# EMC TEST Report

## FCC ID: TFJUIC680

**This report concerns (check one) :** ■ **Original Grant** □ **Class II Change**

**Issued Date :** Nov. 03, 2006
**Report No. :** 0610013
**Equipment :** Contactless Card Reader
**Model No. :** UIC680 Series

**Applicant :** Uniform Industrial Corp.
**Address :** 47709 Fremont Blvd., Fremont, California, Unitied States 94539

**Tested by:**
Neutron Engineering Inc. EMC Laboratory
**Data of Test:**
Oct. 03, 2006 ~ Oct. 26, 2006

Testing Engineer : Alan Liu. (Alan Liu)

Technical Manager : Jeff Yang (Jeff Yang)

Authorized Signatory : (Andy Chiu)

***NEUTRON ENGINEERING INC.***

**No. 132-1, *Lane* 329, Sec. 2, Palain Rd.,**
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***TEL : (02) 2646-5426 FAX : (02) 2646-6815***

NVLAP Lab Code: 200145-0 ilac-MRA TAF Testing Laboratory 0659

## Declaration

**Neutron** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C**., or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

**Neutron**'s reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **Neutron** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **Neutron** issued reports.

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**Neutron**'s laboratory quality assurance procedures are in compliance with the **ISO Guide 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

## Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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## 1. CERTIFICATION

Equipment: Contactless Card Reader
Trade Name: Uniform
Model No.: UIC680 Series
Applicant: Uniform Industrial Corp.
Data of Test: Oct. 03, 2006 ~ Oct. 26, 2006
Test Item: ENGINEERING SAMPLE
Standards: FCC Part15, Subpart C / RSS-210: 2004/ ANCI C63.4 : 2003

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-1-0610013) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and CNLA according to the ISO-17025 quality assessment standard and technical standard(s).

## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards: (Antenna to EUT distance is **3** m)

| **FCC Part15, Subpart C** | | |
|---|---|---|
| Standard | Test Item | Judgment |
| 15.207 | Conducted Emission | PASS |
| 15.35 / 15.205 / 15.209 / 15.225 | Radiated Emission | PASS |
| 15.225(e) | Frequency Stability | PASS |
| 15.203 | Antenna Requirement | PASS |

NOTE:

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

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **C01**/**OS01** at the location of No.132-1, Lane 329, Sec. 2, Palain Road, Shijr City, Taipei, Taiwan.

2.2 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** %。

A. Conducted Measurement :

| Test Site | Method | Measurement Frequency Range | U，(dB) | NOTE |
|---|---|---|---|---|
| C01 | ANSI | 150 KHz ~ 30MHz | 1.94 | |

B. Radiated Measurement :

| Test Site | Method | Measurement Frequency Range | Ant. H / V | U，(dB) | NOTE |
|---|---|---|---|---|---|
| OS-01 | ANSI | 30MHz ~ 200MHz | V | 3.82 | |
| | | 30MHz ~ 200MHz | H | 3.60 | |
| | | 200MHz ~ 1,000MHz | V | 3.86 | |
| | | 200MHz ~ 1,000MHz | H | 3.94 | |
| OS-02 | ANSI | 30MHz ~ 200MHz | V | 2.48 | |
| | | 30MHz ~ 200MHz | H | 2.16 | |
| | | 200MHz ~ 1,000MHz | V | 2.50 | |
| | | 200MHz ~ 1,000MHz | H | 2.66 | |

# 3. GENERAL INFORMATION

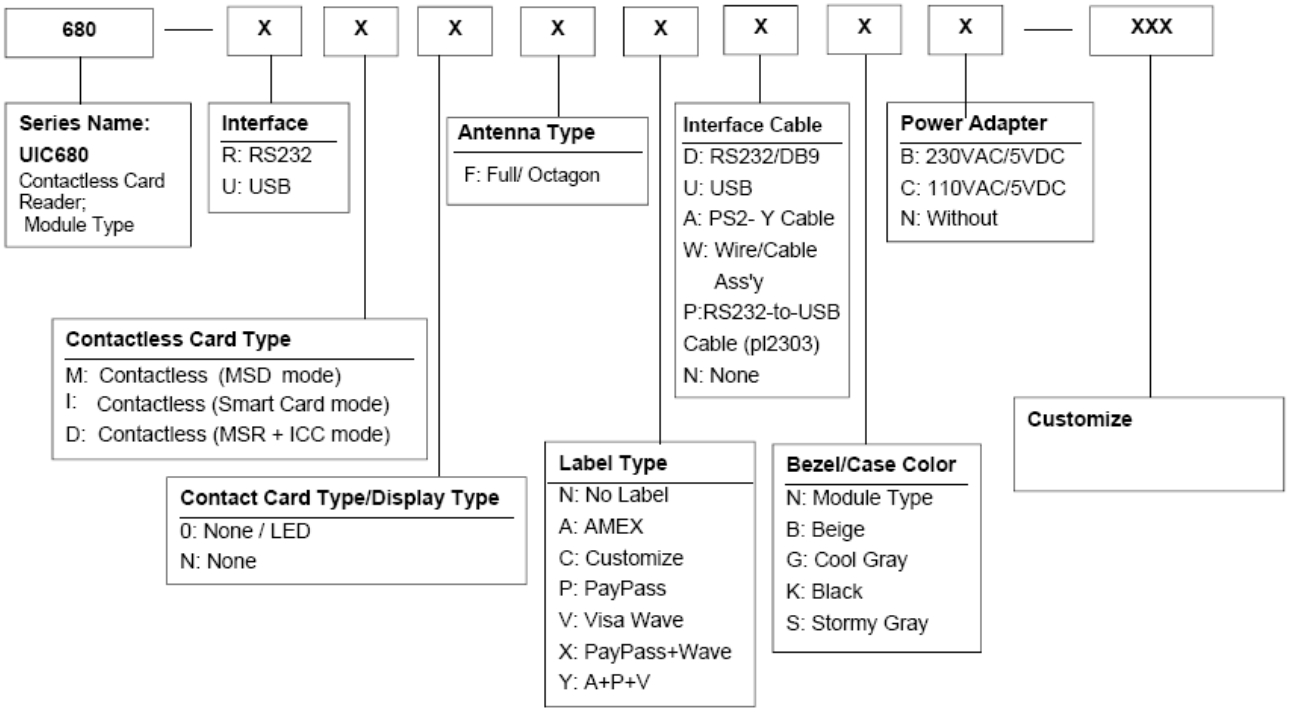
## 3.1 GENERAL DESCRIPTION OF EUT

| | |
|---|---|
| Equipment | Contactless Card Reader |
| Trade Name | Uniform |
| Model No. | UIC680 Series |
| OEM Brand/Model No. | N/A |
| Model Difference | Please refer to next page the Part Number Description of UIC680 Series.<br>All the models were tested, and the model: UIC680-UM0FXUKN-XXX and UIC680-RM0FXDKC-XXX were found to be the worst case during the pr-scanning test. These models of the worst case were used for final testing and collecting test data included in this report. |
| Product Description | The EUT is a Contactless Card Reader.<br>A. Operation Frequency: 13.56 MHz<br>B. Modulation Type: FSK<br>C. Antenna Designation: Integral Antenna / Octagon<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. |
| Power Source | Supplied from PC USB port. /<br>DC Voltage supplied from power adapter. |
| Power Rating | DC I/P 5V. |
| Connecting I/O Port(s) | Please refer to the User's Manual |
| Products Covered | Power adapter:<br>PA1010-050DUB: AC I/P 100-240V, 50-60Hz, 0.4A DC O/P 5V, 2.0A 10W Max.<br>DCU050050: AC I/P 120V, 60Hz, 8W DC O/P 5V, 500mA. |

Note:

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

## Part Number Description of UIC680 Series



## 3.2 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.

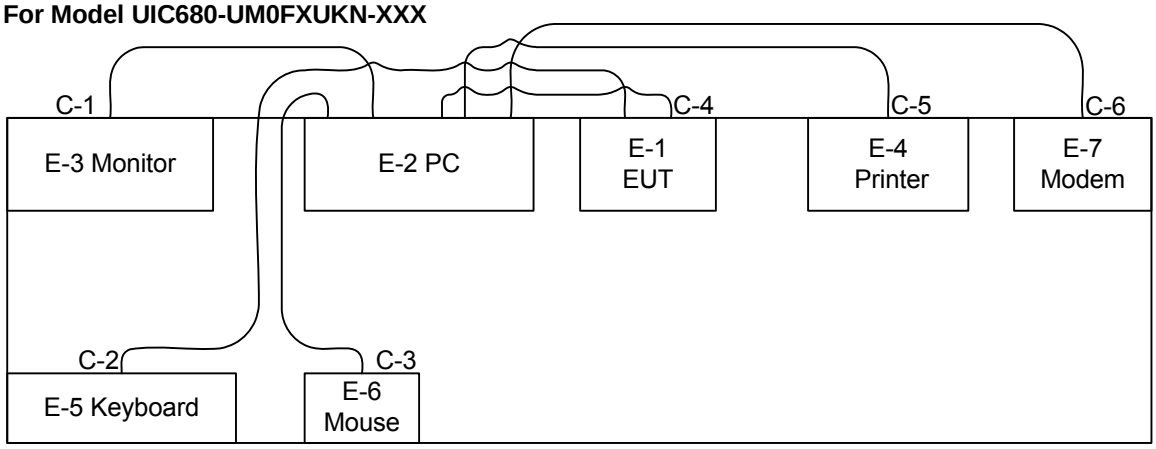
| Pretest Test Mode | Description |
|---|---|
| Mode 1 | Normal |

| **For Conducted Test** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | Normal |

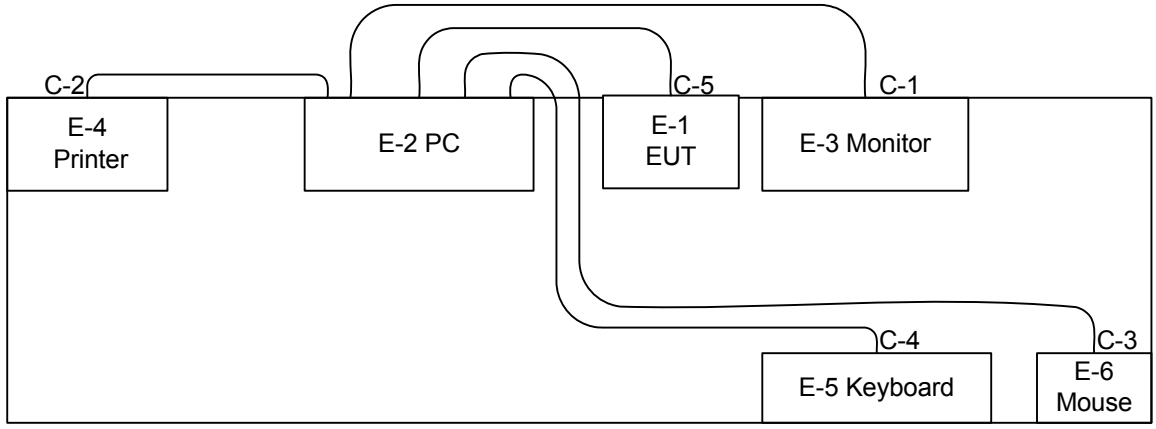
| **For Radiated Test** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | Normal |

## 3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

**For Model UIC680-UM0FXUKN-XXX**




**For Model UIC680-RM0FXDKC-XXX**




C-1 VGA Cable
C-2 Centronics Cable
C-3 Data Cable
C-4 Data Cable
C-5 Data Cable
C-6 Interface Cable

3.4 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 | Mfr/Brand | Model/Type No. | FCC ID | Series No. | Note |
|---|---|---|---|---|---|---|
| E-1 | Contactless Card Reader | Uniform | UIC680-UM0FXUKN-XXX<br>UIC680-RM0FXDKC-XXX | TFJUIC680 | N/A | EUT |
| E-2 | PC | HP | HP Compaq dx6100 MT | DOC | SGH4450D5G | |
| E-3 | 19" LCD Monitor | Samsung | SyncMaster 193P | GH19PH | DI19H4JXC05517A | |
| E-4 | Printer | SII | DPU-414 | DOC | 1045105A | |
| E-5 | PS/2 K/B | Logitech | Y-SJ17(ACK260A) | DOC | SYU44664880 | |
| E-6 | PS/2 Mouse | Logitech | M-SBF69 | DOC | HCA44601156 | |

| Item | Shielded Type | Ferrite Core | Length | Note |
|---|---|---|---|---|
| C-1 | YES | YES | 1.8M | |
| C-2 | YES | NO | 1.8M | |
| C-3 | YES | NO | 1.5M | |
| C-4 | YES | NO | 1.5M | |
| C-5 | YES | NO | 1.7M | |
| C-6 | YES | NO | 1.5M | |

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.

## 4. EMC EMISSION TEST

### 4.1 CONDUCTED EMISSION MEASUREMENT

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

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

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.

#### 4.1.2 MEASUREMENT INSTRUMENTS LIST

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | LISN | Rolf Heine | NNB-2/16Z | 98053 | Dec. 19, 2006 |
| 2 | 4L-V-LISN | Rolf Heine | NNB-4/63TL | 02/10040 | Apr. 06, 2007 |
| 3 | Pulse Limiter | Electro-Metrics | EM-7600 | 112644 | Nov. 29, 2006 |
| 4 | 50Ω Terminator | N/A | N/A | N/A | May.11, 2007 |
| 5 | Test Cable | N/A | C01 | N/A | Nov. 29, 2006 |
| 6 | EMI Test Receiver | R&S | ESCI | 100082 | Feb. 01, 2007 |

Remark: ” N/A” denotes No Model No. , Serial No. or No Calibration specified.

