



FCC TEST REPORT

Issued to

Huawei Technologies Co., Ltd

For

Mobile Phone

Model Name HUAWEI U8650NFC -1/U8650NFC -1/TURKCELL
T20/T20
Trade Name HUAWEI / TURKCELL
Brand Name HUAWEI / TURKCELL
FCC ID QISU8650NFC-1
Standard 47 CFR Part 15 Subpart C
Test date April 12, 2011 – May 16, 2011
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by
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Tu Lang

Date

2011.5.17

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Date

2011.5.17

Review by Huang Pulong
Huang Pulong

Date

2011.5.17

CTIA Authorized Test Lab
LAB CODE 20081223-00

IEEE 1725

OTA

OFTA
電訊管理局



GCF
Official Observer of
Global Certification Forum

Bluetooth
BQTF

FCC
Reg. No.
741109

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Change History		
Issue	Date	Reason for change
1.0	May 17, 2011	First edition

1. GENERAL INFORMATION

1.1 EUT Description

EUT Type: Mobile Phone
Serial No.....: (n.a, marked #1 by test site)
Hardware Version: HD1U865M
Software Version: HUAWEI U8650-1 V100R001C00B820
Applicant: Huawei Technologies Co., Ltd
Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R.
China
Manufacturer: Huawei Technologies Co., Ltd
Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R.
China
Frequency: 13.56MHz
Modulation Type.....: ASK
Power Supply: Battery
Brand Name: HUAWEI
Model No.: HB5K1H
Serial No.: (n.a. marked #1 by test site)
Capacitance: 1400mAh
Rated Voltage: 3.7V
Charge Limit: 4.2V
Ancillary Equipments.....: AC Adapter (Charger for Battery)
Model Name: HW-050100U1W
Brand Name: HUAWEI
Serial No.: (n.a. marked #1 by test site)
Rated Input: ~ 100-240V, 200mA, 50/60Hz
Rated Output: = 5V, 1000mA

Note 1: The EUT is a Mobile Phone; it supports GSM 900MHz, 1800MHz, 1900MHz, GPRS, EDGE, WCDMA 900MHz, WCDMA 2100MHz, HSDPA, GPS, NFC, ISM 2.4GHz Bluetooth and 2.4GHz WIFI module, and only NFC module was tested in this report.

Note 2: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C:

No.	Identity	Document Title
1	47 CFR Part 15 (10-1-09 Edition)	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Result
1	15.207	Conducted Emission	PASS
2	15.225(a) (b)(c)(d)	Radiated Emission	PASS
3	15.225(e)	Frequency Stability	PASS
4	15.215(c)	20dB Bandwidth	PASS

NOTE:

The tests were performed according to the method of measurements prescribed in ANSI C63.4 2010.

1.3 Facilities and Accreditations

1.3.1 Facilities

Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L3572.

All measurement facilities used to collect the measurement data are located at 3/F, Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen, 518055 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22; the FCC registration number is 741109.

1.3.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86-106

1.3.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Conducted Emission:	±1.8dB
Uncertainty of Radiated Emission:	±3.1dB

2. 47 CFR PART 15C REQUIREMENTS

2.1 Conducted Emission

2.1.1 Requirement

According to FCC section 15.207, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN).

