



# **RADIO TEST REPORT**

## **ETSI EN 300 330 V2.1.1 (2017-02)**

**Product :** Smartphone

**Trade Mark :** CUBOT

**Model Name :** KINGKONG 5

**Fmaily Model :** N/A

**Report No. :** S21042201105009

### **Prepared for**

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**TEST RESULT CERTIFICATION**

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**Manufacturer's Name** ..... Shenzhen Huafurui Technology Co., Ltd.  
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**Product description**

**Product name** ..... Smartphone  
**Trademark** ..... CUBOT  
**Model Name** ..... KINGKONG 5  
**Emaily Model** : N/A

**Standards** ..... ETSI EN 300 330 V2.1.1 (2017-02)

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the of Radio Equipment Regulations (SI 2017/1206) requirements. And it is applicable only to the tested sample identified in the report. This report shall not be reproduced except in full, without the written approval of NTEK, this document may be altered or revised by NTEK, personnel only, and shall be noted in the revision of the document.

**Date of Test** .....

**Date (s) of performance of tests** ..... Apr 22, 2021 ~May 19, 2021

**Date of Issue** ..... May 19, 2021

**Test Result** ..... **Pass**

**Testing Engineer** : Cheng Jiawen  
(Cheng Jiawen)

**Technical Manager** : Jason Chen  
(Jason Chen)

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(Alex Li)

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## 1. GENERAL INFORMATION

## 1.1 GENERAL DESCRIPTION OF EUT

|                     |   |  |
|---------------------|---|--|
| Equipment           | Smartphone  |  |
| Trade Mark          | CUBOT   |  |
| Model Name.         | KINGKONG 5  |  |
| Fmaily Model        | N/A   |  |
| Model Difference    | N/A   |  |
| Product Description | The EUT is Smartphone   |  |
|                     | Operation Frequency:  | 13.56 MHz  |
|                     | Number Of Channel   | 1CH  |
|                     | Modulation  | ASK  |
|                     | Technologies  | <input checked="" type="checkbox"/> tagging systems<br><input type="checkbox"/> systems in the 27 MHz range<br><input type="checkbox"/> all others |
|                     | Product Class <sup>Note 3</sup>   | Class 1  |
|                     | Antenna Designation:  | Induction coil   |
| Adapter             | Model: HJ-0502000-UK<br>Input: AC 100-240V~50/60Hz 0.3A<br>Output: DC 5V---2.0A 10.0W |  |
| Battery             | DC 3.85V, 5000mAh, 19.25Wh  |  |
| Rating              | DC 3.85V from battery or DC 5V from Adapter.  |  |
| I/O Ports           | Refer to users manual   |  |
| Hardware Version    | TE826_MAIN_PCB_V1.1   |  |
| Software Version    | CUBOT_KINGKONG 5_B023C_V02_20210513   |  |

- NOTE: 1. The EUT belong to subclass 56 non-specific use devices.  
2. All the tests were performed at 3m test sites.  
3. The description of product classes please see the ETSI EN 300 330 V2.1.1 Annex B Table B.1.  
4. For more information, please refer to User's Manual.

## 1.2 TEST CONDITIONS

|                   | Normal Test Conditions | Extreme Test Conditions     |
|-------------------|------------------------|-----------------------------|
| Temperature       | 15°C ~ 35°C            | -10°C ~ +40°C Note: (1)     |
| Relative Humidity | 20% ~ 75%              | N/A                         |
| Supply Voltage    | DC 3.85V               | DC 3.4V ~ DC 4.2V Note: (2) |

Note:

(1) The temperature range as declared by the manufacturer: -10°C ~ +40°C

(2) The High Voltage 4.2V and Low Voltage 3.4V was declared by manufacturer.

### 1.3 DESCRIPTION OF TEST CONDITIONS

E-1  
EUT

## 1.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment  | Model/Type No. | Series No. | Note |
|------|------------|----------------|------------|------|
| E-1  | Smartphone | KINGKONG 5     | N/A        | EUT  |
|      |            |                |            |      |
|      |            |                |            |      |
|      |            |                |            |      |
|      |            |                |            |      |
|      |            |                |            |      |
|      |            |                |            |      |

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|------|
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

## 1.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

| Item | Kind of Equipment   | Manufacturer | Type No. | Serial No. | Last calibration               | Calibrated until               | Calibration period |
|------|---------------------|--------------|----------|------------|--------------------------------|--------------------------------|--------------------|
| 1    | Bilog Antenna       | TESEQ        | CBL6111D | 31216      | May. 11, 2020<br>Mar. 29, 2021 | May. 10, 2021<br>Mar. 28, 2022 | 1 year             |
| 2    | Test Cable          | N/A          | R-01     | N/A        | Apr. 11, 2020                  | Apr. 10, 2023                  | 3 year             |
| 3    | Test Cable          | N/A          | R-02     | N/A        | Apr. 11, 2020                  | Apr. 10, 2023                  | 3 year             |
| 4    | EMI Test Receiver   | R&S          | ESCI-7   | 101318     | May. 11, 2020<br>Apr. 27, 2021 | May. 10, 2021<br>Apr. 26, 2022 | 1 year             |
| 5    | Antenna Mast        | EM           | SC100_1  | N/A        | N/A                            | N/A                            | N/A                |
| 6    | Turn Table          | EM           | SC100    | 060531     | N/A                            | N/A                            | N/A                |
| 7    | 50Ω Switch          | Anritsu Corp | MP59B    | 6200983705 | May. 11, 2020                  | May. 10, 2023                  | 3 year             |
| 8    | Triple Loop Antenna | EVERFINE     | LLA-2    | 11020003   | Jul. 13, 2020                  | Jul. 12, 2021                  | 1 year             |
| 9    | Spectrum Analyzer   | R&S          | FSV40    | 101417     | Aug. 07, 2020                  | Aug. 06, 2021                  | 1 year             |

Note: Each piece of equipment is scheduled for calibration once a year except the Test Cable which is scheduled for calibration every 3 years.

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| EN 300 330 V2.1.1             |   |         |
|-------------------------------|---|---------|
| Clause                        | Test Item                                     | Results |
| <b>TRANSMITTER PARAMETERS</b> |   |         |
| 4.3.1                         | Permitted range of operating frequencies      | Pass    |
| 4.3.2                         | Operating frequency ranges                    | Pass    |
| 4.3.3                         | Modulation bandwidth                          | Pass    |
| 4.3.4                         | Transmitter H-field requirements              | Pass    |
| 4.3.5                         | Transmitter RF carrier current                | N/A     |
| 4.3.6                         | Transmitter radiated E-field                  | N/A     |
| 4.3.7                         | Transmitter conducted spurious emissions      | N/A     |
| 4.3.8&4.3.9                   | Transmitter radiated spurious domain emission | Pass    |
| 4.3.10                        | Transmitter Frequency stability               | N/A     |
| <b>RECEIVER PARAMETERS</b>    |   |         |
| 4.4.2                         | Receiver spurious emissions                   | Pass    |
| 4.4.3                         | Adjacent channel selectivity                  | N/A     |
| 4.4.4                         | Receiver blocking or desensitization          | N/A     |

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

## 2.1 TEST FACILITY

Shenzhen NTEK Testing Technology Co., Ltd.