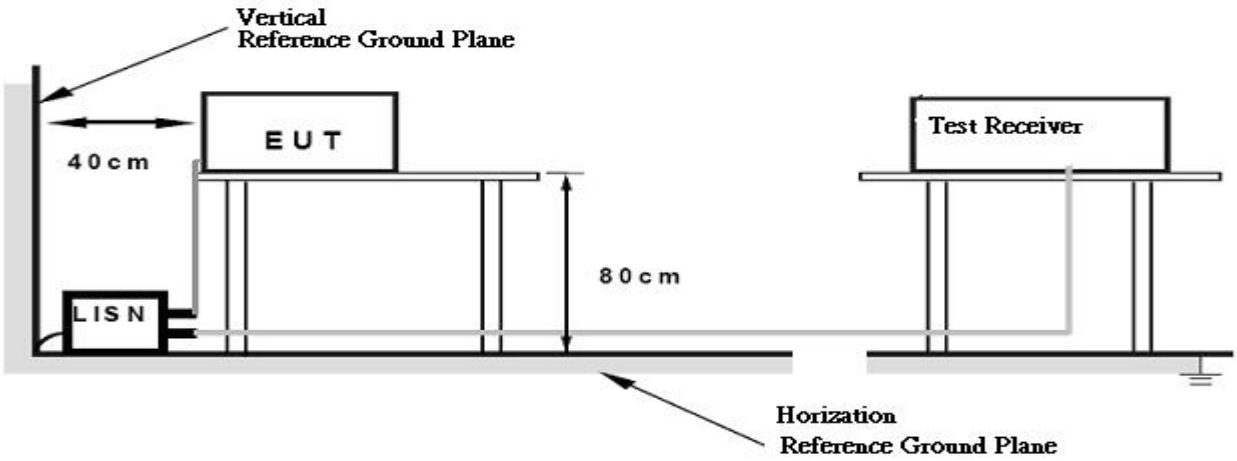
4.1.3 TEST PROCEDURE

a. The EUT was placed 0.4 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.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



4.1.6 EUT OPERATING CONDITIONS

The EUT exercise program used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use. The program contained on a PC hard disk and is auto-starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is:

1. Read (write) from (to) mass storage device (Disk).
2. Send "H" pattern to video port device (Monitor).
3. Send " H " pattern to parallel port device (Printer).
4. Send " H " pattern to serial port device (Modem).
5. The EUT has been programmed to continuously transmit during test.
6. Repeated from 2 to 5 continuously.

As the keyboard and mouse are strictly input devices, no data is transmitted to (from) them during test. They are, however, continuously scanned for data input activity.

4.1.7 TEST RESULTS

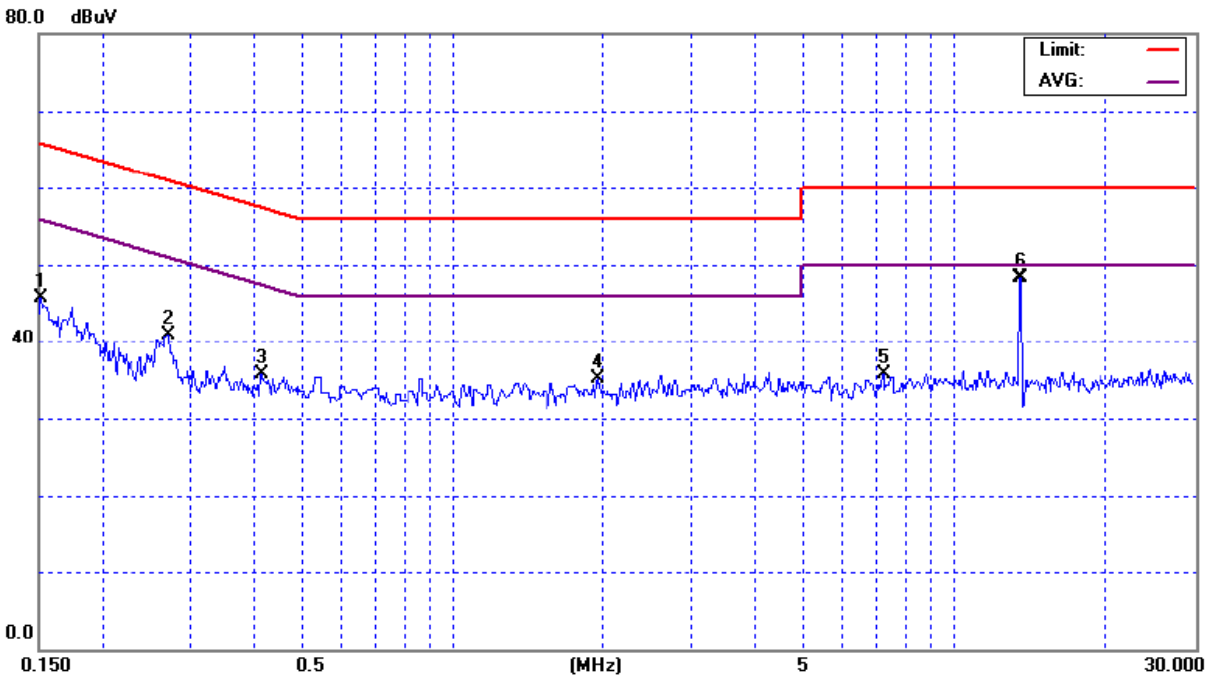
| EUT： | Contactless Card Reader | Model No. ： | UIC680-UM0FXUKN-XXX |
|---|---|---|---|
| Temperature： | 25 ℃ | Relative Humidity： | 61 % |
| Pressure： | 1018 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-without power adapter | | |

| Freq. (MHz) | Terminal L/N | Measured(dBuV) | | Limits(dBuV) | | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|
| | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | |
| 0.15 | Line | 45.68 | * | 65.94 | 55.94 | -20.26 | (QP) |
| 0.27 | Line | 40.89 | * | 61.10 | 51.10 | -20.21 | (QP) |
| 0.41 | Line | 35.73 | * | 57.59 | 47.59 | -21.86 | (QP) |
| 1.95 | Line | 35.12 | * | 56.00 | 46.00 | -20.88 | (QP) |
| 7.21 | Line | 35.61 | * | 60.00 | 50.00 | -24.39 | (QP) |
| 13.57 | Line | 48.35 | 47.85 | 60.00 | 50.00 | -2.15 | (AV) |

Remark

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz；SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz。Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz 。

(2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured 。



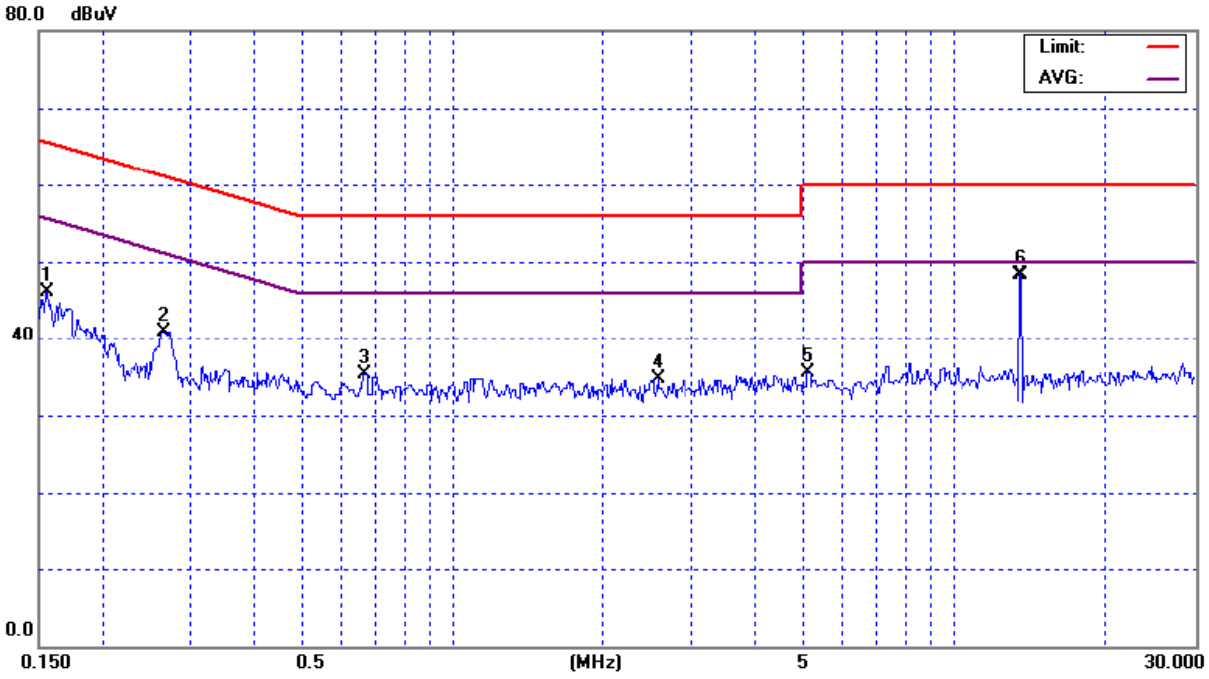
| | | | |
|---|---|---|---|
| EUT： | Contactless Card Reader | Model No. ： | UIC680-UM0FXUKN-XXX |
| Temperature： | 25 ℃ | Relative Humidity： | 61 % |
| Pressure： | 1018 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-without power adapter | | |

| Freq. (MHz) | Terminal L/N | Measured(dBuV) | | Limits(dBuV) | | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|
| | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | |
| 0.16 | Neutral | 46.08 | * | 65.73 | 55.73 | -19.65 | (QP) |
| 0.26 | Neutral | 40.89 | * | 61.29 | 51.29 | -20.40 | (QP) |
| 0.67 | Neutral | 35.35 | * | 56.00 | 46.00 | -20.65 | (QP) |
| 2.56 | Neutral | 34.74 | * | 56.00 | 46.00 | -21.26 | (QP) |
| 5.11 | Neutral | 35.47 | * | 60.00 | 50.00 | -24.53 | (QP) |
| 13.57 | Neutral | 48.35 | 47.97 | 60.00 | 50.00 | -2.03 | (AV) |

Remark

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz；SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz。Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz 。

(2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured 。



| EUT： | Contactless Card Reader | Model No. ： | UIC680-RM0FXDKC-XXX |
|---|---|---|---|
| Temperature： | 25 ℃ | Relative Humidity： | 61 % |
| Pressure： | 1018 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-with power adapter PA1010-050DUB | | |

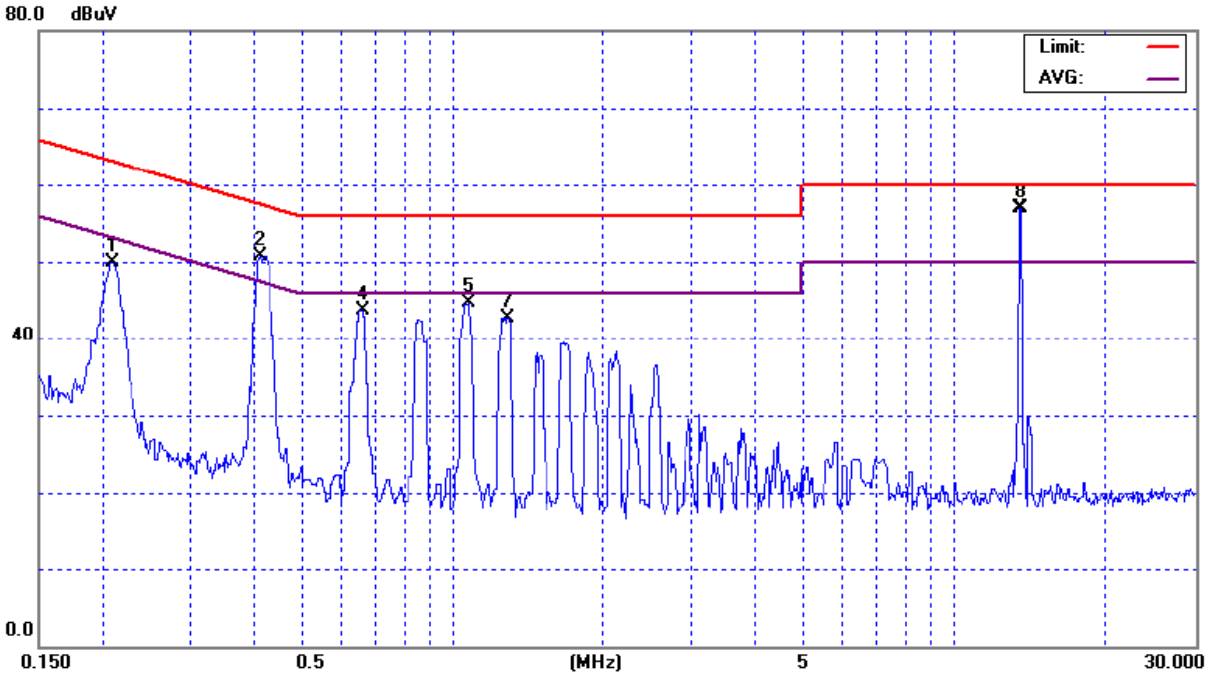
| Freq. (MHz) | Terminal L/N | Measured(dBuV) | | Limits(dBuV) | | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|
| | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | |
| 0.21 | Line | 49.88 | * | 63.27 | 53.27 | -13.39 | (QP) |
| 0.41 | Line | 50.73 | 41.03 | 57.61 | 47.61 | -6.58 | (AV) |
| 0.66 | Line | 43.75 | * | 56.00 | 46.00 | -12.25 | (QP) |
| 1.08 | Line | 44.64 | 31.29 | 56.00 | 46.00 | -11.36 | (QP) |
| 1.28 | Line | 42.66 | * | 56.00 | 46.00 | -13.34 | (QP) |
| 13.57 | Line | 56.95 | 56.75 | 60.00 | 50.00 | 6.75 | Note(3) |

