# EMC TEST REPORT

The device described below is tested by Dongguan Nore Testing Center Co., Ltd. to determine the maximum emission levels emanating from the device, the severe levels which the device can endure and E.U.T.'s performance criterion. The test results are contained in this test report. Dongguan Nore Testing Center Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

| | | |
|---|---|---|
| Applicant | : | Maxxsonics USA Inc |
| Address | : | 851 E. Park Avenue Libertyville, IL 60048 USA |
| Manufacturer/ Factory | : | HASDA ELECTRIC LTD. |
| Address | : | No.4, Xianglong Street, Changlong Village, Huangjiang Town, Dongguan City, Guangdong Province, China |
| E.U.T. | : | WATERPROOF MP3 RADIO RECEIVER |
| Brand Name | : | POLARIS |
| Model No. | : | 2636364 |
| Measurement Standard | : | CFR 47 FCC Part 15, Subpart B, Class B 2014 |
| Date of Receiver | : | January 16, 2016 |
| Date of Test | : | January 16, 2016 to January 29, 2016 |
| Date of Report | : | January 29, 2016 |

This Test Report is Issued Under the Authority of :

Prepared by

Rose Hu / Engineer

Approved & Authorized Signer

Iori Fan / Authorized Signatory

This report shows that the E.U.T. is technically compliant with the CFR 47 FCC Part 15, Subpart B, Class B. This report applies to above tested sample only and shall not be reproduced in part without written approval of Dongguan Nore Testing Center Co., Ltd.

TEL: +86-769-22022444 FAX: +86-769-22022799 Web: www.ntc-c.com
Address: Building D, Gaosheng Science & Technology Park, Zhouxi Longxi Road, Nancheng District, Dongguan, Guangdong, China.

# Revision History of This Test Report

| Report Number | Description | Issued Date |
|---|---|---|
| NTC1601093F | Initial Issue | 2016-01-29 |
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# 1. SUMMARY OF TEST RESULTS

The E.U.T. has been tested according to the following specifications:

| EMISSION | | | |
|---|---|---|---|
| **Standard** | **Test Type** | **Result** | **Remarks** |
| CFR 47 FCC Part 15, Subpart B, Class B 2014 | Radiated Emission Test | PASS | Uncertainty: 3.4dB |

# 2. GENERAL INFORMATION

## 2.1 Details of E.U.T.

| | | |
|---|---|---|
| E.U.T. | : | WATERPROOF MP3 RADIO RECEIVER |
| Model No. | : | 2636364 |
| Brand name | : | POLARIS |
| Rating | : | DC 12V |
| Adapter | : | None |
| E.U.T. Type | : | Class B |
| Operation Frequency | : | Below 108MHz (Except BT function) |
| Test Voltage | : | DC 12V |
| Cable | : | None |
| Description of model difference | : | None |
| Remark | : | None |

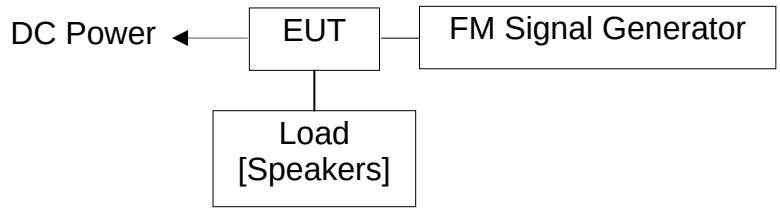
## 2.2 Description of Support Device

| | | |
|---|---|---|
| FM Signal Generator | : | Manufacturer: LEADER<br>M/N: 3214<br>S/N: 1100164 |
| USB Flash Disk | : | Manufacturer: Kingston<br>M/N: 4GB |
| iPod | : | Manufacturer: Apple<br>M/N: A1446<br>S/N: DCYNV5EMF0GQ |
| Speakers | : | Manufacturer: Fenda<br>M/N: A530 |
| Speakers | : | Manufacturer: Fenda<br>M/N: M2 |

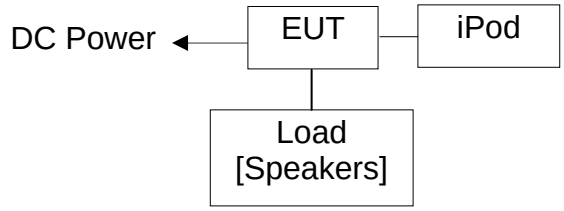
## 2.3 Block Diagram of Test Setup

Block diagram of connection between the E.U.T. and simulators

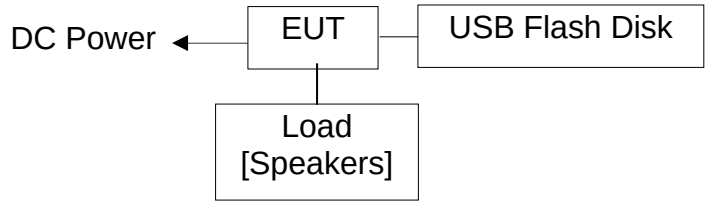
(1) FM Mode




(2) AUX IN




(3) USB Playing



## 2.4 Test Facility

Site Description

| | | |
|---|---|---|
| EMC Lab | : | Listed by CNAS, August 14, 2015<br>The certificate is valid until August 13, 2018<br>The Laboratory has been assessed and proved to be in compliance with CNAS/CL01<br>The Certificate Registration Number is L5795.<br><br>Listed by FCC, July 03, 2014<br>The Certificate Number is 665078.<br><br>Listed by Industry Canada, June 18, 2014<br>The Certificate Registration Number. Is 46405-9743 |
| Name of Firm | : | Dongguan Nore Testing Center Co., Ltd.<br>(Dongguan NTC Co., Ltd.) |
| Site Location | : | Building D, Gaosheng Science & Technology Park, Zhouxi Longxi Road, Nancheng District, Dongguan, Guangdong, China. |

