Microtest
微测检测

# Test Report

FCC ID :2AMKU-DK66

Date of issue: June 16, 2017

| | |
|---|---|
| Sample Description: | Rugged Smartphone |
| Model(s): | DK66, DK66plus, DK6x series (X is arabic number), WF68 |
| Applicant: | Shenzhen Gomtel Science & Technology Co., Ltd. |
| Address: | 5th Floor, Sector B, Fuhua Technology Building No.9116 Beihuan Road, Nanshan, Shenzhen, China. |
| Date of Test: | May 26, 2017 to June 16, 2017 |

Shenzhen Microtest Co., Ltd.
http://www.mtitest.com



Tel:(86-755)88850135 Fax: (86-755) 88850136 Web: http://www.mtitest.com E-mail: mti@51mti.com
Address: No.102A & 302A, East Block, Hengfang Industrial Park, Xingye Road, Xixiang, Bao'an District, Shenzhen, Guangdong, China

| **Test Result Certification** | |
|---|---|
| | |
| **Applicant's name:** | **Shenzhen Gomtel Science & Technology Co., Ltd.** |
| Address: | 5th Floor, Sector B, Fuhua Technology Building No.9116 Beihuan Road, Nanshan, Shenzhen, China. |
| **Manufacture's Name:** | **Shenzhen Gomtel Science & Technology Co., Ltd.** |
| Address: | 5th Floor, Sector B, Fuhua Technology Building No.9116 Beihuan Road, Nanshan, Shenzhen, China. |
| | |
| Product name: | Rugged Smartphone |
| Trademark: | DuraMobi |
| Model name: | DK66, DK66plus, DK6x series (X is arabic number), WF68 |
| **Standards:** | FCC Part15.225 |
| Test procedure ..... : | ANSI C63.10-2013 |

*This device described above has been tested by Shenzhen Toby Technology Co., Ltd. and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.*

Tested by: Ace Chai — June 15, 2017

Reviewed by: Smith Chen — June 16, 2017

Approved by: Tom Xue — June 16, 2017

**Table of Contents**

**Page**

## Table of Contents

## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| Standard Section | Test Item | Judgment |
|---|---|---|
| 15.203/15.225 | Antenna Requirement | PASSED |
| 15.207 | Conducted Emission | PASSED |
| 15.225 | 20dB Bandwidth | PASSED |
| 15.225/15.209 | Spurious Emission | PASSED |
| 15.225 | Frequency stability | PASSED |
| **Remark:** “N/A” is an abbreviation for Not Applicable. | | |

NOTE:

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

## 1.1 TEST FACILITY

Shenzhen Toby Technology Co., Ltd.
Add.: 10/F.,A Block,Jiada R&D Bldg.,No.5 Songpingshan, Road, Science&Technology Park, Shenzhen, 518057
FCC Registration No.:811562

## 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ± U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

| No. | Item | Uncertainty |
|---|---|---|
| 1 | Conducted Emission Test | ±1.38dB |
| 2 | RF power,conducted | ±0.16dB |
| 3 | Spurious emissions,conducted | ±0.21dB |
| 4 | All emissions,radiated(<1G) | ±4.68dB |
| 5 | All emissions,radiated(>1G) | ±4.89dB |
| 6 | Temperature | ±0.5°C |
| 7 | Humidity | ±2% |

# 2. GENERAL INFORMATION

## 2.1 GENERAL DESCRIPTION OF EUT

| | |
|---|---|
| Equipment | Rugged smartphone |
| Trade Name | **DuraMobi** |
| Model Name | DK66 |
| Serial Model | DK66plus, DK6x series (X is arabic number), WF68 |
| Model Difference | N/A |
| Product Description | The EUT is a Rugged smartphone<br>Operation Frequency: 13.56MHz<br>Modulation Type: ASK<br>Number Of Channel 1CH<br>Antenna Designation: Please see Note 3.<br>Antenna Gain (dBi) -0.76dbi<br>Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual. |
| Channel List | Please refer to the Note 2. |
| Adapter | Model: TPA-46050200UU<br>Input:100-240V~, 50/60Hz 0.3A<br>Output:5V 2A |
| Battery | Model:EU955164PV 3.8V 4600mAh |
| Connecting I/O Port(s) | Please refer to the User's Manual |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. Channel List

| Channel | Frequency (MHz) |
|---|---|
| 1 | 13.56 |

3. Table for Filed Antenna

| Ant. | Brand | Model Name | Antenna Type | Connector | Gain (dBi) | NOTE |
|---|---|---|---|---|---|---|
| A | N/A | N/A | Integrated antenna | / | -0.76 | NFC Antenna |

## 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| Pretest Mode | Description |
|---|---|
| Mode 1 | NFC |

| **For Conducted Emission** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | NFC |

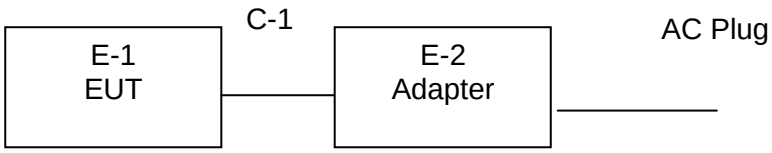
| **For Radiated Emission** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | NFC |

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

(2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

## 2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



## 2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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 | Brand | Model/Type No. | Series No. | Note |
|---|---|---|---|---|---|
| E-1 | Rugged smartphone | DuraMobi | DK66 | N/A | EUT |
| E-2 | Adapter | N/A | TPA-46050200UU | N/A | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| Item | Shielded Type | Ferrite Core | Length | Note |
|---|---|---|---|---|
| C-1 | NO | NO | 1.0m | |
| C-2 | NO | NO | 0.8m | |
| | | | | |
| | | | | |
| | | | | |

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.

