

# Test Report

FCC ID.: MTi160413E004

Date of issue: Jul. 16, 2016

|                     |                                                                             |
|---------------------|-----------------------------------------------------------------------------|
| Sample Description: | Wireless POS Terminal                                                       |
| Model(s):           | G3                                                                          |
| Applicant:          | Shenzhen Xinguodu Technology Co., Ltd.                                      |
| Address:            | 17/A, Jinsong Building Tairan Industry And Trading<br>Garden Shenzhen China |
| Date of Test:       | Jun. 04, 2016 to Jul. 14, 2016                                              |

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



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| TEST RESULT CERTIFICATION  |                                                                             |
|----------------------------|-----------------------------------------------------------------------------|
|                            |                                                                             |
| <b>Applicant's name:</b>   | <b>Shenzhen Xinguodu Technology Co., Ltd.</b>                               |
| Address:                   | 17/A, Jinsong Building Tairan Industry And Trading Garden<br>Shenzhen China |
| <b>Manufacture's Name:</b> | <b>Shenzhen Xinguodu Technology Co., Ltd.</b>                               |
| Address:                   | 17/A, Jinsong Building Tairan Industry And Trading Garden<br>Shenzhen China |
| <b>Product description</b> |                                                                             |
| Product name:              | Wireless POS Terminal                                                       |
| Trademark:                 | <b>NEXGO</b>                                                                |
| Model name:                | G3                                                                          |
| <b>Standards:</b>          | FCC Part 15.225                                                             |
| <b>Test Procedure:</b>     | ANSI C63.4-2014                                                             |

*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:

*David Chen*

David Chen

Jul. 16, 2016

Reviewed by:

*Leon Chen*

Leon Chen

Jul. 16, 2016

Approved by:

*Ares Liu*

Ares Liu

Jul. 16, 2016

## SUMMARY OF TEST RESULT

| Item | FCC Part No. | Description of Test              | Result |
|------|--------------|----------------------------------|--------|
| 1    | 15.203       | Antenna requirement              | Pass   |
| 2    | 15.207       | AC power line conducted emission | Pass   |
| 3    | 15.231(c)    | 20dB bandwidth                   | Pass   |
| 4    | 15.225       | Radiated emission                | Pass   |
| 5    | 15.225       | Frequency stability              | Pass   |

## 1. General description

### 1.1 Feature of equipment under test (EUT)

|                      |                                                                            |
|----------------------|----------------------------------------------------------------------------|
| Product name:        | Wireless POS Terminal                                                      |
| Model name:          | G3                                                                         |
| Operating frequency: | 13.56MHz                                                                   |
| Modulation type:     | FSK                                                                        |
| Power supply:        | DC 7.4V form Polymer-Li-ion battery                                        |
| Adapter information: | Model: HKA02108525-8A<br>Input: 100-240V~0.8A 50/60Hz<br>Output: 8.5V 2.5A |
| Antenna designation: | PCB antenna (Antenna Gain: 0dBi)                                           |

## 2. Test Configuration of EUT

### 2.1 EUT operation mode

During testing, the EUT is operated in a normal mode.

### 2.2 Test conditions

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 20°C~30°C
- Humidity: 30%~70%
- Atmospheric pressure: 98kPa~101kPa

### 2.3 Testing site

|                        |                                                                                                                  |
|------------------------|------------------------------------------------------------------------------------------------------------------|
| Test Site              | Shenzhen Toby Technology Co., Ltd.                                                                               |
| Test Site Location     | 1 A/F., Bldg.6, Yusheng Industrial Zone The National Road No.107 Xixiang Section 467, Shenzhen, Guangdong, China |
| FCC Registration No.:  | 811562                                                                                                           |
| CNAS Registration No.: | CNAS L5813                                                                                                       |

### 2.4 Ancillary equipment list

| Equipment | Model | S/N | Manufacturer |
|-----------|-------|-----|--------------|
| /         | /     | /   | /            |

### 2.5 Measurement uncertainty

Measurement Uncertainty for a Level of Confidence of 95 %,  $U=2 \times U_c(y)$

|                                  |                    |
|----------------------------------|--------------------|
| RF frequency                     | $1 \times 10^{-7}$ |
| RF power, conducted              | $\pm 1$ dB         |
| Conducted emission(150kHz~30MHz) | $\pm 2.5$ dB       |
| Radiated emission(30MHz~1GHz)    | $\pm 4.2$ dB       |
| Radiated emission (above 1GHz)   | $\pm 4.3$ dB       |
| Temperature                      | $\pm 1$ degree     |
| Humidity                         | $\pm 5$ %          |

### 3. List of test equipment

For AC power line conducted emission:

| Equipment         | Manufacturer | Model      | Serial No. | Calibration Due |
|-------------------|--------------|------------|------------|-----------------|
| LISN              | R&S          | ENV216     | 101313     | 2016.12.06      |
| LISN              | SCHWARZBECK  | NNLK 8129  | 8129245    | 2016.12.25      |
| Pulse Limiter     | SCHWARZBECK  | VTSD 9561F | 9716       | 2016.12.25      |
| Test Cable        | N/A          | N/A        | C01        | 2016.12.06      |
| EMI Test Receiver | R&S          | ESCI       | 101160     | 2016.12.06      |

For Radiated emission:

| Equipment                  | Manufacturer        | Model       | Serial No. | Calibration Due |
|----------------------------|---------------------|-------------|------------|-----------------|
| Log-Bicon Antenna          | MESS-ELEKTRO<br>NIK | VULB 9160   | 3058       | 2016.12.11      |
| Horn Antenna               | Schwarzbeck         | BBHA 9120D  | 631        | 2016.12.05      |
| Horn Antenna               | Schwarzbeck         | BBHA 9170   | 373        | 2016.12.05      |
| Loop Antenna               | Schwarzbeck         | FMZB 1519 B | 00005      | 2016.12.05      |
| Test Cable                 | United Microwave    | 57793       | 1m         | 2016.12.05      |
| Test Cable                 | United Microwave    | A30A30-5006 | 10M        | 2016.12.05      |
| Microwave<br>Pre_amplifier | Agilent             | 8449B       | 3008A01714 | 2016.12.05      |
| Pre-Amplifier              | Anritsu             | MH648A      | M09961     | 2016.12.05      |
| EMI Test Receiver          | R&S                 | ESCI-7      | 101318     | 2016.12.05      |
| Spectrum analyzer          | Agilent             | E4470B      | MY41441082 | 2017.06.01      |

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

## 4. Test Result

### 4.1 Conducted emission

#### 4.1.1 Limit

| Frequency<br>(MHz) | Limit      |          |
|--------------------|------------|----------|
|                    | Quasi-peak | Average  |
| 0.15-0.5           | 66 to 56   | 56 50 46 |
| 0.5-5              | 56         | 46       |
| 5-30               | 60         | 50       |

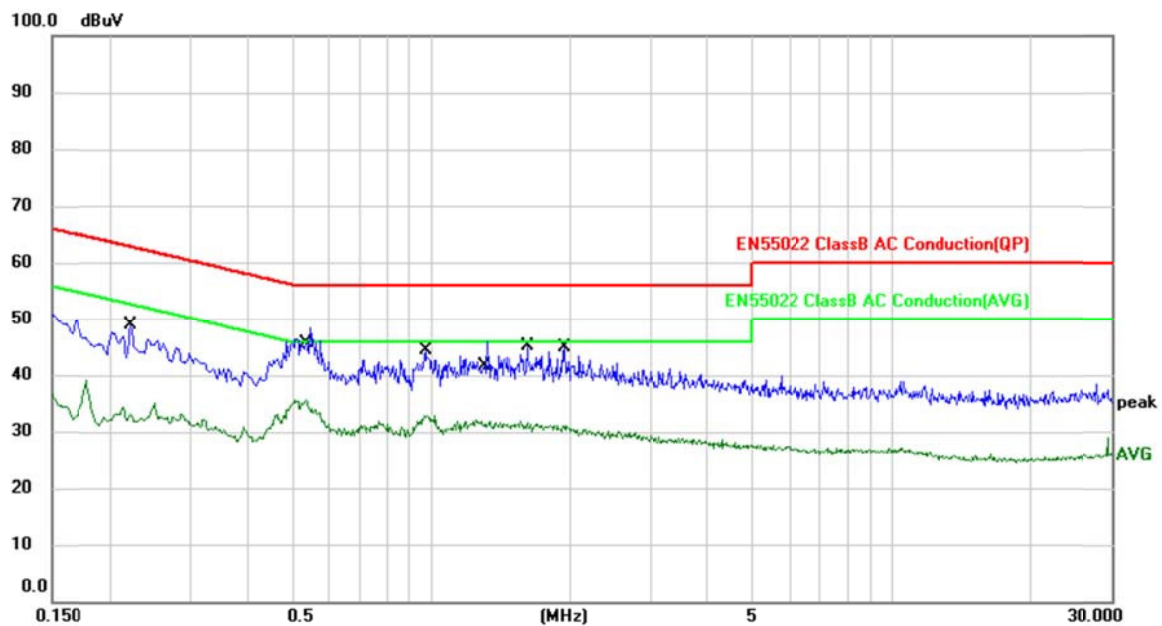
Note: Decreases with the logarithm of the frequency from 0.15MHz to 0.5MHz.

#### 4.1.2 Test method

1. 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 equipment powered from additional LISN(s). The LISN provide 50 Ohm/50uH of coupling impedance for the measuring instrument.
2. 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.
3. 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.
4. LISN is at least 80 cm from nearest part of EUT chassis.
5. The resolution bandwidth of EMI test receiver is set at 9kHz.

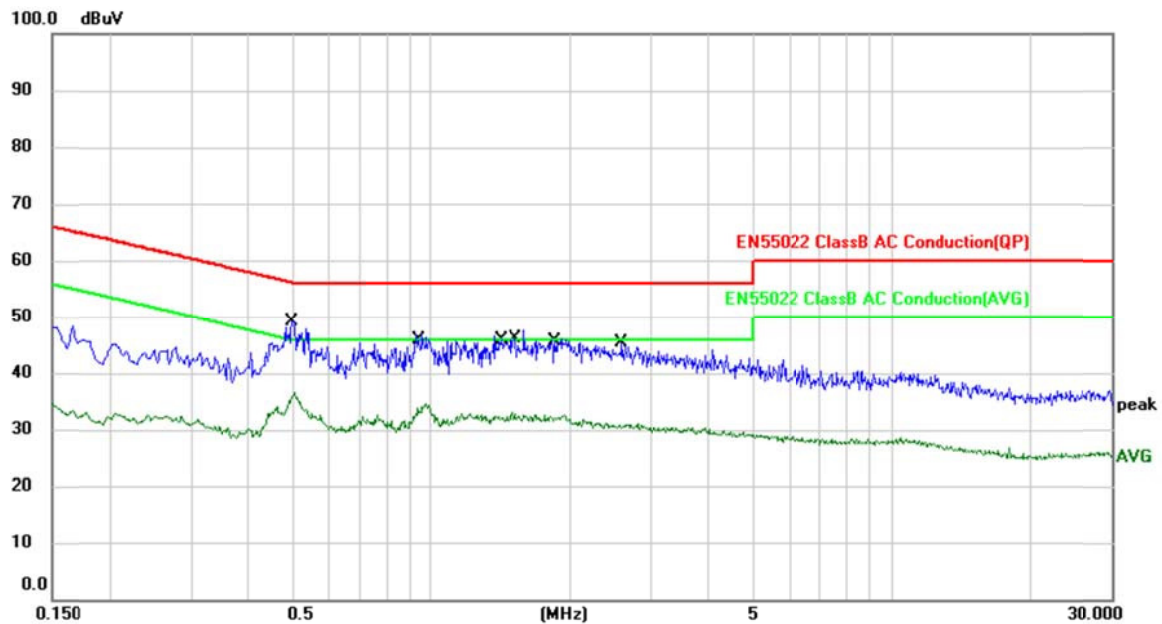
#### 4.1.3 Test Result

|               |              |               |              |
|---------------|--------------|---------------|--------------|
| Temperature:  | 22°C         | Relative      | 51%          |
| Pressure:     | 101kPa       | Polarization: | L            |
| Test voltage: | AC 120V/60Hz | Test mode:    | Transmitting |



| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1   |     | 0.2235       | 9.72                     | 30.02                   | 39.74                    | 62.68         | -22.94     | QP       |         |
| 2   |     | 0.2235       | 1.89                     | 30.02                   | 31.91                    | 52.68         | -20.77     | AVG      |         |
| 3   |     | 0.5298       | 9.07                     | 30.02                   | 39.09                    | 56.00         | -16.91     | QP       |         |
| 4   | *   | 0.5298       | 4.51                     | 30.02                   | 34.53                    | 46.00         | -11.47     | AVG      |         |
| 5   |     | 0.9839       | 7.35                     | 30.02                   | 37.37                    | 56.00         | -18.63     | QP       |         |
| 6   |     | 0.9839       | 2.51                     | 30.02                   | 32.53                    | 46.00         | -13.47     | AVG      |         |
| 7   |     | 1.3044       | 5.69                     | 30.02                   | 35.71                    | 56.00         | -20.29     | QP       |         |
| 8   |     | 1.3044       | 1.03                     | 30.02                   | 31.05                    | 46.00         | -14.95     | AVG      |         |
| 9   |     | 1.6038       | 6.42                     | 30.02                   | 36.44                    | 56.00         | -19.56     | QP       |         |
| 10  |     | 1.6038       | 1.12                     | 30.02                   | 31.14                    | 46.00         | -14.86     | AVG      |         |
| 11  |     | 1.9628       | 5.33                     | 30.02                   | 35.35                    | 56.00         | -20.65     | QP       |         |
| 12  |     | 1.9628       | 0.54                     | 30.02                   | 30.56                    | 46.00         | -15.44     | AVG      |         |

|               |              |               |              |
|---------------|--------------|---------------|--------------|
| Temperature:  | 24°C         | Relative      | 57%          |
| Pressure:     | 101kPa       | Polarization: | N            |
| Test voltage: | AC 120V/60Hz | Test mode:    | Transmitting |



| No. Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector | Comment |
|---------|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1       | 0.4976       | 12.75                    | 30.02                   | 42.77                    | 56.04         | -13.27     | QP       |         |
| 2 *     | 0.4976       | 5.85                     | 30.02                   | 35.87                    | 46.04         | -10.17     | AVG      |         |
| 3       | 0.9406       | 9.45                     | 30.02                   | 39.47                    | 56.00         | -16.53     | QP       |         |
| 4       | 0.9406       | 3.42                     | 30.02                   | 33.44                    | 46.00         | -12.56     | AVG      |         |
| 5       | 1.4213       | 7.78                     | 30.02                   | 37.80                    | 56.00         | -18.20     | QP       |         |
| 6       | 1.4213       | 1.68                     | 30.02                   | 31.70                    | 46.00         | -14.30     | AVG      |         |
| 7       | 1.5254       | 8.72                     | 30.02                   | 38.74                    | 56.00         | -17.26     | QP       |         |
| 8       | 1.5254       | 1.99                     | 30.02                   | 32.01                    | 46.00         | -13.99     | AVG      |         |
| 9       | 1.8668       | 7.99                     | 30.02                   | 38.01                    | 56.00         | -17.99     | QP       |         |
| 10      | 1.8668       | 1.95                     | 30.02                   | 31.97                    | 46.00         | -14.03     | AVG      |         |
| 11      | 2.6080       | 6.72                     | 30.03                   | 36.75                    | 56.00         | -19.25     | QP       |         |
| 12      | 2.6080       | 0.20                     | 30.03                   | 30.23                    | 46.00         | -15.77     | AVG      |         |

## **4.2 Antenna requirement**

### **4.2.1 Requirement defined in FCC 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

### **4.2.2 EUT antenna description**

The radio antenna of EUT is an internal permanently attached antenna, the maximum gain is 0dBi. So the antenna meets the requirement of this part.

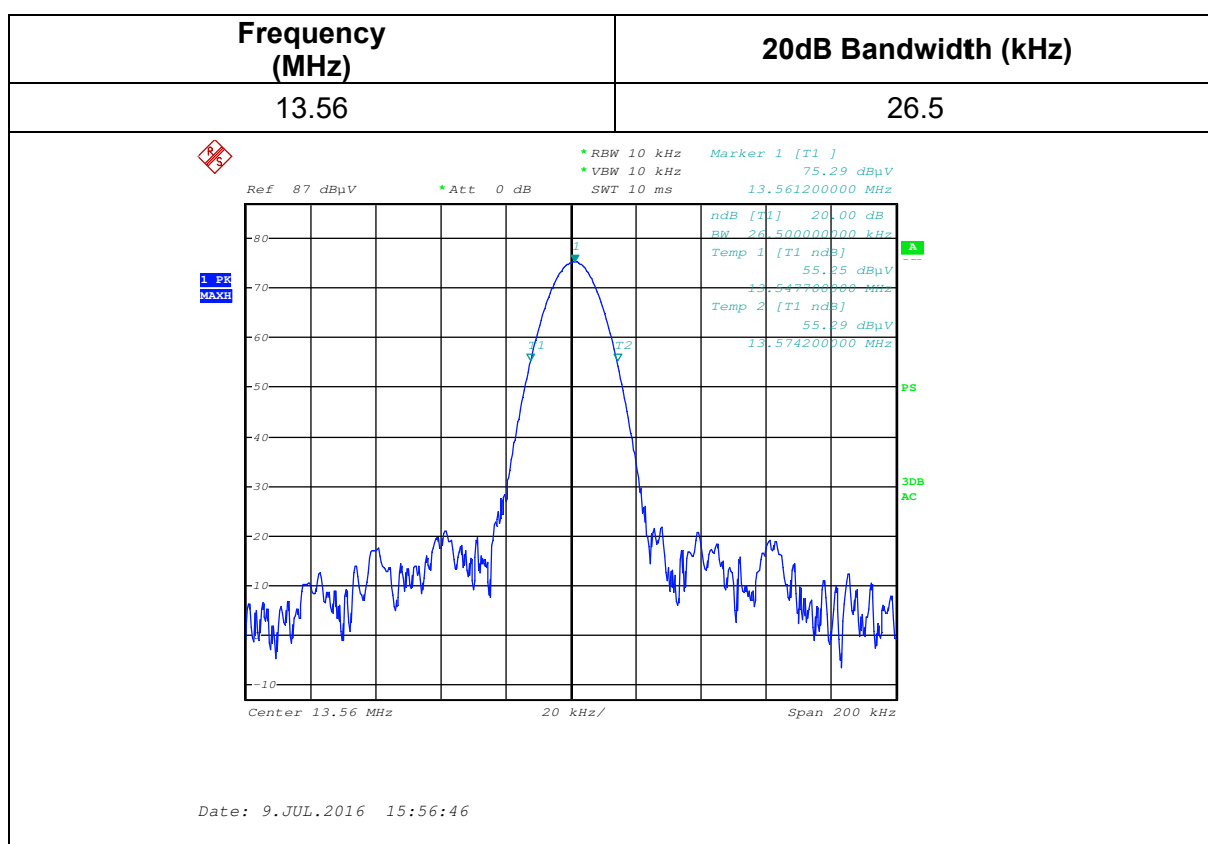
## 4.3 20dB emission bandwidth

### 4.3.1 Test method

Set Spectrum Analyzer centre Frequency= Fundamental Frequency, RBW=3 kHz, VBW= 10 kHz, Span= 1 MHz

Allow the trace to stabilize, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

### 4.3.2 Test result



## 4.4 Radiated emission

### 4.4.1 Limit

The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

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 at 30 meters.

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 at 30 meters.

The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in §15.209, the field strength of emissions from intentional radiators shall not exceed the following:

| Frequency (MHz) | Field strength $\mu\text{V/m}$ | Field strength $\text{dB}\mu\text{V/m}$ | Detector | Measurement distance |
|-----------------|--------------------------------|-----------------------------------------|----------|----------------------|
| 1.705-30        | 30                             | 29.54                                   | QP       | 3m                   |
| 30-88           | 100                            | 40                                      | QP       |                      |
| 88-216          | 150                            | 43.5                                    | QP       |                      |
| 216-960         | 200                            | 46                                      | QP       |                      |
| 960-1000        | 500                            | 46                                      | QP       |                      |
| Above 1000      | 500                            | 54                                      | AV       |                      |
| Above 1000      | 5000                           | 74                                      | PK       |                      |

Note: the measurement distance is 30m for 1.705MHz to 30MHz, 3m for above 30MHz.

### 4.4.2 Test method

The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground; the table was rotated 360 degrees to determine the position of the highest radiation.

For test frequency up to 30MHz, a loop antenna is used, the enter of the loop antenna is 1m above the ground.

For test frequency above 30MHz, he Test antenna shall vary between 1m and 4m, both Horizontal and Vertical polarization are set to make measurement.

For the actual test configuration, please see the test setup photo.

### 4.4.3 Test Result

| Frequency<br>(MHz) | Ant.<br>Polarization<br>H / V | Emission level<br>dBμV/m | Limits<br>dBμV/m | Detector | Result |
|--------------------|-------------------------------|--------------------------|------------------|----------|--------|
| 13.56              | /                             | 89.6                     | 124              | QP       | Pass   |
| 27.12              | /                             | 37.5                     | 69.54            | QP       |        |
| 40.68              | V                             | 33.1                     | 40               | QP       |        |
| 40.68              | H                             | 30.9                     | 40               | QP       |        |
| 54.24              | V                             | 28.4                     | 40               | QP       |        |
| 54.24              | H                             | 29.6                     | 40               | QP       |        |

Remark:

other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

## 4.5 Frequency stability

### 4.5.1 Limit

The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01\%$  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.

### 4.5.2 Test Result

| Voltage (VAC) | Temp. (°C) | Frequency (MHz) | Deviation (%) | Limit (%) |
|---------------|------------|-----------------|---------------|-----------|
| 120           | -20        | 13.560659       | 0.0049%       | +/-0.01%  |
| 120           | -10        | 13.560673       | 0.0050%       |           |
| 120           | 0          | 13.560676       | 0.0050%       |           |
| 120           | 10         | 13.56078        | 0.0058%       |           |
| 120           | 20         | 13.560865       | 0.0064%       |           |
| 120           | 30         | 13.560602       | 0.0044%       |           |
| 120           | 40         | 13.560554       | 0.0041%       |           |
| 120           | 50         | 13.560704       | 0.0052%       |           |
| 138           | 20         | 13.561048       | 0.0077%       |           |
| 102           | 20         | 13.560589       | 0.0043%       |           |

----END OF REPORT----