Remark

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz；SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz。Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz 。

(2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured 。

**(3) Tx Fundamental, For reference only. Please refer to the next page.**



| EUT： | Contactless Card Reader | Model No. ： | UIC680-RM0FXDKC-XXX |
|---|---|---|---|
| Temperature： | 25 ℃ | Relative Humidity： | 61 % |
| Pressure： | 1018 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-with power adapter PA1010-050DUB | | |

| Freq. (MHz) | Terminal L/N | Measured(dBuV) | | Limits(dBuV) | | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|
| | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | |
| 13.56 | Line | 23.27 | 22.80 | 60.00 | 50.00 | -27.20 | (AV) |

Remark

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz；SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz。Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz。

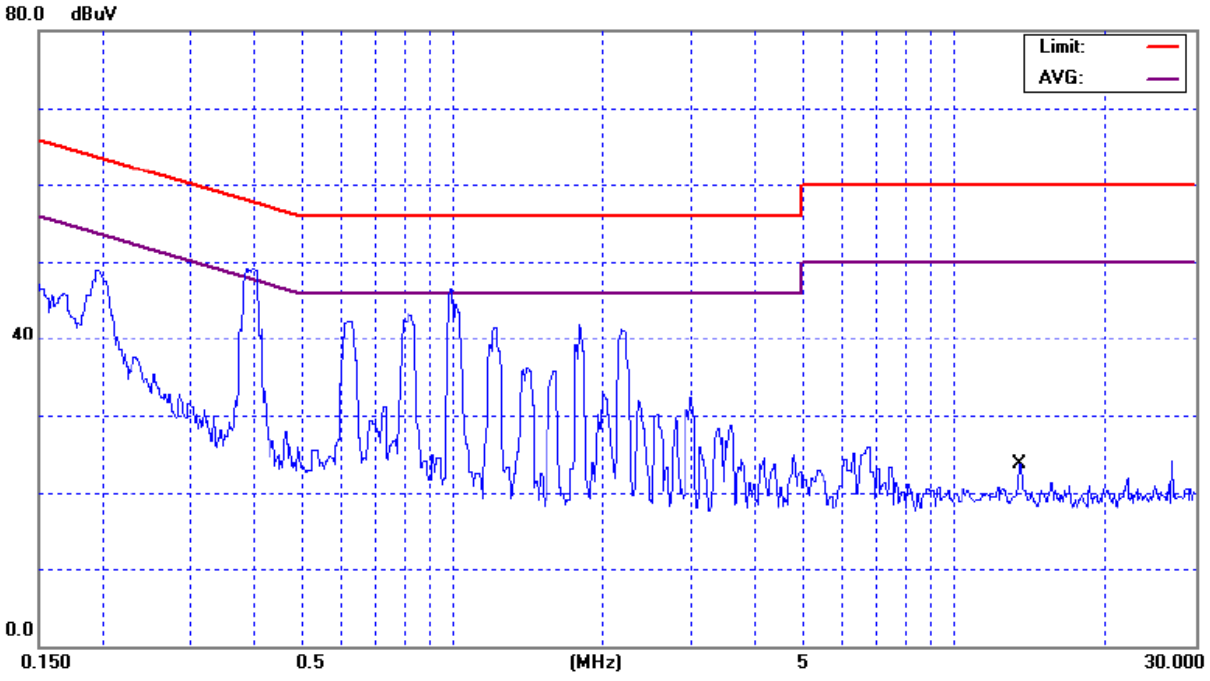
(2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

**(3) FCC May 2005 TCB Conference notes：**

Although C63.4 is designed for Part 15 transmitters that operate above 30 MHz with a detachable antenna, we are willing to accept measurements on a 13.56MHz transmitter done with a dummy load under the following conditions：

1) First, perform the AC line conducted tests with the antenna attached to make sure the device complies with the 15.207 limits outside the transmitter's fundamental emission band.

2) Second, retest with a dummy load to make sure the device complies with the 15.207 limits inside the transmitter's fundamental emission band. Only the fundamental TX emission band needs to be retested.



| | | | |
|---|---|---|---|
| EUT： | Contactless Card Reader | Model No. ： | UIC680-RM0FXDKC-XXX |
| Temperature： | 25 ℃ | Relative Humidity： | 61 % |
| Pressure： | 1018 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-with power adapter PA1010-050DUB | | |

| Freq. (MHz) | Terminal L/N | Measured(dBuV) | | Limits(dBuV) | | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|
| | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | |
| 0.21 | Neutral | 48.07 | * | 63.37 | 53.37 | -15.30 | (QP) |
| 0.42 | Neutral | 50.32 | 40.82 | 57.46 | 47.46 | -6.64 | (AV) |
| 0.65 | Neutral | 45.34 | 37.44 | 56.00 | 46.00 | -8.56 | (AV) |
| 0.85 | Neutral | 43.79 | * | 56.00 | 46.00 | -12.21 | (QP) |
| 1.07 | Neutral | 46.03 | 32.03 | 56.00 | 46.00 | -9.97 | (QP) |
| 13.57 | Neutral | 57.77 | 57.27 | 60.00 | 50.00 | 7.27 | Note(3) |

Remark

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz；SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz。Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz 。

(2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured 。

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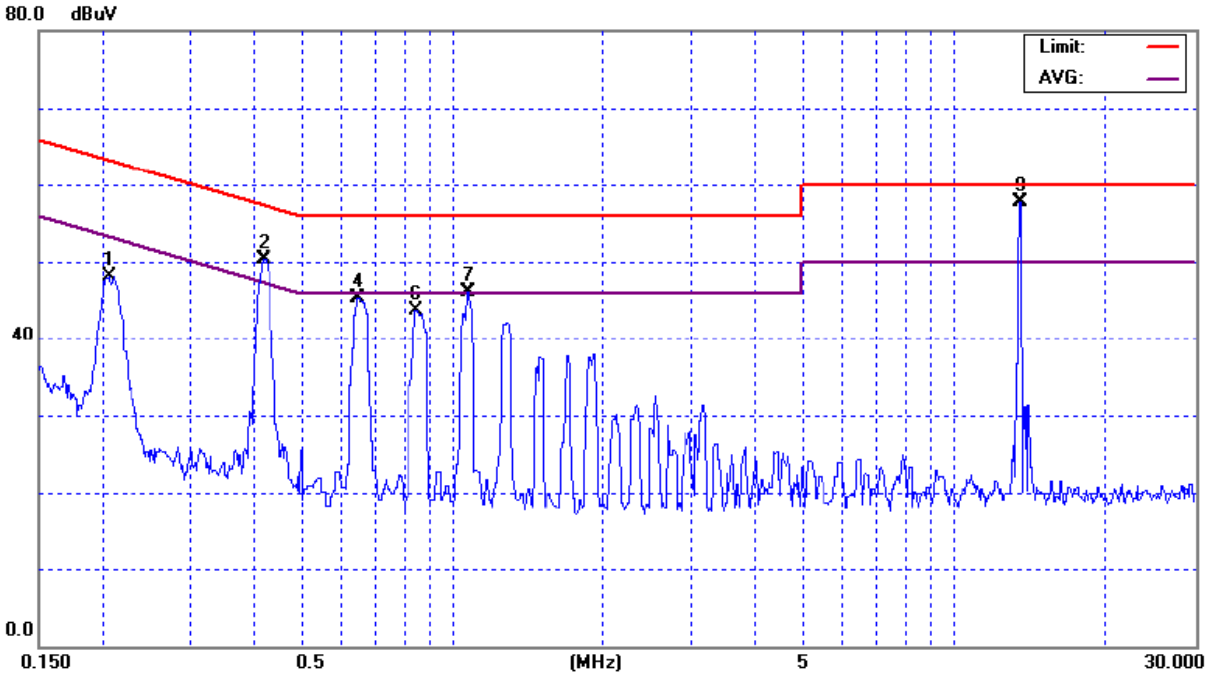

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| Pressure： | 1018 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-with power adapter PA1010-050DUB | | |

| Freq. (MHz) | Terminal L/N | Measured(dBuV) | | Limits(dBuV) | | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|
| | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | |
| 13.56 | Neutral | 22.80 | 22.30 | 60.00 | 50.00 | -27.70 | (AV) |

Remark

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz；SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz。Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz。

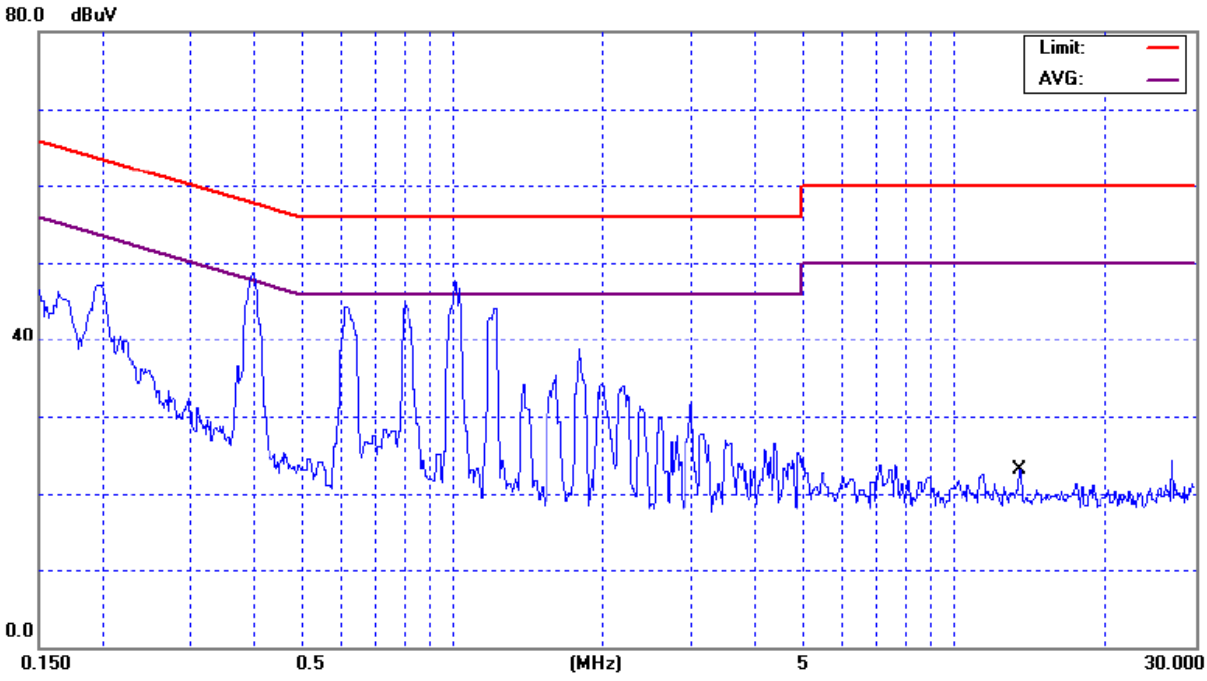
(2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

**(3) FCC May 2005 TCB Conference notes：**

Although C63.4 is designed for Part 15 transmitters that operate above 30 MHz with a detachable antenna, we are willing to accept measurements on a 13.56MHz transmitter done with a dummy load under the following conditions：

1) First, perform the AC line conducted tests with the antenna attached to make sure the device complies with the 15.207 limits outside the transmitter's fundamental emission band.

2) Second, retest with a dummy load to make sure the device complies with the 15.207 limits inside the transmitter's fundamental emission band. Only the fundamental TX emission band needs to be retested.



| | | | |
|---|---|---|---|
| EUT： | Contactless Card Reader | Model No. ： | UIC680-RM0FXDKC-XXX |
| Temperature： | 25 ℃ | Relative Humidity： | 61 % |
| Pressure： | 1018 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-with power adapter DCU050050 | | |

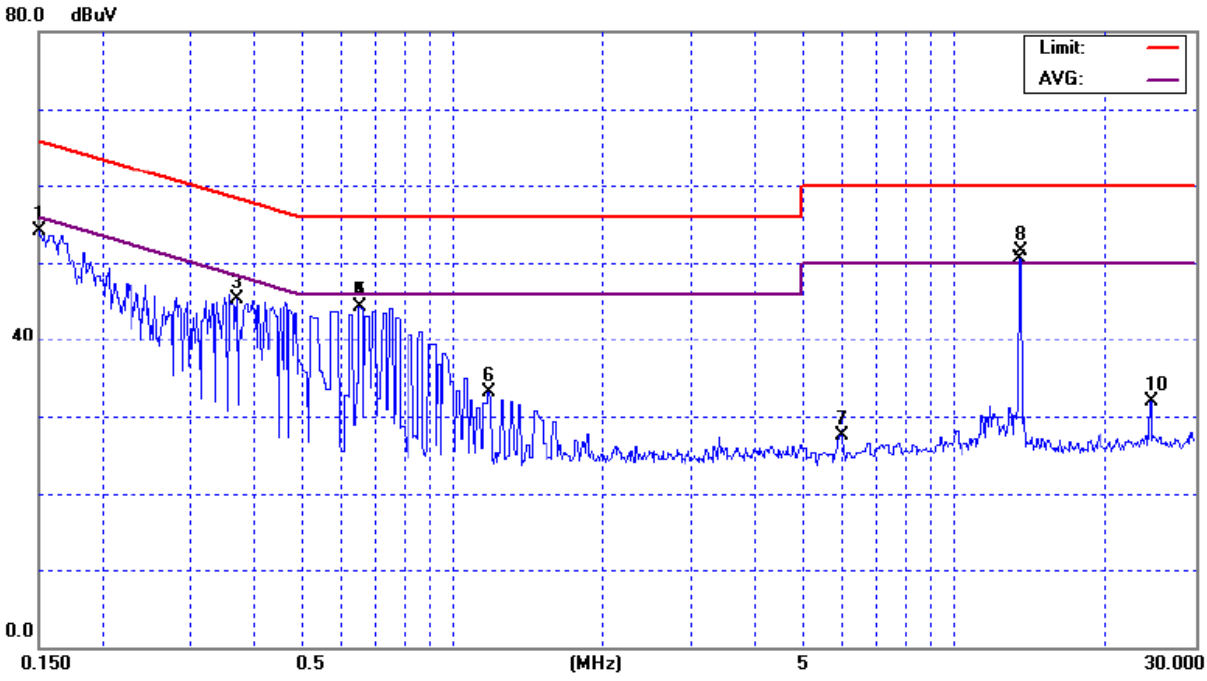
| Freq. (MHz) | Terminal L/N | Measured(dBuV) | | Limits(dBuV) | | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|
| | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | |
| 0.15 | Line | 54.08 | 18.54 | 66.00 | 56.00 | -11.92 | (QP) |
| 0.37 | Line | 45.32 | * | 58.50 | 48.50 | -13.18 | (QP) |
| 0.65 | Line | 44.34 | * | 56.00 | 46.00 | -11.66 | (QP) |
| 1.18 | Line | 33.05 | * | 56.00 | 46.00 | -22.95 | (QP) |
| 5.96 | Line | 27.53 | * | 60.00 | 50.00 | -32.47 | (QP) |
| 13.57 | Line | 51.45 | 50.75 | 60.00 | 50.00 | 0.75 | Note(3) |
| 24.68 | Line | 31.99 | * | 60.00 | 50.00 | -28.01 | (QP) |

