FCC RF Test Report

Product Name: Smart Phone

Model Number: HUAWEI MT1-U06, MT1-U06

Report No: SYBH(Z-RF)001022013-2005

FCC ID: QISMT1-U06N

Reliability Laboratory of Huawei Technologies Co., Ltd.

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
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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 laboratory has been listed by the VCCI to perform EMC measurements. The accreditation numbers of test site No.1 are R-2364, G-415, C-2583, and T-256, and the accreditation numbers of test site No.2 are R-3760, G-485, C-4210 and T-1237.
6. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
7. The test report is invalid if there is any evidence of erasure and/or falsification.
8. The test report is only valid for the test samples.
9. 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 Test Item:	2013-02-03
Start Date of Test:	2013-02-05
End Date of Test:	2013-02-16
Test Result:	Pass

Approved by Senior Engineer:	2013-3-21	Dai Linjun	Dai Linjun
	Date	Name	Signature
Prepared by:	2013-3-21	Zhong Yaning	Zhong Yaning
	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	15,848μV/m @ 30m 13.553 – 13.567 MHz	RADIATED	Pass	Section 4.2
2.1049	20 dB Bandwidth	N/A		Pass	Section 4.1
15.225(b)	In-Band Emissions	334μV/m @ 30m 13.410 – 13.553 MHz 13.567 – 13.710 MHz		Pass	Section 4.2
15.225(c)	In-Band Emissions	106μV/m @ 30m 13.110 – 13.410 MHz 13.710 – 14.010 MHz		Pass	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		Pass	Section 4.3
15.225(e)	Frequency Stability Tolerance	± 0.01% of Operating Frequency	Temperature Chamber	Pass	Section 4.4
15.207	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 limits	LINE CONDUCTED	Pass	Part 15B report

3 Product Description

3.1 Product Information

3.1.1 General Description

HUAWEI MT1-U06, MT1-U06 is subscriber equipment in the UMTS/GSM system. The HSUPA/HSDPA/UMTS frequency band is Band I, Band II, Band IV, Band V and Band VIII. 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, UMTS/GSM protocol processing, voice, video, MMS service, GPS, AGPS, NFC and WIFI etc. Externally it provides 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.
There are two different types of HUAWEI MT1-U06, MT1-U06. One is with NFC function, its FCC ID is QISMT1-U06N, the other is without NFC function, its FCC ID is QISMT1-U06. The others are the same, including circuit design, PCB board, structure. With the consideration of the identities and differences list above, all the RF tests were conducted to the EUT with NFC function.

NOTE: Only NFC test data included in this report.

1.4 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.

1.4.1 Board

Board		
Hardware Version	Serial Number	Description
HD1U9900M	MT1-U06V100R001C00B104SP03	Main board of Mobile Phone

1.4.2 Sub-Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
AC/DC Adapter	HW-050200A3W	Huawei Technologies Co., Ltd.	Input voltage: ~100-240V 50/60Hz 0.5A Output voltage: 5V ⎓ 2A Rated Power: 10W

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
AC/DC Adapter	HW-050200B3W	Huawei Technologies Co., Ltd.	Input voltage: ~100-240V 50/60Hz 0.5A Output voltage: 5V ⎓ 2A

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
			Rated Power: 10W

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
AC/DC Adapter	HW-050200E3W	Huawei Technologies Co., Ltd.	Input voltage: ~100-240V 50/60Hz 0.5A Output voltage: 5V ⎓ 2A Rated Power: 10W

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
AC/DC Adapter	HW-050200U3W	Huawei Technologies Co., Ltd.	Input voltage: ~100-240V 50/60Hz 0.5A Output voltage: 5V ⎓ 2A Rated Power: 10W

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
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
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)	SCHWARZBECK	VULB 9163	9163-521	2011-12-09	2013-12-08
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100391	2011-10-12	2013-10-11

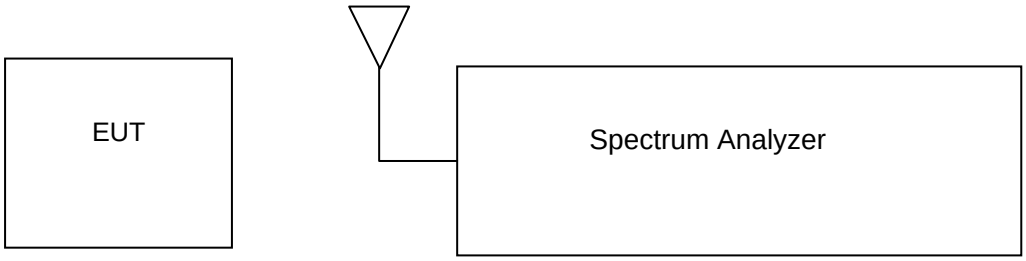
NOTE: All the test equipment are calibrated once a year.