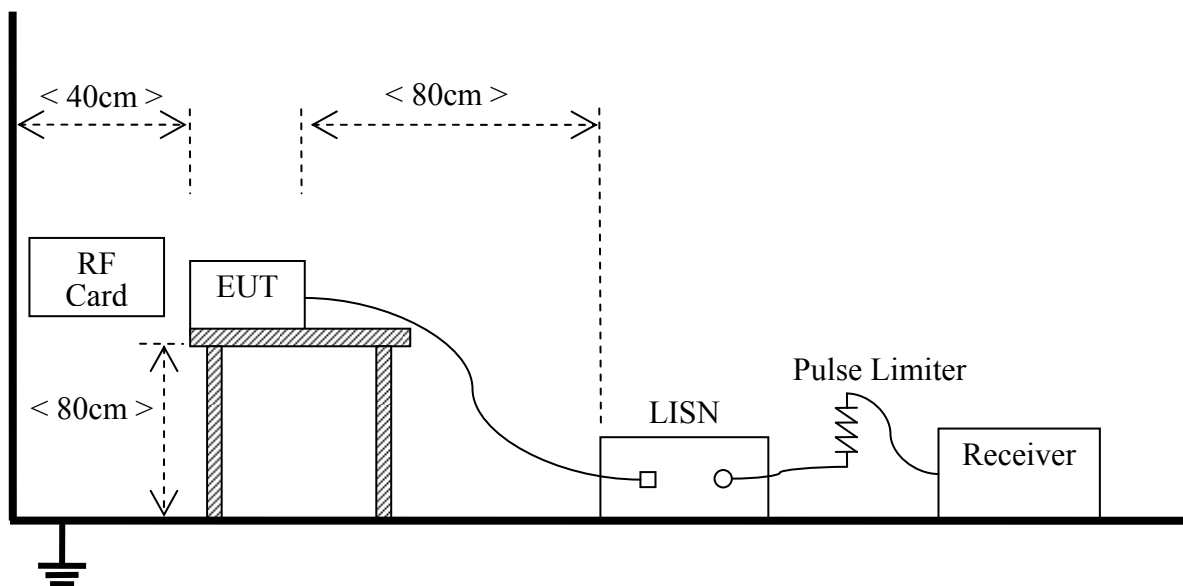
Frequency range (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

NOTE:

- The limit subjects to the Class B digital device.
- The lower limit shall apply at the band edges.
- The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

2.1.2 Test Description

A. Test Setup:



The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor,

and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument. The RF Card is used for the call between with the EUT, and the EUT was measured by transmitter mode continuously. A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date
Receiver	Agilent	E7405A	US44210471	2010.09
LISN	Schwarzbeck	NSLK 8127	812744	2010.09
Pulse Limiter (20dB)	Schwarzbeck	VTSD 9561-D	9391	(n.a.)
Spectrum Analyzer	Agilent	E7405A	US44210471	2010.08
Personal Computer	IBM	IBM_T20	(n.a.)	(n.a.)
Bluetooth-Headset	Nokia	HS-36W	(n.a.)	(n.a.)
T-Flash Card	SanDisk	256MB	(n.a.)	(n.a.)

2.1.3 Test Result

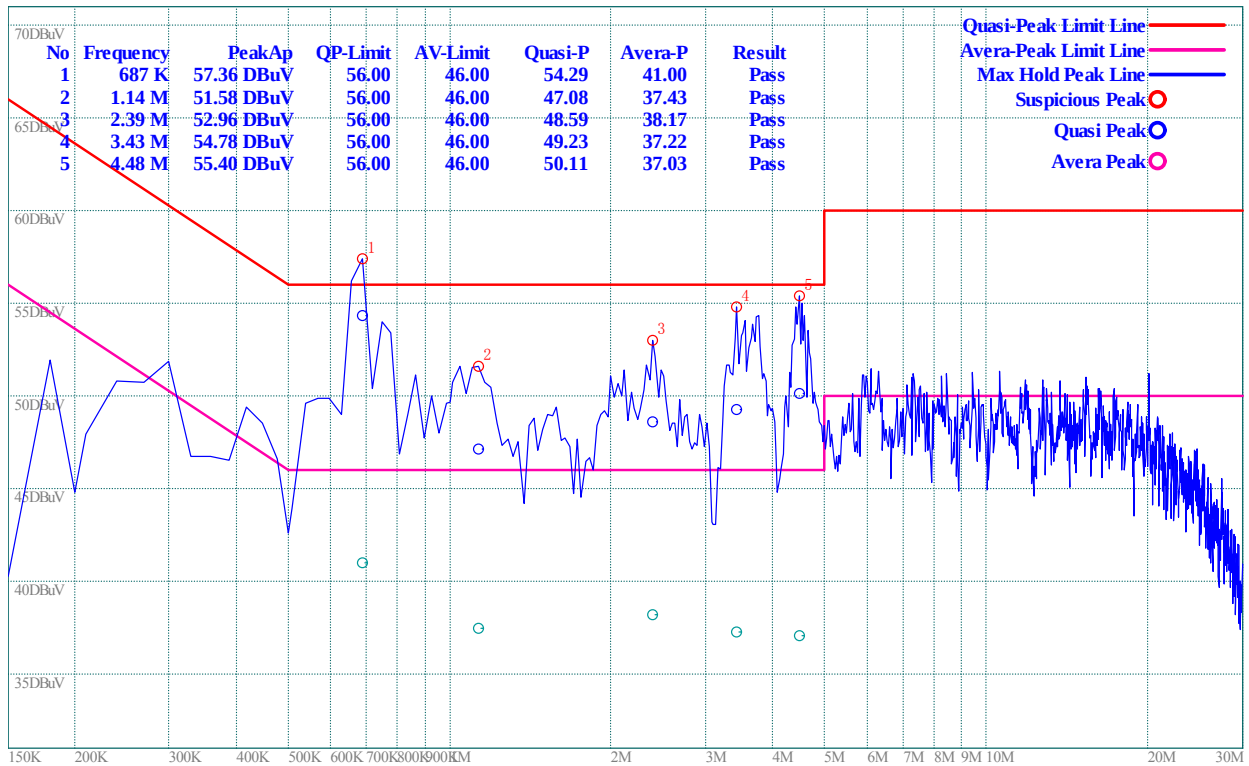
The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. All test modes are considered, refer to recorded points and plots below.

