FCC TEST REPORT

Issued to

ZTE Corporation

For

GSM Digital Mobile Phone

Model Name:	ZTE F231
Trade Name:	ZTE
Brand Name:	ZTE
FCC ID:	SRQ-F231
Standard:	47 CFR Part 15 Subpart B
Test date:	January 9, 2014 – January 22, 2014
Issue date:	January 23, 2014

By

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

Tested by Cai Junlong	*Approved by* Zeng Dexin	*Review by* Wu zhangli
Cai Junlong	Zeng Dexin	Wu Zhangli
(Test Engineer)	(Chief Engineer)	(EMC Manager)
Date 2014.1.23	*Date* 2014.1.23	*Date* 2014.1.23

The report refers only to the sample tested and does not apply to the bulk. This report is issued in confidence to the client and it will be strictly treated as such by the Shenzhen MORLAB Communication Technology Co., Ltd. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the Shenzhen MORLAB Telecommunication Co., Ltd to his customer. Supplier or others persons directly concerned. Shenzhen MORLAB Telecommunication Co., Ltd will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report. In the event of the improper use of the report, Shenzhen MORLAB Telecommunication Co., Ltd reserves the rights to withdraw it and to adopt any other remedies which may be appropriate

TABLE OF CONTENTS

1. GENERAL INFORMATION 3

1.1 EUT DESCRIPTION 3
1.2 TEST STANDARDS AND RESULTS 4
1.3 FACILITIES AND ACCREDITATIONS 5
1.3.1 FACILITIES 5
1.3.2 ENVIRONMENTAL CONDITIONS 5
1.3.3 MEASUREMENT UNCERTAINTY 5

2. TEST CONDITIONS SETTING 6

2.1 TEST MODE 6
2.2 TEST SETUP AND EQUIPMENTS LIST 7
2.2.1 CONDUCTED EMISSION 7
2.2.2 RADIATED EMISSION 8

3. 47 CFR PART 15B REQUIREMENTS 10

3.1 CONDUCTED EMISSION 10
3.1.1 REQUIREMENT 10
3.1.2 TEST DESCRIPTION 10
3.1.3 TEST RESULT 10
3.2 RADIATED EMISSION 13
3.2.1 REQUIREMENT 13
3.2.2 TEST DESCRIPTION 13
3.2.3 FREQUENCY RANGE OF MEASUREMENT 13
3.2.4 TEST RESULT 14

Change History		
Issue	Date	Reason for change
1.0	January 23, 2014	First edition

1. GENERAL INFORMATION

1.1 EUT Description

EUT Type:	GSM Digital Mobile Phone
Serial No:	(n.a., marked #1 by test site)
Hardware Version:	L693095002AB01
Software Version:	S233_V1_Z1_SEFI_DFFM101
Applicant:	ZTE Corporation ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R. China
Manufacturer:	ZTE Corporation ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R. China

Power supply:	**Battery**	
	Brand Name:	RUIDE
	Model No.:	Li3709T42P3h504047
	Serial No.:	(n.a. marked #1 by test site)
	Capacitance:	900mAh
	Rated Voltage:	3.7V
	Charge Limit:	4.2V
Ancillary Equipment:	**AC Adapter (Charger for Battery)**	
	Brand Name:	ZTE
	Model No.:	STC-A22O50I700M5-C
	Serial No.:	(n.a. marked #1 by test site)
	Rated Input:	~ 100-240V, 200mA, 50/60Hz
	Rated Output:	⎓ 5V, 700mA

NOTE:

1. The EUT is a GSM Digital Mobile Phone, It supports GSM850MHz, 1900MHz, GPRS, ISM 2.4GHz Bluetooth band.
2. it is equipped with a T-Flash card slot, a Micro-USB port which can be connected to the ancillary equipments e.g. the PC. It supports FM function.
3. Please refer to Annex A for the photographs of the EUT. 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(10-1-12 Edition)	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. The test site is constructed in conformance with the requirements of ANSI C63.4-2009 and CISPR Publication 22:2008; the FCC registration number is 695796.

