# APPLICATION CERTIFICATION On Behalf of Zhejiang Dictory Electronic Technology Co., Ltd.

### BLUETOOTH HANDS FREE CAR KIT Model No.: DR01A

FCC ID: WVRDR01A

Prepared for : Zhejiang Dictory Electronic Technology Co., Ltd.

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Report Number : ATE20082361

Date of Test : December 12-17, 2008 Date of Report : December 17, 2008

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# **Test Report Certification**

Applicant : Zhejiang Dictory Electronic Technology Co., Ltd.

Manufacturer : Zhejiang Dictory Electronic Technology Co., Ltd.

EUT Description : BLUETOOTH HANDS FREE CAR KIT

(A) MODEL NO.: DR01A(B) SERIAL NO.: N/A

(C) POWER SUPPLY: 3.7V DC (Li-ion battery  $1 \times$ )

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart B FCC Rules and Regulations Part 15 Subpart C Section 15.247 ANSI C63.4: 2003

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 B and 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:                 | December 12-17, 2008 |  |  |
|-------------------------------|----------------------|--|--|
| Prepared by:                  | sky Lang             |  |  |
|                               | (Engineer)           |  |  |
| Approved & Authorized Signer: | Sean (               |  |  |
|                               | (Manager)            |  |  |

#### 1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT : BLUETOOTH HANDS FREE CAR KIT

Model Number : DR01A

Frequency Band : 2400MHz-2483.5MHz

Number of Channels : 79

Antenna Gain : 0dBi

Power Supply : 3.7V DC (Li-ion battery  $1\times$ )

AC Adapter : Model: GFP302-0512

Input: AC 100-240V, 50/60Hz Output: DC 4.2V, 1000mA

Applicant : Zhejiang Dictory Electronic Technology Co., Ltd.

Address : 23/F, Xingyao Building, No.518, Jiangnan Ave., Binjiang

District, Hangzhou City, Zhejiang Province, China

Manufacturer : Zhejiang Dictory Electronic Technology Co., Ltd.

Address : 23/F, Xingyao Building, No.518, Jiangnan Ave., Binjiang

District, Hangzhou City, Zhejiang Province, China

Date of sample received: December 9, 2008

Date of Test : December 12-17, 2008

#### 1.2.Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen

Listed by FCC

The Registration Number is 752051

Listed by Industry Canada

The Registration Number is 5077A-2

Accredited by China National Accreditation Committee

for Laboratories

The Certificate Registration Number is L3193

Name of Firm : ACCURATE TECHNOLOGY CO. LTD

Site Location : F1, Bldg. A, Changyuan New Material Port, Keyuan Rd.

Science & Industry Park, Nanshan, Shenzhen, Guangdong

P.R. China

#### 1.3. Measurement Uncertainty

Conducted Emission Expanded Uncertainty = 2.23dB, k=2

Radiated emission expanded uncertainty = 3.08dB, k=2

(9kHz-30MHz)

Radiated emission expanded uncertainty = 4.42dB, k=2

(30MHz-1000MHz)

Radiated emission expanded uncertainty = 4.06dB, k=2

(Above 1GHz)

# 2. MEASURING DEVICE AND TEST EQUIPMENT

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

| Kind of equipment | Manufacturer  | Туре               | S/N        | Calibrated until |
|-------------------|---------------|--------------------|------------|------------------|
| EMI Test Receiver | Rohde&Schwarz | ESCS30             | 100307     | 03.29.2009       |
| EMI Test Receiver | Rohde&Schwarz | ESPI3              | 101526/003 | 03.29.2009       |
| Spectrum Analyzer | Agilent       | E7405A             | MY45115511 | 03.29.2009       |
| Pre-Amplifier     | Rohde&Schwarz | CBLU118354<br>0-01 | 3791       | 03.31.2009       |
| Loop Antenna      | Schwarzbeck   | FMZB1516           | 1516131    | 03.28.2009       |
| Bilog Antenna     | Schwarzbeck   | VULB9163           | 9163-323   | 03.29.2009       |
| Horn Antenna      | Schwarzbeck   | BBHA9120D          | 9120D-655  | 12.20.2008       |
| Horn Antenna      | Schwarzbeck   | BBHA9170           | 9170-359   | 10.09.2009       |
| LISN              | Rohde&Schwarz | ESH3-Z5            | 100305     | 03.29.2009       |
| LISN              | Schwarzbeck   | NSLK8126           | 8126431    | 03.29.2009       |

# 3. OPERATION OF EUT DURING TESTING

# 3.1.Operating Mode

The mode is used: Transmitting mode

Low Channel: 2402MHz Middle Channel: 2441MHz High Channel: 2480MHz

Hopping

# 3.2. Configuration and peripherals



Figure 1 Setup1: Bluetooth mode

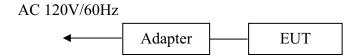


Figure 2 Setup 2: Charging mode

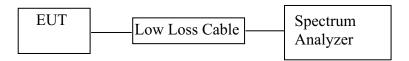
(EUT: BLUETOOTH HANDS FREE CAR KIT)

# 4. TEST PROCEDURES AND RESULTS

| FCC Rules                 | <b>Description of Test</b>        | Result    |
|---------------------------|-----------------------------------|-----------|
| Section 15.107            | Conducted Emission Test           | Compliant |
| Section 15.109            | Radiated Emission Test            | Compliant |
| Section 15.247(a)(1)      | 20dB Bandwidth Test               | Compliant |
| Section 15.247(a)(1)      | Carrier Frequency Separation Test | Compliant |
| Section 15.247(a)(1)(iii) | Number Of Hopping Frequency Test  | Compliant |
| Section 15.247(a)(1)(iii) | Dwell Time Test                   | Compliant |
| Section 15.247(b)(1)      | Maximum Peak Output Power Test    | Compliant |
| Section 15.247(d)         | Radiated Emission Test            | Compliant |
| Section 15.247(d)         | Band Edge Compliance Test         | Compliant |
| Section 15.203            | Antenna Requirement               | Compliant |

#### 5. 20DB BANDWIDTH TEST

#### 5.1.Block Diagram of Test Setup



(EUT: BLUETOOTH HANDS FREE CAR KIT)

#### 5.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

#### 5.3.EUT Configuration on Measurement

The following 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.

#### 5.3.1.BLUETOOTH HANDS FREE CAR KIT (EUT)

Model Number : DR01A Serial Number : N/A

Manufacturer : Zhejiang Dictory Electronic Technology Co., Ltd.

#### 5.4. Operating Condition of EUT

- 5.4.1. Setup the EUT and simulator as shown as Section 7.1.
- 5.4.2. Turn on the power of all equipment.
- 5.4.3.Let the EUT work in TX(Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, 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 30kHz and VBW to 100kHz.
- 5.5.3. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

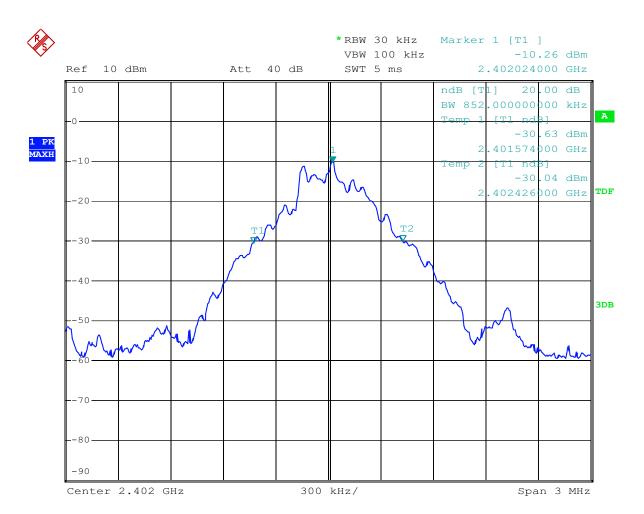
#### 5.6. Test Result

#### PASS.

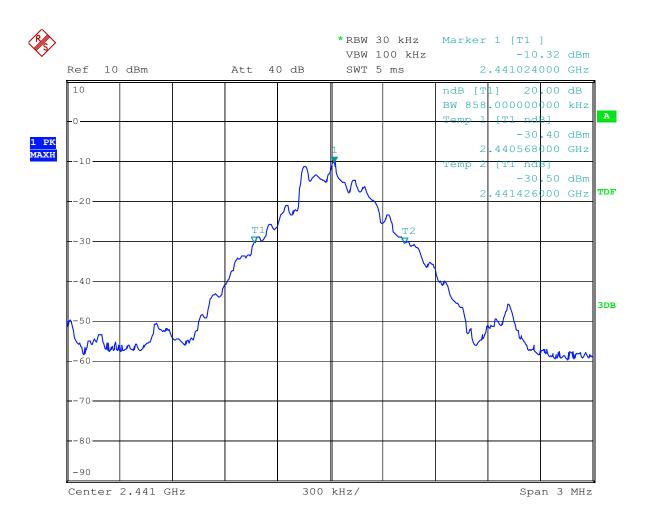
| Date of Test: | December 15, 2008    | Temperature:   | 25°C    |
|---------------|----------------------|----------------|---------|
|               | BLUETOOTH HANDS FREE |                |         |
| EUT:          | CAR KIT              | Humidity:      | 50%     |
| Model No.:    | DR01A                | Power Supply:  | DC 3.7V |
| Test Mode:    | TX                   | Test Engineer: | Joe     |

| Channel | Frequency (MHz) | 20dB Bandwidth<br>(MHz) | Limit<br>(MHz) |
|---------|-----------------|-------------------------|----------------|
| Low     | 2402            | 0.852                   |                |
| Middle  | 2441            | 0.858                   |                |
| High    | 2480            | 0.852                   |                |

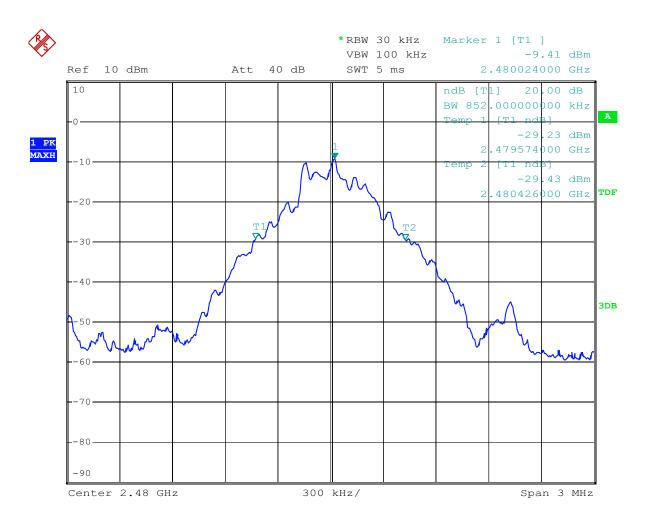
The spectrum analyzer plots are attached as below.



Date: 15.DEC.2008 16:13:35



Date: 15.DEC.2008 16:14:50



Date: 15.DEC.2008 16:15:52

# 6. CARRIER FREQUENCY SEPARATION TEST

#### 6.1.Block Diagram of Test Setup



(EUT: BLUETOOTH HANDS FREE CAR KIT)

#### 6.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

#### 6.3.EUT Configuration on Measurement

The following 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.

#### 6.3.1.BLUETOOTH HANDS FREE CAR KIT (EUT)

Model Number : DR01A Serial Number : N/A

Manufacturer : Zhejiang Dictory Electronic Technology Co., Ltd.

