

### APPLICATION CERTIFICATION FCC Part 15C On Behalf of HONG KONG NATURAL SOUND ELECTRONICS LIMITED

### MID Model No.: PC1015BXC,Trio-Stealth G4 10.1,MST-1041

### FCC ID: PWK-PC1015BXC

| Prepared for           | : | HONG KONG NATURAL SOUND ELECTRONICS<br>LIMITED   |
|------------------------|---|--|
| Address                | : | FLAT/RM M 4/F CONTINENTAL MANSION 300<br>KING'S ROAD HONG KONG   |
| Prepared by<br>Address |   | ACCURATE TECHNOLOGY CO., LTD<br>F1, Bldg. A, Chan Yuan New Material Port, Keyuan<br>Rd. Science & Industry Park, Nan Shan, Shenzhen,<br>Guangdong P.R. China |
|                        |   | Tel: (0755) 26503290<br>Fax: (0755) 26503396   |

| Report Number  | : | ATE20140662    |
|----------------|---|----------------|
| Date of Test   | : | May 01-16,2014 |
| Date of Report | : | May 16,2014    |



### **TABLE OF CONTENTS**

## Description

Page

| Т  | est Re       | eport Certification   |        |
|----|--------------|---|--------|
| 1. | GE           | NERAL INFORMATION   | 5      |
|    | 1.1.         | Description of Device (EUT)   | 5      |
|    | 1.2.         | Carrier Frequency of Channels   | 5      |
|    | 1.3.         | Special Accessory and Auxiliary Equipment                                 |        |
|    | 1.4.         | Description of Test Facility  |        |
|    | 1.5.         | Measurement Uncertainty   |        |
| 2. |              | ASURING DEVICE AND TEST EQUIPMENT   |        |
| 3. | OP           | ERATION OF EUT DURING TESTING   |        |
|    | 3.1.         | Operating Mode  | 9      |
|    | 3.2.         | Configuration and peripherals   |        |
| 4. | TE           | ST PROCEDURES AND RESULTS   |        |
| 5. | PO           | WER LINE CONDUCTED MEASUREMENT  |        |
|    | 5.1.         | Block Diagram of Test Setup   | 47     |
|    | 5.2.         | Power Line Conducted Emission Measurement Limits                          |        |
|    | 5.3.         | Configuration of EUT on Measurement                                       |        |
|    | 5.4.         | Operating Condition of EUT  |        |
|    | 5.5.         | Test Procedure  |        |
| _  | 5.6.         | Power Line Conducted Emission Measurement Results                         |        |
| 6. |              | B BANDWIDTH MEASUREMENT   |        |
|    | 6.1.         | Block Diagram of Test Setup   |        |
|    | 6.2.         | The Requirement For Section 15.247(a)(2)                                  |        |
|    | 6.3.<br>6.4. | EUT Configuration on Measurement<br>Operating Condition of EUT            |        |
|    | 6.4.<br>6.5. | Test Procedure  |        |
|    | 6.6.         | Test Result   |        |
| 7. |              | XIMUM PEAK OUTPUT POWER   |        |
|    | 7.1.         | Block Diagram of Test Setup   |        |
|    | 7.2.         | The Requirement For Section 15.247(b)(3)                                  |        |
|    | 7.3.         | EUT Configuration on Measurement  |        |
|    | 7.4.         | Operating Condition of EUT  | 14     |
|    | 7.5.         | Test Procedure  |        |
|    | 7.6.         | Test Result   |        |
| 8. | PO           | WER SPECTRAL DENSITY MEASUREMENT  |        |
|    | 8.1.         | Block Diagram of Test Setup   | 17     |
|    | 8.2.         | The Requirement For Section 15.247(e)                                     |        |
|    | 8.3.         | EUT Configuration on Measurement  |        |
|    | 8.4.         | Operating Condition of EUT  |        |
|    | 8.5.<br>8.6. | Test Procedure<br>Test Result   |        |
| Δ  |              |   |        |
| 9. |              | ND EDGE COMPLIANCE TEST   |        |
|    | 9.1.         | Block Diagram of Test Setup   |        |
|    | 9.2.<br>9.3. | The Requirement For Section 15.247(d)<br>EUT Configuration on Measurement |        |
|    | 9.3.<br>9.4. | Operating Condition of EUT  |        |
|    | Z.T.         | operating condition of Do I   | •••••• |

| - |  |  |
|---|--|--|

| 9.5.   | Test Procedure   |                                      |
|--------|--|--------------------------------------|
| 9.6.   | Test Result  |                                      |
| 10. RA | DIATED SPURIOUS EMISSION TEST                                |                                      |
| 10.1.  | Block Diagram of Test Setup                                  |                                      |
| 10.2.  | The Limit For Section 15.247(d)                              |                                      |
| 10.3.  | Restricted bands of operation                                |                                      |
| 10.4.  | Configuration of EUT on Measurement                          |                                      |
| 10.5.  | Operating Condition of EUT                                   |                                      |
| 10.6.  | Test Procedure   |                                      |
| 10.7.  | The Field Strength of Radiation Emission Measurement Results |                                      |
| 11. CO | NDUCTED SPURIOUS EMISSION COMPLIANCE TEST                    | 43                                   |
| 11.1.  | Block Diagram of Test Setup                                  |                                      |
| 11.2.  | The Requirement For Section 15.247(d)                        |                                      |
| 11.3.  | EUT Configuration on Measurement                             |                                      |
| 11.4.  | Operating Condition of EUT                                   | 44                                   |
| 11.5.  | Test Procedure   | 44                                   |
|        |  | ···································· |
| 11.6.  | Test Result  |                                      |
|        |  | 44                                   |
|        | Test Result  | 44<br><b>51</b>                      |



### Test Report Certification

| Applicant | : HONG KONG NATURAL SOUND ELECTRONICS LIMITED |
|-----------|---|
| - pp      |   |

Manufacturer : Natural Sound Electronics (Shenzhen) Co., Ltd.

EUT Description : MID

- (A) MODEL NO.: PC1015BXC, Trio-Stealth G4 10.1, MST-1041
- (B) Trade Name .: N/A
- (C) POWER SUPPLY: DC 3.7V (Powered by battery) or DC 5V (Powered by adapter)

Measurement Procedure Used:

#### FCC Rules and Regulations Part 15 Subpart C Section 15.247 ANSI C63.4: 2009

The EUT was tested according to DTS test procedure of April 09, 2013 KDB558074 D01 DTS Meas Guidance v03 for compliance to FCC 47CFR 15.247 requirements

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 Section 15.247 limits. 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 :

Prepared by :

May 01-16,2014

(Engineer)

Approved & Authorized Signer :

(Sean Liu, Manager)



## **1. GENERAL INFORMATION**

## 1.1.Description of Device (EUT)

| EUT                     | : | MID   |
|-------------------------|---|---|
| Model Number            | : | PC1015BXC,Trio-Stealth G4 10.1,MST-1041<br>Note: These samples are same except for the model<br>number is difference. So we prepare the PC1015BXC for<br>test |
| Frequency Range         | : | 802.11b/g/n(20MHz): 2412-2462MHz<br>802.11n(40MHz): 2422-2452MHz<br>Bluetooth 4.0: 2402-2480MHz   |
| Number of Channels      | : | 802.11b/g/n (20MHz):11<br>802.11n (40MHz): 7<br>Bluetooth 4.0LE:40  |
| Antenna Gain            | : | 1.0dBi  |
| Power Supply            | : | DC 5V (Power by adapter)&DC 3.7V(Battery)   |
| Adapter                 | : | Model number: FY0502000<br>Input: AC 100-240V; 50/60Hz 0.6A<br>Output: DC 5V/2.0A<br>USB line: Non-shielded, Non-detachable, 1.5m                             |
| Modulation mode         | : | GFSK<br>DSSS,OFDM   |
| Applicant               | : | HONG KONG NATURAL SOUND ELECTRONICS<br>LIMITED  |
| Address                 | : | FLAT/RM M 4/F CONTINENTAL MANSION 300<br>KING'S ROAD HONG KONG  |
| Manufacturer            | : | Natural Sound Electronics (Shenzhen) Co., Ltd.  |
| Address                 | : | 4th Building, Xinyuan Industrial Zone, Gushu Village,<br>Bao'an District, Shenzhen, China   |
| Date of sample received | : | May 01, 2014  |
| Date of Test            | : | May 01-16,2014  |



| Channel | Frequceny<br>(MHz) | Channel | Frequceny<br>(MHz) | Channel | Frequceny<br>(MHz) | Channe<br>1 | Frequceny<br>(MHz) |
|---------|--------------------|---------|--------------------|---------|--------------------|-------------|--------------------|
| 0       | 2402               | 10      | 2422               | 20      | 2442               | 30          | 2462               |
| 1       | 2404               | 11      | 2424               | 21      | 2444               | 31          | 2464               |
| 2       | 2406               | 12      | 2426               | 22      | 2446               | 32          | 2466               |
| 3       | 2408               | 13      | 2428               | 23      | 2448               | 33          | 2468               |
| 4       | 2410               | 14      | 2430               | 24      | 2450               | 34          | 2470               |
| 5       | 2412               | 15      | 2432               | 25      | 2452               | 35          | 2472               |
| 6       | 2414               | 16      | 2434               | 26      | 2454               | 36          | 2474               |
| 7       | 2416               | 17      | 2436               | 27      | 2456               | 37          | 2476               |
| 8       | 2418               | 18      | 2438               | 28      | 2458               | 38          | 2478               |
| 9       | 2420               | 19      | 2440               | 29      | 2460               | 39          | 2480               |

## 1.2.Carrier Frequency of Channels

## 1.3. Special Accessory and Auxiliary Equipment

N/A



# 1.4.Description of Test Facility

| EMC Lab       | : | Accredited by TUV Rheinland Shenzhen   |
|---------------|---|--|
|               |   | Listed by FCC<br>The Registration Number is 752051   |
|               |   | Listed by Industry Canada<br>The Registration Number is 5077A-2  |
|               |   | Accredited by China National Accreditation Committee<br>for Laboratories<br>The Certificate Registration Number is L3193 |
| Name of Firm  |   | ACCURATE TECHNOLOGY CO. LTD  |
| Site Location | : | F1, Bldg. A, Changyuan New Material Port, Keyuan Rd.<br>Science & Industry Park, Nanshan, Shenzhen, Guangdong            |
|               |   | Science & Industry Park, Nanshan, Shenzhen, Guangdong P.R. China   |

## 1.5.Measurement Uncertainty

| Conducted Emission Expanded Uncertainty                | = | 2.23dB, k=2 |
|--|---|-------------|
| Radiated emission expanded uncertainty (9kHz-30MHz)    | = | 3.08dB, k=2 |
| Radiated emission expanded uncertainty (30MHz-1000MHz) | = | 4.42dB, k=2 |
| Radiated emission expanded uncertainty (Above 1GHz)    | = | 4.06dB, k=2 |



# 2. MEASURING DEVICE AND TEST EQUIPMENT

|                    |                           |   |            | 1                |                  |
|--------------------|---------------------------|---|------------|------------------|------------------|
| Kind of equipment  | Manufacturer              | Туре                                    | S/N        | Calibrated dates | Calibrated until |
| EMI Test Receiver  | Rohde&Schwarz             | ESCS30                                  | 100307     | Jan. 11, 2014    | Jan. 10, 2015    |
| EMI Test Receiver  | Rohde&Schwarz             | ESPI3                                   | 101526/003 | Jan. 11, 2014    | Jan. 10, 2015    |
| Spectrum Analyzer  | Agilent                   | E7405A                                  | MY45115511 | Jan. 11, 2014    | Jan. 10, 2015    |
| Pre-Amplifier      | Rohde&Schwarz             | CBLU118354<br>0-01                      | 3791       | Jan. 11, 2014    | Jan. 10, 2015    |
| Loop Antenna       | Schwarzbeck               | FMZB1516                                | 1516131    | Jan. 15, 2014    | Jan. 14, 2015    |
| Bilog Antenna      | Schwarzbeck               | VULB9163                                | 9163-323   | Jan. 15, 2014    | Jan. 14, 2015    |
| Horn Antenna       | Schwarzbeck               | BBHA9120D                               | 9120D-655  | Jan. 15, 2014    | Jan. 14, 2015    |
| Horn Antenna       | Schwarzbeck               | BBHA9170                                | 9170-359   | Jan. 15, 2014    | Jan. 14, 2015    |
| LISN               | Rohde&Schwarz             | ESH3-Z5                                 | 100305     | Jan. 11, 2014    | Jan. 10, 2015    |
| LISN               | Schwarzbeck               | NSLK8126                                | 8126431    | Jan. 11, 2014    | Jan. 10, 2015    |
| Highpass Filter    | Wainwright<br>Instruments | WHKX3.6/18<br>G-10SS                    | N/A        | Jan. 11, 2014    | Jan. 10, 2015    |
| Band Reject Filter | Wainwright<br>Instruments | WRCG2400/2<br>485-2375/2510<br>-60/11SS | N/A        | Jan. 11, 2014    | Jan. 10, 2015    |

### Table 1: List of Test and Measurement Equipment



## 3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: **BLE Transmitting mode** Low Channel: 2402MHz Middle Channel: 2440MHz High Channel: 2480MHz

### 3.2. Configuration and peripherals

|            | EUT           | ]            |  |
|------------|---------------|--------------|--|
| Figure 1 S | Setup: Transm | nitting mode |  |



# 4. TEST PROCEDURES AND RESULTS

| FCC Rules                           | Description of Test              | Result    |
|-------------------------------------|----------------------------------|-----------|
| Section 15.207                      | Power Line Conducted Emission    | Compliant |
| Section 15.247(a)(2)                | 6dB Bandwidth Test               | Compliant |
| Section 15.247(e)                   | Power Spectral Density Test      | Compliant |
| Section 15.247(b)(3)                | Maximum Peak Output Power Test   | Compliant |
| Section 15.247(d)                   | Band Edge Compliance Test        | Compliant |
| Section 15.247(d)<br>Section 15.209 | Radiated Spurious Emission Test  | Compliant |
| Section 15.247(d)                   | Conducted Spurious Emission Test | Compliant |
| Section 15.203                      | Antenna Requirement              | Compliant |



## 5. 6DB BANDWIDTH MEASUREMENT

#### 5.1.Block Diagram of Test Setup





5.2. The Requirement For Section 15.247(a)(2)

Section 15.247(a)(2): Systems using digital modulation techniques may operate in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

#### 5.3.EUT Configuration on Measurement

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

#### 5.4. Operating Condition of EUT

- 5.4.1.Setup the EUT and simulator as shown as Section 5.1.
- 5.4.2.Turn on the power of all equipment.
- 5.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2402-2480 MHz. We select 2402MHz, 2440MHz, and 2480MHz TX frequency to transmit.



### 5.5.Test Procedure

- 5.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 5.5.2.Set RBW of spectrum analyzer to 100 kHz and VBW to300 kHz.
- 5.5.3.The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

#### 5.6.Test Result

| Channel | Frequency<br>(MHz) | 6 dB Bandwith<br>(MHz) | Minimum<br>Limit(MHz) | PASS/FAIL |
|---------|--------------------|------------------------|-----------------------|-----------|
| 0       | 2402               | 0.6975                 | 0.5                   | PASS      |
| 19      | 2440               | 0. 6975                | 0.5                   | PASS      |
| 39      | 2480               | 0. 6946                | 0.5                   | PASS      |

The spectrum analyzer plots are attached as below.

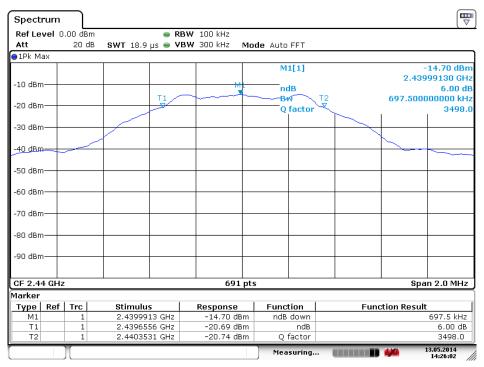
| Spect    | rum   |         |          |        |                   |       |         |        |     |             |                        |
|----------|-------|---------|----------|--------|-------------------|-------|---------|--------|-----|-------------|------------------------|
| Ref Le   | vel 0 | .00 dBm |          | e R    | <b>BW</b> 100 kHz |       |         |        |     |             |                        |
| Att      |       | 20 dB   | SWT 18.9 | µs 👄 🗸 | <b>BW</b> 300 kHz | Mo    | de Auto | FFT    |     |             |                        |
| ∋1Pk M   | ах    |         |          |        |                   |       |         |        |     |             |                        |
|          |       |         |          |        |                   | Т     | Mi      | l[1]   |     |             | -14.63 dBm             |
| -10 dBm  |       |         |          |        |                   |       |         |        |     | 2.40        | 224600 GHz             |
| -10 uBn  |       |         |          |        |                   |       | nd      |        |     |             | 6.00 dB                |
| -20 dBm  |       |         |          | T1     |                   | Τ-    | Br      | · \    | T2  | 697.500     | 000000 kHz             |
| -20 UBII |       |         |          | -      |                   |       | Q       | factor |     |             | 3443.9                 |
| -30 dBm  |       |         |          |        |                   |       |         |        |     |             |                        |
| -30 UBI  |       |         |          |        |                   |       |         |        |     |             |                        |
| -40 dBm  |       |         | 1        |        |                   |       |         |        |     |             |                        |
| -40 UBII |       |         |          |        |                   |       |         |        |     |             | $\sim$                 |
| -50 dBm  |       |         |          |        |                   |       |         |        |     |             |                        |
| -эр авп  |       |         |          |        |                   |       |         |        |     |             |                        |
| -60 dBm  |       |         |          |        |                   |       |         |        |     |             |                        |
| -00 UBII |       |         |          |        |                   |       |         |        |     |             |                        |
| -70 dBm  |       |         |          |        |                   |       |         |        |     |             |                        |
| -70 ubii |       |         |          |        |                   |       |         |        |     |             |                        |
| -80 dBm  |       |         |          |        |                   |       |         |        |     |             |                        |
| -00 0011 |       |         |          |        |                   |       |         |        |     |             |                        |
| -90 dBm  |       |         |          |        |                   |       |         |        |     |             |                        |
| -90 UDII | ·     |         |          |        |                   |       |         |        |     |             |                        |
|          |       |         |          |        |                   |       |         |        |     |             |                        |
| CF 2.40  | 02 GH | lz      |          |        | 69:               | 1 pts | ;       |        |     | Sp          | an 2.0 MHz             |
| Marker   |       |         |          |        |                   |       |         |        |     |             |                        |
| Туре     | Ref   | Trc     | Stimulu  | s      | Response          |       | Funct   | ion    | Fur | nction Resu | t (                    |
| M1       |       | 1       | 2.4022   |        | -14.63 d          |       | ndB     | down   |     |             | 697.5 kHz              |
| Τ1       |       | 1       | 2.40165  |        | -20.65 d          |       |         | ndB    |     |             | 6.00 dB                |
| T2       |       | 1       | 2.40235  | 31 GHz | -20.67 d          | Bm    | Qf      | actor  |     |             | 3443.9                 |
|          |       | )[]     |          |        |                   |       | Meas    | suring |     |             | 13.05.2014<br>14:24:56 |

#### channel 0

Date: 13.MAY.2014 14:24:57

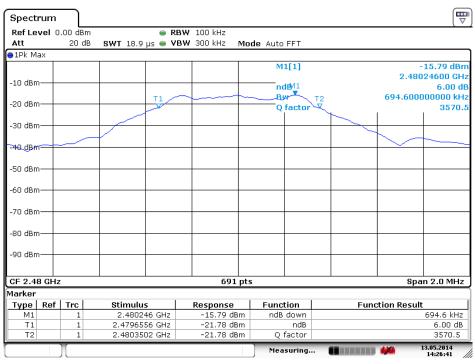


channel 19



Date: 13.MAY.2014 14:26:02

channel 39

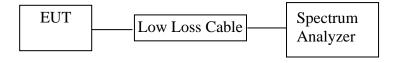


Date: 13.MAY.2014 14:26:40



## 6. MAXIMUM PEAK OUTPUT POWER

#### 6.1.Block Diagram of Test Setup





6.2. The Requirement For Section 15.247(b)(3)

Section 15.247(b)(3): For systems using digital modulation in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands: 1 Watt.

#### 6.3.EUT Configuration on Measurement

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

#### 6.4. Operating Condition of EUT

6.4.1.Setup the EUT and simulator as shown as Section 6.1.

- 6.4.2.Turn on the power of all equipment.
- 6.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2402-2480 MHz. We select 2402MHz, 2440MHz, and 2480MHz TX frequency to transmit.