## 2.5 Abnormalities from Standard Conditions

None

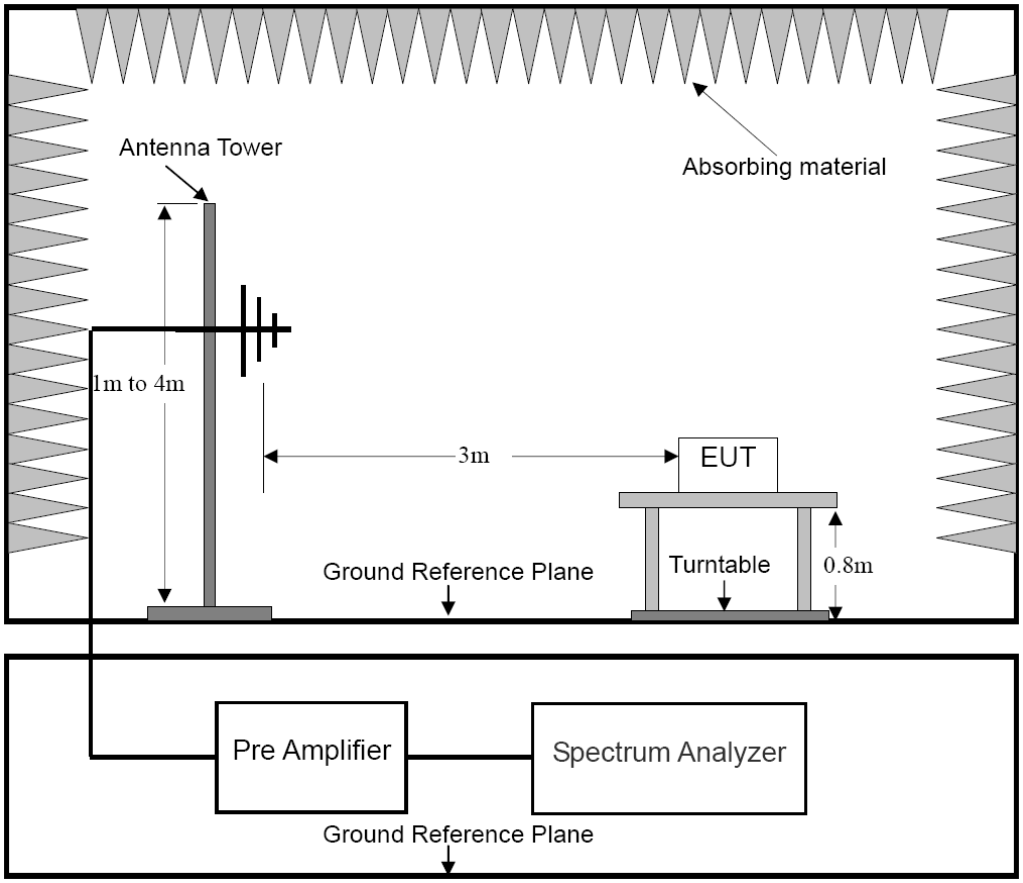
# 3. MEASURING DEVICES AND TEST EQUIPMENT

## 3.1 For Radiated Emission Measurement

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Test Receiver | Rohde & Schwarz | ESCI7 | 100837 | Mar. 07, 2015 | 1 Year |
| 2. | Antenna | Schwarzbeck | VULB9162 | 9162-010 | Mar. 14, 2015 | 1 Year |
| 3. | Positioning Controller | UC | UC 3000 | N/A | N/A | N/A |
| 4. | Color Monitor | SUNSPO | SP-140A | N/A | N/A | N/A |
| 5. | Single Phase Power Line Filter | SAEMC | PF201A-32 | 110210 | N/A | N/A |
| 6. | 3 Phase Power Line Filter | SAEMC | PF401A-200 | 110318 | N/A | N/A |
| 7. | DC Power Filter | SAEMC | PF301A-200 | 110245 | N/A | N/A |
| 8. | Cable | Huber+Suhner | CBL3-NN-9M | 21490001 | Mar. 07, 2015 | 1 Year |
| 9. | Cable | Huber+Suhner | RG223U | N/A | Mar. 07, 2015 | 1 Year |
| 10. | Power Amplifier | HP | HP 8447D | 1145A00203 | Mar. 07, 2015 | 1 Year |

# 4. RADIATED EMISSION MEASUREMENT

## 4.1 Block Diagram of Test




## 4.2 Limit of Radiated Emission Measurement

Test Standard: CFR 47 FCC Part 15, Class B

| Frequency range MHz | Distance Meters | Field Strengths Limit | |
|---|---|---|---|
| | | μV/m | dB(μV)/m |
| 30 ~ 88 | 3 | 100 | 40.0 |
| 88 ~ 216 | 3 | 150 | 43.5 |
| 216 ~ 960 | 3 | 200 | 46.0 |
| 960 ~ 1000 | 3 | 500 | 54.0 |

Remark：(1) Emission level (dB)μV = 20 log Emission level μV/m
(2) The smaller limit shall apply at the cross point between two frequency bands.
(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

## 4.3 Test Procedure

E.U.T. 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. E.U.T. is set 3.0 meters away from the receiving antenna, which is mounted on a 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 polarization of the antenna is set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to FCC ANSI C63.4-2014 on radiated emission measurement.
The bandwidth of the EMI test receiver is set at 120 KHz.
The frequency range from 30 MHz to 1 GHz is checked.

## 4.4 Operating Condition of E.U.T.

4.4.1 Setup the E.U.T. and simulators as shown in Section 2.3.

4.4.2 Turn on the power of all equipments.

4.4.3 Let the E.U.T. work in test modes (FM Mode, USB Playing, AUX IN) and test it.

## 4.5 Radiated Emission Measurement Result

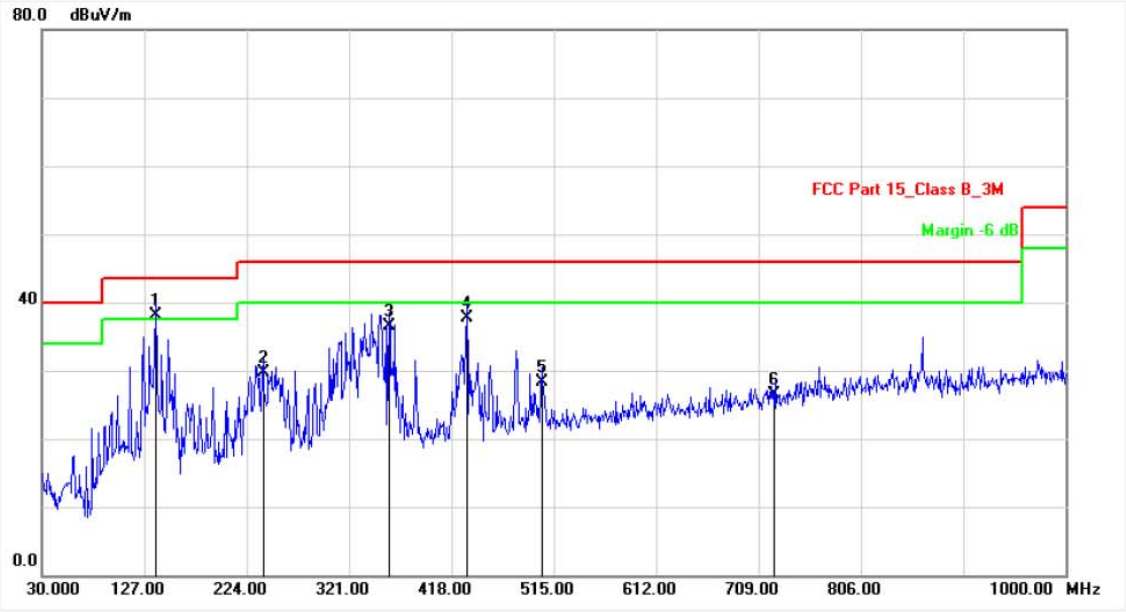
**PASS.**

Please refer to the following pages of the worst case: AUX IN.

**Dongguan NTC Co., Ltd.**
**Tel:+86-769-22022444 Fax:+86-769-22022799**
Web: Http://www.ntc-c.com

Site: Radiation

Test Time: 2016-1-21 13:43:52




| | | | |
|---|---|---|---|
| **Report No.:** | **2636364** | | |
| **Test Standard:** | **FCC Part 15_Class B_3M** | **Test Distance:** | **3m** |
| **Test item:** | **Radiation Emission** | **Ant. Polarization:** | **Horizontal** |
| **Applicant:** | **Maxxsonics USA Inc** | **Temp.(C)/Hum.(%):** | **22(C) / 54 %** |
| **Product:** | **WATERPROOF MP3 RADIO RECEIVER** | **Power Rating:** | **DC 12V** |
| **Model No.:** | **2636364** | **Test Engineer:** | **Frank** |

**Test Mode:** **AXU IN**

**Remark:**

| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg.) | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 137.6700 | -15.48 | 53.58 | 38.10 | 43.50 | -5.40 | QP | | | P | |
| 2 | 239.5200 | -12.06 | 41.86 | 29.80 | 46.00 | -16.20 | QP | | | P | |
| 3 | 358.8299 | -9.14 | 45.64 | 36.50 | 46.00 | -9.50 | QP | | | P | |
| 4 | 432.5500 | -8.37 | 46.07 | 37.70 | 46.00 | -8.30 | QP | | | P | |
| 5 | 503.3600 | -6.75 | 35.15 | 28.40 | 46.00 | -17.60 | QP | | | P | |
| 6 | 724.5198 | -3.19 | 29.69 | 26.50 | 46.00 | -19.50 | QP | | | P | |

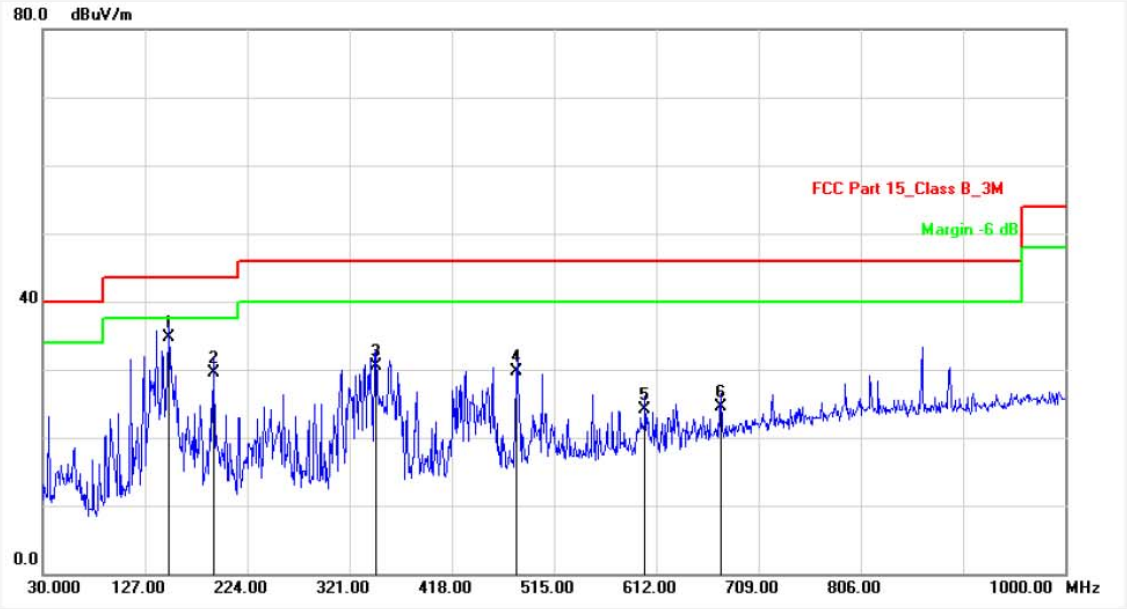
**Note: Level=Reading+Factor.**

**Margin=Limit-Level.**

**Dongguan NTC Co., Ltd.**
**Tel:+86-769-22022444 Fax:+86-769-22022799**
Web: Http://www.ntc-c.com

Site: Radiation

Test Time: 2016-1-21 13:49:16




| | | | |
|---|---|---|---|
| **Report No.:** | **2636364** | | |
| **Test Standard:** | **FCC Part 15_Class B_3M** | **Test Distance:** | **3m** |
| **Test item:** | **Radiation Emission** | **Ant. Polarization:** | **Vertical** |
| **Applicant:** | **Maxxsonics USA Inc** | **Temp.(C)/Hum.(%):** | **22(C) / 54 %** |
| **Product:** | **WATERPROOF MP3 RADIO RECEIVER** | **Power Rating:** | **DC 12V** |
| **Model No.:** | **2636364** | **Test Engineer:** | **Frank** |

**Test Mode:** **AXU IN**

**Remark:**

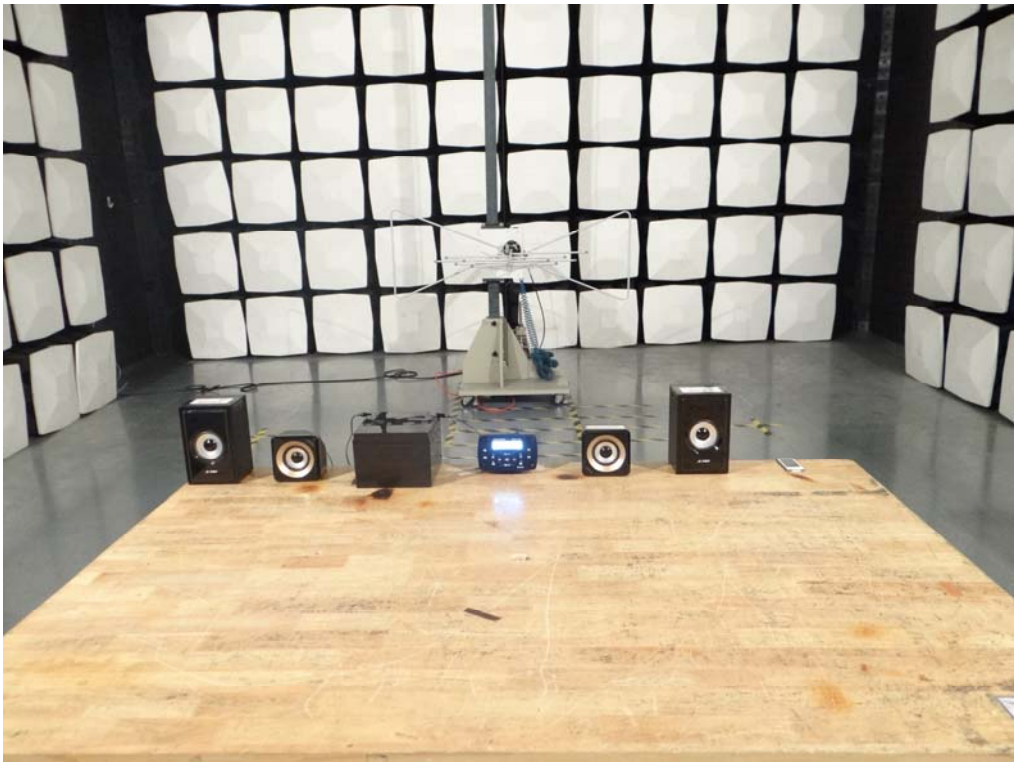
| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg.) | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 149.3100 | -18.52 | 53.22 | 34.70 | 43.50 | -8.80 | QP | | | P | |
| 2 | 191.9900 | -16.51 | 46.01 | 29.50 | 43.50 | -14.00 | QP | | | P | |
| 3 | 346.2200 | -11.19 | 41.79 | 30.60 | 46.00 | -15.40 | QP | | | P | |
| 4 | 480.0799 | -9.21 | 38.91 | 29.70 | 46.00 | -16.30 | QP | | | P | |
| 5 | 601.3300 | -7.00 | 31.10 | 24.10 | 46.00 | -21.90 | QP | | | P | |
| 6 | 673.1100 | -4.53 | 29.03 | 24.50 | 46.00 | -21.50 | QP | | | P | |