## 2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

For RF conducted test:

| Equipment | Manufacturer | Model | Serial No. | Calibration Due |
|---|---|---|---|---|
| Signal Analyzer | Agilent | N9010A | MY48030494 | 2017/11/4 |
| 4 Ch. Simultaneous Sampling 14 Bits 2 MS/s | Agilent | U2531A | TW54063513 | 2017/11/4 |
| X-series USB Peak and Average Power Sensor | Agilent | U2021XA | MY54080019 | 2017/11/4 |
| vector Signal Generator | Agilent | E4438C | US44271917 | 2017/11/4 |
| vector Signal Generator | Agilent | E4438C | MY49070163 | 2017/11/4 |
| Dc Power Supply | GW | GPR-6030D | / | 2017/11/4 |
| Temperature & Humitidy Chamber | GIANT FORCE | GTH-056P | GF-94454-1 | 2017/11/4 |
| Wideband Radio Communication Tester | ROHDE&SCHWARZ | CMW500 | 120909 | 2017/11/4 |

For Radiated test:

| Equipment | Manufacturer | Model | Serial No. | Calibration Due |
|---|---|---|---|---|
| Broadband TRILOG Antenna | Schwarabeck | VULB9163 | 9163-872 | 2017/11/14 |
| Horn Antenna | Schwarzbeck | BBHA 9120 D | 9120D-1145 | 2017/11/14 |
| Amplifier | HP | 8447D | 3113A06150 | 2017/11/4 |
| Amplifier | Agilent | 8449B | 3008A02400 | 2018/7/4 |
| Test Receiver | Schwarabeck | ESPI7 | 100314 | 2017/11/4 |
| Spectrum analyzer | Agilent | E4407B | MY41441082 | 2017/11/4 |
| Signal Generator | R&S | SMT 06 | 832080/007 | 2017/11/4 |

Note: the calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

# 3. EMC EMISSION TEST

## 3.1 CONDUCTED EMISSION MEASUREMENT

### 3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

| FREQUENCY (MHz) | Class A (dBuV) | | Class B (dBuV) | | Standard |
|---|---|---|---|---|---|
| | Quasi-peak | Average | Quasi-peak | Average | |
| 0.15 -0.5 | 79.00 | 66.00 | 66 - 56 * | 56 - 46 * | CISPR |
| 0.50 -5.0 | 73.00 | 60.00 | 56.00 | 46.00 | CISPR |
| 5.0 -30.0 | 73.00 | 60.00 | 60.00 | 50.00 | CISPR |

| | | | | | |
|---|---|---|---|---|---|
| 0.15 -0.5 | 79.00 | 66.00 | 66 - 56 * | 56 - 46 * | FCC |
| 0.50 -5.0 | 73.00 | 60.00 | 56.00 | 46.00 | FCC |
| 5.0 -30.0 | 73.00 | 60.00 | 60.00 | 50.00 | FCC |

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

| Receiver Parameters | Setting |
|---|---|
| Attenuation | 10 dB |
| Start Frequency | 0.15 MHz |
| Stop Frequency | 30 MHz |
| IF Bandwidth | 9 kHz |

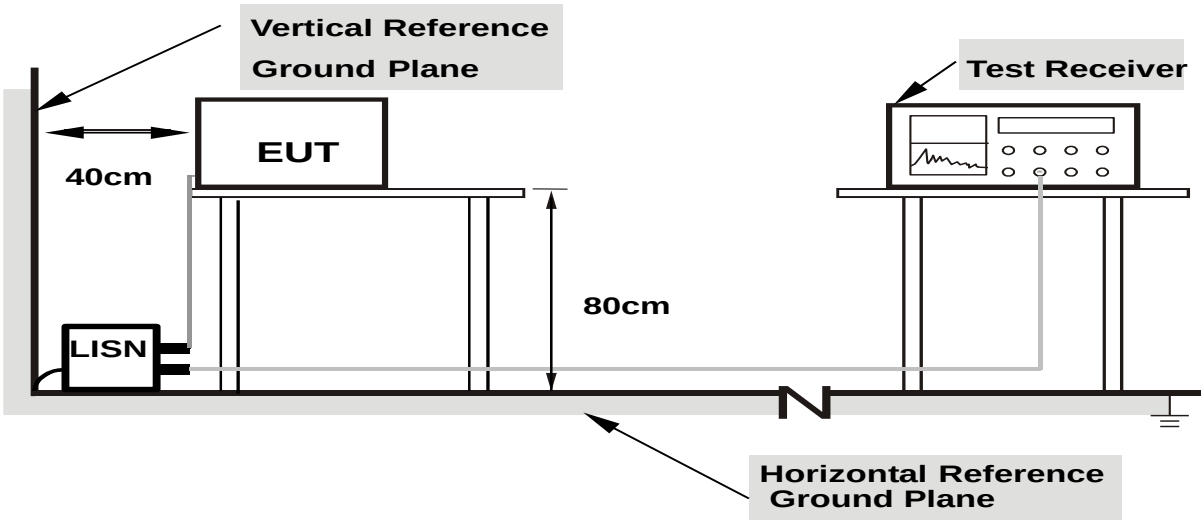
### 3.1.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.1.3 DEVIATION FROM TEST STANDARD

