

# FCC REPORT

**Applicant:** Aqua trading(shenzhen)limited

**Address of Applicant:** No.22D, NEO Building Block B, No.6011.Shennan avenue  
Futian District, Shenzhen China

## Equipment Under Test (EUT)

**Product Name:** Smartphone

**Model No.:** RS3

**Trade mark:** AKUA

**FCC ID:** 2AGE2-RS3

**Applicable standards:** FCC CFR Title 47 Part 15 Subpart C Section 15.225

**Date of sample receipt:** 22 Jul., 2016

**Date of Test:** 22 Jul., to 24 Aug., 2016

**Date of report issue:** 25 Aug., 2016

**Test Result:** PASS\*

\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang  
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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## 2 Version

Version No.	Date	Description
00	25 Aug., 2016	Original

Tested by:

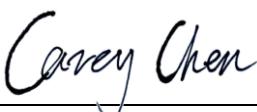
  
YT Yang

Date:

25 Aug., 2016

Test Engineer

Reviewed by:

  
Carey Chen

Date:

25 Aug., 2016

Project Engineer

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## 4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
Field strength of the fundamental signal	15.225 (a),(b),(c)	Pass
Spurious emissions	15.225(d)& 15.209	Pass
20dB Bandwidth	15.215(c)	Pass
Frequency tolerance	15.225 (e)	Pass
Conducted Emission	15.207	Pass

Remarks:

Pass: The EUT complies with the essential requirements in the standard.

## 5 General Information

### 5.1 Client Information

Applicant:	Aqua trading(shenzhen)limited
Address of Applicant:	No.22D, NEO Building Block B, No.6011.Shennan avenue Futian District, Shenzhen China
Manufacturer:	Aqua trading(shenzhen)limited
Address of Manufacturer:	No.22D, NEO Building Block B, No.6011.Shennan avenue Futian District, Shenzhen China
Factory:	Shenzhen Xin Kingbrand Enterprises Co., Ltd
Address of Factory:	Kingbrand Industrial Zone, Nanpu Road, Shang Liao Lin Pi Keng, Shajing Town, Baoan District, Shenzhen City, Guangdong

### 5.2 General Description of E.U.T.

Product Name:	Smartphone
Model No.:	RS3
Operation Frequency:	13.56MHz
Channel numbers:	1
Modulation type:	ASK
Antenna Type:	Internal Antenna
Antenna gain:	-3.2dBi
Power supply:	Rechargeable Li-ion Battery DC3.8V-3000mAh
AC adapter:	Model: TS5100 Input: AC100-240V 50/60Hz 0.15A Output: DC 5.0V, 1000mA

### 5.3 Test mode

Transmitting mode:	Keep the EUT in transmitting mode with modulation										
<b>Pre-Test Mode:</b>											
CCIS has verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:											
<table border="1"> <thead> <tr> <th>Axis</th><th>X</th><th>Y</th><th>Z</th></tr> </thead> <tbody> <tr> <td>Field Strength(dBuV/m)</td><td>68.24</td><td>68.36</td><td>68.11</td></tr> </tbody> </table>				Axis	X	Y	Z	Field Strength(dBuV/m)	68.24	68.36	68.11
Axis	X	Y	Z								
Field Strength(dBuV/m)	68.24	68.36	68.11								
<b>Final Test Mode:</b>											
According to ANSI C63.4 standards, the test results are both the "worst case" and "worst setup": Y axis (see the test setup photo).											

### 5.4 Description of Support Units

N/A
-----

## 5.5 Measurement Uncertainty

Items	Expanded Uncertainty (Confidence of 95%)
Conducted Emission (9kHz ~ 30MHz)	2.14 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	4.24 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	4.35 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	4.44 dB (k=2)
Radiated Emission (18GHz ~ 26.5GHz)	4.56 dB (k=2)

## 5.6 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC - Registration No.: 817957**

Shenzhen ZhongjianNanfang Testing Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 817957, February 27, 2012.

● **IC - Registration No.: 10106A-1**

The 3m Semi-anechoic chamber of Shenzhen ZhongjianNanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● **CNAS - Registration No.: CNAS L6048**

Shenzhen ZhongjianNanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

## 5.7 Laboratory Location

Shenzhen ZhongjianNanfang Testing Co., Ltd.