Remark

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz；SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz。Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz 。

(2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured 。

**(3) Tx Fundamental, For reference only. Please refer to the next page.**



| EUT： | Contactless Card Reader | Model No. ： | UIC680-RM0FXDKC-XXX |
|---|---|---|---|
| Temperature： | 25 ℃ | Relative Humidity： | 61 % |
| Pressure： | 1018 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-with power adapter DCU050050 | | |

| Freq. (MHz) | Terminal L/N | Measured(dBuV) | | Limits(dBuV) | | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|
| | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | |
| 13.56 | Line | 28.35 | 26.10 | 60.00 | 50.00 | -23.90 | (AV) |

Remark

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz；SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz。Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz。

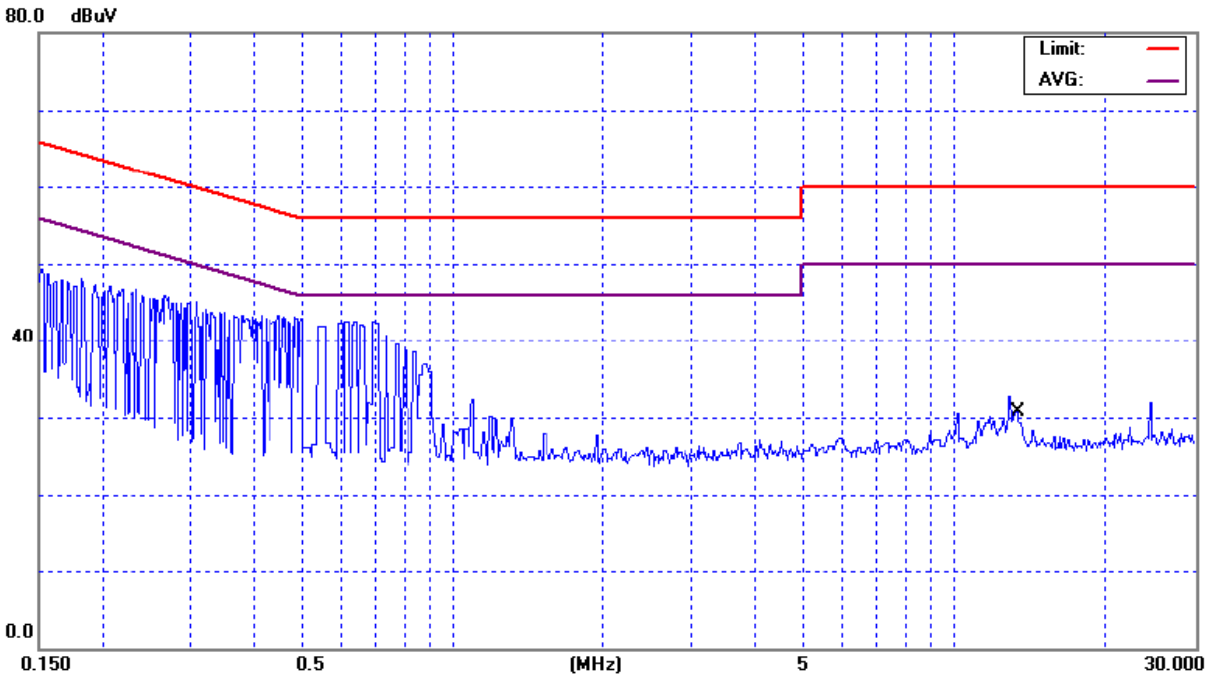
(2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

**(3) FCC May 2005 TCB Conference notes：**

Although C63.4 is designed for Part 15 transmitters that operate above 30 MHz with a detachable antenna, we are willing to accept measurements on a 13.56MHz transmitter done with a dummy load under the following conditions：

1) First, perform the AC line conducted tests with the antenna attached to make sure the device complies with the 15.207 limits outside the transmitter's fundamental emission band.

2) Second, retest with a dummy load to make sure the device complies with the 15.207 limits inside the transmitter's fundamental emission band. Only the fundamental TX emission band needs to be retested.



| | | | |
|---|---|---|---|
| EUT： | Contactless Card Reader | Model No. ： | UIC680-RM0FXDKC-XXX |
| Temperature： | 25 ℃ | Relative Humidity： | 61 % |
| Pressure： | 1018 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-with power adapter DCU050050 | | |

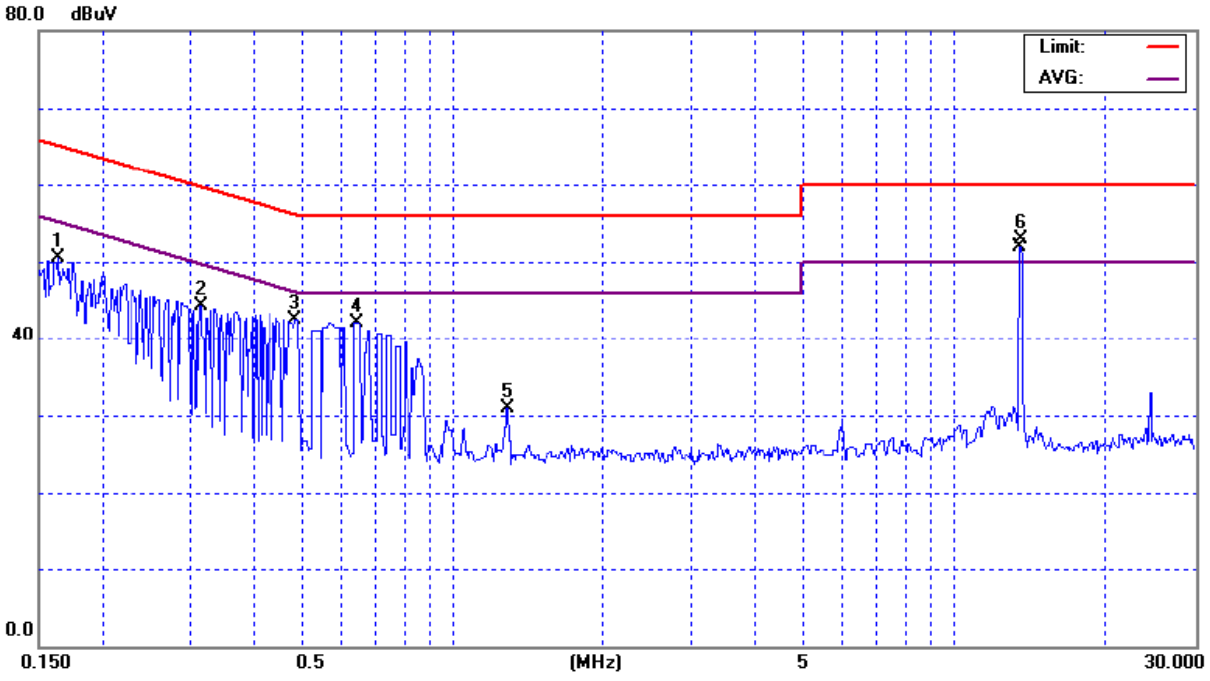
| Freq. (MHz) | Terminal L/N | Measured(dBuV) | | Limits(dBuV) | | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|
| | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | |
| 0.16 | Neutral | 50.48 | * | 65.26 | 55.26 | -14.78 | (QP) |
| 0.31 | Neutral | 44.30 | * | 59.88 | 49.88 | -15.58 | (QP) |
| 0.49 | Neutral | 42.51 | * | 56.25 | 46.25 | -13.74 | (QP) |
| 0.64 | Neutral | 42.14 | * | 56.00 | 46.00 | -13.86 | (QP) |
| 1.28 | Neutral | 30.86 | * | 56.00 | 46.00 | -25.14 | (QP) |
| 13.57 | Neutral | 52.95 | 52.55 | 60.00 | 50.00 | 2.55 | Note(3) |

Remark

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz；SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz。Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz。

(2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

**(3) Tx Fundamental, For reference only. Please refer to the next page.**



| | | | |
|---|---|---|---|
| EUT： | Contactless Card Reader | Model No. ： | UIC680-RM0FXDKC-XXX |
| Temperature： | 25 ℃ | Relative Humidity： | 61 % |
| Pressure： | 1018 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-with power adapter DCU050050 | | |

| Freq. (MHz) | Terminal L/N | Measured(dBuV) | | Limits(dBuV) | | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|
| | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | |
| 13.56 | Neutral | 27.47 | 25.87 | 60.00 | 50.00 | -24.13 | (AV) |

Remark

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz；SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz。Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz。

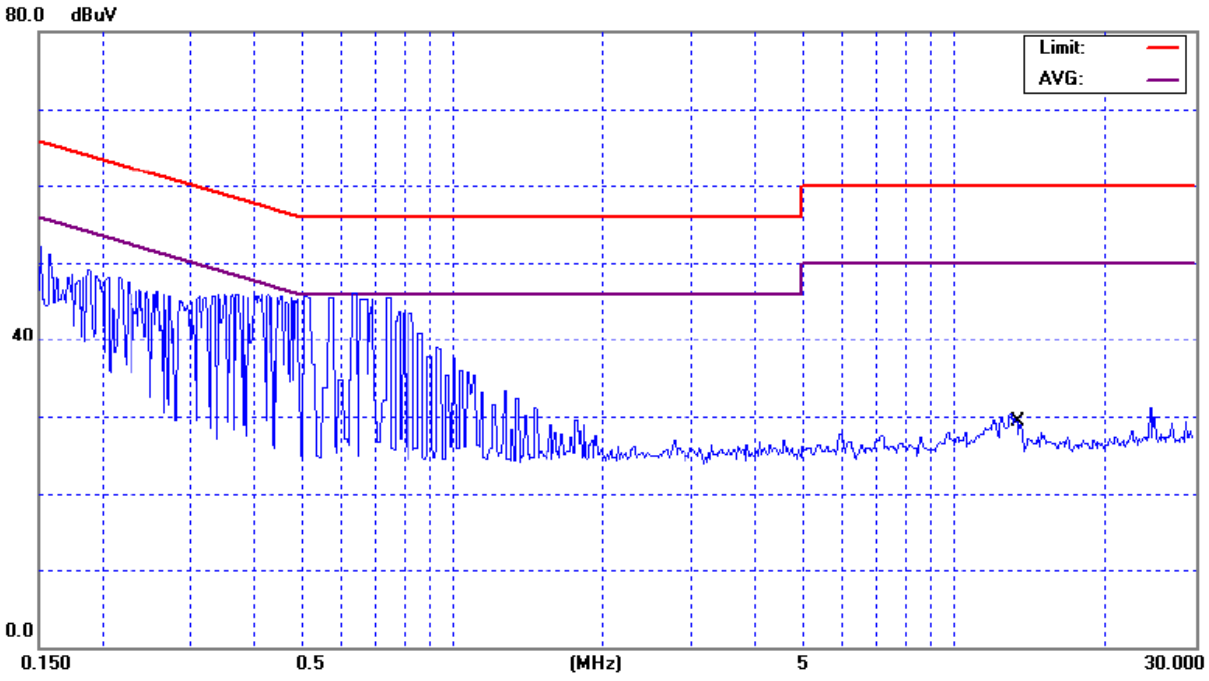
(2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

**(3) FCC May 2005 TCB Conference notes：**

Although C63.4 is designed for Part 15 transmitters that operate above 30 MHz with a detachable antenna, we are willing to accept measurements on a 13.56MHz transmitter done with a dummy load under the following conditions：

1) First, perform the AC line conducted tests with the antenna attached to make sure the device complies with the 15.207 limits outside the transmitter's fundamental emission band.

2) Second, retest with a dummy load to make sure the device complies with the 15.207 limits inside the transmitter's fundamental emission band. Only the fundamental TX emission band needs to be retested.



## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 RADIATED EMISSION LIMITS (Frequency Range 30MHz-1000MHz)

| **FCC Part 15.209** | | | | |
|---|---|---|---|---|
| Frequency (MHz) | Field Strength Limitation | | Field Strength Limitation at 3m Measurement Dist | |
| | (uV/m) | Dist | (uV/m) | (dBuV/m) |
| 0.009 – 0.490 | 2400 / F(KHz) | 300m | 10000 * 2400/F(KHz) | 20log 2400/F(KHz) + 80 |
| 0.490 – 1.705 | 24000 / F(KHz) | 30m | 100 * 24000/F(KHz) | 20log 24000/F(KHz) + 40 |
| 1.705 – 30.00 | 30 | 30m | 100* 30 | 20log 30 + 40 |
| 30.0 – 88.0 | 100 | 3m | 100 | 20log 100 |
| 88.0 – 216.0 | 150 | 3m | 150 | 20log 150 |
| 216.0 – 960.0 | 200 | 3m | 200 | 20log 200 |
| Above 960.0 | 500 | 3m | 500 | 20log 500 |
| **FCC Part 15.225(a)/(b)/(c)** | | | | |
| Frequency (MHz) | Field Strength Limitation | | Field Strength Limitation at 3m Measurement Dist | |
| | (uV/m) | Dist | (uV/m) | (dBuV/m) |
| 13.553 – 13.567 | 15,848 | 30 m | 15,848*100 | 124 |
| 13.567 – 13.710 | 334 | 30 m | 334*100 | 90.5 |
| 13.110 – 13.410<br>13.710 – 14.010 | 106 | 30 m | 106*100 | 80.5 |

Notes:

(1) The tighter limit shall apply at the boundary between two frequency range.

(2) Limitation expressed in dBuV/m is calculated by 20log Emission Level (uV/m).

(3) If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula of $L_{d1} = L_{d2} * (d_2/d_1)^2$.
Example:
F.S Limit at 30m distance is 30uV/m , then F.S Limitation at 3m distance is adjusted as $L_{d1} = L_1 = 30uV/m * (10)^2 = 100 * 30$ uV/m

4.2.2 MEASUREMENT INSTRUMENTS LIST

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | Log-Bicon Antenna | Schwarzbeck | VULB 9160 | 3177 | Feb. 06, 2007 |
| 2 | Test Cable | N/A | 10M_OS01 | N/A | Nov. 29, 2006 |
| 3 | Test Cable | N/A | OS01-1/-2 | N/A | Nov. 29, 2006 |
| 4 | Pre-Amplifier | Anritsu | MH648A | M09961 | Nov. 29, 2006 |
| 5 | Spectrum Analyzer | ADVAN TEST | R3132 | 81700025 | Feb. 21, 2007 |
| 6 | Test Receiver | PMM | PMM 9000 | 4310J01002 | Feb. 23, 2007 |
| 7 | Antenna Mast | Chance Most | CMTB-1.5 | N/A | N/A |
| 8 | Turn Table | Chance Most | CMTB-1.5 | N/A | N/A |
| 9 | Loop Ant | EMCO | 6502 | 00042960 | Jan. 13, 2008 |

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

4.2.3 TEST PROCEDURE

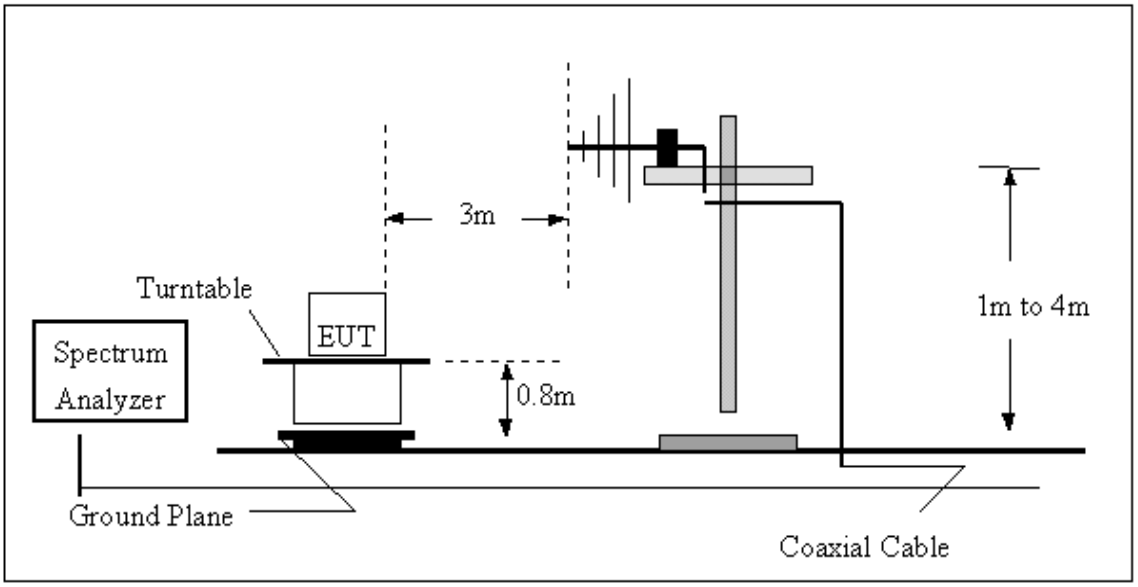
a. The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m or 10 meter open area test site. The table was 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.

4.2.4 DEVIATION FROM TEST STANDARD

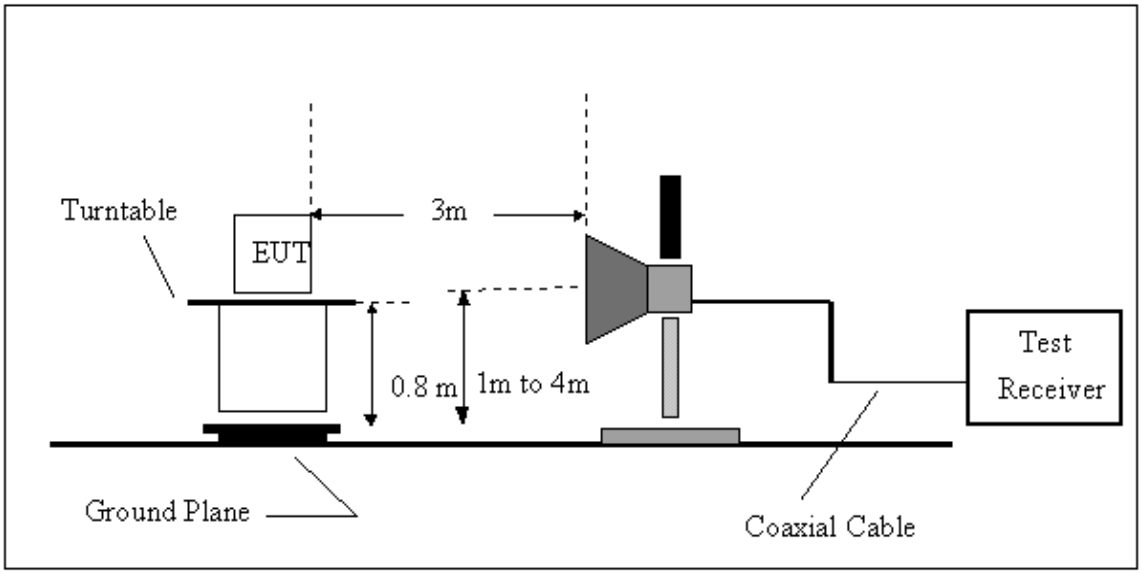
No deviation

4.2.5 TEST SETUP

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz




(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



4.2.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **4.1.6** Unless otherwise a special operating condition is specified in the follows during the testing.

4.2.7 TEST RESULTS **FCC Part 15.209**

| EUT： | Contactless Card Reader | Model No. ： | UIC680-UM0FXUKN-XXX |
|---|---|---|---|
| Temperature： | 30.5 ℃ | Relative Humidity： | 71 % |
| Pressure： | 1011 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-without power adapter | | |

| Freq. (MHz) | Ant.Pol. H/V | DetectorMode (PK/AV) | Reading (dBuV) | Ant./CL/ Amp. CF(dB) | Actual FS (dBuV/m) | Limit-3m (dBuV/m) | Safe Margins (dBuV/m) | Note |
|---|---|---|---|---|---|---|---|---|
| 135.60 | V | Peak | 40.33 | - 4.71 | 35.62 | 43.50 | - 7.88 | |
| 162.72 | V | Peak | 40.24 | - 3.82 | 36.42 | 43.50 | - 7.08 | |
| 176.28 | V | Peak | 43.10 | - 4.83 | 38.27 | 43.50 | - 5.23 | |
| 186.15 | V | Peak | 42.20 | - 5.78 | 36.42 | 43.50 | - 7.08 | |
| 203.41 | V | Peak | 45.14 | - 6.87 | 38.27 | 43.50 | - 5.23 | |
| 216.01 | V | Peak | 43.60 | - 6.39 | 37.21 | 46.00 | - 8.79 | |
| 225.81 | V | Peak | 47.32 | - 6.02 | 41.30 | 46.00 | - 4.70 | |

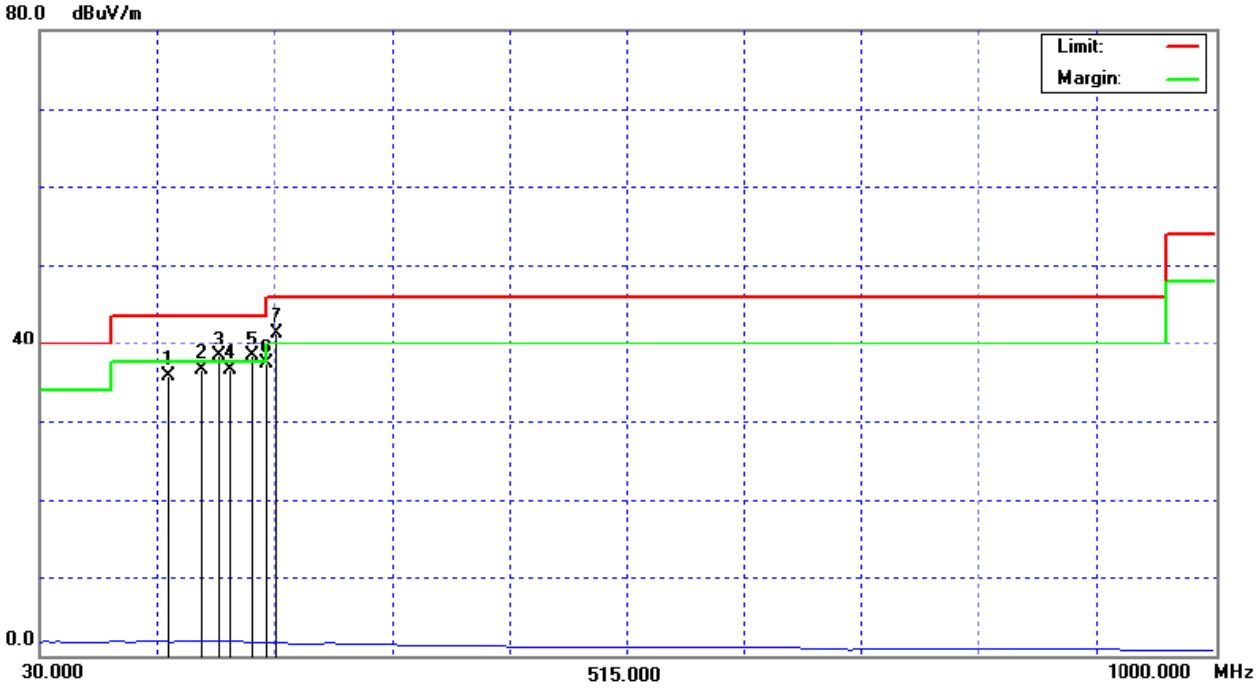
Remark：

(1) Spectrum Setting:
9 KHz – 150 KHz, RBW= 1 KHz, VBW=1 KHz, Sweep time = 200 ms.
150 K Hz – 30 MHz, RBW= 9 KHz, VBW=9 KHz, Sweep time = 200 ms.
30 MHz – 1000 MHz, RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms.

(2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measure-ment didn't perform。

(3) The Log-Bicon Antenna will use to test frequency range from 30MHz to 1000MHz and the Loop Antenna will use to test frequency below 30MHz.

(4) If the peak scan value lower limit more than 20dB, then this signal data does not how in table。



| EUT： | Contactless Card Reader | Model No. ： | UIC680-UM0FXUKN-XXX |
|---|---|---|---|
| Temperature： | 30.5 ℃ | Relative Humidity： | 71 % |
| Pressure： | 1011 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-without power adapter | | |

| Freq. (MHz) | Ant.Pol. H/V | DetectorMode (PK/AV) | Reading (dBuV) | Ant./CL/ Amp. CF(dB) | Actual FS (dBuV/m) | Limit-3m (dBuV/m) | Safe Margins (dBuV/m) | Note |
|---|---|---|---|---|---|---|---|---|
| 135.61 | H | Peak | 41.20 | - 4.71 | 36.49 | 43.50 | - 7.01 | |
| 162.72 | H | Peak | 41.88 | - 3.82 | 38.06 | 43.50 | - 5.44 | |
| 176.27 | H | Peak | 42.40 | - 4.83 | 37.57 | 43.50 | - 5.93 | |
| 186.16 | H | Peak | 40.09 | - 5.78 | 34.31 | 43.50 | - 9.19 | |
| 203.41 | H | Peak | 42.50 | - 6.87 | 35.63 | 43.50 | - 7.87 | |
| 204.41 | H | Peak | 41.13 | - 6.39 | 34.74 | 43.50 | - 8.76 | |
| 205.41 | H | Peak | 41.90 | - 6.02 | 35.88 | 43.50 | - 7.62 | |