No deviation

### 3.1.4 TEST SETUP



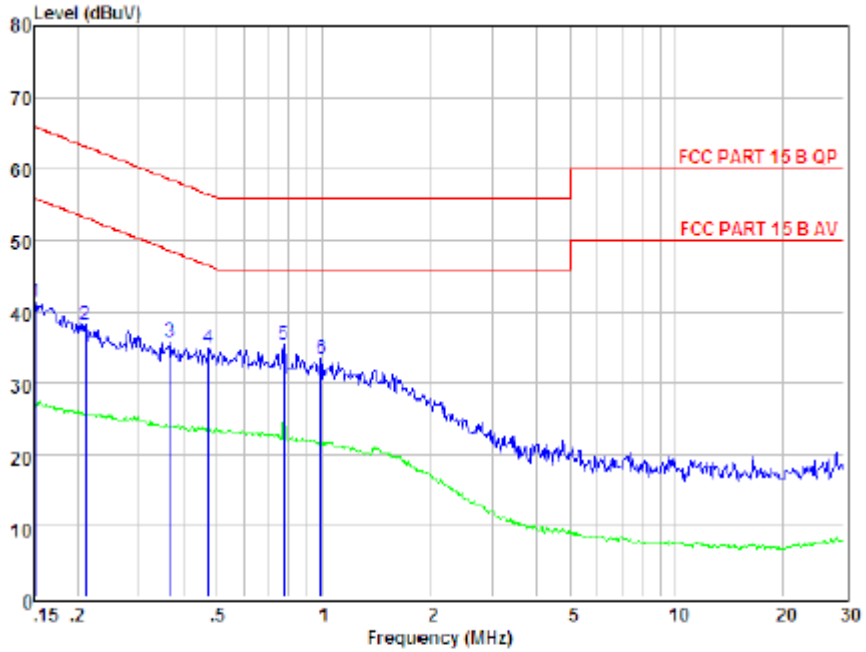

**Note: 1.Support units were connected to second LISN.**
**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

### 3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

### 3.1.6 TEST RESULTS

| | | | |
|---|---|---|---|
| EUT： | Rugged smartphone | Model Name. ： | DK66 |
| Temperature： | 26 ℃ | Relative Humidity： | 54% |
| Pressure： | 1010hPa | Phase： | L |
| Test Voltage ： | DC 5Vfrom adapter AC 120V/60Hz | Test Mode： | Mode 1 |

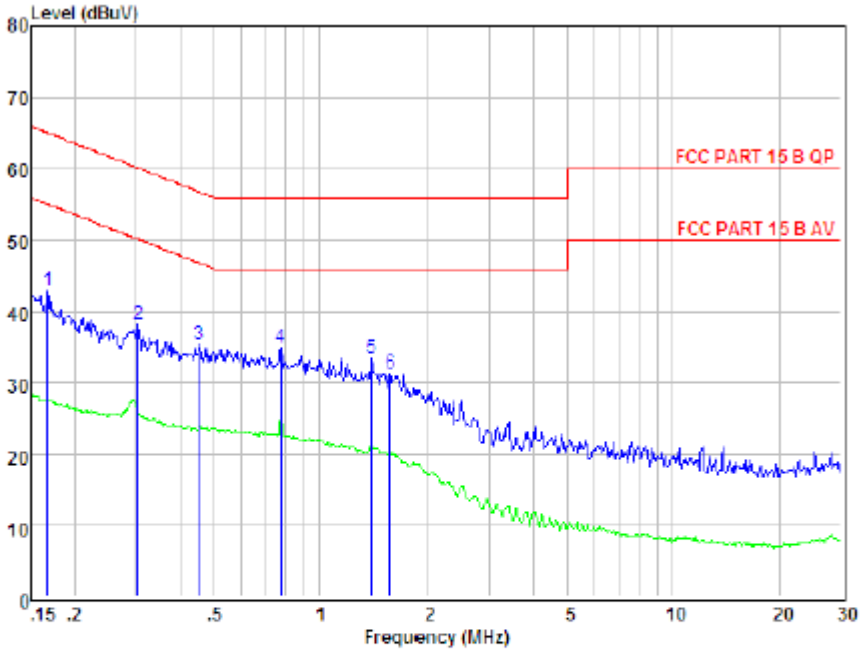



Condition : FCC PART 15 B QP POL: LINE Temp: Hum:

| Item | Freq | Read | LISN Factor | Preamp Factor | Cable Lose | Level | Limit | Margin | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dB | dB | dBuV | dBuV | dBuV | |
| 1 | 0.152 | 31.51 | 0.03 | -9.72 | 0.10 | 41.36 | 65.91 | -24.55 | QP |
| 2 | 0.211 | 28.29 | 0.03 | -9.72 | 0.10 | 38.14 | 63.18 | -25.04 | QP |
| 3 | 0.367 | 25.87 | 0.03 | -9.72 | 0.10 | 35.72 | 58.56 | -22.84 | QP |
| 4 | 0.471 | 25.12 | 0.03 | -9.72 | 0.10 | 34.97 | 56.49 | -21.52 | QP |
| 5 | 0.775 | 25.53 | 0.00 | -9.71 | 0.10 | 35.34 | 56.00 | -20.66 | QP |
| 6 | 0.989 | 23.69 | 0.04 | -9.71 | 0.10 | 33.54 | 56.00 | -22.46 | QP |

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss

| | | | |
|---|---|---|---|
| EUT： | Rugged smartphone | Model Name. ： | DK66 |
| Temperature： | 26 ℃ | Relative Humidity： | 54% |
| Pressure： | 1010hPa | Phase： | N |
| Test Voltage ： | DC 5Vfrom adapter AC 120V/60Hz | Test Mode： | Mode 1 |