4.1.3.1 Test Mode

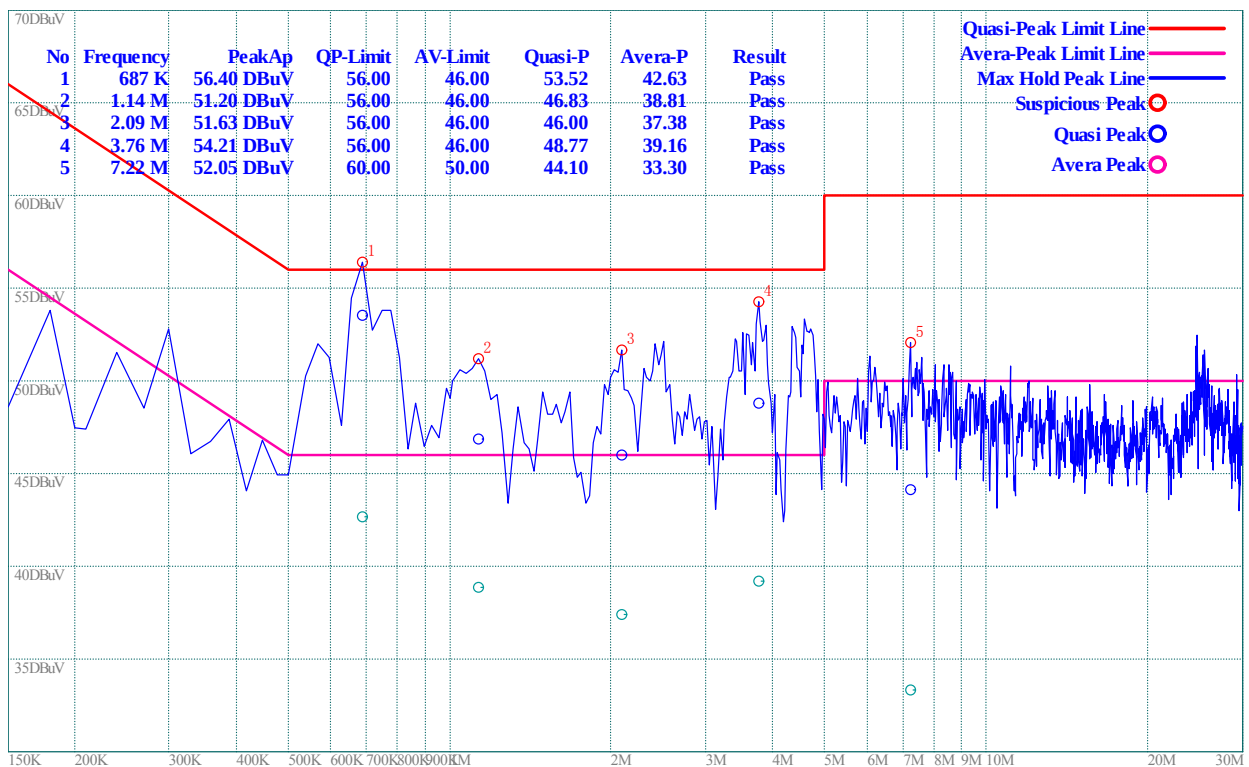
A. Test Verdict Recorded for Suspicious Points:

No.	@Frequency (MHz)	Measured Emission Level (dBμV)				Limit (dBμV)		Verdict
		PK	QP	AV	Phase	QP	AV	
1	0.687	57.36	54.29	41.00	L	56.0	46.0	PASS
2	4.48	55.40	50.11	37.03	L	56.0	46.0	PASS
3	0.687	56.40	53.52	42.63	N	56.0	46.0	PASS
4	7.22	52.05	44.10	33.30	N	56.0	46.0	PASS

B. Test Plot:



(Plot A: L Phase)



(Plot B: N Phase)

Result: PASS

2.2 Radiated Emission

2.2.1 Requirement

Radiated Emission <30MHz (9KHz-30MHz, H-field)

According to FCC section 15.225, for <30MHz, Radiated emissions were measured according to ANSIC63.4. The EUT was set to transmit at the highest output power. The EUT was set 10 meter away from the measuring antenna. The loop antenna was positioned 1 meter above the ground from the center of the loop. The measuring bandwidth was set to 10KHz. (Note: During testing the receive antenna was rotated about its axis to maximize the emission from the EUT)

There was no detected Restricted bands and Radiated suprious emission below 30MHz. The 30m limit was converted to 3m Limit using square factor(x) as it was found by measurements as follows; 3 m Limit(dBuV/m) = $20\log(X) + 40\log(30/3) = 20\log(15848) + 40\log(30/3) = 124\text{dBuV}$

Radiated Emission >30MHz (30MHz-1GHz, E-field)

According to FCC section 15.225, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

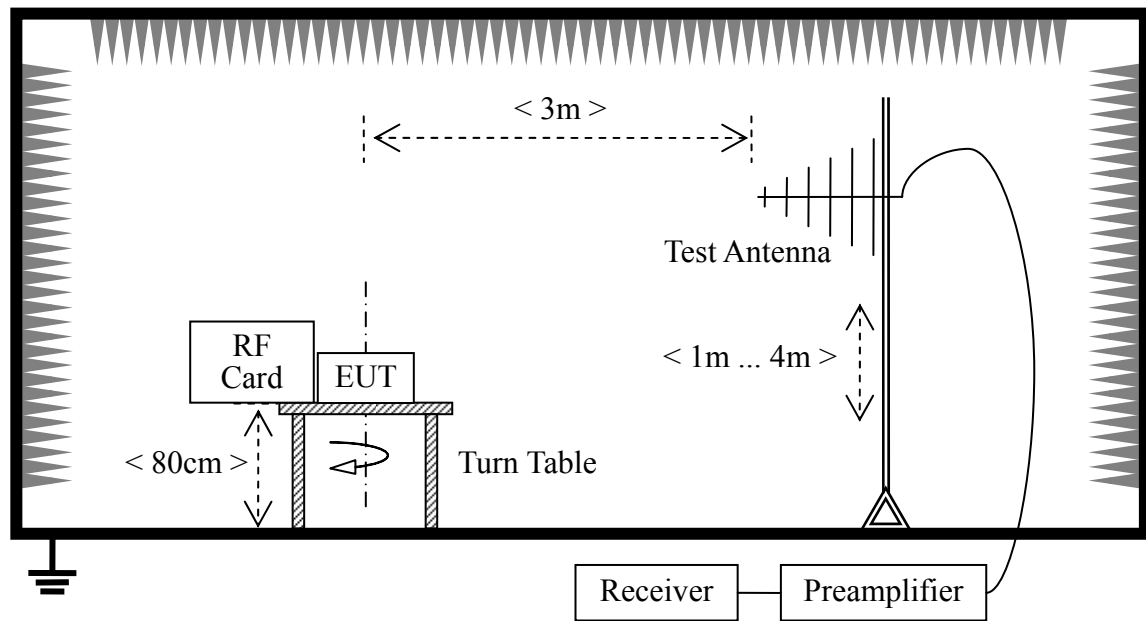
Frequency range (MHz)	Field Strength	
	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

NOTE:

- Field Strength ($\text{dB}\mu\text{V/m}$) = $20*\log[\text{Field Strength } (\mu\text{V/m})]$.
- In the emission tables above, the tighter limit applies at the band edges.

2.2.2 Test Description

C. Test Setup:



The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower. The RF Card is used for the call between with the EUT, and the EUT was measured by transmitter mode continuously.

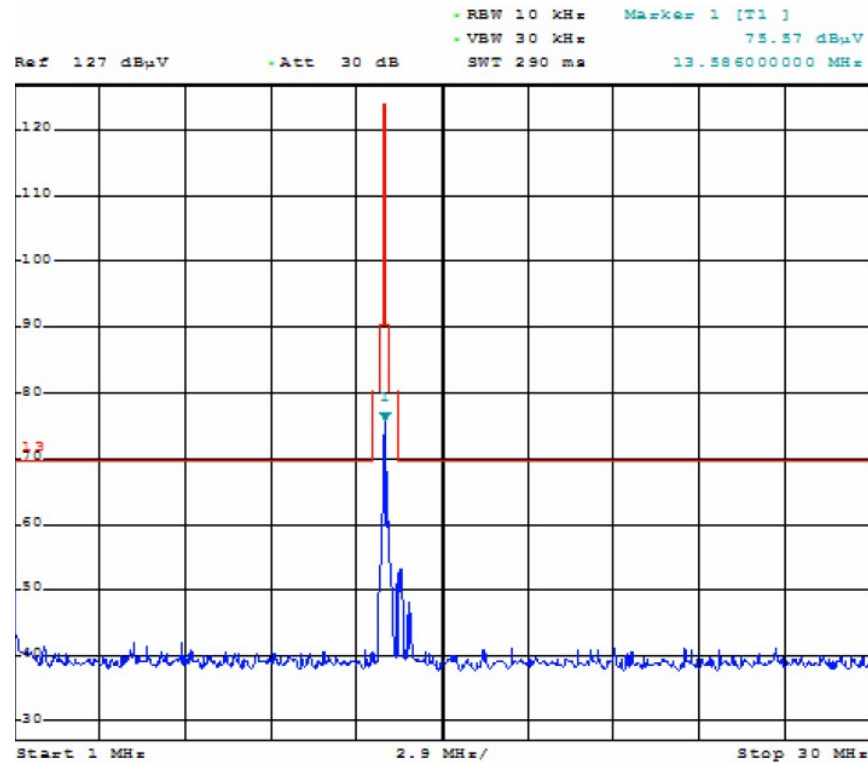
D. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date
Receiver	Agilent	E7405A	US44210471	2010.09
Semi-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2010.09
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2010.09
Test Antenna - Horn	Schwarzbeck	BBHA 9120C	9120C-384	2010.09
Test Antenna- Loop	R&S	HFH2-Z2	(n.a.)	2010.09
Spectrum Analyzer	Agilent	E7405A	US44210471	2010.08
Personal Computer	IBM	IBM_T20	(n.a.)	(n.a.)
Bluetooth-Headset	Nokia	HS-36W	(n.a.)	(n.a.)
T-Flash Card	SanDisk	256MB	(n.a.)	(n.a.)

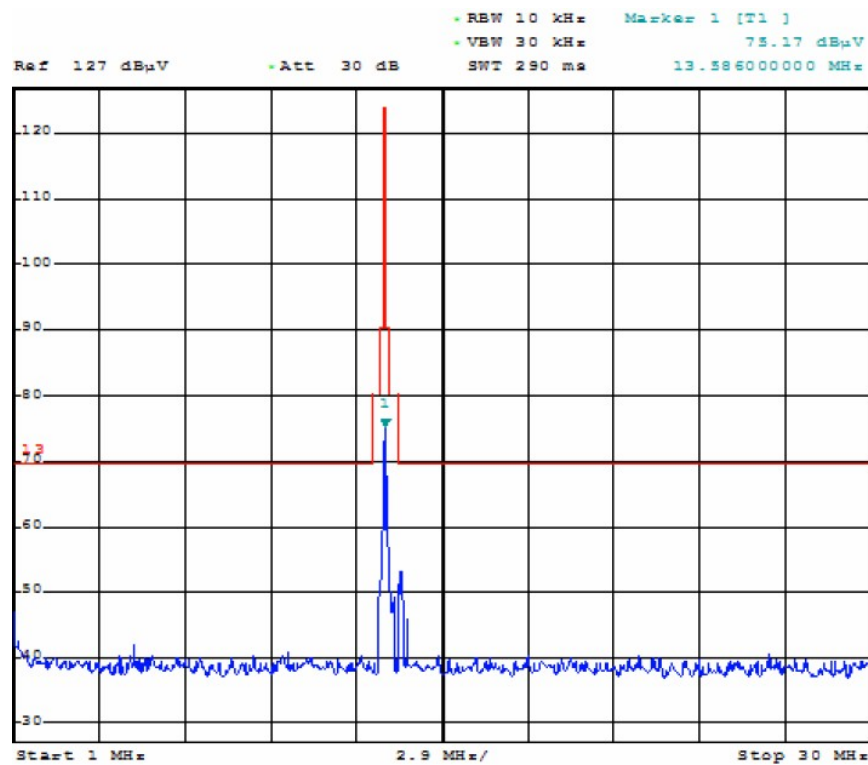
2.2.3 Test Result

2.2.3.1 Radiated Emission <30MHz (9KHz-30MHz, H-field)

A. Test Plots



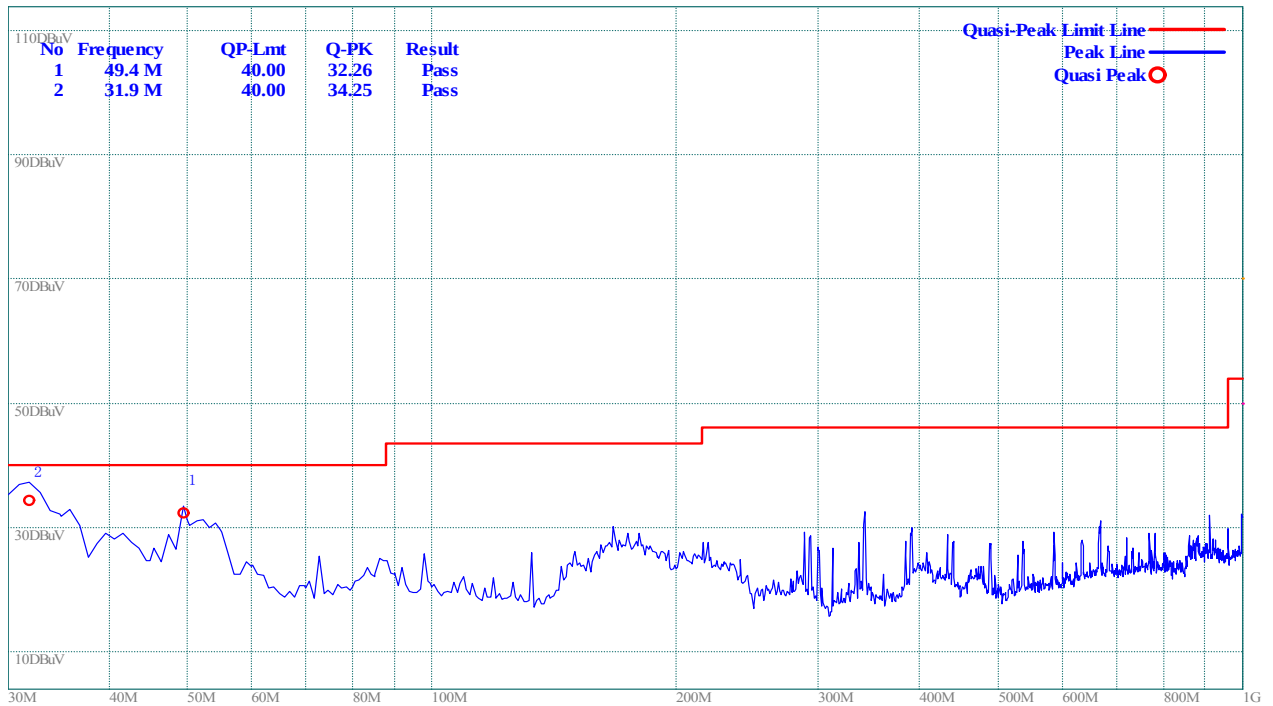
(Plot A: Test Antenna Vertical)



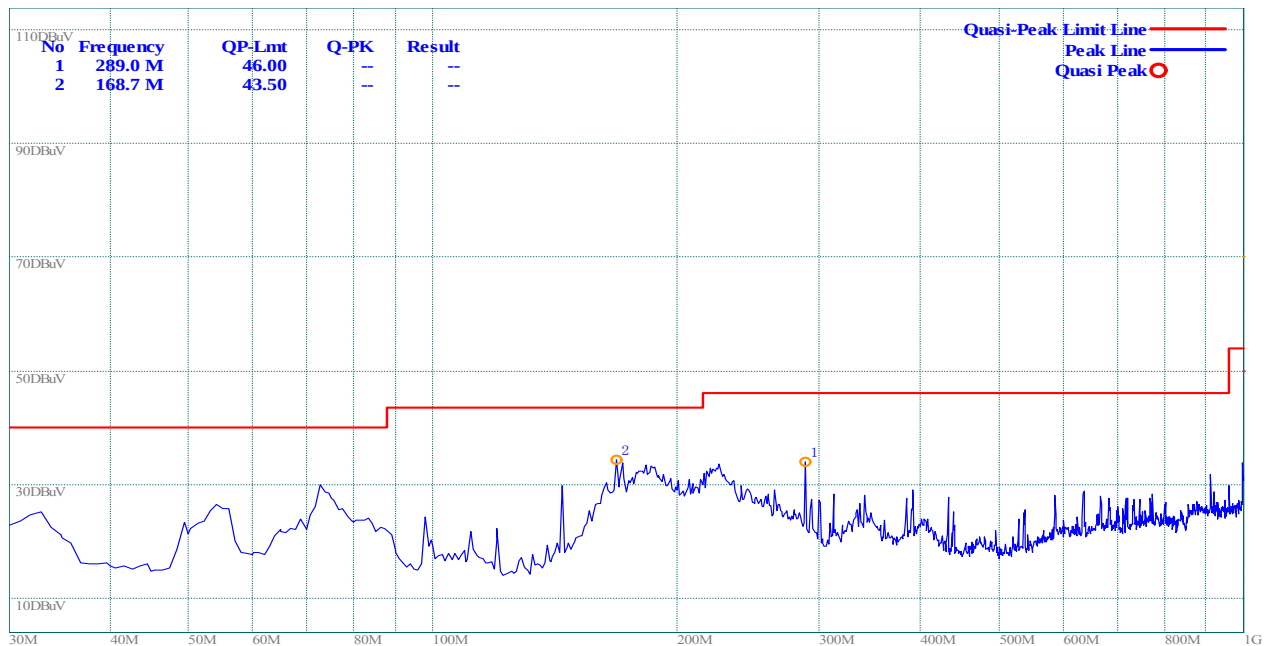
(Plot B: Test Antenna Horizontal)

2.2.3.2 Radiated Emission >30MHz (30MHz-1GHz, E-field)

A. Test Plots:



(Plot A: Test Antenna Vertical)



(Plot B: Test Antenna Horizontal)

Result: PASS

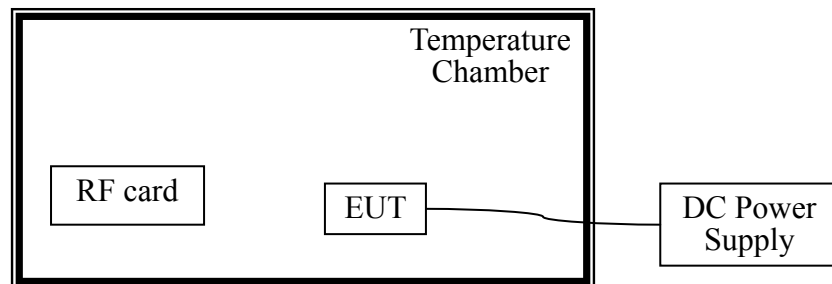
2.3 Frequency Tolerance

2.3.1 Requirement

According to FCC section 15.225, the devices operating in the 13.553 – 13.567 MHz shall maintain the carrier frequency within 0.01% of the operating frequency over the temperature variation of -20°C to +50°C using an environmental chamber. The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

2.3.2 Test Description

Test Setup:



The EUT, which is powered by the DC Power Supply directly, is located in the Temperature Chamber. The RF Card is used for the call between with the EUT, and the EUT was measured by transmitter mode continuously.

1. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E7405A	US44210471	2010.08
DC Power Supply	Good Will	GPS-3030DD	EF920938	2010.08
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2010.08

2.3.3 Test Verdict

Operating Frequency: 13,560,000 Hz

Deference Voltage: 3.7V

Deviant Limit: $\pm 0.01\%$

VOLTAGE (%)	Test Conditions		Frequency(Hz)	Deviation	Verdict
	Power (VDC)	Temperature (°C)			
100	3.7	+20°C(Ref)	13,560,305	-0.002249	PASS
100		-20	13,560,519	-0.003827	
100		-10	13,560,451	-0.003326	
100		0	13,560,351	-0.002588	
100		+10	13,560,321	-0.002367	
100		+20	13,560,315	-0.002323	
100		+25	13,560,612	-0.004513	
100		+30	13,560,648	-0.004779	
100		+40	13,560,588	-0.004336	
100		+50	13,560,579	-0.00427	
Battery End Point	3.6	+20	13,560,636	-0.00469	
115	4.2	+20	13,560,652	-0.004808	

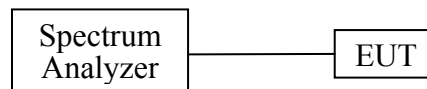
2.4 20dB Bandwidth

2.4.1 Definition

According to FCC section 15.215(c), 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.

2.4.2 Test Description

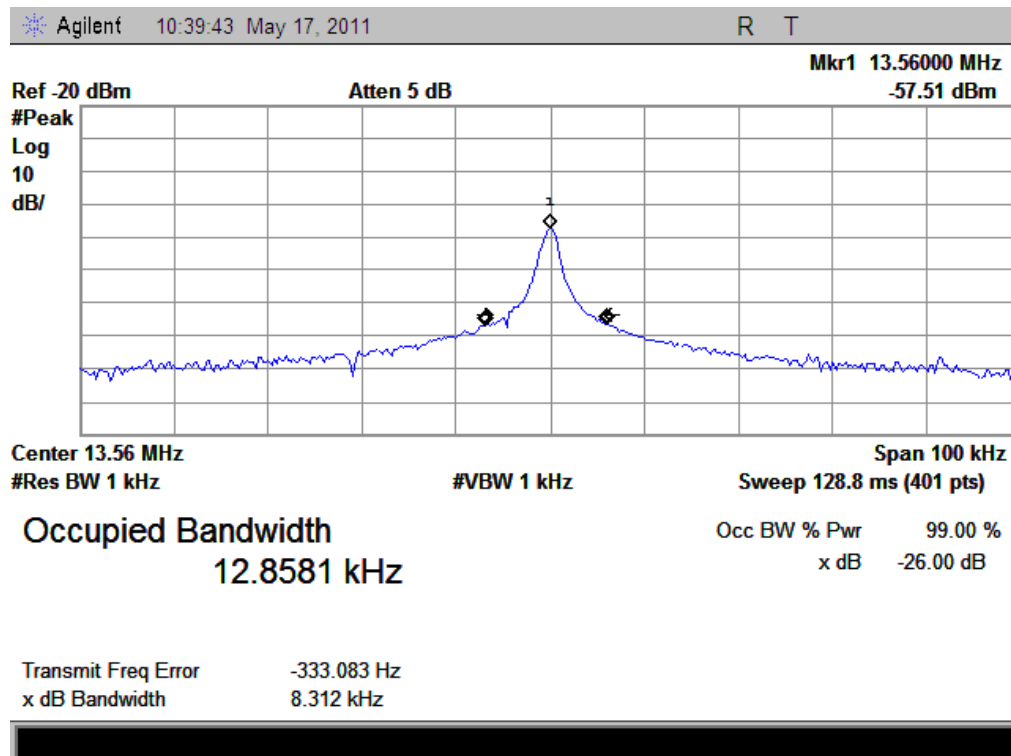
1. Test Setup:



The EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA).

Description	Manufacturer	Model	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E7405A	US44210471	2010.08
DC Power Supply	Good Will	GPS-3030DD	EF920938	2010.08

2.4.3 Test Verdict



** END OF REPORT **