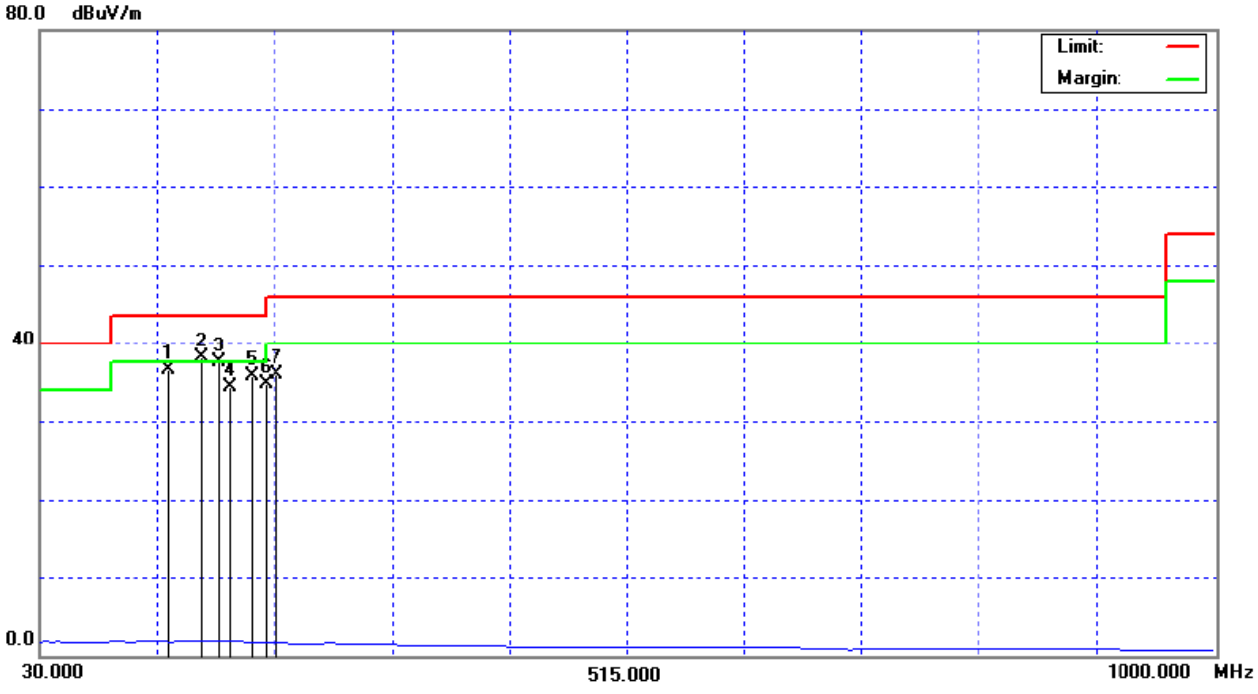
Remark：

(1) Spectrum Setting:
9 KHz – 150 KHz, RBW= 1 KHz, VBW=1 KHz, Sweep time = 200 ms.
150 K Hz – 30 MHz, RBW= 9 KHz, VBW=9 KHz, Sweep time = 200 ms.
30 MHz – 1000 MHz, RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms.

(2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measure-ment didn‘t perform。

(3) The Log-Bicon Antenna will use to test frequency range from 30MHz to 1000MHz and the Loop Antenna will use to test frequency below 30MHz.

(4) If the peak scan value lower limit more than 20dB, then this signal data does not how in table。



| EUT： | Contactless Card Reader | Model No. ： | UIC680-RM0FXDKC-XXX |
|---|---|---|---|
| Temperature： | 30.5 ℃ | Relative Humidity： | 71 % |
| Pressure： | 1011 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-with power adapter PA1010-050DUB | | |

| Freq. (MHz) | Ant.Pol. H/V | DetectorMode (PK/AV) | Reading (dBuV) | Ant./CL/ Amp. CF(dB) | Actual FS (dBuV/m) | Limit-3m (dBuV/m) | Safe Margins (dBuV/m) | Note |
|---|---|---|---|---|---|---|---|---|
| 135.23 | V | Peak | 43.86 | - 4.73 | 39.13 | 43.50 | - 4.37 | QP |
| 162.45 | V | Peak | 44.84 | - 3.81 | 41.03 | 43.50 | - 2.47 | QP |
| 176.26 | V | Peak | 45.73 | - 4.83 | 40.90 | 43.50 | - 2.60 | QP |
| 186.63 | V | Peak | 41.87 | - 5.82 | 36.05 | 43.50 | - 7.45 | |
| 203.25 | V | Peak | 45.34 | - 6.88 | 38.46 | 43.50 | - 5.04 | QP |
| 216.00 | V | Peak | 42.71 | - 6.39 | 36.32 | 46.00 | - 9.68 | |

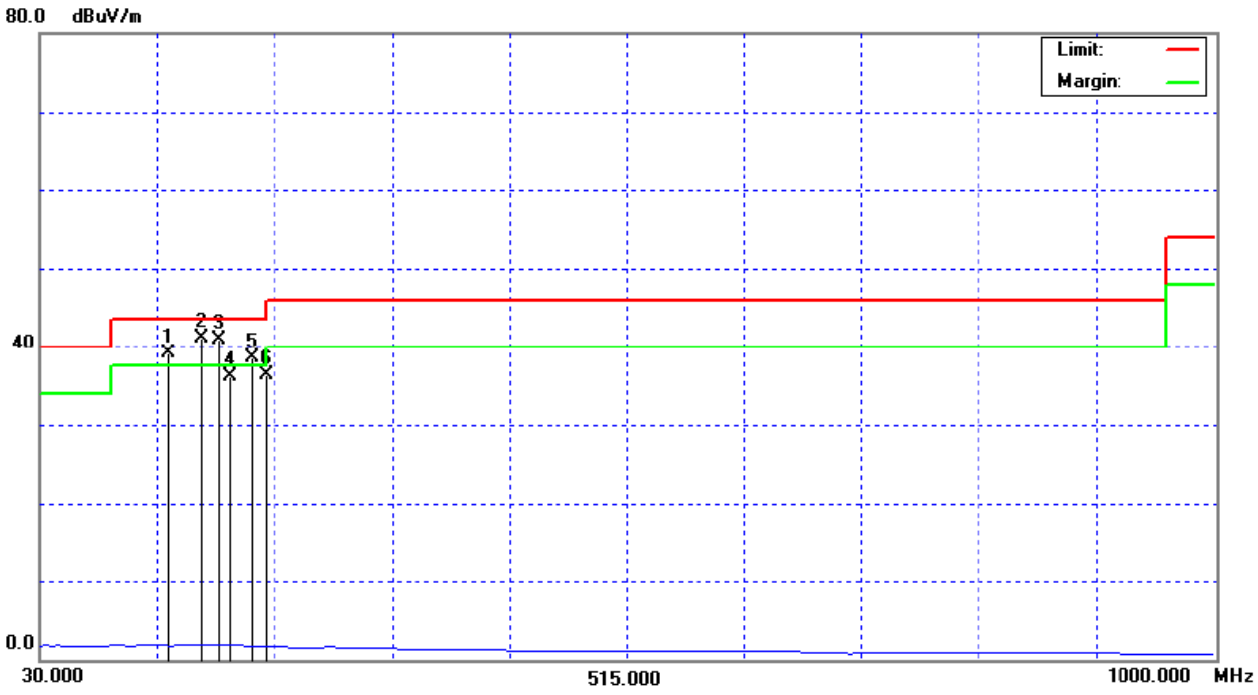
Remark：

(1) Spectrum Setting:
9 KHz – 150 KHz, RBW= 1 KHz, VBW=1 KHz, Sweep time = 200 ms.
150 K Hz – 30 MHz, RBW= 9 KHz, VBW=9 KHz, Sweep time = 200 ms.
30 MHz – 1000 MHz, RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms.

(2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measure-ment didn‘t perform ◦

(3) The Log-Bicon Antenna will use to test frequency range from 30MHz to 1000MHz and the Loop Antenna will use to test frequency below 30MHz.

(4) If the peak scan value lower limit more than 20dB, then this signal data does not how in table ◦



| EUT： | Contactless Card Reader | Model No. ： | UIC680-RM0FXDKC-XXX |
|---|---|---|---|
| Temperature： | 30.5 ℃ | Relative Humidity： | 71 % |
| Pressure： | 1011 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-with power adapter PA1010-050DUB | | |

| Freq. (MHz) | Ant.Pol. H/V | DetectorMode (PK/AV) | Reading (dBuV) | Ant./CL/ Amp. CF(dB) | Actual FS (dBuV/m) | Limit-3m (dBuV/m) | Safe Margins (dBuV/m) | Note |
|---|---|---|---|---|---|---|---|---|
| 135.52 | H | Peak | 42.67 | - 4.72 | 37.95 | 43.50 | - 5.55 | |
| 162.74 | H | Peak | 43.73 | - 3.83 | 39.90 | 43.50 | - 3.60 | QP |
| 176.35 | H | Peak | 45.24 | - 4.84 | 40.40 | 43.50 | - 3.10 | QP |
| 186.38 | H | Peak | 43.13 | - 5.80 | 37.33 | 43.50 | - 6.17 | |
| 203.72 | H | Peak | 45.84 | - 6.86 | 38.98 | 43.50 | - 4.52 | QP |
| 216.04 | H | Peak | 40.55 | - 6.39 | 34.16 | 46.00 | - 11.84 | |
| 225.87 | H | Peak | 42.39 | - 6.01 | 36.38 | 46.00 | - 9.62 | |

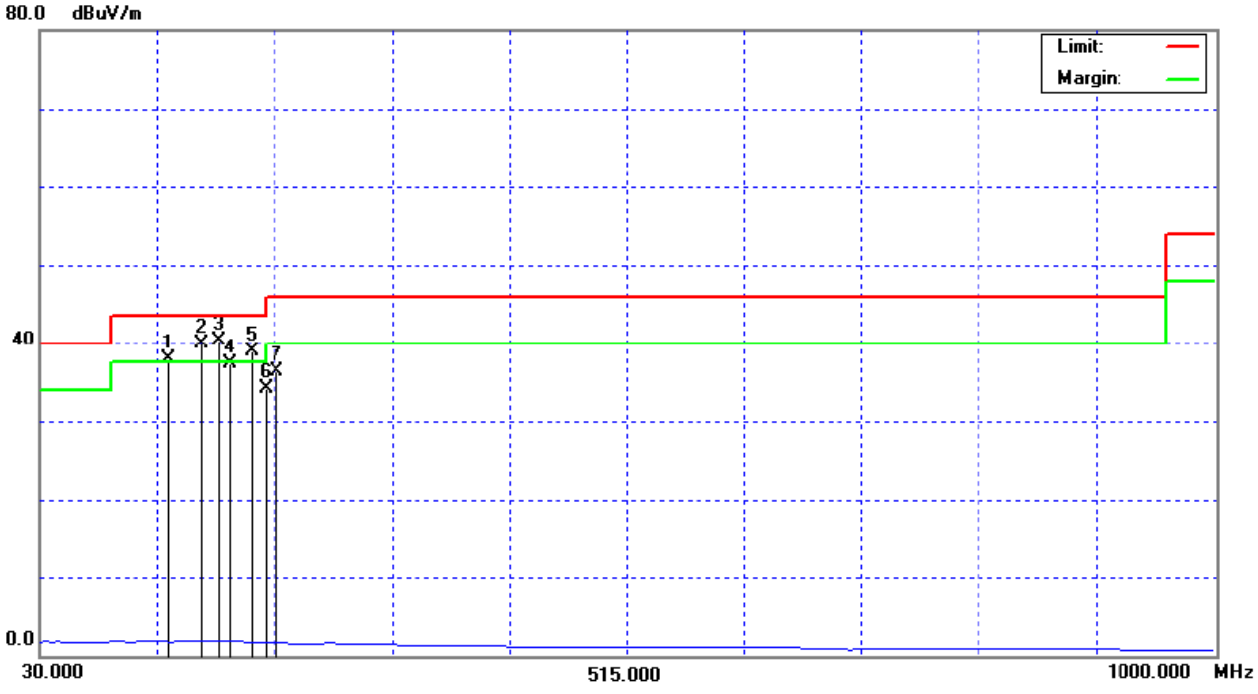
Remark：

(1) Spectrum Setting:
9 KHz – 150 KHz, RBW= 1 KHz, VBW=1 KHz, Sweep time = 200 ms.
150 K Hz – 30 MHz, RBW= 9 KHz, VBW=9 KHz, Sweep time = 200 ms.
30 MHz – 1000 MHz, RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms.

(2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measure-ment didn‘t perform。

(3) The Log-Bicon Antenna will use to test frequency range from 30MHz to 1000MHz and the Loop Antenna will use to test frequency below 30MHz.

(4) If the peak scan value lower limit more than 20dB, then this signal data does not how in table。



| EUT： | Contactless Card Reader | Model No. ： | UIC680-RM0FXDKC-XXX |
|---|---|---|---|
| Temperature： | 30.5 ℃ | Relative Humidity： | 71 % |
| Pressure： | 1011 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-with power adapter DCU050050 | | |

| Freq. (MHz) | Ant.Pol. H/V | DetectorMode (PK/AV) | Reading (dBuV) | Ant./CL/ Amp. CF(dB) | Actual FS (dBuV/m) | Limit-3m (dBuV/m) | Safe Margins (dBuV/m) | Note |
|---|---|---|---|---|---|---|---|---|
| 135.63 | V | Peak | 44.26 | - 4.71 | 39.55 | 43.50 | - 3.95 | QP |
| 162.73 | V | Peak | 45.22 | - 3.82 | 41.40 | 43.50 | - 2.10 | QP |
| 176.24 | V | Peak | 46.53 | - 4.82 | 41.71 | 43.50 | - 1.79 | QP |
| 186.13 | V | Peak | 42.41 | - 5.78 | 36.63 | 43.50 | - 6.87 | |
| 203.55 | V | Peak | 46.00 | - 6.87 | 39.13 | 43.50 | - 4.37 | QP |
| 216.00 | V | Peak | 42.29 | - 6.39 | 35.90 | 46.00 | - 10.10 | |

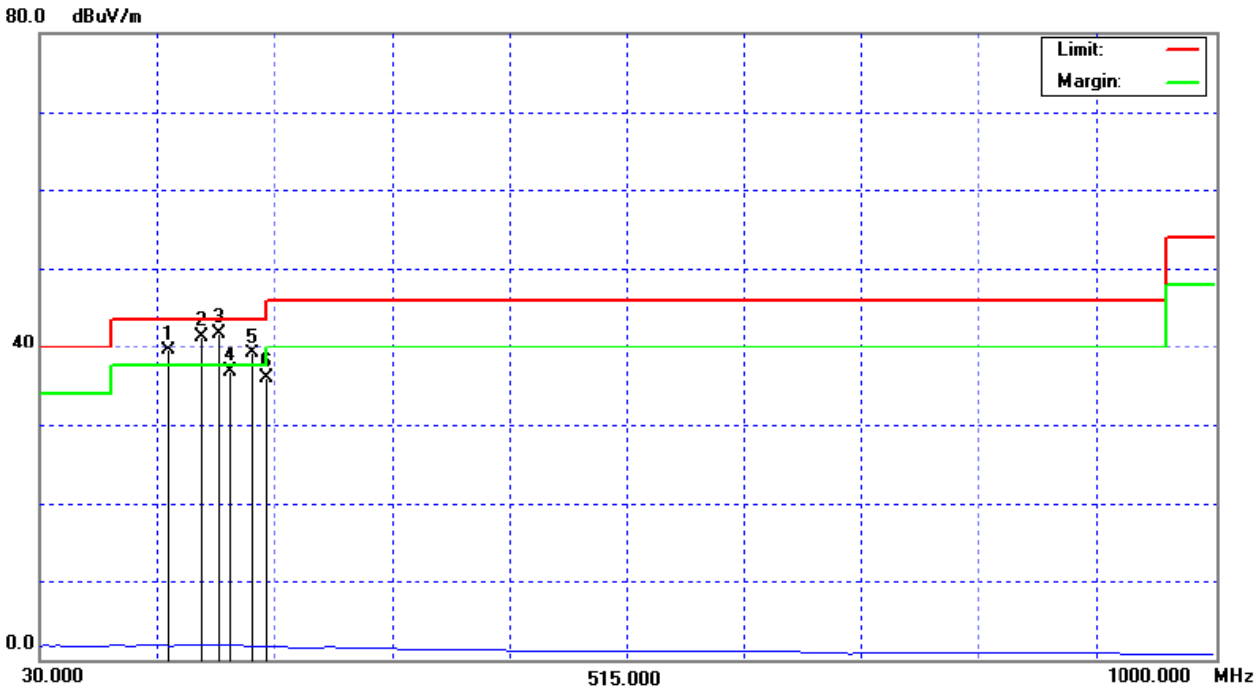
Remark：

(1) Spectrum Setting:
9 KHz – 150 KHz, RBW= 1 KHz, VBW=1 KHz, Sweep time = 200 ms.
150 K Hz – 30 MHz, RBW= 9 KHz, VBW=9 KHz, Sweep time = 200 ms.
30 MHz – 1000 MHz, RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms.

(2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measure-ment didn't perform。

(3) The Log-Bicon Antenna will use to test frequency range from 30MHz to 1000MHz and the Loop Antenna will use to test frequency below 30MHz.

(4) If the peak scan value lower limit more than 20dB, then this signal data does not how in table。



| EUT： | Contactless Card Reader | Model No. ： | UIC680-RM0FXDKC-XXX |
|---|---|---|---|
| Temperature： | 30.5 ℃ | Relative Humidity： | 71 % |
| Pressure： | 1011 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-with power adapter DCU050050 | | |

| Freq. (MHz) | Ant.Pol. H/V | DetectorMode (PK/AV) | Reading (dBuV) | Ant./CL/ Amp. CF(dB) | Actual FS (dBuV/m) | Limit-3m (dBuV/m) | Safe Margins (dBuV/m) | Note |
|---|---|---|---|---|---|---|---|---|
| 135.64 | H | Peak | 42.54 | - 4.71 | 37.83 | 43.50 | - 5.67 | QP |
| 162.73 | H | Peak | 44.25 | - 3.82 | 40.43 | 43.50 | - 3.07 | QP |
| 176.32 | H | Peak | 45.78 | - 4.83 | 40.95 | 43.50 | - 2.55 | |
| 186.22 | H | Peak | 43.51 | - 5.79 | 37.72 | 43.50 | - 5.78 | QP |
| 203.42 | H | Peak | 35.85 | - 6.87 | 28.98 | 43.50 | - 14.52 | |
| 216.01 | H | Peak | 38.63 | - 6.39 | 32.24 | 46.00 | - 13.76 | |

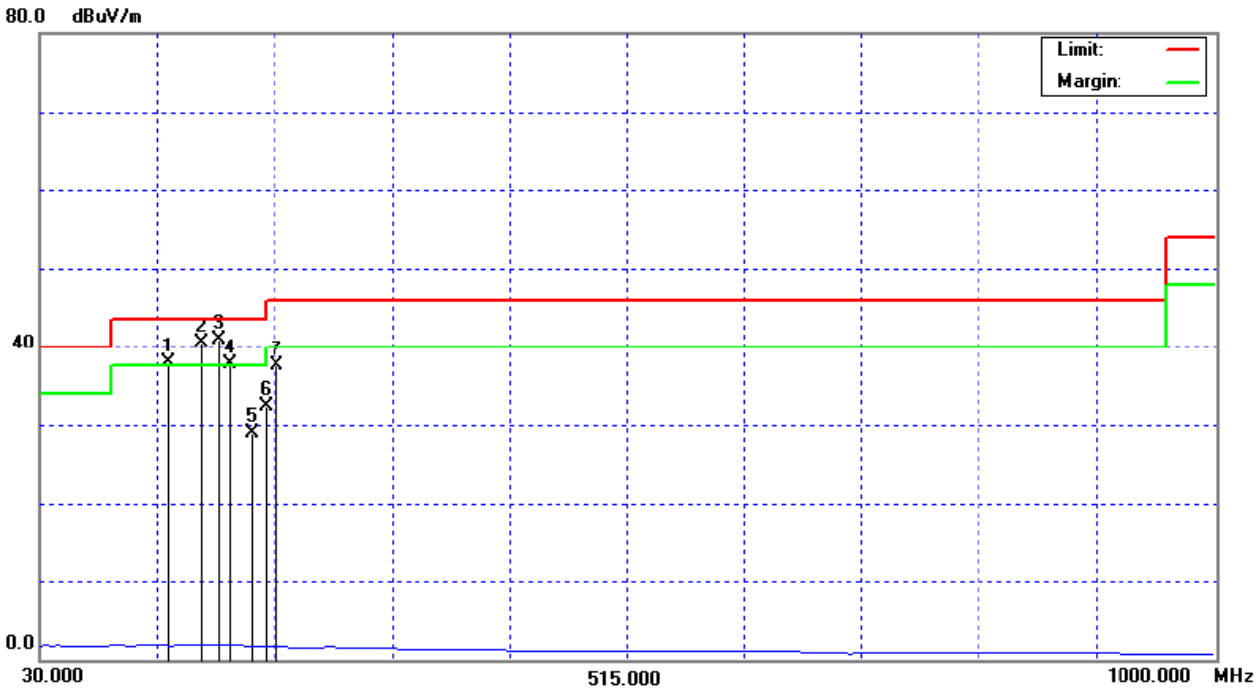
Remark：

(1) Spectrum Setting:
9 KHz – 150 KHz, RBW= 1 KHz, VBW=1 KHz, Sweep time = 200 ms.
150 K Hz – 30 MHz, RBW= 9 KHz, VBW=9 KHz, Sweep time = 200 ms.
30 MHz – 1000 MHz, RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms.

(2) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measure-ment didn't perform。

(3) The Log-Bicon Antenna will use to test frequency range from 30MHz to 1000MHz and the Loop Antenna will use to test frequency below 30MHz.

(4) If the peak scan value lower limit more than 20dB, then this signal data does not how in table。



4.2.8 TEST RESULTS **FCC Part 15.225**

| | | | |
|---|---|---|---|
| EUT： | Contactless Card Reader | Model No. ： | UIC680-UM0FXUKN-XXX |
| Temperature： | 20.2 ℃ | Relative Humidity： | 74 % |
| Pressure： | 1017 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-without power adapter | | |

| Freq. (MHz) | DetectorMode (PK/AV) | Reading (dBuV) | Ant./CL/ Amp. CF(dB) | Actual FS (dBuV/m) | Limit-3m (dBuV/m) | Safe Margins (dBuV/m) | Note |
|---|---|---|---|---|---|---|---|
| 13.56 | Peak | 60.10 | 10.62 | 70.72 | 124.00 | - 53.28 | QP |
| 27.22 | Peak | 19.50 | 8.75 | 28.25 | 69.00 | - 40.75 | QP |

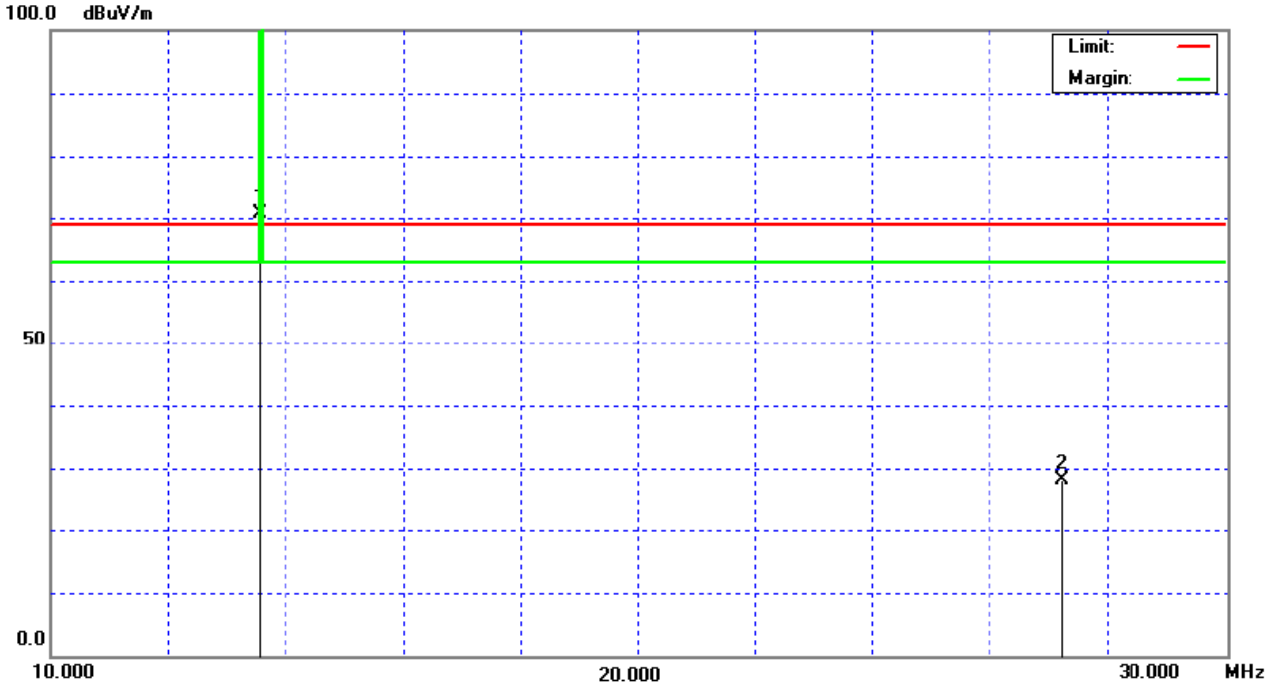
Remark：

(1) Spectrum Setting:
9 KHz – 150 KHz, RBW= 1 KHz, VBW=1 KHz, Sweep time = 200 ms.
150 K Hz – 30 MHz, RBW= 9 KHz, VBW=9 KHz, Sweep time = 200 ms.
30 MHz – 1000 MHz, RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms.

(2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measure-ment didn't perform。

(3) The Log-Bicon Antenna will use to test frequency range from 30MHz to 1000MHz and the Loop Antenna will use to test frequency below 30MHz.

