

FCC RF Test Report

Product Name: LTE/UMTS Smart Phone; HUAWEI Ascend G6

Model Number: HUAWEI G6-L22, G6-L22

Report No: SYBH(Z-RF)008022014-2005

FCC ID: QISG6-L22

Reliability Laboratory of Huawei Technologies Co., Ltd.

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District,
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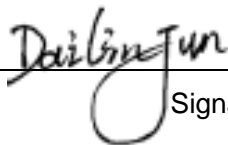
Notice

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-2.
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.
1. The laboratory has Passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.



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 Test Item: 2014-02-05
Start Date of Test: 2014-02-14
End Date of Test: 2014-02-22

Test Result: Pass

Approved by Senior Engineer: 2014-02-24 Dai Linjun
Date Name  Signature

Prepared by: 2014-02-25 Hexiaolin
Date Name  Signature



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1 General Information

1.1 Applied Standard	
Applied Rules:	FCC Part 15 Subpart C (15.225): 2012
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 Environmental Condition	
Ambient Temperature:	20 – 25 °C
Ambient Relative Humidity:	45 – 55 %
Atmospheric Pressure:	101 kPa



2 Summary

Table 1 Summary of results

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE					
15.225 (a)	In-Band Emissions	15,848 μ V/m @ 30m 13.553 – 13.567 MHz	RADIATED	SYBH(Z-RF)012012 014-2005	Section 4.2
2.1049	20 dB Bandwidth	N/A		SYBH(Z-RF)012012 014-2005	Section 4.1
15.225(b)	In-Band Emissions	334 μ V/m @ 30m 13.410 – 13.553 MHz 13.567 – 13.710 MHz		SYBH(Z-RF)012012 014-2005	Section 4.2
15.225(c)	In-Band Emissions	106 μ V/m @ 30m 13.110 – 13.410 MHz 13.710 – 14.010 MHz		SYBH(Z-RF)012012 014-2005	Section 4.2
15.225(d) 15.209	Out-of-Band Emissions	Emissions outside of the specified band (13.110 – 14.010 MHz) must meet the radiated limits detailed in 15.209		SYBH(Z-RF)012012 014-2005	Section 4.3
15.225(e)	Frequency Stability Tolerance	\pm 0.01% of Operating Frequency	Temperature Chamber	SYBH(Z-RF)012012 014-2005	Section 4.4
15.207	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 limits	LINE CONDUCTED	SYBH(Z-RF)012012 014-2005	Part 15B report



3 Product Description

3.1 Product Information

3.1.1 General Description

HUAWEI G6-L22, G6-L22 is subscriber equipment in the LTE/WCDMA/GSM system. The HSPA/UMTS frequency band is Band I and Band V and Band VIII. The LTE frequency band is B3 and B7 and B1. The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900. The Mobile Phone implements such functions as RF signal receiving/transmitting, LTE/HSPA/UMTS and GSM/GPRS/EDGE protocol processing, voice, video MMS service, GPS, AGPS, NFC and WIFI etc. Externally it provides micro SD card interface, earphone port (to provide voice service) and USIM card interface. 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.

The mobile phone G6-L11, G6-L22, and G6-L33 are LTE/UMTS mobile phone with Bluetooth

The differences among G6-L11, G6-L22, and G6-L33 are showed in the following table. Other parts of the mobile phone are the same, including the appearance, the antenna, Chipset, Bluetooth mode, Wifi mode, Adapter, Battery, Mainboard and so on.

	G6-L11	G6-L22	G6-L33
GSM four bands	the same	the same	the same
WCDMA bands	B1/B8	B1/B5/B8	B1/B2/B4/B5
LTE bands	B3/B7/B20	B1/B3/B7	B2/B4/B7
FCC bands	GSM850/1900 LTE B7	GSM850/1900 W850 LTE B7	GSM850/1900 W1900/AWS/W850 LTE B2 B4 B7
FLASH	the same	the same	the same
Mainboard	the same	the same	the same
PCB layout	the same	the same	the same
Appearance	the same	the same	the same
NFC	the same	the same	the same
Bluetooth mode	the same	the same	the same
WLAN mode	the same	the same	the same
BT/ WLAN antenna	the same	the same	the same
GSM/ WCDMA/LTE antenna	the same	the same	the same
External camera	800M	the same	the same



internal camera	100M	the same	the same
Adapter	the same	the same	the same
Battery	the same	the same	the same
Chipset	the same	the same	the same
Memory	the same	the same	the same
RF Parameter	The same RF Parameter in the same band	The same RF Parameter in the same band	The same RF Parameter in the same band
Dimension	the same	the same	the same
Main Frequency NV	The same NV in the same band	The same NV in the same band	The same NV in the same band

So the NFC test cases refer to No SYBH(Z-RF)012012014-2005 of G6-L11.


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		
Software Version	Hardware Version	Description
G6-L22V100R001C00B105	HL1G6L22M	Main Board


3.2.2 Sub-Assembly


AC/DCAdapter Model	HW-050100U2W
Manufacturer	Huawei Technologies Co., Ltd.
Input Voltage	~100-240V 50/60Hz 0.2A
Output Voltage	5V  1A
Rated Power	5W



AC/DCAdapter Model	HW-050100E2W
Manufacturer	Huawei Technologies Co., Ltd.
Input Voltage	~100-240V 50/60Hz 0.2A
Output Voltage	5V  1A
Rated Power	5W

AC/DCAdapter Model	HW-050100B2W
Manufacturer	Huawei Technologies Co., Ltd.



Input Voltage	~100-240V 50/60Hz 0.2A
Output Voltage	5V  1A
Rated Power	5W

AC/DCAdapter Model	HW-050100A2W
Manufacturer	Huawei Technologies Co., Ltd.
Input Voltage	~100-240V 50/60Hz 0.2A
Output Voltage	5V  1A
Rated Power	5W

Name	Manufacture	Description
Rechargeable Li-ion	Huawei Technologies Co., Ltd.	Battery Model: HB3742A0EBC Rated capacity: 2000mAh Nominal Voltage:  +3.8V Charging Voltage:  +4.35V



4 Main Test Instruments

Table 2 Main Test Equipments

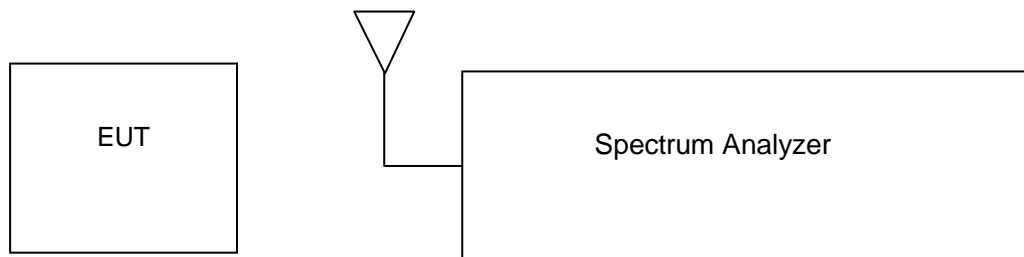
Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal- Due
Power supply	KEITHLEY	2303	1288003	2012-11-19	2014-11-18
Wireless Communication Test set	Agilent	N4010A	MY49081592	2013-10-29	2014-10-28
Universal Radio Communication Tester	R&S	CMU200	113164	2013-07-18	2014-07-17
Universal Radio Communication Tester	R & S	CMW500	126855	2013-08-08	2015-08-09
Spectrum Analyzer	Agilent	E4440A	MY48250119	2013-08-09	2014-08-08
Signal Analyzer	R&S	FSQ31	200021	2013-10-29	2014-10-28
Spectrum Analyzer	Agilent	N9030A	MY49431698	2013-10-29	2014-10-28
Temperature Chamber	ESPEC	MW3030	06114003	2013-05-14	2014-05-13
Signal generator	Agilent	E8257D	MY51500314	2013-04-15	2014-04-14
Vector Signal Generator	R&S	SMU200A	104162	2013-10-29	2014-10-28
Test receiver	R&S	ESU26	100150	2013-05-15	2014-05-14
Spectrum analyzer	R&S	FSU3	200474	2013-12-24	2014-12-23
Spectrum analyzer	R&S	FSU43	100144	2013-12-24	2014-12-23
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100304	2013-02-02	2015-02-01
Trilog Broadband Antenna (30M~3GHz)	SCHWARZ BECK	VULB 9163	9163-490	2013-02-02	2015-02-01
LOOP Antennas(9kHz-30MHz)	R&S	HFH2-Z2	100262	2013-03-23	2015-03-22
Pyramidal Horn Antenna(18GHz-26-5GHz)	ETS-LINDGREN	3160-09	5140299	2013-03-05	2015-03-04
Artificial Mains Network	R&S	ENV4200	100134	2013-12-24	2014-12-23
Artificial Mains Network	R&S	ENV216	100382	2013-12-24	2014-12-23

5 Test Results

5.1 20dB Bandwidth Measurement

The 20dB bandwidth is measured with a spectrum analyzer connected via a receive antenna placed near the EUT while the EUT is operating in transmission mode.

5.1.1 Test Setup



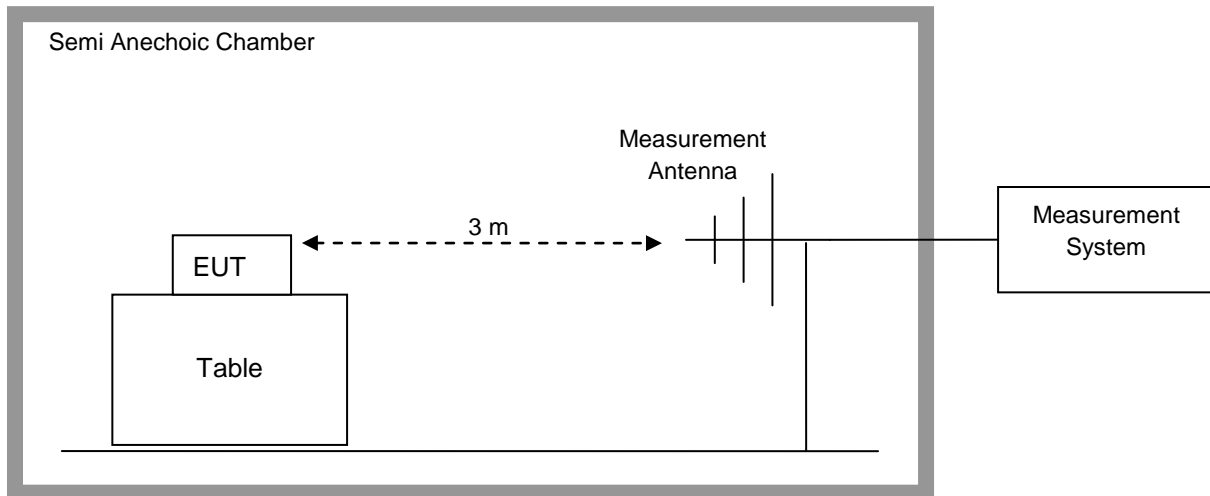
5.1.2 Test Result

Frequency	Occupied Bandwidth
13.56MHz	200KHz

The result of the measurement is passed.

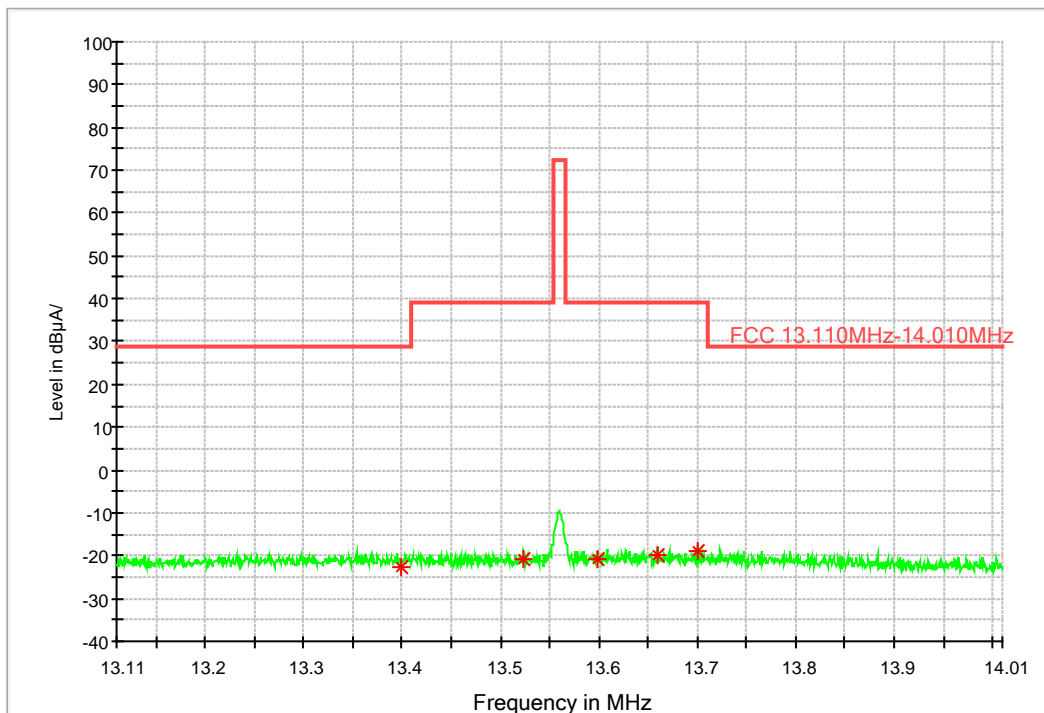
5.2 In-Band Radiated Spurious Emission Measurements

5.2.1 Test Setup



5.2.2 Test Result

FCC Loop Antenna 13.110MHz-14.010MHz





Frequency (MHz)	QuasiPeak (dB μ A/m)	Bandwidth (kHz)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ A/m)
13.399728	-22.6	9.000	V	17.0	-31.2	51.6	29.0
13.524000	-20.9	9.000	V	145.0	-31.2	59.9	39.0
13.598576	-20.7	9.000	V	213.0	-31.2	59.7	39.0
13.659352	-20.0	9.000	V	15.0	-31.2	59.0	39.0
13.700664	-19.0	9.000	V	24.0	-31.2	58.0	39.0

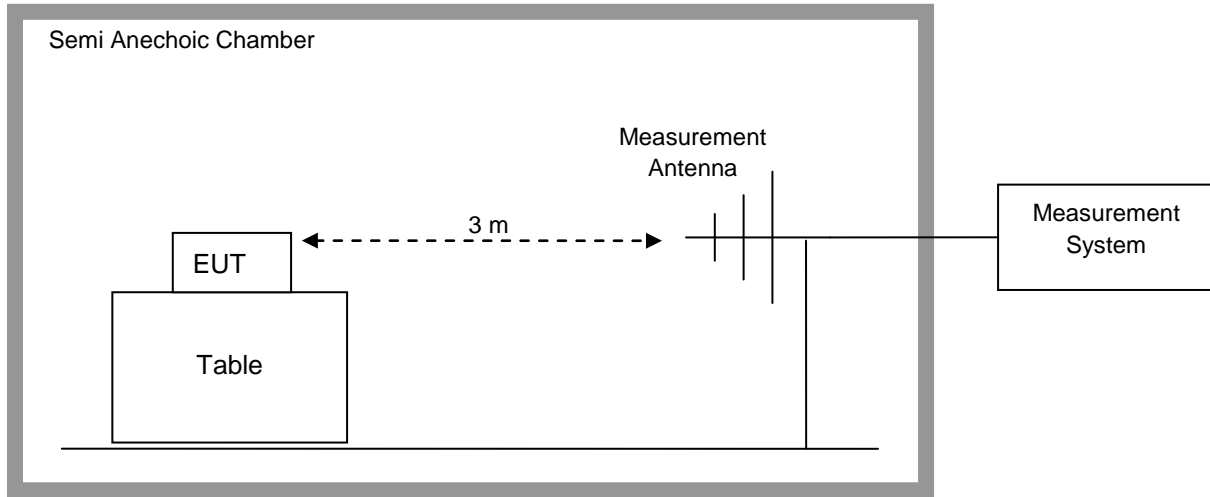
NOTES:

1. All measurements were performed using a loop antenna. The antenna was positioned in three orthogonal positions (X front, Y side, Z top) and the position with the highest emission level was recorded.
2. Measurements were performed at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2). Extrapolation Factor = $20 \log_{10}(30/3)^2 = 40\text{dB}$
3. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector.

The result of the measurement is passed.

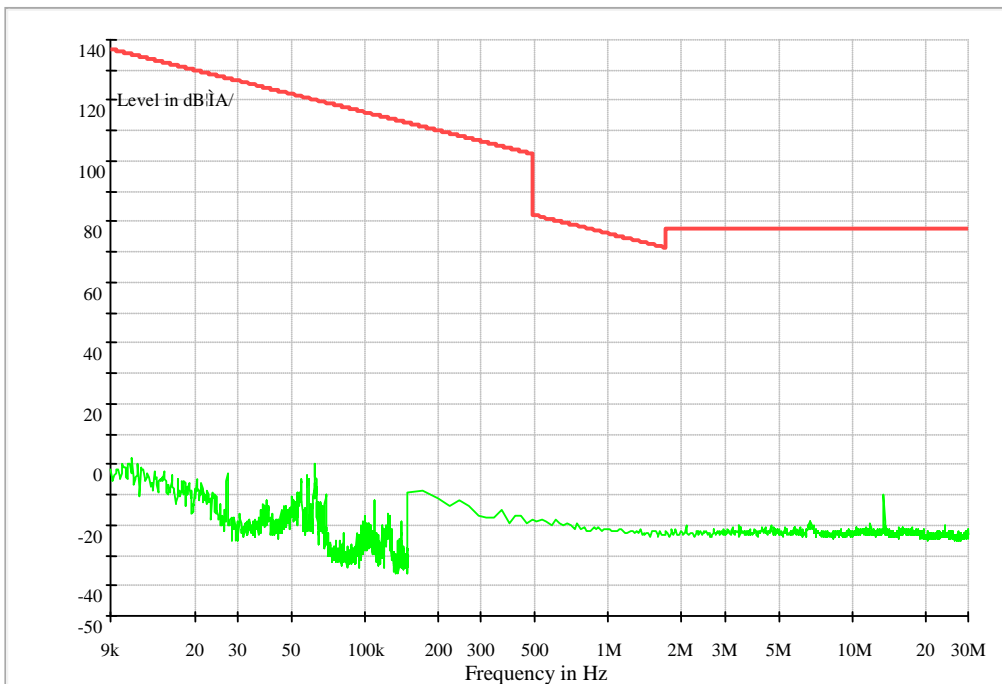
5.3 Radiated Spurious Emission Measurements, Out-of-Band

5.3.1 Test Setup



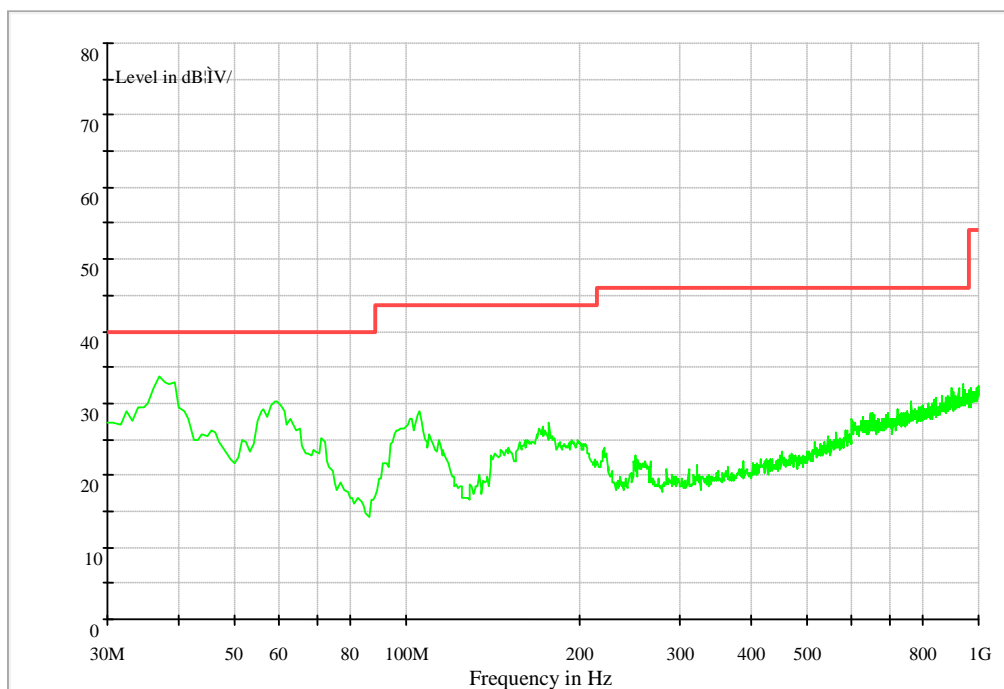
5.3.2 Test Result

9k~30MHz





30M~1GHz



NOTES:

1. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector for emissions below 960MHz.
2. Both Vertical and Horizontal polarities of the receive antenna were evaluated with the worst case emissions being reported. Below 30MHz the Loop antenna was positioned in 3 separate radials.
3. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
4. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.

The result of the measurement is passed.



5.4 Frequency Stability

5.4.1 Test Setup

The EUT was placed in a Climatic Chamber. A small whip antenna was placed close to the EUT, and connected to the measuring Spectrum Analyzer. Measurement performed without modulation on TX.

5.4.2 Test Result

VOLTAGE (%)	POWER Battery	TEMP (°C)	Frequency (MHz)	Freq. Dev. (Hz)	Deviation (%)
100%		-20	13559980	-20	-0.000147492625
100%		-10	13559983	-17	-0.000125368732
100%		0	13560016	16	0.000117994100
100%		10	13560011	11	0.000081120944
100%		20	13560007	7	0.000051622419
100%		30	13560012	12	0.000088495575
100%		40	13560015	15	0.000110619469
100%		50	13559987	-13	-0.000095870206
Battery End Point	3.5	20	13560010	10	0.000073746313
115%	4.35	20	13559987	-13	-0.000095870206

The result of the measurement is passed.

-----The END-----