**Note: Level=Reading+Factor.**

**Margin=Limit-Level.**

# 5. PHOTOGRAPH

## 5.1 Photo of Radiation Emission Measurement



# APPENDIX I
# (Photos of E.U.T.)

**Figure 1**
General Appearance of the E.U.T.


**Figure 2**
General Appearance of the E.U.T.

**Figure 3**
General Appearance of the E.U.T.

**Figure 4**
General Appearance of the E.U.T.

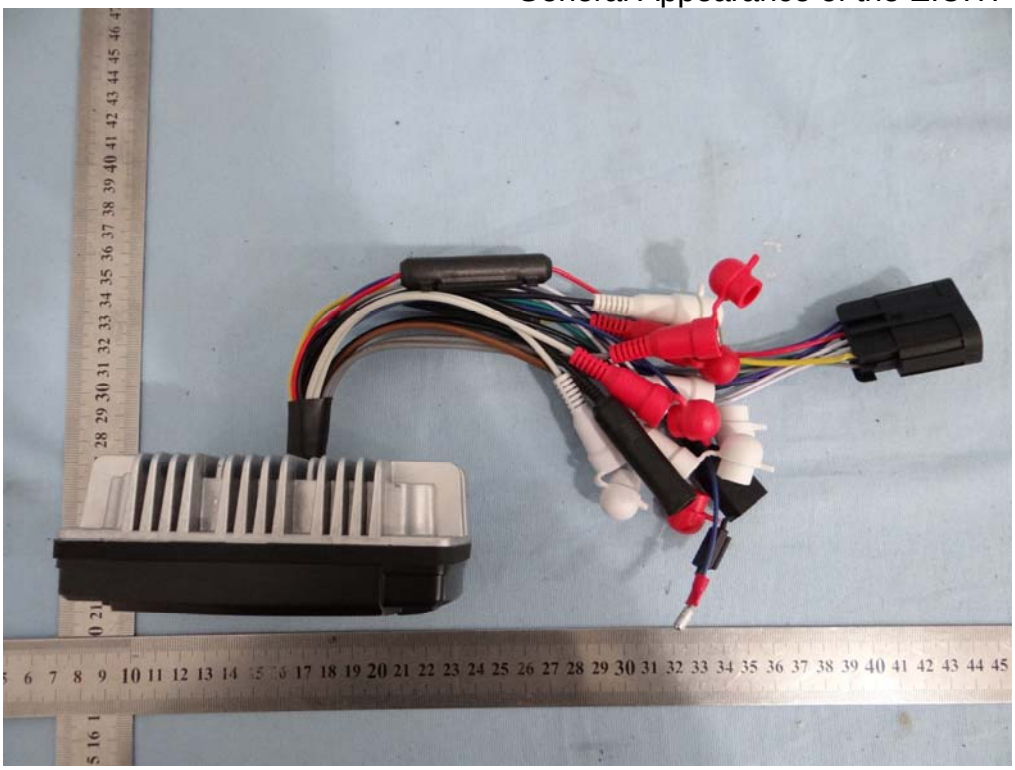


**Figure 5**
General Appearance of the E.U.T.

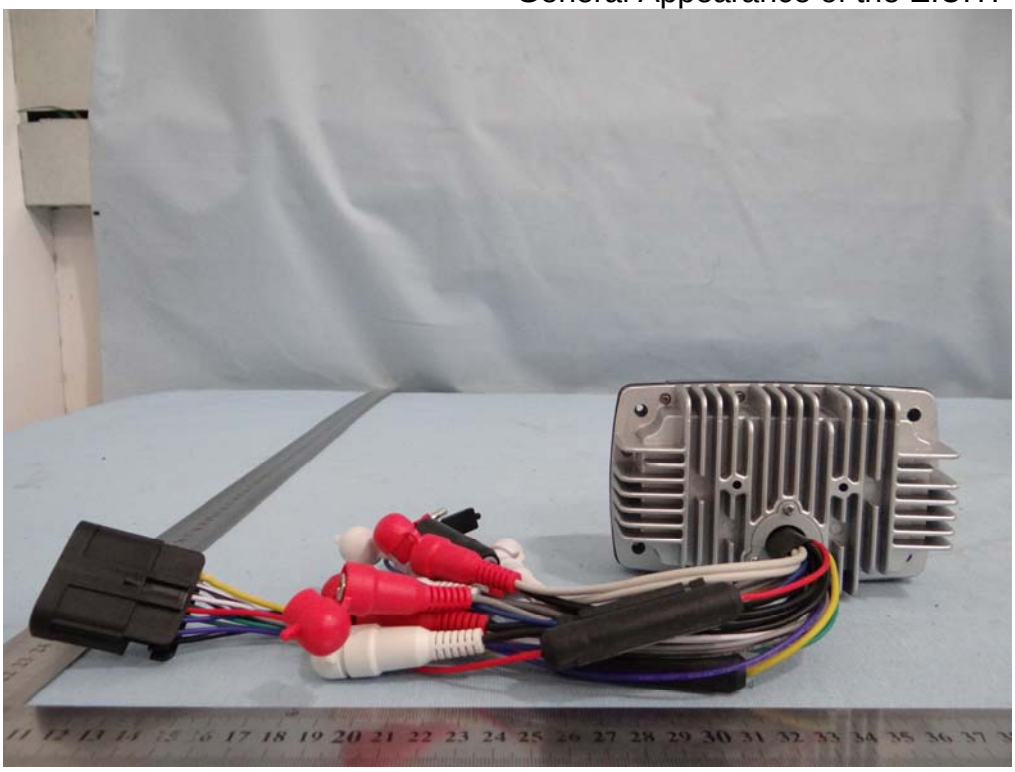


**Figure 6**
General Appearance of the E.U.T.

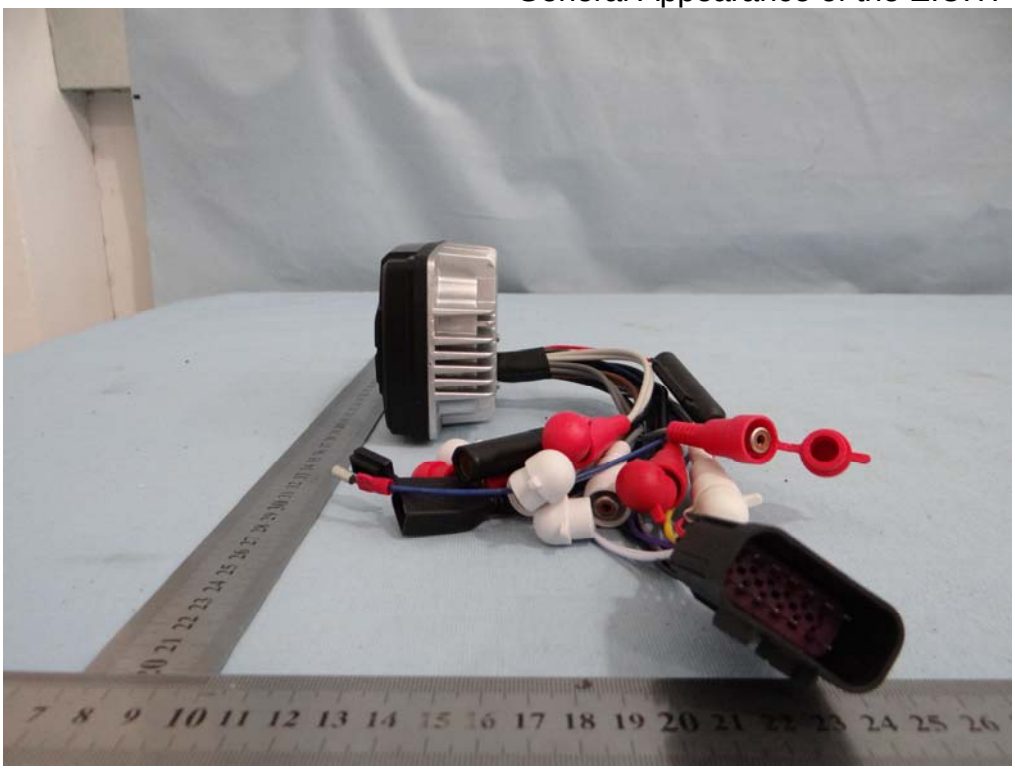


**Figure 7**
General Internal of the E.U.T.

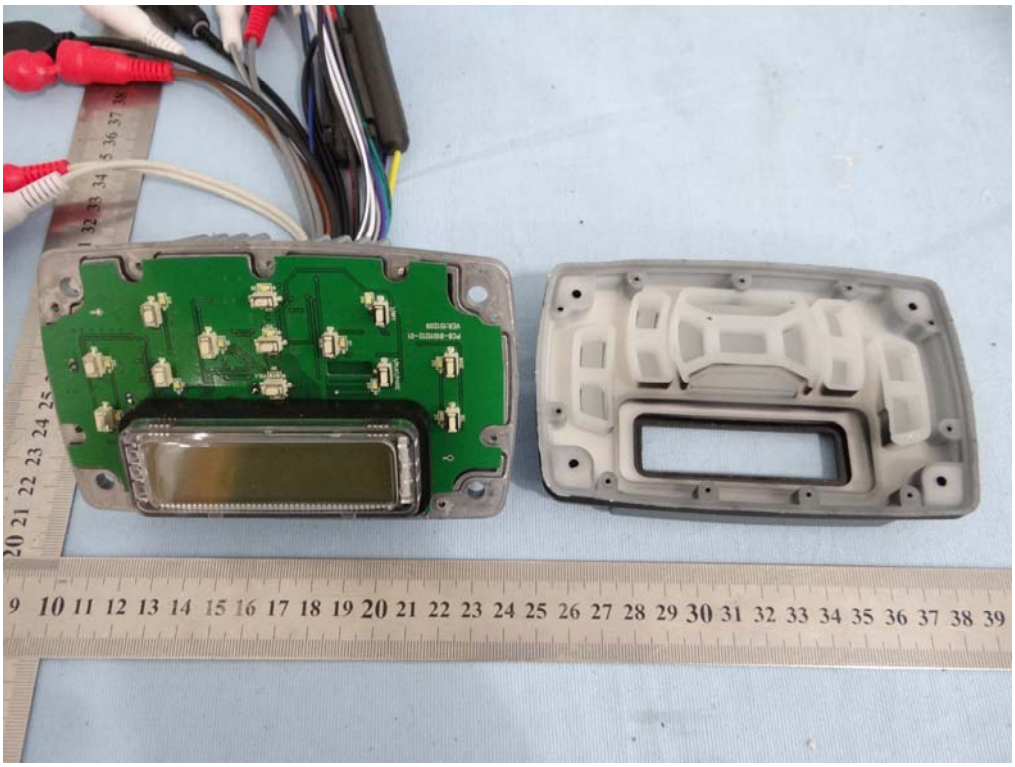


**Figure 8**
General Appearance of the PCB

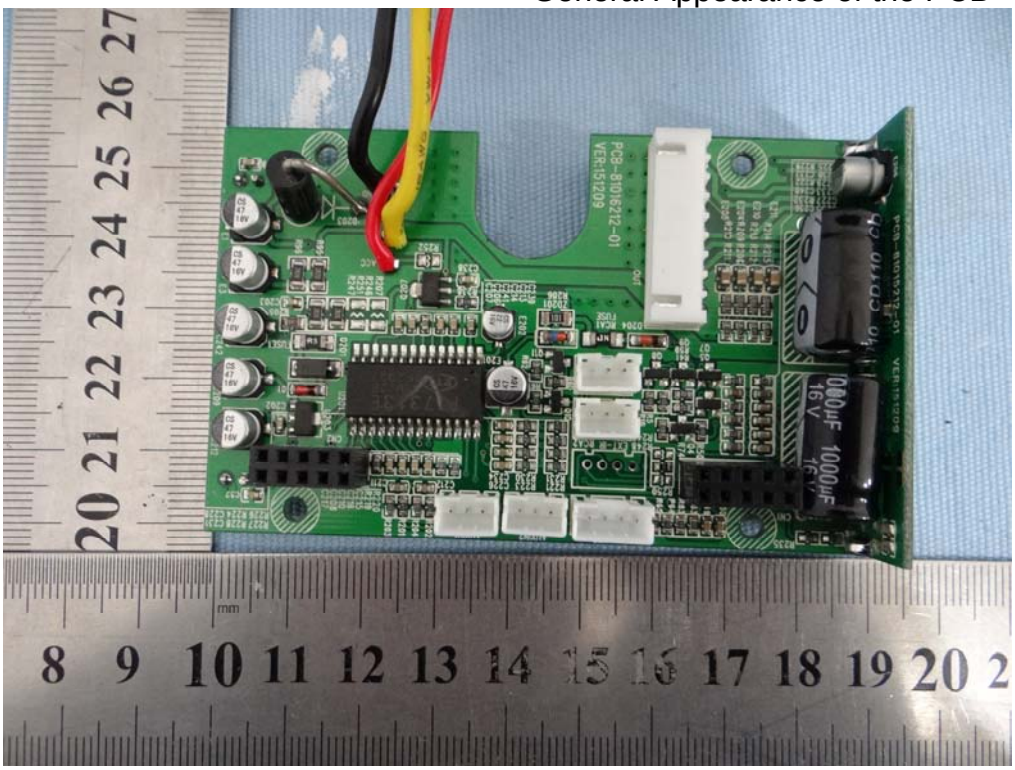


**Figure 9**
General Appearance of the PCB

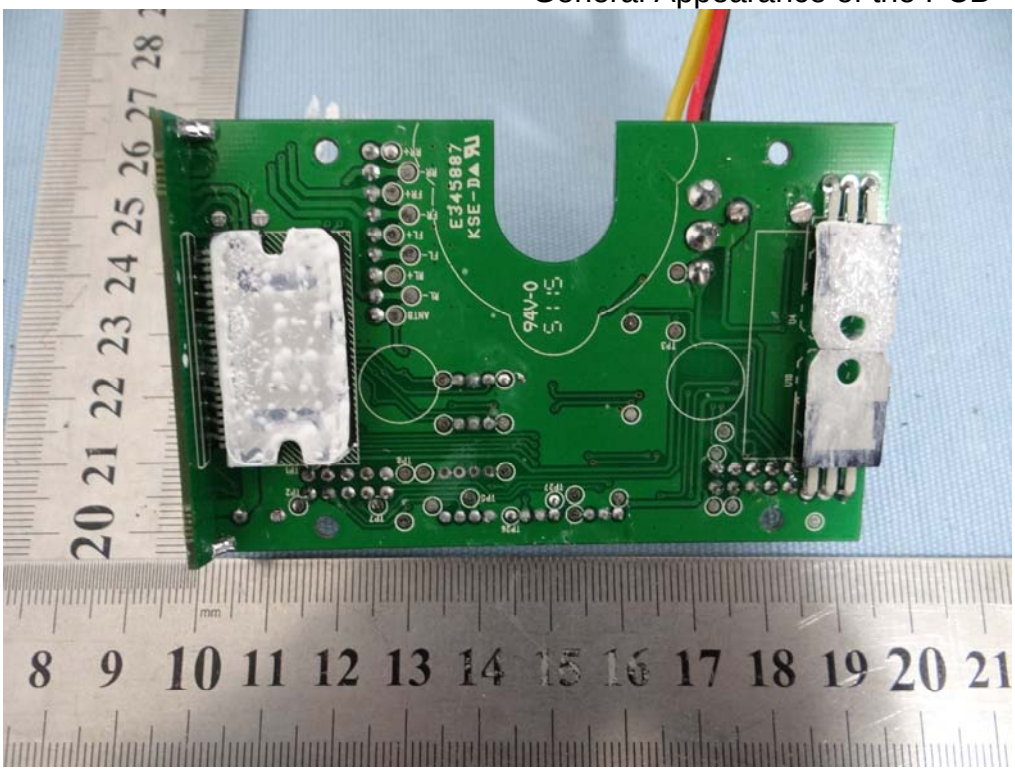



**Figure 10**
General Appearance of the PCB

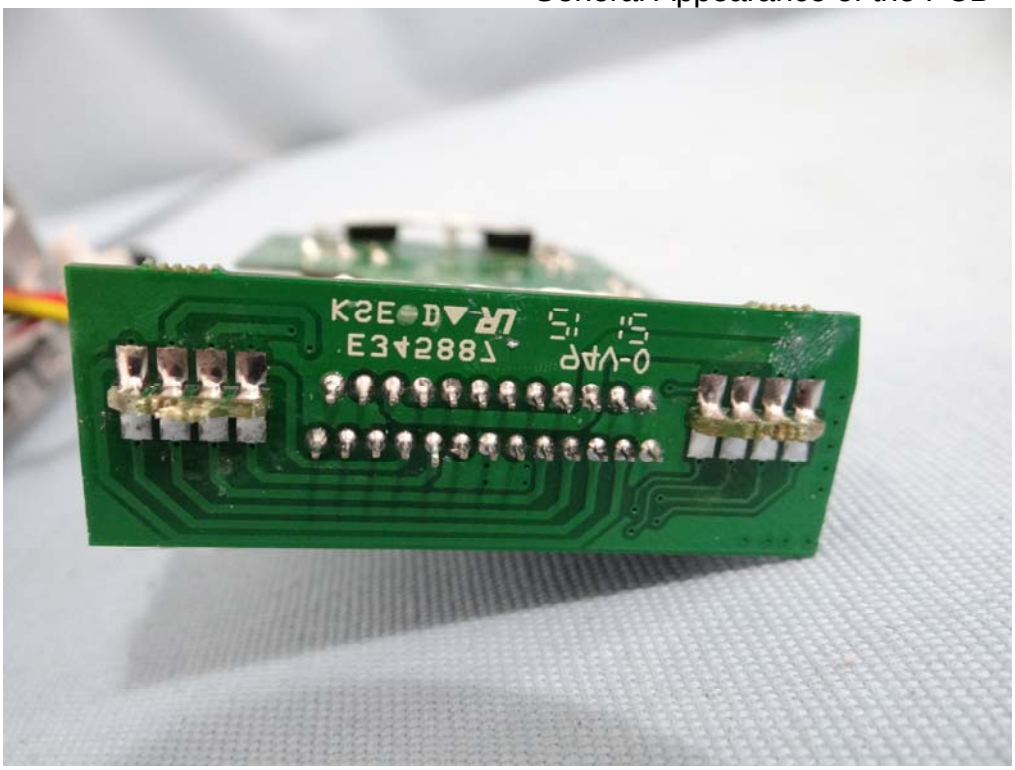


**Figure 11**
General Appearance of the PCB


**Figure 12**
General Appearance of the PCB

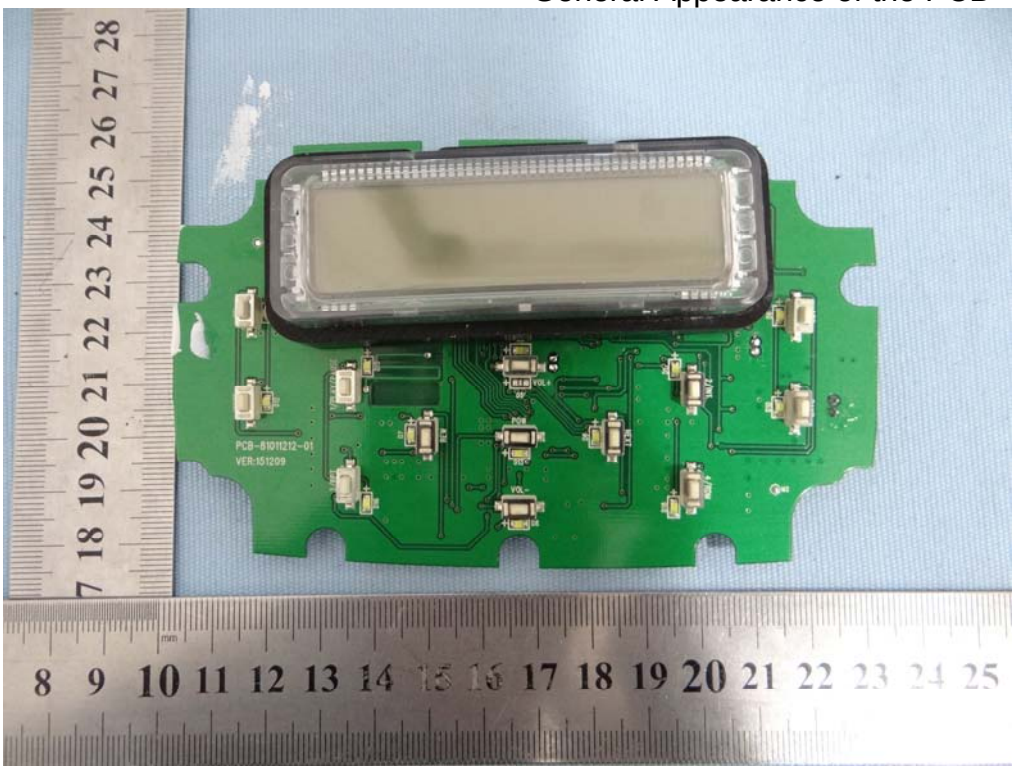


**Figure 13**
General Appearance of the PCB

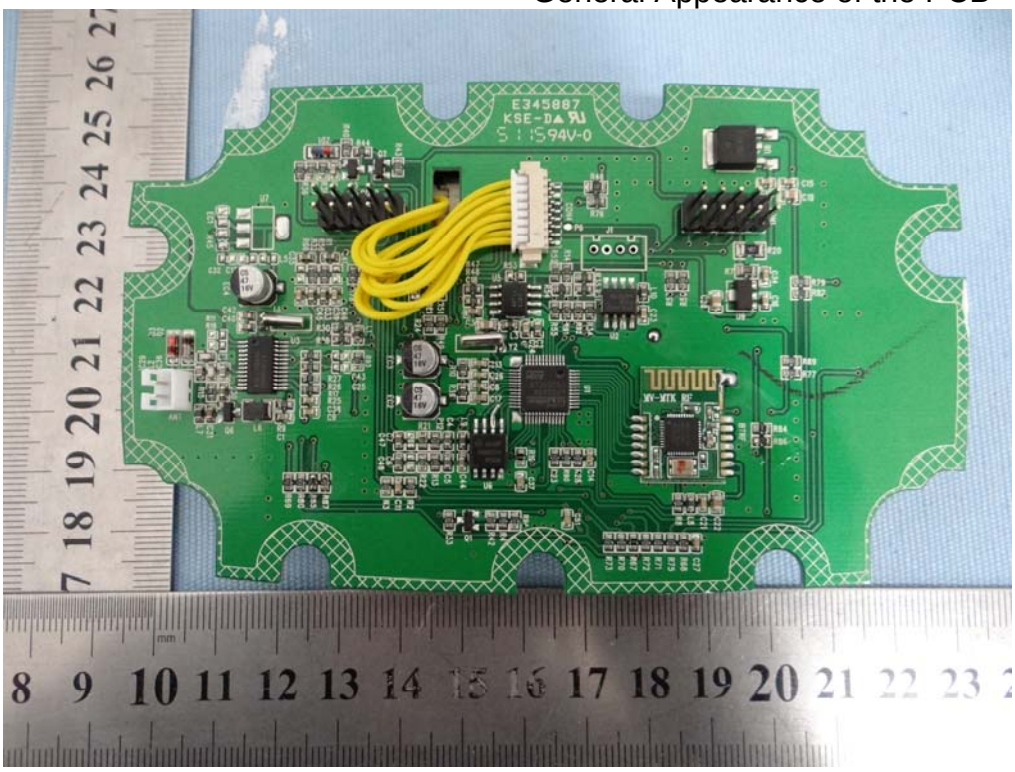
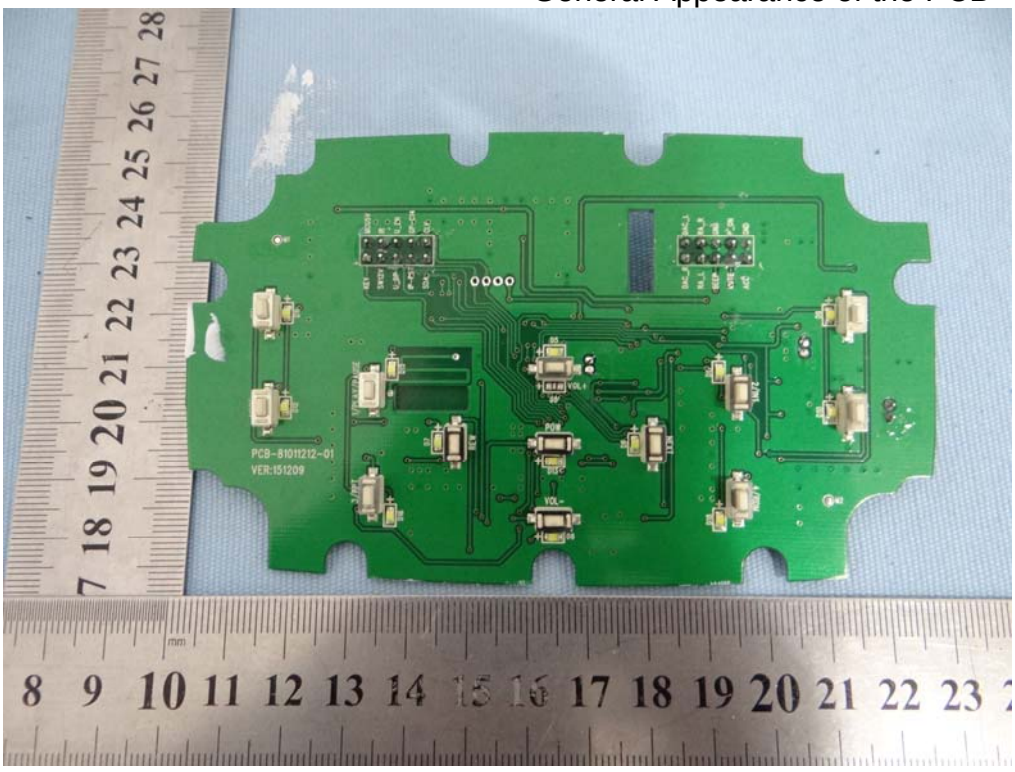



**Figure 14**
General Appearance of the PCB

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