



## **FCC EVALUATION REPORT FOR CERTIFICATION**

### ***KOREA Standard Technology***

*Test report No.: KST-FCC-070076*

**Applicant's Name** : Bioinsec Co., Ltd.

**Applicant's Address** : 3F, Taerim Building, 197-24, Guro3-dong Guro-gu, Seoul 152-848, Korea

**Manufacturer's Name** : Bioinsec Co., Ltd.

**Manufacturer's Address** : 3F, Taerim Building, 197-24, Guro3-dong Guro-gu, Seoul 152-848, Korea

#### **EUT's:**

**FCC ID** : VULBKS-4800M

**Product Name** : Fingerprint Access Controller

**Model Number(s)** : BKS-4800M(CFN-3000M)

**Product Options** : Request for a multi list model name(CFM-3000M) by manufacturer

**Category** : FCC Part 15 subpart C, Section 15.207,15.209,15.225

#### **Supplementary Information**

The device bearing the brand name and FCC ID specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with measurement procedures specified in ANSI C63.4-2003.

I attest to the accuracy of data and all measurements reported herein were performed by or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

**Test Date : November 22, 2007**

**Issued Date : November 26, 2007**

**Tested by:**

**Approved by:**

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## 1. General Description

|                           |   |
|---------------------------|---|
| 1) FCC ID                 | VULBKS-4800M  |
| 2) Purpose of test        | FCC Certification                                     |
| 3) FCC Rules Section      | FCC Parts15 Subpart C, Section 15.207, 15.209, 15.225 |
| 4) Test result            | Compliant to specification                            |
| 5) Equipment under test   | RFID(Radio frequency identification for 13.562MHz     |
| 6) Kind of equipment      | Fingerprint Access Controller                         |
| 7) Equipment Model Name:  | BKS-4800M(CFM-3000M)                                  |
| 8) Equipment Serial No    | Prototype   |
| 9) Utilisation            | Identification and data transmission for fingerprint  |
| 10) ITU emission Code     | A1D   |
| 11) Antenna description   | Internal Loop antenna                                 |
| 12) Modulation Method     | Continuous carrier                                    |
| 13) Fundamental Frequency | 13.562MHz   |
| 14) Channel spacing       | Not applicable  |
| 15) Number of Channel     | 1(one)  |
| 16) Communication Type    | Oneway Type   |
| 17) Weight                | 350g  |
| 18) Dimension             | 155(W) x 3(H) x 155(D) mm                             |
| 19) Operatin temperature  | -20°C ~ +70°C   |
| 20) Power Source          | DC 12V (Adaptor)                                      |



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## 2. Test Facility

The open area field test site and conducted measurement facility are used for these testing, where are located following address and drawing. This site was fully described in a report dated November 14, 2002. that was submitted to the FCC.