Condition : FCC PART 15 B QP POL: NEUTRAL Temp: Hum:

| Item | Freq | Read | LISN Factor | Preamp Factor | Cable Lose | Level | Limit | Margin | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dB | dB | dBuV | dBuV | dBuV | |
| 1 | 0.168 | 33.04 | 0.03 | -9.72 | 0.10 | 42.89 | 65.08 | -22.19 | QP |
| 2 | 0.303 | 28.30 | 0.03 | -9.72 | 0.10 | 38.15 | 60.15 | -22.00 | QP |
| 3 | 0.452 | 25.44 | 0.03 | -9.72 | 0.10 | 35.29 | 56.85 | -21.56 | QP |
| 4 | 0.775 | 25.18 | 0.00 | -9.71 | 0.10 | 34.99 | 56.00 | -21.01 | QP |
| 5 | 1.403 | 23.65 | 0.05 | -9.71 | 0.10 | 33.51 | 56.00 | -22.49 | QP |
| 6 | 1.585 | 21.35 | 0.05 | -9.71 | 0.10 | 31.21 | 56.00 | -24.79 | QP |

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss

## 3.2 RADIATED EMISSION MEASUREMENT

### 3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

| Frequencies (MHz) | Field Strength (micorvolts/meter) | Measurement Distance (meters) |
|---|---|---|
| 0.009~0.490 | 2400/F(KHz) | 300 |
| 0.490~1.705 | 24000/F(KHz) | 30 |
| 1.705~30.0 | 30 | 30 |
| 30~88 | 100 | 3 |
| 88~216 | 150 | 3 |
| 216~960 | 200 | 3 |
| Above 960 | 500 | 3 |

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start Frequency | 1000 MHz |
| Stop Frequency | 10th carrier harmonic |
| RB / VB (emission in restricted band) | 1 MHz / 1 MHz for Peak, 1 MHz / *10Hz* for Average |

| Receiver Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start ~ Stop Frequency | 9kHz~150kHz / RB 200Hz for QP |
| Start ~ Stop Frequency | 150kHz~30MHz / RB 9kHz for QP |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB 120kHz for QP |

Limit for FCC 15.225

Please see the section 15.225(b) and 15.225(c)

15.225(b): Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter (50.5dBuV/m)at 30 meters

15.225(c): Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter (40.5dBuV/m) at 30 meters

Note: 30m to 3m correction factor calculation:

40*Log(30m/3m)=40

### 3.2.2 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

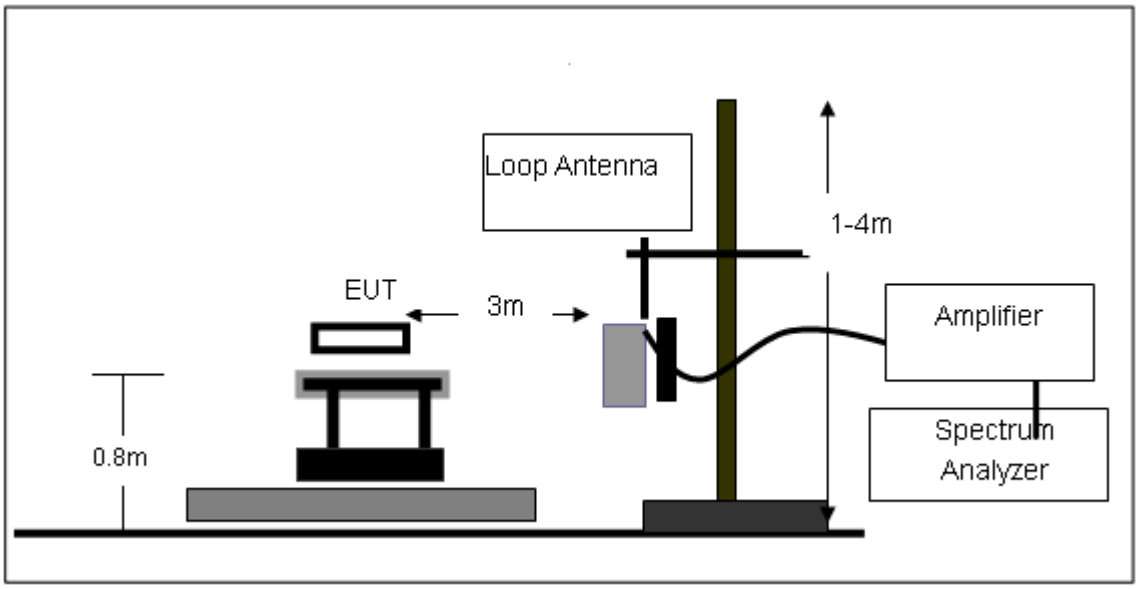
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

### 3.2.3 DEVIATION FROM TEST STANDARD

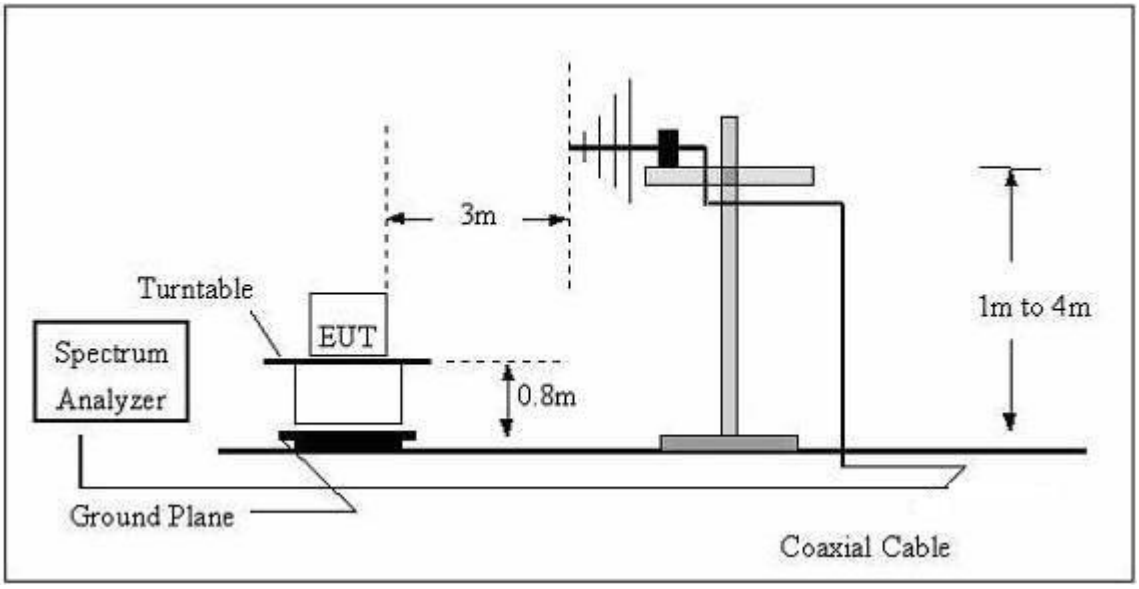
No deviation

### 3.2.4 TEST SETUP

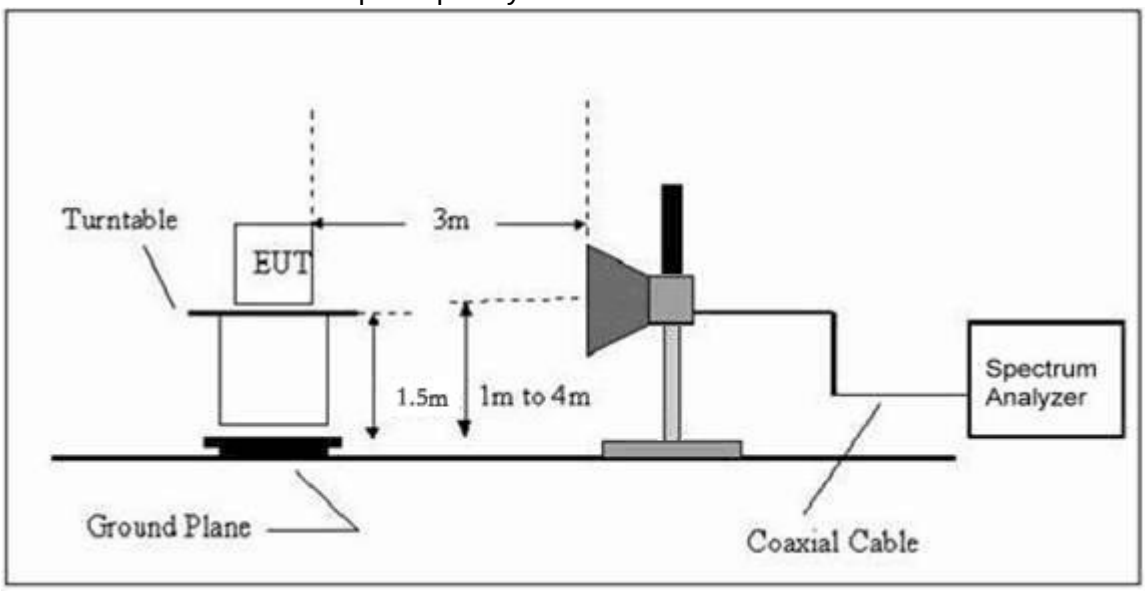
（A）Radiated Emission Test-Up Frequency Below 30MHz




（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz




### 3.2.5 EUT OPERATING CONDITIONS

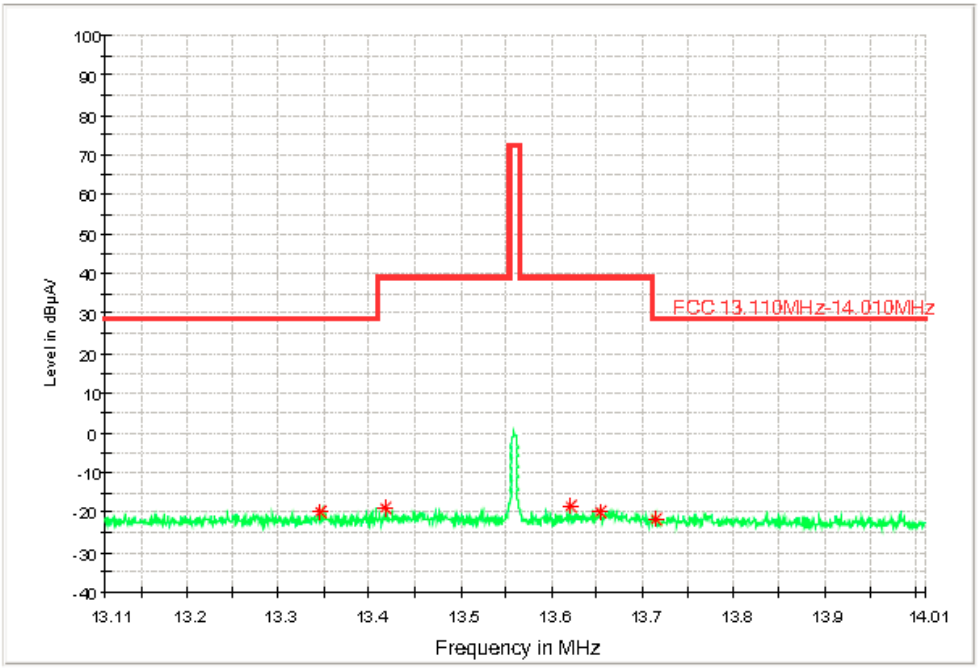
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

