TECHNICAL REPORT

| | |
|---|---|
| Report No: | FCC 1605258-01 |
| File reference No: | 2016-06-29 |
| Applicant: | Shenzhen Guang Xin Yi Electronics Co., Ltd. |
| Product: | Bluetooth In-Car Speakerphone |
| Model No: | G7,G7S,Q7,Q7S,GT86,GT86S,ZNB01,ZNB02,SW01,YHZ01 |
| Trademark: | N/A |
| Test Standards: | FCC Part 15 Subpart C, Paragraph 15.239 |
| Test result: | It is herewith confirmed and found to comply with the requirements set up by ANSI C63.4&FCC Part 15 Subpart C, Paragraph 15.239 regulations for the evaluation of electromagnetic compatibility |

Approved By

Jack Chung

Jack Chung
Manager

Dated: June 29,2016

**Results appearing herein relate only to the sample tested**
**The technical reports is issued errors and omissions exempt and is subject to withdrawal at**


## SHENZHEN TIMEWAY TESTING LABORATORIES

Room 512-519, 5/F., East Tower, Building 4, Anhua Industrial Zone, Futian District, Shenzhen, Guangdong, China

Tel (755) 83448688 Fax (755) 83442996, E-Mail:info@timeway-lab.com

## Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meets with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

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

**CNAS-LAB Code: L2292**

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of testing Laboratories.

**FCC-Registration No.: 899988**

The 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 No.:899988.

Test Report Conclusion

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## 1.0 General Details

### 1.1 Test Lab Details

Name : SHENZHEN TIMEWAY TESTING LABORATORIES.

Address: Room 512-519, 5/F., East Tower, Building 4, Anhua Industrial Zone, Futian District, Shenzhen, Guangdong, China

Telephone: (755) 83448688

Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 899988

For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205A-02

For 3m & 10 m OATS

### 1.2 Applicant Details

Applicant: Shenzhen Guang Xin Yi Electronics Co., Ltd.

Address: F5,Building 2,Shang tang Yu Feng Industrial Zone,Minzhi Street,Longhua New District,Shenzhen City.

Telephone: 13510067584

Fax: 0755 23099491

### 1.3 Description of EUT

| | |
|---|---|
| Product: | Bluetooth In-Car Speakerphone |
| Brand Name: | N/A |
| Model Number: | G7 |
| Additional Model Name | G7S,Q7,Q7S,GT86,GT86S,ZNB01,ZNB02,SW01,YHZ01 |
| **Remark:** | These models are identical in interior structure, electrical circuits and components, different model names for the marketing requirement. |
| Input Voltage: | DC12-24V (Note; DC24V input voltage was selected to do all tests. And it was the worse case. |
| Operation Frequency: | 881.MHz-107.9MHz |
| Channel Spacing; | 0.1MHz |
| Frequency Tuning | The frequency tuning controls have been manually adjusted to the highest and lowest TX frequency. The center frequencies of the tuning range are within 88.1MHz to107.9MHz. |
| Type of Modulation | FM |
| Antenna Designation | Integral antenna, which is built-in, designed as an indispensable part of the EUT. |

### 1.4 Submitted Sample: 2 Sample

1.5 Test Duration

2016-05-26 to 2016-06-28

1.6 Test Uncertainty

Conducted Emissions Uncertainty =3.6dB

Radiated Emissions Uncertainty =4.7dB

1.7 Test Engineer

The sample tested by Terry Tang

Print Name: Terry Tang

| **2.0 Test Equipments** | | | | | |
|---|---|---|---|---|---|
| Instrument Type | Manufacturer | Model | Serial No. | Date of Cal. | Due Date |
| ESPI Test Receiver | R&S | ESPI 3 | 100379 | 2015-08-22 | 2016-08-21 |
| TWO Line-V-NETW | R&S | EZH3-Z5 | 100294 | 2015-08-22 | 2016-08-21 |
| TWO Line-V-NETW | R&S | EZH3-Z5 | 100253 | 2015-08-22 | 2016-08-21 |
| Ultra Broadband ANT | R&S | HL562 | 100157 | 2015-08-23 | 2016-08-22 |
| ESDV Test Receiver | R&S | ESDV | 100008 | 2015-08-22 | 2016-08-21 |
| Impuls-Begrenzer | R&S | ESH3-Z2 | 100281 | 2015-08-22 | 2016-08-21 |
| System Controller | CT | SC100 | - | -- | -- |
| Printer | EPSON | PHOTO EX3 | CFNH234850 | -- | -- |
| Computer | IBM | 8434 | 1S8434KCE99BLXLO* | - | - |
| Loop Antenna | EMCO | 6502 | 00042960 | 2015-08-23 | 2016-08-22 |
| ESPI Test Receiver | R&S | ESI26 | 838786/013 | 2015-08-22 | 2016-08-23 |
| 3m OATS | -- | -- | N/A | 2015-08-24 | 2016-08-23 |
| Horn Antenna | R&S | BBHA 9170 | BBHA9170265 | 2015-08-24 | 2016-08-23 |
| Horn Antenna | R&S | BBHA 9120D | 9120D-631 | 2015-08-24 | 2016-08-23 |
| Power meter | Anritsu | ML2487A | 6K00003613 | 2015-08-22 | 2016-08-21 |
| Power sensor | Anritsu | MA2491A | 32263 | 2015-08-22 | 2016-08-21 |
| Bilog Antenna | Schwarebeck | VULB9163 | 9163/340 | 2015-08-23 | 2016-08-21 |
| LISN | AFJ | LS16C | 10010947251 | 2015-08-22 | 2016-08-21 |
| LISN (Three Phase) | Schwarebeck | NSLK 8126 | 8126453 | 2015-08-23 | 2016-08-22 |
| 9*6*6 Anechoic | -- | -- | N/A | 2015-08-24 | 2016-08-23 |
| EMI Test Receiver | RS | ESCS30 | 100139 | 2015-08-22 | 2016-08-21 |

## 3.0 Technical Details

3.1 Summary of test results

**The EUT has been tested according to the following specifications:**

| Standard | Test Type | Result | Notes |
|---|---|---|---|
| FCC Part 15, Paragraph 15.207 | Conducted Emission Test | **N/A** | N/A |
| FCC Part 15 Subpart C Paragraph 15.239 Limit | Field Strength of Fundamental | **PASS** | Complies |
| FCC Part 15, Paragraph 15.209 | Radiated Emission Test | **PASS** | Meets Class B Limit |
| According to §15.239 (a) Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz | 20dB Bandwidth Tests | **PASS** | Complies |

## 3.2 Test Standards

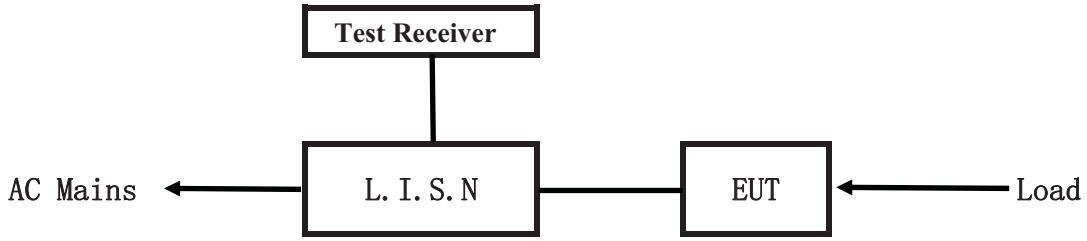
**FCC Part 15 Subpart C, Paragraph 15.239**

## 4.0 EUT Modification

**No modification by SHENZHEN TIMEWAY TESTING LABORATORIES**

## 5. Power Line Conducted Emission Test

5.1 Schematics of the test

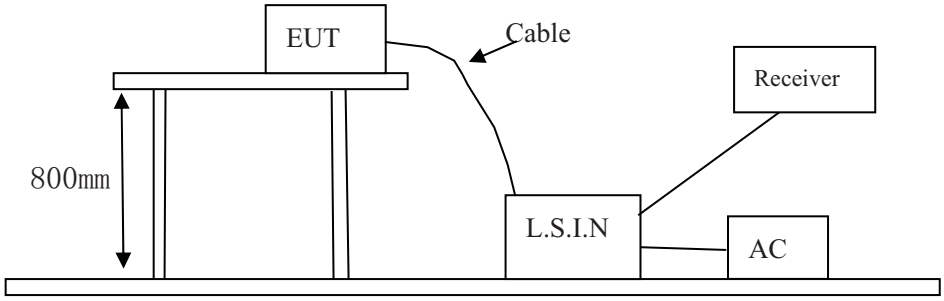



EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2014.The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2014.

Block diagram of Test setup




5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2014. All interface ports were connected to the Appropriate peripherals. All peripherals and cables are listed below.

Note: EUT can be powered by vehicle with 12-24V electrical system or batteries. During radiated emission test, EUT power by a regulated DC power supply because it produced more emission at this time.

A. EUT

| Device | Manufacturer | Model | FCC ID |
|---|---|---|---|
| Bluetooth In-Car Speakerphone | Shenzhen Guang Xin Yi Electronics Co., Ltd. | G7,G7S,Q7,Q7S,GT86,GT86S, ZNB01,ZNB02,SW01,YHZ01 | 2AIFLGXYHOYN-8888 |

B. Internal Device

| Device | Manufacturer | Model | FCC ID/DOC |
|---|---|---|---|
| N/A | | | |

C. Peripherals

| Device | Manufacturer | Model | FCC ID/DOC | Cable |
|---|---|---|---|---|
| U-disk | Kinston | -- | DOC | -- |
| | -- | -- | -- | -- |

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2014.

A Setup the EUT and simulators as shown on follow

B the frequency tuning controls have been manually adjusted to the highest and lowest TX frequency. The center frequencies of the tuning range are within 88.1MHz to 107.9MHz.

5.5 Power line conducted Emission Limit according to Paragraph 15.207

| Frequency (MHz) | Class A Limits (dB μ V) | | Class B Limits (dB μ V) | |
|---|---|---|---|---|
| | Quasi-peak Level | Average Level | Quasi-peak Level | Average Level |
| 0.15 ～ 0.50 | 79.0 | 66.0 | 66.0～56.0* | 56.0～46.0* |
| 0.50 ～ 5.00 | 73.0 | 60.0 | 56.0 | 46.0 |
| 5.00 ～ 30.00 | 73.0 | 60.0 | 60.0 | 50.0 |

Notes: 1. *Decreasing linearly with logarithm of frequency.

2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

**Note: EUT Used in a vehicle. This test item note applicable.**

## 6 Radiated Emission Test

6.1 Test Method and test Procedure:

(1) The EUT was tested according to ANSI C63.4 –2014. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988

(2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2014.

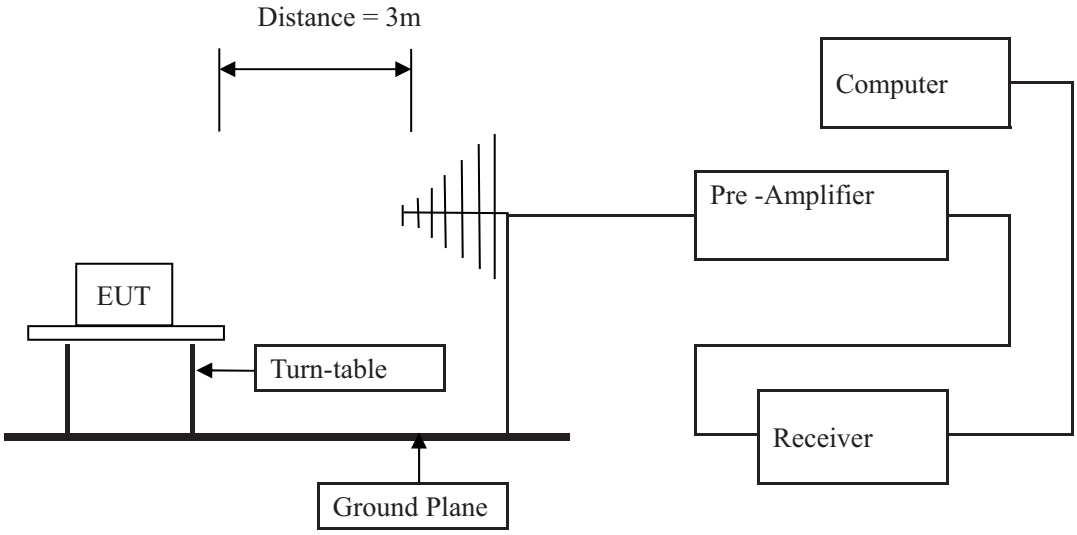
(3) The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz . Measurements were made at 3 meters.

(4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.

(5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "**QP**" in the data table.

(6) The antenna polarization : Vertical polarization and Horizontal polarization.

**Block diagram of Test setup**




6.2 Configuration of The EUT

Same as section 5.3 of this report

6.3 EUT Operating Condition

Same as section 5.4 of this report.

6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

**A FCC Part 15 Subpart C Paragraph 15.239 Limit**

| Fundamental Frequency (MHz) | Field Strength of Fundamental (3m) | |
|---|---|---|
| | **uV/m** | **dBuV/m** |
| 88 to 108 | 250 | 47.96 |

Note: 1. RF Field Strength (dBuV) = 20 log RF Voltage (uV)

2.Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

**B. Frequencies in restricted band are complied to limit on Paragraph 15.209.**

| Frequency Range (MHz) | Distance (m) | Field strength (dB μ V/m) |
|---|---|---|
| 30-88 | 3 | 40.0 |
| 88-216 | 3 | 43.5 |
| 216-960 | 3 | 46.0 |
| Above 960 | 3 | 54.0 |

Note: 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT

**6.5 Test result**

## A Fundamental Radiated Emission Data

| | | | |
|---|---|---|---|
| Product: | Bluetooth In-Car Speakerphone | Test Mode: | FM88.1MHz |
| Test Item: | Fundamental Radiated Emission Data | Temperature: | 25℃ |
| Test Voltage: | DC24V | Humidity: | 56% |
| Test Result: | Pass | | |

| Frequency (MHz) | Emission PK/AV (dBuV/m) | Horiz / Vert | Limits PK/AV (dBuV/m) | Margin (dB) |
|---|---|---|---|---|
| 88.1 | 43.9 (PK)/40.8 (AV) | Vertical | 67.96/47.96 | -24.06/-7.16 |
| 88.1 | 47.8 (PK)/ 45.9(AV) | Horizontal | 67.96/47.96 | -20.16/-2.06 |

| | | | |
|---|---|---|---|
| Product: | Bluetooth In-Car Speakerphone | Test Mode: | FM98MHz |
| Test Item: | Fundamental Radiated Emission Data | Temperature: | 25℃ |
| Test Voltage: | DC24V | Humidity: | 56% |
| Test Result: | Pass | | |

| Frequency (MHz) | Emission PK/AV (dBuV/m) | Horiz / Vert | Limits PK/AV (dBuV/m) | Margin (dB) |
|---|---|---|---|---|
| 98 | 46.3 (PK)/42.0 (AV) | Vertical | 67.96/47.96 | -21.66/-5.96 |
| 98 | 46.2 (PK)/ 41.9(AV) | Horizontal | 67.96/47.96 | -21.76/-6.06 |

| | | | |
|---|---|---|---|
| Product: | Bluetooth In-Car Speakerphone | Test Mode: | FM107.9MHz |
| Test Item: | Fundamental Radiated Emission Data | Temperature: | 25℃ |
| Test Voltage: | DC24V | Humidity: | 56% |
| Test Result: | Pass | | |

| Frequency (MHz) | Emission PK/AV (dBuV/m) | Horiz / Vert | Limits PK/AV (dBuV/m) | Margin (dB) |
|---|---|---|---|---|
| 107.9 | 46.4 (PK)/44.0 (AV) | Vertical | 67.96/47.96 | -21.56/-3.96 |
| 107.9 | 48.4 (PK)/ 44.9(AV) | Horizontal | 67.96/47.96 | -19.56/-3.06 |

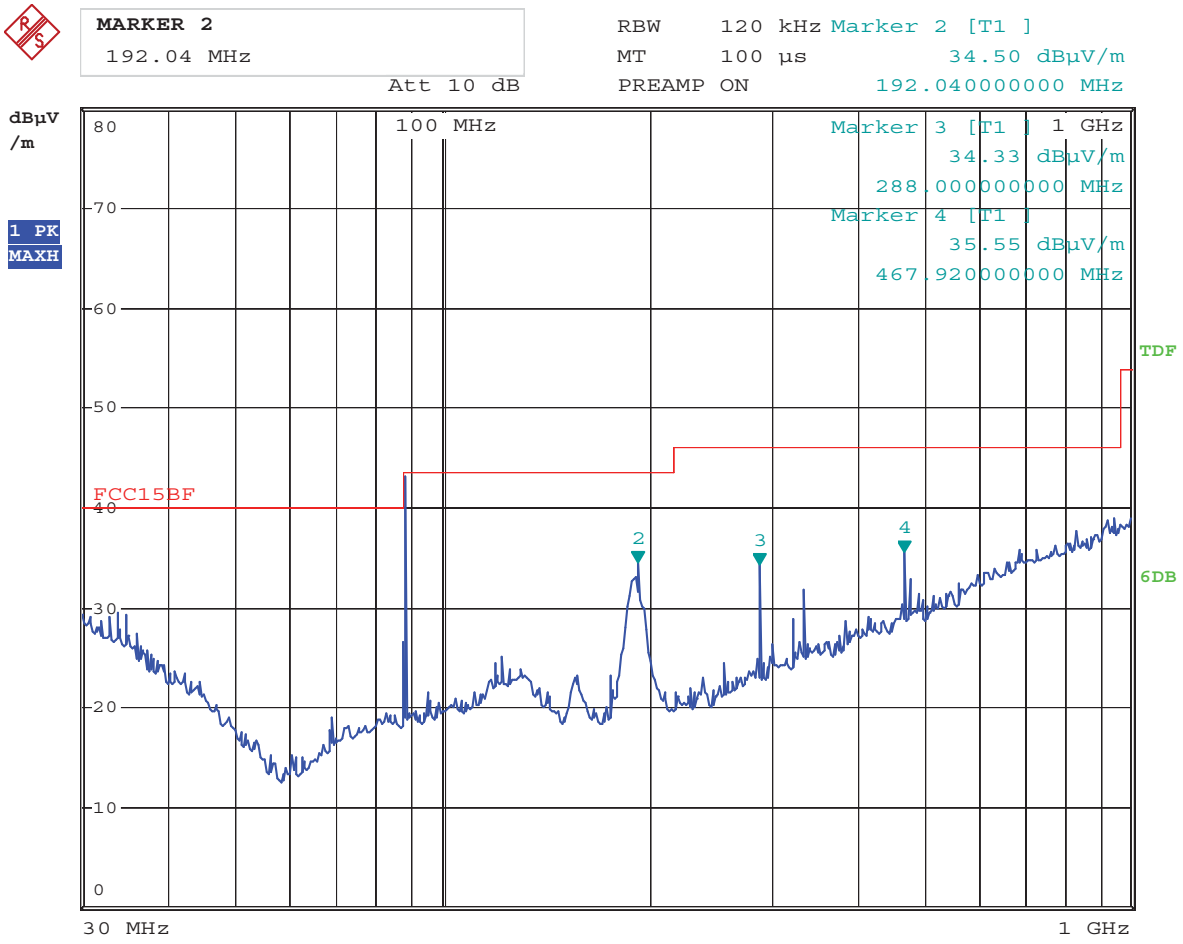
A. **General Radiated Emission Data and Harmonics Radiated Emission Data**

**Radiated Emission In Horizontal (30MHz----1000MHz)**

EUT set Condition: FM88.1MHz

**Results:** **Pass**

Please refer to following diagram for individual




Date: 28.JUN.2016 11:21:11

| Frequency (MHz) | Level@3m (dB µ V/m) | Antenna Polarity | Limit@3m (dB µ V/m) |
|---|---|---|---|
| 192.04 | 34.50 | H | 43.50 |
| 288.00 | 34.33 | H | 46.00 |
| 467.92 | 35.55 | H | 46.00 |
| 88.00 | 30.32 | H | 40.00 |

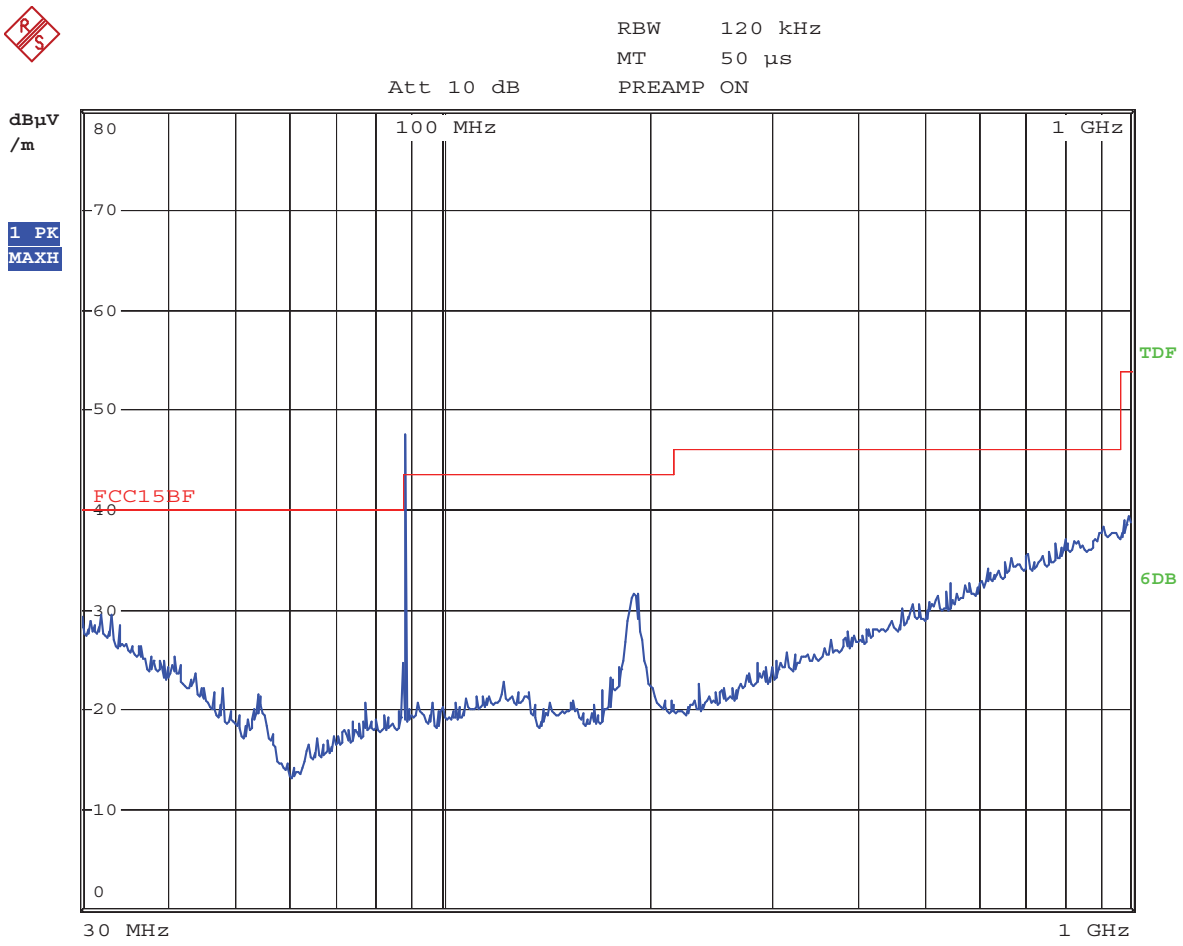
B. **General Radiated Emission Data and Harmonics Radiated Emission Data**

**Radiated Emission In Vertical (30MHz----1000MHz)**

EUT set Condition: FM88.1MHz

**Results:** **Pass**

Please refer to following diagram for individual




Date: 28.JUN.2016 11:14:25

| Frequency (MHz) | Level@3m (dB µ V/m) | Antenna Polarity | Limit@3m (dB µ V/m) |
|---|---|---|---|
| 88.00 | 26.76 | V | 40.00 |

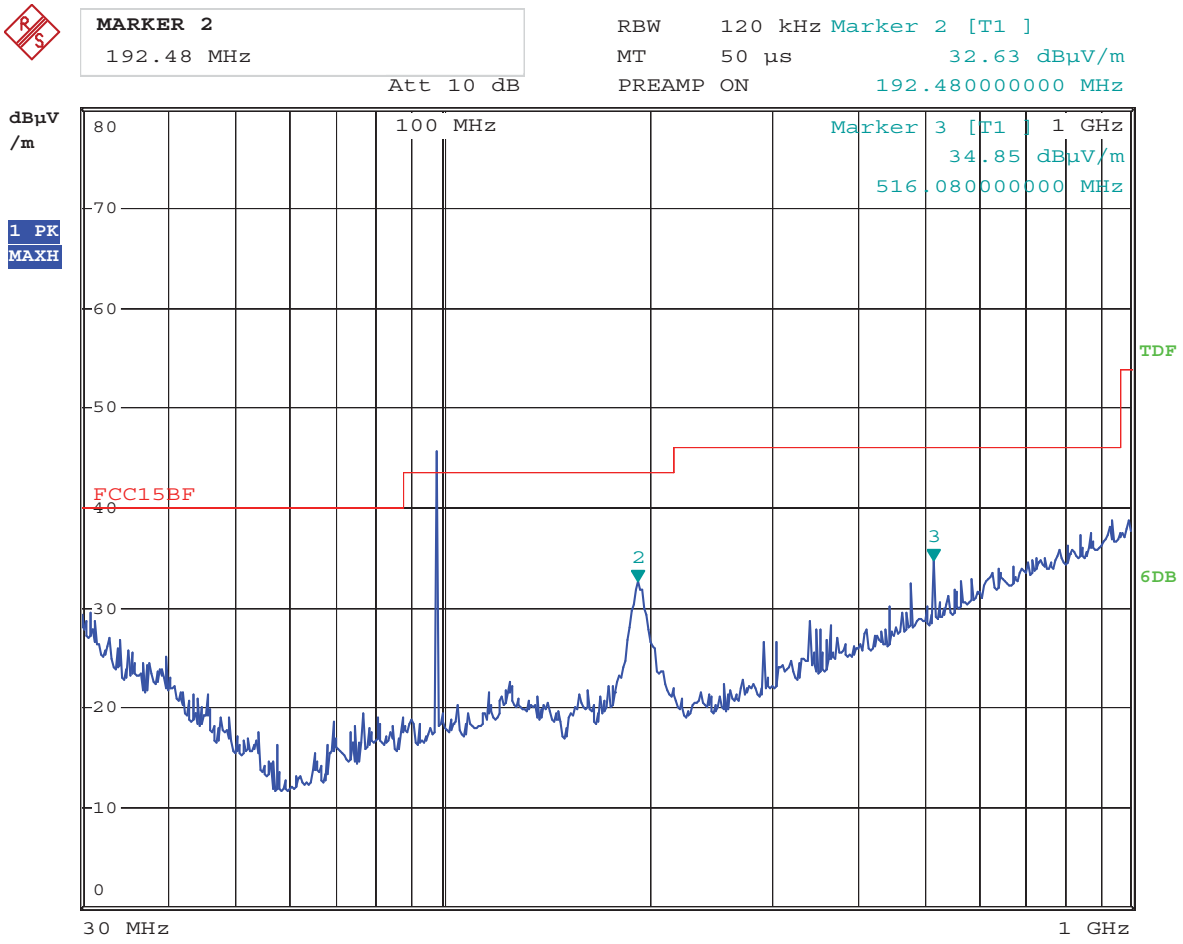
C. **General Radiated Emission Data and Harmonics Radiated Emission Data**

**Radiated Emission In Horizontal (30MHz----1000MHz)**

EUT set Condition: FM98MHz

**Results:** **Pass**

Please refer to following diagram for individual




Date: 28.JUN.2016 14:00:19

| Frequency (MHz) | Level@3m (dB µ V/m) | Antenna Polarity | Limit@3m (dB µ V/m) |
|---|---|---|---|
| 192.48 | 32.63 | H | 43.50 |
| 516.08 | 34.85 | H | 46.00 |

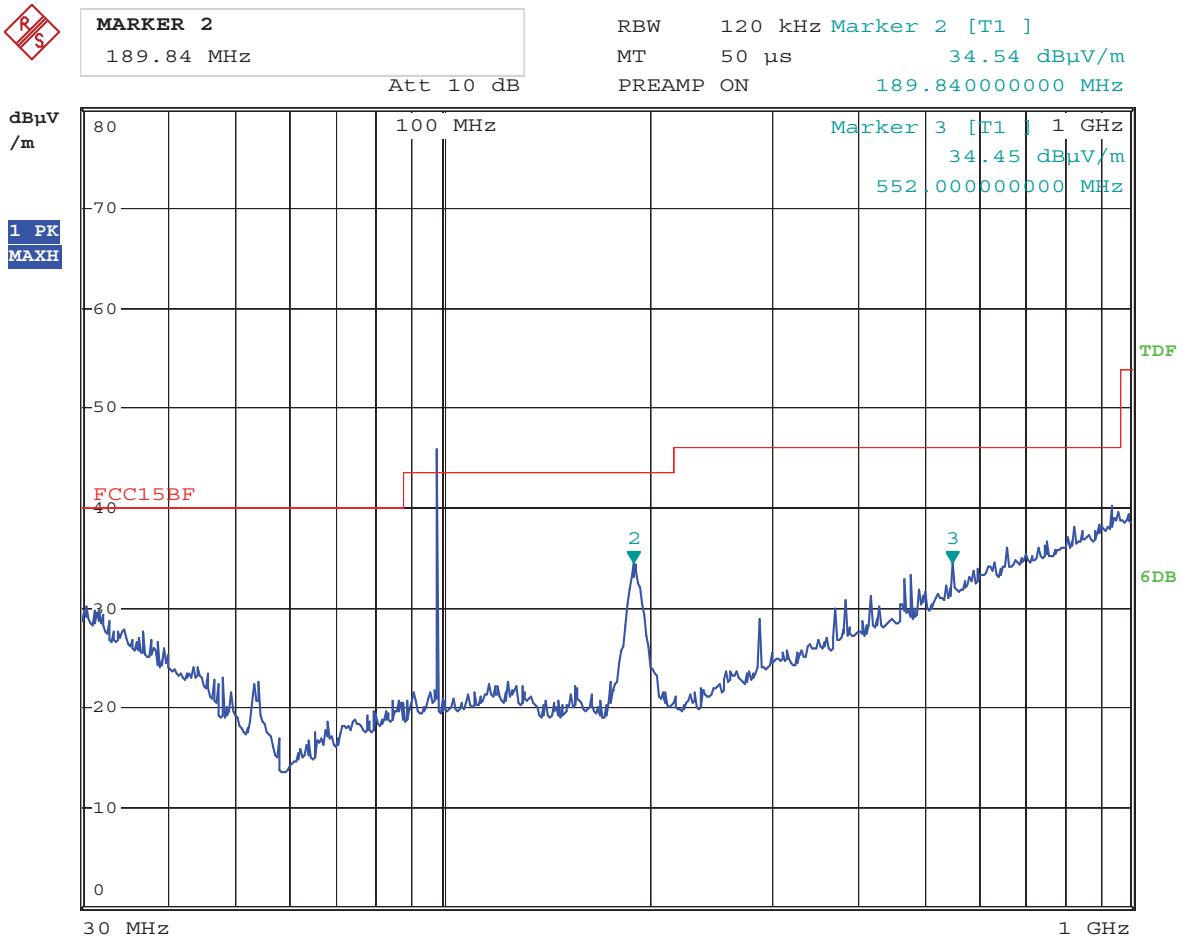
D. **General Radiated Emission Data and Harmonics Radiated Emission Data**

**Radiated Emission In Vertical (30MHz----1000MHz)**

EUT set Condition: FM98MHz

**Results:** **Pass**

Please refer to following diagram for individual




Date: 28.JUN.2016 14:03:13

| Frequency (MHz) | Level@3m (dB µ V/m) | Antenna Polarity | Limit@3m (dB µ V/m) |
|---|---|---|---|
| 189.84 | 34.54 | V | 43.50 |
| 552.00 | 34.45 | V | 46.00 |

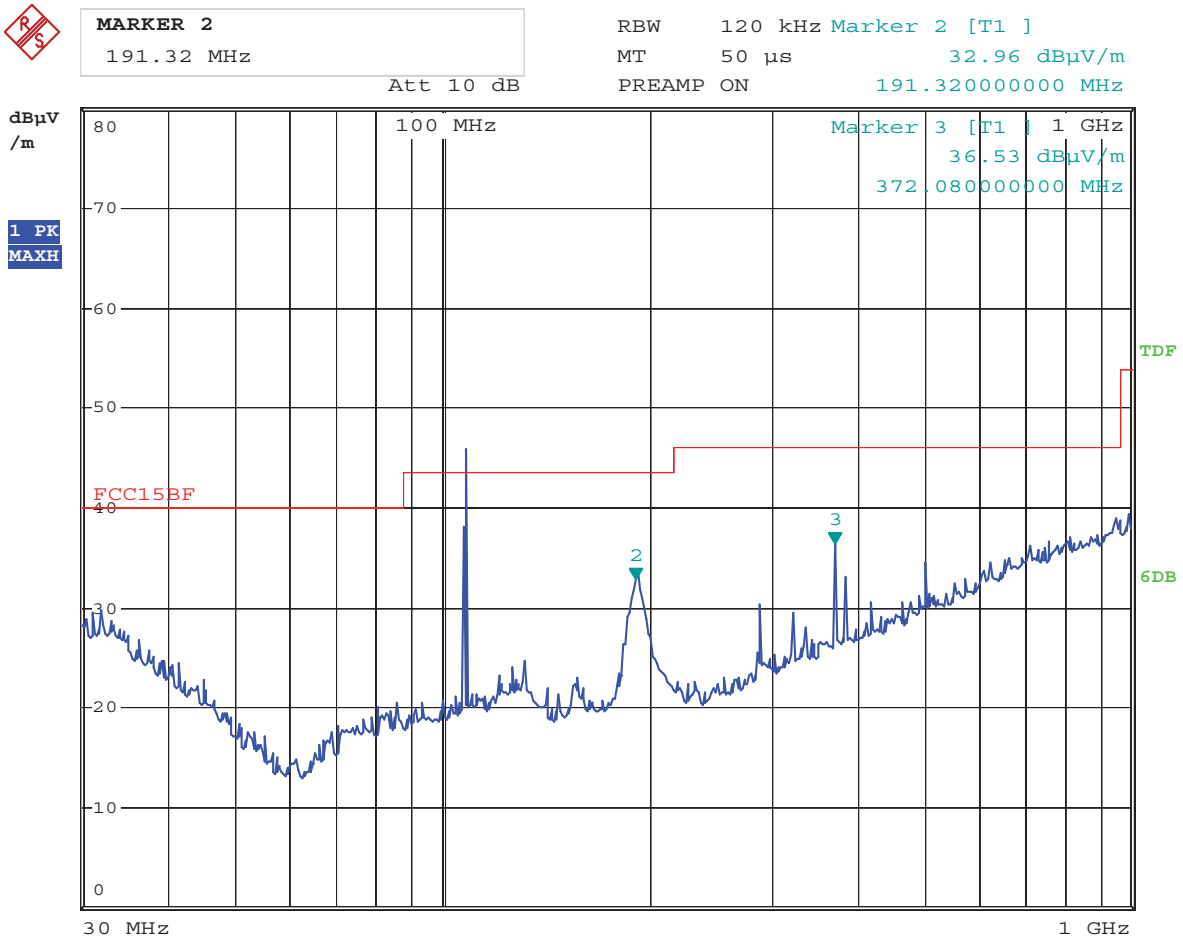
E. **General Radiated Emission Data and Harmonics Radiated Emission Data**

**Radiated Emission In Horizontal (30MHz----1000MHz)**

EUT set Condition: FM107.9MHz

**Results:** **Pass**

Please refer to following diagram for individual




Date: 28.JUN.2016 13:51:38

| Frequency (MHz) | Level@3m (dB µ V/m) | Antenna Polarity | Limit@3m (dB µ V/m) |
|---|---|---|---|
| 191.32 | 32.96 | H | 43.50 |
| 372.08 | 36.53 | H | 46.00 |
| 108.00 | 32.02 | H | 43.50 |

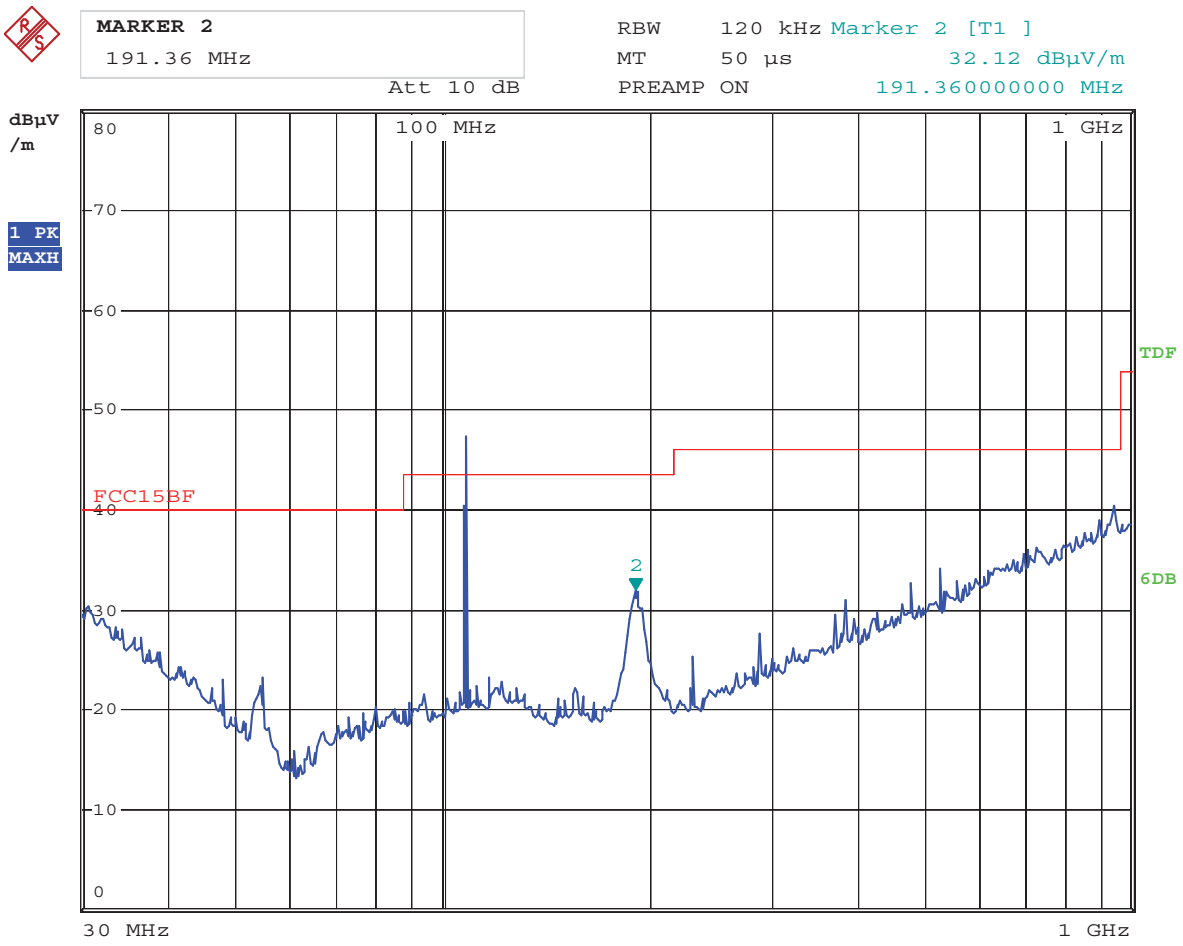
F. **General Radiated Emission Data and Harmonics Radiated Emission Data**

**Radiated Emission In Vertical (30MHz----1000MHz)**

EUT set Condition: FM107.9MHz

**Results:** **Pass**

Please refer to following diagram for individual




Date: 28.JUN.2016 12:09:13

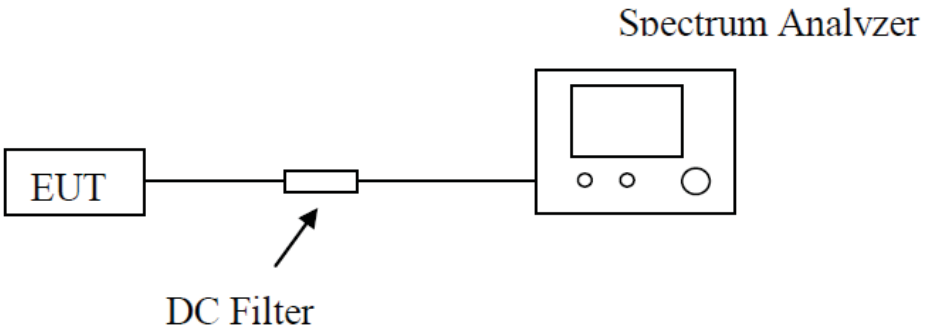
| Frequency (MHz) | Level@3m (dB µ V/m) | Antenna Polarity | Limit@3m (dB µ V/m) |
|---|---|---|---|
| 191.36 | 32.12 | V | 43.50 |
| 108.00 | 29.17 | V | 43.50 |

## 7. 20dB Bandwidth

### 7.1 Test Method and test Procedure:

(1) Span = approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel.
(2) RBW ≥1% of the 20dB bandwidth, VBW ≥RBW.
(3) Detector function = peak.
(4) Trace = max hold.

### 7. 2 Block Diagram of Test Setup




For the actual test configuration , please refer to the related items – Photos of Testing

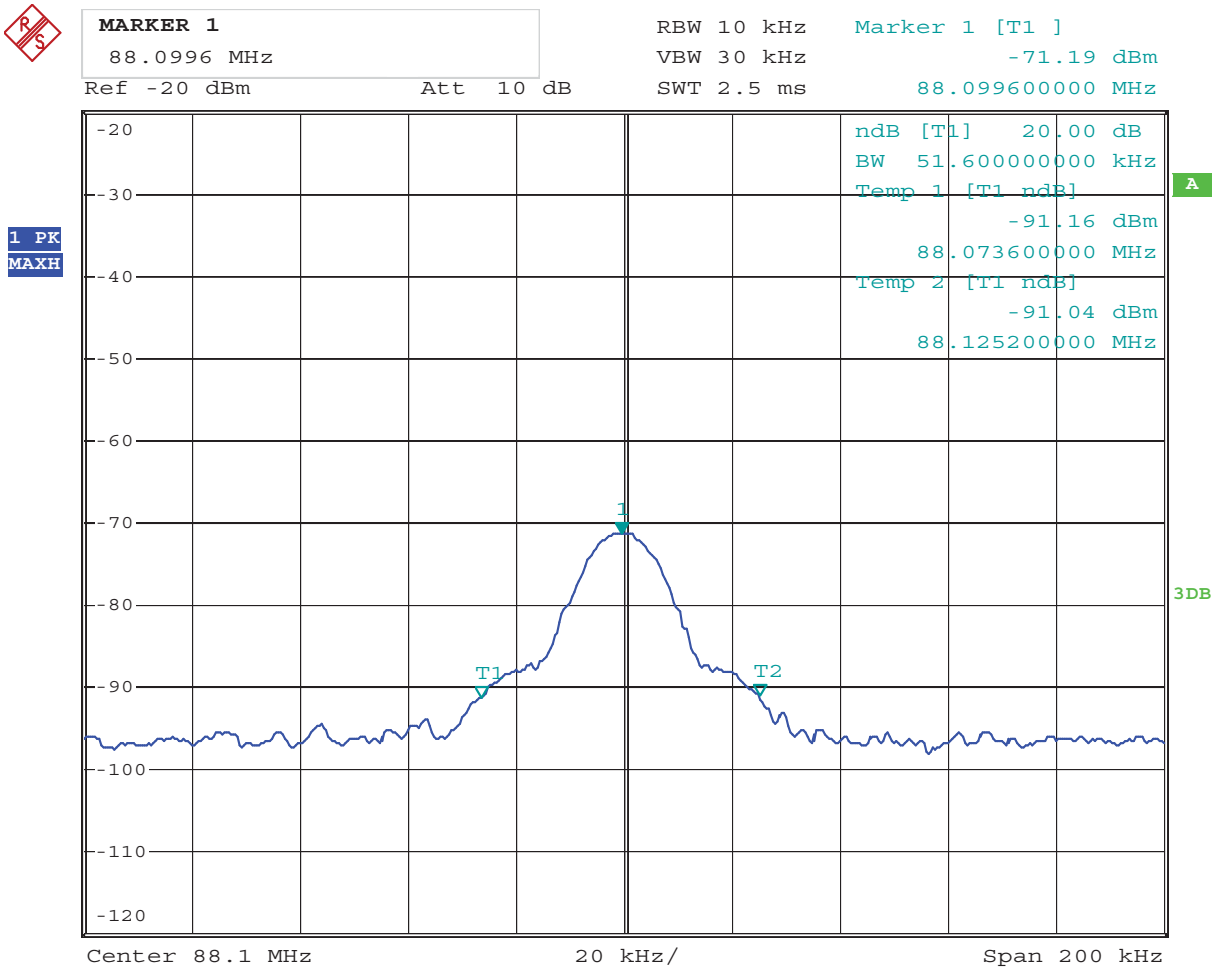
### 7.3 Limit

According to §15.239 (a) Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz

**7.4** Test Result

| Product: | Bluetooth In-Car Speakerphone | Test Mode: | FM88.1MHz |
|---|---|---|---|
| Test Item: | Fundamental Radiated Emission Data | Temperature: | 25℃ |
| Test Voltage: | DC24V | Humidity: | 56% |
| 20dB Bandwidth | 51.6kHz | Test Result: | Pass |

**Test Figure:**

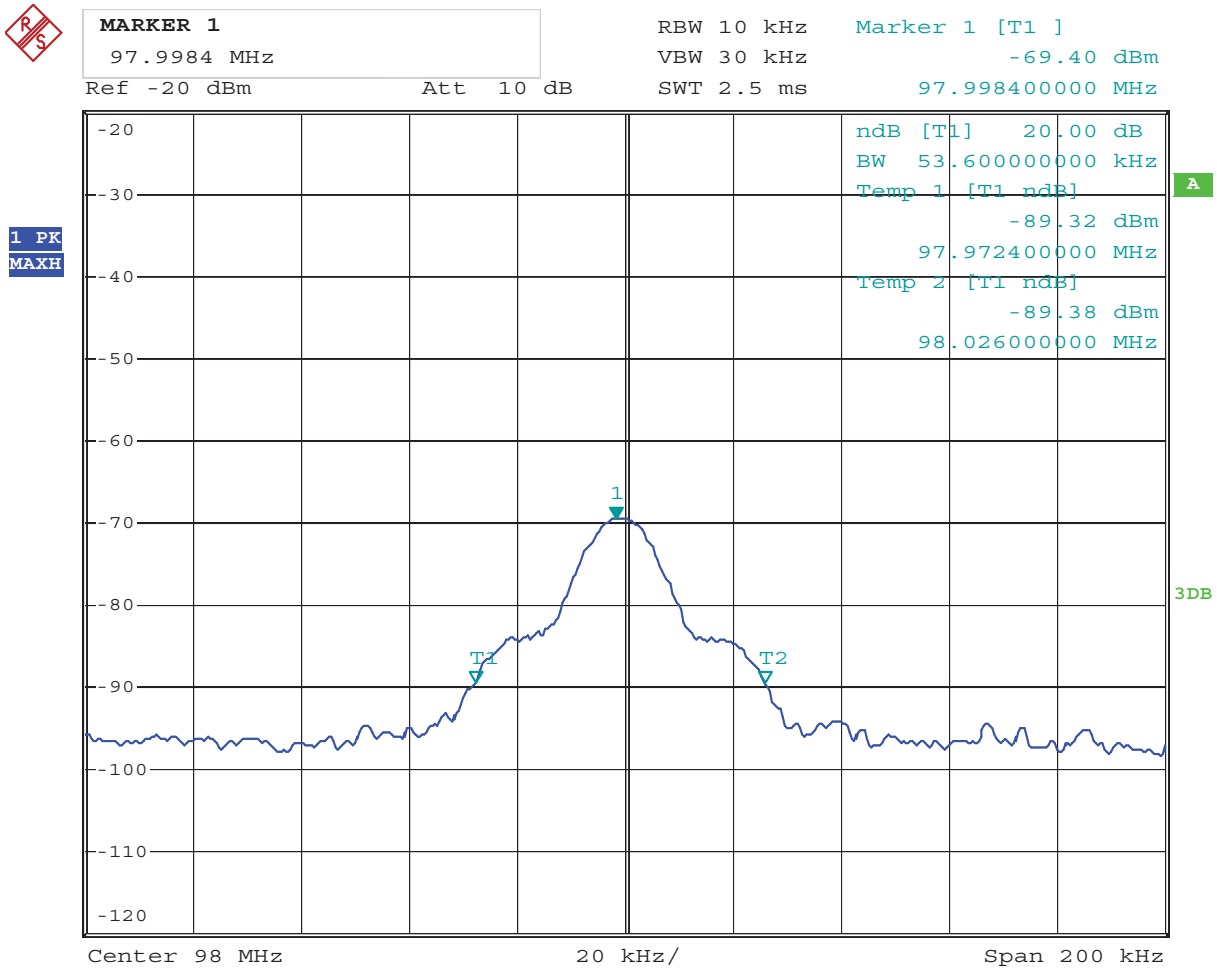



Date: 28.JUN.2016 16:01:14

**7.4** Test Result

| Product: | Bluetooth In-Car Speakerphone | Test Mode: | FM98MHz |
|---|---|---|---|
| Test Item: | Fundamental Radiated Emission Data | Temperature: | 25℃ |
| Test Voltage: | DC24V | Humidity: | 56% |
| 20dB Bandwidth | 53.6kHz | Test Result: | Pass |

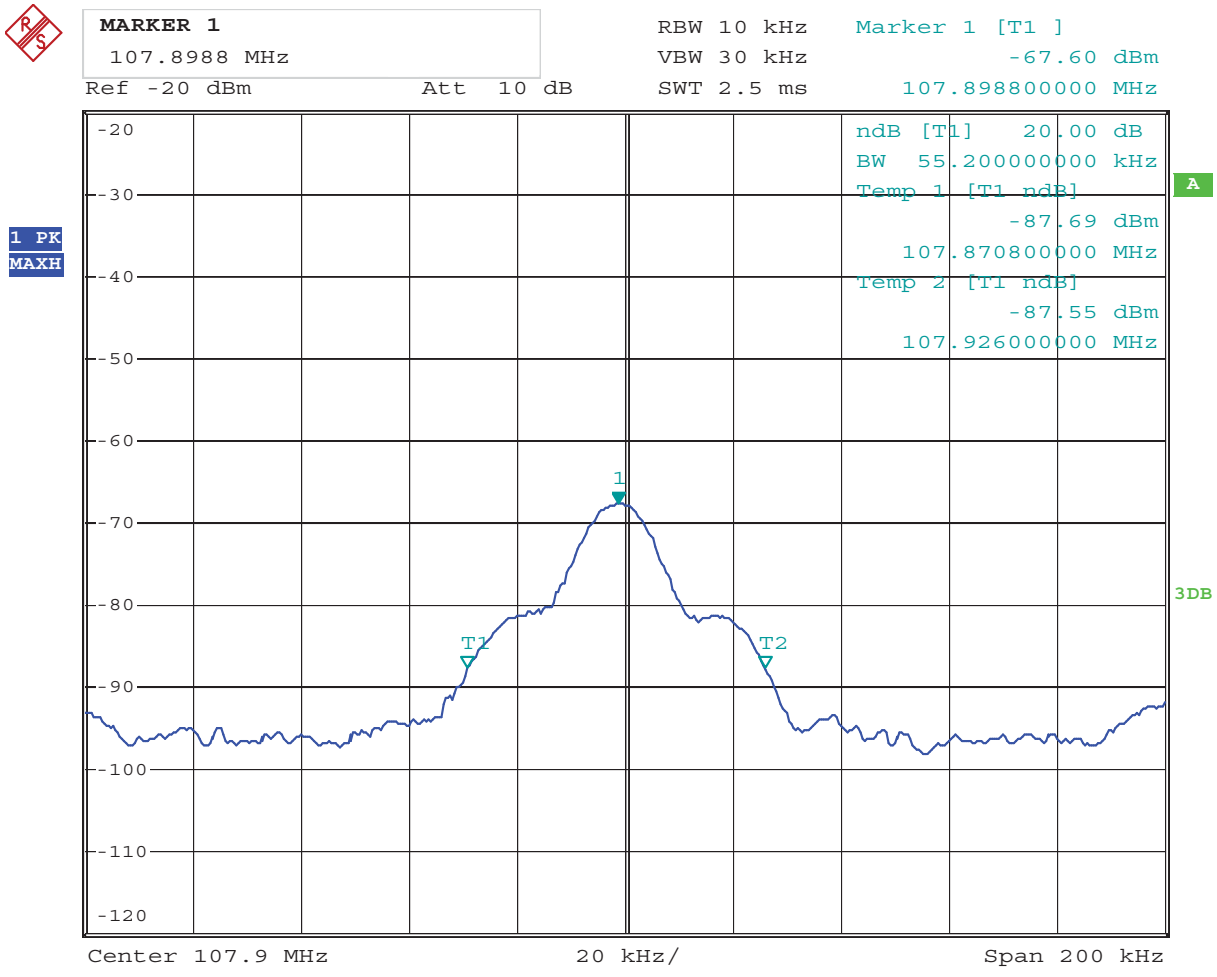
**Test Figure:**



**7.4** Test Result

| Product: | Bluetooth In-Car Speakerphone | Test Mode: | FM107.9MHz |
|---|---|---|---|
| Test Item: | Fundamental Radiated Emission Data | Temperature: | 25℃ |
| Test Voltage: | DC24V | Humidity: | 56% |
| 20dB Bandwidth | 55.2kHz | Test Result: | Pass |

**Test Figure:**



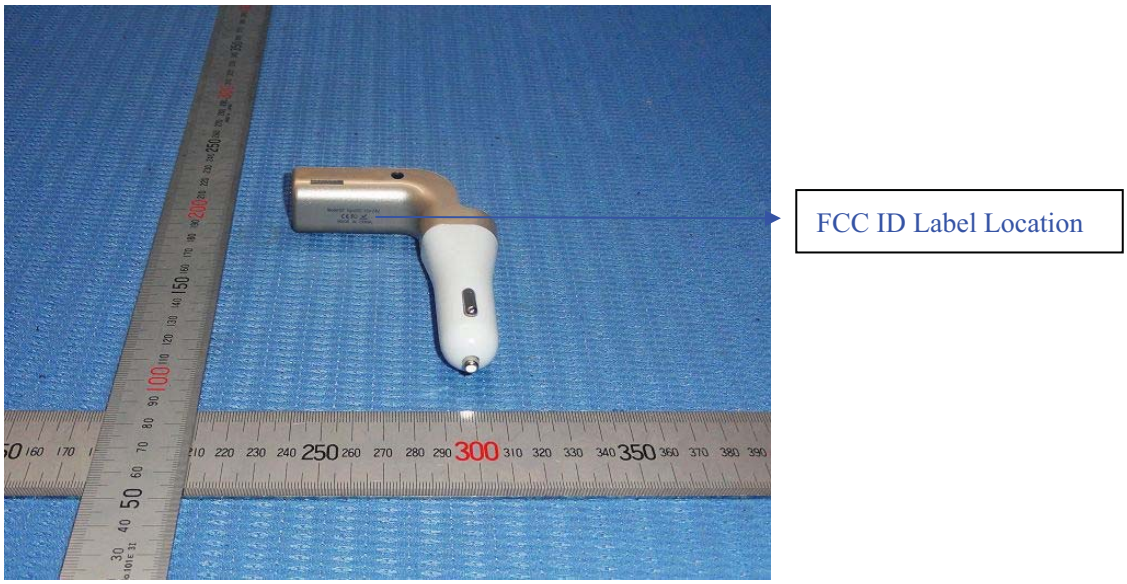
## 8.0 FCC ID Label

**FCC ID: 2AIFLGXYHOYN-8888**

**This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.**

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

**Mark Location:**



## 9.0 Photo of testing

9.1 Conducted test View—N/A

9.2 Radiated emission test view

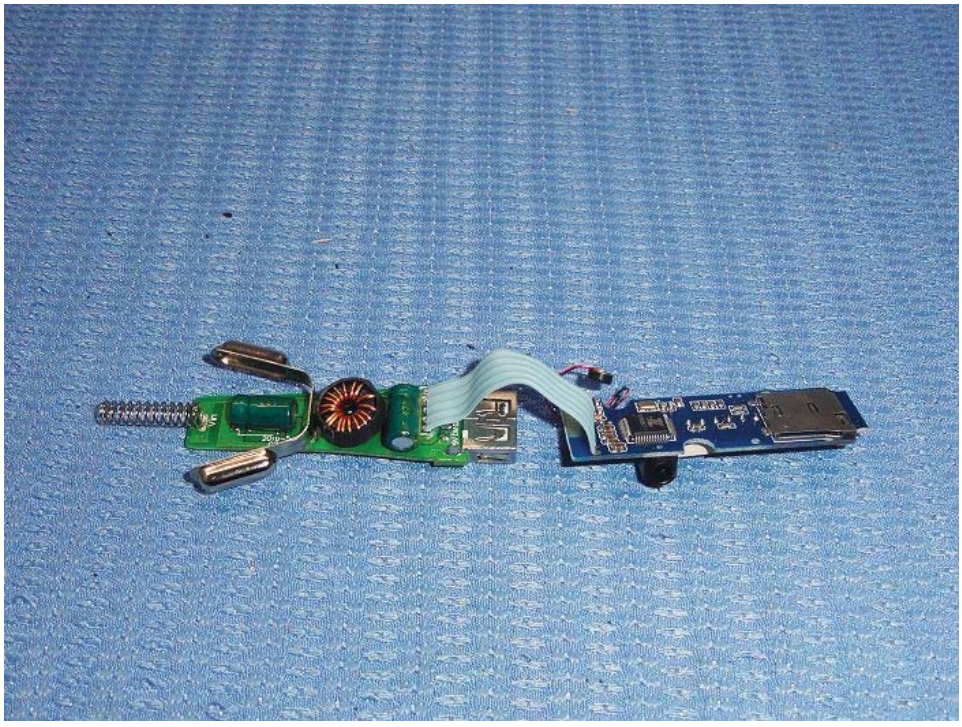
9.3 Photo for the EUT

External View

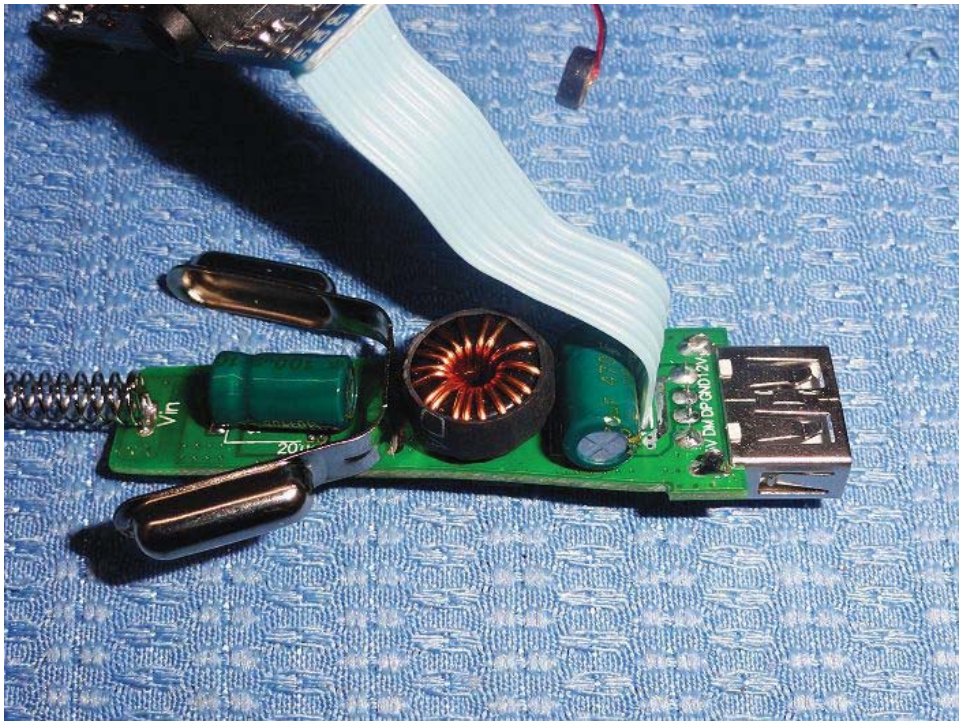
External View

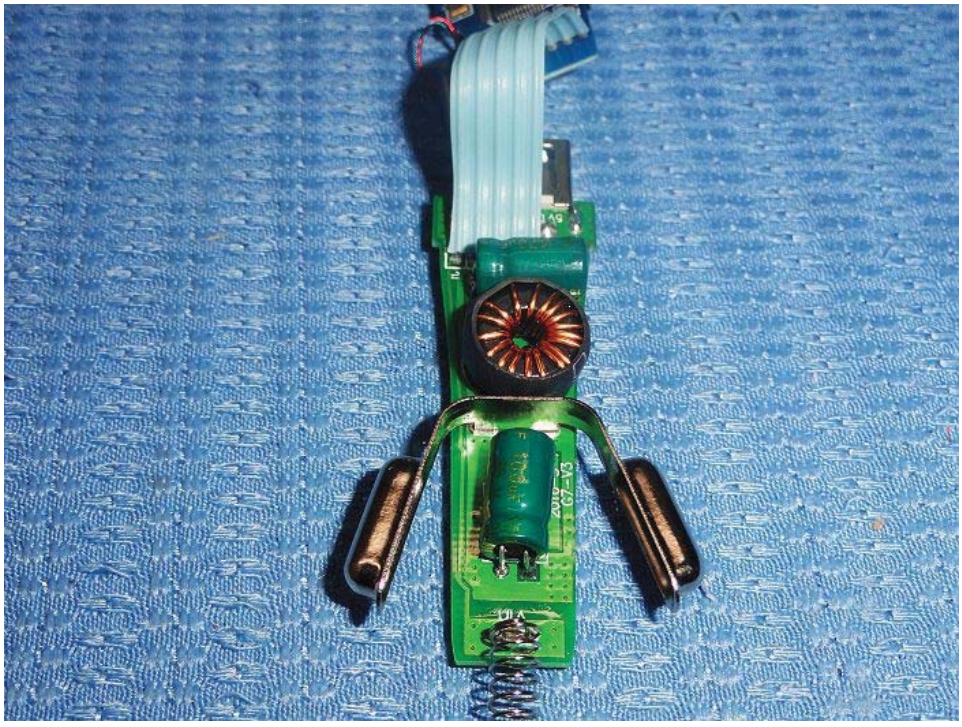
External View

Interior View

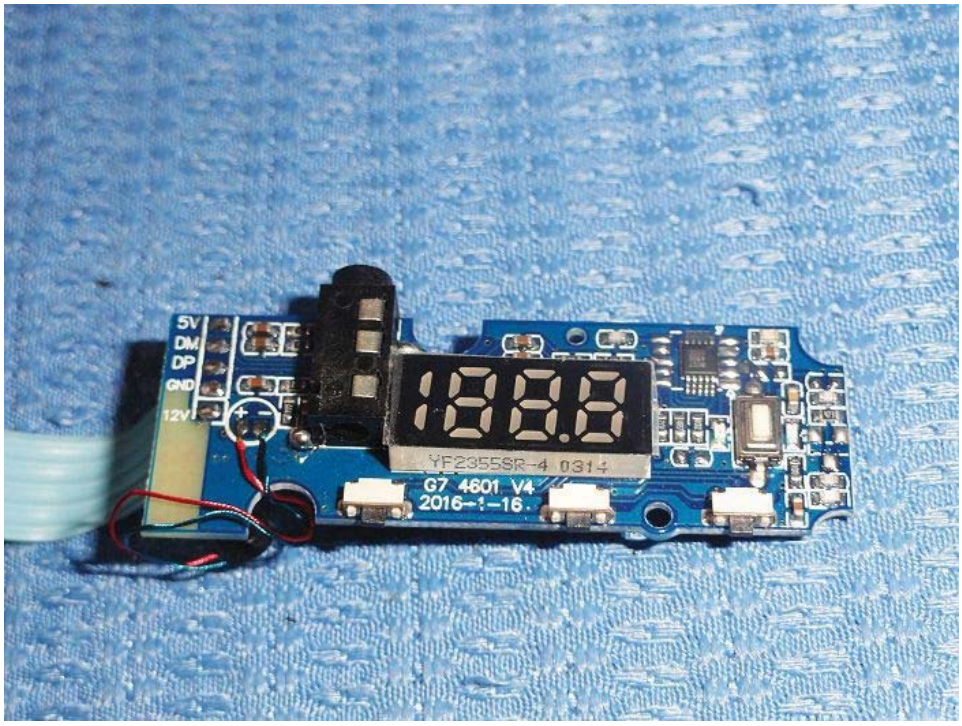


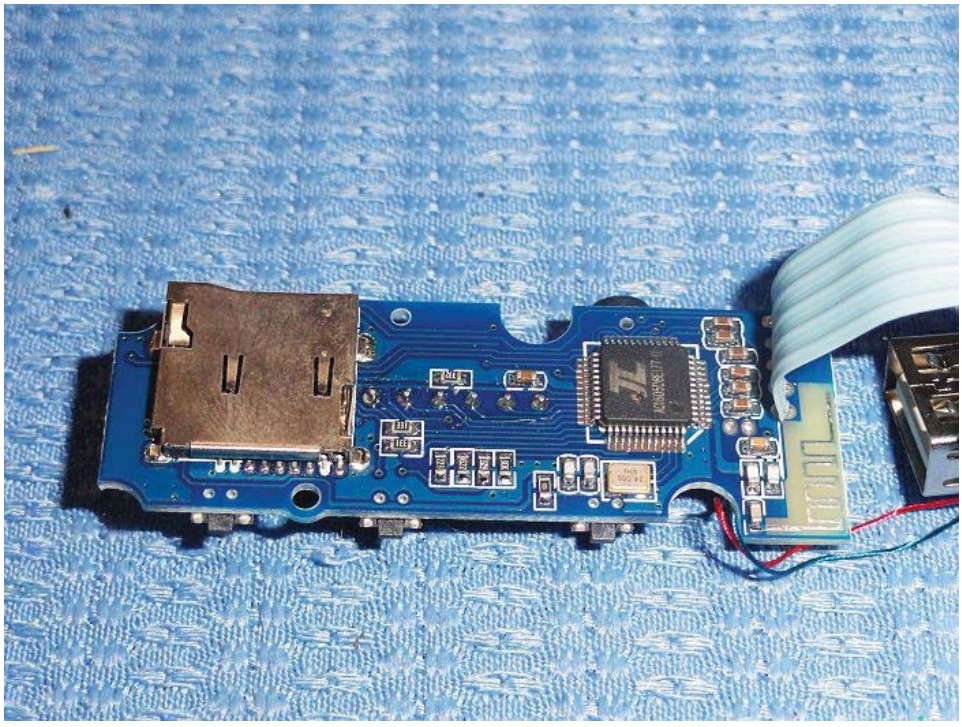
Interior View



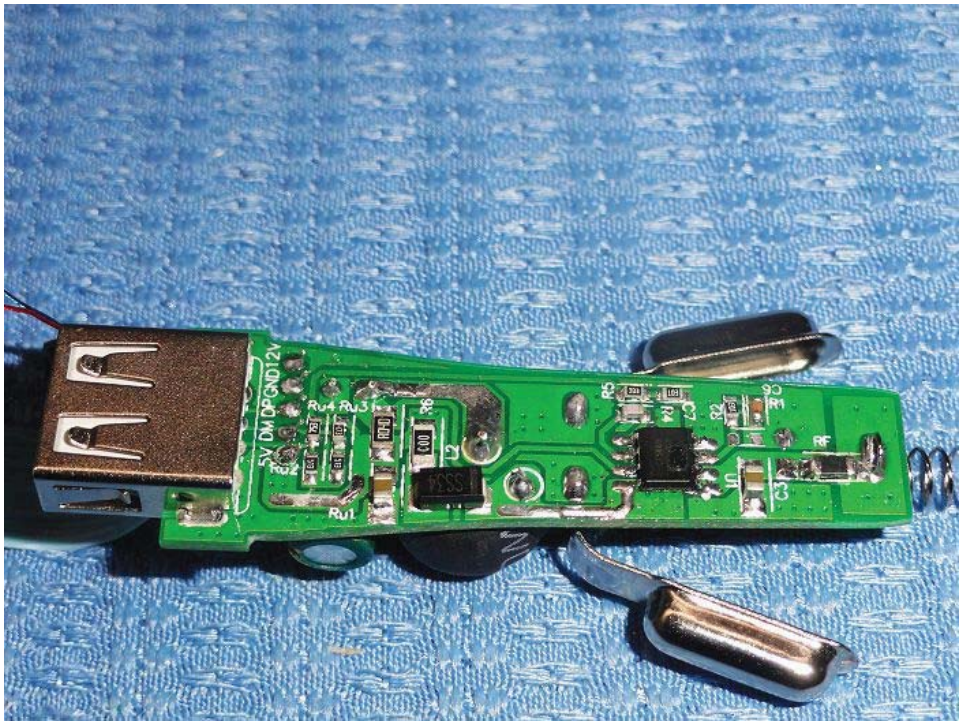



Interior View



Interior View




**End of the report**