Address: No.B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,

Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755-23118282

Fax: +86-755-23116366

## 5.8 Test Instrumentslist

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
1	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	03-24-2016	03-24-2017
2	Loop Antenna	Com-power	AL-130	CCS078	03-25-2016	03-25-2017
2	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	CCIS0005	03-25-2016	03-25-2017
3	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	CCIS0006	03-25-2016	03-25-2017
4	Amplifier (10kHz-1.3GHz)	HP	8447D	CCIS0003	04-01-2016	03-31-2017
5	Amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	04-01-2016	03-31-2017
6	Spectrum analyzer	Rohde & Schwarz	FSP30	CCIS0023	03-28-2016	03-28-2017

Conducted Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Date (mm-dd-yy)
1	Shielding Room	ZhongShuo Electron	11.0(L)x4.0(W)x3.0(H)	CCIS0061	08-23-2014	08-22-2017
2	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	03-24-2016	03-24-2017
3	LISN	CHASE	MN2050D	CCIS0074	03-26-2016	03-26-2017
4	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

## 6 Test results and Measurement Data

### 6.1 Antenna requirement

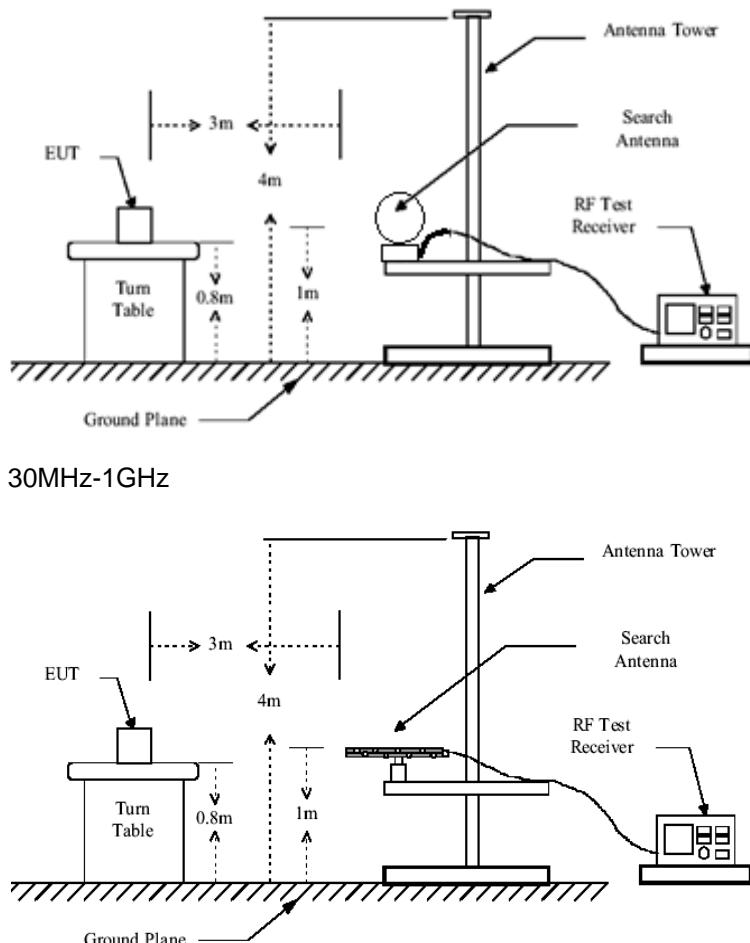
Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement:	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
E.U.T Antenna:	The EUT make use of an integrated antenna, The typical gain of the antenna is -3.2dBi.



## 6.2 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.225(a),(b),(c),(d) and 15.209				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	9 kHz to 1000MHz				
Test site:	Measurement Distance: 3m(Semi-Anechoic Chamber)				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	9kHz-150kHz	Quasi-peak	200Hz	600Hz	Quasi-peak Value
	150kHz-30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
Limit: (Field strength of the fundamental signal)	Frequency	Limit (uV/m @30m)		Limit (dBuV/m @3m)	
	13.553MHz-13.567MHz	15848		124.0	
	13.410MHz-13.553MHz & 13.567MHz-13.710MHz	334		90.5	
	13.110MHz-13.410MHz & 13.710MHz-14.010MHz	106		80.5	
	Remark: Per FCC part 15.31, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).				
Limit: (Spurious Emissions)	Frequency (MHz)	Limit (uV/m @3m)		Distance (m)	
	0.009-0.490	2400/F(kHz)		300	
	0.490-1.705	24000/F(kHz)		30	
	1.705-30	30		30	
	30-88	100		3	
	88-216	150		3	
	216-960	200		3	
	Above 1GHz	500		3	
Test Procedure:	<ol style="list-style-type: none"> <li>The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li> <li>For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</li> </ol>				

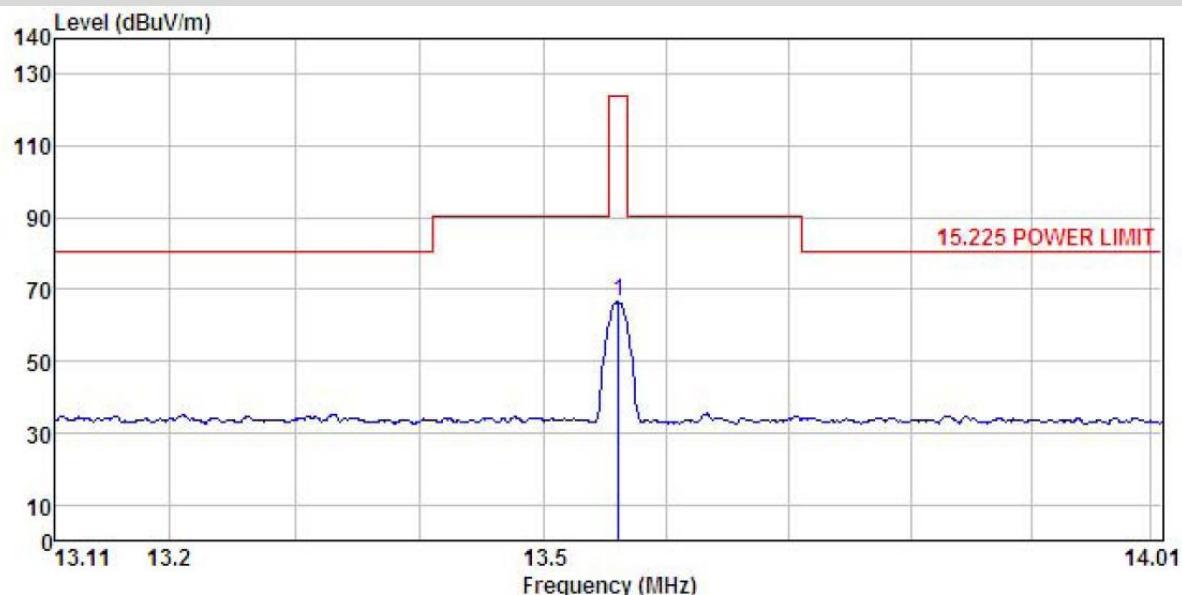
Test setup:	9kHz-30MHz
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Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

## Measurement Data

## 6.2.1 Field Strength Of The Fundamental Signal



Site : 3m chamber  
Condition : 15.225 POWER LIMIT 3m AL-130 LOOP ANTENNA VERTICAL

EUT : Smart phone

Model : RS3

Test mode : NFC Mode

Power Rating : AC120V/60Hz

Environment : Temp:25.5°C Huni:55%

Test Engineer: YT

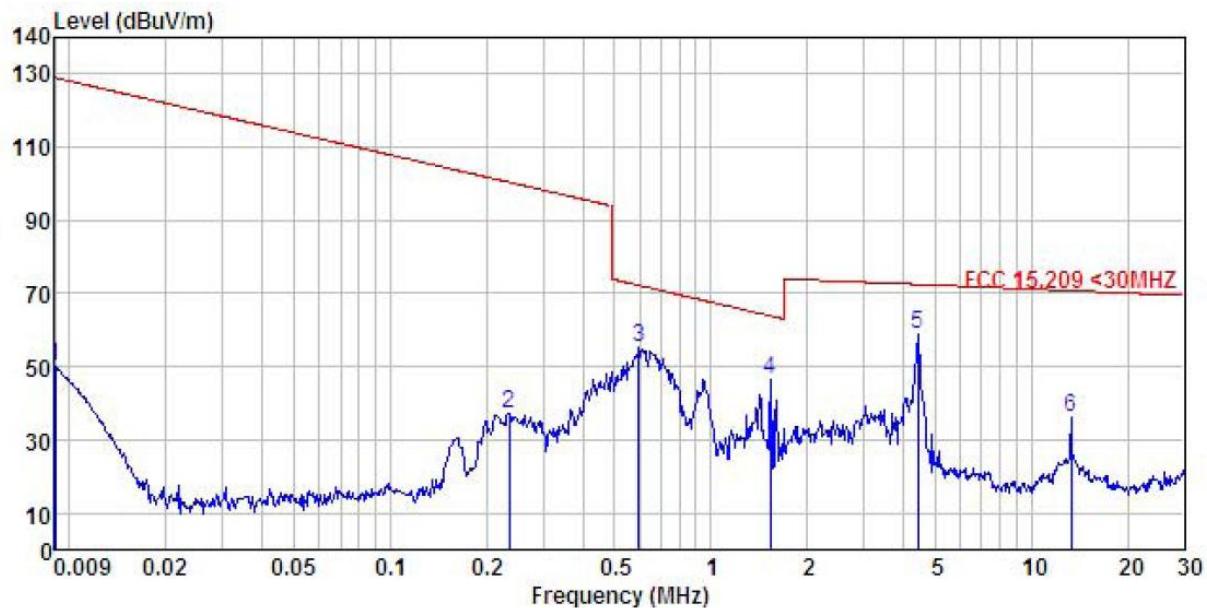
REMARK :