### 3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

| | | | |
|---|---|---|---|
| EUT： | Rugged smartphone | Model Name. ： | DK66 |
| Temperature： | 20 ℃ | Relative Humidtity： | 48% |
| Pressure： | 1010 hPa | Test Voltage ： | DC 5Vfrom adapter AC 120V/60Hz |
| Test Mode ： | TX | Polarization : | -- |

**Radiated Emissions Result of Inside band (13.56MHZ)**

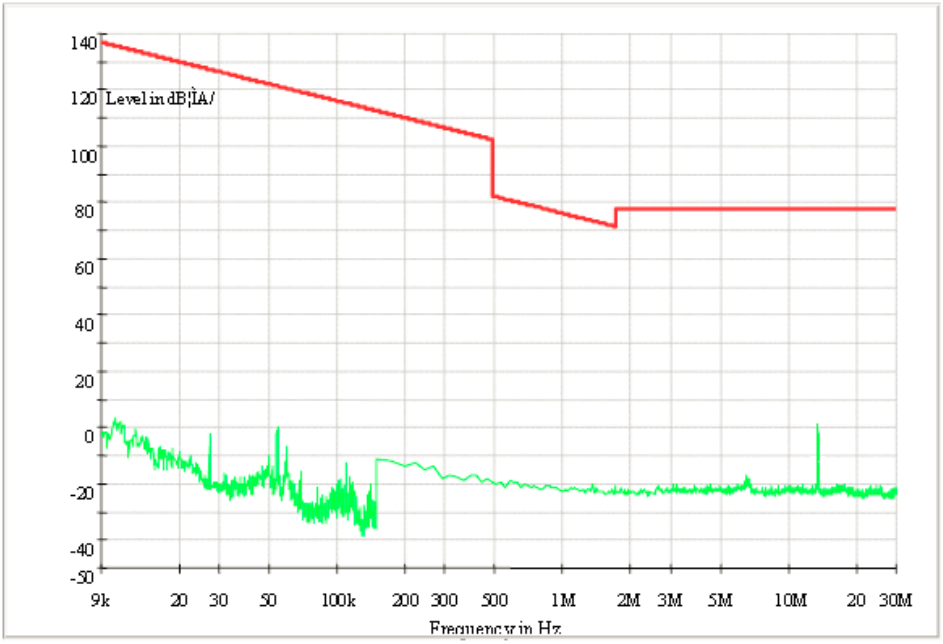
| Fre. MHz | Position H/V | Reading dBuV | Correct Factor dB | Measure Result dBuV/m | Limit dBuV/m | Margin dB |
|---|---|---|---|---|---|---|
| 13.56 | H | 69.46(PK) | -13.72 | 55.74 | 124 | 43.15 |
| 13.56 | H | 55.16 (AV) | -13.72 | 41.44 | 104 | 35.36 |
| -- | -- | -- | -- | -- | -- | -- |
| 13.56 | V | 59.47(PK) | -13.72 | 45.75 | 124 | 53.83 |
| 13.56 | V | 47.65(AV) | -13.72 | 33.93 | 104 | 46.08 |
| -- | -- | -- | -- | -- | -- | -- |




Remark: --Means other frequency and mode comply with standard requirements and at least have 20dB margin.
Correct Factor=Cable Loss+ Antenna Factor- Amplifier Gain
Measurement Result=Reading + Correct Factor
Margin=Measurement Result-Limit
--Spectrum setting:
a. Peak setting RBW=10KHz, VBW=30KHz.
Factor between dBuA/m and dBuV/m is 51.5.

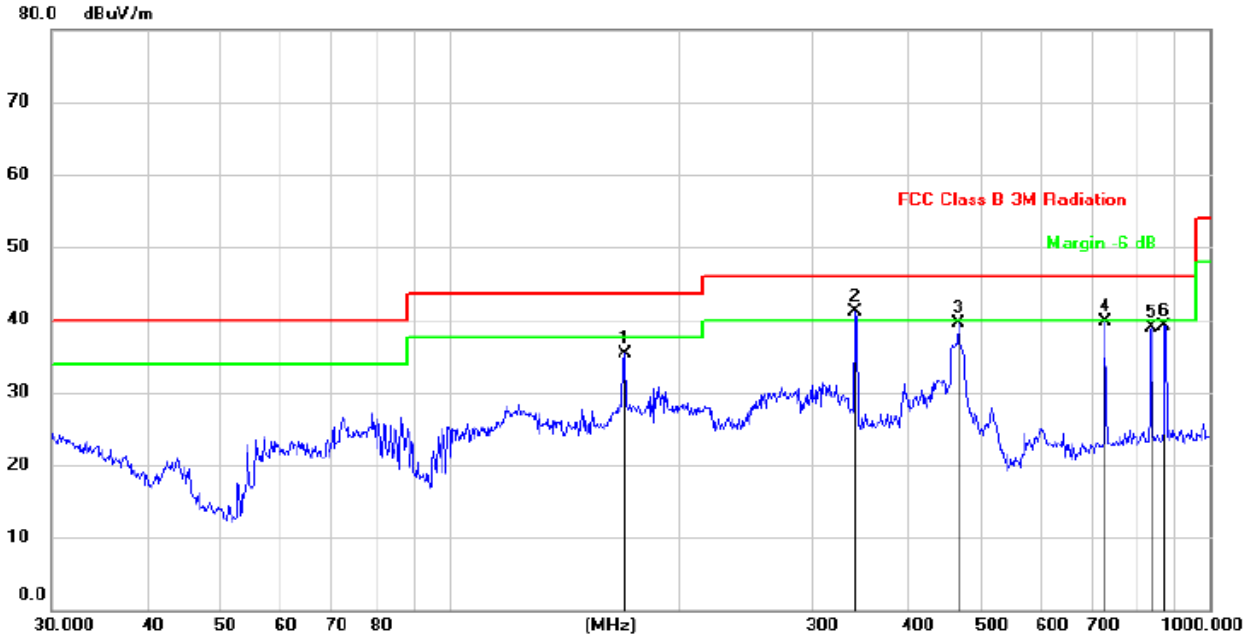
| Freq. (MHz) | Position H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limits 3m (dBuV/m) | Margin (dBuV/m) |
|---|---|---|---|---|---|---|---|
| 13.110 | H | Peak | 42.46 | -13.94 | 28.52 | 80.50 | -51.98 |
| 13.410 | H | Peak | 43.59 | -13.94 | 29.65 | 90.50 | -60.85 |
| 13.553 | H | Peak | 42.43 | -13.94 | 28.49 | 90.50 | -62.01 |
| 13.567 | H | Peak | 45.76 | -13.93 | 31.83 | 90.50 | -58.67 |
| 13.710 | H | Peak | 43.39 | -13.93 | 29.46 | 80.50 | -51.04 |
| 14.010 | H | Peak | 44.45 | -13.93 | 30.52 | 80.50 | -49.98 |