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FCC Registered No.: 463705 IC Registered No.: 9270A-1

CNAS Registration No.: L5516 A2LA No.: 4298.01

## 2.2 MAXIMUM MEASUREMENT UNCERTAINTY

The interpretation of the results recorded in the test report for the measurements described in the present document shall be as follows:

- the measured value related to the corresponding limit shall be used to decide whether an equipment meets the requirements of the present document;
- the value of the measurement uncertainty for the measurement of each parameter shall be separately included in the test report;
- the value of the measurement uncertainty shall be, for each measurement, equal to or less than the figures given below:

| Items               | Uncertainty             |
|---------------------|-------------------------|
| RF Frequency        | $\pm 1 \times 10^{-7}$  |
| RF Power, Conducted | $\pm 1\text{dB}$        |
| RF power, radiated  | $\pm 6\text{dB}$        |
| Temperature         | $\pm 1^{\circ}\text{C}$ |
| Humidity            | $\pm 5 \%$ .            |

For the test methods, according to the EN 300 330 V2.1.1 the uncertainty figures shall be calculated according to the methods described in the ETSI TR 100 028 [i.14] and shall correspond to an expansion factor (coverage factor)  $k = 1,96$  or  $k = 2$  (which provide confidence levels of respectively 95 % and 95,45 % in case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

The measurement uncertainties given above are based on such expansion factors.

The particular expansion factor used for the evaluation of the measurement uncertainty shall be stated.



### 3. TRANSMITTER PARAMETERS

#### 3.1 PERMITTED RANGE OF OPERATING FREQUENCIES

##### 3.1.1 APPLICABILITY& LIMITS

This applies to all EUT.

The permitted range of operating frequencies for intentional emissions shall be entirely within the frequency bands in ETSI EN 300330 table 1.

##### 3.1.2 CONFORMANCE

The permitted range of operating frequencies used by the EUT shall be declared by the manufacturer. The operating frequency range(s) will be tested considered under in the test item Operating frequency ranges.

##### 3.1.3 RESULT

| Items                                      | Notes                      | Result     |
|--|----------------------------|------------|
| Operational Frequency bands                | 13,553 MHz to 13,567 MHz   | Compliance |
| Nominal Operating Frequency or Frequencies | 13.56MHz <sub>Note 1</sub> |            |

Note 1: The operating frequency used by this EUT is declared by the manufacturer.

### 3.2. OPERATING FREQUENCY RANGES

#### 3.2.1 APPLICABILITY& DESCRIPTION

This applies to all EUT.

The operating frequency range (OFR) is the frequency range over which the EUT is transmitting. The operating frequency range of the EUT is determined by the lowest ( $f_L$ ) and highest frequency ( $f_H$ ) as occupied by the power envelope.

With the centre frequency of the OFR as:  $f_c = (f_H + f_L)/2$ .

An EUT could have more than one operating frequency range.

#### 3.2.2 LIMITS

The operating frequency ranges for intentional emissions shall be entirely within the frequency bands in table 1 in EN 300 330 V2.1.1.

#### 3.2.3 TEST PROCEDURE

The measurement antenna shall be placed at one point of the setup up. Alternatively, a current probe could be used.

A spectrum analyser with the following settings is used as measuring receiver in the test set-up:

- Start frequency: lower than the lower edge of the permitted frequency range.
- Stop frequency: higher than the upper edge of the permitted frequency range.
- Resolution Bandwidth: see table 11.

Table 11

| Frequency: (f)  | Detector type | Measurement receiver bandwidth | Spectrum analyser bandwidth |
|---|---------------|--------------------------------|-----------------------------|
| $9 \text{ kHz} \leq f < 150 \text{ kHz}$  | Quasi Peak    | 200 Hz                         | 300 Hz                      |
| $150 \text{ kHz} \leq f < 30 \text{ MHz}$   | Quasi Peak    | 9 kHz                          | 10 KHz                      |
| $30 \text{ MHz} \leq f \leq 1\,000 \text{ MHz}$   | Quasi Peak    | 120 kHz                        | 100 kHz                     |
| NOTE: For the measurement of the ranges $6,765 \text{ MHz} \leq f \leq 6,795 \text{ MHz}$ and $11,810 \text{ MHz} \leq f \leq 15,310 \text{ MHz}$ , the measurement bandwidth has to be 200 Hz respectively 300 Hz. |               |                                |                             |

- Video Bandwidth:  $\geq$  Resolution Bandwidth.
- Detector mode: RMS.
- Display mode: Maxhold.

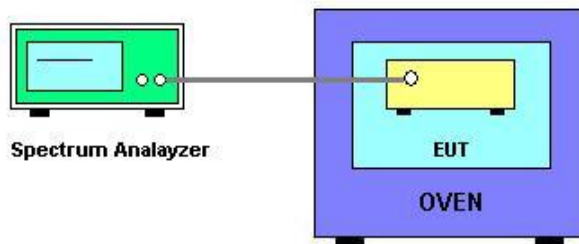
The 99 % OBW function shall be used to determine the operating frequency range:

- $f_H$  is determined.  $f_H$  is the frequency of the upper marker resulting from the OFR.
- $f_L$  is determined.  $f_L$  is the frequency of the lower marker resulting from the OFR.
- $f_c$  is the centre frequency.

$$f_c = \frac{f_H + f_L}{2}$$

Alternatively, the recorded results from the H-field measurement described in clause 6.2.4 may be used.

#### 3.2.4 TEST SETUP



The EUT was programmed to be in continuously transmitting mode.