### **KOSTEC CO., LTD. (Korea Standard Technology)**

#### **■ Head office & Test Lab ;**

180-254, Annyung-Dong, Hwasung-shi, Kyunggi-do, Korea 445-380

Telephone Number : +82-31-222-4251

Facsimile Number : +82-31-222-4252

**MIC**(Ministry of Information and Communication) Number : **KR0041**

**FCC** Filing Number. : **525762**

**VCCI** Membership Number : **2005**

**VCCI** Registration Number : **R-1657 / C-1763**

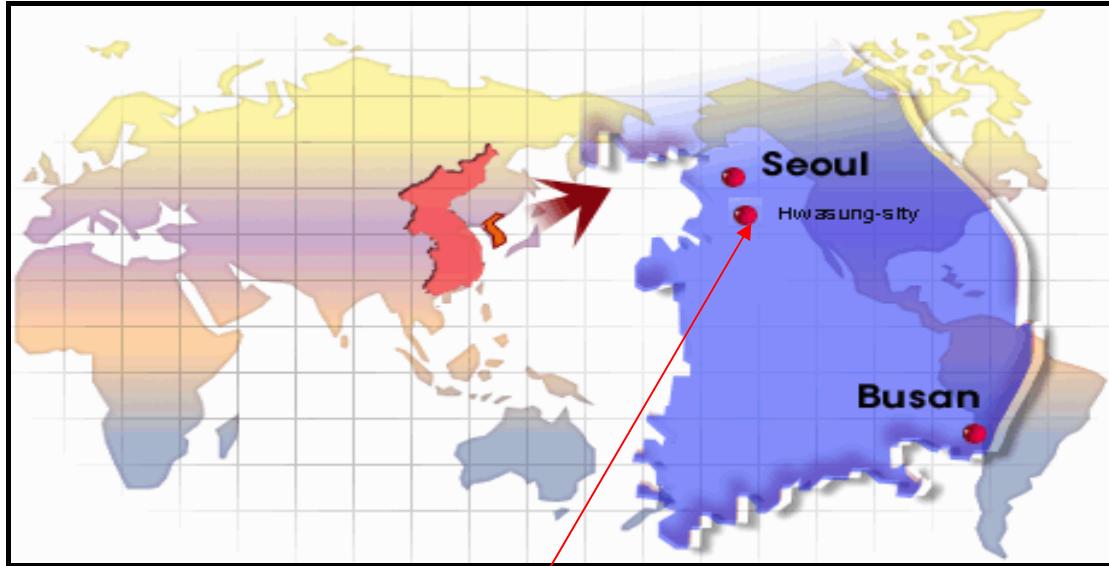
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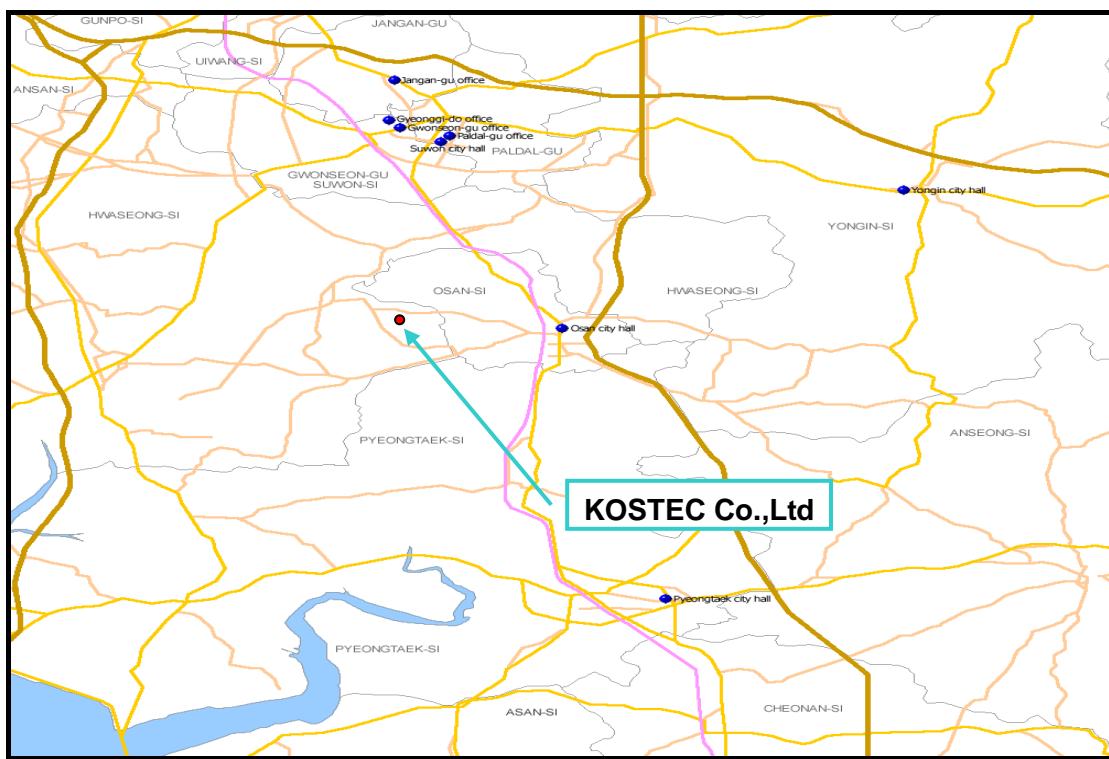
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## 3. MAP

### Korea



### Hwasung-shi (open area test site)



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## 4. TEST SYSTEM CONFIGURATION

### ■ Operation Environment

| Ambient                 | Temperature (°C) | Humidity (%) | Pressure ( hPa ) |
|-------------------------|------------------|--------------|------------------|
| 10m Open area test site | 19               | 51           | 1015             |
| Shielded room           | 24               | 43           | 1015             |

### Test site

These testing were performed following locations ;

- Conducted Emission ..... Shield room
- Radiated Emission ..... 10m Open area test site:

### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC.

The factors contributing to uncertainties are test receiver, Cable loss, Antenna factor calibration, Antenna directivity, Antenna factor variation with height, Antenna phase center variation, Antenna frequency interpolation, measurement distance variation, Site imperfection, mismatch, and system repeatability.

Based on NIS 80,81, The measurement uncertainty level with a 95 % confidence level were applied.

### Sample calculation :

#### Part 15.207 – Powerline Conducted emission

The conducted emission is calculated by adding the LISN Factor, cable loss from the measured reading. The sample calculation is as follows table:

| Frequency(MHz) | Level(dBuV) | Line(Pol) | Loss(dB) | Result(dBuV) | Limit(dBuV) | Margin(dB) |
|----------------|-------------|-----------|----------|--------------|-------------|------------|
| 27.124         | 25.0        | -         | 2.0      | 27.0         | 56.0        | 29.0       |

#### ◎ **Result(dBuV) = Level(dBuV)+Loss(dB)**

- \* Level(dBuV) = Test receiver reading value
- \* Line(Pol) = Live and Neutral port
- \* Loss(dB) = LISN insertion Loss + Cable Loss
- \* Result(dBuV) = Measurement Value
- \* Limit(dBuV) = Value specified by FCC Part 15.207
- \* Margin(dB) = Limit-Result

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## Part 15.209, 15.225 – Radiated emission

The field strength emission is calculated by adding the Antenna factor, cable loss from the measured reading. The sample calculation is as following table :

| Frequency (MHz) | Reading (dBuV) | P (H/V) | H (m) | A(°) | Antenna (dB/m) | Cable loss (dB) | Distance Factor(dB) | Result (dBuV/m) | Limit (dBuV/m) |
|-----------------|----------------|---------|-------|------|----------------|-----------------|---------------------|-----------------|----------------|
| 27.124          | 15.0           | H       | 3.5   | 250  | 20.0           | 1.5             | -40                 | -3.5            | 29.54          |

④ **Result(dBuV/m) = Reading(dBuV) + Antenna(dB/m) + Cable loss(dB) – Distance factor(dB)**

- \* Result(dBuV/m) = Measurement value
- \* Reading(dBuV) = Test receiver reading value
- \* P(H/V)= Antenna Polarization, H(m)=Antenna Height, A(°)=Turn table Angle
- \* Antenna(dB/m) = Antenna factor, Cable loss(dB) = Used cable loss
- \* Distance factor = Extrapolation factor @ 40dB/Decade from 3m to 30m, as per Part 15.31f(2)  
(If Measurement distance is 3m and Mandatory requirement distance is 30m at less than 30MHz  
Extrapolation factor(dB)=40log(MRD/MD)  
@ MRD:Mandatory requirement distance, MD: Measurement distance
- \* Limit(dBuV) = Value Specified by FCC Part 15.209

## 5. Description of E.U.T

### ■ Product Description

|                  |  |
|------------------|--|
| Manufactured By: | Bioinsec Co., Ltd.   |
| Address:         | 3F, Taerim Building, 197-24, Guro3-dong Guro-gu, Seoul 152-848, Korea. |
| Model:           | BKS-4800M(CFN-3000M)   |
| Serial Number:   | Prototype  |

### ■ Configuration of EUT

| Description           | Manufacturer      | Model/Part # | Serial Number |
|-----------------------|-------------------|--------------|---------------|
| Main controller board | Bioinsec Company  | BKS-4700     | None          |
| LCD                   | Bioinsec Company  | None         | None          |
| LED board             | Bioinsec Company  | None         | None          |
| RF Oscillation board  | Bioinsec Company  | None         | None          |
| Antenna board         | Bioinsec Company  | None         | None          |
| Sensor board          | Bioinsec Company  | None         | None          |
| Adaptor               | Dream Electronics | DEP-1220A    | None          |

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## ■ EUT Used cables

| Cable Type                | Shield | Length (m) | Ferrite | Connector           | Connection Point 1 | Connection Point 2 |
|---------------------------|--------|------------|---------|---------------------|--------------------|--------------------|
| DC IN<br>(2Pin Connector) | No     | 2.0        | No      | 2Pin Connector type | EUT                | Adaptor            |
| RJ11                      | No     | 1.6        | No      | RJ45                | EUT                | PC                 |
| RJ45                      | No     | 1.2        | No      | D-Sub (Serial)      | EUT                | PC                 |

## Operating Conditions :

The operating mode/system were as follows in details:

After setting, the DC IN port of EUT connected to AC/DC adaptor and also RJ-45 port and RJ11 port of EUT connected to PC. After that, the EUT was tested in state of control on the PC of EUT with "Biokey Manager" program. And also, the EUT was tested with "ping test" between EUT and PC. and it is radiated emission in transmission mode.

## ■ Peripherals

| No | Description                   | Manufacturer                 | Model/Part #   | Serial Number            |
|----|-------------------------------|------------------------------|----------------|--------------------------|
| 1  | Fingerprint Access Controller | Bioinsec Company             | BKS-4800M      | Prototype                |
| 2  | PC                            | Dell Inc.                    | DIMENSION 4700 | 8VKSD1S                  |
| 3  | LCD Monitor                   | Dell Inc.                    | E153FPb        | CN-0U4938-46633-53P-101L |
| 4  | Keyboard                      | LG                           | LK3800         | None                     |
| 5  | Mouse                         | MONTEREY INTERNATIONAL CORP. | SMH-120C       | TAKY562806E              |
| 6  | Adaptor                       | Dream Electronics            | DEP-1220A      | None                     |

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## 6. Summary of test results

Please refer to see as follow Table

- . Modification to the E.U.T : None

| Test Item                     | Standard                      | Limit                                | Result Value | Test Result |
|-------------------------------|-------------------------------|--------------------------------------|--------------|-------------|
| Conducted power line emission | Part 15.207                   | Refer to Clause 7.1 Test data        |              | Pass        |
| Radiated carrier emission     | Part 15.225(a)                | Refer to Clause 7.2 Test data(1)     |              | Pass        |
| Radiated bandedge emission    | Part 15.225(b),(c)            | Refer to Clause 7.2 Test data(2),(3) |              | Pass        |
| Radiated spurious emission    | Part 15.225(d)<br>Part 15.209 | Refer to Clause 7.2 Test data(4)     |              | Pass        |
| Carrier frequency tolerance   | Part 15.225(e)                | Refer to Clause 7.3 Test data(5)     |              | Pass        |

\* Radiated carrier emission is not contain restrict band of operation by Section Part 15.205

## 7. TEST RESULTS

### 7.1 Conducted emission

#### Measurement procedure

The measurements were performed in a shielded room. EUT was placed on a non-metallic table height of 0.4m above the reference ground plane. They were folded back and forth forming a bundle 30Cm to 40Cm long and were hanged at a 40Cm height to the ground plane.

Each EUT power lead, except ground (safety) lead, were individually connected through a LISN to input power source. Both lines of power cord, hot and neutral, were measured.

#### ■ Used equipment

| Equipment Name | Model Name. | Serial No. | Manufacturer    | Due cal.   |
|----------------|-------------|------------|-----------------|------------|
| Test receiver  | ESPI3       | 100109     | Rohde & Schwarz | 2008.03.03 |
| L.I.S.N.       | ESH3-Z5     | 100147     | Rohde & Schwarz | 2008.08.06 |