(4) If the peak scan value lower limit more than 20dB, then this signal data does not how in table。



| EUT： | Contactless Card Reader | Model No. ： | UIC680-RM0FXDKC-XXX |
|---|---|---|---|
| Temperature： | 20.2 ℃ | Relative Humidity： | 74 % |
| Pressure： | 1017 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-with power adapter PA1010-050DUB | | |

| Freq. (MHz) | DetectorMode (PK/AV) | Reading (dBuV) | Ant./CL/ Amp. CF(dB) | Actual FS (dBuV/m) | Limit-3m (dBuV/m) | Safe Margins (dBuV/m) | Note |
|---|---|---|---|---|---|---|---|
| 13.56 | Peak | 58.30 | 10.62 | 68.92 | 124.00 | - 55.08 | QP |
| 27.22 | Peak | 18.94 | 8.75 | 27.69 | 69.00 | - 41.31 | QP |

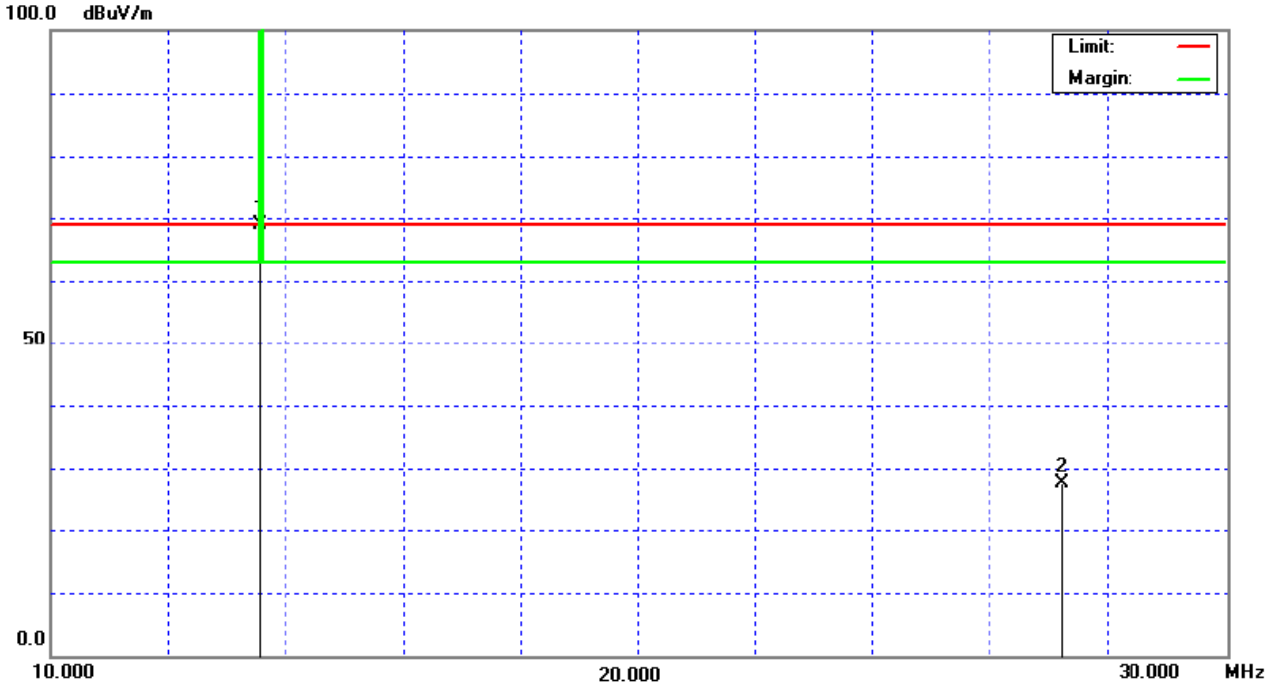
Remark：

(1) Spectrum Setting:
9 KHz – 150 KHz, RBW= 1 KHz, VBW=1 KHz, Sweep time = 200 ms.
150 K Hz – 30 MHz, RBW= 9 KHz, VBW=9 KHz, Sweep time = 200 ms.
30 MHz – 1000 MHz, RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms.

(2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measure-ment didn't perform。

(3) The Log-Bicon Antenna will use to test frequency range from 30MHz to 1000MHz and the Loop Antenna will use to test frequency below 30MHz.

(4) If the peak scan value lower limit more than 20dB, then this signal data does not how in table。



| EUT： | Contactless Card Reader | Model No. ： | UIC680-RM0FXDKC-XXX |
|---|---|---|---|
| Temperature： | 20.2 ℃ | Relative Humidity： | 74 % |
| Pressure： | 1017 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-with power adapter DCU050050 | | |

| Freq. (MHz) | DetectorMode (PK/AV) | Reading (dBuV) | Ant./CL/ Amp. CF(dB) | Actual FS (dBuV/m) | Limit-3m (dBuV/m) | Safe Margins (dBuV/m) | Note |
|---|---|---|---|---|---|---|---|
| 13.56 | Peak | 59.02 | 10.62 | 69.64 | 124.00 | - 54.36 | QP |
| 27.22 | Peak | 19.00 | 8.75 | 27.75 | 69.00 | - 41.25 | QP |

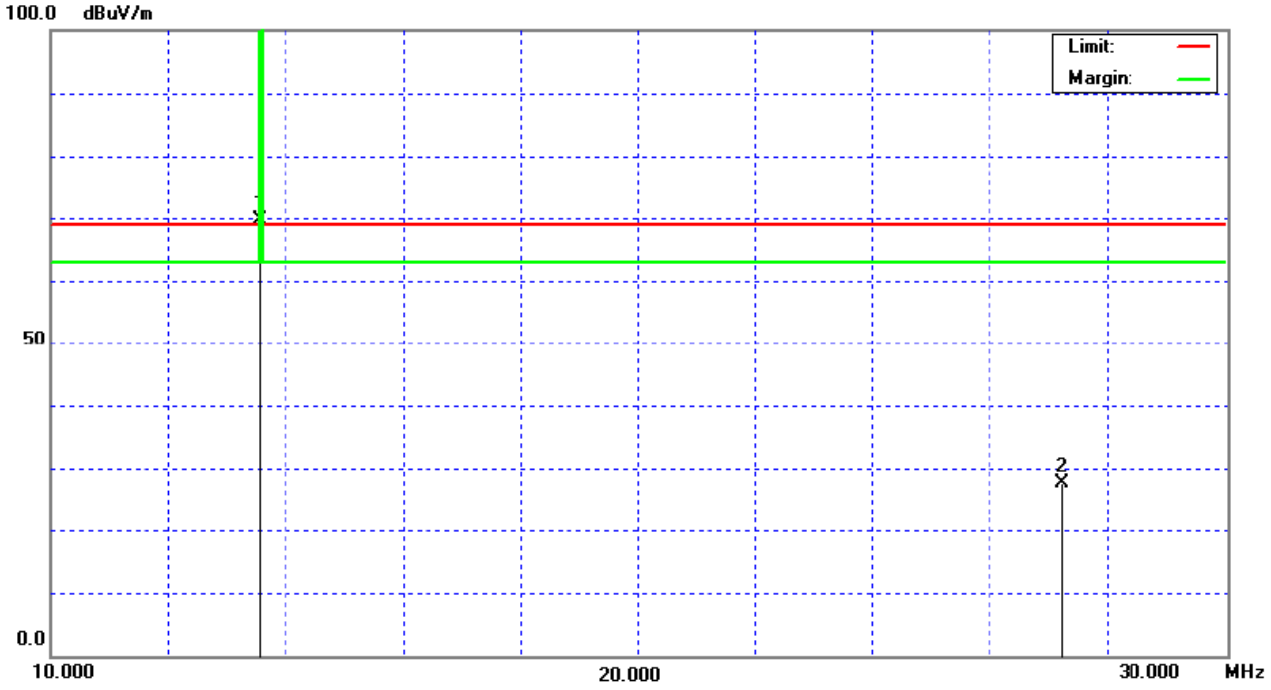
Remark：

(1) Spectrum Setting:
9 KHz – 150 KHz, RBW= 1 KHz, VBW=1 KHz, Sweep time = 200 ms.
150 K Hz – 30 MHz, RBW= 9 KHz, VBW=9 KHz, Sweep time = 200 ms.
30 MHz – 1000 MHz, RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms.

(2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measure-ment didn't perform。

(3) The Log-Bicon Antenna will use to test frequency range from 30MHz to 1000MHz and the Loop Antenna will use to test frequency below 30MHz.

(4) If the peak scan value lower limit more than 20dB, then this signal data does not how in table。



## 4.3 FREQUENCY STABILITY MEASUREMENT

### 4.3.1 FREQUENCY STABILITY LIMITS

| FCC Part 15.225(e) |
|---|
| the frequency tolerance of the carrier signal shall be maintained within +/-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. |

### 4.3.2 MEASUREMENT INSTRUMENTS LIST

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | EMI Test Receiver | R&S | ESCI | 100082 | Feb. 01, 2007 |
| 2 | Loop Ant | EMCO | 6502 | 00042960 | Jan. 13, 2008 |
| 3 | AC Power Source | APE | APW-130 | 883755 | N/A |
| 4 | Temperature & Humitidy Chamber | GIANT FORCE | GTH-056P | GF-94454-1 | Jul. 14, 2007 |

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

### 4.3.3 TEST PROCEDURE

a. The equipment under test was connected to an external AC power supply and the RF output was connected to a frequency counter via feed through attenuators. The EUT was placed inside the temperature chamber.
After the temperature stabilized for approximately 20 minutes, the frequency of the output signal was recorded from the counter.
b. At room temperature (25±5°C), an external variable DC power supply was connected to the EUT. The frequency of the transmitter was measured for 115%, 100% and 85% of the nominal operating input voltage.
c. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.3.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **4.1.6** Unless otherwise a special operating condition is specified in the follows during the testing.

4.3.6 **TEST RESULTS**

| | | | |
|---|---|---|---|
| EUT： | Contactless Card Reader | Model No. ： | UIC680-UM0FXUKN-XXX |
| Temperature： | 26 ℃ | Relative Humidity： | 60 % |
| Pressure： | 1017 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-without power adapter | | |

| Frequency Stability Versus Environmental Temperature | | | | | | |
|---|---|---|---|---|---|---|
| | **Temperature (℃)** | **Voltage (Vac)** | **Frequency (MHz)** | **Freq Error (KHz)** | **Limit (KHz)** | **Results** |
| | 20 | 120V | 13.56049 | | | |
| **0 min** | 50 | 120V | 13.56049 | 0.000 | +/- 1.356 | **PASS** |
| | -20 | 120V | 13.56048 | -0.010 | +/- 1.356 | **PASS** |
| **2 min** | 50 | 120V | 13.56048 | -0.010 | +/- 1.356 | **PASS** |
| | -20 | 120V | 13.56049 | 0.000 | +/- 1.356 | **PASS** |
| **5 min** | 50 | 120V | 13.56049 | 0.000 | +/- 1.356 | **PASS** |
| | -20 | 120V | 13.56047 | -0.020 | +/- 1.356 | **PASS** |
| **10 min** | 50 | 120V | 13.56048 | -0.010 | +/- 1.356 | **PASS** |
| | -20 | 120V | 13.56047 | -0.020 | +/- 1.356 | **PASS** |

| Frequency Stability Versus Input Voltage | | | | | | |
|---|---|---|---|---|---|---|
| **Temperature(℃)** | **Voltage (Vac)** | | **Frequency (MHz)** | **Freq Error (KHz)** | **Limit (KHz)** | **Results** |
| 20 | V-nom | 120 | 13.56048 | | | |
| 20 | V-min | 102 | 13.56049 | 0.01 | +/- 1.356 | **PASS** |
| 20 | V-max | 138 | 13.56048 | 0 | +/- 1.356 | **PASS** |

| | | | |
|---|---|---|---|
| EUT： | Contactless Card Reader | Model No. ： | UIC680-RM0FXDKC-XXX |
| Temperature： | 26 ℃ | Relative Humidity： | 60 % |
| Pressure： | 1017 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-with power adapter PA1010-050DUB | | |

**Frequency Stability Versus Environmental Temperature**

| | Temperature (℃) | Voltage (Vac) | Frequency (MHz) | Freq Error (KHz) | Limit (KHz) | Results |
|---|---|---|---|---|---|---|
| | 20 | 120V | 13.56048 | | | |
| **0 min** | 50 | 120V | 13.56048 | 0.000 | +/- 1.356 | **PASS** |
| | -20 | 120V | 13.56047 | -0.010 | +/- 1.356 | **PASS** |
| **2 min** | 50 | 120V | 13.56049 | 0.010 | +/- 1.356 | **PASS** |
| | -20 | 120V | 13.56048 | 0.000 | +/- 1.356 | **PASS** |
| **5 min** | 50 | 120V | 13.56048 | 0.000 | +/- 1.356 | **PASS** |
| | -20 | 120V | 13.56049 | 0.010 | +/- 1.356 | **PASS** |
| **10 min** | 50 | 120V | 13.56049 | 0.010 | +/- 1.356 | **PASS** |
| | -20 | 120V | 13.56048 | 0.000 | +/- 1.356 | **PASS** |

**Frequency Stability Versus Input Voltage**

| Temperature(℃) | Voltage (Vac) | | Frequency (MHz) | Freq Error (KHz) | Limit (KHz) | Results |
|---|---|---|---|---|---|---|
| 20 | V-nom | 120 | 13.56049 | | | |
| 20 | V-min | 102 | 13.56048 | -0.01 | +/- 1.356 | **PASS** |
| 20 | V-max | 138 | 13.56049 | 0 | +/- 1.356 | **PASS** |

4.3.7 **TEST RESULTS**

| | | | |
|---|---|---|---|
| EUT： | Contactless Card Reader | Model No. ： | UIC680-RM0FXDKC-XXX |
| Temperature： | 26 ℃ | Relative Humidity： | 60 % |
| Pressure： | 1017 hPa | Test Power ： | AC 120V/60Hz |
| Test Mode ： | Normal-with power adapter DCU050050 | | |

| Frequency Stability Versus Environmental Temperature | | | | | | |
|---|---|---|---|---|---|---|
| | **Temperature (℃)** | **Voltage (Vac)** | **Frequency (MHz)** | **Freq Error (KHz)** | **Limit (KHz)** | **Results** |
| | 20 | 120V | 13.56049 | | | |
| **0 min** | 50 | 120V | 13.56050 | 0.008 | +/- 1.356 | **PASS** |
| | -20 | 120V | 13.56048 | -0.010 | +/- 1.356 | **PASS** |
| **2 min** | 50 | 120V | 13.56049 | 0.000 | +/- 1.356 | **PASS** |
| | -20 | 120V | 13.56048 | -0.010 | +/- 1.356 | **PASS** |
| **5 min** | 50 | 120V | 13.56048 | -0.010 | +/- 1.356 | **PASS** |
| | -20 | 120V | 13.56048 | -0.010 | +/- 1.356 | **PASS** |
| **10 min** | 50 | 120V | 13.56049 | 0.000 | +/- 1.356 | **PASS** |
| | -20 | 120V | 13.56048 | -0.010 | +/- 1.356 | **PASS** |

| Frequency Stability Versus Input Voltage | | | | | | |
|---|---|---|---|---|---|---|
| **Temperature(℃)** | **Voltage (Vac)** | | **Frequency (MHz)** | **Freq Error (KHz)** | **Limit (KHz)** | **Results** |
| 20 | V-nom | 120 | 13.56049 | | | |
| 20 | V-min | 102 | 13.56048 | -0.01 | +/- 1.356 | **PASS** |
| 20 | V-max | 138 | 13.56049 | 0 | +/- 1.356 | **PASS** |