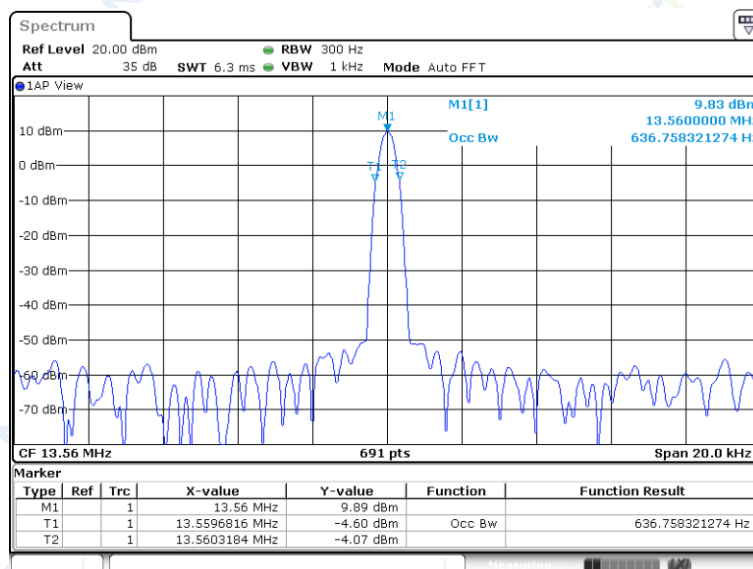
### 3.2.5 TEST RESULTS

|               |            |                   |            |
|---------------|------------|-------------------|------------|
| EUT :         | Smartphone | Model Name :      | KINGKONG 5 |
| Temperature : | 26°C       | Relative Humidity | 60 %       |
| Pressure :    | 1012 hPa   | Test Voltage :    | DC 3.85V   |
| Test Mode :   | TX         |                   |            |

| CHANNEL  | 99%OCCUPIED BANDWIDTH (kHz) | Measured frequencies |                      |                      | Limit  | PASS /FAIL |
|----------|-----------------------------|----------------------|----------------------|----------------------|--|------------|
|          |                             | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | F <sub>C</sub> (MHz) |  |            |
| 13.56MHz | 0.637                       | 13.5596816           | 13.5603184           | 13.56                | F <sub>L</sub> >13.553MHz and F <sub>H</sub> <13.567 MHz | PASS       |

| Extreme condition                                    |        |           |      | Frequency range ( MHz )     |                             |
|--|--------|-----------|------|-----------------------------|-----------------------------|
|  |        |           |      | F <sub>L</sub>              | F <sub>H</sub>              |
| T min (°C)   | -10.00 | V max (V) | 4.2  | 13.5599963                  | 13.5603286                  |
|  |        | V nom (V) | 3.85 | 13.5590132                  | 13.5608562                  |
|  |        | V min (V) | 3.4  | 13.5593256                  | 13.5607969                  |
| T max (°C)   | 40.00  | V max (V) | 4.2  | 13.5593862                  | 13.5601628                  |
|  |        | V nom (V) | 3.85 | 13.5592322                  | 13.5602788                  |
|  |        | V min (V) | 3.4  | 13.5598904                  | 13.5608413                  |
| Min. f <sub>L</sub> / Max. f <sub>H</sub> Band Edges |        |           |      | 13.5590132                  | 13.5608562                  |
| Indoor Use Limits                                    |        |           |      | F <sub>L</sub> > 13.556 MHz | F <sub>L</sub> < 13.567 MHz |
| Result   |        |           |      | Complies                    |                             |

### Test Plot-Normal condition



### 3.3 TRANSMITTER CARRIER OUTPUT LEVELS (H-FIELD (RADIATED))

#### 3.3.1 APPLICABILITY& DESCRIPTION

The Transmitter H-field requirements only applies for equipment under product class 1 and class 2 as defined in EN 300 330 clause 6.1.2 and clause B.2.

In the case of a transmitter with an integral or dedicated antenna, the radiated H-field is defined in the direction of maximum field strength under specified conditions of measurement.

#### 3.3.2 LIMITS

The frequency ranges and limits of the present document are shown in table 2. The limits are based on the European Commission Decision for SRDs [i.10], CEPT/ERC/REC 70-03 [i.1].

**Table 2: H-field limits at 10 m**

| Frequency range (MHz)                                     | H-field strength limit (Hf) dBμA/m at 10 m or specified in mW e.r.p. |
|---|--|
| $13,553 \leq f \leq 13,567$                               | 42 (see note 2) or 60 (see notes 1 and 2)                            |
| NOTE 1: For RFID (incl. NFC) and EAS applications only.   |  |
| NOTE 2: Spectrum mask limit, see ETSI EN 300 330 annex I. |  |

The H-field limit in dBμA/m at 3 m, H<sub>3m</sub>, is determined by the following equation:

$$H_{3m} = H_{10m} + C3 \text{ (F.2)}$$

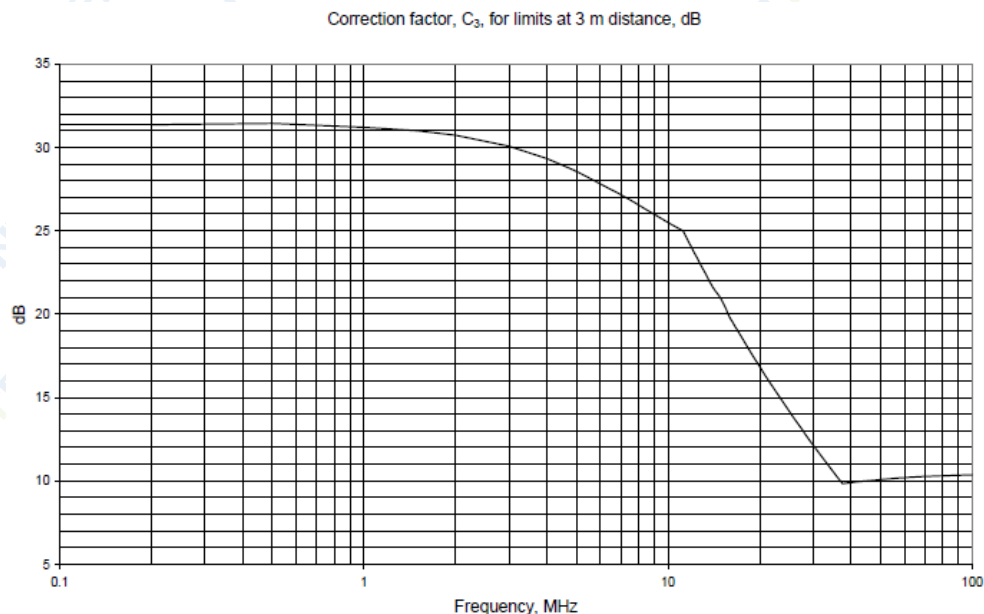
Where: H<sub>10m</sub> is the H-field limit in dBμA/m at 10 m distance according to the present document; and C3 is a conversion factor in dB determined from figure F.2.

The limit at 10 m(H<sub>10m</sub>) is 60 dBμA/m.

For 13.56MHz: Owing to the frequency EUT is 13.56MHz, so the C3 approach to 23dB.

Then the limit at 3m(H<sub>3m</sub>) = H<sub>10m</sub> + C3 = 60 + 23 =83 dBμA/m.

The H Field Strength shall not exceed the values 83 dBuA/m 3m Distance under normal test conditions.