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



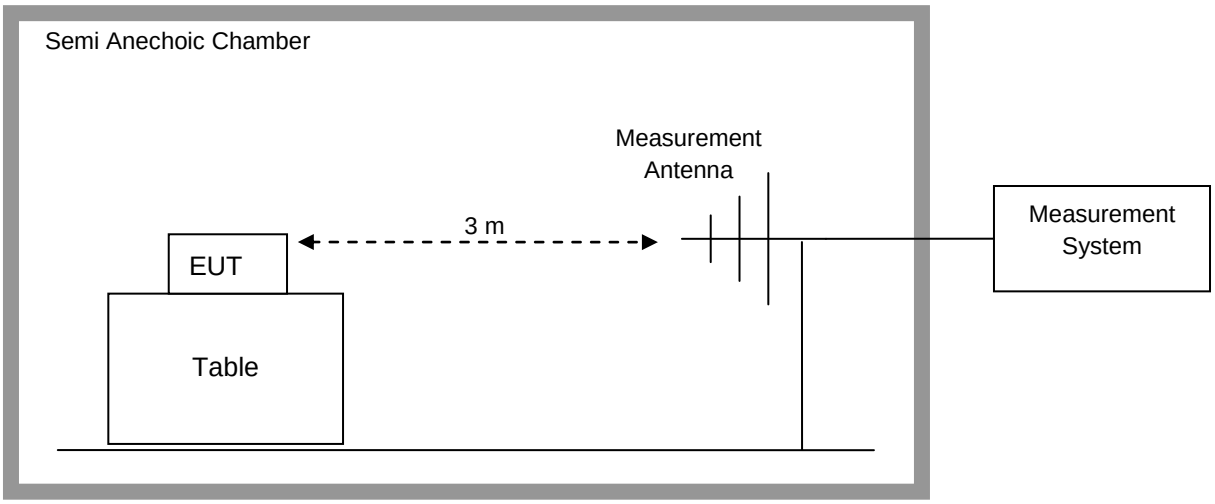
5.1.2 Test Result

Frequency	Occupied Bandwidth
13.56MHz	200KHz

The result of the measurement is passed.

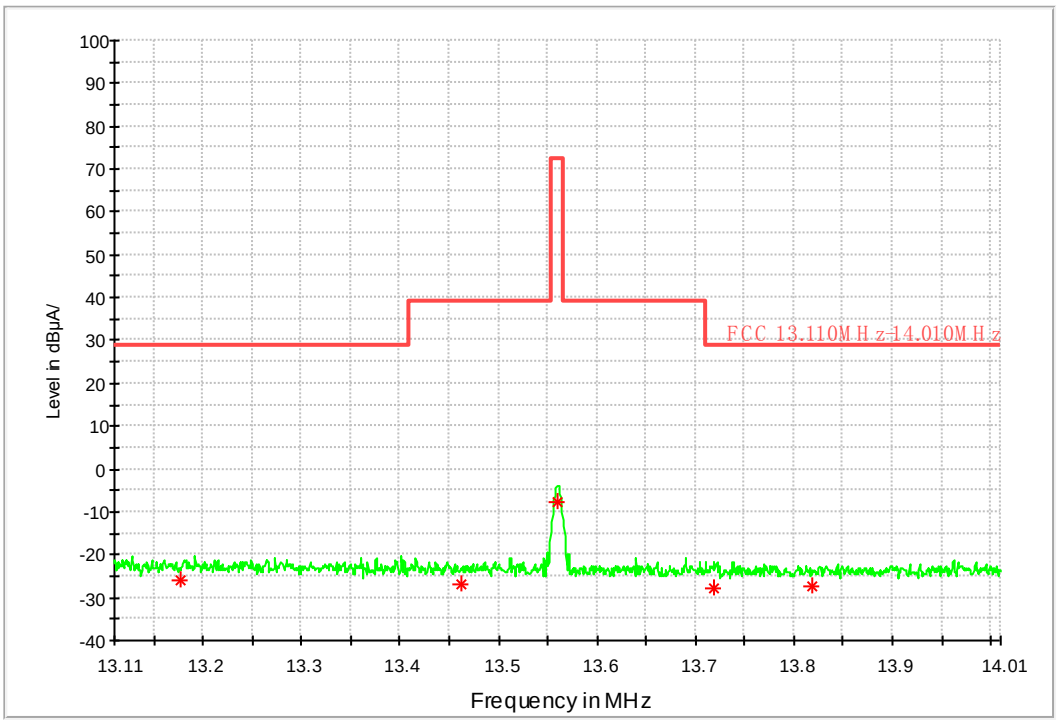
5.2 In-Band Radiated Spurious Emission Measurements

5.2.1 Test Setup



5.2.2 Test Result

FCC Loop Antenna 13.110MHz-14.010MHz



Frequency (MHz)	QuasiPeak (dBμ A/m)	Bandwidth (kHz)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμ A/m)
13.177248	-25.7	9.000	V	-34.0	-31.2	54.7	29.0
13.461360	-27.1	9.000	V	155.0	-31.2	66.1	39.0
13.560000	-7.9	9.000	V	330.0	-31.2	80.4	72.5
13.719840	-27.7	9.000	V	10.0	-31.2	56.7	29.0
13.819200	-27.2	9.000	V	164.0	-31.2	56.2	29.0

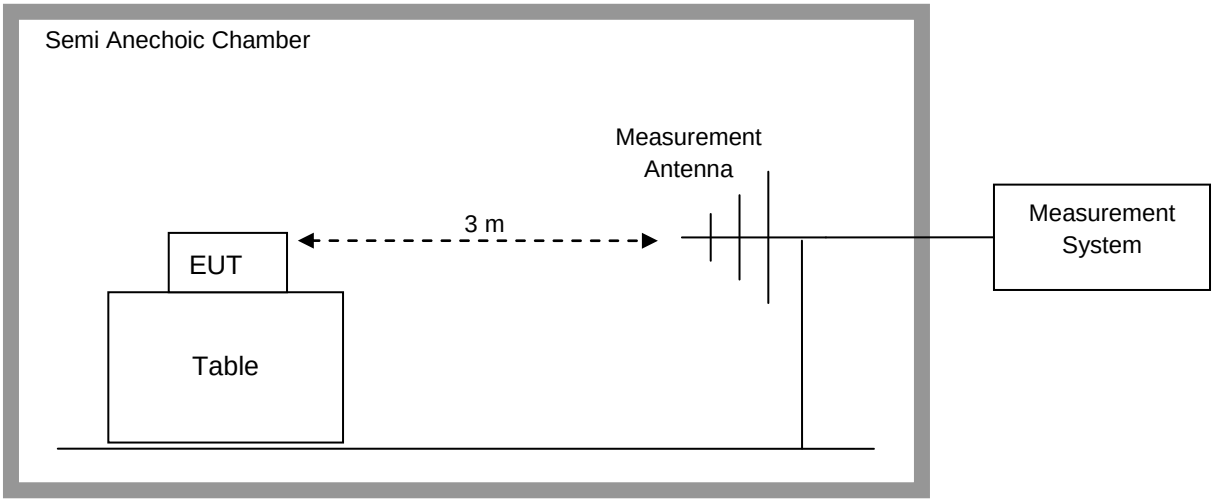
NOTES:

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 log10(30/3)2 = 40dB
3. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector.

The result of the measurement is passed.