#### **6.5.Test Procedure**

- 6.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 6.5.2.Test method is options 1 from KDB558074 D01 DTS Meas Guidance v03
- 6.5.3.Set RBW of spectrum analyzer to 1 MHz and VBW to 3 MHz.
- 6.5.4.Measurement the maximum peak output power.

| 6.6.Test Result |
|-----------------|
|-----------------|

| Channel | Frequency<br>(MHz) | Peak Power<br>Output<br>(dBm) | Peak Power<br>Limit<br>(dBm) | Pass / Fail |
|---------|--------------------|-------------------------------|------------------------------|-------------|
| 0       | 2402               | -9.12                         | 30                           | PASS        |
| 19      | 2440               | -9.09                         | 30                           | PASS        |
| 39      | 2480               | -8.64                         | 30                           | PASS        |

The spectrum analyzer plots are attached as below.

| Spectrum           |            |                 |                 |            |         |   |      |            |
|--------------------|------------|-----------------|-----------------|------------|---------|---|------|------------|
| Ref Level 0.00 dBr | n          | ● RBW 11        | MH <sub>2</sub> |            |         |   |      | (*         |
| Att 20 d           |            | е <b>VBW</b> Зг |                 | le Auto Sv | /een    |   |      |            |
| 1Pk Max            | - 01111113 | <u> </u>        |                 | o Hato of  | , oop   |   |      |            |
|                    |            | T T             |                 |            | M1[1]   |   |      | -9.12 dBn  |
|                    |            |                 |                 |            | M1      |   | 2.40 | 219680 GH  |
| -10 dBm            |            |                 |                 |            | ¥       |   |      |            |
|                    |            |                 |                 |            |         |   |      | <u> </u>   |
| -20 dBm            |            |                 |                 |            |         |   |      |            |
|                    |            |                 |                 |            |         |   |      |            |
| -30 dBm            |            |                 |                 |            |         |   |      |            |
| -30 UBIII          |            |                 |                 |            |         |   |      |            |
|                    |            |                 |                 |            |         |   |      |            |
| -40 dBm            |            |                 |                 |            |         |   |      |            |
|                    |            |                 |                 |            |         |   |      |            |
| -50 dBm            |            |                 |                 |            |         |   |      |            |
|                    |            |                 |                 |            |         |   |      |            |
| -60 dBm            |            |                 |                 |            |         |   |      |            |
|                    |            |                 |                 |            |         |   |      |            |
| -70 dBm            |            |                 |                 |            |         |   |      |            |
|                    |            |                 |                 |            |         |   |      |            |
| 00 d0              |            |                 |                 |            |         |   |      |            |
| -80 dBm            |            |                 |                 |            |         |   |      |            |
|                    |            |                 |                 |            |         |   |      |            |
| -90 dBm            |            |                 |                 |            |         |   |      |            |
|                    |            |                 |                 |            |         |   |      |            |
| CF 2.402 GHz       |            |                 | 691             | nts        |         | I | Sn   | an 2.0 MHz |
|                    |            |                 |                 |            |         |   |      | 13.05.2014 |
|                    |            |                 |                 | Me         | asuring |   |      | 14:28:55   |

channel 0

Date: 13.MAY.2014 14:28:55



#### channel 19

| Ref Level 0.00 dBm |            |           |      |            |          |   |       |                        |
|--------------------|------------|-----------|------|------------|----------|---|-------|------------------------|
|                    |            | RBW 1 MHz |      |            |          |   |       |                        |
| Att 20 dB          | SWT 1 ms 👄 | VBW 3 MHz | Mode | e Auto Swe | эер      |   |       |                        |
| 1Pk Max            |            |           |      |            |          |   |       |                        |
|                    |            |           |      | M<br>M1    | 1[1]     |   | 9.440 | -9.09 dBm<br>15050 GHz |
|                    |            |           |      | INIT.      | <u> </u> | + | 2.440 | 13030 GH2              |
|                    |            |           |      |            |          |   |       |                        |
| 20 dBm             |            |           |      |            |          |   |       |                        |
|                    |            |           |      |            |          |   |       |                        |
|                    |            |           |      |            |          |   |       |                        |
| 30 dBm             |            |           |      |            |          |   |       |                        |
|                    |            |           |      |            |          |   |       |                        |
| +0 dBm             |            |           |      |            |          |   |       |                        |
|                    |            |           |      |            |          |   |       |                        |
| 50 dBm             |            |           |      |            |          | - |       |                        |
|                    |            |           |      |            |          |   |       |                        |
| 50 dBm             |            |           |      |            |          | _ |       |                        |
|                    |            |           |      |            |          |   |       |                        |
| 70 dBm             |            |           |      |            |          |   |       |                        |
|                    |            |           |      |            |          |   |       |                        |
| 30 dBm             |            |           |      |            |          |   |       |                        |
|                    |            |           |      |            |          |   |       |                        |
| 90 dBm             |            |           |      |            |          |   |       |                        |
|                    |            |           |      |            |          |   |       |                        |
|                    |            |           |      |            |          |   |       |                        |
| F 2.44 GHz         |            |           | 691  | \          | suring   |   |       | n 2.0 MHz              |

Date: 13.MAY.2014 14:29:39

#### channel 39

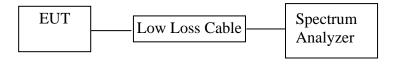
| Spectrum              | <u>]</u> |                   |                    |              |                                 |
|-----------------------|----------|-------------------|--------------------|--------------|---------------------------------|
| Ref Level 0.00<br>Att |          | RBW<br>1 ms = VBW | 1 MHz<br>3 MHz Mod | e Auto Sweep |                                 |
| 1Pk Max               |          | 1 110 0 1011      |                    |              |                                 |
|                       |          |                   | M1                 | M1[1]        | <br>-8.64 dBm<br>2.47983210 GHz |
| -10 dBm               |          |                   |                    |              |                                 |
| -20 dBm               |          |                   |                    |              |                                 |
| -30 dBm               |          |                   |                    |              |                                 |
| -40 dBm               |          |                   |                    |              |                                 |
| -50 dBm               |          |                   |                    |              |                                 |
| -60 dBm               |          |                   |                    |              |                                 |
| -70 dBm               |          |                   |                    |              |                                 |
| -80 dBm               |          |                   |                    |              |                                 |
| -90 dBm               |          |                   |                    |              |                                 |
| CF 2.48 GHz           |          |                   | 691                | pts          | Span 2.0 MHz                    |
|                       |          |                   |                    | Measuring.   | <br>13.05.2014<br>14:28:28      |

Date: 13.MAY.2014 14:28:29



## 7. POWER SPECTRAL DENSITY MEASUREMENT

### 7.1.Block Diagram of Test Setup





#### 7.2. The Requirement For Section 15.247(e)

Section 15.247(e): For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

#### 7.3.EUT Configuration on Measurement

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

#### 7.4. Operating Condition of EUT

- 7.4.1.Setup the EUT and simulator as shown as Section 8.1.
- 7.4.2.Turn on the power of all equipment.
- 7.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2402-2480. We select 2402MHz, 2440MHz, and 2480MHz TX frequency to transmit.



### 7.5.Test Procedure

- 7.5.1.The EUT was tested according to DTS test procedure of April 09, 2013 KDB558074 D01 DTS Meas Guidance v03 for compliance to FCC 47CFR 15.247 requirements.
- 7.5.2.The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 7.5.3.Measurement Procedure PKPSD:

This procedure must be used if maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit, and is optional if the maximum (average) conducted output power was used to demonstrate compliance.

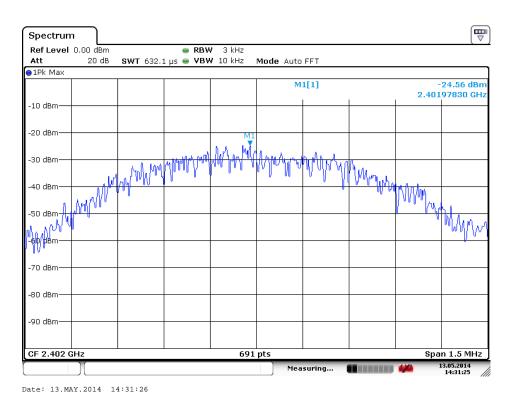
- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. Set the span to 1.5 times the DTS channel bandwidth.
- 3. Set the RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- 4. Set the VBW  $\geq$  3 x RBW.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum amplitude level.
- 10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
- 7.5.4.Measurement the maximum power spectral density.

### 7.6.Test Result

| CHANNEL<br>NUMBER | FREQUENCY<br>(MHz ) | PSD<br>(dBm/3KHz) | LIMIT<br>(dBm/3KHz) | PASS/FAIL |
|-------------------|---------------------|-------------------|---------------------|-----------|
| 0                 | 2402                | -24.56            | 8                   | PASS      |
| 19                | 2440                | -24.30            | 8                   | PASS      |
| 39                | 2480                | -23.71            | 8                   | PASS      |

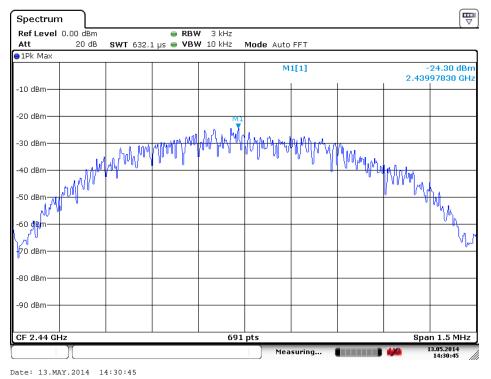
The spectrum analyzer plots are attached as below.

#### channel 0

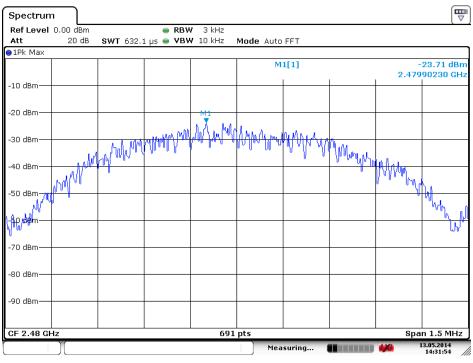




channel 19



channel 39

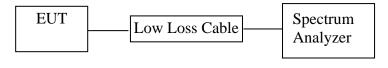


Date: 13.MAY.2014 14:31:53



## 8. BAND EDGE COMPLIANCE TEST

#### 8.1.Block Diagram of Test Setup





#### 8.2. The Requirement For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.209(a).

#### 8.3.EUT Configuration on Measurement

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



#### 8.4.Operating Condition of EUT

- 8.4.1.Setup the EUT and simulator as shown as Section 9.1.
- 8.4.2.Turn on the power of all equipment.
- 8.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2402-2480 MHz. We select 2402MHz, 2480MHz TX frequency to transmit.

#### 8.5.Test Procedure

Conducted Band Edge:

- 8.5.1. The transmitter output was connected to the spectrum analyzer via a low loss cable.
- 8.5.2.Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz.

Radiate Band Edge:

- 8.5.3. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.
- 8.5.4. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
- 8.5.5. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
- 8.5.6. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

RBW=1MHz, VBW=1MHz

8.5.7.The band edges was measured and recorded.

8.6.Test Result

Pass

| Channel | Frequency | Delta peak to band emission | Limit(dBc) |
|---------|-----------|-----------------------------|------------|
| 0       | 2386.0MHz | 57.87                       | 20         |
| 39      | 2483.8MHz | 55.55                       | 20         |



#### channel 0

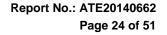
| Ref Leve   | 0.00 dBm | 🖷 R                      | <b>BW</b> 100 kHz        |               |  |                            |
|------------|----------|--------------------------|--------------------------|---------------|--|----------------------------|
| Att        | 20 dB    | SWT 113.8 µs 👄 V         | <b>BW</b> 300 kHz        | Mode Auto FFT |  |                            |
| ∎1Pk Max   |          |                          |                          |               |  |                            |
|            |          |                          |                          | M3[1]         |  | -68.16 dBn                 |
| -10 dBm—   |          |                          |                          |               |  | 2.3860969 GH               |
|            |          |                          |                          | M1[1]         |  | -10.29 dBr<br>2.4020150 GH |
| -20 dBm—   |          |                          |                          |               |  | 2.4020130 GH               |
|            |          |                          |                          |               |  |                            |
| -30 dBm—   |          |                          |                          |               |  |                            |
|            |          |                          |                          |               |  |                            |
| -40 dBm—   |          |                          |                          |               |  |                            |
| -50 dBm—   |          |                          |                          |               |  |                            |
| -50 aBm—   |          |                          |                          |               |  |                            |
| -60 dBm—   |          |                          |                          |               |  |                            |
|            |          |                          |                          | M             |  | 1 4 4                      |
| -70 dBm    | -        | mound                    | on wearson               | manne         | M2   | munum                      |
|            |          | and the second second    | ~~~~ [~                  | Man an        | and a second sec |                            |
| -80 dBm—   |          |                          | ++                       |               |  |                            |
|            |          |                          |                          |               |  |                            |
| -90 dBm—   |          |                          |                          |               |  |                            |
|            |          |                          |                          |               |  |                            |
| Start 2.35 | GHz      | •                        | 691 p                    | ts            |  | Stop 2.405 GHz             |
| 1arker     |          |                          |                          |               |  |                            |
|            | ef Trc   | Stimulus                 | Response                 | Function      | Functi   | ion Result                 |
| M1         | 1        | 2.402015 GHz             | -10.29 dBm               |               |  |                            |
| M2<br>M3   | 1        | 2.39 GHz<br>2.386096 GHz | -71.98 dBm<br>-68.16 dBm |               |  |                            |
| 1913       | 1        | 2.300090 GH2             | -08.10 UBII              |               |  |                            |

Date: 13.MAY.2014 14:46:25

#### channel 39

| Spectrum    |  |                              |                    |                 |             |      |     |             |                          |
|-------------|--|------------------------------|--------------------|-----------------|-------------|------|-----|-------------|--------------------------|
| Ref Level ( |  | _                            | RBW 100 kHz        |                 |             |      |     |             |                          |
| Att         | 20 dB                                  | SWT 56.8 µs 👄                | <b>VBW</b> 300 kHz | Moe             | de Auto FFT |      |     |             |                          |
| ●1Pk Max    |  |                              |                    |                 |             |      |     |             |                          |
|             |  |                              |                    |                 | M2[1]       |      |     |             | -70.60 dBm               |
| -10 dBm     |  | MB                           |                    | _               | M1[1]       |      |     |             | 338470 GHz<br>-72.20 dBm |
|             |  |                              |                    |                 | mili        |      |     |             | 335000 GHz               |
| -20 dBm     |  | 1 1                          |                    | -               |             |      |     | 1           |                          |
|             |  |                              |                    |                 |             |      |     |             |                          |
| -30 dBm     |  |                              |                    |                 |             |      |     |             |                          |
| -40 dBm     |  |                              |                    |                 |             |      |     |             |                          |
| -to doin    |  |                              | }                  |                 |             |      |     |             |                          |
| -50 dBm     |  |                              | 4                  | _               |             |      |     |             |                          |
|             |  |                              |                    |                 |             |      |     |             |                          |
| -60 dBm     |  |                              |                    | -               |             |      |     |             |                          |
|             |  | $\wedge$                     | ų į                | M <sup>M2</sup> |             |      |     |             |                          |
| -79 dBm     | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | mm                           | Vww                | wh              | m           | mo   | mm  | turn        | mm                       |
| -80 dBm     |  |                              |                    |                 |             |      |     |             |                          |
| oo abiii    |  |                              |                    |                 |             |      |     |             |                          |
| -90 dBm     |  |                              |                    | _               |             |      |     |             |                          |
|             |  |                              |                    |                 |             |      |     |             |                          |
| CF 2.4835 ( | GHz                                    |                              | 69                 | 1 pts           |             |      |     | Spar        | 20.0 MHz                 |
| Marker      |  |                              |                    |                 |             |      |     |             |                          |
| Type Ref    | Trc                                    | Stimulus                     | Respons            |                 | Function    |      | Fun | ction Resul | t                        |
| M1          | 1                                      | 2.4835 GHz                   |                    |                 |             |      |     |             |                          |
| M2<br>M3    | 1                                      | 2.483847 GHz<br>2.479998 GHz |                    |                 |             |      |     |             |                          |
| M13         |  | 2.479998 GH2                 | -15.05             | uвт             |             |      |     |             | 10.05.0014               |
|             | Л                                      |                              |                    |                 | Measuri     | ng ( |     | 444         | 13.05.2014<br>14:47:28   |

Date: 13.MAY.2014 14:47:28



**Radiated Band Edge Result** 

Note:

- 1. Emissions attenuated more than 20 dB below the permissible value are not reported.
- 2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows: Result = Reading + Corrected Factor
- 3. Display the measurement of peak values.



Model:

ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park, Nanshan Shenzhen, P.R. China

Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: ricky #1343 Standard: FCC PK Test item: Radiation Test Temp.( C)/Hum.(%) 23 C / 49 % EUT: MID Mode: TX 2402MHz

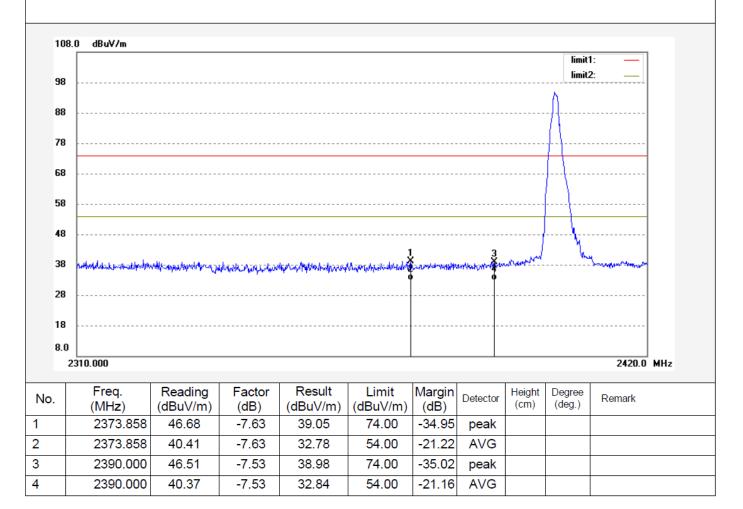
Power Source: DC 3.7V Date: 14/05/16/ Time: 9/16/25 Engineer Signature: Ricky Distance: 3m

Horizontal

Polarization:

Report No.:ATE20140662 Note:

PC1015BXC Manufacturer: Natural Sound







F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.Chin Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

|         | _               | Sc                  | ience & Ind                               | dustry Park,I                   | Nanshan Sh         | enzhen,                | P.R.Chi    | na             | Fax              | :+86-0755-265 | 0339 |
|---------|-----------------|---------------------|---|---------------------------------|--------------------|------------------------|------------|----------------|------------------|---------------|------|
| Job No  | o.: ricky #134  | 2                   |   |                                 |                    | F                      | Polarizati | ion: \         | /ertical         |               |      |
| Standa  | ard: FCC PK     |                     |   |                                 |                    | F                      | ower So    | ource:         | DC 3.7           | V             |      |
| est ite | em: Radiatio    |                     |   |                                 |                    |                        |            |                |                  |               |      |
| Temp.   | ( C)/Hum.(%     | ) 23 C/4            | 9 %                                       |                                 |                    | Т                      | ime: 9/1   | 5/24           |                  |               |      |
| EUT:    | MID             |                     |   |                                 |                    | E                      | Ingineer   | Signat         | ure: R           | licky         |      |
| /lode:  | TX 2402M        | 1Hz                 |   |                                 |                    | C                      | )istance:  | 3m             |                  |               |      |
| Nodel:  | PC1015B         | XC                  |   |                                 |                    |                        |            |                |                  |               |      |
| ∕lanufa | acturer: Natur  | ral Sound           |   |                                 |                    |                        |            |                |                  |               |      |
| lote:   | Report No.:     | ATE201406           | 62  |                                 |                    |                        |            |                |                  |               |      |
|         | ·               |                     |   |                                 |                    |                        |            |                |                  |               |      |
|         |                 |                     |   |                                 |                    |                        |            |                |                  |               |      |
| 108     | .0 dBu∀/m       |                     |   |                                 |                    |                        |            |                |                  |               |      |
|         |                 |                     |   |                                 |                    |                        |            |                | limit<br>limit   |               |      |
| 98      |                 |                     |   |                                 |                    |                        |            |                |                  |               |      |
| 88      |                 |                     |   |                                 |                    |                        |            |                | ·A               |               |      |
|         |                 |                     |   |                                 |                    |                        |            |                | []               |               |      |
| 78      |                 |                     |   |                                 |                    |                        |            |                | 1-1              |               |      |
| 68      |                 |                     |   |                                 |                    |                        |            |                | <u></u>          |               |      |
| 50      |                 |                     |   |                                 |                    |                        |            |                | $  \rangle$      |               |      |
| 58      |                 |                     |   |                                 |                    |                        |            |                |                  |               |      |
| 48      |                 |                     |   |                                 |                    |                        |            |                |                  |               |      |
| 38      |                 |                     |   |                                 |                    |                        | 1<br>X.3   | aturnel        | h.               | unipeda and   |      |
| 30      | monomorphistoph | wiki wakaji katika  | 4/11/19/19/19/19/19/19/19/19/19/19/19/19/ | twatter anna <sub>d</sub> again | Marchine Marca And | with the second states | A B        |                |                  |               |      |
| 28      |                 |                     |   |                                 |                    |                        |            |                |                  |               |      |
| 18      |                 |                     |   |                                 |                    |                        |            |                |                  |               |      |
| 8.0     |                 |                     |   |                                 |                    |                        |            |                |                  |               |      |
|         | 2310.000        |                     |   |                                 |                    |                        |            |                |                  | 2420.0 MHz    |      |
|         |                 | Γ                   | Γ   | 1                               | 1                  |                        |            | 1              |                  |               |      |
| 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        |      |
|         | 2384.838        | 46.83               | -7.56                                     | 39.27                           | 74.00              | -34.73                 | peak       | (/             | (3-)             |               |      |
|         |                 |                     |   |                                 |                    |                        |            |                |                  |               |      |

2

3

4

2384.838

2390.000

2390.000

40.20

44.16

38.92

-7.56

-7.53

-7.53

32.64

36.63

31.39

54.00

74.00

54.00

-21.36

-37.37

-22.61

AVG

peak

AVG





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

|         |                | Sc           | ience & Ind    | dustry Park,I | Nanshan Sh | nenzhen        | ,P.R.Chi  | na             | Fax              | (:+86-0755-26        | 5033 |
|---------|----------------|--------------|----------------|---------------|------------|----------------|-----------|----------------|------------------|----------------------|------|
| ob No   | o.: ricky #134 | 1            |                |               |            | F              | Polarizat | on: \          | /ertical         |                      |      |
| tanda   | ard: FCC PK    |              |                |               |            | F              | Power So  | ource:         | DC 3.7           | V                    |      |
| est ite | em: Radiatio   | on Test      |                |               |            | [              | Date: 14/ | 05/16/         |                  |                      |      |
| emp.    | ( C)/Hum.(%    | ) 23 C/4     | 9 %            |               |            | ٦              | Time: 9/1 | 4/24           |                  |                      |      |
| UT:     | MID            |              |                |               |            | E              | Engineer  | Signat         | ure: R           | licky                |      |
| /lode:  | TX 2480M       | 1Hz          |                |               |            | [              | Distance  | 3m             |                  |                      |      |
| Nodel:  | PC1015B        | XC           |                |               |            |                |           |                |                  |                      |      |
| /lanufa | acturer: Natu  | ral Sound    |                |               |            |                |           |                |                  |                      |      |
| lote:   | Report No.:    | ATE201406    | 62             |               |            |                |           |                |                  |                      |      |
|         |                |              |                |               |            |                |           |                |                  |                      |      |
|         |                |              |                |               |            |                |           |                |                  |                      |      |
| 108     | 0.0 dBu∀/m     |              |                |               |            |                |           |                | limit            | 1]                   |      |
| 98      |                |              |                |               |            |                |           |                | limit            |                      |      |
| 36      |                |              |                |               | $\wedge$   |                |           |                |                  |                      |      |
| 88      |                |              |                |               | {}         |                |           |                |                  |                      |      |
| 78      |                |              |                |               | /          |                |           |                |                  |                      |      |
| 10      |                |              |                |               | <u> </u>   |                |           |                |                  |                      |      |
| 68      |                |              |                | /             |            |                |           |                |                  |                      |      |
| 58      |                |              |                |               | <u> </u>   |                |           |                |                  |                      |      |
|         |                |              |                | {             |            | 1              |           |                |                  |                      |      |
| 48      |                |              |                |               |            | 4 3<br>\ X     |           |                |                  |                      |      |
| 38      | manuthermonth  | Muchan maker | an believe and | mml           |            | " Thur         | mannesty  | munsher        | en sen andere    | starth weberster and |      |
|         |                |              |                |               |            |                |           |                |                  |                      |      |
| 28      |                |              |                |               |            |                |           |                |                  |                      |      |
| 18      |                |              |                |               |            |                |           |                |                  |                      |      |
| 8.0     |                |              |                |               |            |                |           |                |                  |                      |      |
|         | 2460.000       |              |                |               |            |                |           |                |                  | 2500.0 Mi            | łz   |
|         | Freq.          | Reading      | Factor         | Result        | Limit      | Margin         |           | Hojaht         | Dograc           |                      |      |
| No.     | (MHz)          | (dBuV/m)     | ractor<br>(dB) | (dBuV/m)      | (dBuV/m)   | Margin<br>(dB) | Detector  | Height<br>(cm) | Degree<br>(deg.) | Remark               |      |
|         | 2483.500       | 55.21        | -7.37          | 47.84         | 74.00      | -26.16         | peak      |                |                  |                      |      |
|         |                |              |                |               |            |                |           |                |                  |                      |      |

2

3

4

2483.500

2484.814

2484.814

49.28

51.97

45.25

-7.37

-7.38

-7.38

41.91

44.59

37.87

54.00

74.00

54.00

-12.09

-29.41

-16.13

AVG

peak

AVG



# Page 27 of 51

ACCURATE TECHNOLOGY CO., LTD. F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Report No.: ATE20140662

|               |                    | 50           | ence & ind                   | austry Park,            | vansnan Sr                                | enznen   | ,P.R.Chi   | na   | 1 47            |                               |
|---------------|--------------------|--------------|------------------------------|-------------------------|---|--|------------|--|-----------------|-------------------------------|
| b No.: rick   | y #134             | 0            |                              |                         |   | F  | Polarizati | on: H  | Iorizont        | al                            |
| tandard: FC   | C PK               |              |                              |                         |   | F  | Power So   | ource:   | DC 3.7          | V                             |
| est item: R   | adiatio            | n Test       |                              |                         |   | [  | Date: 14/  | 05/16/   |                 |                               |
| emp.( C)/H    | um.(%)             | ) 23 C/4     | 9 %                          |                         |   | ٦  | Time: 9/1  | 3/41   |                 |                               |
| EUT: MI       | ID                 |              |                              |                         |   | E  | Engineer   | Signat   | ure: R          | Ricky                         |
| /lode: TX     | 2480M              | Hz           |                              |                         |   | [  | Distance:  | 3m   |                 |                               |
| Nodel: PC     | 1015B>             | (C           |                              |                         |   |  |            |  |                 |                               |
| lanufacturer: | Natur              | al Sound     |                              |                         |   |  |            |  |                 |                               |
| lote: Repo    | ort No.:/          | ATE201406    | 62                           |                         |   |  |            |  |                 |                               |
|               |                    |              |                              |                         |   |  |            |  |                 |                               |
| 108.0 dBuV    | Um                 |              |                              |                         |   |  |            |  |                 |                               |
| 100.0 0004    | /                  |              |                              |                         |   |  |            |  | limit           | 1: —                          |
| 98            |                    |              |                              |                         |   |  |            |  | limit           | 2:                            |
|               |                    |              |                              |                         | $\wedge$                                  |  |            |  |                 |                               |
| 88            |                    |              |                              |                         | 1   |  |            |  |                 |                               |
| 78            |                    |              |                              |                         | l   |  |            |  |                 |                               |
| 68            |                    |              |                              | /                       |   |  |            |  |                 |                               |
| 00            |                    |              |                              |                         | \<br>\                                    |  |            |  |                 |                               |
| 58            |                    |              |                              | ····· <del>/</del> -··· |   |  |            |  |                 |                               |
| 48            |                    |              |                              |                         | le la | l<br>(3  |            |  |                 |                               |
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| 28            |                    |              |                              |                         |   |  |            |  |                 |                               |
|               |                    |              |                              |                         |   |  |            |  |                 |                               |
| 18            |                    |              |                              |                         |   |  |            |  |                 |                               |
| 8.0           |                    |              |                              |                         |   |  |            |  |                 |                               |
| 2460.000      |                    |              |                              |                         |   |  |            |  |                 | 2500.0 MHz                    |
| No. Free      |                    | Reading      | Factor                       | Result                  | Limit                                     | Margin   | Detector   | Height   | Degree          | Remark                        |
| (IVIH         |                    | (dBuV/m)     | (dB)                         | (dBuV/m)                | (dBuV/m)                                  | (dB)   |            | (cm)   | (deg.)          |                               |
|               | 3.500              | 55.98        | -7.37                        | 48.61                   | 74.00                                     | -25.39   | -          |  |                 |                               |
|               | 3.500              | 50.03        | -7.37                        | 42.66                   | 54.00                                     | -11.34   |            |  |                 |                               |
| 248           | 4.091              | 52.89        | -7.38                        | 45.51                   | 74.00                                     | -28.49   | peak       |  |                 |                               |

4

2484.091

48.11

-7.38

40.73

54.00

-13.27

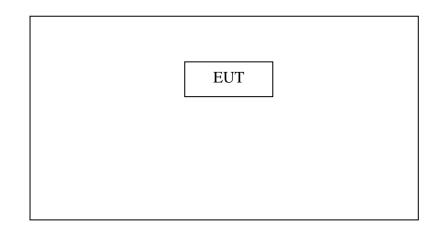
AVG



## 9. RADIATED SPURIOUS EMISSION TEST

### 9.1.Block Diagram of Test Setup

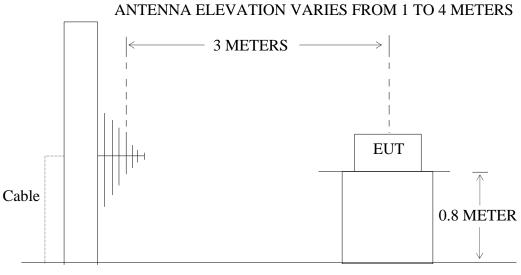
9.1.1.Block diagram of connection between the EUT and peripherals



Setup: Transmitting mode

(EUT: MID)

9.1.2.Semi-Anechoic Chamber Test Setup Diagram



GROUND PLANE



### 9.2. The Limit For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

#### 9.3.Restricted bands of operation

#### 9.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

| MHz               | MHz                 | MHz           | GHz              |
|-------------------|---------------------|---------------|------------------|
| 0.090-0.110       | 16.42-16.423        | 399.9-410     | 4.5-5.15         |
| $^{1}0.495-0.505$ | 16.69475-16.69525   | 608-614       | 5.35-5.46        |
| 2.1735-2.1905     | 16.80425-16.80475   | 960-1240      | 7.25-7.75        |
| 4.125-4.128       | 25.5-25.67          | 1300-1427     | 8.025-8.5        |
| 4.17725-4.17775   | 37.5-38.25          | 1435-1626.5   | 9.0-9.2          |
| 4.20725-4.20775   | 73-74.6             | 1645.5-1646.5 | 9.3-9.5          |
| 6.215-6.218       | 74.8-75.2           | 1660-1710     | 10.6-12.7        |
| 6.26775-6.26825   | 108-121.94          | 1718.8-1722.2 | 13.25-13.4       |
| 6.31175-6.31225   | 123-138             | 2200-2300     | 14.47-14.5       |
| 8.291-8.294       | 149.9-150.05        | 2310-2390     | 15.35-16.2       |
| 8.362-8.366       | 156.52475-156.52525 | 2483.5-2500   | 17.7-21.4        |
| 8.37625-8.38675   | 156.7-156.9         | 2690-2900     | 22.01-23.12      |
| 8.41425-8.41475   | 162.0125-167.17     | 3260-3267     | 23.6-24.0        |
| 12.29-12.293      | 167.72-173.2        | 3332-3339     | 31.2-31.8        |
| 12.51975-12.52025 | 240-285             | 3345.8-3358   | 36.43-36.5       |
| 12.57675-12.57725 | 322-335.4           | 3600-4400     | ( <sup>2</sup> ) |
| 13.36-13.41       |                     |               |                  |

<sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510

#### $^{2}$ Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



#### 9.4. Configuration of EUT 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.

#### 9.5. Operating Condition of EUT

- 9.5.1.Setup the EUT and simulator as shown as Section 10.1.
- 9.5.2.Turn on the power of all equipment.
- 9.5.3.Let the EUT work in TX modes measure it. The transmit frequency are 2402-2480 MHz. We select 2402MHz, 2440MHz, and 2480MHz TX frequency to transmit.

#### 9.6.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 C63.4: 2009 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

The bandwidth of test receiver is set at 9 kHz in below 30MHz. and set at 120 kHz in 30-1000MHz, and 1MHz in above 1000MHz.

The frequency range from 9 kHz to 25GHz is checked.

The final measurement in band 9-90 kHz, 110-490 kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

The field strength is calculated by adding the antenna factor, and cable loss, and subtracting the amplifier gain from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

Where Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

#### 9.7. The Field Strength of Radiation Emission Measurement Results

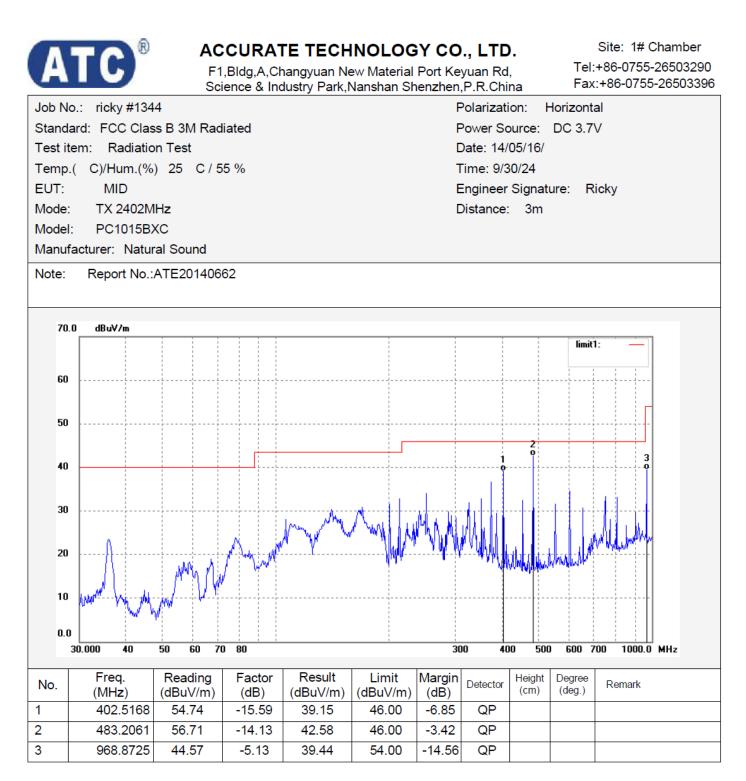
Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.

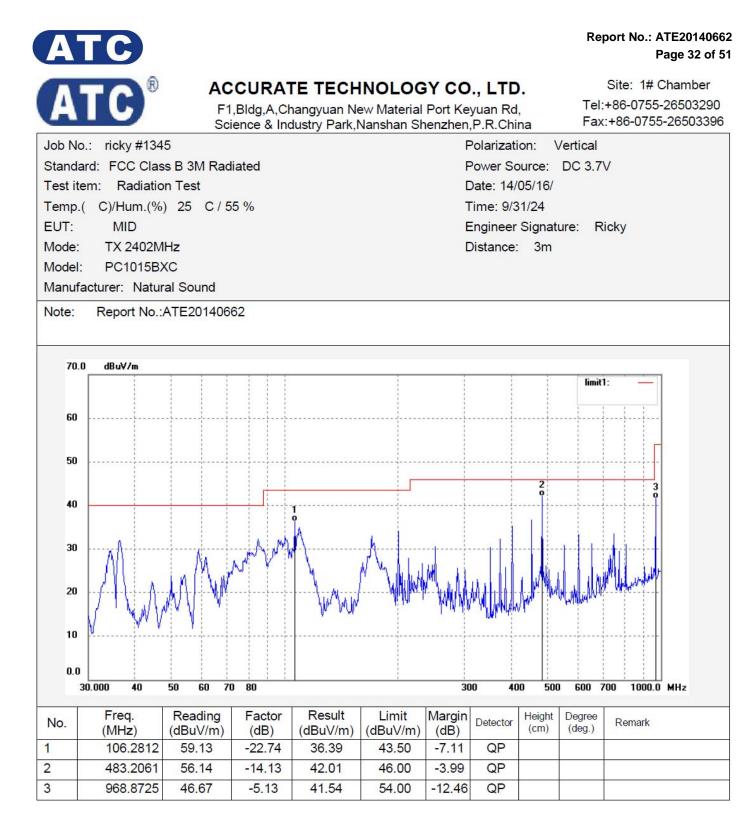
2. The EUT is tested radiation emission at Low, Middle, High channel in three axes. The worst emissions are reported in all channels. The fundamental radiated emissions were reduced by Band Reject Filter in the attached plots.

3. The radiation emissions from 18-25GHz are not reported, because the test values lower than the limits of 20dB.

4. The average measurement was not performed when peak measured data under the limit of average detection.



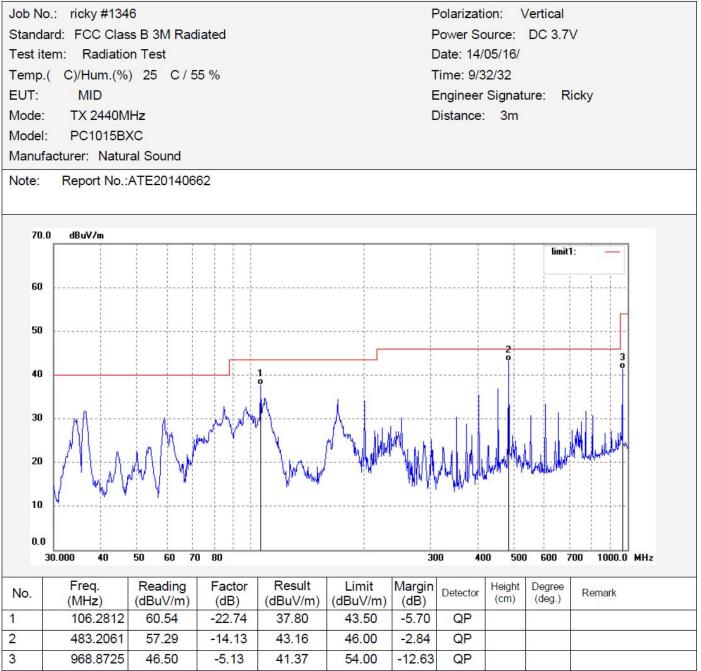






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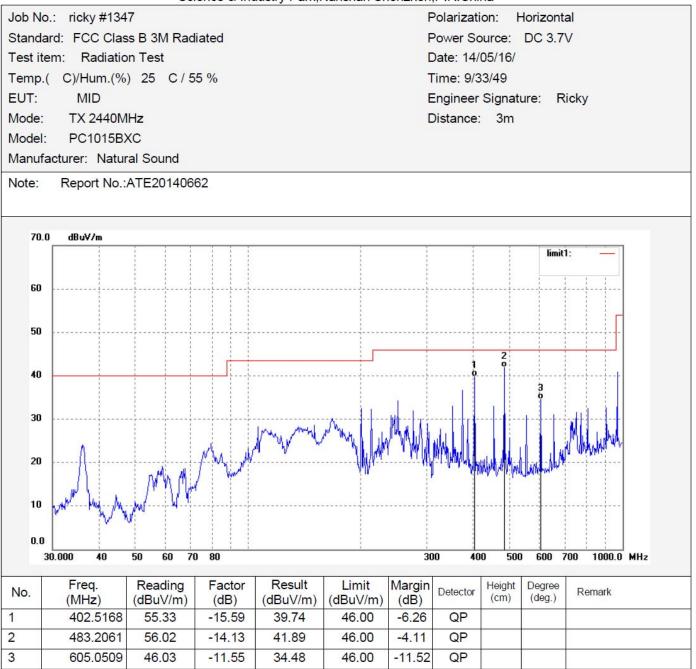
Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396





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Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

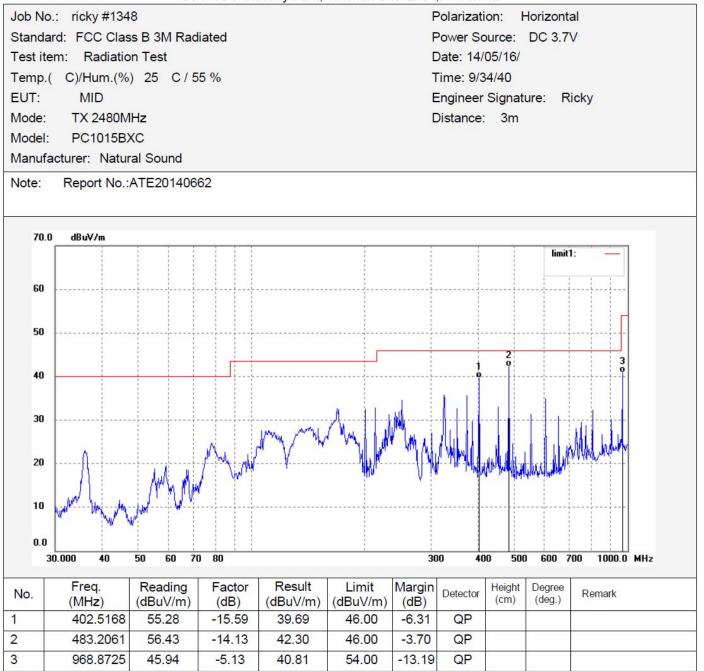




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Report No.: ATE20140662

Page 35 of 51

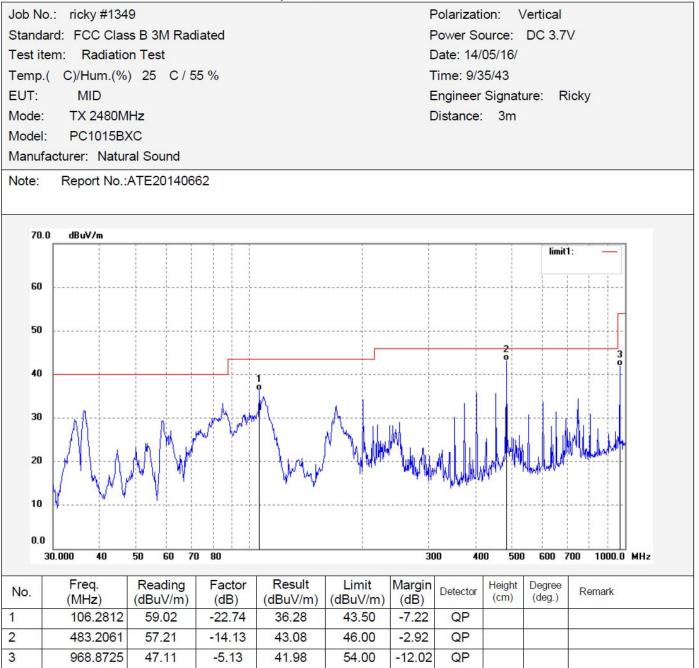




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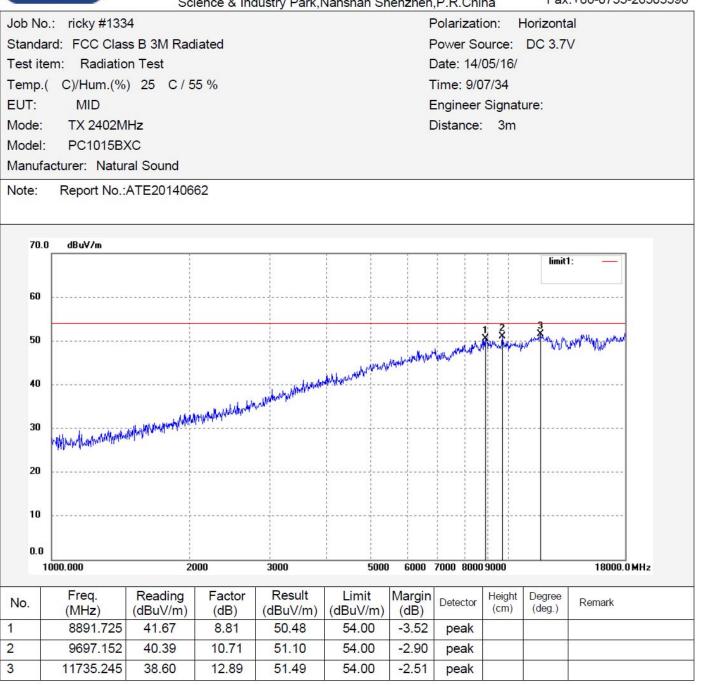
Report No.: ATE20140662

Page 36 of 51





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|            |                         |            |   |  | Valisian Of       |          |            |              |          |               |
|------------|-------------------------|------------|---|--|-------------------|----------|------------|--------------|----------|---------------|
|            | .: ricky #133           |            |   |  |                   |          | Polarizati |              | /ertical |               |
|            |                         |            |   |  |                   |          |            |              | DC 3.7   | V             |
|            | em: Radiatio            |            |   |  |                   |          | Date: 14/  |              |          |               |
| mp.(       | ( C)/Hum.(%)            | ) 25 C/5   | 55 %                                      |  |                   | Т        | Time: 9/0  | 8/48         |          |               |
| JT:        | MID                     |            |   |  |                   | E        | Engineer   | Signat       | ure:     |               |
| ode:       | TX 2402M                | Hz         |   |  |                   | C        | Distance:  | 3m           |          |               |
| odel:      | PC1015B)                | KC         |   |  |                   |          |            |              |          |               |
| anufa      | acturer: Natur          | al Sound   |   |  |                   |          |            |              |          |               |
| ote:       | Report No.:.            | ATE201406  | i62                                       |  |                   |          |            |              |          | _             |
| 70.0       | ) dBuV/m                |            |   | 1                                      |                   |          |            |              | limit1   | :             |
| 60         |                         |            |   |  |                   |          |            |              |          |               |
|            |                         |            |   |  |                   | 1        |            |              |          |               |
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|            |                         |            |   |  |                   |          |            |              |          |               |
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|            |                         |            |   |  |                   |          |            |              |          |               |
| 0.0        |                         |            |   |  |                   |          |            |              |          |               |
| 1          | 000.000                 | 2          | 000                                       | 3000                                   | 5000              | 6000     | 7000 8000  | 9000         |          | 18000.0 MHz   |
| <b>b</b> . | Freq.                   | Reading    | Factor                                    | Result                                 | Limit             | Margin   | Detector   | Height       | Degree   | Remark        |
| 0.         | (MHz)                   | (dBuV/m)   | (dB)                                      | (dBuV/m)                               | (dBuV/m)          | (dB)     | Delector   | (cm)         | (deg.)   | Kendik        |
|            | 8082.803                | 42.22      | 8.47                                      | 50.69                                  | 54.00             | -3.31    | peak       |              |          |               |
|            | 11906.073               | 38.41      | 12.58                                     | 50.99                                  | 54.00             | -3.01    | peak       |              |          |               |
|            | 16696.884               | 2.03       | 49.87                                     | 51.90                                  | 54.00             | -2.10    | peak       |              |          |               |



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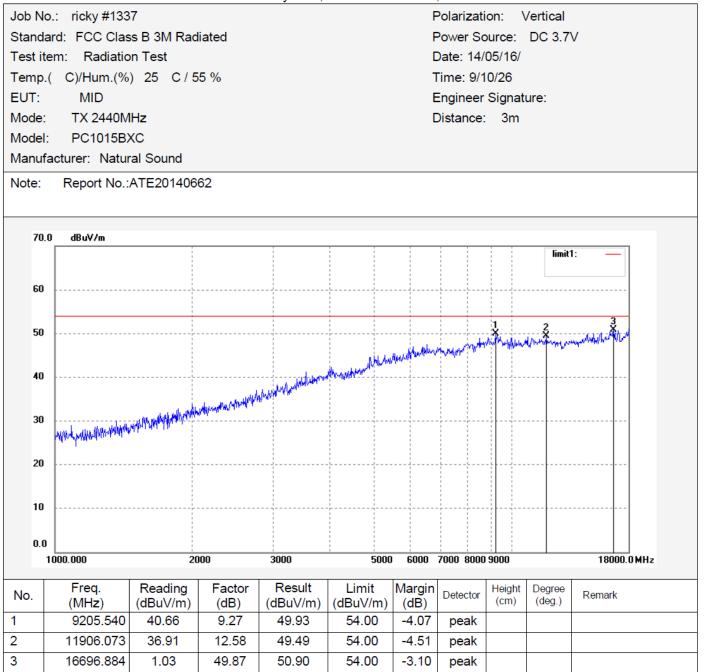
| oh         | No   | : ricky #133              |                   |                          | aotry i ant,i   |                              |             | Polarizati  |           | Horizonta      | al          |
|------------|------|---------------------------|-------------------|--------------------------|---|------------------------------|-------------|-------------|-----------|----------------|-------------|
|            |      | d: FCC Clas               |                   | liated                   |   |                              |             | Power Sc    |           |                |             |
|            |      | m: Radiatio               |                   | lateu                    |   |                              |             | Date: 14/   |           | 00 3.7         | v           |
|            |      | C)/Hum.(%                 |                   | 55 %                     |   |                              |             | Time: 9/0   |           |                |             |
| EUT        |      | MID                       | ) 25 070          | JJ 70                    |   |                              |             | Engineer    |           | uro:           |             |
| Лоd        |      | TX 2440M                  | <b>U</b> -        |                          |   |                              |             | Distance:   | -         | ure.           |             |
| Лос<br>Лос |      | PC1015B                   |                   |                          |   |                              | L           | Jistance.   | SIII      |                |             |
|            |      | cturer: Natur             |                   |                          |   |                              |             |             |           |                |             |
|            |      |                           |                   |                          |   |                              |             |             |           |                |             |
| lote       | e:   | Report No.:               | ATE201406         | 62                       |   |                              |             |             |           |                |             |
|            |      |                           |                   |                          |   |                              |             |             |           |                |             |
|            | 70.0 | dBu∀/m                    |                   |                          |   |                              |             |             |           |                |             |
|            |      |                           |                   |                          |   |                              |             |             |           | limit          | 1: —        |
|            | 60   |                           |                   |                          |   |                              |             |             |           |                |             |
|            | 60   |                           |                   |                          |   |                              |             |             |           |                |             |
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|            | 10   |                           |                   |                          |   |                              |             |             |           |                |             |
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|            | 10   | 000.000                   | 2                 | 000                      | 3000  | 5000                         | 6000        | 7000 8000   | 9000      |                | 18000.0 MHz |
| ۷o.        |      | Freq.                     | Reading           | Factor                   | Result  | Limit                        | Margin      | Detector    | Height    | Degree         | Remark      |
|            | _    | (MHz)                     | (dBuV/m)          | (dB)                     | (dBuV/m)  | (dBuV/m)                     | (dB)        |             | (cm)      | (deg.)         |             |
|            | +    | 8891.725                  | 40.17             | 8.81                     | 48.98   | 54.00                        | -5.02       | peak        |           |                |             |
| 2          | _    | 9697.152                  | 38.39             | 10.71                    | 49.10   | 54.00                        | -4.90       | peak        |           |                |             |
|            |      | 17948.048                 | -0.38             | 51.56                    | 51.18   | 54.00                        | -2.82       | peak        |           |                |             |



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Report No.: ATE20140662

Page 40 of 51

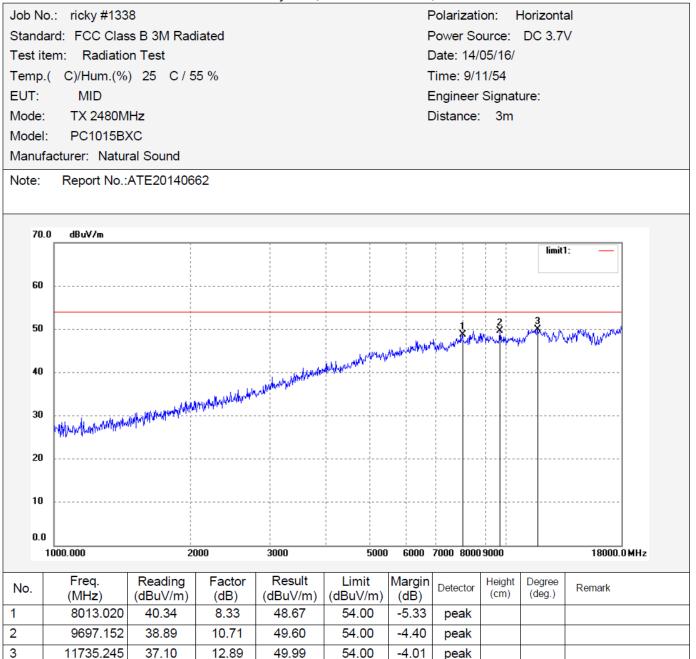




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Report No.: ATE20140662

Page 41 of 51





#### Report No.: ATE20140662 Page 42 of 51

# ACCURATE TECHNOLOGY CO., LTD.

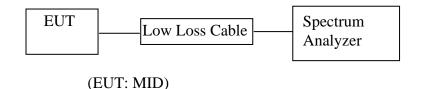
F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

| Job No.: ricky #1339 |  | a maasay r ano,  |                   | Polar          |                   | /ertical         |                       |  |  |  |
|----------------------|--|--|-------------------|----------------|-------------------|------------------|-----------------------|--|--|--|
|                      | -  |  |                   |                |                   |                  | Power Source: DC 3.7V |  |  |  |
| Test item: Radiation | n Test   |  |                   | Date           | 14/05/16/         |                  |                       |  |  |  |
| Temp.( C)/Hum.(%)    | 25 C/55%   |  |                   | Time           | 9/12/18           |                  |                       |  |  |  |
| EUT: MID             |  |  |                   | Engir          | eer Signat        | ure:             |                       |  |  |  |
| Mode: TX 2480M       | Ηz   |  |                   | Dista          | nce: 3m           |                  |                       |  |  |  |
| Model: PC1015BX      | C  |  |                   |                |                   |                  |                       |  |  |  |
| Manufacturer: Natura | al Sound   |  |                   |                |                   |                  |                       |  |  |  |
| Note: Report No.:/   | ATE20140662  |  |                   |                |                   |                  |                       |  |  |  |
| 70.0 dBuV/m          |  |  |                   |                |                   |                  |                       |  |  |  |
|                      |  |  |                   |                |                   | limit            | I: <u> </u>           |  |  |  |
| 60                   |  |  |                   |                |                   |                  |                       |  |  |  |
| 00                   |  |  |                   |                |                   |                  |                       |  |  |  |
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|                      |  |  | the asker the has | ANY MANAGE AND |                   |                  |                       |  |  |  |
| 40                   |  | 1 h water for the laborer  | Acc-49482         |                |                   |                  |                       |  |  |  |
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|                      |  |  |                   |                |                   |                  |                       |  |  |  |
| 0.0                  |  |  |                   |                |                   |                  |                       |  |  |  |
| 1000.000             | 2000   | 3000   | 5000              | 6000 7000      | 8000 9000         |                  | 18000.0 MHz           |  |  |  |
| No. Freq.<br>(MHz)   |  | ctor Result<br>B) (dBuV/m)   | Limit<br>(dBuV/m) | Margin<br>(dB) | ctor Height (cm)  | Degree<br>(deg.) | Remark                |  |  |  |
| 1 6526.373           | 43.14 4.   | 45 47.59   | 54.00             | -6.41 pe       | ak                |                  |                       |  |  |  |
| 2 8082.803           | 40.22 8.   | 47 48.69   | 54.00             | -5.31 pe       | ak                |                  |                       |  |  |  |
| 3 9205.540           | 39.66 9.   | 27 48.93   | 54.00             | -5.07 pe       | ak                |                  |                       |  |  |  |



# **10.CONDUCTED SPURIOUS EMISSION COMPLIANCE TEST**

10.1.Block Diagram of Test Setup



10.2. The Requirement of Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

## 10.3.EUT Configuration on Measurement

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



# 10.4.Operating Condition of EUT

10.4.1.Setup the EUT and simulator as shown as Section 11.1.