**Figure H.2: Conversion factor C<sub>3</sub> versus frequency**

### 3.3.3 TEST PROCEDURE

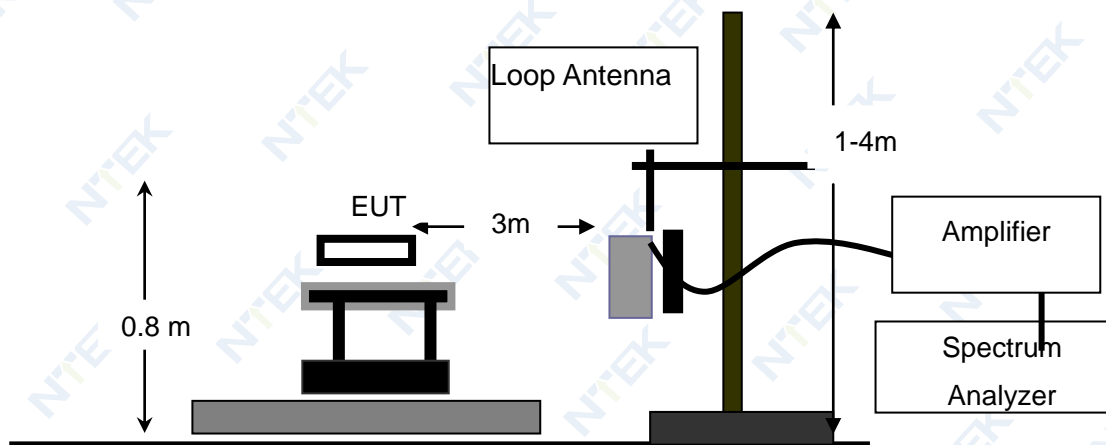
The measurements of the transmitter radiated H-field shall be made on an open field test site as specified in clause C.1.3. Any measured values shall be at least 6 dB above the ambient noise level. The H-field produced by the equipment shall be measured at standard distance of 10 m. Where this is not practical, e.g. due to physical size of the equipment including the antenna or with use of special field cancelling antenna, then other distances may be used. When another distance is used, the distance used and the field strength value measured shall be stated in the test report. In this case, the measured value at actual test distance shall be extrapolated to 10 m according to EN 300 330 annex H and these calculations shall be stated in the test report.

The H-field is measured with a shielded loop antenna connected to a measurement receiver. The measuring bandwidth and detector type of the measurement receiver shall be in accordance with EN 300 330 clause 5.12.

The equipment under test shall operate where possible, with modulation. Where this is not possible, it shall be stated in the test report. For transmitters using a continuous wideband swept carrier, the measurement shall be made with the sweep off. When it is not possible to turn the sweep off the measurements shall be made with the sweep on and this shall be stated in the test report.

For measuring equipment calibrated in dB $\mu$ V/m, the reading should be reduced by 51,5 dB to be converted to dB $\mu$ A/m.

### 3.3.4 TEST SETUP



## 3.3.5 TEST RESULTS

|               |            |                     |                   |
|---------------|------------|---------------------|-------------------|
| EUT :         | Smartphone | Model Name :        | KINGKONG 5        |
| Temperature : | 26°C       | Relative Humidity : | 60 %              |
| Pressure :    | 1012 hPa   | Test Voltage :      | DC 3.85V (Normal) |
| Test Mode :   | TX         |                     |                   |

| Test condition<br>s <sup>(4)</sup> | Freq. | Antenna Factor | Reading Level@3 m | Corrected Level@3 m | Calculated Level@10 m | Limit@10 m | Margin@10 m |
|------------------------------------|-------|----------------|-------------------|---------------------|-----------------------|------------|-------------|
| NVNT                               | (MHz) | (dB)           | (dBuA/m)          | (dBuA/m)            | (dBuA/m)              | (dBuA/m)   | (dB)        |
| NVLT                               | 13.56 | 19.59          | 28.19             | 47.78               | 24.78                 | 60         | 35.22       |
| NVHT                               | 13.56 | 19.59          | 26.89             | 46.48               | 23.48                 | 60         | 36.52       |
| LVLT                               | 13.56 | 19.59          | 26.80             | 46.39               | 23.39                 | 60         | 36.61       |
| LVHT                               | 13.56 | 19.59          | 27.98             | 47.57               | 24.57                 | 60         | 35.43       |
| HVLT                               | 13.56 | 19.59          | 27.17             | 46.76               | 23.76                 | 60         | 36.24       |
| HVHT                               | 13.56 | 19.59          | 27.66             | 47.25               | 24.25                 | 60         | 35.75       |
| NVNT                               | 13.56 | 19.59          | 27.15             | 46.74               | 23.74                 | 60         | 36.26       |

## Remark:

- (1) Corrected Level (dBuA/m) = Reading Level + Antenna Factor;
- (2) For the calculated method, please refer to Annex H at EN 300330 V 2.1.1.
- (3) The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement –X, Y, and Z-plane. The Y-plane results were found as the worst case and were shown in this report.
- (4) Under normal and extreme test conditions (see ETSI EN 300 330 clauses 5.5 and 5.6)



### 3.4. MODULATION BANDWIDTH

#### 3.4.1 APPLICABILITY& DESCRIPTION

This applies to all EUT.

The modulation bandwidth contains all associated side bands above the following level:

a) For carrier frequencies below 135 kHz:

- 23 dB below the carrier, for RFID within the transmitter emission boundary of figure I.1, and for RFID and EAS systems within the transmitter mask of figures I.2, I.3 and I.4, see CISPR 16-1-4 [2] or the appropriate spurious limit as defined in EN 300 330 clauses 4.3.7, 4.3.8, 4.3.9.

b) For carrier frequencies in the range 135 kHz to 30 MHz:

- 15 dB below the carrier or the appropriate spurious limit as defined in EN 300 330 clauses 4.3.7, 4.3.8, 4.3.9.

#### 3.4.2 LIMITS

The modulation bandwidth shall be within the assigned frequency band see table 1 or  $\pm 7,5\%$  of the carrier frequency whichever is the smallest. For RFID and EAS Systems, the modulation bandwidth shall be within the transmitter emission boundary of figures I.1, I.2, I.3 and I.4.

For further information, see CEPT/ERC/REC 70-03 [i.1] or ERC/ECC/CEPT Decisions as implemented through National Radio Interfaces (NRI) and additional NRI as relevant.

For 13.56MHz:

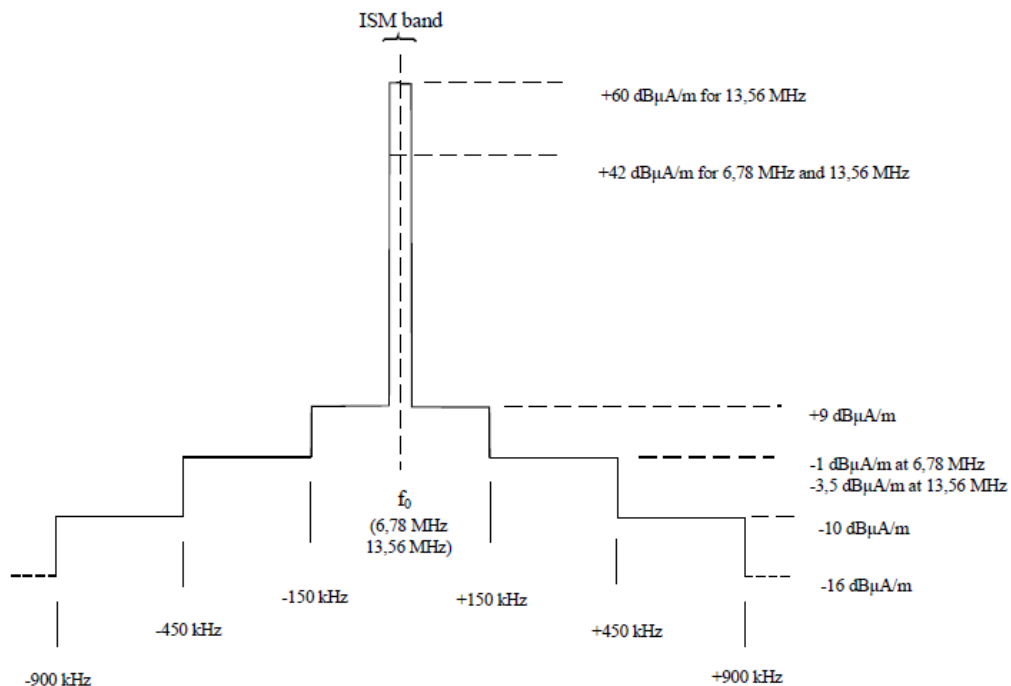


Figure I.2: Spectrum mask limit for RFIDs and EAS in the 6,78 MHz and 13,56 MHz range

Note: The limit is 60dBμA/m for 10m, Owing to the frequency EUT is 13.56MHz, so the C3 approach to 23dB. Then the limit at 3m(H3m) = H10m + C3 = 60 + 23 = 83 dBμA/m.



### 3.4.3 TEST PROCEDURE

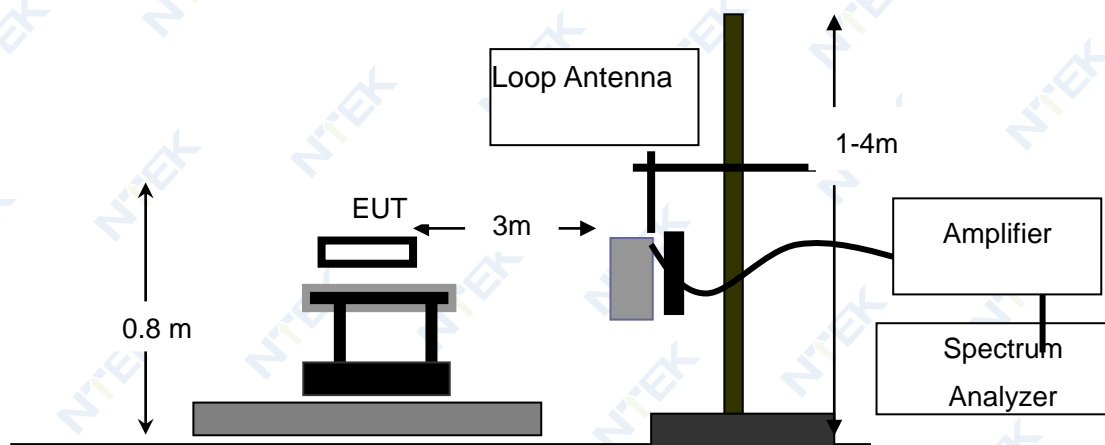
The transmitter shall be connected to an artificial antenna or if the transmitter has an integral antenna, a test fixture shall be used (see clause 5.10). The RF output of the equipment shall be connected to a spectrum analyser via a 50  $\Omega$  variable attenuator.

The transmitter shall be operated at the nominal carrier power or field strength measured under normal test conditions in clause 4.3.4. The attenuator shall be adjusted to an appropriate level displayed at the spectrum analyser screen. The transmitter shall be modulated with standard test modulation (see clauses 5.8.1 and 5.8.2). If the equipment cannot be modulated externally, the internal modulation shall be used.

For transmitters using a continuous wideband swept carrier the measurement shall be made with the sweep on. The output of the transmitter, with or without test fixture, shall be measured by using a spectrum analyser with a resolution bandwidth appropriate to accept all major side bands. The power level calibration of the spectrum analyser shall then be related to the power level or field strength measured in clause 4.3.3. The calculation will be used to calculate the absolute level of the sideband power.

The test laboratory shall ensure that the spectrum analyser's span is sufficiently wide enough to ensure that the carrier and all its major side bands are captured.

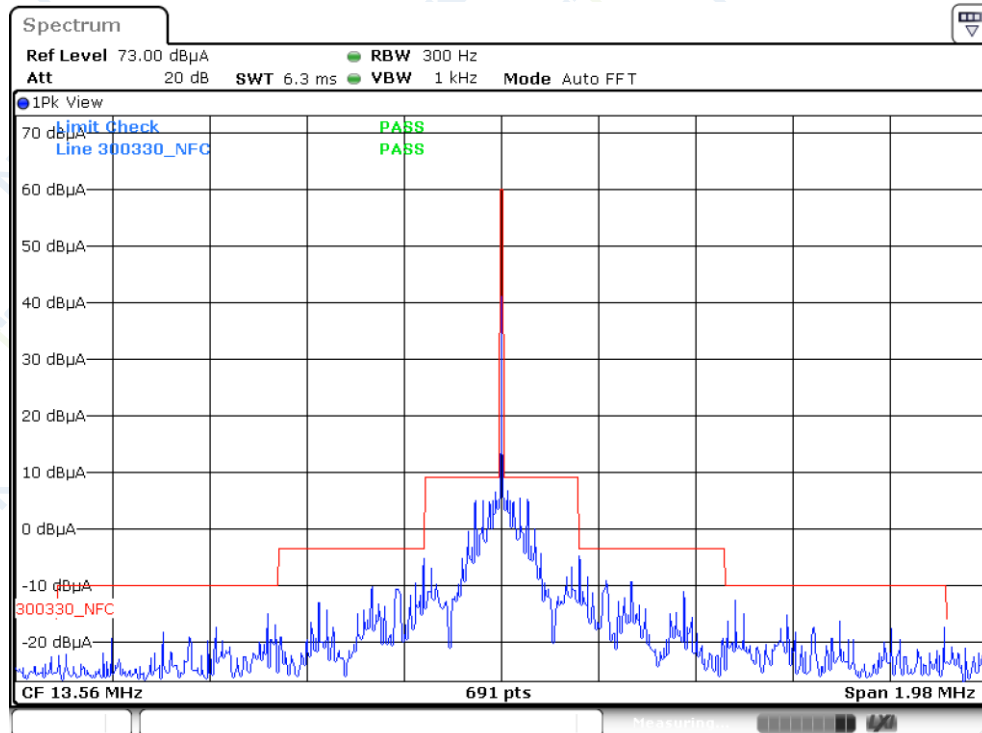
### 3.4.4 TEST SETUP



## 3.4.5 TEST RESULTS

|               |            |                     |            |
|---------------|------------|---------------------|------------|
| EUT :         | Smartphone | Model Name :        | KINGKONG 5 |
| Temperature : | 26°C       | Relative Humidity : | 60 %       |
| Pressure :    | 1012 hPa   | Test Voltage :      | DC 3.85V   |
| Test Mode :   | TX         |                     |            |

## 13.56MHZ TEST PLOT



### 3.5. SPURIOUS DOMAIN EMISSION LIMITS

#### 3.5.1 APPLICABILITY& DESCRIPTION

This applies to all EUT.

Spurious domain emission limits are limits on emissions at frequencies other than those of the carrier and sidebands associated with normal test modulation.

#### 3.5.2 LIMITS

The radiated field strength of the spurious domain emissions below 30 MHz shall not exceed the generated H-field dB $\mu$ A/m at 10 m given in table 5& 6.

**Table 5**

| State     | Frequency 9 kHz $\leq$ f < 10 MHz             | Frequency 10 MHz $\leq$ f < 30 MHz |
|-----------|---|------------------------------------|
| Operating | 27 dB $\mu$ A/m at 9 kHz descending 3 dB/oct  | -3,5 dB $\mu$ A/m                  |
| Standby   | 5,5 dB $\mu$ A/m at 9 kHz descending 3 dB/oct | -25 dB $\mu$ A/m                   |

$$3m(H_{3m}) = H_{10m} + C3 = H_{10m} + 23$$

**Table 6**

| State     | 47 MHz to 74 MHz<br>87,5 MHz to 118 MHz<br>174 MHz to 230 MHz<br>470 MHz to 790 MHz | Other frequencies between<br>30 MHz to 1 000 MHz |
|-----------|---|--|
| Operating | 4 nW  | 250 nW   |
| Standby   | 2 nW  | 2 nW   |

#### 3.5.3 TEST PROCEDURE

Transmitter radiated spurious domain emission limits < 30 MHz

The field strength shall be measured for frequencies below 30 MHz. The equipment under test shall be measured at a distance of 10 m on an outdoor test site. The test antenna shall be a calibrated shielded magnetic field antenna. The equipment under test and test antenna shall be arranged as stated in EN 300 330 clause C.1.

For Product Class 3 the transmitter antenna connector of the equipment under test shall be connected to an artificial antenna and the output connector terminated.

The equipment under test shall be switched on with normal modulation. The characteristics of the modulation signal used shall be stated on the test report. The measuring receiver shall be tuned over the frequency range 9 kHz to 30 MHz, except for the frequency band on which the transmitter is intended to operate.

At each frequency at which a relevant spurious signal is detected the equipment under test and the test antenna shall be rotated until maximum field strength is indicated on the measuring receiver. This level shall be noted.

If the transmitter can be operated in the standby mode, then the measurements shall be repeated in the standby mode.

For measuring equipment calibrated in dB $\mu$ V/m, the reading should be reduced by 51,5 dB to be converted to dB $\mu$ A/m.

Transmitter radiated spurious domain emission limits > 30 MHz

For EN 300 330 classes 1, 2 and 4 an appropriate test site selected from EN 300 330 annex C shall be used. The equipment shall be placed at the specified height on a non-conducting support and in the position closest to normal use as declared by the manufacturer.

The test antenna shall be oriented for vertical polarization. The output of the test antenna shall be connected to a measuring receiver.

The transmitter shall be switched on with normal modulation, and the measuring receiver shall be tuned over the frequency range 30 MHz to 1 000 MHz.

At each frequency at which a relevant spurious component is detected, the test antenna shall be raised and lowered through the specified range of heights until a maximum signal level is detected on the measuring receiver.

The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

The maximum signal level detected by the measuring receiver shall be noted

The substitution antenna shall be oriented for vertical polarization and calibrated for the frequency of the spurious component detected.

The frequency of the calibrated signal generator shall be set to the frequency of the spurious component detected. The input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver, if necessary.

The test antenna shall be raised and lowered through the specified range of heights to ensure that the maximum signal is received.

When a test site according to EN 300 330 clause C.1.1 is used, there is no need to vary the height of the antenna.

The input signal to the substitution antenna shall be adjusted until an equal or a known related level to that detected from the transmitter is obtained on the measuring receiver.

The input signal to the substitution antenna shall be recorded as a power level and corrected for any change of input attenuator setting of the measuring receiver.

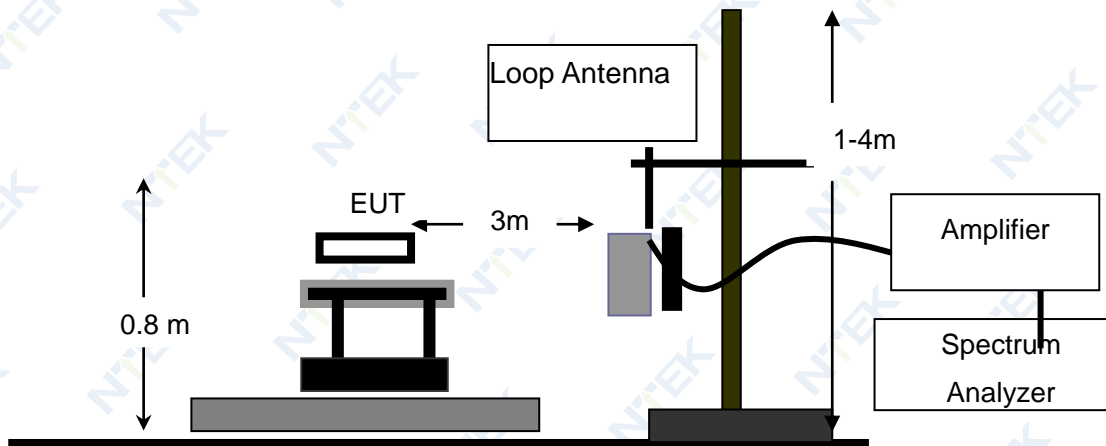
The measure of the effective radiated power of the spurious components is the larger of the two power levels recorded for each spurious component at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.

If an unmodulated carrier cannot be obtained then the measurements shall be made with the transmitter modulated by the normal test signal (see clause 5.8.2) in which case this fact shall be recorded in the test report.

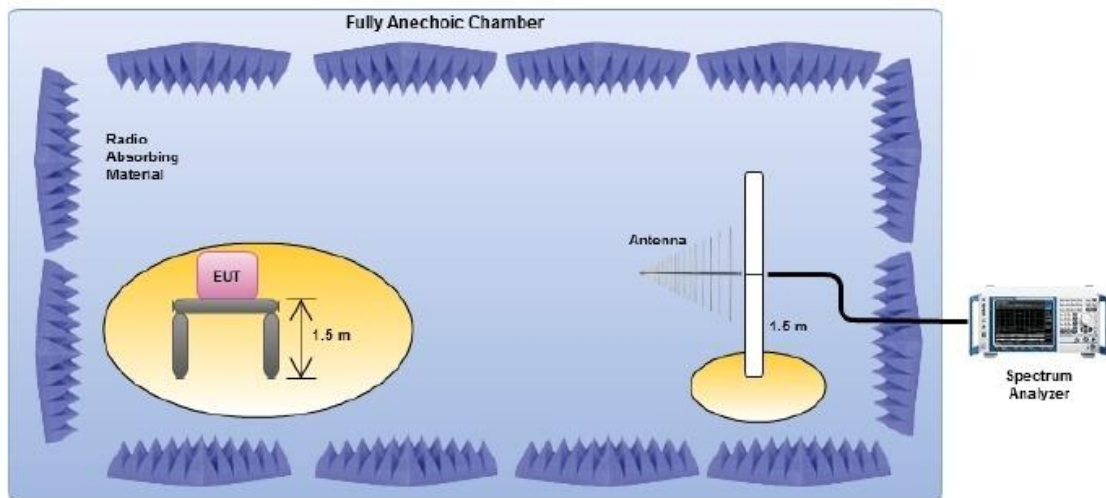
If standby mode is available, the measurements shall be repeated in that mode.

### 3.5.4 TEST SETUP

#### FREQUENCY RANGE (9KHZ-30MHZ)



#### FREQUENCY RANGE (30MHZ~1GHZ)



## 3.5.5 TEST RESULTS

|               |            |                   |            |
|---------------|------------|-------------------|------------|
| EUT :         | Smartphone | Model Name :      | KINGKONG 5 |
| Temperature : | 24 °C      | Relative Humidity | 54%        |
| Pressure :    | 1010 hPa   | Test Power :      | DC 3.85V   |
| Test Mode :   | TX         |                   |            |

## BELOW 30MHZ TEST RESULT

| Operating Mode |                   |                      |           |            |
|----------------|-------------------|----------------------|-----------|------------|
| Frequency      | Emission level@3m | Calculated Level@10m | Limit@10m | Margin@10m |
| (MHz)          | (dBuA/m)          | (dBuA/m)             | (dBuA/m)  | (dB)       |
| 6.247          | 6.22              | -16.78               | -1.32     | -15.46     |
| 8.69           | 8.38              | -14.62               | -2.75     | -11.87     |
| 15.946         | 6.4               | -16.60               | -3.50     | -13.1      |

| Standby Mode |                   |                      |           |            |
|--------------|-------------------|----------------------|-----------|------------|
| Frequency    | Emission level@3m | Calculated Level@10m | Limit@10m | Margin@10m |
| (MHz)        | (dBuA/m)          | (dBuA/m)             | (dBuA/m)  | (dB)       |
| 6.067        | -17.45            | -40.45               | -22.69    | -17.76     |
| 8.504        | -21.11            | -44.11               | -24.15    | -19.96     |
| 14.801       | -16.16            | -39.16               | -25.00    | -14.16     |

## Remark:

- (1) The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement –X, Y, and Z-plane. The Y-plane results were found as the worst case and were shown in this report.
- (2) Measuring frequencies from 9KHz to the 30MHz.



## ABOVE 30 MHz TEST RESULT

|               |            |                   |            |
|---------------|------------|-------------------|------------|
| EUT :         | Smartphone | Model Name :      | KINGKONG 5 |
| Temperature : | 24 °C      | Relative Humidity | 54%        |
| Pressure :    | 1010 hPa   | Test Power :      | DC 3.85V   |
| Test Mode :   | TX         |                   |            |

| Polar<br>(H/V) | Frequency | Meter<br>Reading | Factor | Emission<br>Level | Limits | Margin | Remark |
|----------------|-----------|------------------|--------|-------------------|--------|--------|--------|
|                | (MHz)     | (dBm)            | (dB)   | (dBm)             | (dBm)  | (dB)   |        |
| V              | 41.790    | -61.47           | 11.21  | -50.26            | -36    | -14.26 | peak   |
| V              | 101.112   | -86.34           | 10.96  | -75.38            | -54    | -21.38 | peak   |
| V              | 198.654   | -89.39           | 11.04  | -78.35            | -54    | -24.35 | peak   |
| V              | 366.760   | -68.48           | 9.81   | -58.67            | -36    | -22.67 | peak   |
| V              | 549.067   | -91.92           | 10.34  | -81.58            | -54    | -27.58 | peak   |
| H              | 38.044    | -61.96           | 11.43  | -50.53            | -36    | -14.53 | peak   |
| H              | 105.448   | -85.22           | 11.34  | -73.88            | -54    | -19.88 | peak   |
| H              | 222.215   | -82.59           | 9.63   | -72.96            | -54    | -18.96 | peak   |
| H              | 305.146   | -67.05           | 10.08  | -56.97            | -36    | -20.97 | peak   |
| H              | 558.703   | -77.55           | 10.37  | -67.18            | -54    | -13.18 | peak   |

**Remark:**

1. Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit



## 4. RECEIVER PARAMETERS

The required Receiver Conformance tests are defined in table 7.

**Table 7**

| Technologies                   | Receiver spurious emission<br>(clause 4.4.2) | Adjacent channel selectivity<br>(clause 4.4.3) | Blocking or desensitization<br>(clause 4.4.4) |
|--------------------------------|--|--|---|
| tagging systems                | yes  | no (note 2)                                    | no (note 1)                                   |
| systems in the<br>27 MHz range | yes  | Yes  | yes   |
| all others                     | yes  | no (note 2)                                    | yes   |

NOTE 1: Blocking or desensitization not needed because of the physical co-location of RX to TX in tagging systems where the RX and TX operate simultaneously. The TX signal is used for the RX baseband mixing. The TX signal at the RX input is about 90 dB above the receiver sensitivity or tagging signal level the receiver (see ETSI TR 103 059 [i.9], figure 8).  
Furthermore given the very short communication ranges for most applications (e.g. NFC, RFID), a given interference blocking signal will have to be about 90 dB higher as the transmitter signal at the transceiver antenna, which is unlikely to happen.

NOTE 2: This requirement can only be required where a frequency plan with standard channel spacing is consistently used, for example in the 27 MHz band.

### 4.1 RECEIVER SPURIOUS RADIATION

#### 4.1.1 APPLICABILITY& DESCRIPTION

These requirements does not apply to receivers used in combination with permanently co-located transmitters continuously transmitting. In these cases the receivers will be tested together with the transmitter in operating mode.

Spurious radiation from receivers are emissions radiated from the antenna, the chassis and case of the receiver. It is specified as the radiated power of a discrete signal.

#### 4.1.2 LIMITS

The spurious components below 30 MHz shall not exceed the generated H-field dBμA/m values at 10 m according to table 8.

**Table 8: Receiver spurious radiation limits**

| Frequency $9 \text{ kHz} \leq f < 10 \text{ MHz}$ | Frequency $10 \text{ MHz} \leq f < 30 \text{ MHz}$ |
|---|--|
| 5,5 dBμA/m at 9 kHz descending 3 dB/oct           | -25 dBμA/m   |

$$3m(H_{3m}) = H_{10m} + C3 = H_{10m} + 23$$

The spurious components above 30 MHz measured values shall not exceed 2 nW.

#### 4.1.3 TEST PROCEDURE

Please refer to clause 3.5.3.

#### 4.1.4 TEST SETUP

Please refer to clause 3.5.4.

#### 4.1.5 TEST RESULTS

|               |            |                   |            |
|---------------|------------|-------------------|------------|
| EUT :         | Smartphone | Model Name :      | KINGKONG 5 |
| Temperature : | 24 °C      | Relative Humidity | 54%        |
| Pressure :    | 1010 hPa   | Test Power :      | DC 3.85V   |
| Test Mode :   | RX         |                   |            |

##### Below 30MHz test result

| Operating Mode |                   |                      |           |            |
|----------------|-------------------|----------------------|-----------|------------|
| Frequency      | Emission level@3m | Calculated Level@10m | Limit@10m | Margin@10m |
| (MHz)          | (dBuA/m)          | (dBuA/m)             | (dBuA/m)  | (dB)       |
| 6.097          | -24.71            | -47.71               | -22.71    | -25.00     |
| 8.284          | -25.63            | -48.63               | -24.04    | -24.59     |
| 15.297         | -20.39            | -43.39               | -25.00    | -18.39     |
| 16.755         | -21.23            | -44.23               | -25.00    | -19.23     |

Remark:

- (1) Emission level = Total Factor + Reading Level; Margin= Emission level- Limit.
- (2) Measuring frequencies from 9KHz to the 30MHz.

##### Above 30M Test Result

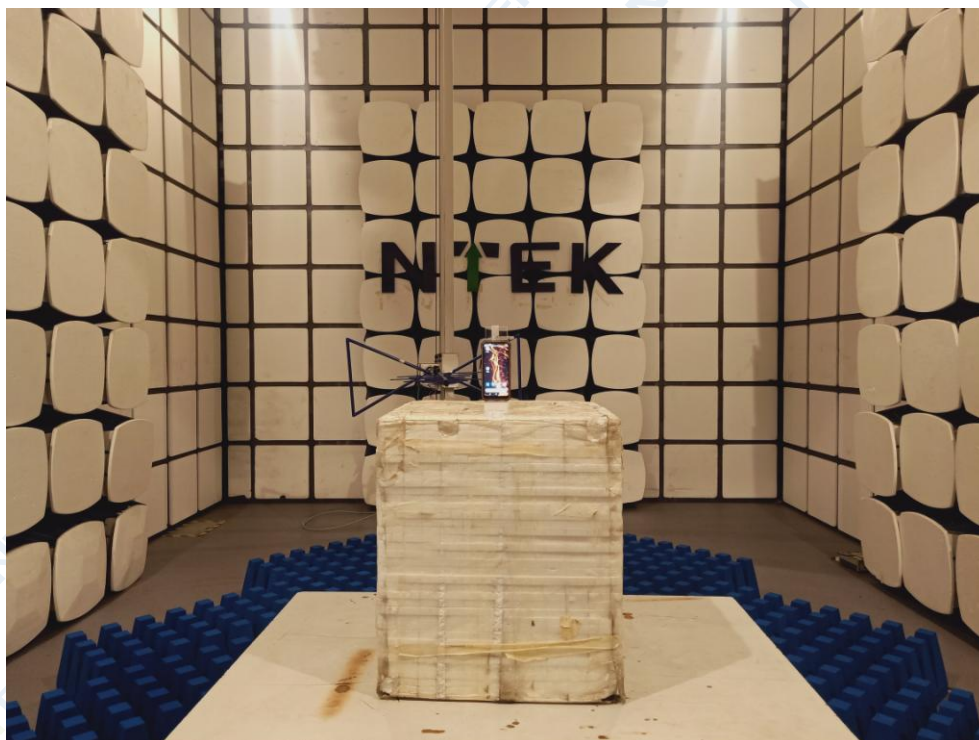
| Polar (H/V) | Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Remark |
|-------------|-----------|---------------|--------|----------------|--------|--------|--------|
|             | (MHz)     | (dBm)         | (dB)   | (dBm)          | (dBm)  | (dB)   |        |
| V           | 43.847    | -83.27        | 18.53  | -64.74         | -57    | -7.74  | peak   |
| V           | 103.348   | -88.21        | 13.70  | -74.51         | -57    | -17.51 | peak   |
| V           | 188.698   | -89.64        | 14.34  | -75.30         | -57    | -18.30 | peak   |
| V           | 351.775   | -84.81        | 14.87  | -69.94         | -57    | -12.94 | peak   |
| V           | 623.959   | -86.05        | 15.80  | -70.25         | -57    | -13.25 | peak   |
| H           | 35.556    | -82.46        | 13.73  | -68.73         | -57    | -11.73 | peak   |
| H           | 92.068    | -86.28        | 12.85  | -73.43         | -57    | -16.43 | peak   |
| H           | 184.014   | -81.36        | 18.92  | -62.44         | -57    | -5.44  | peak   |
| H           | 320.362   | -84.03        | 12.66  | -71.37         | -57    | -14.37 | peak   |
| H           | 727.832   | -83.05        | 18.12  | -64.93         | -57    | -7.93  | peak   |

Remark:

1. Emission Level = Meter Reading+ Factor, Margin= Emission Level- Limit.

## 5. PHOTOGRAPHS OF THE TEST CONFIGURATION

### SPURIOUS EMISSIONS MEASUREMENT PHOTOS



END OF REPORT