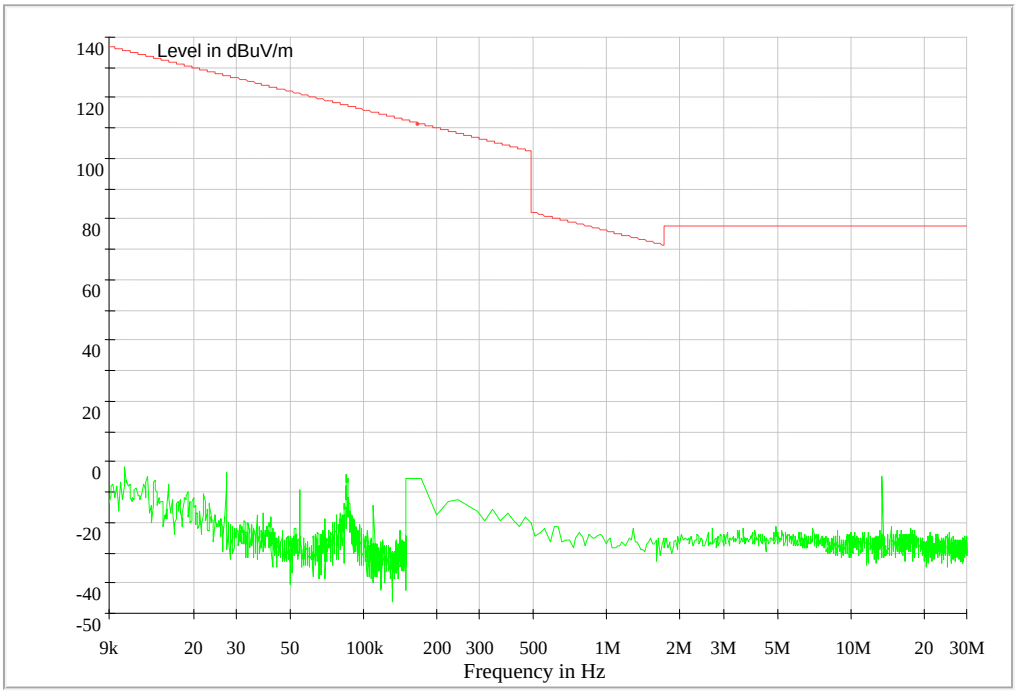
5.3 Radiated Spurious Emission Measurements, Out-of-Band

5.3.1 Test Setup

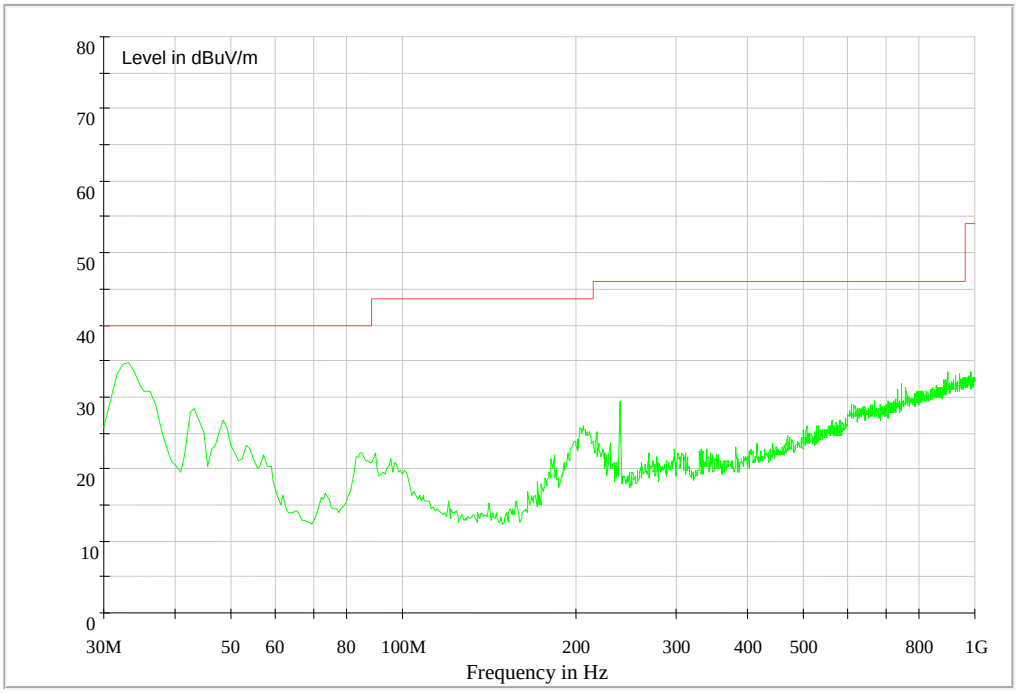


5.3.2 Test Result

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 (ºC)	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----------