

FCC TEST REPORT  
for  
SHENZHEN XTOOLTECH CO. ,LTD

iOBD2  
Model No.: MFi BT

Prepared for : SHENZHEN XTOOLTECH CO. ,LTD  
Address : 4/F Floor, Building C, Longjing Second Industrial Zone,  
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Report Number : CTE13DR-218F  
Date of Test : Jun. 1~3, 2013  
Date of Report : Jun. 3, 2013

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APPENDIX I (External Photos) (2 Pages)

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## TEST REPORT

Applicant : SHENZHEN XTOOLTECH CO. ,LTD  
Manufacturer : SHENZHEN XTOOLTECH CO. ,LTD  
EUT : iOBD2  
Model No. : MFi BT  
Serial No. : N/A  
Rating : DC 12.0V  
Trade Mark : N/A

### Measurement Procedure Used:

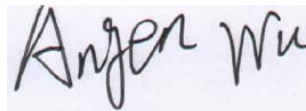
FCC Part15 Subpart C, Paragraph 15.207, 15.249 & 15.209

The device described above is tested by Coffee-T Electronics Technology Co Ltd to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Coffee-T Electronics Technology Co Ltd is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Coffee-T Electronics Technology Co Ltd

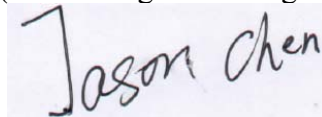
Date of Test :

Jun. 1~5, 2013



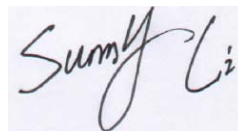
Prepared by :

(Tested Engineer / Angel wu)



Reviewer :

(Project Manager /Jason Chen )



Approved & Authorized Signer :

(Manager / Sumy li)

## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

EUT : iOBD2

Model Number : MFi BT

Test Power Supply : DC 12.0V

Frequency : 2402~2480MHz

Antenna Specification : Printed Antenna:1.87dBi

Applicant : SHENZHEN XTOOLTECH CO. ,LTD  
Address : 4/F Floor, Building C, Longjing Second Industrial Zone, Longzhu  
5th Road, Nanshan District , Shenzhen,Guangdong,China

Manufacturer : SHENZHEN XTOOLTECH CO. ,LTD  
Address : 4/F Floor, Building C, Longjing Second Industrial Zone, Longzhu  
5th Road, Nanshan District , Shenzhen,Guangdong,China

Date of receiver : Jun. 1, 2013  
Date of Test : Jun. 1~3, 2013

## 1.2. Auxiliary Equipment Used during Test

Adapter : Model: MFI BT  
Input: DC 12.0V

## 1.3. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

### **CNAS - LAB Code: L3503**

Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

### **FCC-Registration No.: 752021**

Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 752021, August 20, 2010.

## 1.4. Measurement Uncertainty

Radiation Uncertainty : Ur = 4.3dB

## 2. Test Procedure

**GENERAL:** This report shall NOT be reproduced except in full without the written approval of Coffee-T Electronics Technology Co Ltd. The EUT was transmitting a test signal during the testing.

**RADIATION INTERFERENCE:** The test procedure used was ANSI STANDARD C63.4-2009 using a spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100KHz and the video bandwidth was 300KHz up to 1.0GHz and 1.0MHz with a video BW of 3.0MHz above 1.0GHz. The ambient temperature of the EUT was 74.3oF with a humidity of 69%.

**FORMULA OF CONVERSION FACTORS:** The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

**Example:**

Freq (MHz) METER READING + ACF = FS  
20 dBuV + 10.36 dB = 30.36 dBuV/m @ 3m

**ANSI STANDARD C63.4-2009 10.1.7 MEASUREMENT PROCEDURES:** The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

### 3. Radiation Interference

#### 3.1. Requirements (15.249, 15.209):

|   |   |  |   |
|---|---|--|---|
| FIELD STRENGTH<br>of Fundamental:<br>902-928 MHz<br>2.4-2.4835 GHz<br>94 dB $\mu$ V/m @3m | FIELD STRENGTH<br>of Harmonics<br><br><br>54 dB $\mu$ V/m @3m | S15.209<br>30 - 88 MHz<br>88 - 216 MHz<br>216 - 960 MHz<br>ABOVE 960 MHz | 40 dBuV/m @3M<br>43.5<br>46<br>54dBuV/m |
|---|---|--|---|

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in 15.209, whichever is the lesser attenuation.

#### 3.2 Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

All readings from 30MHz to 1GHz are quasi-peak values with a resolution bandwidth of 120kHz. All reading are above 1GHz, peak & average values with a resolution bandwidth of 1MHz. The EUT is tested in 9\*6\*6 Chamber.

The test results are listed in Section 4.3.

#### Test Equipment

| Item | Equipment                | Manufacturer         | Model No. | Serial No.    | Last Cal.     | Cal. Interval |
|------|--------------------------|----------------------|-----------|---------------|---------------|---------------|
| 1.   | EMI Test Receiver        | Rohde & Schwarz      | ESCI      | 100627        | Nov. 12, 2012 | 1 Year        |
| 2.   | Trilog Broadband Antenna | Schwarzbeck          | VULB9163  | VULB 9163-289 | May 17, 2013  | 1 Year        |
| 3.   | Pre-amplifier            | Compliance Direction | PAP-0203  | 22008         | May 19, 2013  | 1 Year        |
| 4.   | EMI Test Software EZ-EMC | SHURPLE              | N/A       | N/A           | N/A           | N/A           |

Radiation Uncertainty : Ur = 4.3dB

### 3.3 Test Results

PASS.

Please refer the following pages.

**Data:**

Horizontal  
CH Low (2402MHz)

| Frequency<br>MHz | Cable<br>Loss<br>dB | Ant<br>Factor<br>dB/m | Preamp<br>Factor<br>dB | Read<br>Level<br>dBμV | Level<br>dBμV/m | Limit<br>dBμV/m | Over<br>Limit<br>dB | Remark |
|------------------|---------------------|-----------------------|------------------------|-----------------------|-----------------|-----------------|---------------------|--------|
| 232.95           | 1.58                | 13.50                 | 38.90                  | 57.19                 | 33.43           | 46.00           | -11.19              | QP     |
| 2402.00          | 2.17                | 31.21                 | 35.30                  | 86.76                 | 92.75           | 114.0           | -27.24              | Peak   |
| 2402.00          | 2.17                | 31.21                 | 35.30                  | 84.74                 | 89.28           | 94.0            | -9.26               | AV     |
| 4804.04          | 2.56                | 34.01                 | 34.71                  | 41.35                 | 43.66           | 74.0            | -32.65              | Peak   |
| 4804.04          | 2.56                | 34.01                 | 34.71                  | 38.22                 | 40.21           | 54.0            | -15.78              | AV     |
| 7207.98          | 2.98                | 36.16                 | 35.15                  | 38.94                 | 42.54           | 74.0            | -35.06              | Peak   |
| 7207.98          | 2.98                | 36.16                 | 35.15                  | 28.21                 | 39.76           | 54.0            | -25.79              | AV     |
| 9608.00          | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 12010.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 14412.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 16814.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| ---              | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |

Vertical  
CH Low (2402MHz)

| Frequency<br>MHz | Cable<br>Loss<br>dB | Ant<br>Factor<br>dB/m | Preamp<br>Factor<br>dB | Read<br>Level<br>dBμV | Level<br>dBμV/m | Limit<br>dBμV/m | Over<br>Limit<br>dB | Remark |
|------------------|---------------------|-----------------------|------------------------|-----------------------|-----------------|-----------------|---------------------|--------|
| 38.19            | 1.43                | 12.13                 | 38.45                  | 53.19                 | 28.13           | 40.00           | -11.87              | QP     |
| 2402.00          | 2.17                | 31.21                 | 35.30                  | 84.62                 | 89.65           | 114.0           | -24.35              | Peak   |
| 2402.00          | 2.17                | 31.21                 | 35.30                  | 81.31                 | 88.41           | 94.0            | -5.59               | AV     |
| 4804.10          | 2.56                | 34.01                 | 34.71                  | 41.07                 | 42.27           | 74.0            | -31.73              | Peak   |
| 4804.10          | 2.56                | 34.01                 | 34.71                  | 38.45                 | 40.65           | 54.0            | -13.35              | AV     |
| 7207.93          | 2.98                | 36.16                 | 35.15                  | 37.89                 | 41.33           | 74.0            | -32.67              | Peak   |
| 7207.93          | 2.98                | 36.16                 | 35.15                  | 34.22                 | 38.19           | 54.0            | -15.81              | AV     |
| 9608.00          | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 12010.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 14412.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 16814.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| ---              | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |



Horizontal  
CH Middle (2441MHz)

| Frequency<br>MHz | Cable<br>Loss<br>dB | Ant<br>Factor<br>dB/m | Preamp<br>Factor<br>dB | Read<br>Level<br>dBμV | Level<br>dBμV/m | Limit<br>dBμV/m | Over<br>Limit<br>dB | Remark |
|------------------|---------------------|-----------------------|------------------------|-----------------------|-----------------|-----------------|---------------------|--------|
| 316.98           | 1.60                | 13.52                 | 38.82                  | 56.25                 | 32.65           | 46.00           | -13.35              | QP     |
| 2441.00          | 2.19                | 31.22                 | 34.60                  | 85.44                 | 90.42           | 114.0           | -23.58              | Peak   |
| 2441.00          | 2.19                | 31.22                 | 34.60                  | 83.36                 | 84.51           | 94.0            | -9.49               | AV     |
| 4882.08          | 2.57                | 35.00                 | 34.58                  | 39.27                 | 42.79           | 74.0            | -31.21              | Peak   |
| 4882.08          | 2.57                | 35.00                 | 34.58                  | 37.68                 | 40.02           | 54.0            | -13.98              | AV     |
| 7323.05          | 3.00                | 36.17                 | 35.14                  | 35.51                 | 42.22           | 74.0            | -31.78              | Peak   |
| 7323.05          | 3.00                | 36.17                 | 35.14                  | 34.77                 | 40.16           | 54.0            | -13.84              | AV     |
| 9764.00          | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 12205.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 14646.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 17087.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| ---              | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |

Vertical  
CH Middle (2441MHz)

| Frequency<br>MHz | Cable<br>Loss<br>dB | Ant<br>Factor<br>dB/m | Preamp<br>Factor<br>dB | Read<br>Level<br>dBμV | Level<br>dBμV/m | Limit<br>dBμV/m | Over<br>Limit<br>dB | Remark |
|------------------|---------------------|-----------------------|------------------------|-----------------------|-----------------|-----------------|---------------------|--------|
| 155.49           | 1.50                | 13.40                 | 38.89                  | 53.11                 | 29.12           | 43.50           | -14.38              | QP     |
| 2441.01          | 2.19                | 31.22                 | 34.60                  | 81.46                 | 91.07           | 114.0           | -22.93              | Peak   |
| 2441.01          | 2.19                | 31.22                 | 34.60                  | 82.25                 | 86.35           | 94.0            | -7.65               | AV     |
| 4882.11          | 2.57                | 35.00                 | 34.58                  | 43.36                 | 43.48           | 74.0            | -30.52              | Peak   |
| 4882.11          | 2.57                | 35.00                 | 34.58                  | 35.19                 | 40.76           | 54.0            | -13.24              | AV     |
| 7323.02          | 3.00                | 36.17                 | 35.14                  | 37.05                 | 42.21           | 74.0            | -31.79              | Peak   |
| 7323.02          | 3.00                | 36.17                 | 35.14                  | 38.44                 | 40.44           | 54.0            | -13.56              | AV     |
| 9764.00          | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 12205.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 14646.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 17087.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| ---              | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |

Horizontal  
CH High (2480MHz)

| Frequency<br>MHz | Cable<br>Loss<br>dB | Ant<br>Factor<br>dB/m | Preamp<br>Factor<br>dB | Read<br>Level<br>dBμV | Level<br>dBμV/m | Limit<br>dBμV/m | Over<br>Limit<br>dB | Remark |
|------------------|---------------------|-----------------------|------------------------|-----------------------|-----------------|-----------------|---------------------|--------|
| 314.68           | 1.60                | 13.52                 | 38.82                  | 54.12                 | 29.52           | 46.00           | -16.48              | QP     |
| 2480.00          | 2.20                | 31.65                 | 36.00                  | 97.78                 | 90.41           | 114.0           | -23.59              | Peak   |
| 2480.00          | 2.20                | 31.65                 | 36.00                  | 88.51                 | 85.76           | 94.0            | -8.24               | AV     |
| 4960.05          | 2.58                | 35.06                 | 34.79                  | 43.19                 | 44.04           | 74.0            | -29.96              | Peak   |
| 4960.05          | 2.58                | 35.06                 | 34.79                  | 37.82                 | 42.82           | 54.0            | -11.18              | AV     |
| 7439.99          | 3.02                | 36.19                 | 34.90                  | 41.37                 | 43.84           | 74.0            | -30.16              | Peak   |
| 7439.99          | 3.02                | 36.20                 | 35.20                  | 37.40                 | 41.92           | 54.0            | -12.08              | AV     |
| 9920.00          | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 12400.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 14880.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 17360.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |

Vertical  
CH High (2480MHz)

| Frequency<br>MHz | Cable<br>Loss<br>dB | Ant<br>Factor<br>dB/m | Preamp<br>Factor<br>dB | Read<br>Level<br>dBμV | Level<br>dBμV/m | Limit<br>dBμV/m | Over<br>Limit<br>dB | Remark |
|------------------|---------------------|-----------------------|------------------------|-----------------------|-----------------|-----------------|---------------------|--------|
| 404.19           | 1.62                | 13.54                 | 38.45                  | 53.16                 | 27.22           | 46.00           | -18.78              | QP     |
| 2480.00          | 2.20                | 31.65                 | 36.00                  | 83.79                 | 91.45           | 114.0           | -22.55              | Peak   |
| 2480.00          | 2.20                | 31.65                 | 36.00                  | 82.12                 | 86.17           | 94.0            | -7.83               | AV     |
| 4960.10          | 2.58                | 35.06                 | 34.79                  | 40.58                 | 42.44           | 74.0            | -31.56              | Peak   |
| 4960.10          | 2.58                | 35.06                 | 34.79                  | 38.31                 | 40.05           | 54.0            | -13.95              | AV     |
| 7439.96          | 3.02                | 36.19                 | 34.90                  | 38.68                 | 42.76           | 74.0            | -31.24              | Peak   |
| 7439.96          | 3.02                | 36.20                 | 35.20                  | 36.91                 | 40.21           | 54.0            | -13.79              | AV     |
| 9920.00          | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 12400.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 14880.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |
| 17360.00         | ---                 | ---                   | ---                    | ---                   | ---             | ---             | ---                 | ---    |

**NOTE: “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.**

## 4. Occupied Bandwidth

### 4.1. Requirements (15.249):

The field strength of any emissions appearing outside the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 50 dB below the level of the carrier or to the general limits of 15.249.

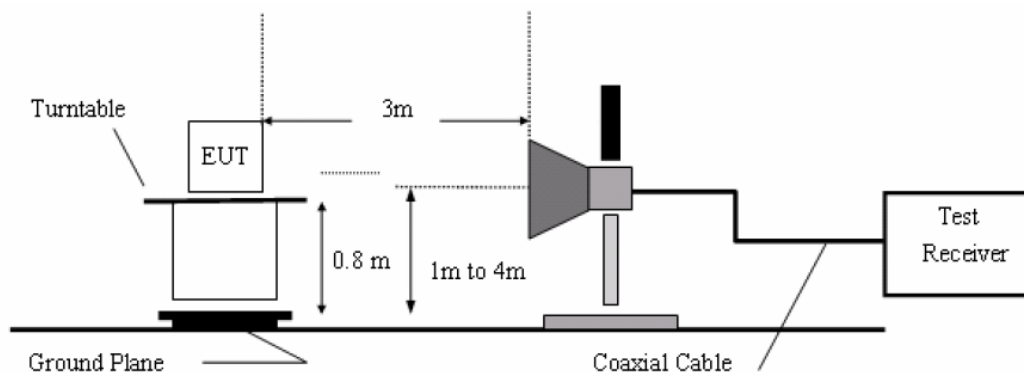
### 4.2. Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

#### Test Equipment

| Item | Equipment                  | Manufacturer            | Model No. | Serial No. | Last Cal.     | Cal. Interval |
|------|----------------------------|-------------------------|-----------|------------|---------------|---------------|
| 1.   | EMI Receiver               | Rohde & Schwarz         | ESCI      | 100627     | Nov. 12, 2012 | 1 Year        |
| 2.   | Preamplifier               | Instruments corporation | EMC011830 | 980100     | July 03, 2012 | 1 Year        |
| 3.   | Double Ridged Horn Antenna | Instruments corporation | GTH-0118  | 351600     | Apr. 07, 2013 | 1 Year        |
| 4.   | EMI Test Software EZ-EMC   | SHURPLE                 | N/A       | N/A        | N/A           | N/A           |

### 4.3. Test Configuration:



### 4.4. Test Results

Pass.

Please refer the following plot.

(Note: Marker 3 means the highest value in 2.39GHz~2.4GHz or 2.4835~2.5GHz)