- 10.4.2.Turn on the power of all equipment.
- 10.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2402-2480 MHz. We select 2402MHz, 2440MHz, and 2480MHz TX frequency to transmit.

## 10.5.Test Procedure

- 10.5.1.The transmitter output was connected to the spectrum analyzer via a low loss cable.
- 10.5.2.Set RBW of spectrum analyzer to 100kHz and VBW to 300kHz
- 10.5.3. The Conducted Spurious Emission was measured and recorded.

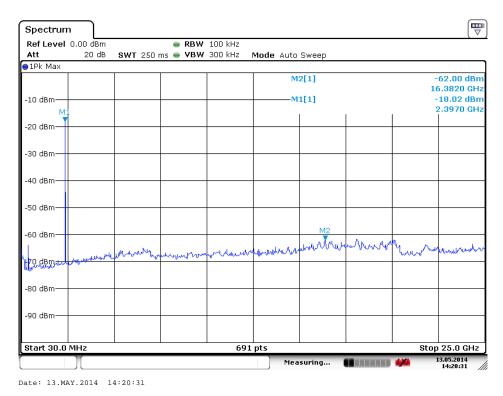
## 10.6.Test Result

### Pass.

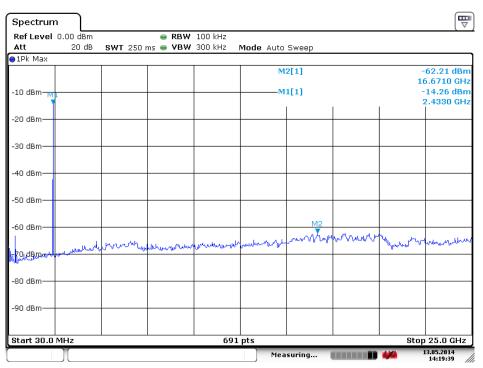
The spectrum analyzer plots are attached as below.



#### **BLE Channel Low 2402MHz**



#### **BLE Channel Middle 2440MHz**



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# **BLE Channel High 2480MHz**

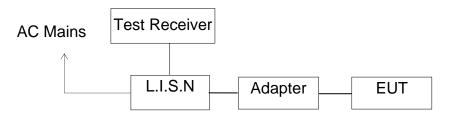
| Ref Level (                             | ).00 dBm     |                 | 🖷 RBW      | 100 kHz |              |             |           |            | ( '                    |
|---|--------------|-----------------|------------|---------|--------------|-------------|-----------|------------|------------------------|
| Att                                     | 20 dB        | SWT 250 r       | ns 👄 VBW   | 300 kHz | Mode Auto    | Sweep       |           |            |                        |
| ∋1Pk Max                                |              |                 |            |         |              |             |           |            |                        |
|   |              |                 |            |         | M            | 2[1]        |           |            | 64.67 dBr              |
| .                                       |              |                 |            |         |              |             |           |            | 5.4320 GH              |
| -10 dBm                                 |              |                 |            |         | M            | 1[1]        |           |            | 17.28 dBr<br>2.4690 GH |
| MIL T                                   |              |                 |            |         |              |             | I         | 1          | 2.4090 GH              |
| -20 dBm                                 |              |                 |            |         |              |             |           |            |                        |
|   |              |                 |            |         |              |             |           |            |                        |
| -30 dBm —                               |              |                 |            |         |              |             |           |            |                        |
|   |              |                 |            |         |              |             |           |            |                        |
| -40 dBm                                 |              |                 |            |         |              |             |           |            |                        |
|   |              |                 |            |         |              |             |           |            |                        |
| -50 dBm                                 |              |                 |            |         |              |             |           |            |                        |
| -30 abiii                               |              |                 |            |         |              |             |           |            |                        |
| -60 dBm                                 |              |                 |            |         |              |             |           |            |                        |
| -60 uBili                               |              | M2<br>With Mary |            |         |              | us Mr. A. a | Menter    | n .        |                        |
| . I.                                    | where of     | white may       | bookenbour | wohnter | alubrandowan | and of our  | or shalls | Twoweb and | Murrison               |
| ₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽ | AP-10- 10- 1 |                 |            |         |              |             |           |            |                        |
| ·                                       |              |                 |            |         |              |             |           |            |                        |
| -80 dBm                                 |              |                 |            |         |              |             |           |            |                        |
|   |              |                 |            |         |              |             |           |            |                        |
| -90 dBm                                 |              |                 |            |         |              |             |           |            |                        |
|   |              |                 |            |         |              |             |           |            |                        |
| Start 30.0 M                            | 411-7        |                 |            | 691     | nte          |             |           | Stor       | 25.0 GHz               |
| start 30.0 P                            |              |                 |            | 091     | prs          |             |           |            | 13.05.2014             |

Date: 13.MAY.2014 14:21:15



# **11.POWER LINE CONDUCTED MEASUREMENT**

# 11.1.Block Diagram of Test Setup



(EUT: MID)

11.2.Power Line Conducted Emission Measurement Limits

| Frequency  | Limit d          | Β(μV)         |  |  |  |  |  |  |  |
|--|------------------|---------------|--|--|--|--|--|--|--|
| (MHz)  | Quasi-peak Level | Average Level |  |  |  |  |  |  |  |
| 0.15 - 0.50  | 66.0 - 56.0 *    | 56.0 - 46.0 * |  |  |  |  |  |  |  |
| 0.50 - 5.00  | 46.0             |               |  |  |  |  |  |  |  |
| 5.00 - 30.00   | 60.0             | 50.0          |  |  |  |  |  |  |  |
| NOTE1: The lower limit shall apply at the transition frequencies.<br>NOTE2: The limit decreases linearly with the logarithm of the frequency in the<br>range 0.15MHz to 0.50MHz. |                  |               |  |  |  |  |  |  |  |

# 11.3.Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

- 11.4.Operating Condition of EUT
  - 11.4.1.Setup the EUT and simulator as shown as Section 5.1.
  - 11.4.2.Turn on the power of all equipment.
  - 11.4.3.Let the EUT work in test mode and measure it.



# 11.5.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.

11.6.Power Line Conducted Emission Measurement Results

## PASS.

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

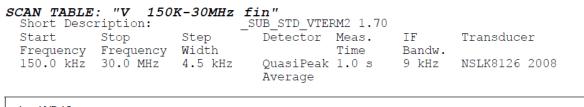
The spectral diagrams are attached as below.

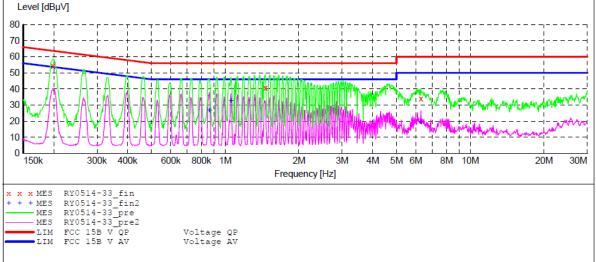


#### CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: MID M/N:PC1015BXC Manufacturer: Natural Sound Operating Condition: Operation Test Site: 1#Shielding Room Operator: Ricky Test Specification: N 120V/60Hz Comment:

Report No.:ATE20140662





#### MEASUREMENT RESULT: "RY0514-33 fin"

5/14/2014 4:26PM

| Frequency<br>MHz                 | Level<br>dBµV | Limit<br>dBµV | Margin<br>dB        | Detector | Line        | PE                |
|----------------------------------|---------------|---------------|---------------------|----------|-------------|-------------------|
| 0.198359<br>1.459848<br>6.292837 | 40.70         | 56            | 9.5<br>15.3<br>25.8 | ÕР       | N<br>N<br>N | GND<br>GND<br>GND |

#### MEASUREMENT RESULT: "RY0514-33 fin2"

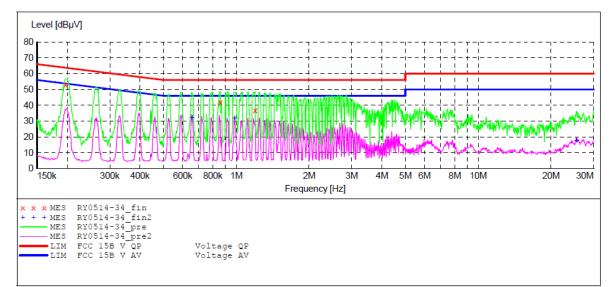
5/14/2014 4:26PM Frequency Level Transd Limit Margin Detector Line PE MHz dBµV dB dBµV dB 19.2 AV 13.4 AV 30.9 AV 0.861901 26.80 10.8 46 Ν GND 10.9 1.056518 32.60 46 Ν GND 6.292837 19.10 11.2 50 Ν GND



#### CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: MID M/N:PC1015BXC Manufacturer: Natural Sound Operating Condition: Operation Test Site: 1#Shielding Room Operator: Ricky Test Specification: L 120V/60Hz Comment: Report No.:ATE20140662

| Scan TABLE<br>Short Desc |                   | K-30MHz | fin"<br>_SUB_STD_VTERM2 1.7 | 70           |               |
|--------------------------|-------------------|---------|-----------------------------|--------------|---------------|
|                          | Stop<br>Frequency | -       | Detector Meas.<br>Time      | IF<br>Bandw. | Transducer    |
| 150.0 kHz                | 30.0 MHz          | 4.5 kHz | QuasiPeak 1.0 s<br>Average  | 9 kHz        | NSLK8126 2008 |



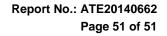
#### MEASUREMENT RESULT: "RY0514-34 fin"

| 5/14/2014 4:3<br>Frequency<br>MHz |                         |                      |    | Margin<br>dB         | Detector | Line           | PE                |
|-----------------------------------|-------------------------|----------------------|----|----------------------|----------|----------------|-------------------|
| 0.196781<br>0.858467<br>1.195699  | 53.10<br>41.70<br>36.80 | 10.5<br>10.8<br>10.9 | 56 | 10.6<br>14.3<br>19.2 | ΏΡ       | L1<br>L1<br>L1 | GND<br>GND<br>GND |

#### MEASUREMENT RESULT: "RY0514-34 fin2"

5/14/2014 4:30PM

| Frequency<br>MHz                  | Level<br>dBµV |      | Limit<br>dBµV | 2                    | Detector | Line           | PE                |
|-----------------------------------|---------------|------|---------------|----------------------|----------|----------------|-------------------|
| 0.654382<br>0.983264<br>25.447547 | 31.60         | 10.8 | 46            | 14.0<br>14.4<br>32.3 | AV       | L1<br>L1<br>L1 | GND<br>GND<br>GND |





# **12.ANTENNA REQUIREMENT**

# 12.1.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.

## 12.2.Antenna Construction

Device is equipped with unique antenna, which isn't displaced by other antenna. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna