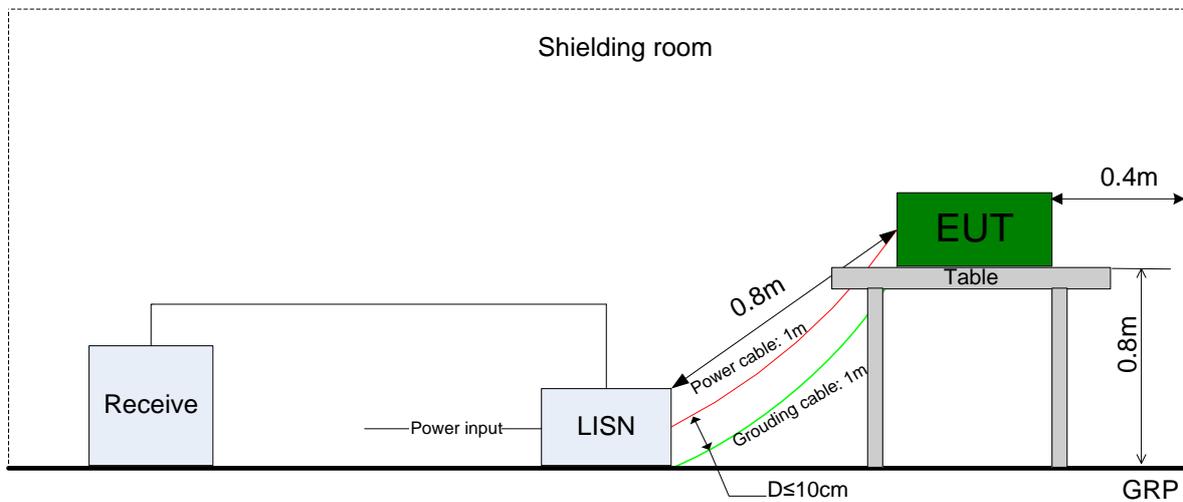


(Above 1 GHz)

### 4.5.3 Test Setup 3

The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.





## 4.6 Test Conditions

Test Case	Test Conditions	
	Configuration	Description
DTS (6 dB) Bandwidth	Measurement Method	FCC KDB 558074 §8.2 Option 2.
	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11B_L, 11B_M, 11B_H 11G_L, 11G_M, 11G_H 11N20_L, 11 N20_M, 11 N20_H
Occupied Bandwidth (Only for IC requirement)	Measurement Method	RSS-Gen, 4.6.1.
	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11B_L, 11B_M, 11B_H 11G_L, 11G_M, 11G_H 11N20_L, 11 N20_M, 11 N20_H
Maximum Peak Conducted Output Power	Measurement Method	FCC KDB 558074 §9.1 .2 (integrated band power method).
	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11B_L, 11B_M, 11B_H 11G_L, 11G_M, 11G_H 11N20_L, 11 N20_M, 11 N20_H
Maximum Power Spectral Density Level	Measurement Method	FCC KDB 558074 §10.2 (peak PSD).
	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11B_L, 11B_M, 11B_H 11G_L, 11G_M, 11G_H 11N20_L, 11 N20_M, 11 N20_H
Band Edges Compliance	Measurement Method	FCC KDB 558074 §13.0.
	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11B_L, 11B_H 11G_L, 11G_H 11N20_L, 11 N20_H
Unwanted Emissions into Non-Restricted Frequency Bands	Measurement Method	FCC KDB 558074 §11.0
	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11B_L, 11B_M, 11B_H 11G_L, 11G_M, 11G_H 11N20_L, 11 N20_M, 11 N20_H
Unwanted	Measurement Method	ANSI C63.10; FCC KDB 558074 §12.1, Radiated



Test Case	Test Conditions	
	Configuration	Description
Emissions into Restricted Frequency Bands (Radiated)	Test Environment	NTNV
	Test Setup	Test Setup 2
	EUT Placement	<input type="checkbox"/> Flatwise, <input type="checkbox"/> Upright, <input type="checkbox"/> Hung
	EUT Configuration	(1) 30 MHz to 1 GHz: 11B_L (Worst Conf.). (2) 1 GHz to 3 GHz: 11B_L, 11B_H 11G_L, 11G_H 11N20_L, 11 N20_H (3) 3 GHz to 18 GHz: 11B_L (Worse Conf.), 11B_H (Worse Conf.). (4) 18 GHz to 26.5 GHz: 11B_L (Worse Conf.), 11B_H (Worse Conf.).
AC Power Line Conducted Emissions	Measurement Method	AC mains conducted.
	Test Environment	NTNV
	Test Setup	Test Setup 3
	EUT Configuration	11B_L(Worst Conf.).



## 5 Main Test Instruments

Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal- Due
Power supply	KEITHLEY	2303	1288003	2012-11-19	2014-11-18
Spectrum Analyzer	Agilent	E4440A	MY48250119	2012-08-20	2013-08-19
Signal Analyzer	R&S	FSQ31	200021	2012-11-09	2013-11-08
Spectrum Analyzer	Agilent	N9030A	MY49431698	2012-11-09	2013-11-08
Temperature Chamber	WEISS	WKL64	56246002940010	2013-01-29	2014-01-28
Signal generator	Agilent	E8257D	MY49281095	2012-09-14	2013-09-13
Spectrum analyzer	R&S	FSU3	200474	2013-01-29	2014-01-28
Test receiver	R&S	ESU26	100150	2013-05-15	2014-05-14
Spectrum analyzer	R&S	FSU43	100144	2013-01-29	2014-01-28
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100304	2013-02-02	2014-02-01
Trilog Broadband Antenna (30M~3GHz)	SCHWARZBE CK	VULB 9163	9163-521	2011-12-09	2013-12-08
Pyramidal Horn Antenna(18GHz-26-5 GHz)	ETS-Lindgren	3160-09	00091989	2011-10-20	2013-10-19

END