Freq	ReadAntenna Level	Cable Factor	Preamp Loss	Level Factor	Limit Level	Line Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	13.561	52.64	13.36	0.64	0.00	66.64	124.00 -57.36

## 6.2.2 Spurious Emissions

### 9kHz-30MHz:

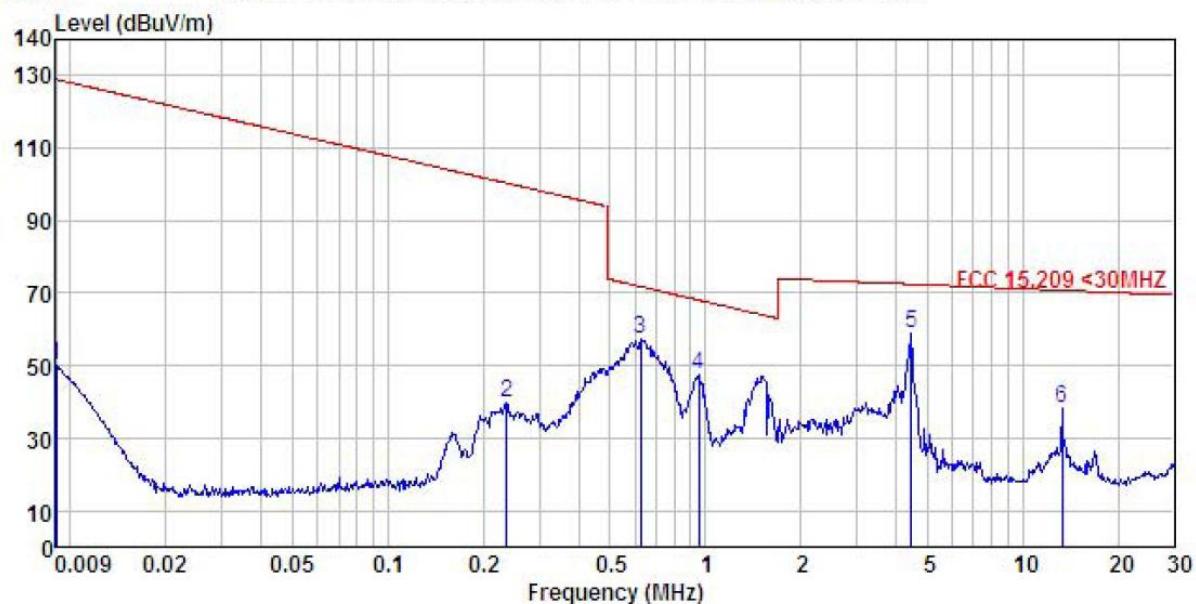
Horizontal:



Site : 3m chamber  
 Condition : FCC 15.209 <30MHz 3m LOOP ANTENNA(9K-30M) HORIZONTAL  
 EUT : Smart phone  
 Model : RS3  
 Test mode : NFC Mode  
 W850- : AC120V/60Hz  
 Environment : Temp:25.5°C Huni:55%  
 Test Engineer: YT  
 REMARK :

Freq	ReadAntenna	Cable	Preamp	Limit	Over	Remark	
	Level	Factor	Loss				
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	0.009	28.29	21.87	0.02	0.00	50.18	129.00 -78.82 QP
2	0.235	14.93	22.13	0.34	0.00	37.40	100.45 -63.05 QP
3	0.596	32.09	22.47	0.52	0.00	55.08	72.27 -17.19 QP
4	1.541	25.59	20.33	0.63	0.00	46.55	63.89 -17.34 QP
5	4.423	34.60	23.56	0.62	0.00	58.78	72.50 -13.72 QP
6	13.330	13.62	22.15	0.63	0.00	36.40	70.77 -34.37 QP

Vertical:

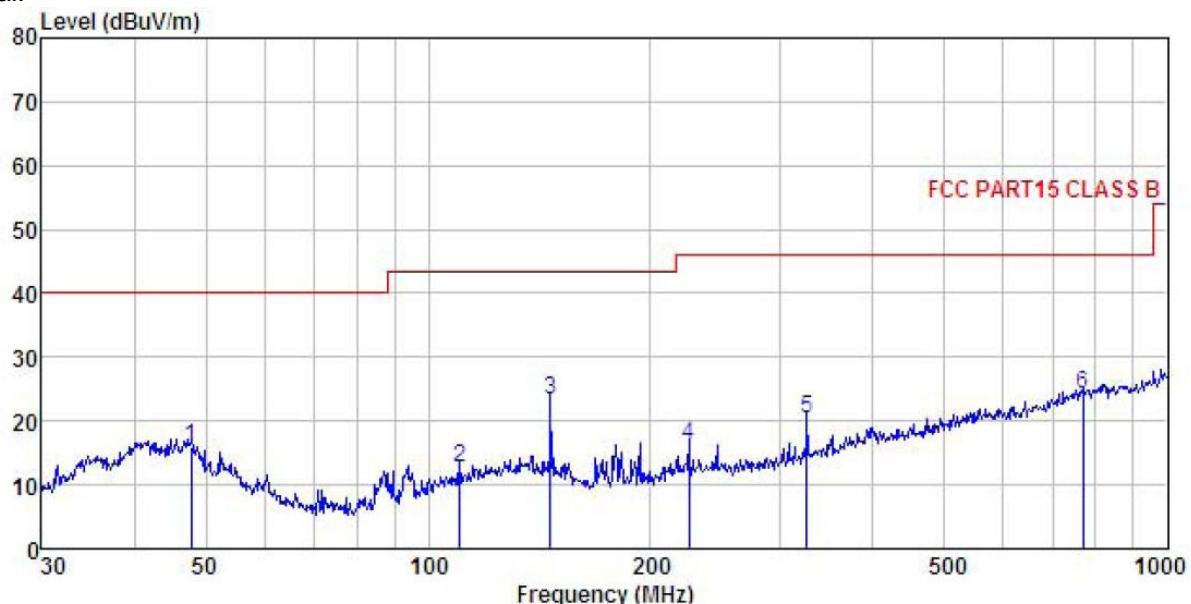


Site : 3m chamber  
Condition : FCC 15.209 <30MHz 3m LOOP ANTENNA (9K-30M) VERTICAL  
EUT : Smart phone  
Model : RS3  
Test mode : NFC Mode  
W850- : AC120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK :

		ReadAntenna	Cable	Preamp	Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	0.009	28.33	21.87	0.02	0.00	50.22	129.00	-78.78 QP
2	0.237	17.09	22.15	0.34	0.00	39.58	100.38	-60.80 QP
3	0.626	34.36	22.47	0.53	0.00	57.36	71.84	-14.48 QP
4	0.955	24.39	22.39	0.61	0.00	47.39	68.12	-20.73 QP
5	4.459	34.93	23.48	0.62	0.00	59.03	72.49	-13.46 QP
6	13.330	15.20	22.15	0.63	0.00	37.98	70.77	-32.79 QP

## 30MHz-1000MHz

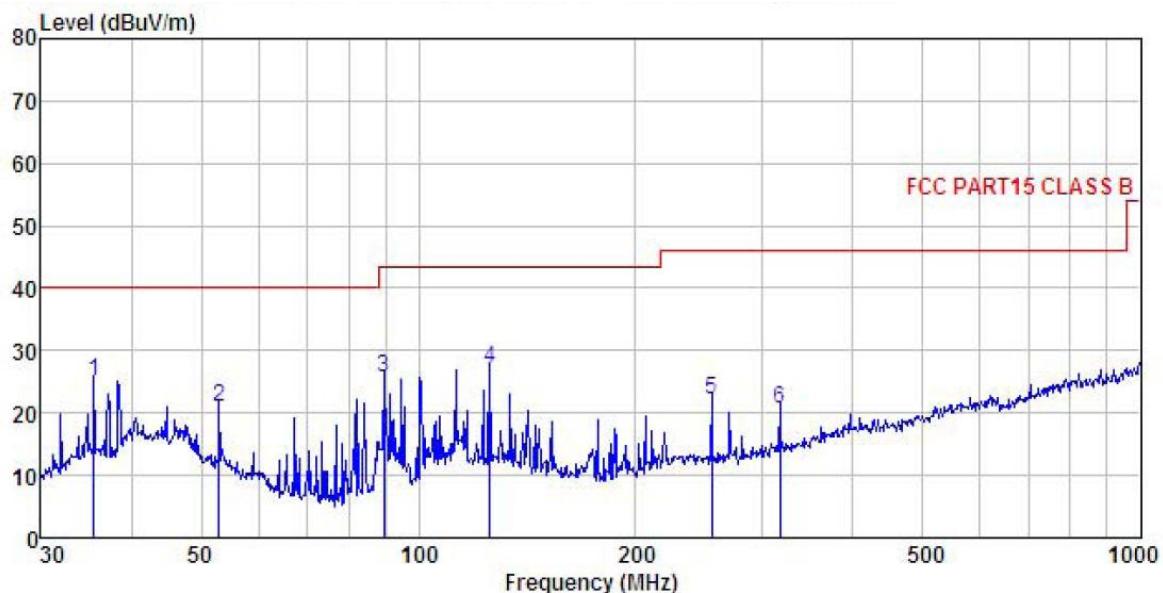
Horizontal:



Site : 3m chamber  
Condition : FCC PART15 CLASS B 3m VULB9163(30M3G) HORIZONTAL  
EUT : Smart phone  
Model : RS3  
Test mode : NFC Mode  
Power Rating : AC120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK :

Freq	Read	Antenna	Cable	Preamp	Limit		Over	Remark
	Level	Factor	Loss	Factor	Level	Line	Limit	
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	47.826	28.43	16.22	1.27	29.84	16.08	40.00	-23.92 QP
2	110.182	29.79	10.30	2.05	29.46	12.68	43.50	-30.82 QP
3	146.374	39.02	11.06	2.47	29.24	23.31	43.50	-20.19 QP
4	225.308	30.37	11.56	2.84	28.68	16.09	46.00	-29.91 QP
5	325.596	32.28	13.46	3.02	28.51	20.25	46.00	-25.75 QP
6	768.748	27.67	20.47	4.36	28.37	24.13	46.00	-21.87 QP

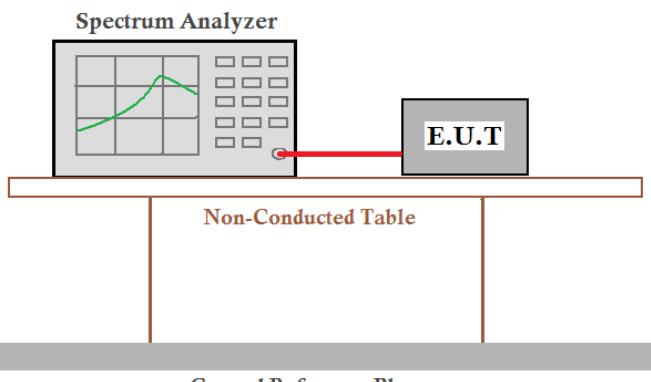
Vertical:



Site : 3m chamber  
Condition : FCC PART15 CLASS B 3m VULB9163(30M3G) VERTICAL  
EUT : Smart phone  
Model : RS3  
Test mode : NFC Mode  
Power Rating : AC120V/60Hz  
Environment : Temp:25.5°C Huni:55%  
Test Engineer: YT  
REMARK :

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Remark	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	
1	35.499	38.77	15.05	1.07	29.94	24.95	40.00	-15.05 QP
2	52.945	36.11	13.31	1.32	29.81	20.93	40.00	-19.07 QP
3	89.590	44.92	8.15	2.04	29.57	25.54	43.50	-17.96 QP
4	125.446	42.19	12.09	2.24	29.36	27.16	43.50	-16.34 QP
5	254.728	36.12	11.81	2.82	28.53	22.22	46.00	-23.78 QP
6	316.589	33.06	13.21	2.99	28.49	20.77	46.00	-25.23 QP

### 6.3 20dB Bandwidth

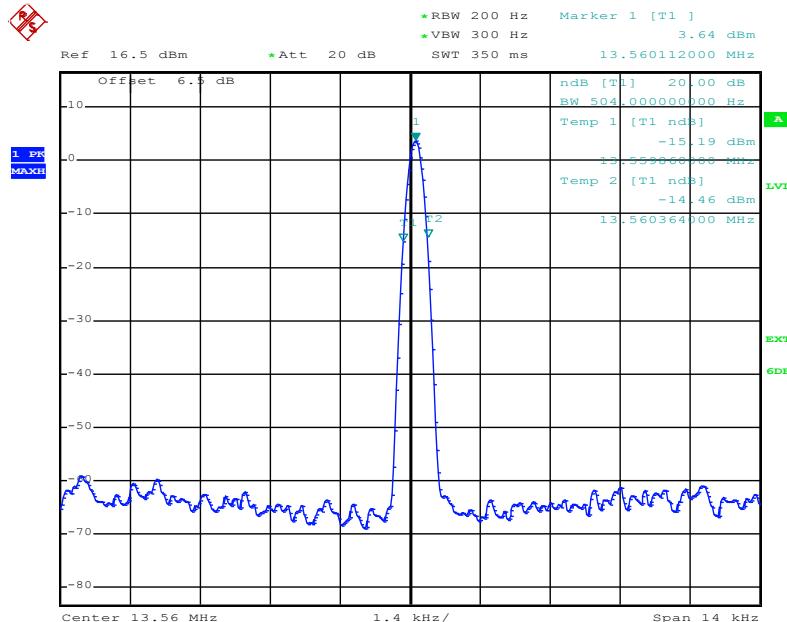
Test Requirement:	FCC Part15 C Section 15.215 (c)
Test Method:	ANSI C63.4:2014
Receiver setup:	RBW=200Hz, VBW=300Hz, detector: Peak
Limit:	The fundamental emission be kept within atleast the central 80% of the permitted band
Test Procedure:	<ol style="list-style-type: none"> <li>1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.</li> <li>2. Set the EUT to proper test channel.</li> <li>3. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points.</li> <li>4. Read 20dB bandwidth.</li> </ol>
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

#### Measurement Data

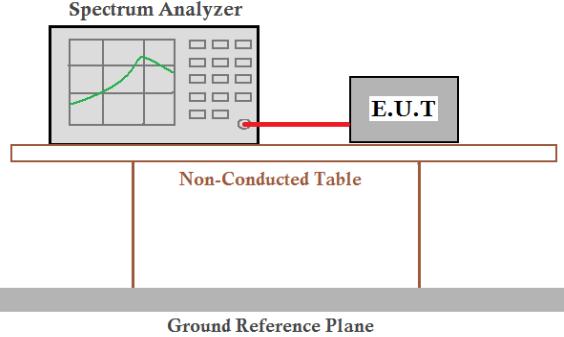
20dB bandwidth (kHz)	Limit (kHz)	Results
0.504	11.2	Passed

Note: For 13.56MHz, permitted Band is 14 kHz, so the Limit is 11.2 kHz.

Test plot as follows:



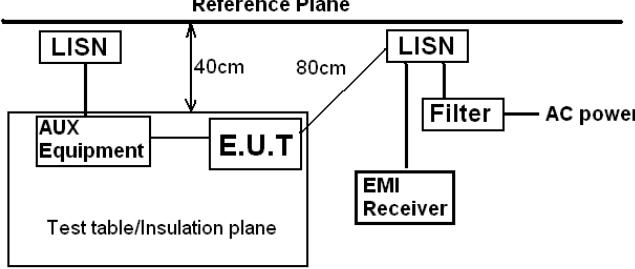
## 6.4 Frequency Tolerance

Test Requirement:	FCC Part15 C Section 15.225 (e)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=200Hz, VBW=300Hz, span=14kHz, detector: Peak
Limit:	$\pm 0.01\%$ of the operating frequency
Test mode:	Transmitting mode
Test Procedure:	<p><b>Frequency stability V.S. Temperature measurement</b></p> <ol style="list-style-type: none"> <li>1. The equipment under test was powered by a fresh battery.</li> <li>2. RF output was connected to spectrum analyzer via feed through attenuators.</li> <li>3. The EUT was placed inside the temperature chamber.</li> <li>4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency.</li> <li>5. Turn EUT off and set the chamber temperature to -20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency.</li> <li>6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached</li> </ol> <p><b>Frequency stability V.S. Voltage measurement</b></p> <ol style="list-style-type: none"> <li>1. Set chamber temperature to 20°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage.</li> <li>2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.</li> </ol> <p>Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.</p>
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

**Measurement Data**

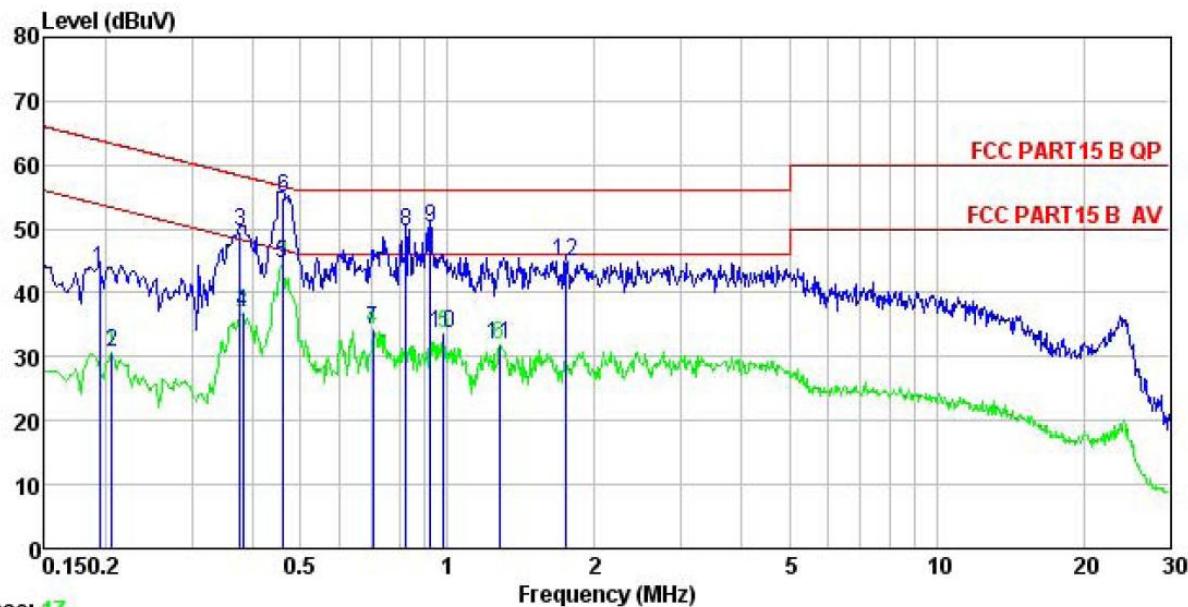
Temperature (°C)	Voltage (Vdc)	Frequency Tolerance (MHz)	Frequency Error (%)	Limit (%)
-20	3.80	13.56014	0.001	±0.01
+50	3.80	13.56010	0.001	±0.01
+20	3.23	13.56013	0.001	±0.01
+20	4.37	13.56011	0.001	±0.01

## 6.5 Conducted Emission

Test Requirement:	FCC Part15 B Section 15.207					
Test Method:	ANSI C63.4:2014					
Test Frequency Range:	150kHz to 30MHz					
Class / Severity:	Class B					
Receiver setup:	RBW=9kHz, VBW=30kHz					
Limit:	Frequency range (MHz)	Limit (dB <sub>μ</sub> V)				
		Quasi-peak	Average			
	0.15-0.5	66 to 56*	56 to 46*			
	0.5-5	56	46			
	0.5-30	60	50			
* Decreases with the logarithm of the frequency.						
Test setup:	 <p>Remark:  <i>E.U.T: Equipment Under Test</i>  <i>LISN: Line Impedance Stabilization Network</i>  <i>Test table height=0.8m</i></p>					
Test procedure	<ol style="list-style-type: none"> <li>1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). It provides a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</li> <li>3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.</li> </ol>					
Test environment:	Temp.:	23°C	Humid.:	56%	Press.:	101kPa
Test Instruments:	Refer to section 5.7 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Pass					

## Measurement Data:

Line:



Site : CCIS Shielding Room  
 Condition : FCC PART15 B QP LISN LINE  
 EUT : Smart phone  
 Model : RS3  
 Test Mode : NFC mode  
 Power Rating : AC 120/60Hz  
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa  
 Test Engineer: YT  
 Remark :

Freq	Read	LISN	Cable	Limit	Over	Remark
	Level	Factor	Loss			
MHz	dBuV		dB	dBuV	dBuV	dB
1	0.194	32.84	0.15	10.76	43.75	63.84 -20.09 QP
2	0.206	19.84	0.15	10.76	30.75	53.36 -22.61 Average
3	0.377	38.79	0.22	10.72	49.73	58.34 -8.61 QP
4	0.381	25.99	0.23	10.72	36.94	48.25 -11.31 Average
5	0.459	33.55	0.24	10.75	44.54	46.71 -2.17 Average
6	0.461	44.05	0.24	10.75	55.04	56.67 -1.63 QP
7	0.705	23.26	0.32	10.77	34.35	46.00 -11.65 Average
8	0.822	38.55	0.29	10.82	49.66	56.00 -6.34 QP
9	0.923	38.94	0.27	10.85	50.06	56.00 -5.94 QP
10	0.984	22.60	0.26	10.87	33.73	46.00 -12.27 Average
11	1.276	20.65	0.28	10.90	31.83	46.00 -14.17 Average
12	1.744	33.52	0.31	10.94	44.77	56.00 -11.23 QP

Neutral:

