

APPLICATION FOR VERIFICATION  
On Behalf of  
AEI Protect-On Systems Limited

Access Control Keypad with Proximity Card Reader  
Model No.: DK2852

FCC ID: OGJ-DK2852

Prepared for : AEI Protect-On Systems Limited  
Address : Flat B, 4/F., Effort Industrial. Building, 2-8 Kung Yip Street  
Kwai Chung, N.T. Hong Kong  
Prepared by : Accurate Technology Co., Ltd.  
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Report No. : ATE20151934  
Date of Test : Sep 1-8, 2015  
Date of Report : Sep 9, 2015

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## Test Report Declaration

Applicant& address : AEI Protect-On Systems Limited  
Flat B, 4/F., Effort Industrial. Building, 2-8 Kung Yip Street  
Kwai Chung, N.T. Hong Kong

Manufacturer& address : AEI Protect-On Systems Limited  
Flat B, 4/F., Effort Industrial. Building, 2-8 Kung Yip Street  
Kwai Chung, N.T. Hong Kong

Product : Access Control Keypad with Proximity Card Reader

Model No. : DK2852

Trade name : N/A

Measurement Procedure Used:

### **FCC Rules and Regulations Part 15 Subpart C 15.207&15.209 FCC/ANSI C63.4-2014**

The device described above is tested by Accurate Technology Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both radiated and conducted emissions. The measurement results are contained in this test report and Accurate Technology Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Accurate Technology Co., Ltd.

Date of Test : Sep 1-8, 2015

Date of Report : Sep 9, 2015

Prepared by :   
(Mark Chen, Engineer)

Approved & Authorized Signer :   
( Sean Liu, Manager)

## 1. TEST RESULTS SUMMARY

| Test Items                    | Test Standard   | Test Results |
|-------------------------------|-----------------|--------------|
| Power Line Conducted Emission | FCC Part 15.207 | Pass         |
| Radiated Emission             | FCC Part 15.209 | Pass         |

## 2. GENERAL INFORMATION

### 2.1. Description of Device (EUT)

The submitted sample is a Access Control Keypad with Proximity Card Reader.  
The sample is powered by 12-24V DC/AC.

|                    |   |                                                  |
|--------------------|---|--------------------------------------------------|
|                    |   | Access Control Keypad with Proximity Card Reader |
| Frequency          | : | 125KHz                                           |
| Number of Channels | : | 1                                                |
| Modulation Type    | : | GFSK                                             |
| Type of Antenna    | : | Internal Antenna                                 |
| Max antenna gain   | : | 0dBi                                             |
| Power Supply       | : | 12-24V DC/AC                                     |

### 2.2. Special Accessory and Auxiliary Equipment

N/A

## 2.3. Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen, May 10, 2004

Listed by FCC  
The Registration Number is 253065  
Listed by FCC  
The Registration Number is 752051

Listed by Industry Canada  
The Registration Number is 5077A-1  
Listed by Industry Canada  
The Registration Number is 5077A-2

Accredited by China National Accreditation Committee for Laboratories  
The Certificate Registration Number is L3193

Name of Firm : Accurate Technology Co., Ltd.  
Site Location : F1, Bldg. A&D, Changyuan New Material Port, Keyuan Rd., Science & Industry Park, Nanshan District, Shenzhen 518057, P.R. China

## 2.4. Measurement Uncertainty

Conducted emission expanded uncertainty : U=2.23dB, k=2  
Power disturbance expanded uncertainty : U=2.92dB, k=2  
Radiated emission expanded uncertainty : U=3.08dB, k=2  
(9kHz-30MHz)  
Radiated emission expanded uncertainty : U=4.42dB, k=2  
(30MHz-1000MHz)  
Radiated emission expanded uncertainty : U=4.06dB, k=2  
(Above 1GHz)

### 3. POWER LINE CONDUCTED MEASUREMENT

#### 3.1. For Power Line Conducted Emission

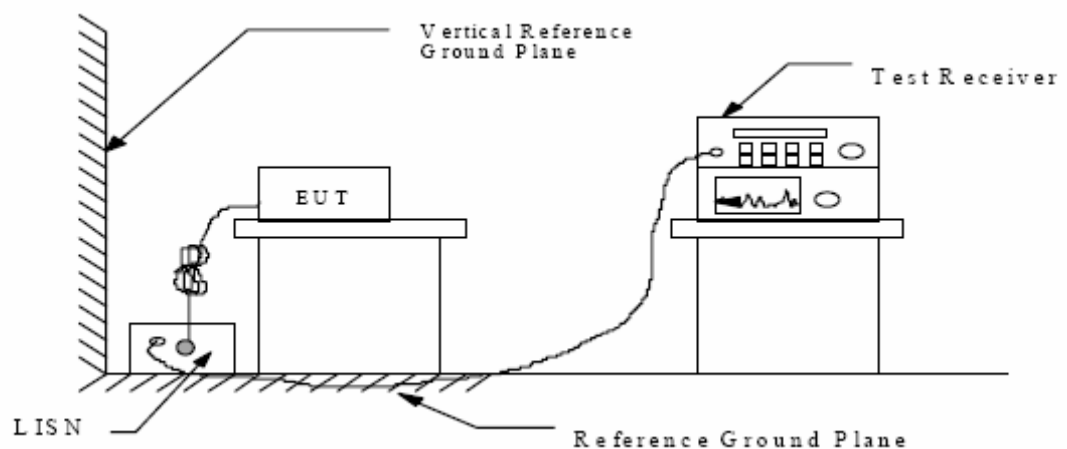
| Item                                 | Equipment          | Manufacturer    | Model No. | Serial No. | Last Cal.     | Cal. Interval |
|--------------------------------------|--------------------|-----------------|-----------|------------|---------------|---------------|
| 1.                                   | Test Receiver      | Rohde & Schwarz | ESCS30    | 100307     | Jan. 11, 2015 | 1 Year        |
| 2.                                   | L.I.S.N.           | Schwarzbeck     | NLSK8126  | 8126431    | Jan. 11, 2015 | 1 Year        |
| 3.                                   | Pulse Limiter      | Rohde & Schwarz | ESH3-Z2   | 100815     | Jan. 11, 2015 | 1 Year        |
| 4.                                   | 50Ω Coaxial Switch | Anritsu Corp    | MP59B     | 6200283933 | Jan. 11, 2015 | 1 Year        |
| Expanded Uncertainty: U= 2.23dB, k=2 |                    |                 |           |            |               |               |

#### 3.2. Block Diagram of Test Setup

##### 3.2.1. Block diagram of connection between the EUT and simulators



##### 3.2.2. Shielding Room Test Setup Diagram



(EUT: Access Control Keypad with Proximity Card Reader)

### 3.3.The Emission Limit

#### 3.3.1.Conducted Emission Measurement Limits According to Section 15.107(a)

| Frequency<br>(MHz) | Limit dB( $\mu$ V) |               |
|--------------------|--------------------|---------------|
|                    | Quasi-peak Level   | Average Level |
| 0.15 - 0.50        | 66.0 – 56.0 *      | 56.0 – 46.0 * |
| 0.50 - 5.00        | 56.0               | 46.0          |
| 5.00 - 30.00       | 60.0               | 50.0          |

\* Decreases with the logarithm of the frequency.

### 3.4.Configuration of EUT on Measurement

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

#### 3.4.1.Access Control Keypad with Proximity Card Reader (EUT)

Model Number : DK2852

Manufacturer : AEI Protect-On Systems Limited

### 3.5.Operating Condition of EUT

3.5.1.Setup the EUT and simulator as shown as Section 3.1.

3.5.2.Turn on the power of all equipment.

3.5.3.Let the EUT work in modes (TX) and measure it.

### 3.6.Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4: 2009 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.



The frequency range from 150kHz to 30MHz is checked.

Test mode : TX (AC 12V)

**MEASUREMENT RESULT: "RY0814-1\_fin"**

8/14/2015 4:04PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.450000         | 33.90         | 10.7         | 57            | 23.0         | QP       | L1   | GND |
| 2.600000         | 27.90         | 11.0         | 56            | 28.1         | QP       | L1   | GND |
| 12.115000        | 37.00         | 11.3         | 60            | 23.0         | QP       | L1   | GND |

**MEASUREMENT RESULT: "RY0814-1\_fin2"**

8/14/2015 4:04PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.450000         | 26.40         | 10.7         | 47            | 20.5         | AV       | L1   | GND |
| 1.360000         | 25.10         | 10.9         | 46            | 20.9         | AV       | L1   | GND |
| 12.115000        | 30.20         | 11.3         | 50            | 19.8         | AV       | L1   | GND |

**MEASUREMENT RESULT: "RY0814-2\_fin"**

8/14/2015 4:08PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.450000         | 33.50         | 10.7         | 57            | 23.4         | QP       | N    | GND |
| 1.730000         | 27.60         | 10.9         | 56            | 28.4         | QP       | N    | GND |
| 10.885000        | 29.30         | 11.3         | 60            | 30.7         | QP       | N    | GND |

**MEASUREMENT RESULT: "RY0814-2\_fin2"**

8/14/2015 4:08PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.450000         | 20.30         | 10.7         | 47            | 26.6         | AV       | N    | GND |
| 2.720000         | 22.30         | 11.0         | 46            | 23.7         | AV       | N    | GND |
| 10.885000        | 21.30         | 11.3         | 50            | 28.7         | AV       | N    | GND |

Test mode : TX (AC 24V)

**MEASUREMENT RESULT: "RY0818-1\_fin"**

8/18/2015 9:36AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.180000         | 43.50         | 10.5         | 65            | 21.0         | QP       | L1   | GND |
| 3.770000         | 36.20         | 11.1         | 56            | 19.8         | QP       | L1   | GND |
| 26.395000        | 29.60         | 11.5         | 60            | 30.4         | QP       | L1   | GND |

**MEASUREMENT RESULT: "RY0818-1\_fin2"**

8/18/2015 9:36AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.605000         | 26.60         | 10.7         | 46            | 19.4         | AV       | L1   | GND |
| 3.800000         | 23.00         | 11.1         | 46            | 23.0         | AV       | L1   | GND |
| 6.490000         | 18.50         | 11.2         | 50            | 31.5         | AV       | L1   | GND |

**MEASUREMENT RESULT: "RY0818-2\_fin"**

8/18/2015 9:40AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.150000         | 43.90         | 10.5         | 66            | 22.1         | QP       | N    | GND |
| 3.710000         | 35.20         | 11.1         | 56            | 20.8         | QP       | N    | GND |
| 6.920000         | 29.10         | 11.2         | 60            | 30.9         | QP       | N    | GND |

**MEASUREMENT RESULT: "RY0818-2\_fin2"**

8/18/2015 9:40AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.605000         | 26.60         | 10.7         | 46            | 19.4         | AV       | N    | GND |
| 3.700000         | 23.30         | 11.1         | 46            | 22.7         | AV       | N    | GND |
| 6.680000         | 18.70         | 11.2         | 50            | 31.3         | AV       | N    | GND |

Emissions attenuated more than 20 dB below the permissible value are not reported.

The spectral diagrams are attached as below.

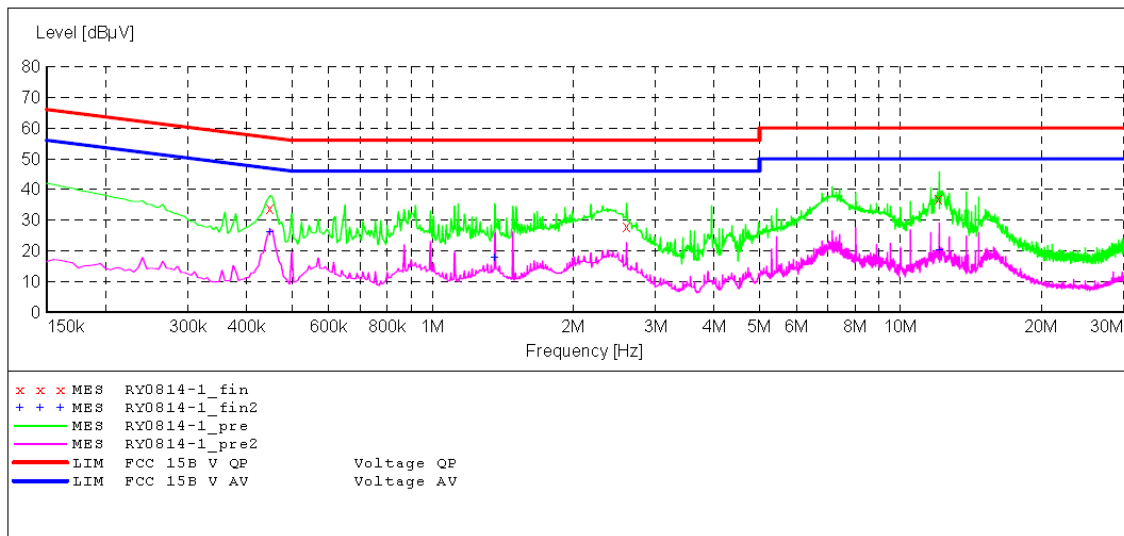
## ACCURATE TECHNOLOGY CO., LTD

### CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: Access Control Keypad with Proximity Card Reader M/N:DK2852  
 Manufacturer: AEI  
 Operating Condition: TX  
 Test Site: 1#Shielding Room  
 Operator: Ricky  
 Test Specification: L AC 12V  
 Comment: Report No.:ATE20151934  
 Start of Test: 9/5/2015 / 3:59:34PM

#### SCAN TABLE: "V 9K-30MHz fin"

Short Description: \_SUB\_STD\_VTERM2 1.70  
 Start Stop Step Detector Meas. IF Transducer  
 Frequency Frequency Width Time Bandw.  
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008  
 Average  
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008  
 Average



#### MEASUREMENT RESULT: "RY0814-1\_fin"

8/14/2015 4:04PM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.450000      | 33.90      | 10.7      | 57         | 23.0      | QP       | L1   | GND |
| 2.600000      | 27.90      | 11.0      | 56         | 28.1      | QP       | L1   | GND |
| 12.115000     | 37.00      | 11.3      | 60         | 23.0      | QP       | L1   | GND |

#### MEASUREMENT RESULT: "RY0814-1\_fin2"

8/14/2015 4:04PM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.450000      | 26.40      | 10.7      | 47         | 20.5      | AV       | L1   | GND |
| 1.360000      | 25.10      | 10.9      | 46         | 20.9      | AV       | L1   | GND |
| 12.115000     | 30.20      | 11.3      | 50         | 19.8      | AV       | L1   | GND |

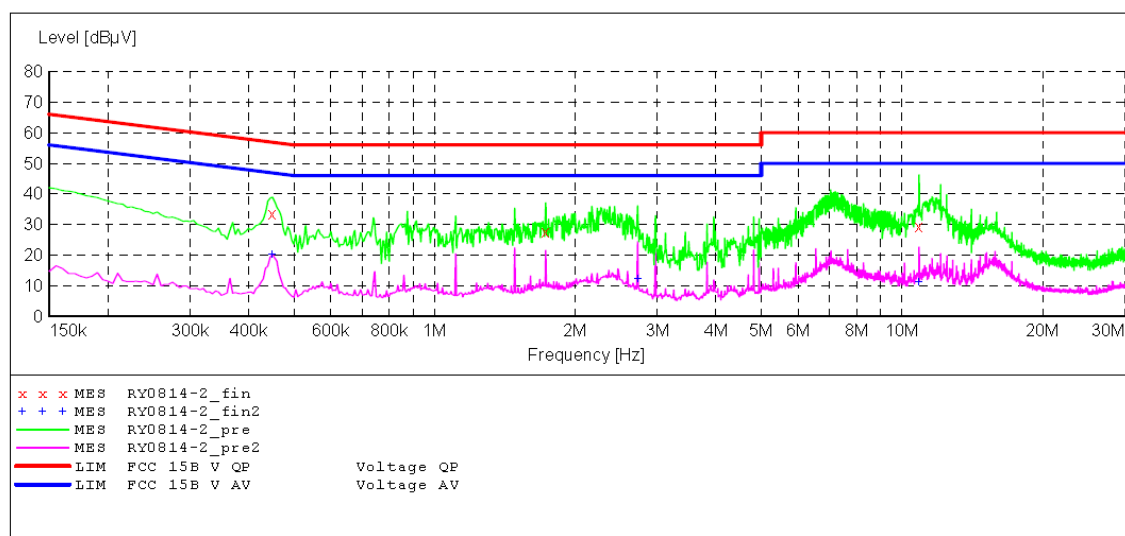
## ACCURATE TECHNOLOGY CO., LTD

### CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: RAccess Control Keypad with Proximity Card Reader M/N:DK2852  
 Manufacturer: AEI  
 Operating Condition: TX  
 Test Site: 1#Shielding Room  
 Operator: Ricky  
 Test Specification: N AC 12  
 Comment: Report No.:ATE20151934  
 Start of Test: 9/5/2015 / 4:04:57PM

### SCAN TABLE: "V 9K-30MHz fin"

Short Description: \_SUB\_STD\_VTERM2 1.70  
 Start Stop Step Detector Meas. IF Transducer  
 Frequency Frequency Width Time Bandw.  
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008  
 Average  
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008  
 Average



### MEASUREMENT RESULT: "RY0814-2\_fin"

8/14/2015 4:08PM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.450000      | 33.50      | 10.7      | 57         | 23.4      | QP       | N    | GND |
| 1.730000      | 27.60      | 10.9      | 56         | 28.4      | QP       | N    | GND |
| 10.885000     | 29.30      | 11.3      | 60         | 30.7      | QP       | N    | GND |

### MEASUREMENT RESULT: "RY0814-2\_fin2"

8/14/2015 4:08PM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.450000      | 20.30      | 10.7      | 47         | 26.6      | AV       | N    | GND |
| 2.720000      | 22.30      | 11.0      | 46         | 23.7      | AV       | N    | GND |
| 10.885000     | 21.30      | 11.3      | 50         | 28.7      | AV       | N    | GND |

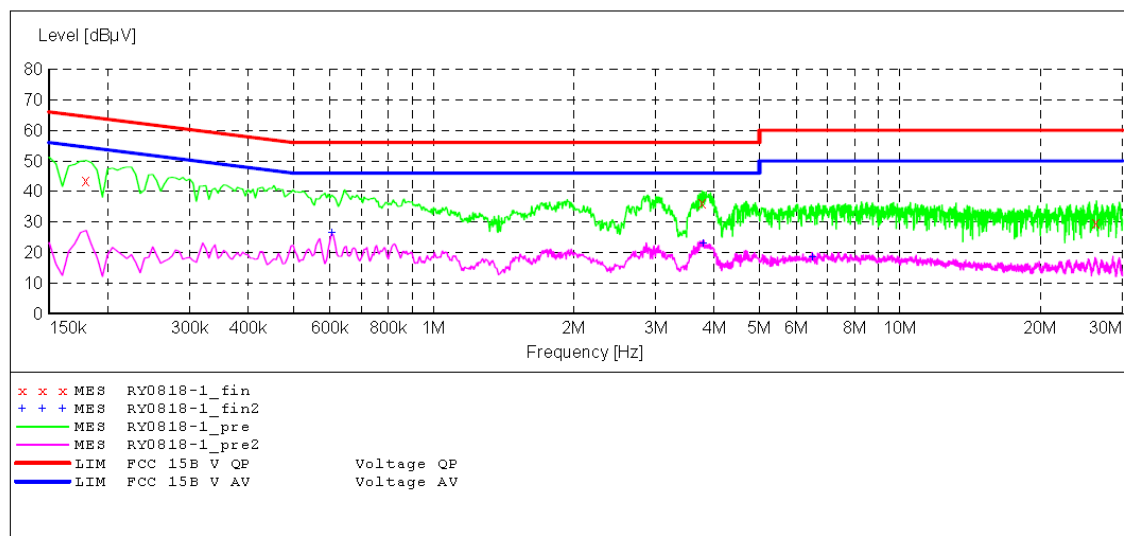
## ACCURATE TECHNOLOGY CO., LTD

### CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: Access Control Keypad with Proximity Card Reader M/N:DK2852  
 Manufacturer: AEI  
 Operating Condition: TX  
 Test Site: 1#Shielding Room  
 Operator: Ricky  
 Test Specification: L AC 24V  
 Comment: Report No.:ATE20151934  
 Start of Test: 9/6/2015 / 9:33:49AM

### SCAN TABLE: "V 9K-30MHz fin"

Short Description: \_SUB\_STD\_VTERM2 1.70  
 Start Stop Step Detector Meas. IF Transducer  
 Frequency Frequency Width Time Bandw.  
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008  
 Average  
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008  
 Average



### MEASUREMENT RESULT: "RY0818-1\_fin"

8/18/2015 9:36AM

| Frequency MHz | Level dBuV | Transd dB | Limit dBuV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.180000      | 43.50      | 10.5      | 65         | 21.0      | QP       | L1   | GND |
| 3.770000      | 36.20      | 11.1      | 56         | 19.8      | QP       | L1   | GND |
| 26.395000     | 29.60      | 11.5      | 60         | 30.4      | QP       | L1   | GND |

### MEASUREMENT RESULT: "RY0818-1\_fin2"

8/18/2015 9:36AM

| Frequency MHz | Level dBuV | Transd dB | Limit dBuV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.605000      | 26.60      | 10.7      | 46         | 19.4      | AV       | L1   | GND |
| 3.800000      | 23.00      | 11.1      | 46         | 23.0      | AV       | L1   | GND |
| 6.490000      | 18.50      | 11.2      | 50         | 31.5      | AV       | L1   | GND |

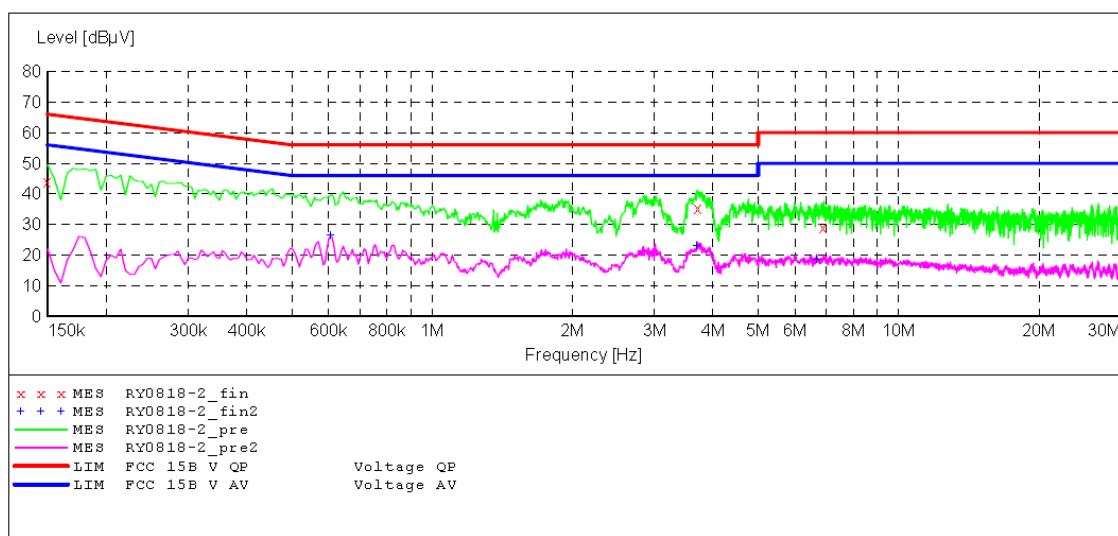
## ACCURATE TECHNOLOGY CO., LTD

### CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: Access Control Keypad with Proximity Card Reader M/N:DK2852  
 Manufacturer: AEI  
 Operating Condition: TX  
 Test Site: 1#Shielding Room  
 Operator: Ricky  
 Test Specification: N AC 24V  
 Comment: Report No.:ATE20151934  
 Start of Test: 9/6/2015 / 9:37:41AM

### SCAN TABLE: "V 9K-30MHz fin"

Short Description: \_SUB\_STD\_VTERM2 1.70  
 Start Stop Step Detector Meas. IF Transducer  
 Frequency Frequency Width Time Bandw.  
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008  
 Average  
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008  
 Average



### MEASUREMENT RESULT: "RY0818-2\_fin"

8/18/2015 9:40AM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.150000      | 43.90      | 10.5      | 66         | 22.1      | QP       | N    | GND |
| 3.710000      | 35.20      | 11.1      | 56         | 20.8      | QP       | N    | GND |
| 6.920000      | 29.10      | 11.2      | 60         | 30.9      | QP       | N    | GND |

### MEASUREMENT RESULT: "RY0818-2\_fin2"

8/18/2015 9:40AM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.605000      | 26.60      | 10.7      | 46         | 19.4      | AV       | N    | GND |
| 3.700000      | 23.30      | 11.1      | 46         | 22.7      | AV       | N    | GND |
| 6.680000      | 18.70      | 11.2      | 50         | 31.3      | AV       | N    | GND |

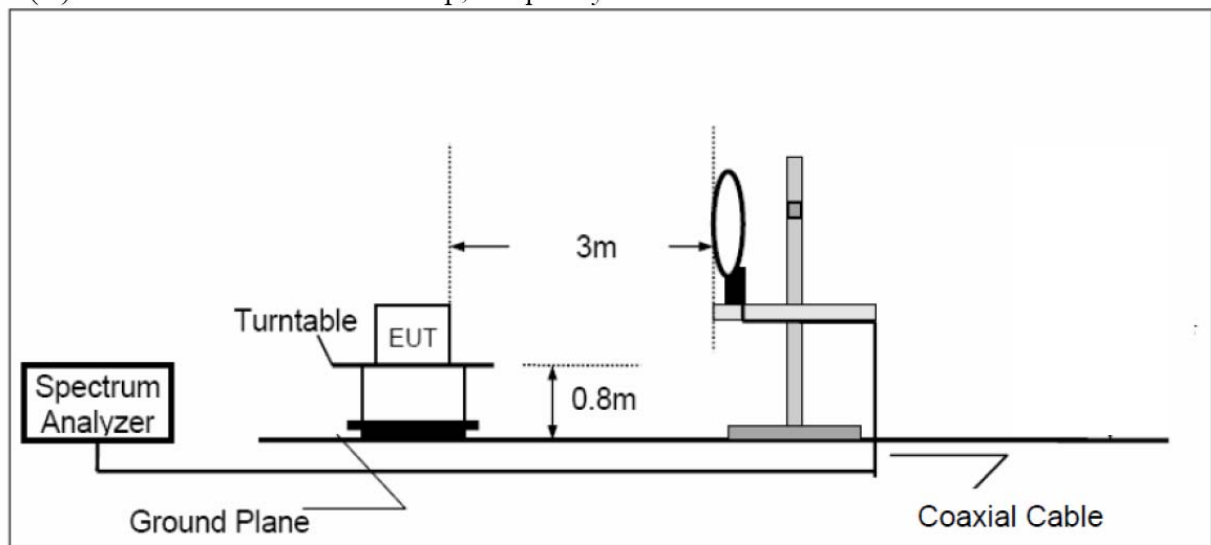
## 4. RADIATED EMISSION MEASUREMENT

### 4.1. For Radiated Emission Measurement

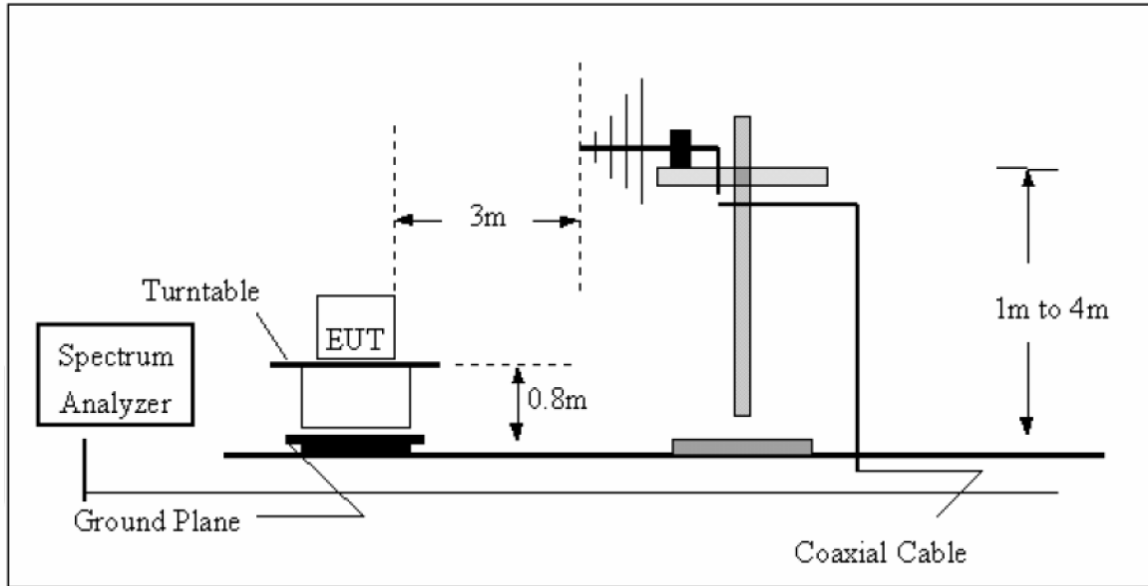
| Item                                                                                                                                                        | Equipment         | Manufacturer    | Model No.          | Serial No. | Last Cal.     | Cal. Interval |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|--------------------|------------|---------------|---------------|
| 1.                                                                                                                                                          | Spectrum Analyzer | Agilent         | E7405A             | MY45115511 | Jan. 11, 2015 | 1 Year        |
| 2.                                                                                                                                                          | Test Receiver     | Rohde & Schwarz | ESCS30             | 100307     | Jan. 11, 2015 | 1 Year        |
| 3.                                                                                                                                                          | Bilog Antenna     | Schwarzbeck     | VULB9163           | 9163-323   | Jan. 15, 2015 | 1 Year        |
| 4.                                                                                                                                                          | Loop Antenna      | Schwarzbeck     | FMZB1516           | 1516131    | Jan. 15, 2015 | 1 Year        |
| 5.                                                                                                                                                          | Horn Antenna      | Schwarzbeck     | BBHA9120D          | 9120D-655  | Jan. 15, 2015 | 1 Year        |
| 6.                                                                                                                                                          | 50 Coaxial Switch | Anritsu Corp    | MP59B              | 6200506474 | Jan. 11, 2015 | 1 Year        |
| 12.                                                                                                                                                         | Pre-Amplifier     | Rohde & Schwarz | CBLU11835<br>40-01 | 3791       | Jan. 11, 2015 | 1 Year        |
| Expanded Uncertainty (9kHz-30MHz): U=3.08dB, k=2<br>Expanded Uncertainty (30MHz-1000MHz): U=4.42dB, k=2<br>Expanded Uncertainty (Above 1GHz): U=4.06dB, k=2 |                   |                 |                    |            |               |               |

### 4.2. TEST CONFIGURATION

(A) Radiated Emission Test Set-Up, Frequency below 30MHz



(B) Radiated Emission Test Set-Up, Frequency 30-1000MHz



### 4.3. Block Diagram of Test Setup

#### 4.3.1. Block diagram of connection between the EUT and simulators



### 4.4. Radiated Emission Limit

| 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               |

Limit:  $2400/125=19.2\mu\text{V/m}@300\text{m}$

Distance Correction Factor= $40\log(\text{test distance}/\text{specific distance})$

### 4.5. EUT Configuration on Measurement

The equipment is installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.



## 4.6. Operating Condition of EUT

4.6.1. Setup the EUT and simulator as shown as Section 4.2.

4.6.2. Turn on the power of all equipment.

4.6.3. Let the EUT work in test mode and measure it.

## 4.7. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.10:2013 on radiated emission measurement.

From 9kHz to 30MHz at distance 3m The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

From 30MHz to 1000MHz at distance 3m The measuring antenna height varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity. The measurements were performed for both vertical and horizontal antenna polarization.

The final measurement will be performed with an EMI Receiver set to Quasi Peak detector for the frequency bands 9kHz to 90kHz and 110 to 490 kHz where an average detector will be used according to Section 15.209(d)(2).

The final level, expressed in dBuV/m, is arrived at by taking the reading from the EMI receiver (Level dBuV) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC limit. The resolution bandwidth during the measurement is as follows:

9kHz – 150kHz: ResBW:200Hz

150kHz – 30MHz: ResBW:9kHz

The bandwidth of the EMI test receiver (R&S ESCS30) is set at 120kHz from 30MHz to 1000MHz.

## 4.8.Radiated Emission Noise Measurement Result

**PASS.**

From 9 kHz to 30MHz (DC 24V (Worse))

| Frequency (MHz) | Quasi Peak (dB $\mu$ V/m) | Azimuth | Polarity (H/V) | Factors (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) |
|-----------------|---------------------------|---------|----------------|------------------------|----------------------|-------------|
| 0.125           | 70.14                     | 158     | H              | -56.36                 | 105.7                | -35.56      |
| 2.02            | 39.55                     | 40      | H              | -54.15                 | 69.5                 | -29.95      |
| 14.25           | 38.22                     | 205     | H              | -53.01                 | 69.5                 | -31.28      |
| 0.125           | 73.22                     | 190     | V              | -56.36                 | 105.7                | -32.48      |
| 3.68            | 41.29                     | 362     | V              | -51.27                 | 69.5                 | -28.21      |
| 17.35           | 33.24                     | 26      | V              | -51.25                 | 69.5                 | -36.26      |

From 9 kHz to 30MHz (AC 24V (Worse))

| Frequency (MHz) | Quasi Peak (dB $\mu$ V/m) | Azimuth | Polarity (H/V) | Factors (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) |
|-----------------|---------------------------|---------|----------------|------------------------|----------------------|-------------|
| 0.125           | 68.14                     | 142     | H              | -56.77                 | 105.7                | -37.56      |
| 2.02            | 40.55                     | 47      | H              | -54.32                 | 69.5                 | -28.95      |
| 14.25           | 35.22                     | 205     | H              | -52.16                 | 69.5                 | -34.28      |
| 0.125           | 72.14                     | 185     | V              | -56.01                 | 105.7                | -33.56      |
| 3.68            | 42.74                     | 270     | V              | -53.12                 | 69.5                 | -26.76      |
| 17.35           | 36.24                     | 164     | V              | -51.31                 | 69.5                 | -33.26      |

Part 15 Section 15.31(f)(2) (9kHz-30MHz)

Limit at 3m=Limit at 300m-40\*log(300(m)/3(m))

Limit at 3m=Limit at 30m-40\*log(30(m)/3(m))



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Job No.: ricky2015 #818

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Access Control Keypad with Proxini

Mode: TX

Model: DK2852

Manufacturer: AEI

Polarization: Horizontal

Power Source: DC 12V

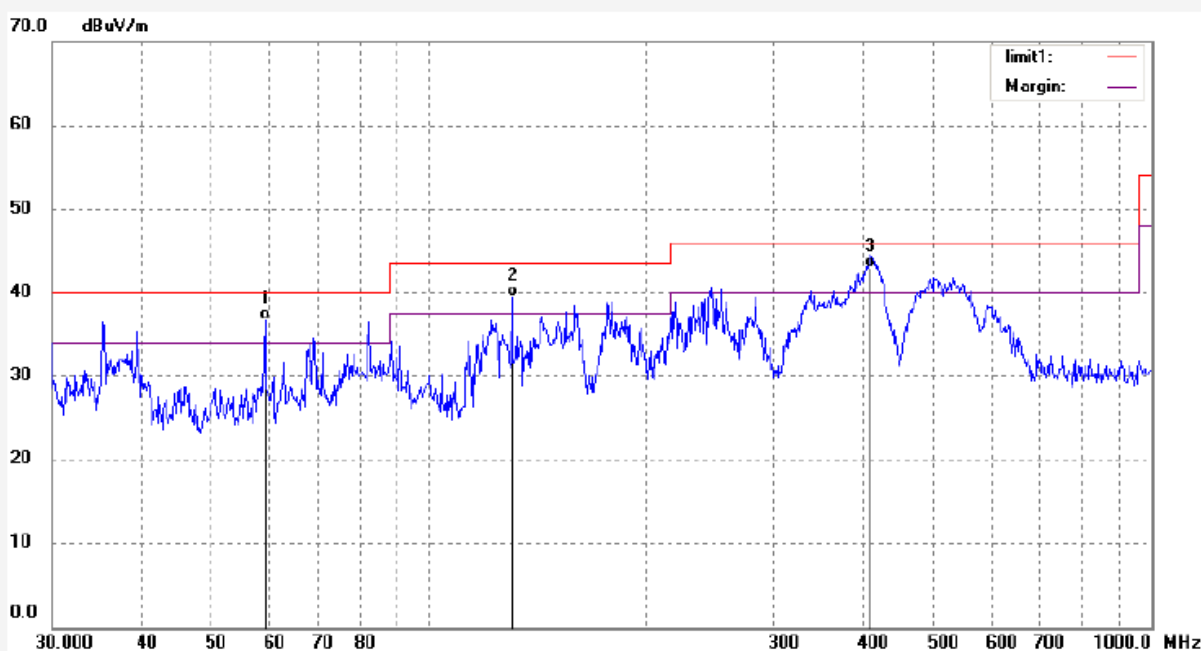
Date: 15/09/14/

Time: 9/17/50

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20151934



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 59.1052        | 69.31               | -32.61         | 36.70              | 40.00             | -3.30          | QP       |                |                  |        |
| 2   | 130.3048       | 71.47               | -32.05         | 39.42              | 43.50             | -4.08          | QP       |                |                  |        |
| 3   | 408.2137       | 73.85               | -30.94         | 42.91              | 46.00             | -3.09          | QP       |                |                  |        |



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Job No.: ricky2015 #819

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Access Control Keypad with Proxini

Mode: TX

Model: DK2852

Manufacturer: AEI

Polarization: Vertical

Power Source: DC 12V

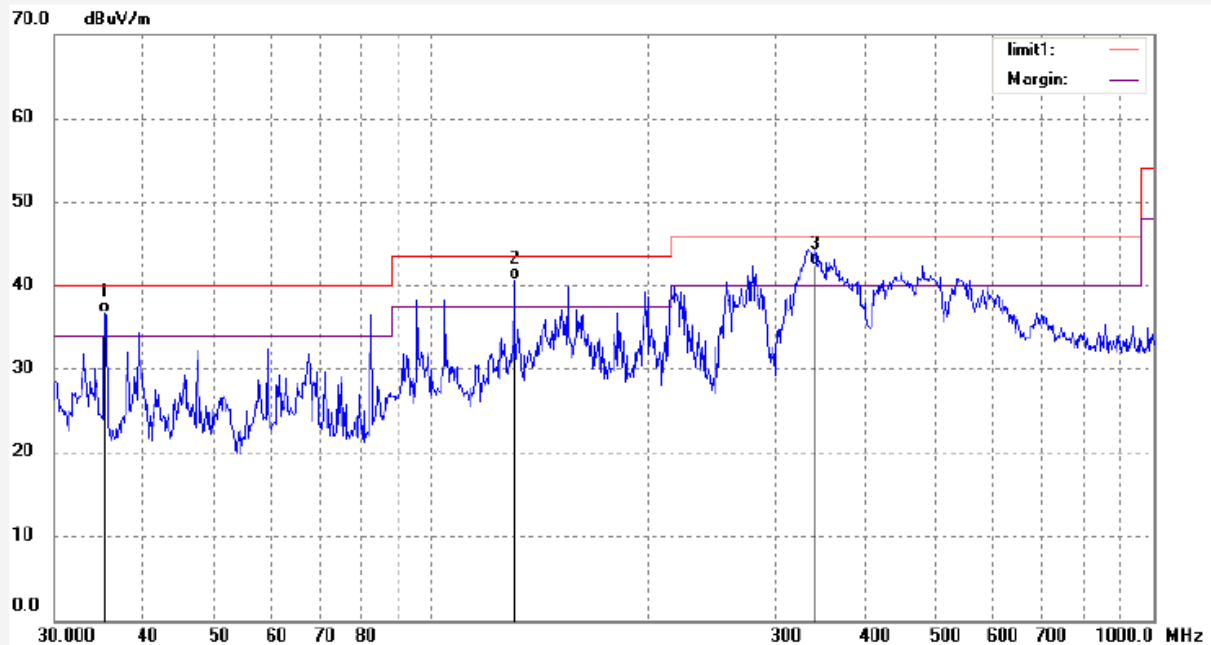
Date: 15/09/14/

Time: 9/19/47

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20151934



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 35.2625        | 69.45               | -32.80         | 36.65              | 40.00             | -3.35          | QP       |                |                  |        |
| 2   | 130.3048       | 72.79               | -32.05         | 40.74              | 43.50             | -2.76          | QP       |                |                  |        |
| 3   | 340.0473       | 73.48               | -31.05         | 42.43              | 48.00             | -3.57          | QP       |                |                  |        |



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Job No.: ricky2015 #814

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Access Control Keypad with Proxini

Mode: TX

Model: DK2852

Manufacturer: AEI

Polarization: Horizontal

Power Source: DC 24V

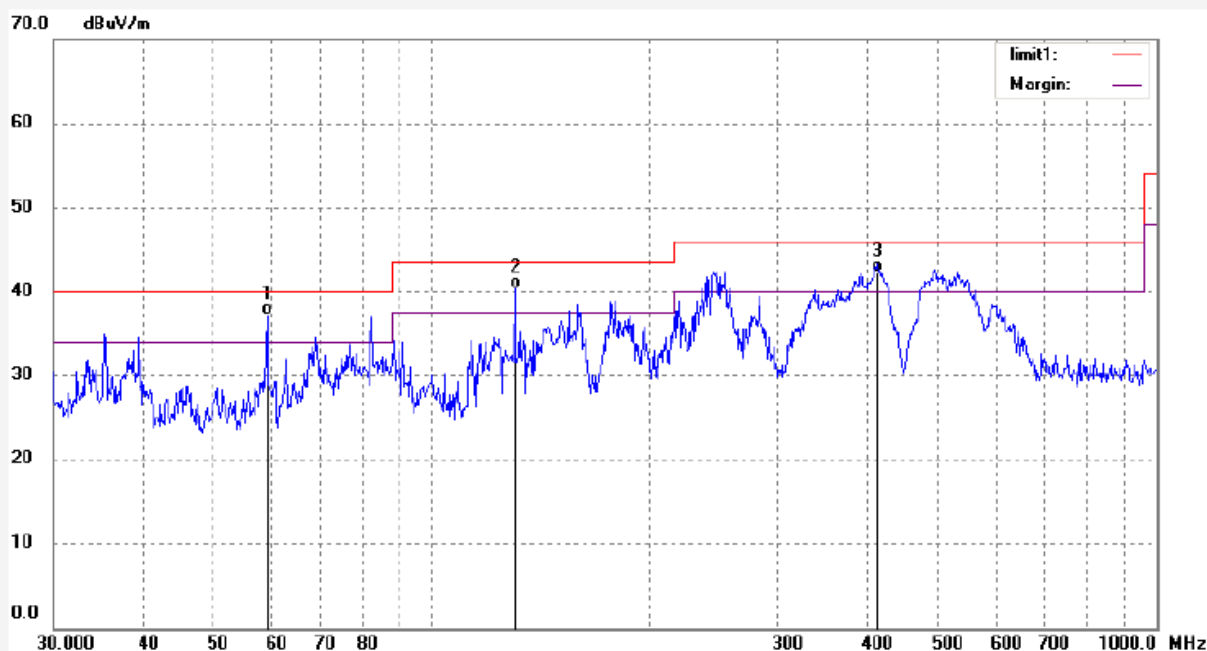
Date: 15/09/14/

Time: 9/13/22

Engineer Signature: Frank

Distance: 3m

Note: Report NO.: ATE20151934



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 59.1052     | 69.81            | -32.61      | 37.20           | 40.00          | -2.80       | QP       |             |               |        |
| 2   | 130.3048    | 72.47            | -32.05      | 40.42           | 43.50          | -3.08       | QP       |             |               |        |
| 3   | 412.5394    | 73.18            | -30.91      | 42.27           | 46.00          | -3.73       | QP       |             |               |        |



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Job No.: ricky2015 #815

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Access Control Keypad with Proxini

Mode: TX

Model: DK2852

Manufacturer: AEI

Polarization: Vertical

Power Source: DC 24V

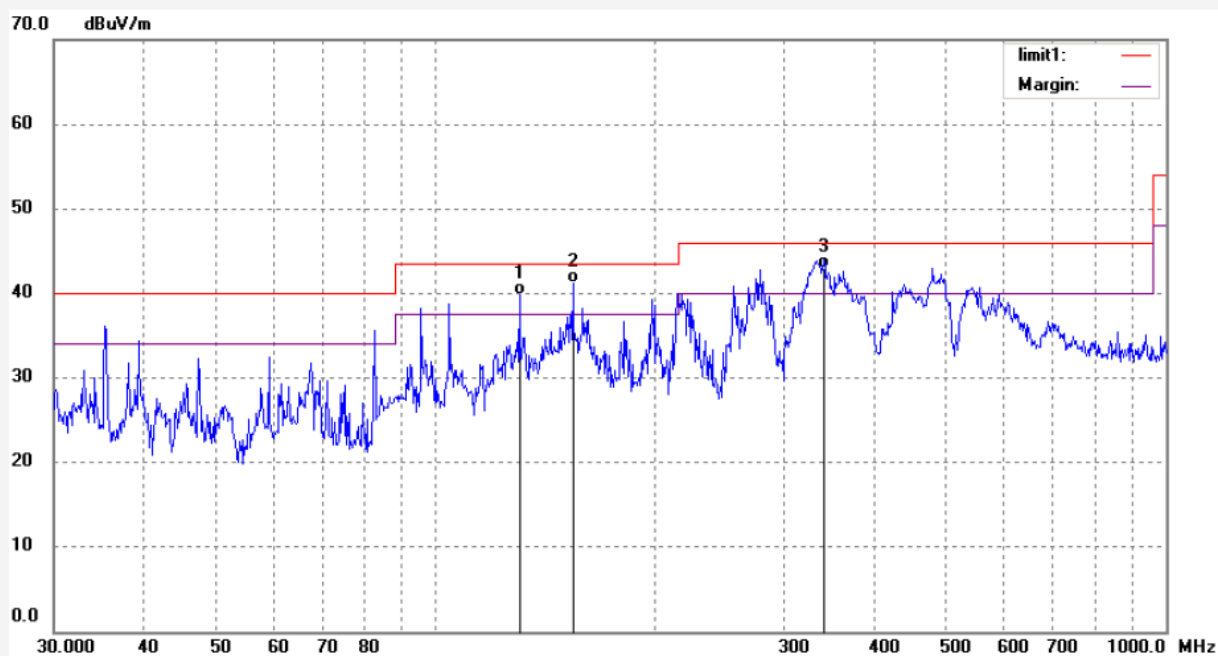
Date: 15/09/14/

Time: 9/15/55

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20151934



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 130.3048       | 71.79               | -32.05         | 39.74              | 43.50             | -3.76          | QP       |                |                  |        |
| 2   | 154.2427       | 73.19               | -31.89         | 41.30              | 43.50             | -2.20          | QP       |                |                  |        |
| 3   | 340.0473       | 73.98               | -31.05         | 42.93              | 46.00             | -3.07          | QP       |                |                  |        |



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Job No.: Ricky2015 #734

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Access Control Keypad with Proxini

Mode: TX

Model: DK2852

Manufacturer: AEI

Polarization: Horizontal

Power Source: AC 12V

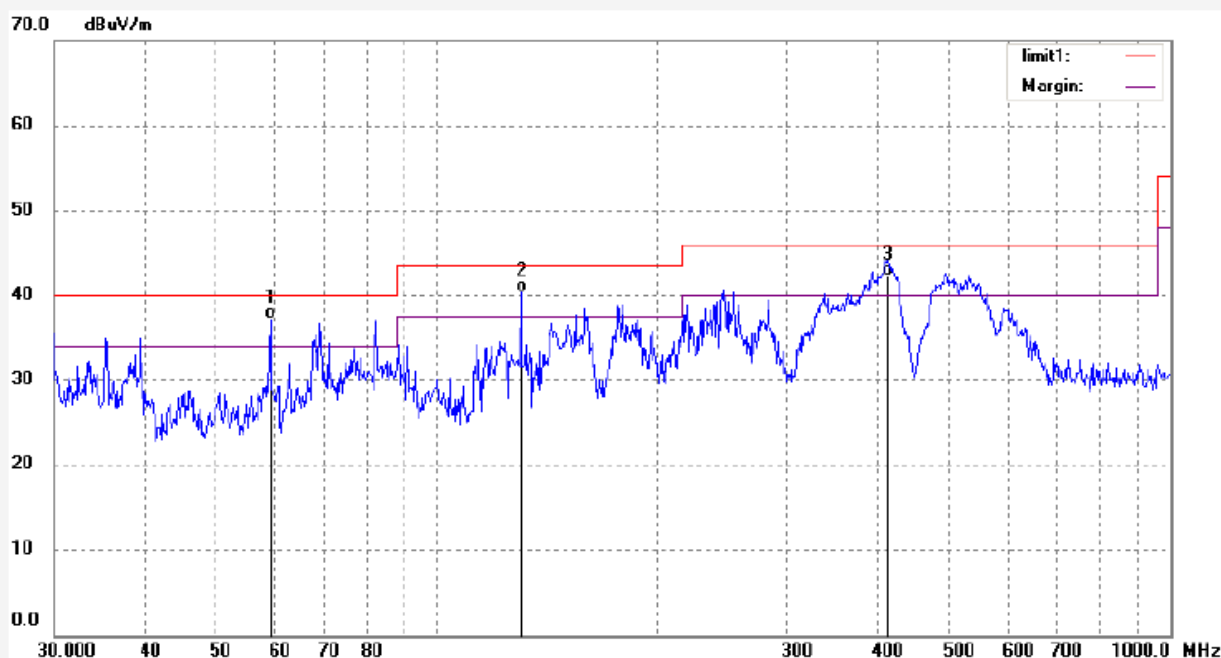
Date: 15/09/04/

Time: 12/11/50

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20151934



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 59.1052     | 71.31            | -34.11      | 37.20           | 40.00          | -2.80       | QP       |             |               |        |
| 2   | 130.3048    | 71.17            | -30.75      | 40.42           | 43.50          | -3.08       | QP       |             |               |        |
| 3   | 412.5395    | 71.53            | -29.26      | 42.27           | 46.00          | -3.73       | QP       |             |               |        |



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Job No.: Ricky2015 #735

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Access Control Keypad with Proximi

Mode: TX

Model: DK2852

Manufacturer: AEI

Polarization: Vertical

Power Source: AC 12V

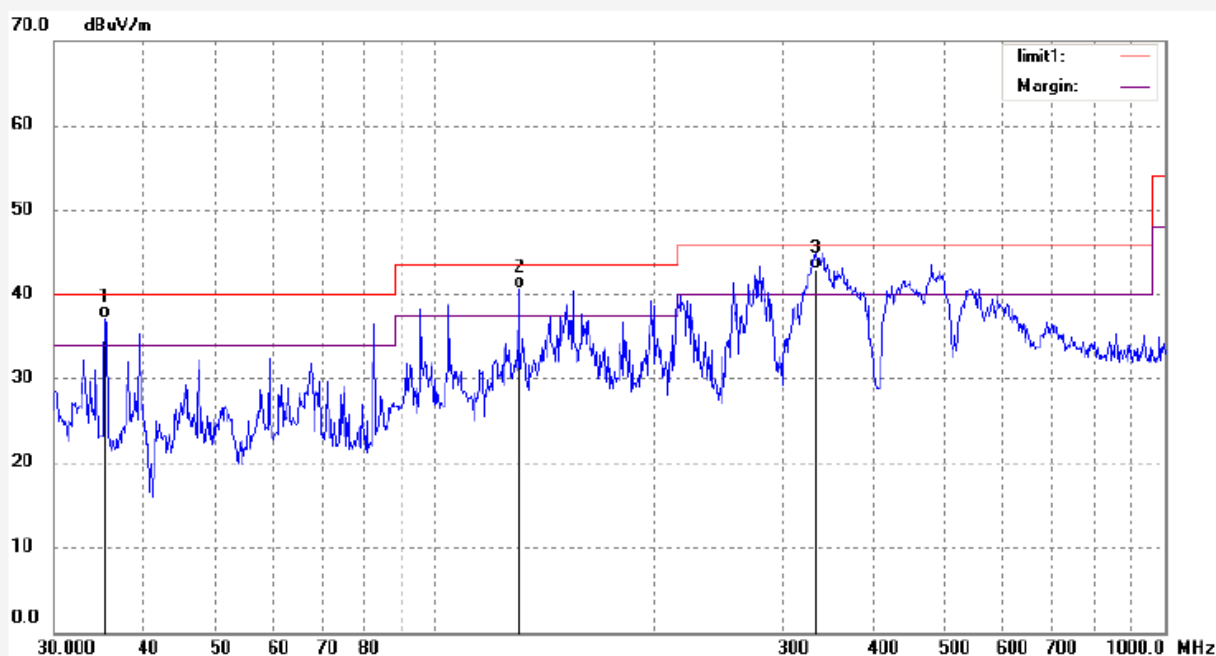
Date: 15/09/04/

Time: 12/16/03

Engineer Signature: Frank

Distance: 3m

Note: Report NO.: ATE20151934



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 35.2626        | 69.95               | -32.80         | 37.15              | 40.00             | -2.85          | QP       |                |                  |        |
| 2   | 130.3048       | 71.49               | -30.75         | 40.74              | 43.50             | -2.76          | QP       |                |                  |        |
| 3   | 331.7858       | 72.40               | -29.49         | 42.91              | 46.00             | -3.09          | QP       |                |                  |        |





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Job No.: ricky2015 #810

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Access Control Keypad with Proxini

Mode: TX

Model: DK2852

Manufacturer: AEI

Polarization: Horizontal

Power Source: AC 24V

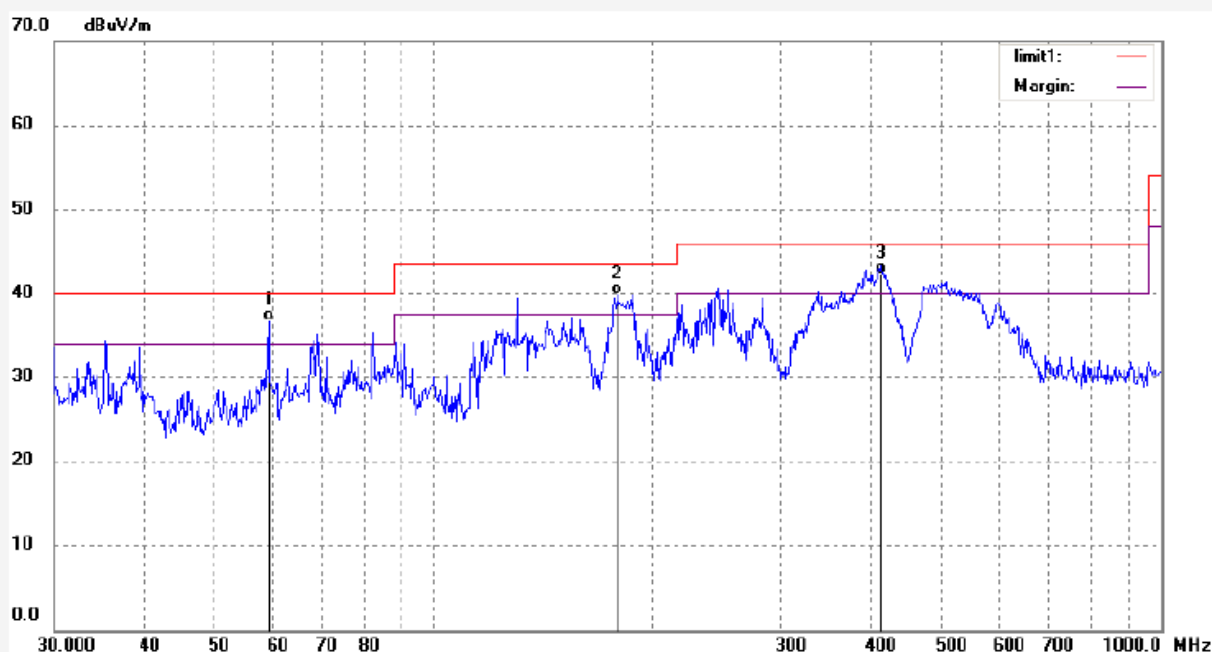
Date: 15/09/14/

Time: 9/09/15

Engineer Signature: Frank

Distance: 3m

Note: Report NO.: ATE20151934



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 59.1052        | 69.31               | -32.61         | 36.70              | 40.00             | -3.30          | QP       |                |                  |        |
| 2   | 178.7697       | 71.63               | -31.78         | 39.85              | 43.50             | -3.65          | QP       |                |                  |        |
| 3   | 412.5394       | 73.18               | -30.91         | 42.27              | 46.00             | -3.73          | QP       |                |                  |        |



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Job No.: ricky2015 #811

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: Access Control Keypad with Proxini

Mode: TX

Model: DK2852

Manufacturer: AEI

Polarization: Vertical

Power Source: AC 24V

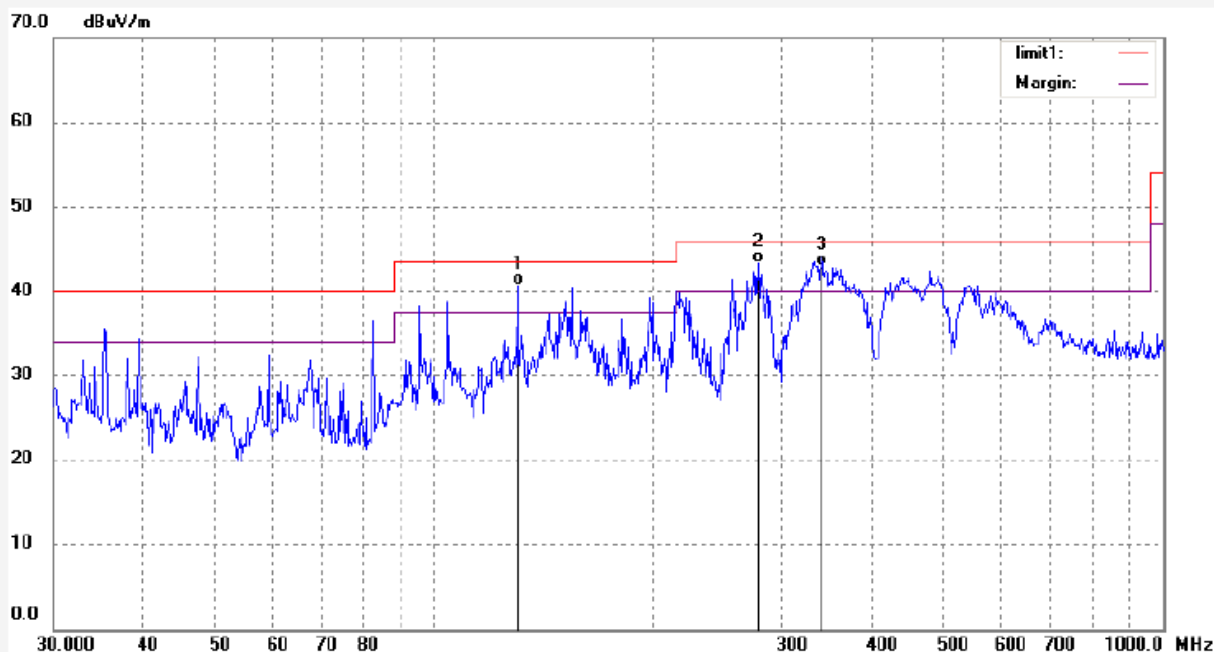
Date: 15/09/14/

Time: 9/11/21

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20151934



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 130.3048    | 72.79            | -32.05      | 40.74           | 43.50          | -2.76       | QP       |             |               |        |
| 2   | 278.3308    | 74.77            | -31.40      | 43.37           | 46.00          | -2.63       | QP       |             |               |        |
| 3   | 340.0473    | 73.98            | -31.05      | 42.93           | 46.00          | -3.07       | QP       |             |               |        |

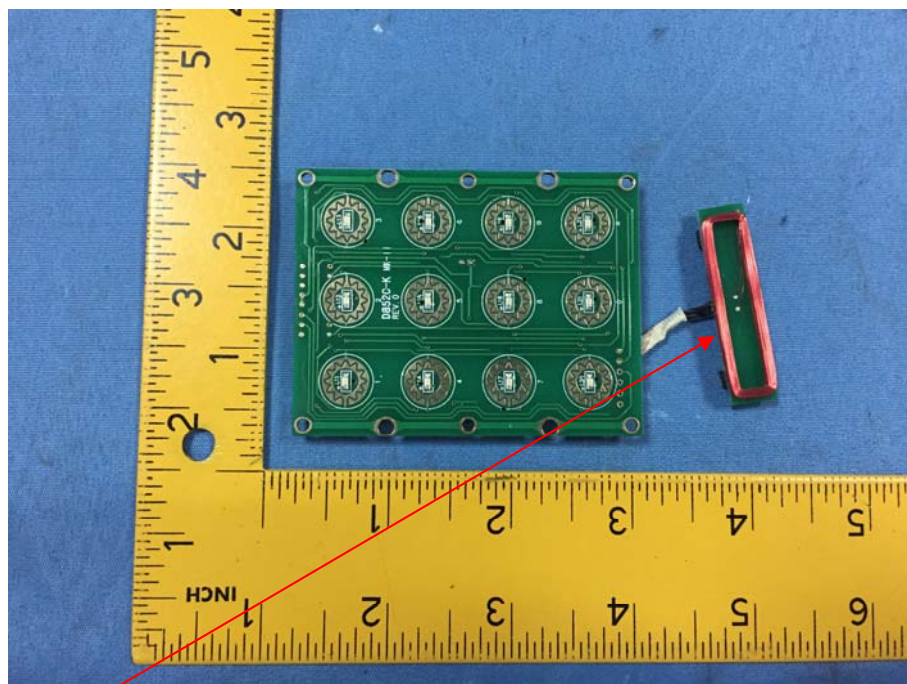
## 5. ANTENNA REQUIREMENT

### 5.1.The Requirement

According to Section 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.

### 5.2.Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Antenna gain of EUT is 0dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna