

SPECTRUM REPORT

(FM)

Applicant: Shenzhen Huafurui Technology Co., Ltd.
Address of Applicant: Unit 1401 & 1402, 14/F, Jinqi zhigu mansion (No. 4 building of Chong wen Garden), Crossing of the Liu xian street and Tang ling road, Tao yuan street, Nan shan district, Shenzhen, P.R. China

Equipment Under Test (EUT)

Product Name: Smart Phone
Model No.: KINGKONG MINI
Trade mark: CUBOT

Applicable standards: ETSI EN 303 345-1 V1.1.1 (2019-06)

Date of sample receipt: 23 Sep., 2019

Date of Test: 24 Sep., to 17 Oct., 2019

Date of report issue: 24 Oct., 2019

Test Result: PASS*

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives. The protection requirements with respect to electromagnetic compatibility contained in Directive 2014/53/EU are considered.



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.

This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

2 Version

Version No.	Date	Description
00	22 Oct., 2019	Original
01	24 Oct., 2019	1. Updated hardware version on page 5.

Tested by:

Tanet Wei

Test Engineer

Date:

24 Oct., 2019

Reviewed by:

Winner Zhang

Project Engineer

Date:

24 Oct., 2019

3 Contents

	Page
1 COVER PAGE.....	1
2 VERSION	2
3 CONTENTS	3
4 TEST SUMMARY.....	4
5 GENERAL INFORMATION.....	5
5.1 CLIENT INFORMATION	5
5.2 GENERAL DESCRIPTION OF E.U.T.	5
5.3 TEST ENVIRONMENT AND MODE.....	6
5.4 DESCRIPTION OF SUPPORT UNITS.....	6
5.5 MEASUREMENT UNCERTAINTY	6
5.6 LABORATORY FACILITY	6
5.7 LABORATORY LOCATION	6
5.8 TEST INSTRUMENTS LIST.....	7
6 RADIO TECHNICAL SPECIFICATION IN ETSI EN 303 345	8
6.1 SENSITIVITY	8
6.2 ADJACENT CHANNEL SELECTIVITY AND BLOCKING	10
6.3 UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN	12
7 TEST SETUP PHOTO	18
8 EUT CONSTRUCTIONAL DETAILS	20

4 Test Summary

Test Items	Test Requirement	Test method	Limit/Severity	Result
Sensitivity	Clause 4.2.4	Clause 5.3.4.1	Clause 4.2.4.2	PASS
Receiver adjacent channel selectivity and blocking	Clause 4.2.5	Clause 5.3.5.1	Clause 4.2.5.2	PASS
Unwanted emissions in the spurious domain	Clause 4.2.6	Clause 5.3.6.1	Clause 4.2.6.2	PASS
Remark: Pass: Meet the requirement				

5 General Information

5.1 Client Information

Applicant:	Shenzhen Huafurui Technology Co., Ltd.
Address:	Unit 1401 & 1402, 14/F, Jinqi zhigu mansion (No. 4 building of Chong wen Garden), Crossing of the Liu xian street and Tang ling road, Tao yuan street, Nan shan district, Shenzhen, P.R. China
Manufacturer:	Shenzhen Huafurui Technology Co., Ltd.
Address:	Unit 1401 & 1402, 14/F, Jinqi zhigu mansion (No. 4 building of Chong wen Garden), Crossing of the Liu xian street and Tang ling road, Tao yuan street, Nan shan district, Shenzhen, P.R. China
Factory:	Shenzhen Huafurui Technology Co., Ltd.
Address:	Unit 1401 & 1402, 14/F, Jinqi zhigu mansion (No. 4 building of Chong wen Garden), Crossing of the Liu xian street and Tang ling road, Tao yuan street, Nan shan district, Shenzhen, P.R. China

5.2 General Description of E.U.T.

Product Name:	Smart Phone
Model No.:	KINGKONG MINI
Hardware version:	D936_MB_V2.0_20190817
Software version:	CUBOT_KINGKONG MINI_9101C_V01_20190814
Operation Frequency:	VHF band II: 87.5 MHz to 108 MHz
Modulation Technology:	Frequency modulation(FM)
Antenna Type:	Earphone as antenna
Power supply:	Rechargeable Li-ion polymer Battery DC3.7V/2000mAh
AC adapter:	Model No.:HJ-0501000B3-EU Input: AC100-240V, 50/60Hz 0.15 A Output: DC 5.0V, 1.0A

5.3 Test environment and mode

Operating Environment:	
Temperature:	15°C ~ 35 °C
Humidity:	20 % ~ 75%
Atmospheric Pressure:	1008 mbar
Test mode:	
Receiving mode:	Keep the EUT in continuously Receiving mode with modulation.

5.4 Description of Support Units

Manufacturer	Description	Model	S/N	FCC ID/DoC
Lenovo	PC	ThinkPad E450	PF-OKTSQQ 16/06	DoC

5.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Conducted Measurement	±1.0 dB
Radiated Emission (30MHz ~ 1000MHz)	±4.32 dB
Radiated Emission (1GHz ~ 18GHz)	±5.38 dB

5.6 Laboratory Facility

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

● **FCC - Designation No.: CN1211**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

● **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang 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 Zhongjian Nanfang 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.

● **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

5.7 Laboratory Location

Shenzhen Zhongjian Nanfang 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
Email: info@ccis-cb.com, Website: <http://www.ccis-cb.com>

5.8 Test Instruments list

Radiated Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-18-2019	03-17-2020
Biconical Antenna	SCHWARZBECK	VUBA9117	359	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-18-2019	03-17-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-22-2017	06-21-2020
EMI Test Software	AUDIX	E3	Version: 6.110919b		
Pre-amplifier	HP	8447D	2944A09358	03-18-2019	03-17-2020
Pre-amplifier	CD	PAP-1G18	11804	03-18-2019	03-17-2020
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-18-2019	03-17-2020
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-18-2019	03-17-2020
Signal Generator	Rohde & Schwarz	SMX	835454/016	03-18-2019	03-17-2020
Signal Generator	R&S	SMR20	1008100050	03-18-2019	03-17-2020
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-18-2019	03-17-2020
Cable	MICRO-COAX	MFR64639	K10742-5	03-18-2019	03-17-2020
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-18-2019	03-17-2020

Conducted method:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
Signal Generator	Rohde & Schwarz	SMX	835454/016	03-18-2019	03-17-2020
Cell Site Test Set	HP	8921A	3606A07821	03-18-2019	03-17-2020
Spectrum Analyzer	Rohde & Schwarz	FSP 30	101454	03-18-2019	03-17-2020
Impedance converter	SUNLIGHT	ST-5075	N/A	03-18-2019	03-17-2020

6 Radio Technical Specification in ETSI EN 303 345

6.1 Sensitivity

Test Requirement:	ETSI EN 303 345 clause 4.2.4																																																																																		
Test Method:	ETSI EN 303 345 clause 5.3.4.1																																																																																		
Limit:	<table><tr><th rowspan="2">Test</th><th rowspan="2">De-modulation</th><th rowspan="2">Tuned frequency band</th><th rowspan="2">Wanted signal centre frequency (MHz)</th><th colspan="2">Required sensitivity limit</th></tr><tr><th>Conducted (dBm)</th><th>Radiated (dBµV/m)</th></tr><tr><td>1</td><td rowspan="3">AM</td><td>LF</td><td>0,216</td><td>-65</td><td>74</td></tr><tr><td>2</td><td>MF</td><td>0,999</td><td>-65</td><td>66</td></tr><tr><td>3</td><td>HF</td><td>9,9</td><td>-65</td><td>60</td></tr><tr><td>4</td><td>FM</td><td>VHF band II</td><td>98</td><td>-90</td><td>50 (see note 1)</td></tr><tr><td>5</td><td>DAB</td><td>VHF band III</td><td>202,928</td><td>-94</td><td>37 (see note 2)</td></tr><tr><td>6</td><td rowspan="8">DRM</td><td>LF</td><td>0,216</td><td>-101</td><td>58</td></tr><tr><td>7</td><td>MF</td><td>0,999</td><td>-101</td><td>52</td></tr><tr><td>8</td><td>HF1</td><td>4</td><td>-101</td><td>44</td></tr><tr><td>9</td><td>HF2</td><td>19</td><td>-101</td><td>40</td></tr><tr><td>10</td><td>VHF band I</td><td>65</td><td>-102</td><td>45</td></tr><tr><td>11</td><td>VHF band II</td><td>100</td><td>-102</td><td>46</td></tr><tr><td>12</td><td>VHF band III</td><td>200</td><td>-102</td><td>51</td></tr></table> <p>NOTE 1: For products with an integral antenna, the requirement is relaxed to 67 dBµV/m. NOTE 2: For products with an integral antenna, the requirement is relaxed to 50 dBµV/m.</p> <table><tr><th>Demodulation</th><th>Impairment criteria</th></tr><tr><td>AM</td><td>SNR ≥ 28 dBQ ref 40 % AM</td></tr><tr><td>FM</td><td>SNR ≥ 40 dBQ ref ±60,8 kHz deviation; clean audio (see note 1)</td></tr><tr><td>DAB</td><td>Clean audio (see note 2)</td></tr><tr><td>DRM</td><td>Clean audio (see note 2)</td></tr></table> <p>NOTE 1: Clean audio is defined as 10 seconds of audio with no subjective impairments (e.g. clicks resulting from FM threshold effects). NOTE 2: Clean audio is defined as 10 seconds of audio with no subjective impairments (e.g. muting, clicks, warbles or squeaks).</p>	Test	De-modulation	Tuned frequency band	Wanted signal centre frequency (MHz)	Required sensitivity limit		Conducted (dBm)	Radiated (dBµV/m)	1	AM	LF	0,216	-65	74	2	MF	0,999	-65	66	3	HF	9,9	-65	60	4	FM	VHF band II	98	-90	50 (see note 1)	5	DAB	VHF band III	202,928	-94	37 (see note 2)	6	DRM	LF	0,216	-101	58	7	MF	0,999	-101	52	8	HF1	4	-101	44	9	HF2	19	-101	40	10	VHF band I	65	-102	45	11	VHF band II	100	-102	46	12	VHF band III	200	-102	51	Demodulation	Impairment criteria	AM	SNR ≥ 28 dBQ ref 40 % AM	FM	SNR ≥ 40 dBQ ref ±60,8 kHz deviation; clean audio (see note 1)	DAB	Clean audio (see note 2)	DRM	Clean audio (see note 2)
Test	De-modulation					Tuned frequency band	Wanted signal centre frequency (MHz)	Required sensitivity limit																																																																											
		Conducted (dBm)	Radiated (dBµV/m)																																																																																
1	AM	LF	0,216	-65	74																																																																														
2		MF	0,999	-65	66																																																																														
3		HF	9,9	-65	60																																																																														
4	FM	VHF band II	98	-90	50 (see note 1)																																																																														
5	DAB	VHF band III	202,928	-94	37 (see note 2)																																																																														
6	DRM	LF	0,216	-101	58																																																																														
7		MF	0,999	-101	52																																																																														
8		HF1	4	-101	44																																																																														
9		HF2	19	-101	40																																																																														
10		VHF band I	65	-102	45																																																																														
11		VHF band II	100	-102	46																																																																														
12		VHF band III	200	-102	51																																																																														
Demodulation		Impairment criteria																																																																																	
AM	SNR ≥ 28 dBQ ref 40 % AM																																																																																		
FM	SNR ≥ 40 dBQ ref ±60,8 kHz deviation; clean audio (see note 1)																																																																																		
DAB	Clean audio (see note 2)																																																																																		
DRM	Clean audio (see note 2)																																																																																		
Test setup:																																																																																			
Test procedure:	<p>AM and FM sensitivity measurements:</p> <ol style="list-style-type: none">1) The 'unwanted' signal generator remains switched off for the duration of the test.2) The 'wanted' signal generator is set to the required modulation method and test configuration as specified in clause 4.2.3, and to the frequency specified in clause 4.2.4. The signal level is adjusted to provide the level, as measured at ©, specified in clause 4.2.4 plus 30 dB.3) The receiver is tuned to the frequency of the 'wanted' signal generator. For a receiver without a digital frequency display, the receiver shall be tuned for optimum THD+N (i.e. as it would be tuned by a user for best quality). The receiver's audio level shall be set so as to provide clean 1 kHz audio tone at the audio output (that is less than 10 % total harmonic distortion) but of sufficient level to drive the measurement device.4) The level of the 'wanted' signal generator is adjusted to provide the level, as measured at ©, specified in clause 4.2.4.5) The audio output, measured using the measurement device, is recorded as the signal level, S.6) The modulating audio signal for the 'wanted' signal generator is removed. The audio output, measured using the measurement device, is recorded as the noise level, N.																																																																																		

	<p>7) If the impairment criteria given in clause 4.2.4 are met then the receiver has passed</p> <p>8) The EUT connector impedance is 75 Ω, which connect the equipment test systems via a 50-75 Ω impedance converter.</p>
Test Instruments:	See section 5.8
Test mode:	Receiving mode
Test Result:	Pass

Measurement Data:

Modulation	Tuned Frequency Band	Wanted Signal		S (mV)	N (mV)	SNR (dBQ)	Limit (dBQ)	Audio	Result
		Frequency (MHz)	Level at \odot (dBm)						
FM	VHF Band II	98.00	-90.00	289.40	1.89	43.70	≥ 40	Clean Audio	Pass

Note:

- The wanted signal used FM modulation with ± 60.8 kHz deviation and 1 kHz tone. According to the pre-calibration, the actual level of signal generator is -52 dBm
- The earphone antenna connector Impedance for 75 Ω , by Impedance Converter(50 - 75 Ω) connect to test instrument.

6.2 Adjacent channel selectivity and blocking

Test Requirement:	ETSI EN 303 345 clause 4.2.5																																																																																																																																																																																
Test Method:	ETSI EN 303 345 clause 5.3.5.1																																																																																																																																																																																
Limit:	<div>Table 8: Adjacent channel selectivity and blocking requirements</div> <table><tr><th rowspan="2">Test</th><th rowspan="2">De-modulation</th><th rowspan="2">Tuned frequency band</th><th rowspan="2">C Wanted signal centre frequency (MHz)</th><th colspan="2">C Wanted signal level</th><th colspan="4">Required I/C ratio (see notes 1 and 2)</th></tr><tr><th>Conducted (dBm)</th><th>Radiated (dBµV/m)</th><th>N = 1 (dB)</th><th>N = 2 (dB)</th><th>N = 3 (dB)</th><th>Blocking (dB)</th></tr><tr><td>1R</td><td rowspan="3">AM (built-in or integral antenna, see note 4)</td><td>LF</td><td>0,216</td><td>n/a</td><td>80</td><td>-30</td><td>10</td><td>20</td><td>20</td></tr><tr><td>2R</td><td>MF</td><td>0,999</td><td>n/a</td><td>72</td><td>-30</td><td>10</td><td>20</td><td>20</td></tr><tr><td>3R</td><td>HF</td><td>9,9</td><td>n/a</td><td>66</td><td>-30</td><td>10</td><td>20</td><td>20</td></tr><tr><td>1C</td><td rowspan="3">AM (external antenna)</td><td>LF</td><td>0,216</td><td>-59</td><td>n/a</td><td>-5</td><td>25</td><td>35</td><td>40</td></tr><tr><td>2C</td><td>MF</td><td>0,999</td><td>-59</td><td>n/a</td><td>-5</td><td>25</td><td>35</td><td>40</td></tr><tr><td>3C</td><td>HF</td><td>9,9</td><td>-59</td><td>n/a</td><td>-5</td><td>25</td><td>35</td><td>40</td></tr><tr><td>4R</td><td>FM (built-in or integral antenna, see note 4)</td><td>VHF band II</td><td>98</td><td>n/a</td><td>56 (see note 3)</td><td>-15</td><td>-3</td><td>8</td><td>20</td></tr><tr><td>4C</td><td>FM (external antenna)</td><td>VHF band II</td><td>98</td><td>-84</td><td>n/a</td><td>3</td><td>17</td><td>30</td><td>30</td></tr><tr><td>5</td><td>DAB</td><td>VHF band III</td><td>202,928</td><td>-70</td><td>61</td><td>35</td><td>40</td><td>45</td><td>40</td></tr><tr><td>6</td><td rowspan="7">DRM</td><td>LF</td><td>0,216</td><td>-91</td><td>68</td><td>25</td><td>35</td><td>45</td><td>50</td></tr><tr><td>7</td><td>MF</td><td>0,999</td><td>-91</td><td>62</td><td>25</td><td>35</td><td>45</td><td>50</td></tr><tr><td>8</td><td>HF1</td><td>4</td><td>-91</td><td>54</td><td>25</td><td>35</td><td>45</td><td>50</td></tr><tr><td>9</td><td>HF2</td><td>19</td><td>-91</td><td>54</td><td>25</td><td>35</td><td>45</td><td>50</td></tr><tr><td>10</td><td>VHF band I</td><td>65</td><td>-91</td><td>50</td><td>35</td><td>40</td><td>45</td><td>50</td></tr><tr><td>11</td><td>VHF band II</td><td>100</td><td>-92</td><td>55</td><td>35</td><td>40</td><td>45</td><td>50</td></tr><tr><td>12</td><td>VHF band III</td><td>200</td><td>-92</td><td>61</td><td>35</td><td>40</td><td>45</td><td>50</td></tr></table> <div><div>NOTE 1: The frequency of the interferer shall be calculated using the channel spacing data in table 7 for each of the 6 defined adjacent channels N = {-3, -2, -1, +1, +2, +3} and the two blocking offsets. Each row of table 8 thus defines 8 individual tests.</div><div>NOTE 2: The minimum level of I for the relevant level of impairment is calculated by adding the I/C ratio to the wanted C level.</div><div>NOTE 3: The wanted signal level for receivers with integral antenna is 73 dBµV/m.</div><div>NOTE 4: The ACS and blocking requirements for AM and FM devices are currently separated into different limits for radiated and conducted testing methods. These limits are likely to be unified in a future revision of the present document. Users of the present document should consult frequently the latest list published in the Official Journal of the European Union.</div></div> <div>Table 9: Impairment criteria for adjacent channel selectivity and blocking tests</div> <table><tr><th>Demodulation</th><th>Impairment criteria</th></tr><tr><td>AM</td><td>SNR ≥ 28 dBQ ref 40 % AM</td></tr><tr><td>FM</td><td>SNR ≥ 40 dBQ ref ±60,8 kHz deviation; clean audio (see note 1)</td></tr><tr><td>DAB</td><td>Clean audio (see note 2)</td></tr><tr><td>DRM</td><td>Clean audio (see note 2)</td></tr></table> <div><div>NOTE 1: Clean audio is defined as 10 seconds of audio with no subjective impairments (e.g. clicks resulting from FM threshold effects).</div><div>NOTE 2: Clean audio is defined as 10 seconds of audio with no subjective impairments (e.g. muting, clicks, warbles or squeaks).</div></div>	Test	De-modulation	Tuned frequency band	C Wanted signal centre frequency (MHz)	C Wanted signal level		Required I/C ratio (see notes 1 and 2)				Conducted (dBm)	Radiated (dBµV/m)	N = 1 (dB)	N = 2 (dB)	N = 3 (dB)	Blocking (dB)	1R	AM (built-in or integral antenna, see note 4)	LF	0,216	n/a	80	-30	10	20	20	2R	MF	0,999	n/a	72	-30	10	20	20	3R	HF	9,9	n/a	66	-30	10	20	20	1C	AM (external antenna)	LF	0,216	-59	n/a	-5	25	35	40	2C	MF	0,999	-59	n/a	-5	25	35	40	3C	HF	9,9	-59	n/a	-5	25	35	40	4R	FM (built-in or integral antenna, see note 4)	VHF band II	98	n/a	56 (see note 3)	-15	-3	8	20	4C	FM (external antenna)	VHF band II	98	-84	n/a	3	17	30	30	5	DAB	VHF band III	202,928	-70	61	35	40	45	40	6	DRM	LF	0,216	-91	68	25	35	45	50	7	MF	0,999	-91	62	25	35	45	50	8	HF1	4	-91	54	25	35	45	50	9	HF2	19	-91	54	25	35	45	50	10	VHF band I	65	-91	50	35	40	45	50	11	VHF band II	100	-92	55	35	40	45	50	12	VHF band III	200	-92	61	35	40	45	50	Demodulation	Impairment criteria	AM	SNR ≥ 28 dBQ ref 40 % AM	FM	SNR ≥ 40 dBQ ref ±60,8 kHz deviation; clean audio (see note 1)	DAB	Clean audio (see note 2)	DRM	Clean audio (see note 2)
Test	De-modulation					Tuned frequency band	C Wanted signal centre frequency (MHz)	C Wanted signal level		Required I/C ratio (see notes 1 and 2)																																																																																																																																																																							
		Conducted (dBm)	Radiated (dBµV/m)	N = 1 (dB)	N = 2 (dB)			N = 3 (dB)	Blocking (dB)																																																																																																																																																																								
1R	AM (built-in or integral antenna, see note 4)	LF	0,216	n/a	80	-30	10	20	20																																																																																																																																																																								
2R		MF	0,999	n/a	72	-30	10	20	20																																																																																																																																																																								
3R		HF	9,9	n/a	66	-30	10	20	20																																																																																																																																																																								
1C	AM (external antenna)	LF	0,216	-59	n/a	-5	25	35	40																																																																																																																																																																								
2C		MF	0,999	-59	n/a	-5	25	35	40																																																																																																																																																																								
3C		HF	9,9	-59	n/a	-5	25	35	40																																																																																																																																																																								
4R	FM (built-in or integral antenna, see note 4)	VHF band II	98	n/a	56 (see note 3)	-15	-3	8	20																																																																																																																																																																								
4C	FM (external antenna)	VHF band II	98	-84	n/a	3	17	30	30																																																																																																																																																																								
5	DAB	VHF band III	202,928	-70	61	35	40	45	40																																																																																																																																																																								
6	DRM	LF	0,216	-91	68	25	35	45	50																																																																																																																																																																								
7		MF	0,999	-91	62	25	35	45	50																																																																																																																																																																								
8		HF1	4	-91	54	25	35	45	50																																																																																																																																																																								
9		HF2	19	-91	54	25	35	45	50																																																																																																																																																																								
10		VHF band I	65	-91	50	35	40	45	50																																																																																																																																																																								
11		VHF band II	100	-92	55	35	40	45	50																																																																																																																																																																								
12		VHF band III	200	-92	61	35	40	45	50																																																																																																																																																																								
Demodulation	Impairment criteria																																																																																																																																																																																
AM	SNR ≥ 28 dBQ ref 40 % AM																																																																																																																																																																																
FM	SNR ≥ 40 dBQ ref ±60,8 kHz deviation; clean audio (see note 1)																																																																																																																																																																																
DAB	Clean audio (see note 2)																																																																																																																																																																																
DRM	Clean audio (see note 2)																																																																																																																																																																																
Test setup:																																																																																																																																																																																	
Test procedure:	<div>1) The 'wanted' signal generator is set to the required modulation method and test configuration as specified in clause 4.2.3, and to the frequency specified in clause 4.2.5. The signal level is adjusted to provide the level, as measured at ©, specified in clause 4.2.5, with the 'unwanted' generator switched off.</div> <div>2) The 'unwanted' signal generator is set to the required modulation method and test configuration as specified in clause 4.2.3, and to the frequency calculated from the wanted signal centre frequency and the required offset specified in clause 4.2.5. The signal level is adjusted to provide the level, as measured at ©, specified in clause 4.2.5, with the 'wanted' generator switched off. For the blocking test only, the audio modulation of the 'unwanted' signal shall be removed</div>																																																																																																																																																																																

	<p>whilst measuring the level at ©.</p> <p>3) The 'wanted' signal generator is switched back on.</p> <p>4) The receiver is tuned to the frequency of the 'wanted' signal generator. For a receiver without a digital frequency display, the receiver shall be tuned for optimum THD+N (i.e. as it would be tuned by a user for best quality). The receiver's audio level shall be set so as to provide clean 1 kHz audio tone at the audio output (that is less than 10 % total harmonic distortion) but of sufficient level to drive the measurement device.</p> <p>5) The audio output, measured using the measurement device, is recorded as the signal level, S.</p> <p>6) The modulating audio signal for the 'wanted' signal generator is removed. The audio output, measured using the measurement device, is recorded as the noise level, N.</p> <p>7) If the impairment criteria given in clause 4.2.5 are met then the receiver has passed the test.</p>
Test Instruments:	See section 5.8
Test mode:	Receiving mode
Test Result:	Pass

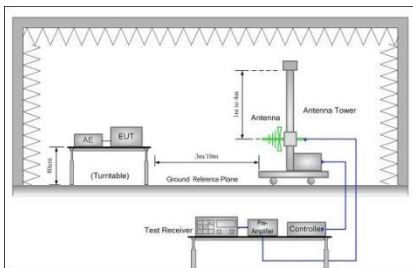
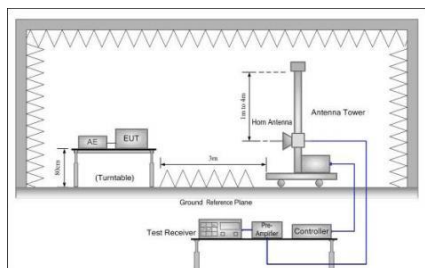
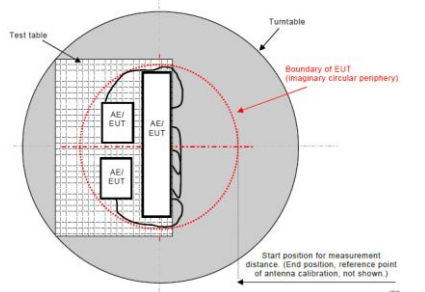
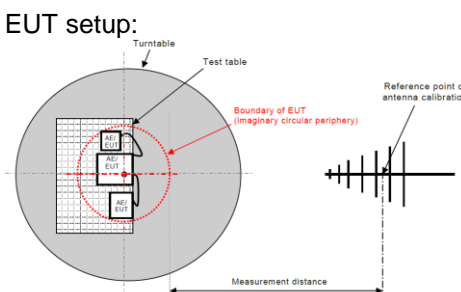
Test Data:

Test Data:

Modulation: FM, Tuned Frequency Band: VHF Band II										
Wanted Signal		Unwanted Signal		S (mV)	N (mV)	SNR (dBQ)	Limit (dBQ)	Audio	Result	
Frequency (MHz)	Level at © (dBm)	Frequency (MHz)	Level at © (dBm)							
98.00	-84.00	N=-1	97.80	-79.00	289.8	1.91	43.62	≥40	Clean Audio	Pass
		N=1	98.20	-79.00	289.5	1.89	43.70	≥40	Clean Audio	Pass
		N=-2	97.70	-67.00	289.9	1.99	43.27	≥40	Clean Audio	Pass
		N=2	98.30	-67.00	289.1	1.87	43.78	≥40	Clean Audio	Pass
		N=-3	97.60	-54.00	289.3	1.88	43.74	≥40	Clean Audio	Pass
		N=3	98.40	-54.00	289.5	1.89	43.70	≥40	Clean Audio	Pass
		Blocking	97.20	-54.00	289.7	1.9	43.66	≥40	Clean Audio	Pass
			98.80	-54.00	289.6	1.92	43.57	≥40	Clean Audio	Pass

Note:
1. For Adjacent channel selectivity test, the unwanted signal used FM modulation with weighted noise and 32 kHz quasi-peak deviation. The actual level of signal generator is -43 dBm.
2. For Blocking test, the unwanted signal used AM modulation with 1 kHz tone and 80% depth. The actual level of signal generator is -18 dBm.
3. The earphone antenna connector Impedance for 75Ω, by Impedance Converter(50 – 75 Ω) connect to test instrument.

6.3 Unwanted emissions in the spurious domain

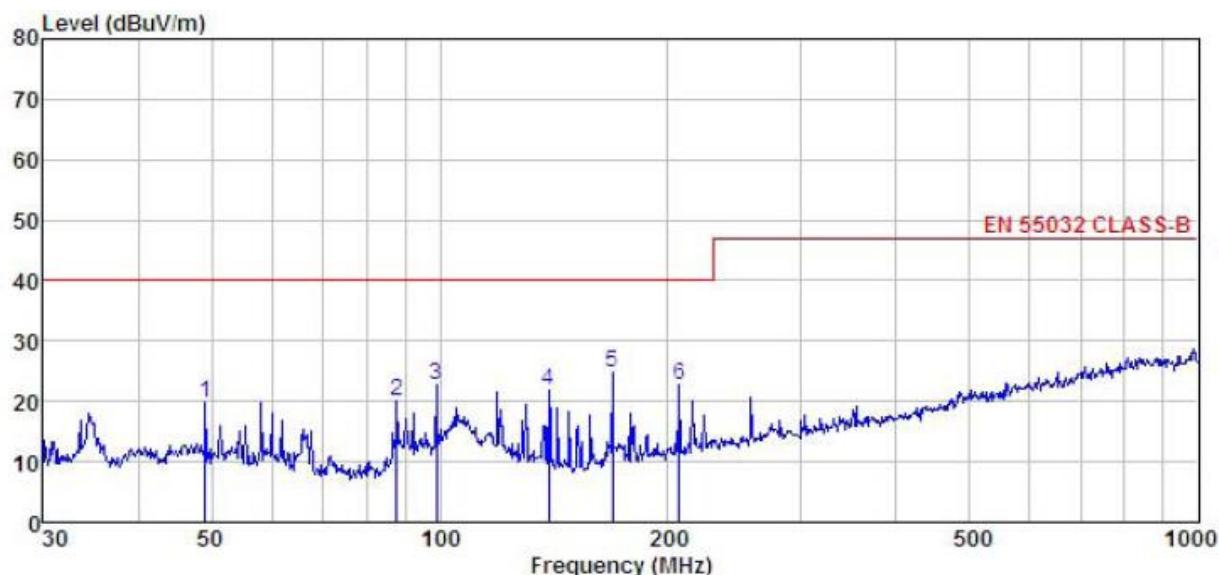
Test Requirement:	ETSI EN 303 345 clause 4.2.6																																																																					
Test Method:	ETSI EN 303 345 clause 5.3.6.1																																																																					
Limit:	<div>Table A.4 – Requirements for radiated emissions at frequencies up to 1 GHz for class B equipment</div> <table><tr><th>Table clause</th><th>Frequency range MHz</th><th colspan="3">Measurement</th><th>Class B limits dB(μV/m)</th></tr><tr><th></th><th></th><th>Facility (see Table A.1)</th><th>Distance m</th><th>Detector type / bandwidth</th><th></th></tr><tr><td rowspan="2">A4.1</td><td>30 to 230</td><td rowspan="2">OATS/SAC</td><td rowspan="2">10</td><td rowspan="4">Quasi Peak / 120 kHz</td><td>30</td></tr><tr><td>230 to 1 000</td><td>37</td></tr><tr><td rowspan="2">A4.2</td><td>30 to 230</td><td rowspan="2">OATS/SAC</td><td rowspan="2">3</td><td>40</td></tr><tr><td>230 to 1 000</td><td>47</td></tr><tr><td rowspan="2">A4.3</td><td>30 to 230</td><td rowspan="2">FAR</td><td rowspan="2">10</td><td rowspan="4">Quasi Peak / 120 kHz</td><td>32 to 25</td></tr><tr><td>230 to 1 000</td><td>32</td></tr><tr><td rowspan="2">A4.4</td><td>30 to 230</td><td rowspan="2">FAR</td><td rowspan="2">3</td><td>42 to 35</td></tr><tr><td>230 to 1 000</td><td>42</td></tr></table> <div>Apply only table clause A4.1 or A4.2 or A4.3 or A4.4 across the entire frequency range.</div> <div>These requirements are not applicable to the local oscillator and harmonics frequencies of equipment covered by Table A.6.</div> <div>Table A.5 – Requirements for radiated emissions at frequencies above 1 GHz for class B equipment</div> <table><tr><th>Table clause</th><th>Frequency range MHz</th><th colspan="3">Measurement</th><th>Class B limits dB(μV/m)</th></tr><tr><th></th><th></th><th>Facility (see Table A.1)</th><th>Distance m</th><th>Detector type/ bandwidth</th><th></th></tr><tr><td rowspan="2">A5.1</td><td>1 000 to 3 000</td><td rowspan="4">FSOATS</td><td rowspan="4">3</td><td rowspan="2">Average/ 1 MHz</td><td>50</td></tr><tr><td>3 000 to 6 000</td><td>54</td></tr><tr><td rowspan="2">A5.2</td><td>1 000 to 3 000</td><td rowspan="2">Peak/ 1 MHz</td><td>70</td></tr><tr><td>3 000 to 6 000</td><td>74</td></tr></table> <div>Apply A5.1 and A5.2 across the frequency range from 1 000 MHz to the highest required frequency of measurement derived from Table 1.</div>		Table clause	Frequency range MHz	Measurement			Class B limits dB(μV/m)			Facility (see Table A.1)	Distance m	Detector type / bandwidth		A4.1	30 to 230	OATS/SAC	10	Quasi Peak / 120 kHz	30	230 to 1 000	37	A4.2	30 to 230	OATS/SAC	3	40	230 to 1 000	47	A4.3	30 to 230	FAR	10	Quasi Peak / 120 kHz	32 to 25	230 to 1 000	32	A4.4	30 to 230	FAR	3	42 to 35	230 to 1 000	42	Table clause	Frequency range MHz	Measurement			Class B limits dB(μV/m)			Facility (see Table A.1)	Distance m	Detector type/ bandwidth		A5.1	1 000 to 3 000	FSOATS	3	Average/ 1 MHz	50	3 000 to 6 000	54	A5.2	1 000 to 3 000	Peak/ 1 MHz	70	3 000 to 6 000	74
Table clause	Frequency range MHz	Measurement			Class B limits dB(μV/m)																																																																	
		Facility (see Table A.1)	Distance m	Detector type / bandwidth																																																																		
A4.1	30 to 230	OATS/SAC	10	Quasi Peak / 120 kHz	30																																																																	
	230 to 1 000				37																																																																	
A4.2	30 to 230	OATS/SAC	3		40																																																																	
	230 to 1 000				47																																																																	
A4.3	30 to 230	FAR	10	Quasi Peak / 120 kHz	32 to 25																																																																	
	230 to 1 000				32																																																																	
A4.4	30 to 230	FAR	3		42 to 35																																																																	
	230 to 1 000				42																																																																	
Table clause	Frequency range MHz	Measurement			Class B limits dB(μV/m)																																																																	
		Facility (see Table A.1)	Distance m	Detector type/ bandwidth																																																																		
A5.1	1 000 to 3 000	FSOATS	3	Average/ 1 MHz	50																																																																	
	3 000 to 6 000				54																																																																	
A5.2	1 000 to 3 000			Peak/ 1 MHz	70																																																																	
	3 000 to 6 000				74																																																																	
Test Frequency range:	30MHz to 6GHz																																																																					
Test setup:	<div><div>Below 1GHz:</div></div> <div><div>Above 1GHz:</div></div> <div><div>EUT setup:</div></div>																																																																					
Test procedure:	<div>From 30MHz to 1GHz:</div> <div><div>1. The radiated emissions test was conducted in a semi-anechoic chamber.</div><div>2. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.</div><div>3. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT.</div></div>																																																																					

	<p>4. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.</p> <p>Above 1GHz:</p> <ol style="list-style-type: none"> 1. The radiated emissions test was conducted in a fully-anechoic chamber. 2. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation. 3. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emission spectrum plots of the EUT. 4. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.
Test Instruments:	See section 5.8
Test mode:	Receiving mode
Measurement Result:	Pass

Measurement Data:

Below 1GHz:

Product Name:	Smart Phone	Product Model:	KINGKONG MINI
Test By:	Janet	Test mode:	FM - 98 MHz
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	AC 230/50Hz	Environment:	Temp: 24℃ Humi: 57%

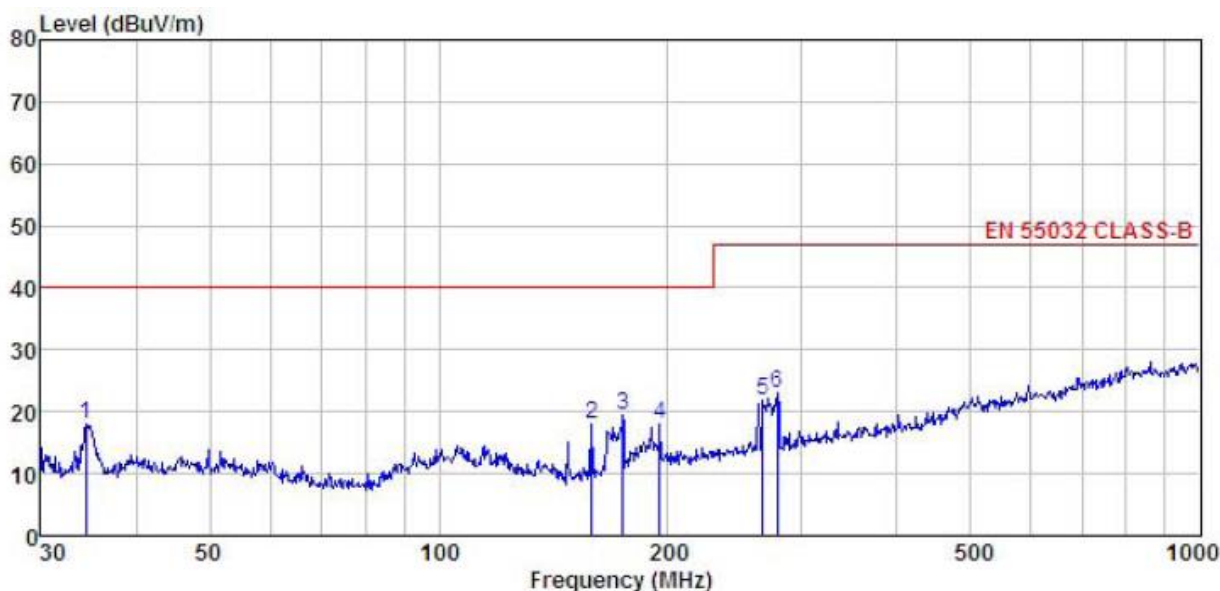


	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	49.014	36.10	12.14	1.26	29.83	19.67	40.00	-20.33	QP
2	87.725	38.41	9.35	1.96	29.58	20.14	40.00	-19.86	QP
3	98.833	38.20	12.22	1.97	29.53	22.86	40.00	-17.14	QP
4	139.361	39.32	9.54	2.39	29.28	21.97	40.00	-18.03	QP
5	169.005	41.56	9.61	2.65	29.06	24.76	40.00	-15.24	QP
6	207.123	37.77	10.92	2.86	28.78	22.77	40.00	-17.23	QP

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product Name:	Smart Phone	Product Model:	KINGKONG MINI
Test By:	Janet	Test mode:	FM - 98 MHz
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 230/50Hz	Environment:	Temp: 24℃ Humi: 57%



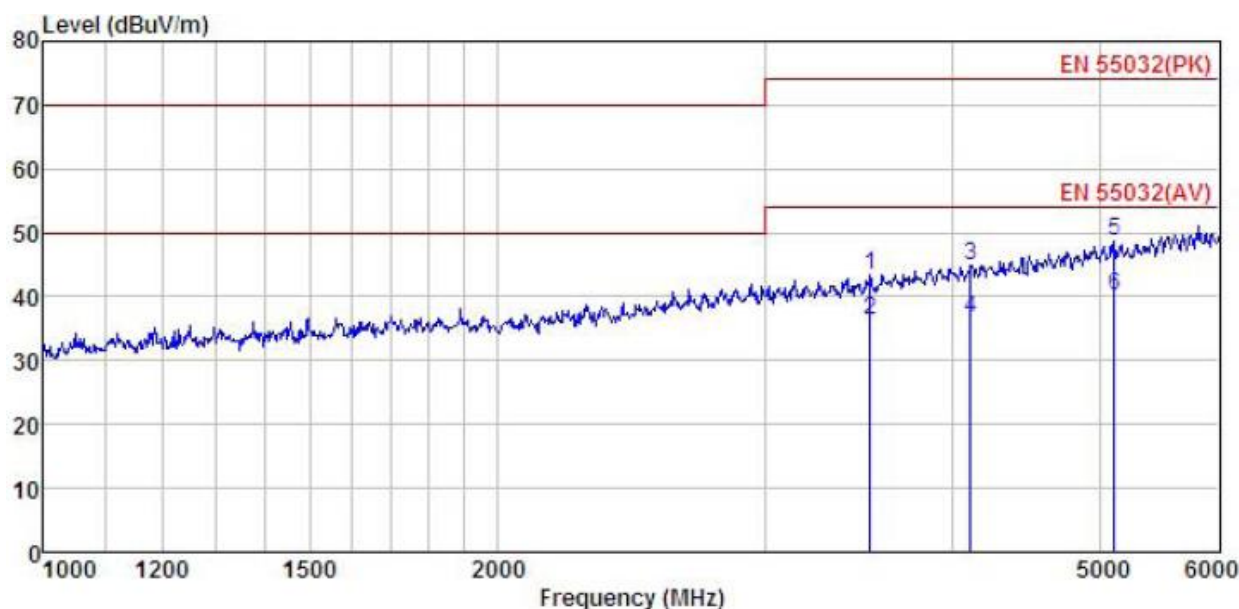
	ReadAntenna	Cable	Preamp		Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit
-----	-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	34.396	35.90	11.14	1.04	29.95	18.13	40.00
2	158.668	35.27	9.24	2.57	29.14	17.94	40.00
3	174.424	35.89	9.79	2.69	29.02	19.35	40.00
4	195.137	33.64	10.45	2.84	28.86	18.07	40.00
5	266.609	34.44	13.01	2.85	28.51	21.79	47.00
6	278.067	35.31	13.22	2.88	28.49	22.92	47.00

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Above 1GHz:

Product Name:	Smart Phone	Product Model:	KINGKONG MINI
Test By:	Janet	Test mode:	FM - 98 MHz
Test Frequency:	1 GHz ~ 6 GHz	Polarization:	Vertical
Test Voltage:	AC 230/50Hz	Environment:	Temp: 24℃ Humi: 57%

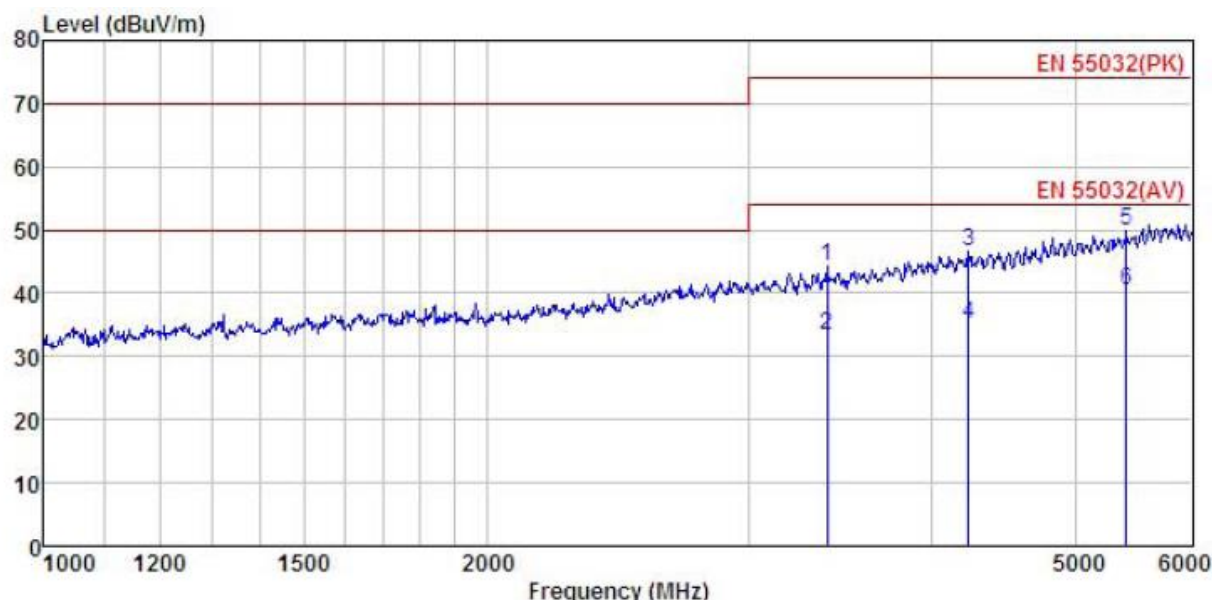


	Freq	Read	Antenna	Cable	Preamp	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	3524.036	48.08	28.71	5.80	41.47	43.32	74.00	-30.68 Peak
2	3524.036	40.98	28.71	5.80	41.47	36.22	54.00	-17.78 Average
3	4111.131	47.88	30.32	6.27	41.81	44.89	74.00	-29.11 Peak
4	4111.131	39.67	30.32	6.27	41.81	36.68	54.00	-17.32 Average
5	5115.591	49.24	31.69	7.03	41.92	48.58	74.00	-25.42 Peak
6	5115.591	40.78	31.69	7.03	41.92	40.12	54.00	-13.88 Average

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product Name:	Smart Phone	Product Model:	KINGKONG MINI
Test By:	Janet	Test mode:	FM - 98 MHz
Test Frequency:	1 GHz ~ 6 GHz	Polarization:	Horizontal
Test Voltage:	AC 230/50Hz	Environment:	Temp: 24℃ Humi: 57%



	Freq	Read	Antenna	Cable	Preamp	Level	Limit	Over	Remark
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	
		dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	3393.901	49.35	28.58	5.62	41.35	44.33	74.00	-29.67	Peak
2	3393.901	38.41	28.58	5.62	41.35	33.39	54.00	-20.61	Average
3	4230.695	49.39	30.35	6.45	41.83	46.64	74.00	-27.36	Peak
4	4230.695	38.02	30.35	6.45	41.83	35.27	54.00	-18.73	Average
5	5417.471	49.70	32.41	7.15	41.86	50.02	74.00	-23.98	Peak
6	5417.471	40.07	32.41	7.15	41.86	40.39	54.00	-13.61	Average

Remark:

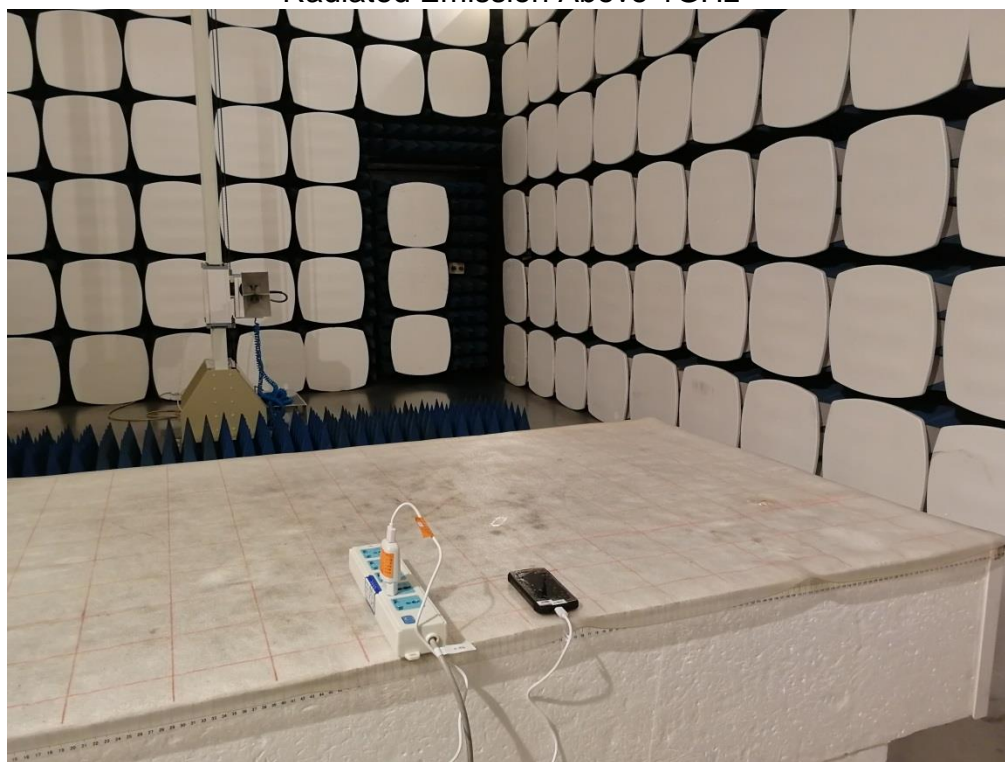
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

7 Test setup photo

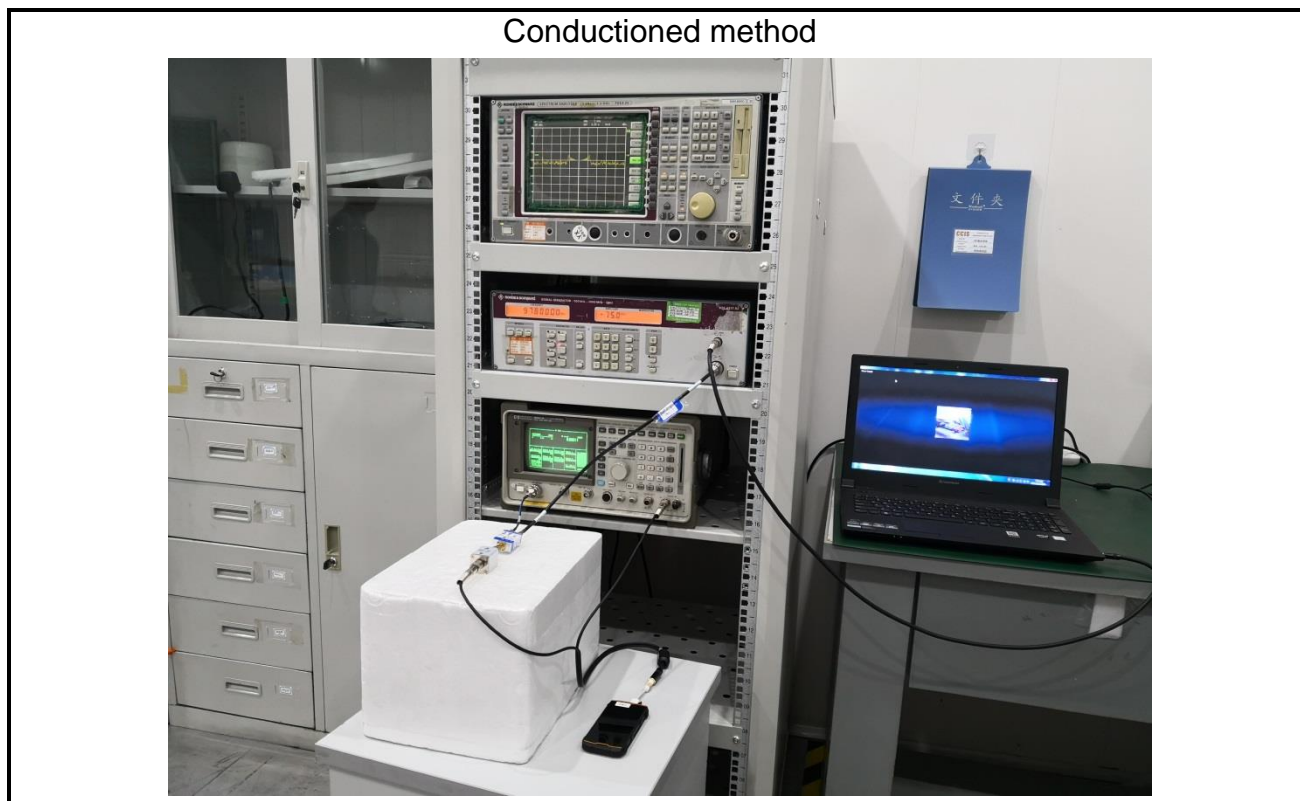
Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



Conduction method



8 EUT Constructional Details

Reference to the test report No. CCISE190909401

-----End of report-----