



Report No.: SZ13010023E01



FCC TEST REPORT

Issued to

Qingdao Haier Telecom Co., Ltd.

For

CDMA 1x + gsm double mode handset

Model Name: HC-CG300
 Trade Name: Haier
 Brand Name: Haier
 FCC ID: SG71301HC-CG300
 Standard: 47 CFR Part 15 Subpart B
 Test date: February 19, 2013 - March 1, 2013
 Issue date: March 7, 2013

By
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 Xiao Xiong
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Date 2013.3.7



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 Date 2013.03.07

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 (EMC Manager)

Date 2013.3.7



IEEE 1725

OTA



電訊管理局



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Change History		
Issue	Date	Description
1.0	March 7, 2013	First edition

1. GENERAL INFORMATION

1.1 EUT Description

EUT Type: CDMA 1x + gsm double mode handset
Serial No.....: (n.a., marked #1 by test site)
Hardware Version.....: SP
Software Version: N/A
Applicant: Qingdao Haier Telecom Co., Ltd
No.1, Haier Road Hi-tech Zone, Qingdao, 266101, P.R. China
Manufacturer: Qingdao Haier Telecom Co., Ltd
No.1, Haier Road Hi-tech Zone, Qingdao, 266101, P.R. China
Power supply: Battery
Brand Name: Haier
Model No.: H11169
Serial No.: (n.a. marked #1 by test site)
Capacitance: 1000mAh
Rated Voltage: 3.7V
Charge Limit: 4.2V
Ancillary Equipment 1: AC Adapter (Charger for Battery)
Brand Name: Haier
Model Name: CYSK05-050055-CE
Serial No.: (n.a. marked #1 by test site)
Rated Input: ~ 100-240V, 150mA, 50/60Hz
Rated Output: = 5V, 550mA
Speed of the processor.....: 316MHz (generated by the CPU)
19.20M (generated by the crystal oscillator)

Note 1: The EUT is a CDMA 1x + GSM double mode Mobile Phone which is equipped with a USB port which can be connected to the ancillary equipments supplied by the manufacturer e.g. the AC Adapter and the USB Cable.

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 B:

No.	Identity	Document Title
1	47 CFR Part 15	Radio Frequency Devices

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

No.	Section	Description	Result
1	15.107	Conducted Emission	PASS
2	15.109	Radiated Emission	PASS

NOTE: The tests were performed according to the method of measurements prescribed in ANSI C63.4 2009.

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 FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China 518101.

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. TEST CONDITIONS SETTING

2.1 Test Mode

The first test mode (Data Transmission)

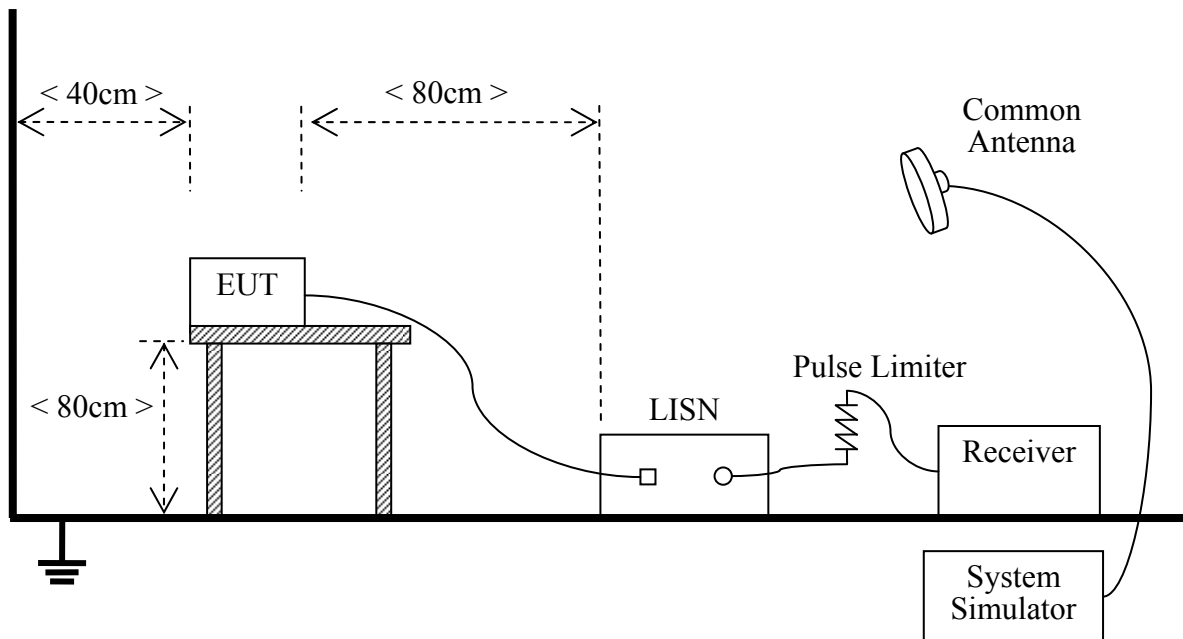
The EUT configuration of the emission tests is EUT + Battery + PC.

During the measurement, the data is transmitting between the PC and the EUT.

2.2 Test Setup and Equipments List

2.2.1 Conducted Emission

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 $50\Omega/50\mu\text{H}$ of coupling impedance for the measuring instrument. The Common Antenna is used for the call between the EUT and the System Simulator (SS). A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

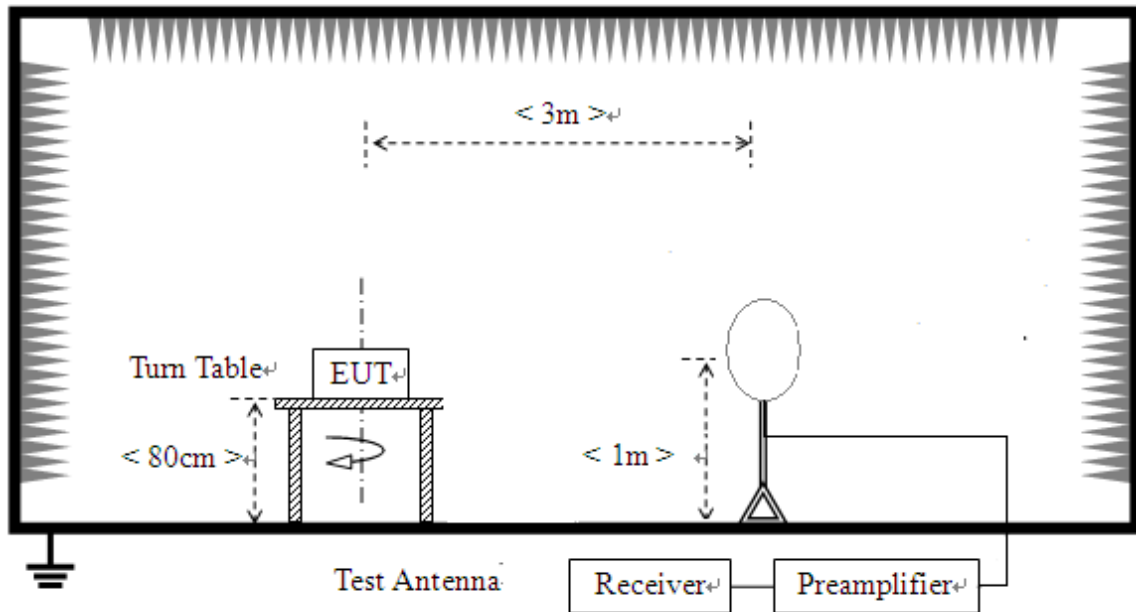
B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
EMC Analyzer	Agilent	E7405A	US44210471	2012.05	2013.05
Receiver	Narda	PMM 9060	001WX11001	2012.11	2013.11
Receiver	Narda	PMM 9010	595WX11007	2012.11	2013.11
LISN	Schwarzbeck	NSLK 8127	812744	2012.05	2013.05
Pulse Limiter (20dB)	Schwarzbeck	VTSD 9561-D	9391	(n.a.)	(n.a.)

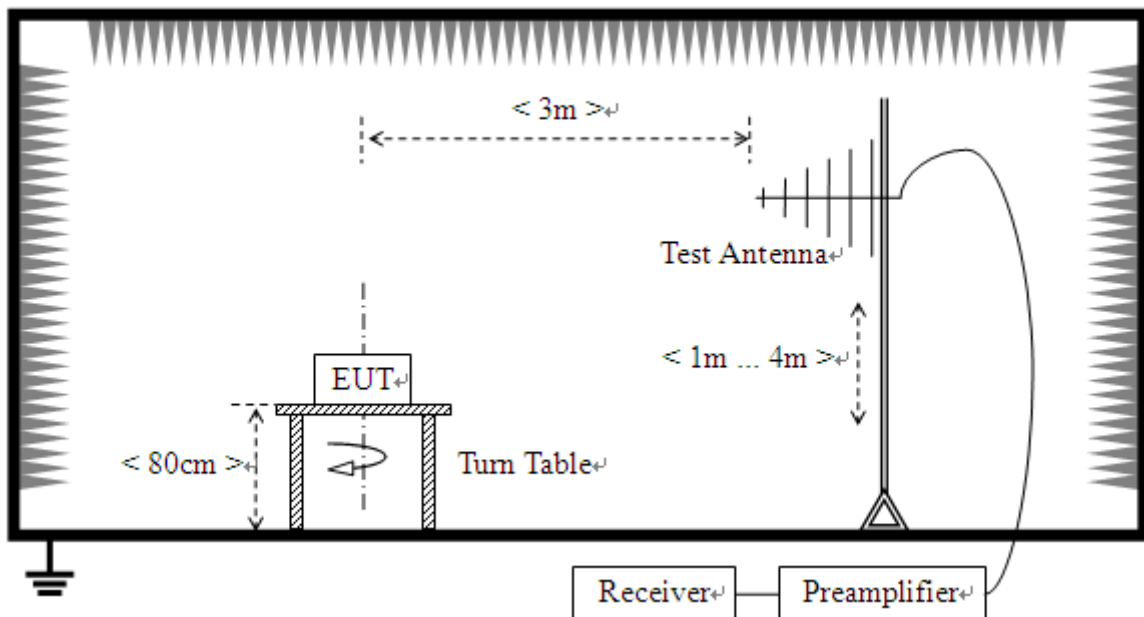
2.2.2 Radiated Emission

A. Test Setup:

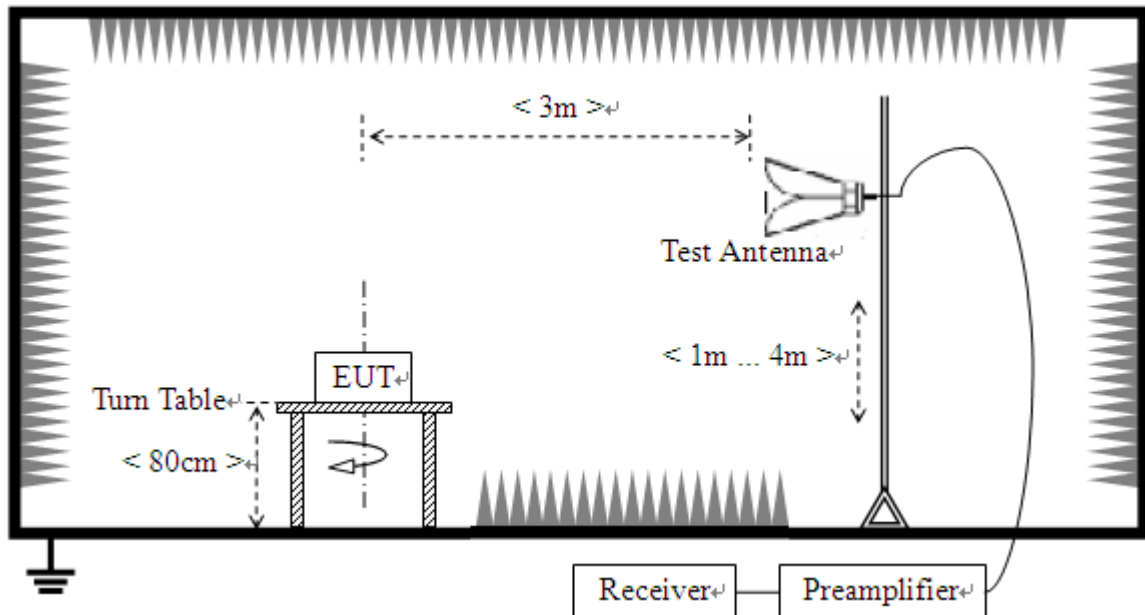
- 1) For radiated emissions from 9kHz to 30MHz



- 2) For radiated emissions from 30MHz to 1GHz



3) For radiated emissions above 1GHz



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.

For the test Antenna:

- 1) In the frequency range of 9KHz to 30MHz, magnetic field is measured with Loop Test Antenna.

The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.

- 2) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
EMC Analyzer	Agilent	E7405A	US44210471	2012.05	2013.05
Receiver	Narda	PMM 9060	001WX11001	2012.11	2013.11
Receiver	Narda	PMM 9010	595WX11007	2012.11	2013.11
Semi-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2012.05	2014.05
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2012.05	2014.05



Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Test Antenna - Horn	Schwarzbeck	BBHA 9120D	9120D-963	2012.05	2014.05
Test Antenna -Loop	Schwarzbeck	FMZB 1519	1519-022	2012.05	2014.05

3. 47 CFR PART 15B REQUIREMENTS

3.1 Conducted Emission

3.1.1 Requirement

According to FCC section 15.107, 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:

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

3.1.2 Test Description

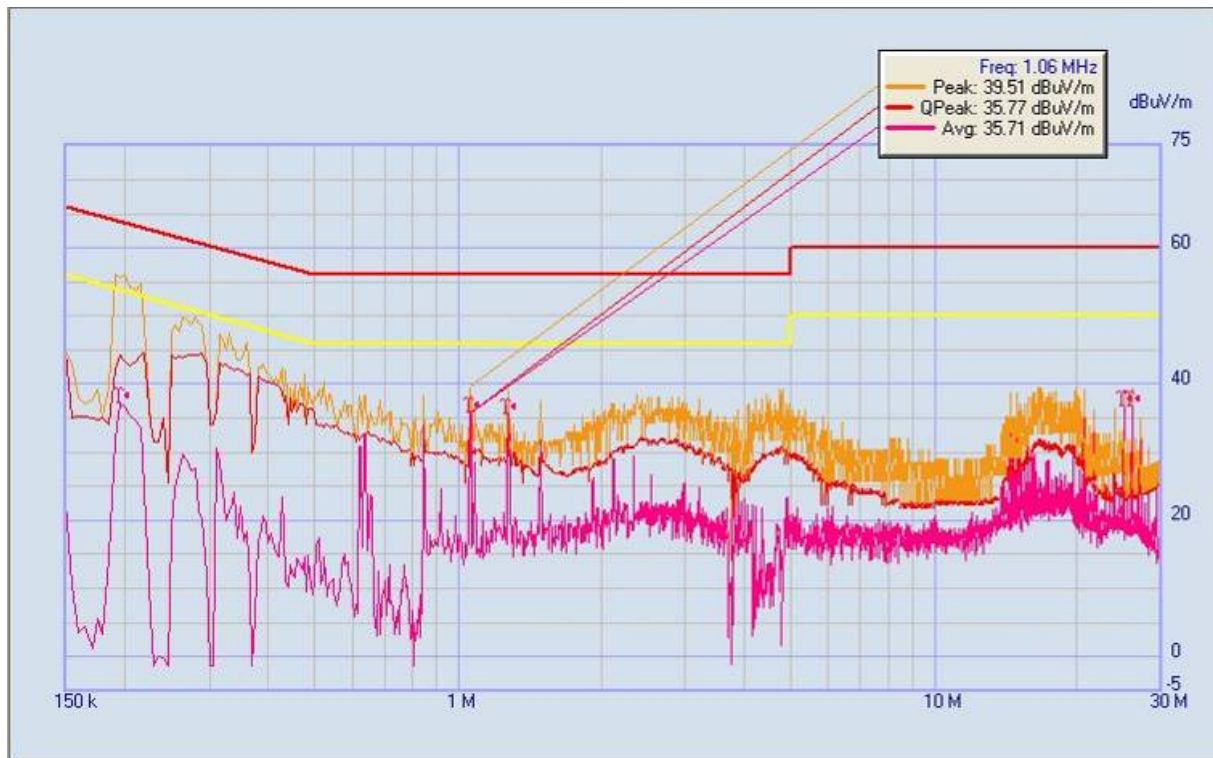
See section 2.2.1 of this report.

3.1.3 Test Result

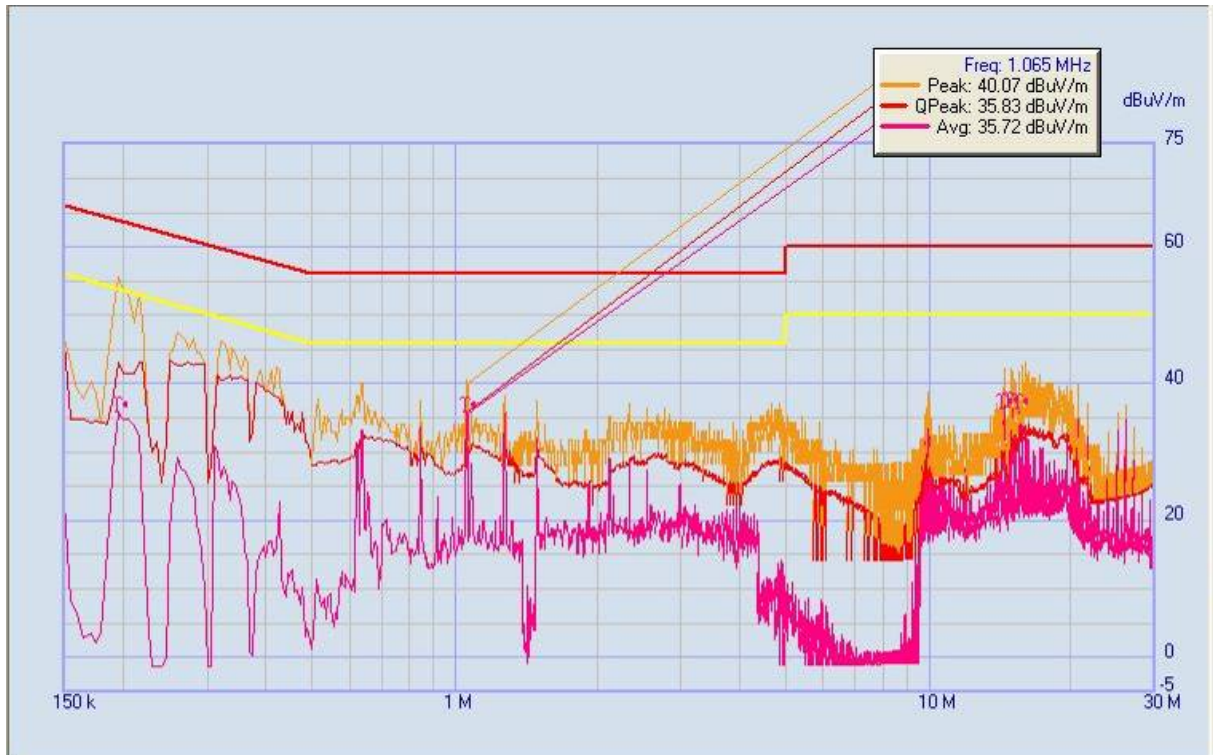
The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines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

3.1.3.1 Test Mode

A. Test Plot and Suspicious Points:



(Plot A: L Phase)



(Plot B: N Phase)

Test Result: PASS

3.2 Radiated Emission

3.2.1 Requirement

According to FCC section 15.109, 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		Field Strength Limitation at 3m Measurement Dist	
	$\mu\text{V/m}$	Dist	(uV/m)	(dBuV/m)
0.009 - 0.490	$2400/F(\text{KHz})$	300m	$10000 * 2400/F(\text{KHz})$	$20\log 2400/F(\text{KHz}) + 80$
0.490 - 1.705	$2400/F(\text{KHz})$	30m	$100 * 2400/F(\text{KHz})$	$20\log 2400/F(\text{KHz}) + 40$
1.705 - 30.00	30	30m	$100 * 30$	$20\log 30 + 40$
30.0 - 88.0	100	3m	100	$20\log 100$
88.0 - 216.0	150	3m	150	$20\log 150$
216.0 - 960.0	200	3m	200	$20\log 200$
Above 960.0	500	3m	500	$20\log 500$

As shown in FCC section 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector. When average radiated emission measurements are specified in this part, including emission measurements below 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

Note:

- 1) The tighter limit shall apply at the boundary between two frequency range.
- 2) Limitation expressed in dBuV/m is calculated by $20\log$ Emission Level(uV/m).
- 3) If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula of $Ld1 = Ld2 * (d2/d1)^2$.

Example:

F.S Limit at 30m distance is 30uV/m , then F.S Limitation at 3m distance is adjusted as

$$Ld1 = L1 = 30\text{uV/m} * (10)^2 = 100 * 30\text{uV/m}$$

3.2.2 Test Description

See section 2.2.2 of this report.

3.2.3 Frequency range of measurement

Highest frequency generated or used in the device is the highest speed of the processor, lowest frequency generated or used in the device is the lowest frequency of the oscillator. According to 15.33(b)(1), the frequency range of radiated measurement for the EUT is listed in the following table:

Frequency.	Frequency generated or used in the device	Frequency range of radiated measurement in the report
Highest	316MHz	2GHz
Lowest	32.768KHz	9KHz

3.2.4 Test Result

The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests. All test modes are considered, refer to recorded points and plots below.

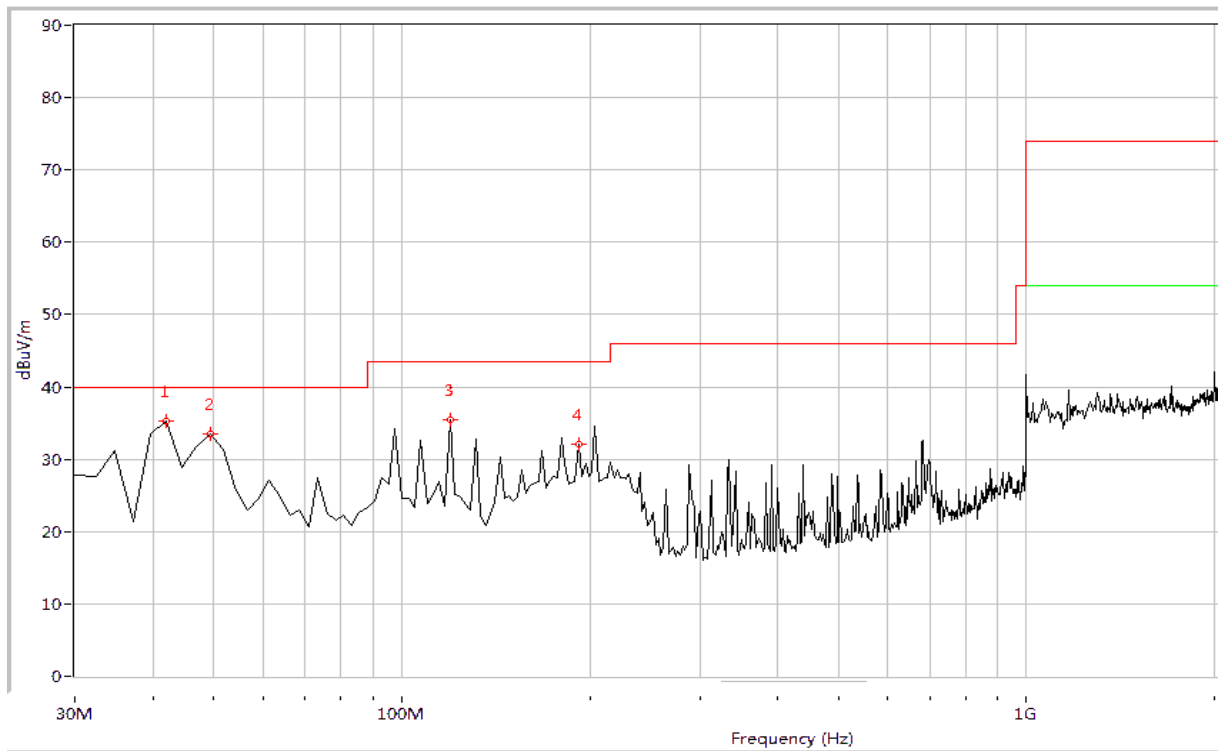
The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

Note: All radiated emission tests were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.

A. Test Plots and Suspicious Points:

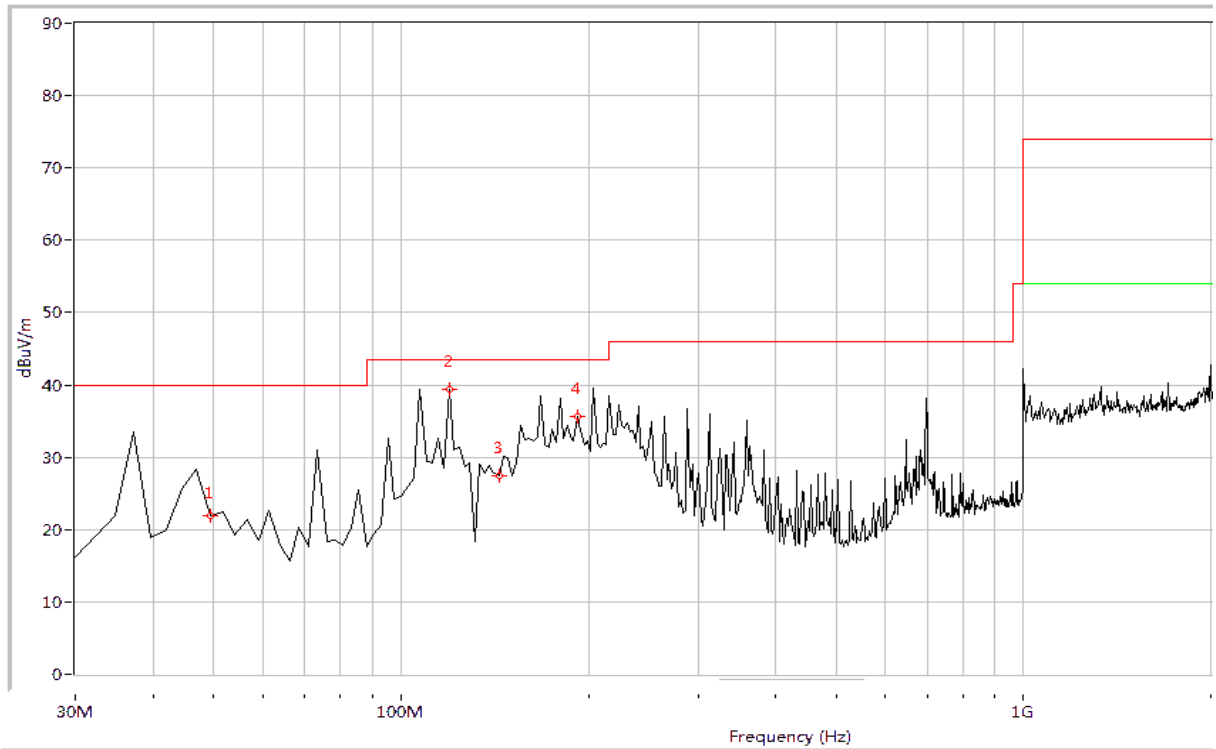


(Plot A: 9K – 30M)



(Plot B: Test Antenna Vertical)

NO.	Fre. (MHz)	PK	QP	AV	Limit- PK	Limit- QP	Limit- AV	Antenna	Verdict
1	42.095	35.36	35.34	-5.57	N.A	40.0	N.A	Vertical	PASS
2	49.352	33.49	31.65	52.14	N.A	40.0	N.A	Vertical	PASS
3	119.501	35.44	N.A	N.A	N.A	43.5	N.A	Vertical	PASS
4	192.070	32.13	28.26	24.26	N.A	43.5	N.A	Vertical	PASS



(Plot C: Test Antenna Horizontal)

NO.	Fre. (MHz)	Pk	QP	AV	Limit- PK	Limit- QP	Limit- AV	Antenna	Verdit
1	49.352	21.87	21.17	39.19	N.A	40.0	N.A	Horizontal	PASS
2	119.501	39.38	36.31	44.73	N.A	43.5	N.A	Horizontal	PASS
3	143.691	27.42	24.73	20.85	N.A	43.5	N.A	Horizontal	PASS
4	192.070	35.73	35.70	32.10	N.A	43.5	N.A	Horizontal	PASS

Test Result: PASS

**** END OF REPORT ****