| Freq. (MHz) | Position H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limits 3m (dBuV/m) | Margin (dBuV/m) |
|---|---|---|---|---|---|---|---|
| 13.110 | V | Peak | 42.74 | -13.94 | 28.80 | 69.5 | -40.70 |
| 13.410 | V | Peak | 45.61 | -13.94 | 31.67 | 80.5 | -48.83 |
| 13.553 | V | Peak | 43.59 | -13.94 | 29.65 | 90.5 | -60.85 |
| 13.567 | V | Peak | 42.27 | -13.94 | 28.33 | 90.5 | -62.17 |
| 13.710 | V | Peak | 43.09 | -13.93 | 29.16 | 80.5 | -51.34 |
| 14.010 | V | Peak | 44.64 | -13.93 | 30.71 | 69.5 | -38.79 |



### 3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

| EUT： | Rugged smartphone | Model Name ： | DK66 |
|---|---|---|---|
| Temperature： | 20 ℃ | Relative Humidity： | 48% |
| Pressure： | 1010 hPa | Test Voltage ： | DC 5Vfrom adapter |
| Test Mode ： | TX | Polarization： | Vertical |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dBuV/m | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 170.1947 | 51.64 | -16.41 | 35.23 | 43.50 | -8.27 | QP | | | |
| 2 | * | 341.9786 | 50.77 | -9.75 | 41.02 | 46.00 | -4.98 | QP | | | |
| 3 | | 467.2348 | 47.08 | -7.55 | 39.53 | 46.00 | -6.47 | QP | | | |
| 4 | | 729.3582 | 43.44 | -3.81 | 39.63 | 46.00 | -6.37 | QP | | | |
| 5 | | 839.1816 | 41.03 | -2.20 | 38.83 | 46.00 | -7.17 | QP | | | |
| 6 | | 872.1832 | 40.77 | -1.70 | 39.07 | 46.00 | -6.93 | QP | | | |

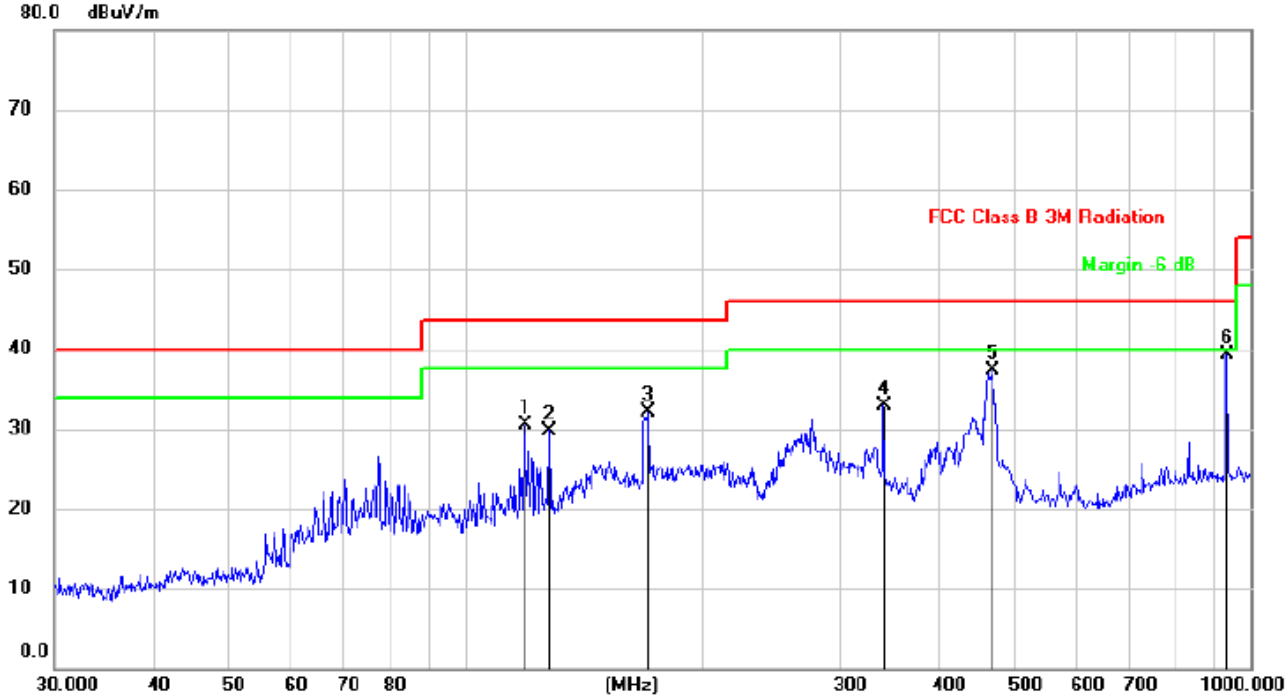
**Remark:**

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

| EUT： | Rugged smartphone | Model Name ： | DK66 |
|---|---|---|---|
| Temperature： | 20 ℃ | Relative Humidity： | 48% |
| Pressure： | 1010 hPa | Test Voltage ： | DC 5Vfrom adapter |
| Test Mode ： | TX | Polarization： | Horizontal |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dBuV/m | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 119.0180 | 46.39 | -15.90 | 30.49 | 43.50 | -13.01 | QP | | | |
| 2 | | 128.1127 | 47.03 | -17.23 | 29.80 | 43.50 | -13.70 | QP | | | |
| 3 | | 170.7923 | 48.55 | -16.37 | 32.18 | 43.50 | -11.32 | QP | | | |
| 4 | | 340.7817 | 42.73 | -9.77 | 32.96 | 46.00 | -13.04 | QP | | | |
| 5 | | 468.8761 | 44.90 | -7.54 | 37.36 | 46.00 | -8.64 | QP | | | |
| 6 | * | 932.2712 | 40.28 | -0.98 | 39.30 | 46.00 | -6.70 | QP | | | |

**Remark:**

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

# 4. 20 DB OCCUPY BANDWIDTH

## 4.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.225) , Subpart C | | | |
|---|---|---|---|
| Section | Test Item | Limit | Result |
| 15.225 | 20dB bandwidth | / | PASS |

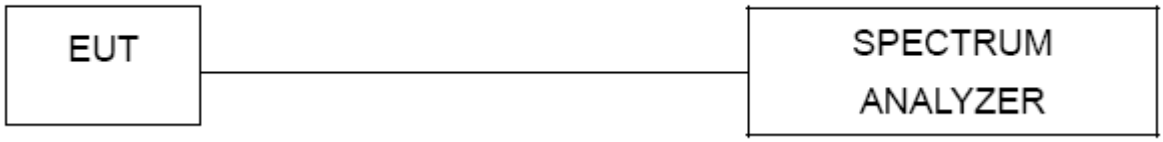
### 4.1.1 TEST PROCEDURE

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
(2) Spectrum Setting:
Bandwidth: RBW=3 kHz, VBW=10 kHz, detector= Peak

### 4.1.2 DEVIATION FROM STANDARD

No deviation.

### 4.1.3 TEST SETUP




### 4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

### 4.1.5 TEST RESULTS

| EUT : | Rugged smartphone | Model Name : | DK66 |
|---|---|---|---|
| Temperature : | 25 ℃ | Relative Humidity : | 60% |
| Pressure : | 1015 hPa | Test Voltage : | DC 5Vfrom adapter |
| Test Mode : | NFC | | |

| Frequency | 20dB Bandwidth (KHz) | Limit | Result |
|---|---|---|---|
| 13.56 MHz | 8.963 | / | PASS |

**13.56MHz**

# 5. FREQUENCY STABILITY

## 5.1 APPLIED PROCEDURES / LIMIT

Please refer section15.225e.

Regulation 15.225(e) The frequency tolerance of the carrier signal shall be maintained within +/-0.01%(±100 ppm) of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

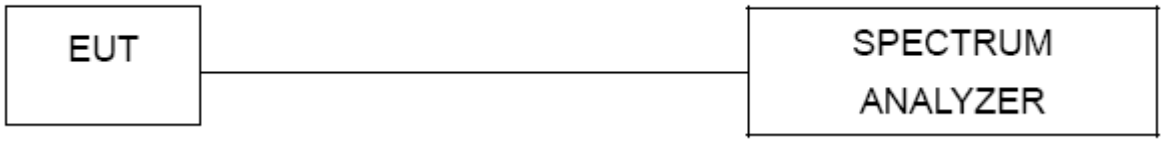
### 5.1.1 TEST PROCEDURE

The following equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 5.1.2 DEVIATION FROM STANDARD

No deviation.

### 5.1.3 TEST SETUP




### 5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

### 5.1.5 TEST RESULTS

| EUT： | Rugged smartphone | Model Name ： | DK66 |
|---|---|---|---|
| Temperature： | 25 ℃ | Relative Humidity： | 60% |
| Pressure： | 1012 hPa | Test Voltage ： | DC 5Vfrom adapter |
| Test Mode ： | NFC | | |

Assigned Frequency(MHz): 13.56MHz
Voltage: DC 5V from adapter

| Voltage | Temperature | Measured Frequency (MHz) | Frequency stability | Limit |
|---|---|---|---|---|
| Low AC 102V | +20℃ | 13.56072 | 0.00072 | ±100 ppm ±0.001356MHz |
| Normal AC 120V | -20℃ | 13.56069 | 0.00069 | |
| | -10℃ | 13.55951 | -0.00049 | |
| | 0℃ | 13.56042 | 0.00042 | |
| | +10℃ | 13.55937 | -0.00063 | |
| | +20℃ | 13.56045 | 0.00045 | |
| | +30℃ | 13.56061 | 0.00061 | |
| | +40℃ | 13.55983 | -0.00017 | |
| | +50℃ | 13.55972 | -0.00028 | |
| High AC138V | +20℃ | 13.56058 | 0.00058 | |

# 6. ANTENNA REQUIREMENT

## 6.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: 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.

## 6.2 EUT ANTENNA

The EUT antenna is Integrated antenna . It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used.

**----End of Report----**