1.3.2 Environmental 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

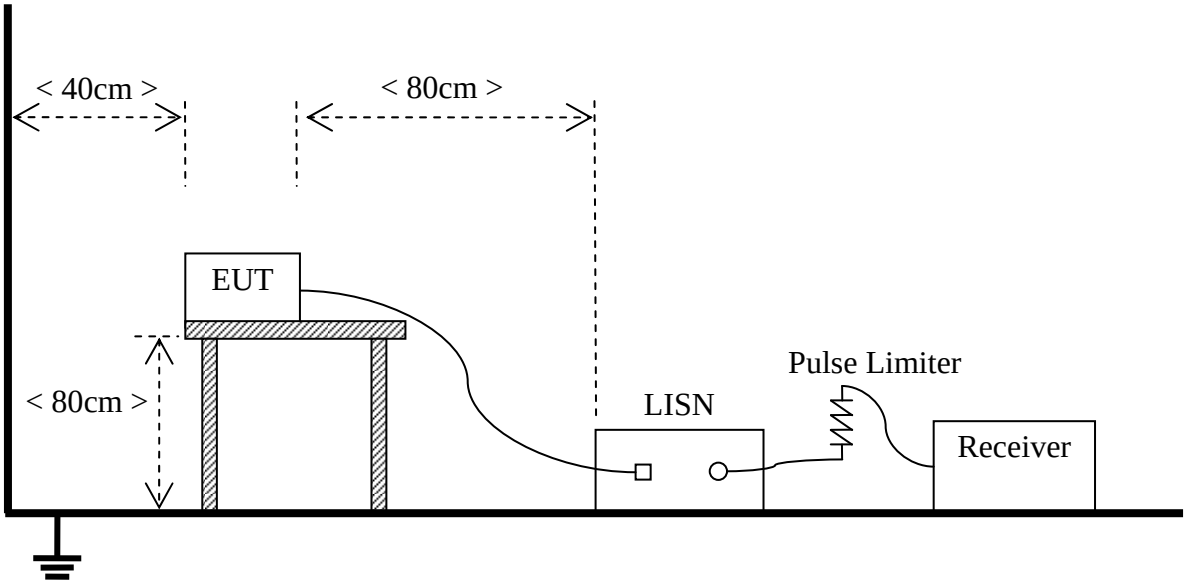
2.1 Test Mode

1	**The first test mode (Data Transmission)**
	The EUT configuration of the emission tests is EUT + Battery + T-Flash Card + PC. In this test mode, the EUT with a T-Flash Card embedded was connected to a PC via the Micro-B USB port. During the measurement, the date is transmitting between the PC and the T-Flash Card of the EUT.
2	**The second test mode (Standby)**
	The EUT configuration of the emission tests is EUT + Battery + Charger. During the measurement, the EUT was charged by its adapter and turned on.
Note: All test modes are performed, only the worst case(Data Transmission) is recorded in this report.	

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 50Ω/50μH of coupling impedance for the measuring instrument. A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

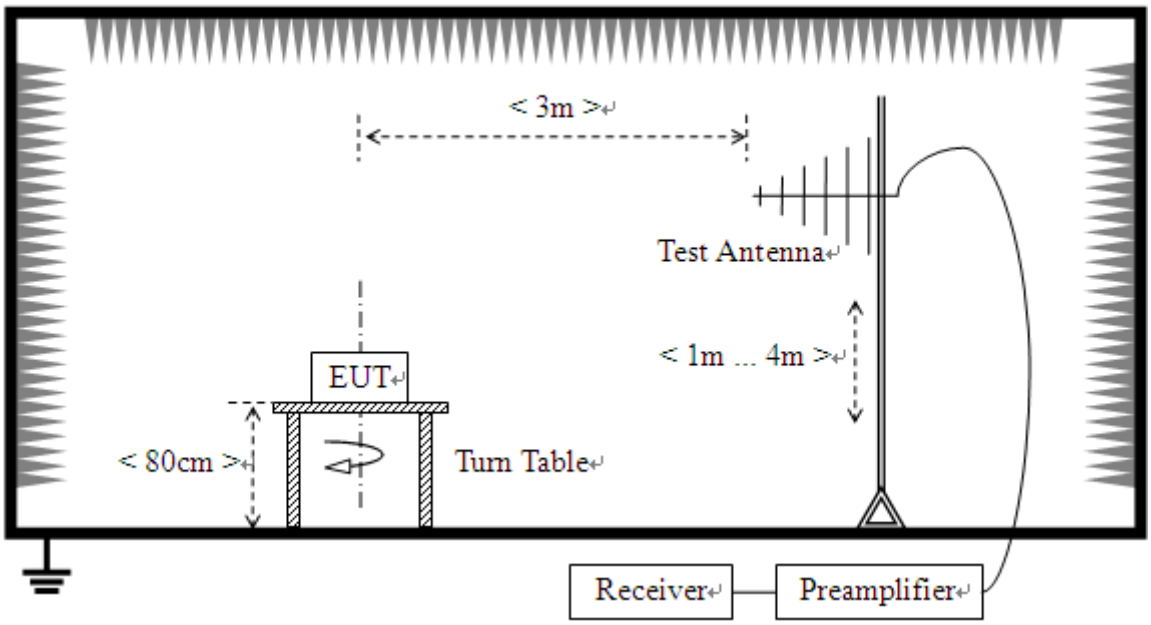
B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Due. Date
Receiver	Narda	PMM 9010	595WX11007	12/11/2013	11/11/2014
EMC Analyzer	Agilent	E7405A	US44210471	12/05/2013	11/05/2014
LISN	Schwarzbeck	NSLK 8127	812744	12/05/2013	11/05/2014
Pulse Limiter (20dB)	Schwarzbeck	VTSD 9561-D	9391	(n.a.)	(n.a.)
System Simulator	Agilent	E5515C	GB43130131	12/05/2013	11/05/2014
PC	Lenovo	ThinkPadT61	ZZF3077	(n.a.)	(n.a.)

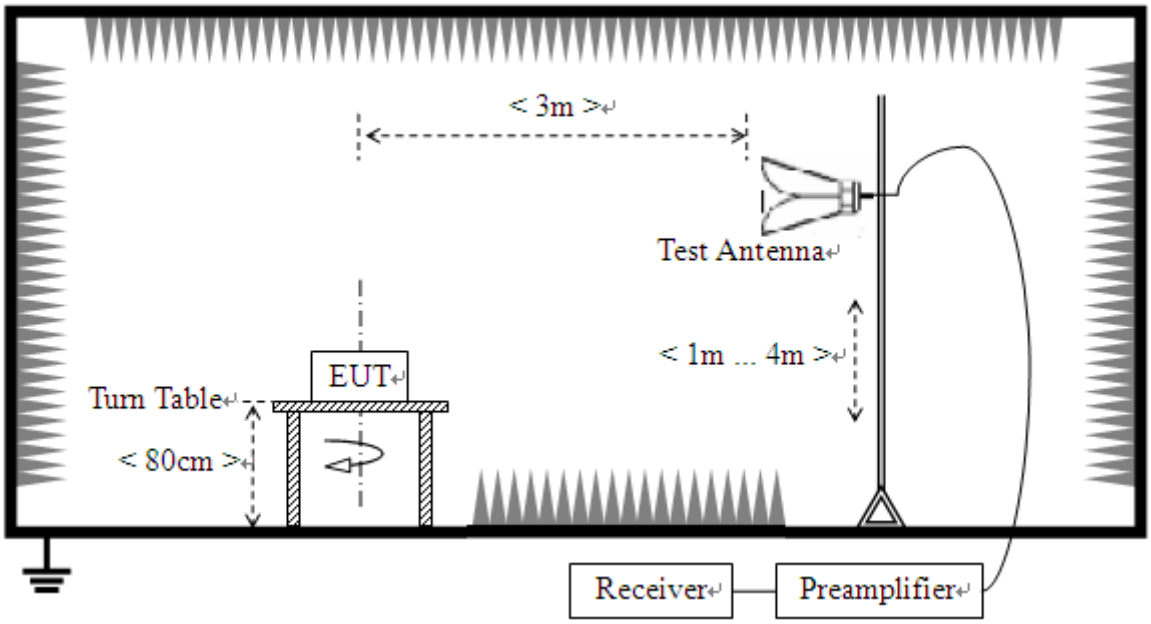
2.2.2 Radiated Emission

A. Test Setup:

1) For radiated emissions from 30MHz to1GHz



2) 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:

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	Due. Date
EMC Analyzer	Agilent	E7405A	US44210471	12/05/2013	11/05/2014
Semi-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	12/05/2012	11/05/2014
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	12/05/2012	11/05/2014
Test Antenna - Horn	Schwarzbeck	BBHA 9120D	9120D-963	12/05/2012	11/05/2014
Test Antenna -Loop	Schwarzbeck	FMZB 1519	1519-022	12/05/2012	11/05/2014
PC	Lenovo	ThinkPadT61	ZZF3077	(n.a.)	(n.a.)

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 50μH/50Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dBμV)	
	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.

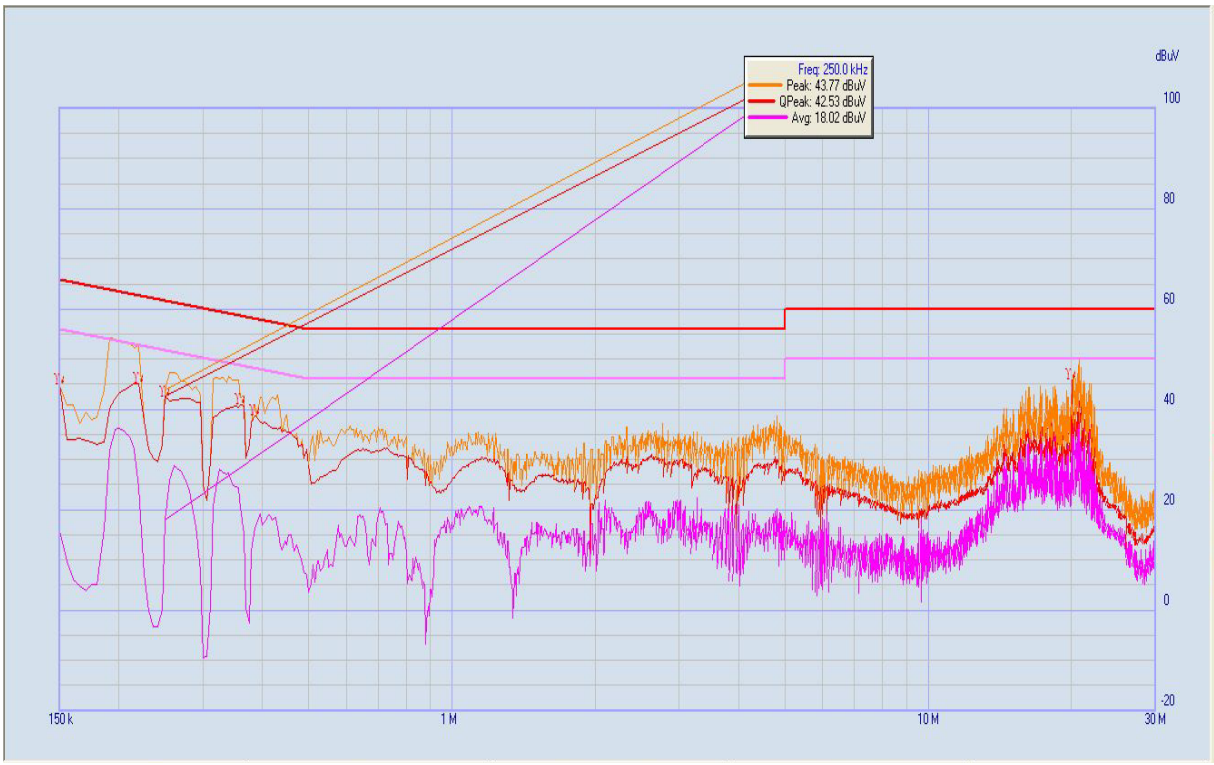
3.1.2 Test Description

See section 2.2.1 of this report.

3.1.3 Test Result

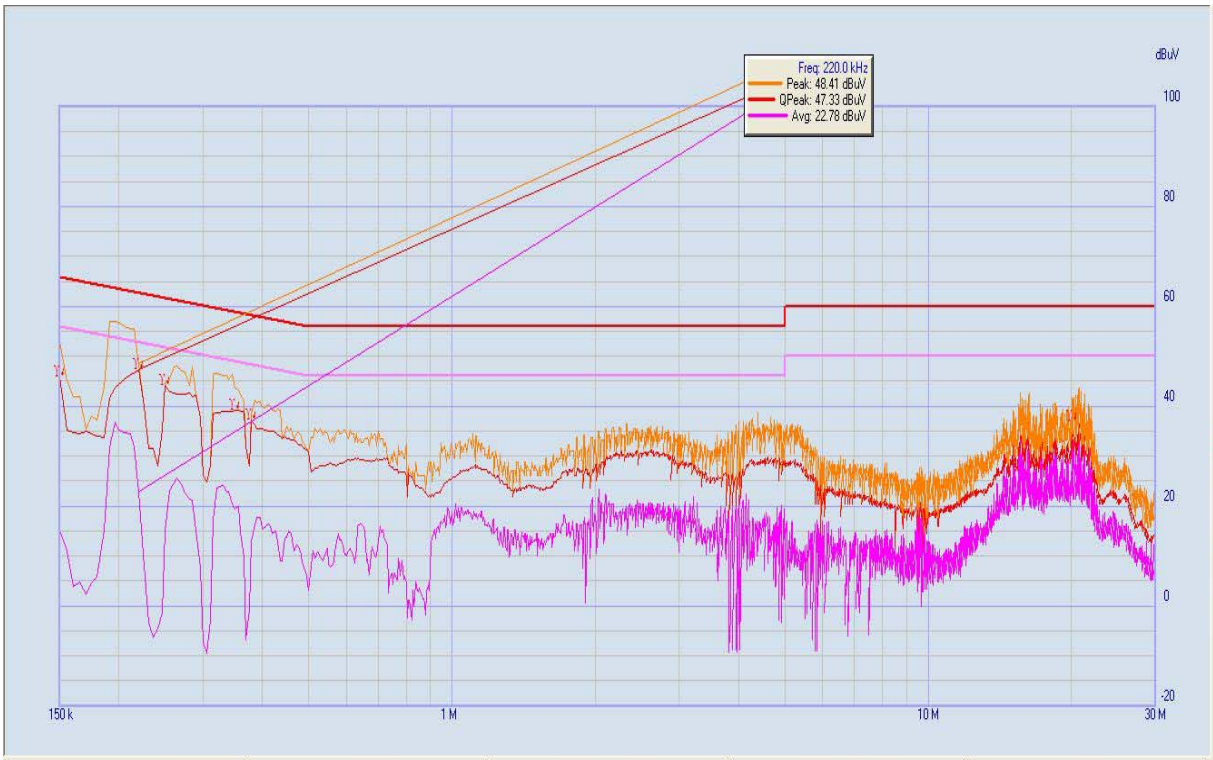
The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines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

A. Test Plot and Suspicious Points:



(Plot A: L Phase)

NO.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.15	44.93	15.80	66.00	56.00	Line	PASS
2	0.22	45.17	24.26	64.00	54.00		PASS
3	0.25	42.53	18.02	63.14	53.14		PASS
4	0.36	40.94	20.52	60.00	50.00		PASS
5	0.385	38.72	16.49	59.29	49.29		PASS
6	20.0	45.92	36.61	60.00	50.00		PASS



(Plot B: N Phase)

NO.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.15	45.97	15.17	66.00	56.00	Neutral	PASS
2	0.22	47.33	22.78	64.00	54.00		PASS
3	0.25	44.12	15.07	63.14	53.14		PASS
4	0.35	39.19	19.46	60.29	50.29		PASS
5	0.38	37.19	13.04	59.43	49.43		PASS
6	20.0	36.47	31.83	60.00	50.00		PASS

Test Result: PASS

3.2 Radiated Emission

3.2.1 Requirement

According to FCC section 15.109(a), 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	
	μV/m	Dist	(μV/m)	(dBμV/m)
30.0 - 88.0	100	3m	100	20log 100
88.0 - 216.0	150	3m	150	20log 150
216.0 - 960.0	200	3m	200	20log 200
Above 960.0	500	3m	500	20log 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 dBμV/m is calculated by 20log Emission Level(μV/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 30μV/m, then F.S Limitation at 3m distance is adjusted as
   $Ld1 = L1 = 30\mu V/m * (10)^2 = 100 * 30\mu V/m$

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	1GHz	5GHz

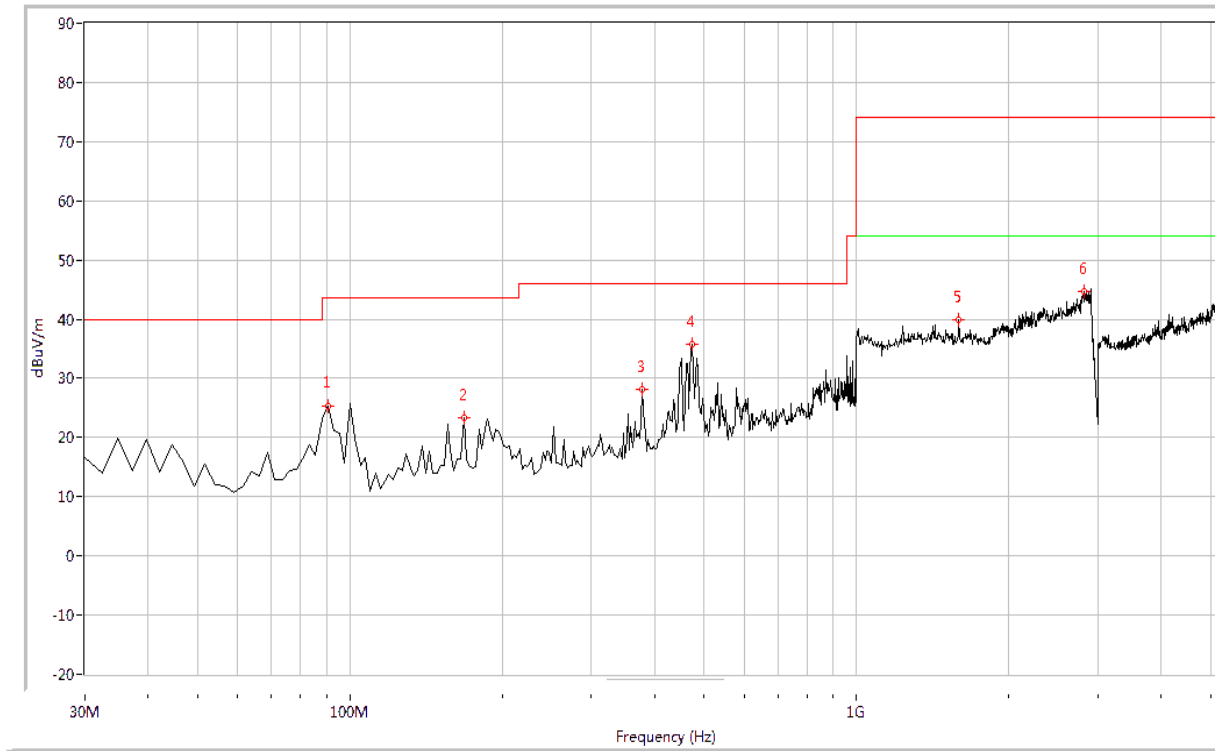
3.2.4 Test Result

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.

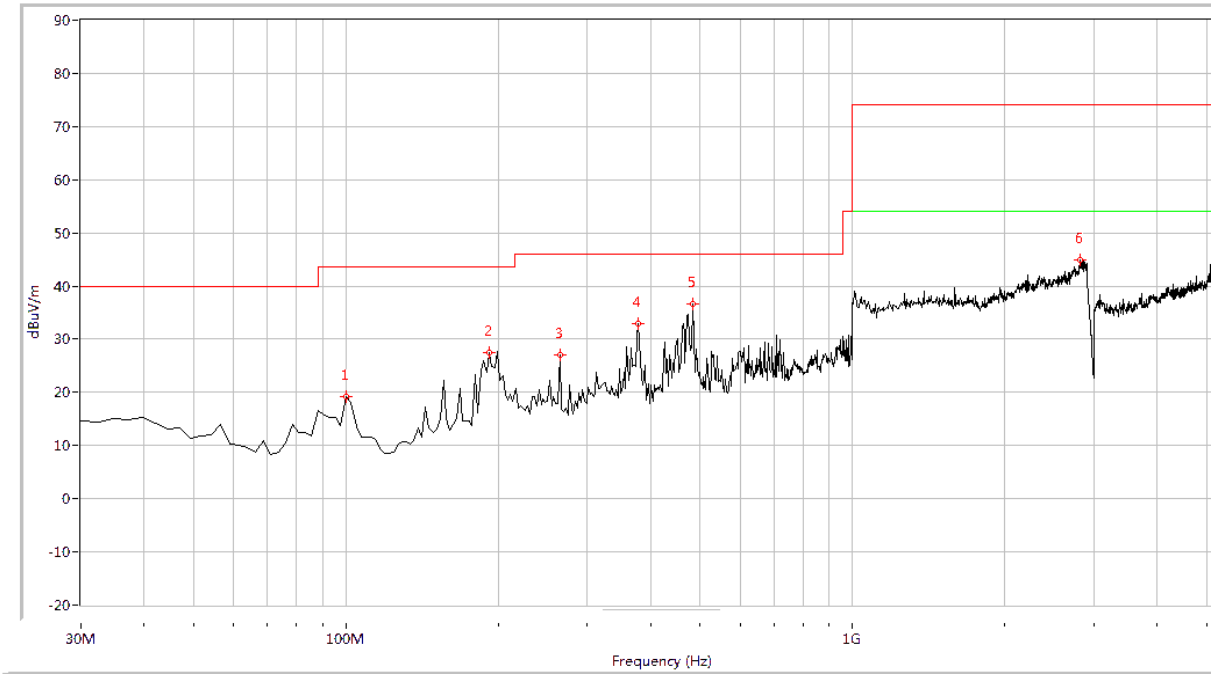
Note: All radiated emission tests were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.

A. Test Plots and Suspicious Points:



(Plot A: 30MHz – 5GHz, Test Antenna Vertical)

NO.	Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
1	90.474	N.A	25.35	N.A	N.A	43.5	N.A	Vertical	Pass
2	167.880	N.A	23.44	N.A	N.A	43.5	N.A	Vertical	Pass
3	378.329	N.A	28.11	N.A	N.A	46.0	N.A	Vertical	Pass
4	475.087	N.A	35.73	N.A	N.A	46.0	N.A	Vertical	Pass
5	1593.516	39.89	N.A	34.11	74.0	N.A	54.0	Vertical	Pass
6	2820.449	44.69	N.A	39.82	74.0	N.A	54.0	Vertical	Pass



(Plot B: 30MHz – 5GHz, Test Antenna Horizontal)

NO.	Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
1	100.150	N.A	19.10	N.A	N.A	43.5	N.A	Horizontal	Pass
2	192.070	N.A	27.51	N.A	N.A	43.5	N.A	Horizontal	Pass
3	264.638	N.A	27.11	N.A	N.A	46.0	N.A	Horizontal	Pass
4	378.329	N.A	32.98	N.A	N.A	46.0	N.A	Horizontal	Pass
5	484.763	N.A	36.71	N.A	N.A	46.0	N.A	Horizontal	Pass
6	2810.474	44.96	N.A	38.64	74.0	N.A	54.0	Horizontal	Pass

Test Result: PASS

****END OF REPORT ****