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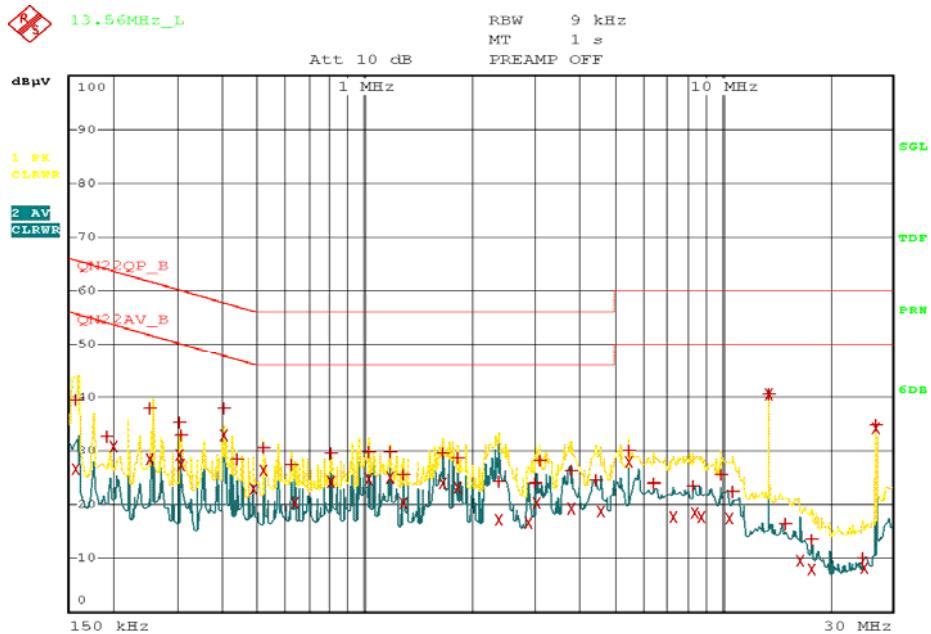
■ **Test data** ..... FCC Part 15.207

| Frequency (MHz) | Level(dB $\mu$ N) |       | LINE (Pol) | Loss (dB) | Limit(dB $\mu$ N) |       | Margin(dB $\mu$ N) |       |
|-----------------|-------------------|-------|------------|-----------|-------------------|-------|--------------------|-------|
|                 | QP                | AV    |            |           | QP                | AV    | QP                 | AV    |
| 0.150           | 47.29             | 33.88 | N          | 0.08      | 66.00             | 56.00 | 18.63              | 22.04 |
| 0.254           | 37.91             | 28.55 | L          | 0.29      | 61.63             | 51.63 | 23.43              | 22.79 |
| 0.402           | 37.91             | 32.86 | L          | 0.29      | 57.81             | 46.00 | 19.61              | 12.85 |
| 0.522           | 30.51             | 26.39 | L          | 0.90      | 56.00             | 46.00 | 24.59              | 18.71 |
| 1.038           | 30.44             | 21.78 | N          | 0.44      | 56.00             | 46.00 | 25.12              | 23.78 |
| 1.178           | 29.68             | 24.97 | L          | 0.44      | 56.00             | 46.00 | 25.88              | 20.59 |
| 5.506           | 30.15             | 28.08 | L          | 0.75      | 60.00             | 50.00 | 29.10              | 21.17 |
| 10.786          | 22.43             | 17.32 | L          | 1.33      | 60.00             | 50.00 | 36.24              | 31.35 |
| 27.122          | 34.83             | 34.28 | L          | 2.29      | 60.00             | 50.00 | 22.88              | 13.43 |

● Measurement uncertainty :  $\pm 2.4$  dB (Confidence 95%, K=2)

- \*  $\text{Leve}(dB\mu N)$  = Test receiver reading value
- \*  $\text{Line}(Pol)$  = Live and Neutral
- \*  $\text{Loss}(dB)$  = LISN insertion Loss + Cable Loss
- \*  $\text{Limit}(dB\mu N)$  = Value specified by FCC Part 15.207
- \*  $\text{Margin}(dB)$  =  $\text{Limit}(dB\mu N)$  - [ $\text{Leve}(dB\mu N)$  +  $\text{Loss}(dB)$ ]

## ■ Test graphs

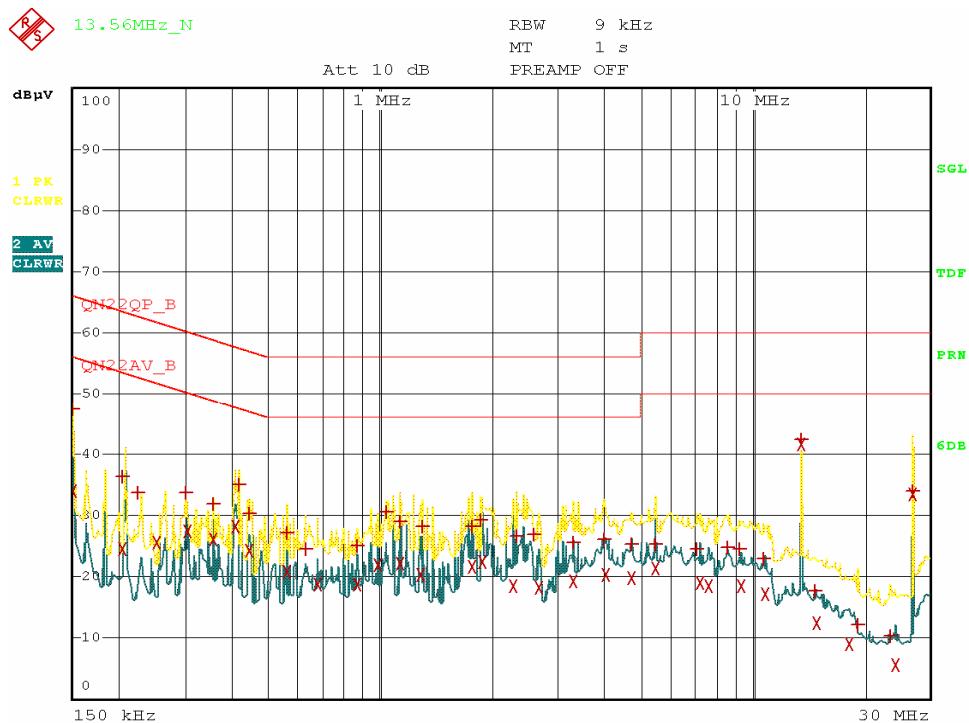


[ LIVE LINE ]

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## [ NEUTRAL LINE ]

## 7.2 Radiated Emission

### Measurement procedure

According to the test method ANSI63.4:2003, radiated emission pretest was performed at 3m distances in a semi-anechoic chamber for searching correct frequency. The final test was done at a 3m or 10m open area test site with a quasi-peak detector.

EUT was placed on a non-metallic table height of 0.8m above the reference ground plane.

Cables connected to EUT were fixed to cause maximum emission.

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.

The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

### ■ Used equipment

| Equipment Name          | Model Name. | Serial No. | Manufacturer    | Due cal.   |
|-------------------------|-------------|------------|-----------------|------------|
| Test receiver           | ESCS30      | 100111     | Rohde & Schwarz | 2008.03.07 |
| Ultra broadband antenna | HL562       | 100075     | Rohde & Schwarz | 2008.03.23 |
| Loop Antenna            | 6502        | 9203-0493  | EMCO            | 2008.06.15 |
| Antenna Mast            | AT14        | none       | Daeil EMC       | -          |
| Turn Table              | TT15        | none       | Daeil EMC       | -          |
| 10m Open area test site | None        | none       | KOSTEC Lab      | -          |
| 3m Anechoice Chamber    | none        | none       | FRANCONIA       | -          |

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## ■ Test data(1) ..... FCC Part 15.225(a)

| Frequency (MHz) | Reading (dBuV) | P (H/V) | H (m) | A (°) | Antenna (dB/m) | Cable Loss (dB) | Distance factor(dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----------------|----------------|---------|-------|-------|----------------|-----------------|---------------------|-----------------|----------------|-------------|
| 13.562          | 48.10          | V       | 1.50  | 180   | 9.85           | 2.10            | -40                 | 20.05           | 83.99          | 63.94       |

Reading = Test receiver reading, P= Antenna Polarization, H=Antenna Height, A=Turn table Angle  
Antenna = Antenna factor, Cable loss = Used cable loss, Result = Reading + Antenna + Cable loss-  
Distance factor

● Notes:

- Extrapolation factor @ 40dB/Decade at 30m, as per Part 15.31f(2)
- Receiver detector @fc = CISPR, Quasi-Peak, 10KHz bandwidth
- Measurements 13.562MHz @3m, as per Part 15.31f(2)
- Test site Open area test site @3m

## ■ Test data(2) ..... FCC Part 15.225(b),(c)

| Frequency (MHz) | Reading (dBuV) | P (H/V) | H (m) | A (°) | Antenna (dB/m) | Cable Loss (dB) | Distance factor(dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----------------|----------------|---------|-------|-------|----------------|-----------------|---------------------|-----------------|----------------|-------------|
| 13.110-13.410   | 38.75          | V       | 1.50  | 180   | 9.85           | 0.50            | -40                 | 9.10            | 40.50          | 31.40       |
| 13.410-13.553   | 42.26          | H       | 1.50  | 210   | 9.85           | 0.50            | -40                 | 12.61           | 50.47          | 37.86       |
| 13.567-13.710   | 39.87          | V       | 1.50  | 135   | 9.85           | 0.50            | -40                 | 10.22           | 50.47          | 40.25       |

Reading = Test receiver reading, P= Antenna Polarization, H=Antenna Height, A=Turn table Angle  
Antenna = Antenna factor, Cable loss = Used cable loss, Result = Reading + Antenna + Cable loss-  
Distance factor

● Notes:

- Extrapolation factor @ 40dB/Decade at 30m, as per Part 15.31f(2)
- Receiver detector @fc = CISPR, Quasi-Peak, 10KHz bandwidth
- Measurements 13.110-13.710MHz @3m, as per Part 15.31f(2)
- Test site Open area test site @3m

## ■ Test data(3) ..... FCC Part 15.225(d), 15.209 <30MHz

| Frequency (MHz) | Reading (dBuV) | H (m) | Antenna (dB/m) | Cable Loss (dB) | Distance (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----------------|----------------|-------|----------------|-----------------|---------------|-----------------|----------------|-------------|
| 0.42            | 34.10          | 1.50  | 10.43          | 0.30            | -80           | -35.17          | 15.13          | 50.30       |
| 0.84            | 15.90          | 1.50  | 10.27          | 0.30            | -40           | -13.53          | 29.11          | 42.64       |
| 1.69            | 24.50          | 1.50  | 10.18          | 1.20            | -40           | -4.12           | 23.04          | 27.16       |
| 3.34            | 28.70          | 1.50  | 10.10          | 1.50            | -40           | 0.30            | 29.54          | 29.24       |
| 6.78            | 32.20          | 1.50  | 9.93           | 1.90            | -40           | 4.03            | 29.54          | 25.51       |
| 27.12           | 36.40          | 1.50  | 8.18           | 2.60            | -40           | 7.18            | 29.54          | 22.36       |

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Reading = Test receiver reading, H=Antenna Height

Antenna = Loop antenna factor, Cable loss = Used cable loss, Result = Reading + Antenna + Cable loss-Distance factor

① Notes:

- Extrapolation factor @40dB/decade from 300m to 30m, as per Part 15.31f(2)
- Measurements <490KHz @3m, as per Part 15.31f(2)
- Measurements <1705KHz @3m, as per Part 15.31f(2)
- Measurements <30MHz @3m, as per Part 15.31f(2)
- Receiver detector <30MHz=CISPR, Quasi-Peak(Avg.110KHz~490KHz), 10KHz bandwidth
- Test site Open area test site @3m

## ■ Test data(4) ..... FCC Part 15.225(d), 15.209 > 30MHz

| Freq (MHz) | Reading (dBuV) | P (H/V) | H (m) | A (°) | Antenna (dB/m) | Cable Loss (dB) | Result (dBuV/m)   | Limit (dBuV/m) | Margin (dB) |
|------------|----------------|---------|-------|-------|----------------|-----------------|-------------------|----------------|-------------|
| 40.69      | 1.24           | H       | 1.70  | 135   | 14.10          | 2.50            | 17.84             | 40.00          | 22.16       |
| 54.25      | 8.26           | V       | 1.75  | 160   | 5.07           | 3.02            | 16.35             | 40.00          | 23.65       |
| 67.81      | 6.94           | H       | 2.10  | 110   | 5.70           | 3.22            | 15.86             | 40.00          | 24.14       |
| 81.37      | 4.78           | V       | 2.00  | 90    | 8.25           | 3.40            | 16.43             | 40.00          | 23.57       |
| 176.31     | 6.43           | H       | 2.50  | 120   | 7.88           | 4.48            | 18.79             | 43.52          | 24.73       |
| 203.43     | 4.12           | H       | 1.85  | 105   | 7.42           | 5.07            | 16.61             | 43.52          | 26.91       |
| 216~960    | Nil emission   |         |       |       |                |                 | -20dB below Limit |                |             |
| Above 960  | Nil emission   |         |       |       |                |                 | -20dB below Limit |                |             |

Reading = Test receiver reading, P= Antenna Polarization, H=Antenna Height, A=Turn table angle  
Antenna = Antenna factor, Cable loss = Used cable loss, Result = Reading + Antenna + Cable loss

- ① Measurement uncertainty : 30- 300 MHz = + 3.96 dB / -4.04 dB(Confidency 95%, k=2)  
300-1000 MHz = + 3.04 dB / -3.00 dB(Confidency 95%, k=2)

① Notes:

- Receiver detector <1GHz=CISPR, Quasi-Peak, 120KHz bandwidth
- Test site Open area test site @3m

## 7.3 Carrier Frequency tolerance

### Measurement procedure

Carrier frequency tolerance was performed at Temperature &humidity chamber for searching the carrier frequency tolerance

The frequency tolerance of the carrier signal shall be maintained within +/-0.01% of the operating Frequency over a temperature variation of -20degrees 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. and also EUT operated and tested @5,&10mins after startup

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## ■ Used equipment

| Equipment Name         | Model Name. | Serial No. | Manufacturer       | Due cal.   |
|------------------------|-------------|------------|--------------------|------------|
| Frequency counter      | 5352B       | 2908A00480 | Agilent Technology | 2008.05.23 |
| Loop Antenna           | 6502        | 9203-0493  | EMCO               | 2008.06.15 |
| DC Power supply        | E3610A      | KR24104505 | Agilent Technology | 2008.05.22 |
| Temp.&Humidity Chamber | TABAI ESPEC | 90E14260   | EY-101             | 2008.03.26 |

## ■ Test data(5) ..... FCC Part 15.225(e)

### ■ Environment Condition

- . Ambient temperature = +20 (°C)
- . Relative humidity = 65%
- . Conditions = Indoor
- . Period after startup = 5min

| Temperature(°C)           | Voltage(%)              | Measurement frequency(Hz)                             | Frequency tolerance(%) | Frequency tolerance(Hz) |
|---------------------------|-------------------------|---|------------------------|-------------------------|
| T <sub>nom</sub> (+20 °C) | V <sub>min</sub> (-15%) | 13.561550   | 0.0033                 | -450                    |
|                           | V <sub>nom</sub> (00%)  | 13.561570   | 0.0032                 | -430                    |
|                           | V <sub>max</sub> (+15%) | 13.561560   | 0.0032                 | -440                    |
| T <sub>min</sub> (-20 °C) | V <sub>nom</sub> (00%)  | 13.561480   | 0.0038                 | -520                    |
| T <sub>max</sub> (+50 °C) | V <sub>nom</sub> (00%)  | 13.561200   | 0.0059                 | -800                    |
| Limit                     |                         | 13.562MHz±0.01% = ±1356Hz(nom)                        |                        |                         |
| Measurement Uncertainty   |                         | ±4.3X10 <sup>-6</sup> = ±58.31Hz(Confidence 95%, k=2) |                        |                         |

### ■ Environment Condition

- . Ambient temperature = +20 (°C)
- . Relative humidity = 65%
- . Conditions = Indoor
- . Period after startup = 10min

| Temperature(°C)           | Voltage(%)              | Measurement frequency(Hz)                             | Frequency tolerance(%) | Frequency tolerance(Hz) |
|---------------------------|-------------------------|---|------------------------|-------------------------|
| T <sub>nom</sub> (+20 °C) | V <sub>min</sub> (-15%) | 13.561700   | 0.0022                 | -300                    |
|                           | V <sub>nom</sub> (00%)  | 13.561720   | 0.0021                 | -280                    |
|                           | V <sub>max</sub> (+15%) | 13.561690   | 0.0023                 | -310                    |
| T <sub>min</sub> (-20 °C) | V <sub>nom</sub> (00%)  | 13.561540   | 0.0034                 | -460                    |
| T <sub>max</sub> (+50 °C) | V <sub>nom</sub> (00%)  | 13.561480   | 0.0038                 | -520                    |
| Limit                     |                         | 13.562MHz±0.01% = ±1356Hz(nom)                        |                        |                         |
| Measurement Uncertainty   |                         | ±4.3X10 <sup>-6</sup> = ±58.31Hz(Confidence 95%, k=2) |                        |                         |