#### 6.4. Operating Condition of EUT

- 6.4.1. Setup the EUT and simulator as shown as Section 8.1.
- 6.4.2. Turn on the power of all equipment.
- 6.4.3.Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, 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.Set RBW of spectrum analyzer to 100kHz and VBW to 300kHz. Adjust Span to 3 MHz.
- 6.5.3. Set the adjacent channel of the EUT maxhold another trace.
- 6.5.4. Measurement the channel separation

#### 6.6.Test Result

#### PASS.

Date of Test: December 15, 2008

BLUETOOTH HANDS FREE

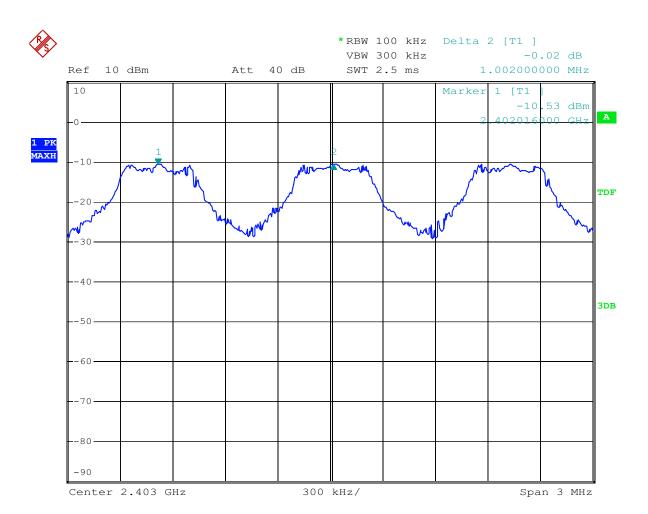
EUT: CAR KIT Humidity: 50%

Model No.: DR01A Power Supply: DC 3.7V

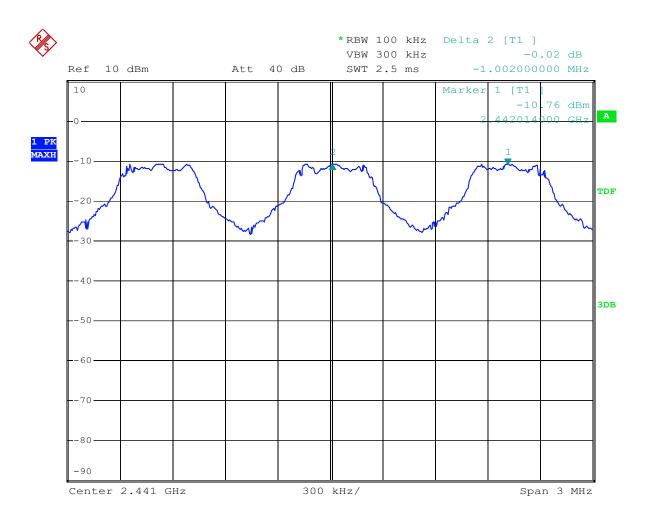
Test Mode: Hopping Test Engineer: Joe

|         | Channel Frequency | Channel separation |                               |
|---------|-------------------|--------------------|-------------------------------|
| Channel |                   |                    | Limit                         |
|         | (MHz)             | (MHz)              |                               |
| Low     | 2402              | 1.002              | > the 20dB Bandwidth or 25kHz |
| Low     | 2402              | 1.002              | (whichever is greater)        |
| Middle  | 2441              | 1.002              | > the 20dB Bandwidth or 25kHz |
| Middle  | 2 <del>44</del> 1 | 1.002              | (whichever is greater)        |
| ILiah   | 2490              | 1.002              | > the 20dB Bandwidth or 25kHz |
| High    | 2480              | 1.002              | (whichever is greater)        |

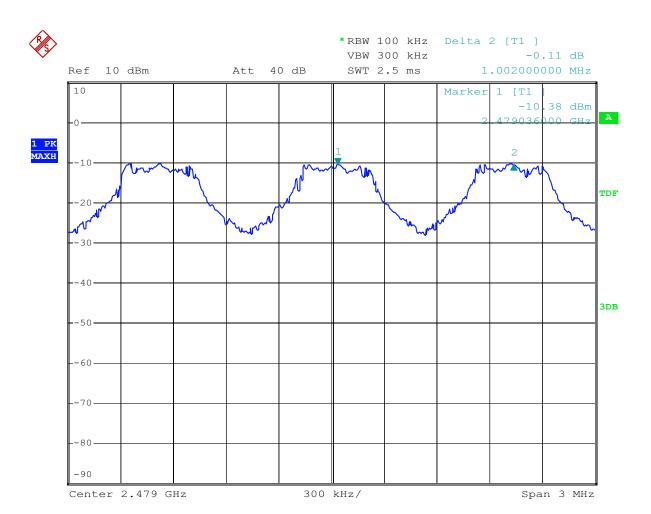
The spectrum analyzer plots are attached as below.



Date: 15.DEC.2008 15:41:28



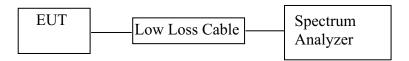
Date: 15.DEC.2008 15:44:56



Date: 15.DEC.2008 15:47:11

# 7. NUMBER OF HOPPING FREQUENCY TEST

#### 7.1.Block Diagram of Test Setup



(EUT: BLUETOOTH HANDS FREE CAR KIT)

#### 7.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

#### 7.3.EUT Configuration on Measurement

The following 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.

#### 7.3.1.BLUETOOTH HANDS FREE CAR KIT (EUT)

Model Number : DR01A Serial Number : N/A

Manufacturer : Zhejiang Dictory Electronic Technology Co., Ltd.

#### 7.4. Operating Condition of EUT

- 7.4.1. Setup the EUT and simulator as shown as Section 9.1.
- 7.4.2. Turn on the power of all equipment.
- 7.4.3.Let the EUT work in TX (Hopping on) modes measure it.

## 7.5.Test Procedure

- 7.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 7.5.2.Set the spectrum analyzer as Span=30MHz, RBW=300kHz, VBW=300kHz.
- 7.5.3.Max hold, view and count how many channel in the band.

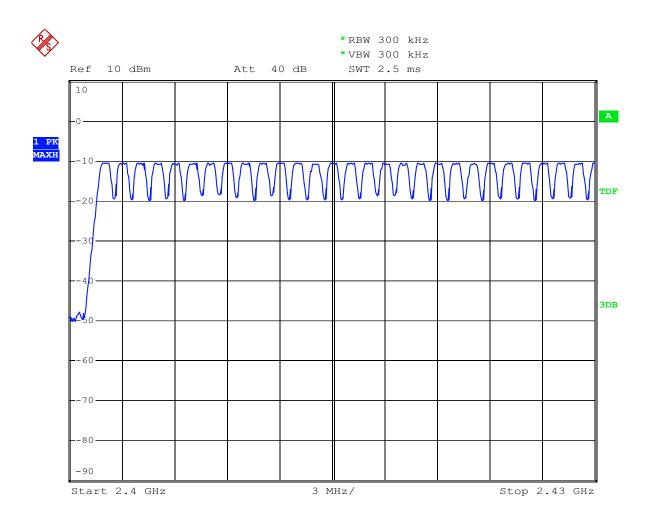
#### 7.6.Test Result

#### PASS.

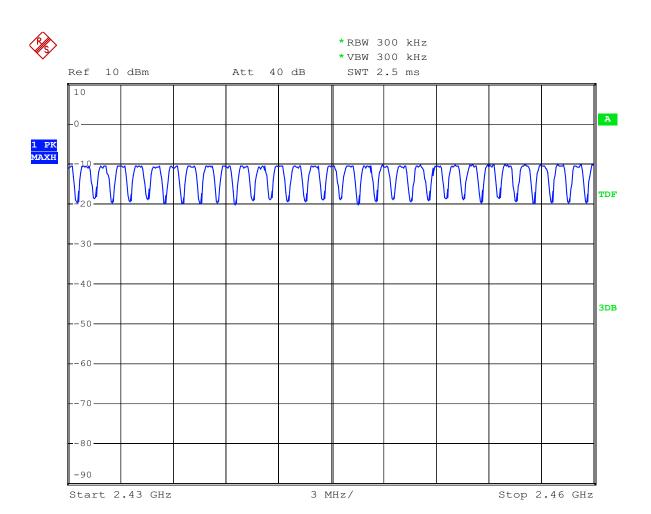
| Date of Test: | December 15, 2008 | Temperature:   | 25°C    |
|---------------|-------------------|----------------|---------|
|               | BLUETOOTH HANDS   |                |         |
| EUT:          | FREE CAR KIT      | Humidity:      | 50%     |
| Model No.:    | DR01A             | Power Supply:  | DC 3.7V |
| Test Mode:    | Hopping           | Test Engineer: | Joe     |

|                 | Measurement result | Limit |
|-----------------|--------------------|-------|
| Total number of | (CH)               | (CH)  |
| hopping channel | 79                 | >15   |
|                 |                    |       |

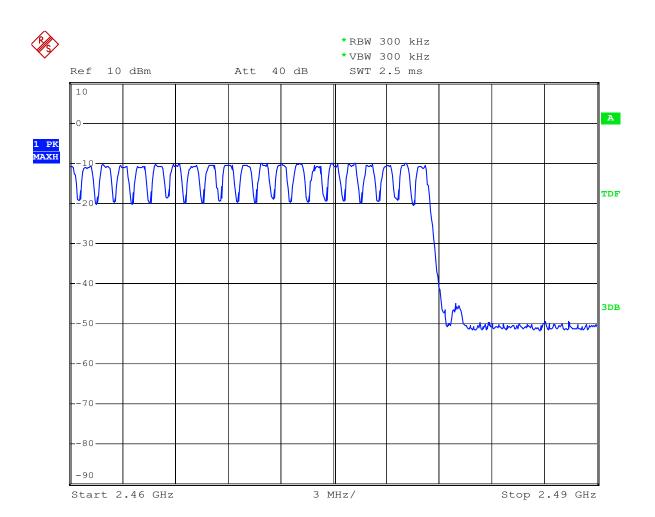
The spectrum analyzer plots are attached as below.



Date: 15.DEC.2008 15:27:00



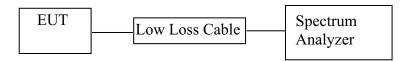
Date: 15.DEC.2008 15:28:39



Date: 15.DEC.2008 15:29:49

#### 8. DWELL TIME TEST

#### 8.1.Block Diagram of Test Setup



(EUT: BLUETOOTH HANDS FREE CAR KIT)

#### 8.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

## 8.3.EUT Configuration on Measurement

The following 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.

#### 8.3.1.BLUETOOTH HANDS FREE CAR KIT (EUT)

Model Number : DR01A Serial Number : N/A

Manufacturer : Zhejiang Dictory Electronic Technology Co., Ltd.

#### 8.4. Operating Condition of EUT

- 8.4.1. Setup the EUT and simulator as shown as Section 10.1.
- 8.4.2. Turn on the power of all equipment.
- 8.4.3.Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, 2480MHz TX frequency to transmit.

#### 8.5. Test Procedure

- 8.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 8.5.2. Set center frequency of spectrum analyzer = operating frequency.
- 8.5.3.Set the spectrum analyzer as RBW=100kHz, VBW=300kHz, Span=0Hz, Adjust Sweep=1s. Get the burst (in 1 sec.).
- 8.5.4.Set the spectrum analyzer as RBW=1MHz, VBW=3MHz, Span=0Hz, Adjust Sweep=2ms. Get the pulse time.
- 8.5.5.Repeat above procedures until all frequency measured were complete.

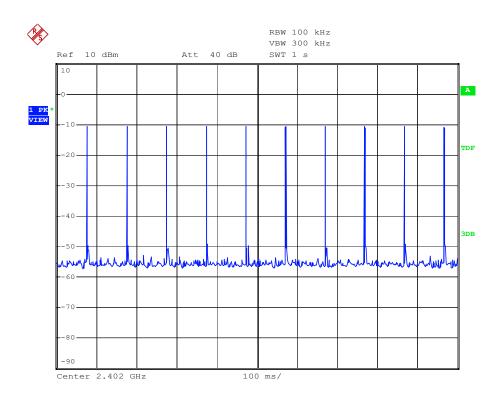
#### 8.6.Test Result

#### PASS.

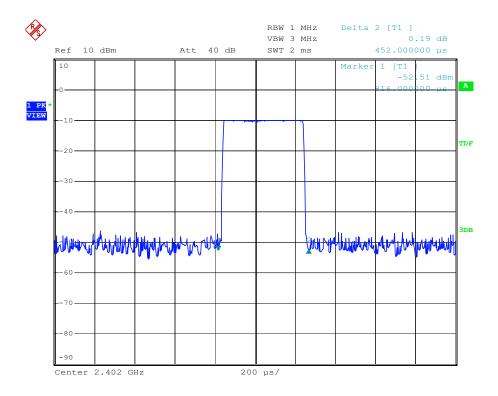
25°C Date of Test: December 15, 2008 Temperature: BLUETOOTH HANDS FREE EUT: CAR KIT Humidity: 50% Model No.: DR01A Power Supply: DC 3.7V Test Engineer: Joe Test Mode: Hopping

| A period transmit time = $0.4 \times 79 = 31.6$ |                             |            |             |            |       |
|---|-----------------------------|------------|-------------|------------|-------|
| Dwell time = p                                  | oulse time × burst (in 1 se | ec.)×31.6  |             |            |       |
| Channel   | Channel Frequency           | Pulse Time | Burst       | Dwell Time | Limit |
|   | (MHz)                       | (ms)       | (in 1 sec.) | (ms)       | (ms)  |
| Low   | 2402                        | 0.452      | 10          | 142.83     | 400   |
| Middle  | 2441                        | 0.436      | 10          | 137.78     | 400   |
| High  | 2480                        | 0.436      | 10          | 137.78     | 400   |

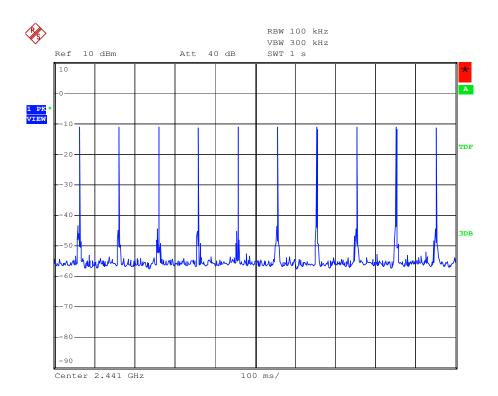
The spectrum analyzer plots are attached as below.



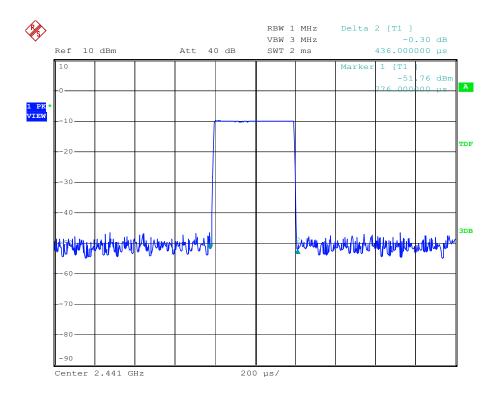
Date: 15.DEC.2008 15:48:40



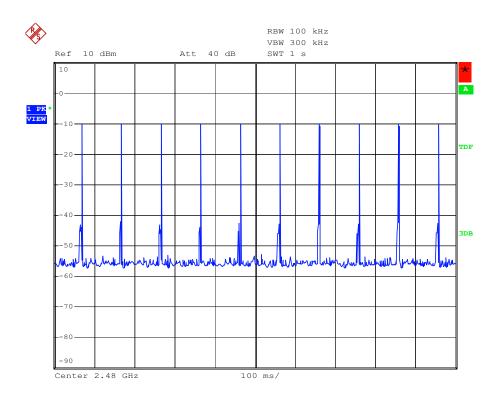
Date: 15.DEC.2008 16:08:27



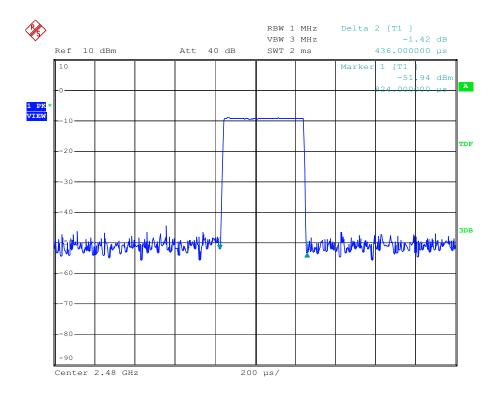
Date: 15.DEC.2008 15:50:38



Date: 15.DEC.2008 16:09:48



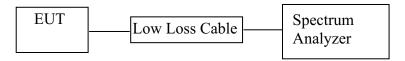
Date: 15.DEC.2008 15:51:32



Date: 15.DEC.2008 16:10:56

#### 9. MAXIMUM PEAK OUTPUT POWER TEST

#### 9.1.Block Diagram of Test Setup



(EUT: BLUETOOTH HANDS FREE CAR KIT)

#### 9.2. The Requirement For Section 15.247(b)(1)

Section 15.247(b)(1): For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

#### 9.3.EUT Configuration on Measurement

The following 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.

#### 9.3.1.BLUETOOTH HANDS FREE CAR KIT (EUT)

Model Number : DR01A Serial Number : N/A

Manufacturer : Zhejiang Dictory Electronic Technology Co., Ltd.

#### 9.4. Operating Condition of EUT

- 9.4.1. Setup the EUT and simulator as shown as Section 11.1.
- 9.4.2. Turn on the power of all equipment.
- 9.4.3.Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, 2480MHz TX frequency to transmit.

#### 9.5.Test Procedure

- 9.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 9.5.2.Set RBW of spectrum analyzer to 1MHz and VBW to 3MHz.
- 9.5.3. Measurement the maximum peak output power.

#### 9.6.Test Result

PASS.

Date of Test: December 15, 2008

BLUETOOTH HANDS FREE

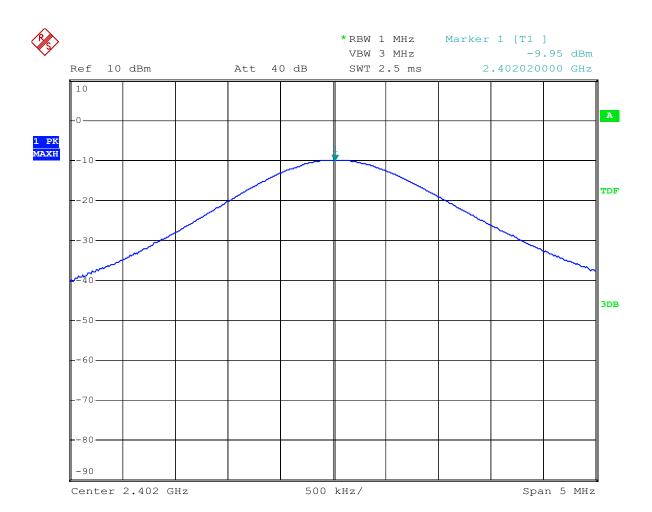
EUT: CAR KIT Humidity: 50%

Model No.: DR01A Power Supply: DC 3.7V

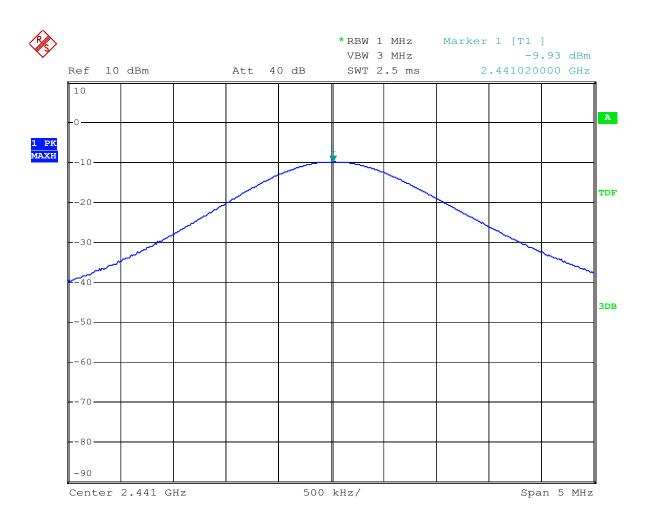
Test Mode: TX Test Engineer: Joe

| Channel | Frequency (MHz) | Peak Output Power (dBm) | Peak Output Power (mW) | Limits<br>dBm / W |
|---------|-----------------|-------------------------|------------------------|-------------------|
| Low     | 2402            | -9.95                   | 0.101                  | 30 dBm / 1 W      |
| Middle  | 2441            | -9.93                   | 0.102                  | 30 dBm / 1 W      |
| High    | 2480            | -10.34                  | 0.092                  | 30 dBm / 1 W      |

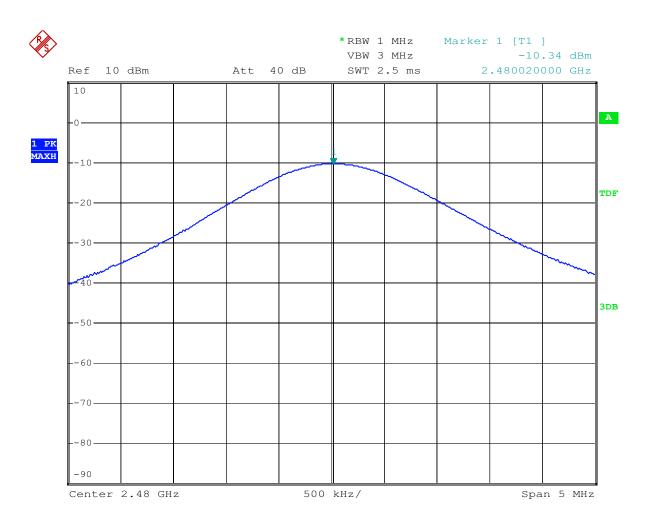
The spectrum analyzer plots are attached as below.



Date: 15.DEC.2008 16:18:04



Date: 15.DEC.2008 16:19:50



Date: 15.DEC.2008 16:20:39

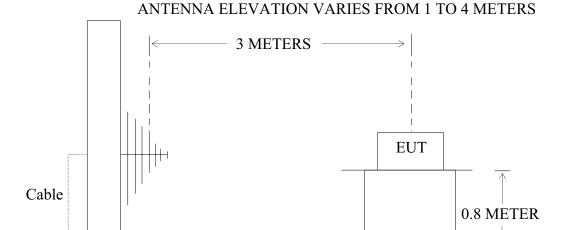
#### 10. RADIATED EMISSION TEST

#### 10.1.Block Diagram of Test Setup

10.1.1.Block diagram of connection between the EUT and simulators

(EUT: BLUETOOTH HANDS FREE CAR KIT)

#### 10.1.2. Anechoic Chamber Test Setup Diagram



GROUND PLANE (EUT: BLUETOOTH HANDS FREE CAR KIT)

#### 10.2. 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).

#### 10.3.Restricted bands of operation

#### 10.3.1.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      |
| <sup>1</sup> 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     | $\binom{2}{}$ |
| 13.36-13.41              |                     |               |               |

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

(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.

#### 10.4. Configuration of EUT on Measurement

The following equipment are 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.

#### 10.4.1.BLUETOOTH HANDS FREE CAR KIT (EUT)

Model Number : DR01A Serial Number : N/A

Manufacturer : Zhejiang Dictory Electronic Technology Co., Ltd.

<sup>&</sup>lt;sup>2</sup>Above 38.6

#### 10.5.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: 2003 on radiated emission measurement.

The bandwidth of test receiver (R&S ESI26) is set at 120kHz in 30-1000MHz. and set at 1MHz in above 1000MHz.

The frequency range from 30MHz to 25000MHz is checked.

The final measurement in band 9-90kHz, 110-490kHz 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

## 10.6. The Field Strength of Radiation Emission Measurement Results PASS.

Date of Test: December 15, 2008 Temperature: 25°C

**BLUETOOTH HANDS FREE** 

DR01A

EUT: CAR KIT Humidity: 50% Power Supply: DC 3.7V

Test Mode: TX (2402MHz) Test Engineer: Joe

#### For 30MHz-1000MHz

Model No.:

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

|           | Timema Tactor Cacre Boso Timpinter Cam |        |          |          |        |              |  |  |  |
|-----------|--|--------|----------|----------|--------|--------------|--|--|--|
| Frequency | Reading                                | Factor | Result   | Limit    | Margin | Polarization |  |  |  |
| (MHz)     | (dBµV/m)                               | Corr.  | (dBµV/m) | (dBµV/m) | (dB)   |              |  |  |  |
|           | QP                                     | (dB)   | QP       | QP       | QP     |              |  |  |  |
| 126.8158  | 17.95                                  | 15.01  | 32.96    | 43.50    | -10.54 | Vertical     |  |  |  |
| 144.7760  | 19.33                                  | 14.48  | 33.81    | 43.50    | -9.69  | Vertical     |  |  |  |
| 158.5289  | 19.44                                  | 14.59  | 34.03    | 43.50    | -9.47  | Vertical     |  |  |  |
| 144.7760  | 22.72                                  | 14.48  | 37.20    | 43.50    | -6.30  | Horizontal   |  |  |  |
| 173.5974  | 22.80                                  | 14.74  | 37.54    | 43.50    | -5.96  | Horizontal   |  |  |  |
| 190.2074  | 23.60                                  | 14.87  | 38.47    | 43.50    | -5.03  | Horizontal   |  |  |  |

#### For 1GHz-25GHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

| Frequency | Reading( | dBμV/m) | Factor     | Result(c | Result(dBμV/m) |    | Limit(dBµV/m) |        | n(dB)  | Polarizati |
|-----------|----------|---------|------------|----------|----------------|----|---------------|--------|--------|------------|
| (MHz)     | AV       | PEAK    | Corr. (dB) | AV       | PEAK           | AV | PEAK          | AV     | PEAK   | on         |
| 2400.000  | 44.02    | 46.17   | -7.46      | 36.56    | 38.71          | 54 | 74            | -17.44 | -35.29 | Vertical   |
| 2402.026  | 85.59    | 87.57   | -7.45      | 78.14    | 80.12          | -  | -             | -      | -      | Vertical   |
| 4804.040  | 50.34    | 52.76   | -0.30      | 50.04    | 52.46          | 54 | 74            | -3.96  | -21.54 | Vertical   |
| 7206.068  | 45.00    | 47.37   | 2.97       | 47.97    | 50.34          | 54 | 74            | -6.03  | -23.66 | Vertical   |
| 2400.000  | 43.18    | 44.89   | -7.46      | 35.72    | 37.43          | 54 | 74            | -18.28 | -36.57 | Horizontal |
| 2402.026  | 84.01    | 85.77   | -7.45      | 76.56    | 78.32          | -  | -             | -      | -      | Horizontal |
| 4804.040  | 50.03    | 52.59   | -0.30      | 49.73    | 52.29          | 54 | 74            | -4.27  | -21.71 | Horizontal |

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

2. \*: Denotes restricted band of operation.

Date of Test: December 15, 2008 Temperature: 25°C

BLUETOOTH HANDS FREE

EUT: CAR KIT Humidity: 50%

Model No.: DR01A Power Supply: DC 3.7V

Test Mode: TX (2441MHz) Test Engineer: Joe

#### For 30MHz-1000MHz

Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain

|           |          |        | 1        |          | 1      |              |
|-----------|----------|--------|----------|----------|--------|--------------|
| Frequency | Reading  | Factor | Result   | Limit    | Margin | Polarization |
| (MHz)     | (dBµV/m) | Corr.  | (dBµV/m) | (dBµV/m) | (dB)   |              |
|           | QP       | (dB)   | QP       | QP       | QP     |              |
| 126.8158  | 18.37    | 15.01  | 33.38    | 43.50    | -10.12 | Vertical     |
| 144.7760  | 19.49    | 14.48  | 33.97    | 43.50    | -9.53  | Vertical     |
| 190.2074  | 19.13    | 14.87  | 34.00    | 43.50    | -9.50  | Vertical     |
| 158.5289  | 22.24    | 14.59  | 36.83    | 43.50    | -6.67  | Horizontal   |
| 173.6102  | 21.81    | 14.74  | 36.55    | 43.50    | -6.95  | Horizontal   |
| 190.2075  | 22.26    | 14.87  | 37.13    | 43.50    | -6.37  | Horizontal   |

#### For 1GHz-25GHz

Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain

| Frequency | Reading( | dBμV/m) | μV/m) Factor |       | Result(dBµV/m) |    | Limit(dBµV/m) |       | n(dB)  | Polarizati |  |
|-----------|----------|---------|--------------|-------|----------------|----|---------------|-------|--------|------------|--|
| (MHz)     | AV       | PEAK    | Corr. (dB)   | AV    | PEAK           | AV | PEAK          | AV    | PEAK   | on         |  |
| 2441.024  | 86.00    | 87.78   | -7.35        | 78.65 | 80.43          | -  | -             | -     | -      | Vertical   |  |
| 4882.039  | 48.88    | 50.92   | 0.14         | 49.02 | 51.06          | 54 | 74            | -4.98 | -22.94 | Vertical   |  |
| 2441.024  | 83.84    | 85.80   | -7.35        | 76.49 | 78.45          | -  | -             | -     | -      | Horizontal |  |
| 4882.039  | 49.32    | 51.51   | 0.14         | 49.46 | 51.65          | 54 | 74            | -4.54 | -22.35 | Horizontal |  |

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

2. \*: Denotes restricted band of operation.

Date of Test: December 15, 2008 Temperature: 25°C

BLUETOOTH HANDS FREE

EUT: CAR KIT Humidity: 50%

Model No.: DR01A Power Supply: DC 3.7V

Test Mode: TX (2480MHz) Test Engineer: Joe

#### For 30MHz-1000MHz

Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain

|           |          |        |          | 1        |        |              |
|-----------|----------|--------|----------|----------|--------|--------------|
| Frequency | Reading  | Factor | Result   | Limit    | Margin | Polarization |
| (MHz)     | (dBµV/m) | Corr.  | (dBµV/m) | (dBµV/m) | (dB)   |              |
|           | QP       | (dB)   | QP       | QP       | QP     |              |
| 126.8159  | 19.19    | 15.01  | 34.20    | 43.50    | -9.30  | Vertical     |
| 144.7760  | 19.64    | 14.48  | 34.12    | 43.50    | -9.38  | Vertical     |
| 173.5975  | 18.74    | 14.74  | 33.48    | 43.50    | -10.02 | Vertical     |
| 158.5288  | 21.66    | 14.59  | 36.25    | 43.50    | -7.25  | Horizontal   |
| 173.6102  | 22.03    | 14.74  | 36.77    | 43.50    | -6.73  | Horizontal   |
| 190.2074  | 22.77    | 14.87  | 37.64    | 43.50    | -5.86  | Horizontal   |

#### For 1GHz-25GHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

| Frequency | Reading( | dBμV/m) | Factor     | Result(c | Result(dBμV/m) |    | Limit(dBμV/m) |        | n(dB)  | Polarizati |
|-----------|----------|---------|------------|----------|----------------|----|---------------|--------|--------|------------|
| (MHz)     | AV       | PEAK    | Corr. (dB) | AV       | PEAK           | AV | PEAK          | AV     | PEAK   | on         |
| 2480.023  | 84.73    | 86.69   | -7.37      | 77.36    | 79.32          | -  | -             | -      | -      | Vertical   |
| 2483.500  | 41.31    | 43.22   | -7.37      | 33.94    | 35.85          | 54 | 74            | -20.06 | -38.15 | Vertical   |
| 4960.039  | 49.05    | 51.52   | 0.52       | 49.57    | 52.04          | 54 | 74            | -4.43  | -21.96 | Vertical   |
| 7440.058  | 40.11    | 42.56   | 3.69       | 43.80    | 46.25          | 54 | 74            | -10.20 | -27.75 | Vertical   |
| 2480.023  | 84.68    | 86.57   | -7.37      | 77.31    | 79.20          | -  | -             | -      | -      | Horizontal |
| 2483.500  | 41.20    | 43.28   | -7.37      | 33.83    | 35.91          | 54 | 74            | -20.17 | -38.09 | Horizontal |
| 4960.039  | 49.46    | 52.03   | 0.52       | 49.98    | 52.55          | 54 | 74            | -4.02  | -21.45 | Horizontal |
| 7440.058  | 42.42    | 44.81   | 3.69       | 46.11    | 48.50          | 54 | 74            | -7.89  | -25.50 | Horizontal |

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

2. \*: Denotes restricted band of operation.



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

Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: RTTE #844

Standard: FCC Class B 3M Radiated

Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 50 %

EUT: BLUETOOTH HANDS FREE CAR KIT

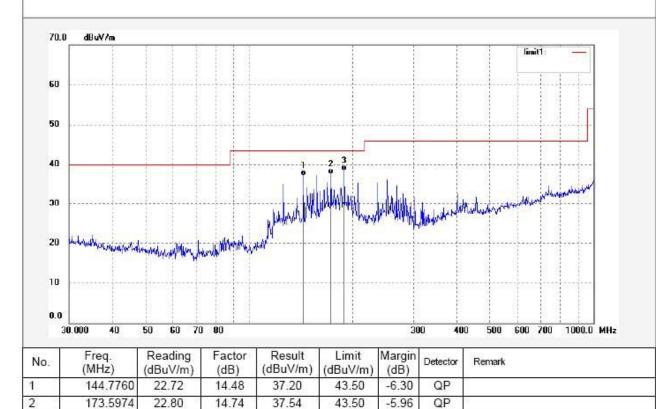
Mode: TX 2402MHz Model: DR01A Manufacturer: Dictory

Note: Sample No.:084317 Report No.:ATE20082361 Polarization: Horizontal Power Source: DC 3.7V

Date: 2008/12/15 Time: 08:34:33

Engineer Signature: Joe

Distance: 3m



3

190.2074

23.60

14.87

38.47

43.50

-5.03

QP



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Job No.: RTTE #845

Standard: FCC Class B 3M Radiated

Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 50 %

EUT: BLUETOOTH HANDS FREE CAR KIT

Mode: TX 2402MHz Model: DR01A Manufacturer: Dictory

ada: TV 2402MU=

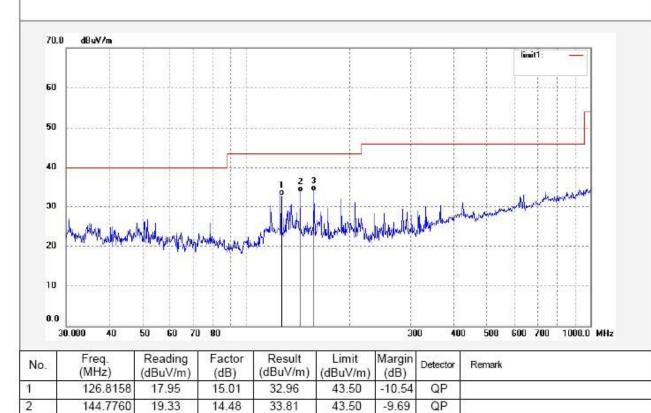
Note: Sample No.:084317 Report No.:ATE20082361

Polarization: Vertical Power Source: DC 3.7V

Date: 2008/12/15 Time: 08:37:20

Engineer Signature: Joe

Distance: 3m



3

158.5289

19.44

14.59

34.03

43.50

-9.47

QP



F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: RTTE #874

Standard: FCC Class B 3M Radiated

Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 50 %

EUT: BLUETOOTH HANDS FREE CAR KIT

Mode: TX 2402MHz Model: DR01A Manufacturer: Dictory Polarization: Horizontal Power Source: DC 3.7V

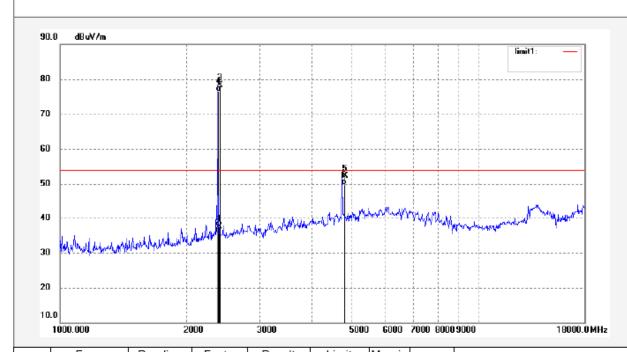
Date: 2008/12/15

Engineer Signature: Joe

Distance: 3m

Time: 10:29:41

Note: Sample No.:084317 Report No.:ATE20082361



| No. | Freq.<br>(MHz) | (dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | (dBuV/m) | Margin<br>(dB) | Detector | Remark |
|-----|----------------|----------|----------------|--------------------|----------|----------------|----------|--------|
| 1   | 2400.000       | 44.89    | -7.46          | 37.43              | 74.00    | -36.57         | peak     |        |
| 2   | 2400.000       | 43.18    | -7.46          | 35.72              | 54.00    | -18.28         | AVG      |        |
| 3   | 2402.026       | 85.77    | -7.45          | 78.32              | -        | -              | peak     |        |
| 4   | 2402.026       | 84.01    | -7.45          | 76.56              | -        | -              | AVG      |        |
| 5   | 4804.040       | 52.59    | -0.30          | 52.29              | 74.00    | -21.71         | peak     |        |
| 6   | 4804.040       | 50.03    | -0.30          | 49.73              | 54.00    | -4.27          | AVG      |        |



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Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: RTTE #875

Standard: FCC Class B 3M Radiated

Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 50 %

EUT: BLUETOOTH HANDS FREE CAR KIT

Mode: TX 2402MHz Model: DR01A Manufacturer: Dictory

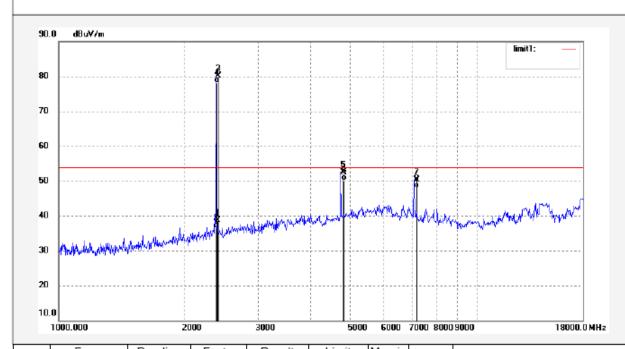
Note: Sample No.:084317 Polarization: Vertical Power Source: DC 3.7V

Date: 2008/12/15 Time: 10:32:31

Engineer Signature: Joe

Distance: 3m

Report No.:ATE20082361



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|--------|
| 1   | 2400.000       | 46.17               | -7.46          | 38.71              | 74.00             | -35.29         | peak     |        |
| 2   | 2400.000       | 44.02               | -7.46          | 36.56              | 54.00             | -17.44         | AVG      |        |
| 3   | 2402.026       | 87.57               | -7.45          | 80.12              | -                 | -              | peak     |        |
| 4   | 2402.026       | 85.59               | -7.45          | 78.14              | -                 | -              | AVG      |        |
| 5   | 4804.040       | 52.76               | -0.30          | 52.46              | 74.00             | -21.54         | peak     |        |
| 6   | 4804.040       | 50.34               | -0.30          | 50.04              | 54.00             | -3.96          | AVG      |        |
| 7   | 7206.068       | 47.37               | 2.97           | 50.34              | 74.00             | -23.66         | peak     |        |
| 8   | 7206.068       | 45.00               | 2.97           | 47.97              | 54.00             | -6.03          | AVG      |        |



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Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: RTTE #881

Standard: FCC Class B 3M Radiated

Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 50 %

EUT: BLUETOOTH HANDS FREE CAR KIT

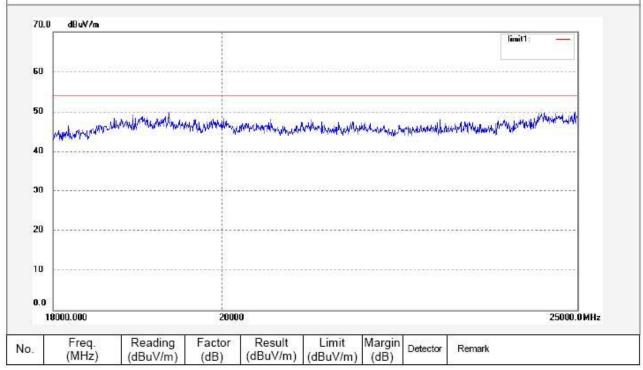
Mode: TX 2402MHz Model: DR01A Manufacturer: Dictory

Note: Sample No.:084317 Polarization: Horizontal Power Source: DC 3.7V

Date: 2008/12/15 Time: 10:53:26

Engineer Signature: Joe







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

Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: RTTE #880

Standard: FCC Class B 3M Radiated

Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 50 %

EUT: BLUETOOTH HANDS FREE CAR KIT

Mode: Model: DR01A Manufacturer: Dictory

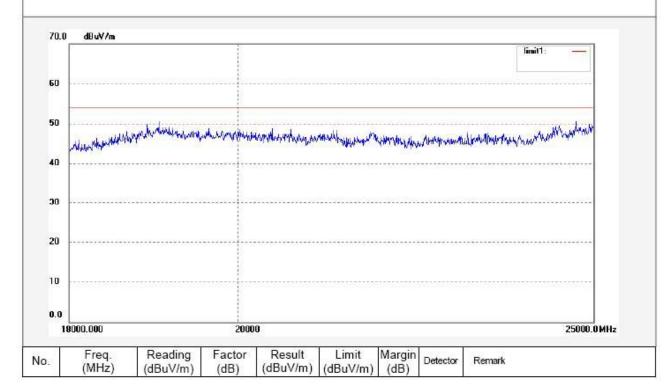
TX 2402MHz

Polarization: Vertical Power Source: DC 3.7V

Date: 2008/12/15 Time: 10:50:38

Engineer Signature: Joe







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

Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: RTTE #847

Standard: FCC Class B 3M Radiated

Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 50 %

EUT: BLUETOOTH HANDS FREE CAR KIT

Mode: TX 2441MHz Model: DR01A Manufacturer: Dictory

Note:

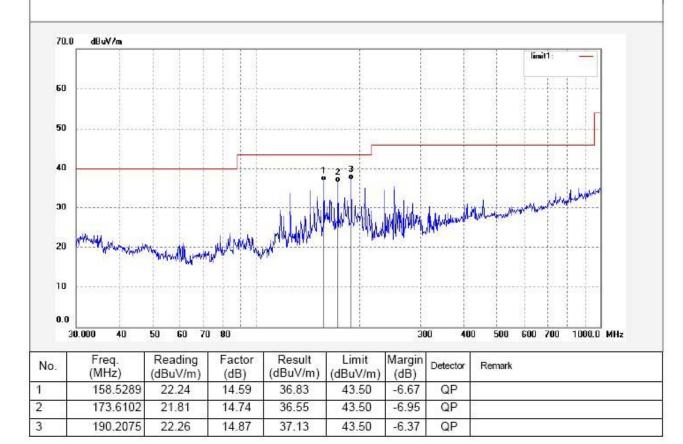
Sample No.:084317 Report No.:ATE20082361 Power Source: DC 3.7V Date: 2008/12/15

Time: 08:44:00

Polarization:

Engineer Signature: Joe

Horizontal





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

Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: RTTE #846

Standard: FCC Class B 3M Radiated

Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 50 %

EUT:

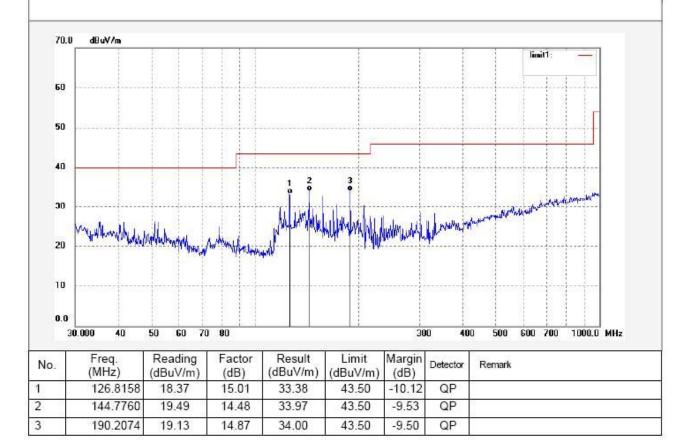
Mode: TX 2441MHz Model: DR01A Manufacturer: Dictory

BLUETOOTH HANDS FREE CAR KIT

Note: Sample No.:084317 Report No.:ATE20082361 Polarization: Vertical Power Source: DC 3.7V

Date: 2008/12/15 Time: 08:41:12

Engineer Signature: Joe





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

Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: RTTE #877

Standard: FCC Class B 3M Radiated

Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 50 %

EUT: BLUETOOTH HANDS FREE CAR KIT

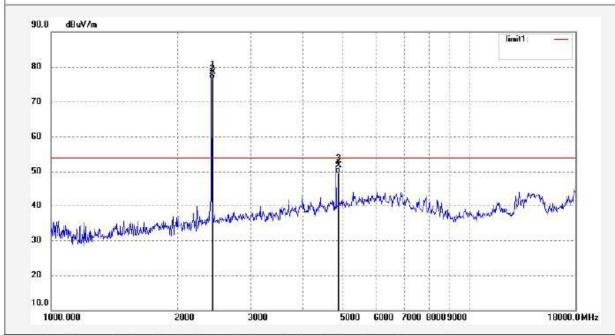
Mode: TX 2441MHz Model: DR01A Manufacturer: Dictory

Note:

Sample No.:084317 Report No.:ATE20082361 Polarization: Horizontal Power Source: DC 3.7V

Date: 2008/12/15 Time: 10:38:44

Engineer Signature: Joe



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) |                   | Margin<br>(dB) | Detector | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|--------|
| 1   | 2441.024       | 85.80               | -7.35          | 78.45              | 2                 | 24             | peak     |        |
| 2   | 2441.024       | 83.84               | -7.35          | 76.49              | 9 <del>11</del> 4 | j e            | AVG      |        |
| 3   | 4882.039       | 51.51               | 0.14           | 51.65              | 74.00             | -22.35         | peak     |        |
| 4   | 4882.039       | 49.32               | 0.14           | 49.46              | 54.00             | -4.54          | AVG      |        |



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

Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: RTTE #876 Standard: FCC Class B 3M Radiated

Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 50 %

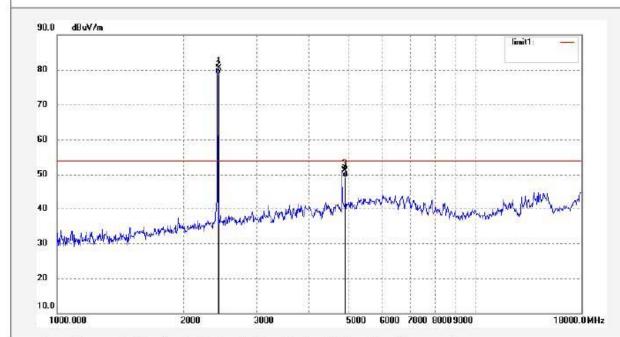
EUT: BLUETOOTH HANDS FREE CAR KIT

Mode: TX 2441MHz Model: DR01A Manufacturer: Dictory

Note: Sample No.:084317 Report No.:ATE20082361 Polarization: Vertical Power Source: DC 3.7V

Date: 2008/12/15 Time: 10:35:52

Engineer Signature: Joe



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) |                   | Margin<br>(dB) | Detector | Remark        |  |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|---------------|--|
| 1   | 2441.024       | 87.78               | -7.35          | 80.43              | 2                 |                | peak     | 30            |  |
| 2   | 2441.024       | 86.00               | -7.35          | 78.65              | 9 <del>11</del> 4 | 1988           | AVG      | 3             |  |
| 3   | 4882.039       | 50.92               | 0.14           | 51.06              | 74.00             | -22.94         | peak     | <del>77</del> |  |
| 4   | 4882.039       | 48.88               | 0.14           | 49.02              | 54.00             | -4.98          | AVG      | 8             |  |



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

Polarization:

Date: 2008/12/15

Time: 10:56:48

Distance: 3m

Power Source: DC 3.7V

Engineer Signature: Joe

Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Horizontal

Job No.: RTTE #882

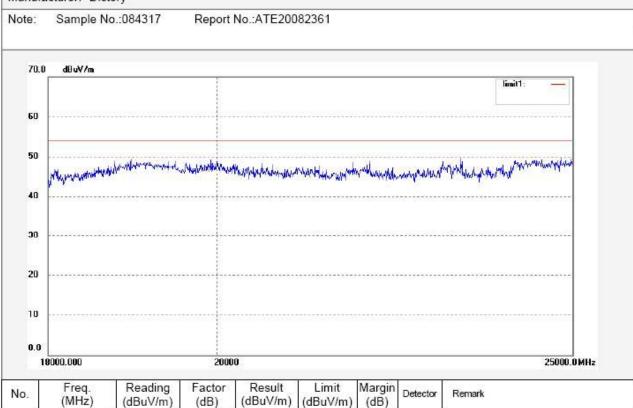
Standard: FCC Class B 3M Radiated

Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 50 %

EUT: BLUETOOTH HANDS FREE CAR KIT

Mode: TX 2441MHz Model: DR01A

Manufacturer: Dictory





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

Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: RTTE #883

Standard: FCC Class B 3M Radiated

Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 50 %

EUT: BLUETOOTH HANDS FREE CAR KIT

Mode: Model: DR01A Manufacturer: Dictory

TX 2441MHz

Sample No.:084317

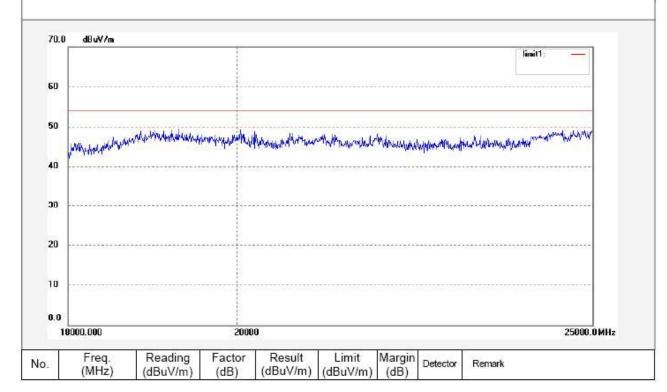
Polarization: Vertical Power Source: DC 3.7V

Date: 2008/12/15 Time: 10:59:33

Engineer Signature: Joe

Distance: 3m

Note: Report No.:ATE20082361





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

Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: RTTE #848

Standard: FCC Class B 3M Radiated

Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 50 %

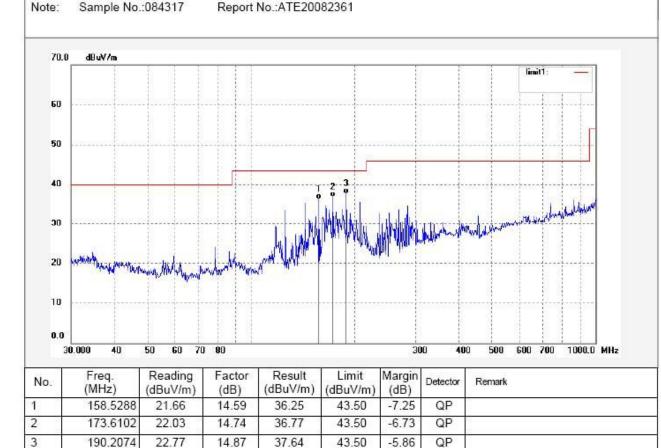
EUT: BLUETOOTH HANDS FREE CAR KIT

Mode: TX 2480MHz Model: DR01A Manufacturer: Dictory

Sample No.:084317 Report No.:ATE20082361 Polarization: Horizontal Power Source: DC 3.7V

Date: 2008/12/15 Time: 08:47:52

Engineer Signature: Joe





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

Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: RTTE #849

Standard: FCC Class B 3M Radiated

Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 50 %

EUT: BLUETOOTH HANDS FREE CAR KIT

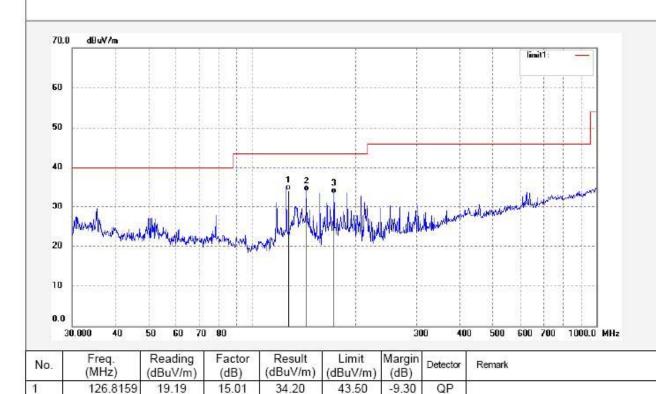
Mode: TX 2480MHz Model: DR01A Manufacturer: Dictory

Note: Sample No.:084317 Report No.:ATE20082361 Polarization: Power Source: DC 3.7V

Date: 2008/12/15 Time: 08:50:46

Engineer Signature: Joe

Distance: 3m



2

3

144.7760

173.5975

19.64

18.74

14.48

14.74

34.12

33.48

43.50

43.50

-9.38

-10.02

QP

QP



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

Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: RTTE #878 Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 50 %

EUT: BLUETOOTH HANDS FREE CAR KIT

Mode: TX 2480MHz Model: DR01A Manufacturer: Dictory

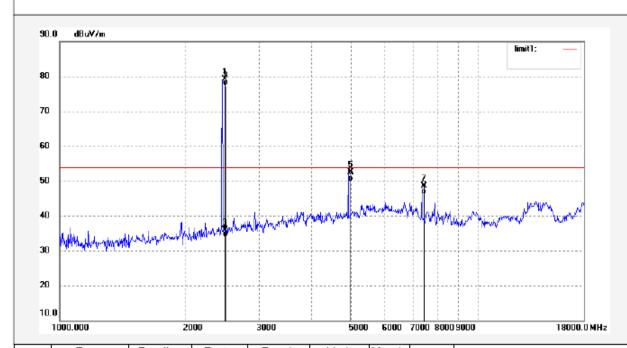
Note: Sample No.:084317 Polarization: Horizontal Power Source: DC 3.7V

Date: 2008/12/15 Time: 10:42:39

Engineer Signature: Joe

Distance: 3m

Report No.:ATE20082361



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|--------|
| 1   | 2480.023       | 86.57               | -7.37          | 79.20              | -                 | -              | peak     |        |
| 2   | 2480.023       | 84.68               | -7.37          | 77.31              | -                 | -              | AVG      |        |
| 3   | 2483.500       | 43.28               | -7.37          | 35.91              | 74.00             | -38.09         | peak     |        |
| 4   | 2483.500       | 41.20               | -7.37          | 33.83              | 54.00             | -20.17         | AVG      |        |
| 5   | 4960.039       | 52.03               | 0.52           | 52.55              | 74.00             | -21.45         | peak     |        |
| 6   | 4960.039       | 49.46               | 0.52           | 49.98              | 54.00             | -4.02          | AVG      |        |
| 7   | 7440.058       | 44.81               | 3.69           | 48.50              | 74.00             | -25.50         | peak     |        |
| 8   | 7440.058       | 42.42               | 3.69           | 46.11              | 54.00             | -7.89          | AVG      |        |



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

Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: RTTE #879

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 50 %

EUT: BLUETOOTH HANDS FREE CAR KIT

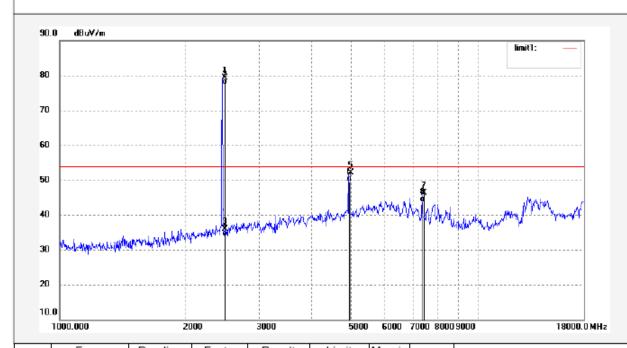
Mode: TX 2480MHz Model: DR01A Manufacturer: Dictory

Report No.:ATE20082361 Sample No.:084317

Polarization: Vertical Power Source: DC 3.7V

Date: 2008/12/15 Time: 10:45:31

Engineer Signature: Joe



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|--------|
| 1   | 2480.023       | 86.69               | -7.37          | 79.32              | -                 | -              | peak     |        |
| 2   | 2480.023       | 84.73               | -7.37          | 77.36              | -                 | -              | AVG      |        |
| 3   | 2483.500       | 43.22               | -7.37          | 35.85              | 74.00             | -38.15         | peak     |        |
| 4   | 2483.500       | 41.31               | -7.37          | 33.94              | 54.00             | -20.06         | AVG      |        |
| 5   | 4960.039       | 51.52               | 0.52           | 52.04              | 74.00             | -21.96         | peak     |        |
| 6   | 4960.039       | 49.05               | 0.52           | 49.57              | 54.00             | -4.43          | AVG      |        |
| 7   | 7440.058       | 42.56               | 3.69           | 46.25              | 74.00             | -27.75         | peak     |        |
| 8   | 7440.058       | 40.11               | 3.69           | 43.80              | 54.00             | -10.20         | AVG      |        |



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

Polarization:

Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Horizontal

Job No.: RTTE #885

Standard: FCC Class B 3M Radiated

Power Source: DC 3.7V Test item: Radiation Test Date: 2008/12/15 Temp.( C)/Hum.(%) 25 C / 50 % Time: 11:05:24 EUT: BLUETOOTH HANDS FREE CAR KIT Engineer Signature: Joe Mode: TX 2480MHz Distance: 3m DR01A Model: Manufacturer: Dictory Note: Sample No.:084317 Report No.:ATE20082361 70.0 dBuV/m limit1: 60 50 40 30 20 10

18000.000 20000 25000.0 MHz Freq. Reading Factor Result Limit Margin Detector No. Remark (dBuV/m) (MHz) (dBuV/m) (dB) (dBuV/m) (dB)

0.0



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

Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: RTTE #884

Standard: FCC Class B 3M Radiated

Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 50 %

EUT: BLUETOOTH HANDS FREE CAR KIT

Mode: TX 2480MHz DR01A Model: Manufacturer: Dictory

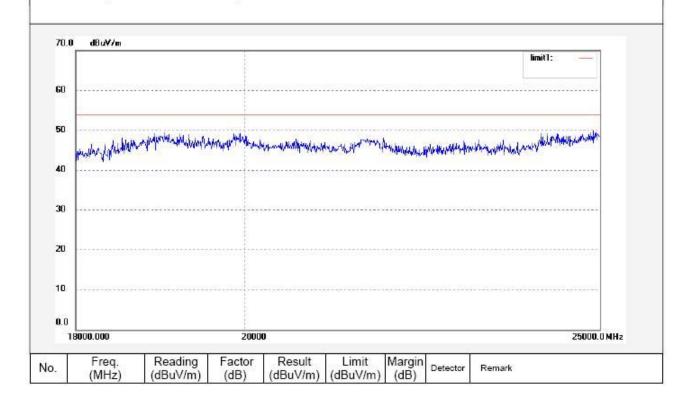
Note:

Sample No.:084317 Report No.:ATE20082361 Power Source: DC 3.7V Date: 2008/12/15

Time: 11:02:38

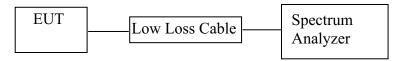
Polarization:

Engineer Signature: Joe



#### 11.BAND EDGE COMPLIANCE TEST

#### 11.1.Block Diagram of Test Setup



(EUT: BLUETOOTH HANDS FREE CAR KIT)

### 11.2. 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 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

#### 11.3.EUT Configuration on Measurement

The following 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.

#### 11.3.1.BLUETOOTH HANDS FREE CAR KIT (EUT)

Model Number : DR01A Serial Number : N/A

Manufacturer : Zhejiang Dictory Electronic Technology Co., Ltd.

## 11.4. Operating Condition of EUT

- 11.4.1. Setup the EUT and simulator as shown as Section 13.1.
- 11.4.2. Turn on the power of all equipment.
- 11.4.3.Let the EUT work in TX (Hopping off, Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2480MHz TX frequency to transmit.

#### 11.5.Test Procedure

- 11.5.1. The transmitter output was connected to the spectrum analyzer via a low loss cable.
- 11.5.2.Set RBW of spectrum analyzer to 100kHz and VBW to 300kHz.
- 11.5.3. The band edges was measured and recorded.

### 11.6.Test Result

#### **Pass**

Date of Test: December 17, 2008

BLUETOOTH HANDS FREE CAR

EUT: KIT Humidity: 50%

Model No.: DR01A Power Supply: DC 3.7V

Test Mode: TX (Hopping off) Test Engineer: Joe

#### Conducted test

| Frequency | Result of Band Edge<br>(dBc) | Limit of Band Edge<br>(dBc) |
|-----------|------------------------------|-----------------------------|
| (MHz)     |                              |                             |
| 2402      | 37.56                        | > 20dBc                     |
| 2480      | 41.86                        | > 20dBc                     |

Date of Test: December 15, 2008 Temperature: 25°C

BLUETOOTH HANDS FREE CAR

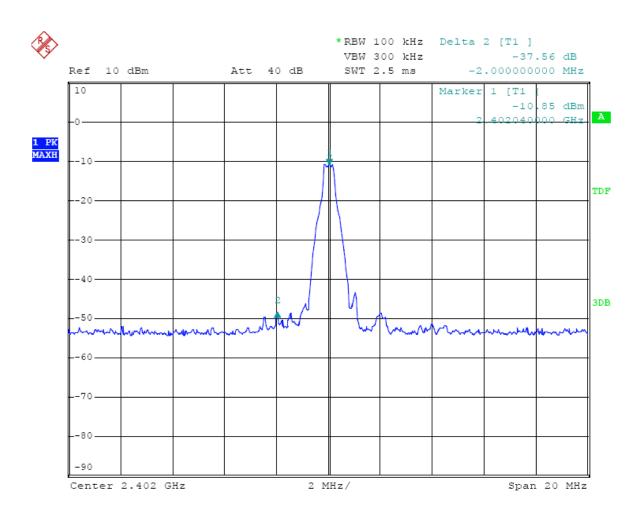
EUT: KIT Humidity: 50%

Model No.: DR01A Power Supply: DC 3.7V

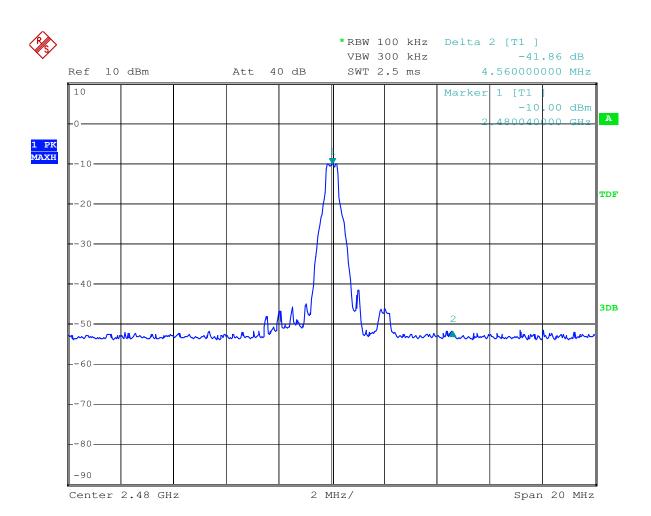
Test Mode: TX (Hopping on) Test Engineer: Joe

#### Conducted test

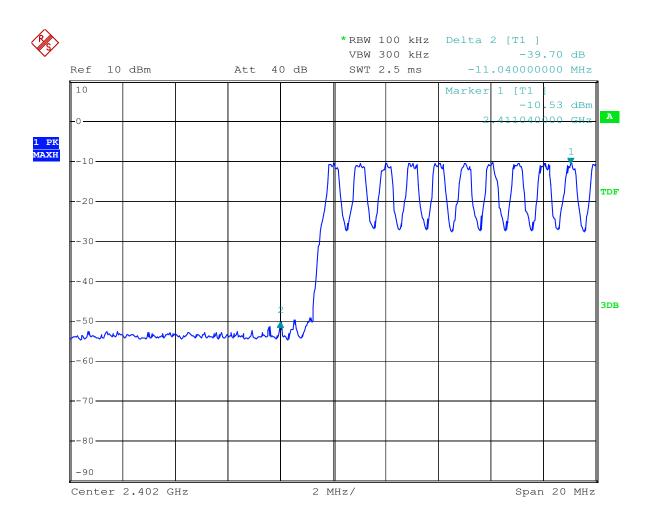
| Frequency | Result of Band Edge<br>(dBc) | Limit of Band Edge<br>(dBc) |
|-----------|------------------------------|-----------------------------|
| (MHz)     |                              |                             |
| 2402      | 39.70                        | > 20dBc                     |
| 2480      | 41.06                        | > 20dBc                     |



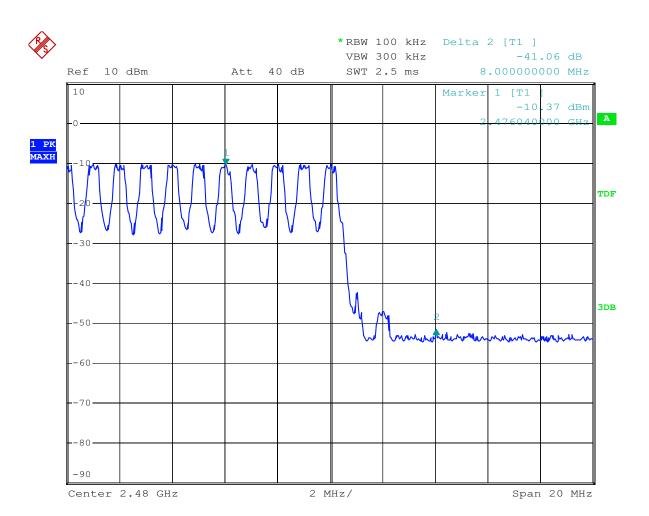
Date: 17.DEC.2008 09:33:44



Date: 17.DEC.2008 09:55:42



Date: 15.DEC.2008 15:34:26



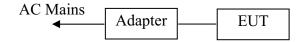
Date: 15.DEC.2008 15:38:45

## 12. CONDUCTED EMISSION FOR FCC PART 15 SECTION

## 15.107(A)

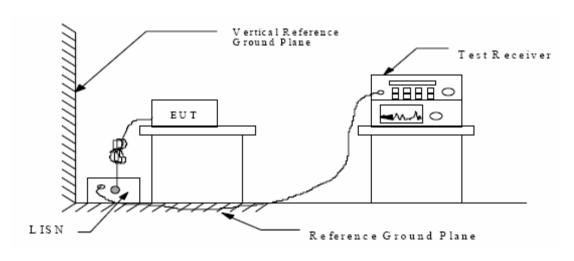
## 12.1.Block Diagram of Test Setup

12.1.1.Block diagram of connection between the EUT and simulators



(EUT: BLUETOOTH HANDS FREE CAR KIT)

### 12.1.2. Shielding Room Test Setup Diagram



(EUT: BLUETOOTH HANDS FREE CAR KIT)

#### 12.2. The Emission Limit

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

| Frequency    | Limit dB(μV)     |               |  |  |  |  |
|--------------|------------------|---------------|--|--|--|--|
| (MHz)        | Quasi-peak Level | Average Level |  |  |  |  |
| 0.15 - 0.50  | 66.0 - 56.0 *    | 56.0 – 46.0 * |  |  |  |  |
| 0.50 - 5.00  | 56.0             | 46.0          |  |  |  |  |
| 5.00 - 30.00 | 60.0             | 50.0          |  |  |  |  |

<sup>\*</sup> Decreases with the logarithm of the frequency.

## 12.3. Configuration of EUT on Measurement

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

#### 12.3.1.BLUETOOTH HANDS FREE CAR KIT (EUT)

Model Number : DR01A Serial Number : N/A

Manufacturer : Zhejiang Dictory Electronic Technology Co., Ltd.

#### 12.4. Operating Condition of EUT

12.4.1. Setup the EUT and simulator as shown as Section 5.1.

12.4.2. Turn on the power of all equipment.

12.4.3.Let the EUT work in Charging mode measure it.

#### 12.5.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: 2003 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.

## 12.6.Power Line Conducted Emission Measurement Results

#### PASS.

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

Date of Test: December 12, 2008

BLUETOOTH HANDS FREE

EUT: CAR KIT

Model No.: DR01A

Temperature: 25°C

Humidity: 49%

DC 4.2V (Adapter input)

Adapter power: AC120V/60Hz

Test Mode: Charging Test Engineer: Joe

| Frequency<br>MHz                 | Level<br>dBµV | Transd<br>dB         | Limit<br>dBµV | -                   | Detector | Line           | PE                |
|----------------------------------|---------------|----------------------|---------------|---------------------|----------|----------------|-------------------|
| 0.195000<br>0.298500<br>0.496500 |               |                      | 60            | 16.9                | QP       | N<br>N<br>N    | GND<br>GND<br>GND |
| Frequency<br>MHz                 |               |                      | Limit<br>dBµV | -                   | Detector | Line           | PE                |
| 0.199500<br>0.496500<br>2.386500 |               | 11.2<br>12.0<br>11.6 |               | 13.1                | AV       | N<br>N<br>N    | GND<br>GND<br>GND |
|                                  |               |                      |               |                     |          |                |                   |
| Frequency<br>MHz                 | Level<br>dBµV | Transd<br>dB         | Limit<br>dBµV | _                   | Detector | Line           | PE                |
| 0.199500<br>0.496500<br>1.986000 |               | 11.2<br>12.0<br>11.7 |               |                     | QP       | L1<br>L1<br>L1 |                   |
| Frequency<br>MHz                 | Level<br>dBµV |                      | Limit<br>dBµV | Margin<br>dB        | Detector | Line           | PE                |
| 0.496500<br>1.491000<br>1.986000 |               |                      | 46            | 12.9<br>12.9<br>9.4 | AV       | L1<br>L1<br>L1 | GND<br>GND<br>GND |

The spectral diagrams are attached as below.

#### CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: BLUETOOTH HANDS FREE CAR KIT M/N:DR01A

Manufacturer: Dictory Operating Condition: Charging

Test Site: 1#Shielding Room

Operator: Joe

Test Specification: Va 120V/60Hz

Sample No.:084317 Comment: Report No.:ATE20082361

Start of Test: 12/12/2008 / 9:56:57AM

# SCAN TABLE: "V 150K-30MHz fin" Short Description: \_SUB\_S

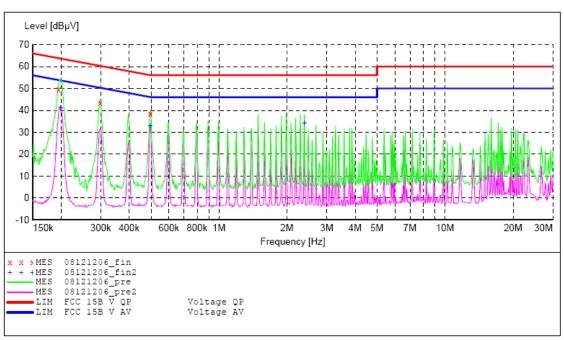
\_SUB\_STD\_VTERM2 1.70

Detector Meas. Stop Step ΙF Start Transducer

Time Bandw.

Frequency Frequency Width 150.0 kHz 30.0 MHz 0.8 % QuasiPeak 1.0 s 9 kHz NSLK8126 2008

Average



#### MEASUREMENT RESULT: "08121206 fin"

| 12/12/2008 9:    | 59AM  |              |    |              |          |      |     |
|------------------|-------|--------------|----|--------------|----------|------|-----|
| Frequency<br>MHz |       | Transd<br>dB |    | Margin<br>dB | Detector | Line | PE  |
| 0.195000         | 49.70 | 11.2         | 64 | 14.1         | QP       | N    | GND |
| 0.298500         | 43.40 | 11.6         | 60 | 16.9         | QP       | N    | GND |
| 0.496500         | 38.50 | 12.0         | 56 | 17.6         | QP       | N    | GND |

#### MEASUREMENT RESULT: "08121206 fin2"

| 12/12/2008 9     | :59AM |      |               |              |          |      |     |
|------------------|-------|------|---------------|--------------|----------|------|-----|
| Frequency<br>MHz |       |      | Limit<br>dBµV | Margin<br>dB | Detector | Line | PE  |
| 0.199500         | 41.00 | 11.2 | 54            | 12.6         | AV       | N    | GND |
| 0.496500         | 33.00 | 12.0 | 46            | 13.1         | AV       | N    | GND |
| 2.386500         | 34.30 | 11.6 | 46            | 11.7         | AV       | N    | GND |

#### CONDUCTED EMISSION STANDARD FCC PART 15B

BLUETOOTH HANDS FREE CAR KIT M/N:DR01A EUT:

Manufacturer: Dictory Operating Condition: Charging

Test Site: 1#Shielding Room Operator: Joe

Test Specification: Vb 120V/60Hz

Sample No.:084317 Report No.:ATE20082361 Comment:

Start of Test: 12/12/2008 / 9:52:42AM

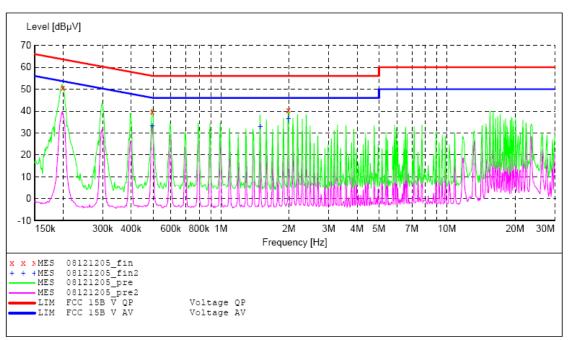
SCAN TABLE: "V 150K-30MHz fin"
Short Description: \_SUB\_S \_SUB\_STD\_VTERM2 1.70

Step Detector Meas. Start Stop TF Transducer

Width Time Bandw.

Frequency Frequency Width 150.0 kHz 30.0 MHz 0.8 % QuasiPeak 1.0 s 9 kHz NSLK8126 2008

Average



#### MEASUREMENT RESULT: "08121205 fin"

| 12/12/2008       | 9:55AM |      |               |              |          |      |     |
|------------------|--------|------|---------------|--------------|----------|------|-----|
| Frequency<br>MHz |        |      | Limit<br>dBµV | Margin<br>dB | Detector | Line | PE  |
| 0.199500         | 50.50  | 11.2 | 64            | 13.1         | QP       | L1   | GND |
| 0.496500         | 39.80  | 12.0 | 56            | 16.3         | QP       | L1   | GND |
| 1.986000         | 40.60  | 11.7 | 56            | 15.4         | QP       | L1   | GND |

#### MEASUREMENT RESULT: "08121205 fin2"

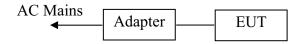
| 12/12/2008       | 9:55AM     |      |               |              |          |      |     |
|------------------|------------|------|---------------|--------------|----------|------|-----|
| Frequency<br>MHz | Level dBµV |      | Limit<br>dBµV | Margin<br>dB | Detector | Line | PE  |
| 0.496500         | 33.20      | 12.0 | 46            | 12.9         | AV       | L1   | GND |
| 1.491000         | 33.10      | 11.7 | 46            | 12.9         | AV       | L1   | GND |
| 1.986000         | 36.60      | 11.7 | 46            | 9.4          | AV       | L1   | GND |

## 13. RADIATED EMISSION FOR FCC PART 15 SECTION 15.109

**(A)** 

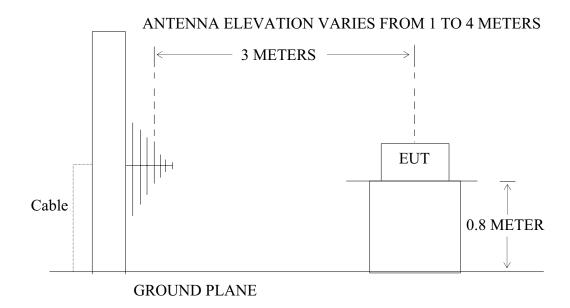
## 13.1.Block Diagram of Test Setup

13.1.1.Block diagram of connection between the EUT and simulators



(EUT: BLUETOOTH HANDS FREE CAR KIT)

### 13.1.2. Anechoic Chamber Test Setup Diagram



(EUT: BLUETOOTH HANDS FREE CAR KIT)

## 13.2. The Emission Limit For Section 15.109 (a)

13.2.1. Radiation Emission Measurement Limits According to Section 15.109 (a).

|                 | Limit   |   |  |  |  |  |
|-----------------|---|---|--|--|--|--|
| Frequency (MHz) | Field Strength of Quasi-peak Value (microvolts/m) | Field Strength of Quasi-peak Value (dBµV/m) |  |  |  |  |
| 30 - 88         | 100   | 40  |  |  |  |  |
| 88 - 216        | 150   | 43.5  |  |  |  |  |
| 216 - 960       | 200   | 46  |  |  |  |  |
| Above 960       | 500   | 54  |  |  |  |  |

## 13.3.EUT Configuration on Measurement

The following 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.

#### 13.3.1.BLUETOOTH HANDS FREE CAR KIT (EUT)

Model Number : DR01A Serial Number : N/A

Manufacturer : Zhejiang Dictory Electronic Technology Co., Ltd.

## 13.4. Operating Condition of EUT

- 13.4.1. Setup the EUT and simulator as shown as Section 6.1.
- 13.4.2. Turn on the power of all equipment.
- 13.4.3.Let the EUT work in Charging mode measure it.

#### 13.5.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: 2003 on radiated emission measurement.

The bandwidth of test receiver is set at 120kHz in 30-1000MHz.

The frequency range from 30MHz to 1000MHz is checked.

The final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

#### 13.6. The Emission Measurement Result

#### PASS.

| Frequency | Reading  | Factor(dB) | Result        | Limit    | Margin | Polarization |
|-----------|----------|------------|---------------|----------|--------|--------------|
| (MHz)     | (dBµV/m) | Corr.      | $(dB\mu V/m)$ | (dBµV/m) | (dB)   |              |
|           | QP       |            | QP            | QP       | QP     |              |
| 35.9616   | 8.94     | 18.47      | 27.41         | 40.00    | -12.59 | Vertical     |
| -         | -        | -          | -             | -        | -      | Horizontal   |

The spectral diagrams are attached as below display the measurement of peak values.

#### 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

Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Amplifier Gain



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

Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: RTTE #843

Standard: FCC Class B 3M Radiated

Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 50 %

EUT: BLUETOOTH HANDS FREE CAR KIT

Mode: DR01A Model: Manufacturer: Dictory

Charging

Note: Sample No.:084317 Polarization: Horizontal

Power Source: AC 120V/60Hz

Date: 2008/12/12 Time: 11:02:04

Engineer Signature: Joe





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

Site: 966 chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.: RTTE #842

Standard: FCC Class B 3M Radiated

Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 50 %

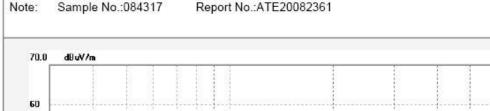
EUT: BLUETOOTH HANDS FREE CAR KIT

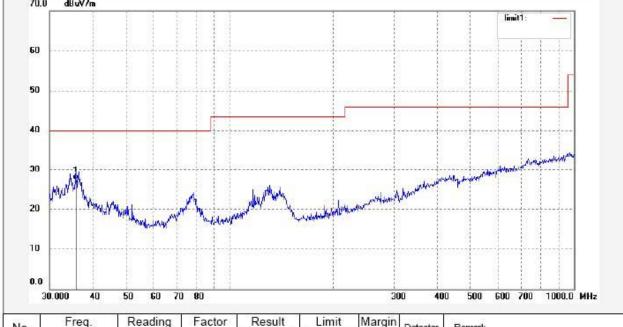
Mode: Charging DR01A Model: Manufacturer: Dictory Polarization: Vertical

Power Source: AC 120V/60Hz

Date: 2008/12/12 Time: 10:59:04

Engineer Signature: Joe





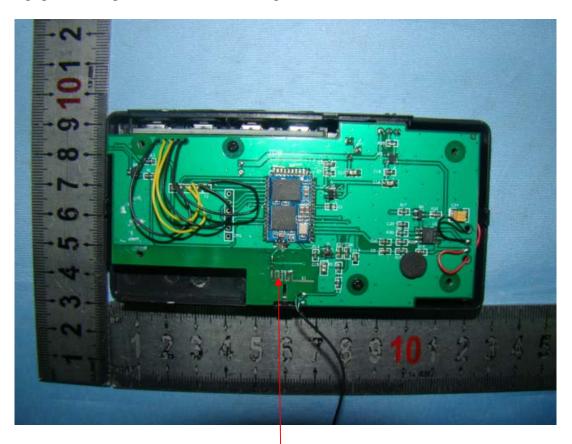
## 14.ANTENNA REQUIREMENT

## 14.1.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.

#### 14.2.Antenna Construction

The antenna is PCB Layout antenna, no consideration of replacement. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna