# Application for FCC Certificate
# On Behalf of

# TTE Technology, Inc.

# LCD TV or LED TV

# Model Number: 49R80

# FCC ID:W8U49R80

Prepared for : TTE Technology, Inc.
Address : 2455 Anselmo Drive Suite 101
Corona California United States

Prepared by : EST Technology Co., Ltd.
Address : San Tun Management Zone, Houjie Town, Dongguan, Guangdong, China

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Report No. : ESTE-R1705166
Date of Report : May 28,2017

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# EST Technology Co., Ltd.

| | | | |
|---|---|---|---|
| **Applicant:**<br>**Address:** | TTE Technology, Inc.<br>2455 Anselmo Drive Suite 101<br>Corona California United States | | |
| **Manufacturer**<br>**Address:** | TCL King Electrical Appliances(Huizhou) Co.,Ltd<br>Section 19,ZhongKai New and High-tech Industries Development Zone,Huizhou.Guangdong,P.R.China | | |
| **Factory 1:**<br>**Address:** | TCL King Electrical Appliances(Huizhou) Co.,Ltd<br>Section 19,ZhongKai New and High-tech Industries Development Zone,Huizhou.Guangdong,P.R.China | | |
| **E.U.T:** | LCD TV or LED TV | | |
| **Model Number:** | 49R80 | | |
| **Additional Model:** | 49RH1、49VH、**49**** (* can be A-Z,0-9 or "-" or blank) | | |
| **Trade Name:** | HITACHI | **Serial No.:** | ------ |
| **Date of Receipt:** | May 22,2017 | **Date of Test:** | May 22,2017~May 28,2017 |
| **Test Specification:** | FCC Rules and Regulations Part 15 Subpart B:2016<br>ANSI C63.4:2014 | | |
| **Test Result:** | The device described above is tested by EST Technology Co., Ltd..<br>The measurement results were contained in this test report and EST Technology Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC Rules and Regulations Part 15 Subpart B requirements.<br>This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd.<br>**Issue Date:** May 28,2017 | | |
| Prepared by: | Tested by: | Approved by: | |
| Amy / Assistant | Bible / Engineer | Iceman Hu / Manager | |
| **Other Aspects:**<br>None. | | | |
| *Abbreviations: OK/P=passed* | *fail/F=failed* | *n.a/N=not applicable* | *E.U.T=equipment under tested* |

# 1. GENERAL PRODUCT INFORMATION

## 1.1. Product Function

Refer to Technical Construction Form and User Manual.

## 1.2. Difference between Model Numbers

**Note:** The Product only different model number,
But the PCB board inside are identical.

## 1.3. Independent Operation Modes

### 1.3.1. Conducted Modes

| | | |
|---|---|---|
| 1 | HDMI(3840*2160+Running “H” Pattern) | Worst case |
| 2 | HDMI(1920*1080+Running “H” Pattern) | |
| 3 | HDMI(800*600+Running “H” Pattern) | |
| 4 | Connect to PC | |
| Note: The worst case will be recorded in this report. | | |

### 1.3.2. Radiated Modes

| | | |
|---|---|---|
| 30MHz~1GHz | | |
| 1 | HDMI(3840*2160+Running “H” Pattern) | Worst case |
| 2 | HDMI(1920*1080+Running “H” Pattern) | |
| 3 | HDMI(800*600+Running “H” Pattern) | |
| 4 | Connect to PC | |
| Above 1GHz | | |
| 1 | HDMI(3840*2160+Running “H” Pattern) | Worst case |
| 2 | HDMI(1920*1080+Running “H” Pattern) | |
| 3 | HDMI(800*600+Running “H” Pattern) | |
| 4 | Connect to PC | |
| Note: The worst case will be recorded in this report. | | |

# 2. TEST SITES

## 2.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below

| EMISSION | | | |
|---|---|---|---|
| **Description of Test Item** | **Standard** | **Limits** | **Results** |
| Conducted disturbance at mains terminals | FCC Rules and Regulations Part 15 Subpart B:2016 ANSI C63.4:2014 | 15.107(a) Class B | PASS |
| | | Minimum passing margin is 10.16dB at 1.02MHz | |
| Radiated Emission Test | FCC Rules and Regulations Part 15 Subpart B:2016 ANSI C63.4:2014 | 15.109(a) Class B | PASS |
| | | Minimum passing margin is 5.86dB at 742.95MHz for 30-1000MHz; Minimum passing margin is 4.65dB at 1885.00MHz for above 1GHZ; | |

## 2.2. Test Facilities

| | | |
|---|---|---|
| EMC Lab | : | Certificated by CNAS, CHINA<br>Registration No.: L5288<br>Date of registration: December 07, 2015<br><br>Certificated by FCC, USA<br>Registration No.: 989591<br>Date of registration: November 15, 2016<br><br>Certificated by Industry Canada<br>Registration No.: 9405A-1<br>Date of registration: December 30, 2015<br><br>Certificated by VCCI, Japan<br>Registration No.: R-3663 & C-4103<br>Date of registration: July 25, 2014<br><br>Certificated by TUV Rheinland, Germany<br>Registration No.: UA 50195514 0001<br>Date of registration: January 07, 2011<br><br>Certificated by TUV/PS, Shenzhen<br>Registration No.: SCN1017<br>Date of registration: January 27, 2011<br><br>Certificated by Intertek ETL SEMKO<br>Registration No.: 2011-RTL-L1-18<br>Date of registration: April 28, 2011<br><br>Certificated by Nemko, Hong Kong<br>Registration No.: 175193<br>Date of registration: May 4, 2011 |
| Name of Firm | : | EST Technology Co., Ltd. |
| Site Location | : | San Tun Management Zone, Houjie Town, Dongguan, Guangdong, China |

## 2.3. List of Test and Measurement Instruments

### 2.3.1. For conducted emission at the mains terminals test (844 Room)

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| EMI Test Receiver | Rohde& Schwarz | ESVS30 | 832354 | June 25,16 | 1 Year |
| Artificial Mains Network | Rohde& Schwarz | ENV216 | 101260 | June 25,16 | 1 Year |
| Pulse Limiter | Rohde& Schwarz | ESH3-Z2 | 101100 | June 25,16 | 1 Year |

### 2.3.2. For radiated emission test

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| EMI Test Receiver | Rohde& Schwarz | ESVS10 | 100004 | June 25,16 | 1 Year |
| Spectrum Analyzer | Agilent | E4411B | MY50140697 | June 25,16 | 1 Year |
| Bilog Antenna | Teseq | CBL 6111D | 25872 | June 28,15 | 3 Year |
| Signal Amplifier | Agilent | 310N | 187037 | June 25,16 | 1 Year |
| Horn Antenna | SCHWARZBECK | BBHA9120D | 8128-290 | June 28,15 | 3 Year |
| Signal Amplifier | SCHWARZBECK | BBV9718 | 9718-212 | June 25,16 | 1 Year |
| Spectrum Analyzer | Agilent | E4408B | MY44211139 | June 25,16 | 1 Year |

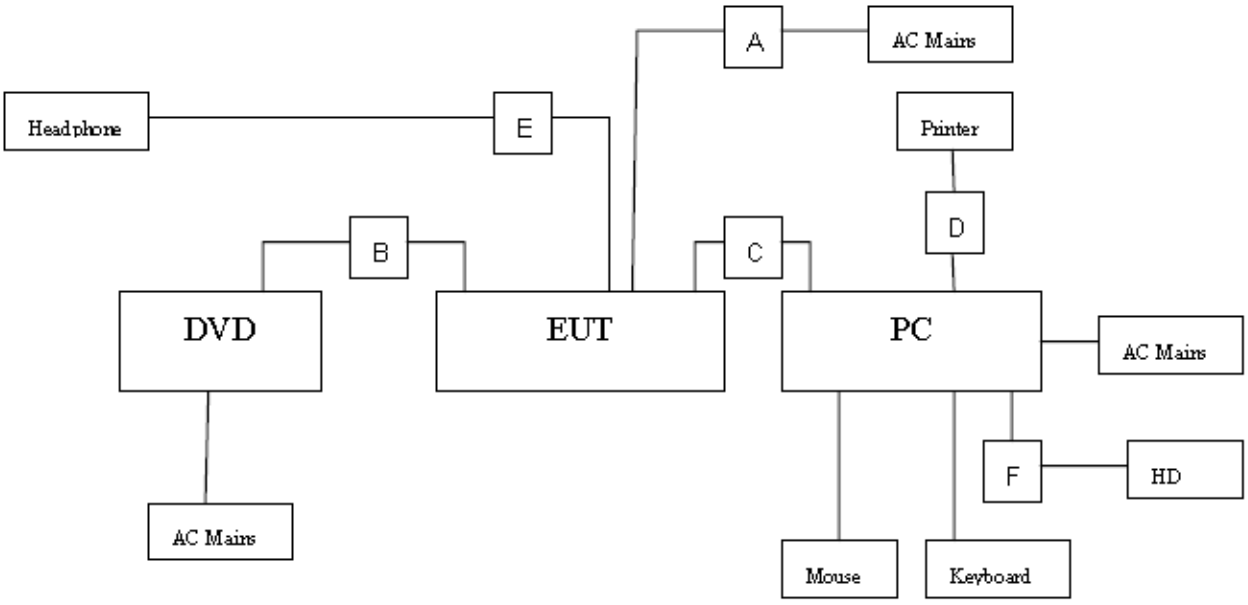
# 3. TEST SET-UP AND OPERATION MODES

## 3.1. Principle of Configuration Selection

**Emission:** The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

## 3.2. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators




(EUT: LCD TV or LED TV)

| | | |
|---|---|---|
| A | AC Line | Unshielded, Undetachable 1.2m |
| B | AV IN | Unshielded, Detachable 1.2m |
| C | HDMI | Shielded, Detachable 1.2m |
| D | USB Cabel | Shielded, Detachable 1.8m |
| F | USB Cabel | Shielded, Detachable 1.0m |

## 3.3. Test Operation Mode and Test Software

Refer to Test Setup in clause 4.

## 3.4. Special Accessories and Auxiliary Equipment

### 3.4.1. PC

| | | |
|---|---|---|
| M / N | : | VOSTRO |
| Manufacturer | : | DELL |
| Power Cord | : | Unshielded, Detachable, 1.6m |

### 3.4.2. DVD Player

| | | |
|---|---|---|
| M / N | : | DVDHDMI01 |
| Manufacturer | : | SAMWIN |
| Data Cable | : | Shielded, Undetachable, 1.6m |

### 3.4.3. Printer

| | | |
|---|---|---|
| M / N | : | HP1020 |
| Manufacturer | : | HP |
| Data Cable | : | Non-shielded, Detachable, 1.5m |

### 3.4.4. Mouse

| | | |
|---|---|---|
| M / N | : | MOL5VO |
| S / N | : | JOQ03RNT |
| Manufacturer | : | Dell |
| cable | : | Shielded, Undetachable, 1.5m |

### 3.4.5. Keyboard

| | | |
|---|---|---|
| M / N | : | L100 |
| S / N | : | CN-0RH656-65890-01M-070T |
| Manufacturer | : | Dell |
| cable | : | Shielded, Undetachable, 1.8m |

### 3.4.6. HD

| | | |
|---|---|---|
| M / N | : | A1446 |
| Manufacturer | : | Apple |
| cable | : | Shielded, Undetachable, 1.0m |

## 3.5. Countermeasures to Achieve EMC Compliance

None.

# 4. EMISSION TEST RESULTS

## 4.1. Conducted Emission at the Mains Terminals Test

| | | |
|---|---|---|
| **RESULT** | **:** | **Pass** |
| Test Procedure | : | ANSI C63.4:2014 |
| Frequency Range | : | 0.15 to 30MHz |
| Test Site | : | Shielded Room |
| Limits | : | FCC Part 15:2016 Class B |

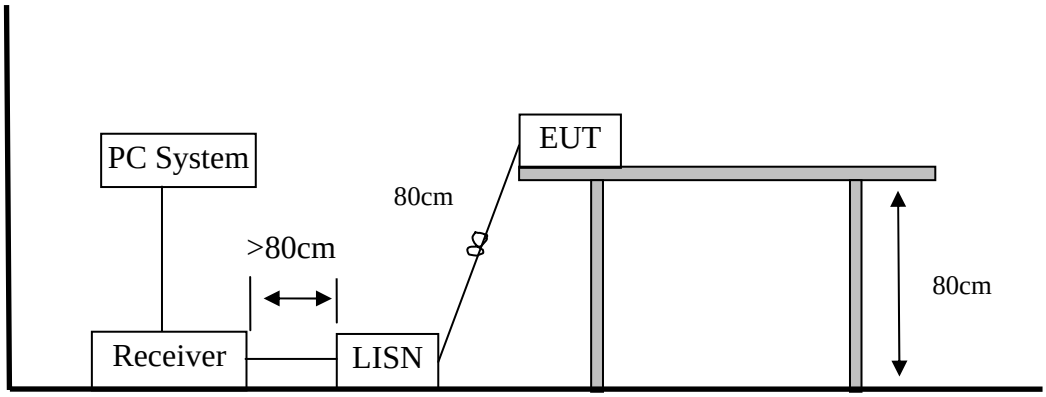
**Test Setup**

| | | |
|---|---|---|
| Date of Test | : | May 24,2017 |
| M/N | : | 49R80 |
| Input Voltage | : | AC 120V/60Hz |
| Operation Mode | : | HDMI |

The frequency range from 150 kHz to 30 MHz was investigated.

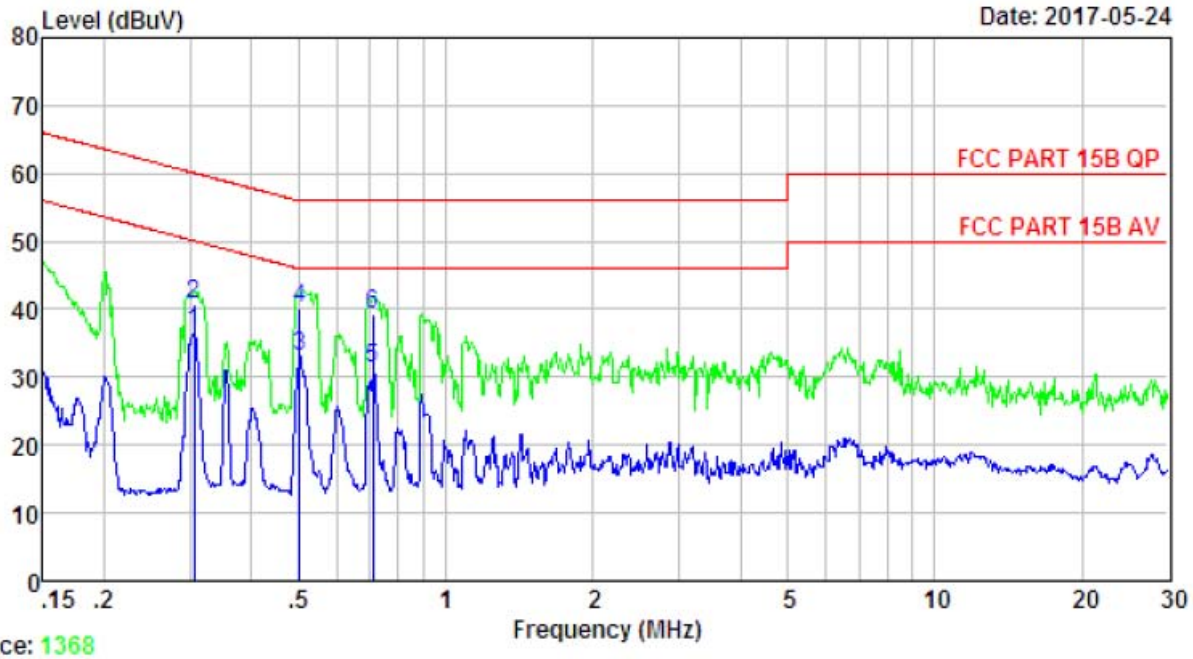
The bandwidth of the test receiver was set at 9 kHz.

The test data of the worst case condition(s) was reported on the following page.



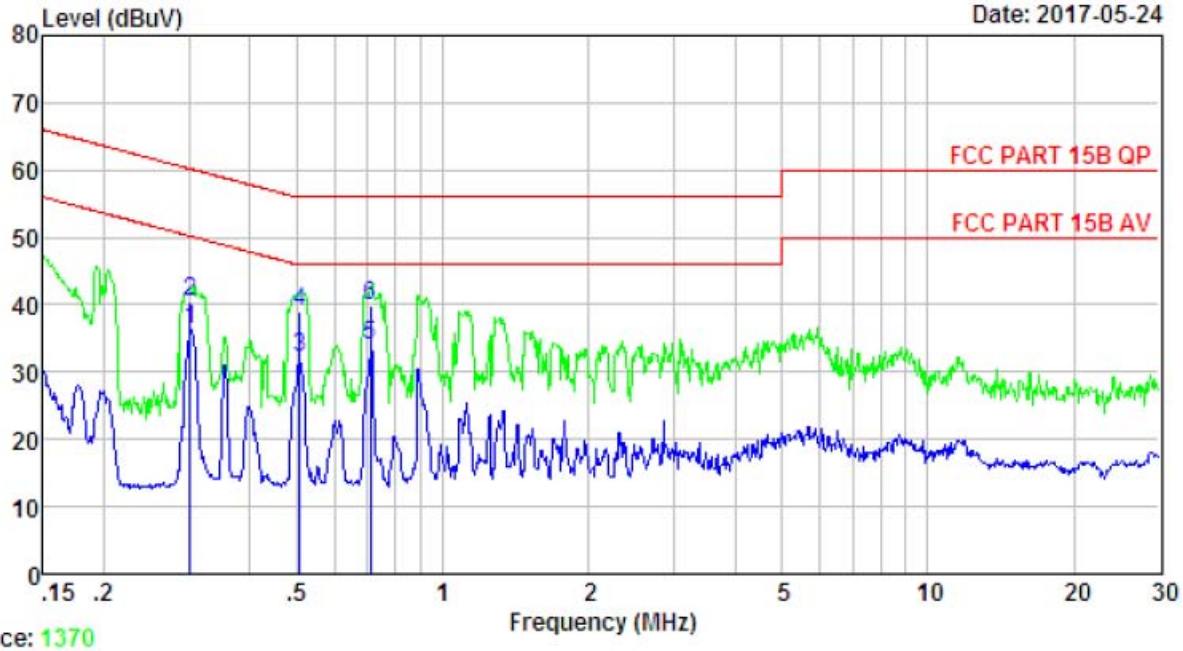

**Note: Measurement Uncertainty: ±2.54 dB at a level of confidence of 95%.**

## Test Data




```
Site no       : 844 Shield Room                      Data no.    : 1369
Env. / Ins.   : Temp:25.3'C Humi:58% Press:101.50kPa LINE Phase : LINE
Limit         : FCC PART 15B QP
Engineer      : Bible
EUT           : LCD TV or LED TV
Power         : AC 120V/60Hz
M/N           : 49R80
Test Mode     : HDMI (3840*2160+Running "H"Pattern)
```

| | Freq. (MHz) | LISN Factor (dB) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuv) | Limits (dBuv) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.31 | 9.61 | 9.83 | 17.27 | 36.71 | 50.10 | 13.39 | Average |
| 2 | 0.31 | 9.61 | 9.83 | 21.27 | 40.71 | 60.10 | 19.39 | QP |
| 3 | 0.50 | 9.61 | 9.81 | 13.60 | 33.02 | 46.00 | 12.98 | Average |
| 4 | 0.50 | 9.61 | 9.81 | 20.60 | 40.02 | 56.00 | 15.98 | QP |
| 5 | 0.71 | 9.59 | 9.81 | 11.85 | 31.25 | 46.00 | 14.75 | Average |
| 6 | 0.71 | 9.59 | 9.81 | 19.85 | 39.25 | 56.00 | 16.75 | QP |




```
Site no       : 844 Shield Room                      Data no.   : 1371
Env. / Ins.   : Temp:25.3'C Humi:58% Press:101.50kPa LINE Phase : NEUTRAL
Limit         : FCC PART 15B QP
Engineer      : Bible
EUT           : LCD TV or LED TV
Power         : AC 120V/60Hz
M/N           : 49R80
Test Mode     : HDMI (3840*2160+Running "H"Pattern)
```

| | Freq. (MHz) | LISN Factor (dB) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuv) | Limits (dBuv) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.30 | 9.60 | 9.83 | 16.93 | 36.36 | 50.19 | 13.83 | Average |
| 2 | 0.30 | 9.60 | 9.83 | 20.93 | 40.36 | 60.19 | 19.83 | QP |
| 3 | 0.51 | 9.59 | 9.81 | 12.66 | 32.06 | 46.00 | 13.94 | Average |
| 4 | 0.51 | 9.59 | 9.81 | 19.66 | 39.06 | 56.00 | 16.94 | QP |
| 5 | 0.71 | 9.63 | 9.81 | 14.37 | 33.81 | 46.00 | 12.19 | Average |
| 6 | 0.71 | 9.63 | 9.81 | 20.37 | 39.81 | 56.00 | 16.19 | QP |

## 4.2. Radiated Emission Test

| | | |
|---|---|---|
| **RESULT** | **:** | **Pass** |
| Test Procedure | : | ANSI C63.4:2014 |
| Frequency Range | : | 30-1000 MHz;1-6 GHz |
| Test Site | : | 966 Chamber |
| Limits | : | FCC Part 15:2016 Class B |

**Test Setup**

| | | |
|---|---|---|
| Date of Test | : | May 22,2017~May 24,2017 |
| M/N | : | 49R80 |
| Input Voltage | : | AC 120V/60Hz |
| Operation Mode | : | HDMI |

The EUT was placed on a turn table which was 0.8 m above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.

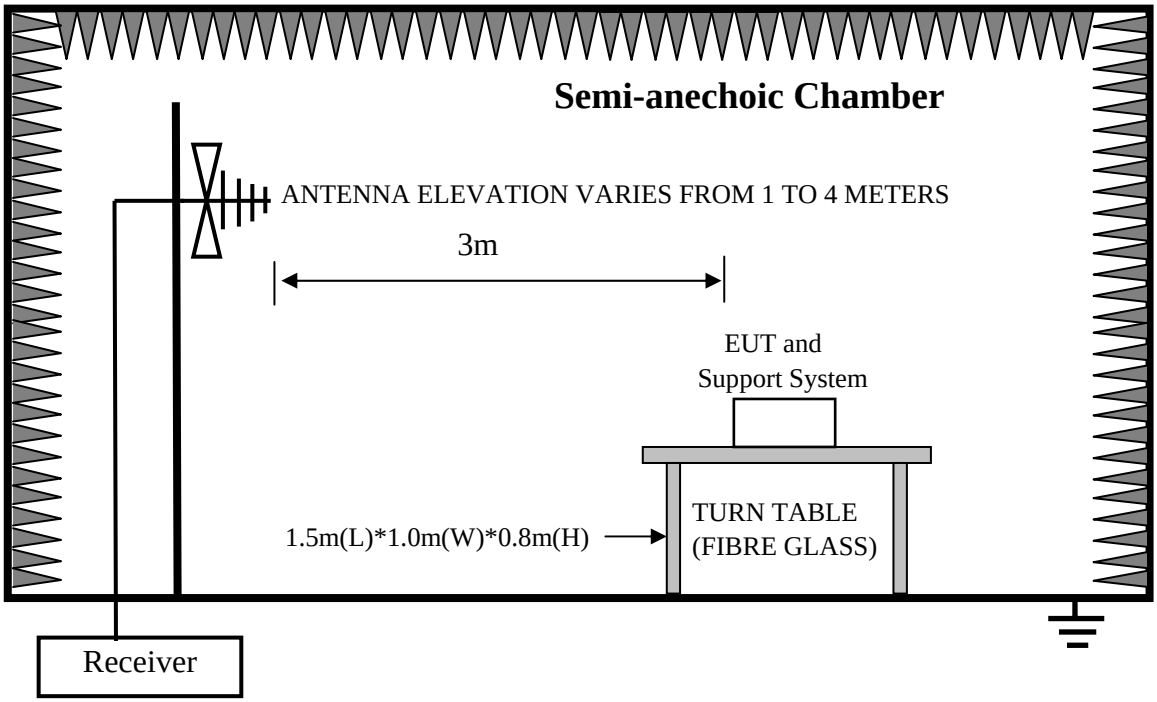
The EUT was tested in the Chamber Site. It was pre-scanned with a Peak detector from the spectrum, and all the final readings from the test receiver were measured with the Quasi-Peak detector.

The bandwidth setting on the test receiver was 120 kHz.

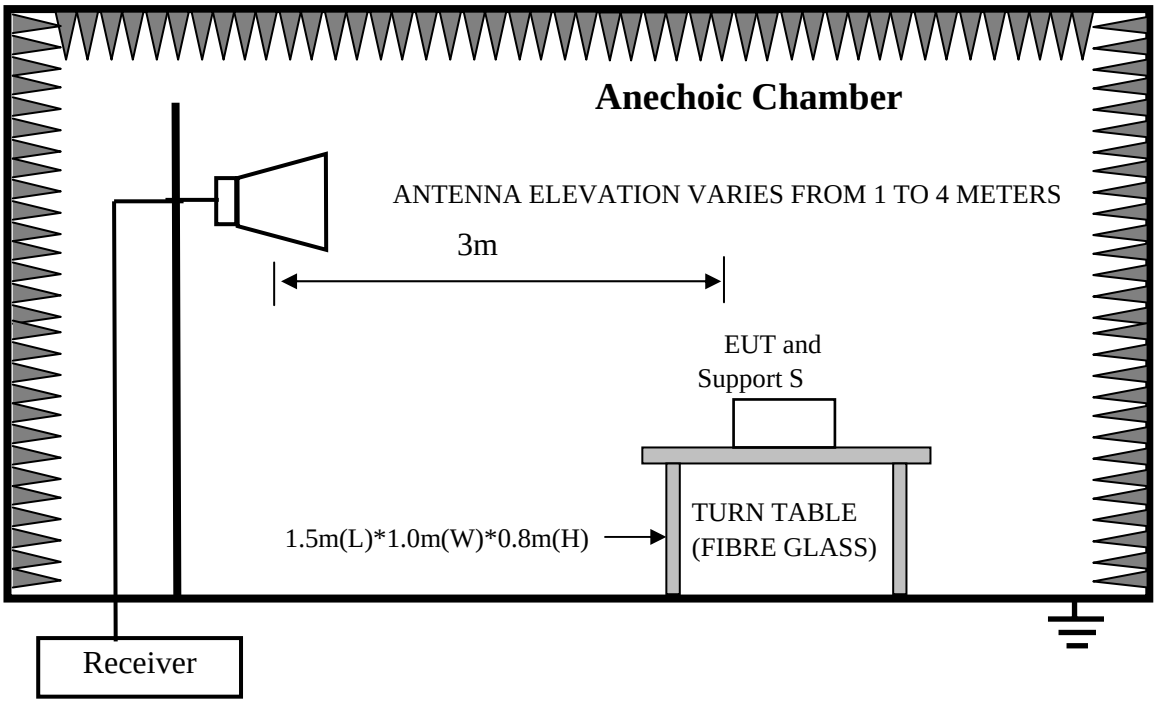
The bandwidth of the Spectrum's VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz

The test data of the worst case condition(s) was reported on the following page.

1、In Semi-anechoic Chamber Test Setup Diagram for 30MHz~1000MHz



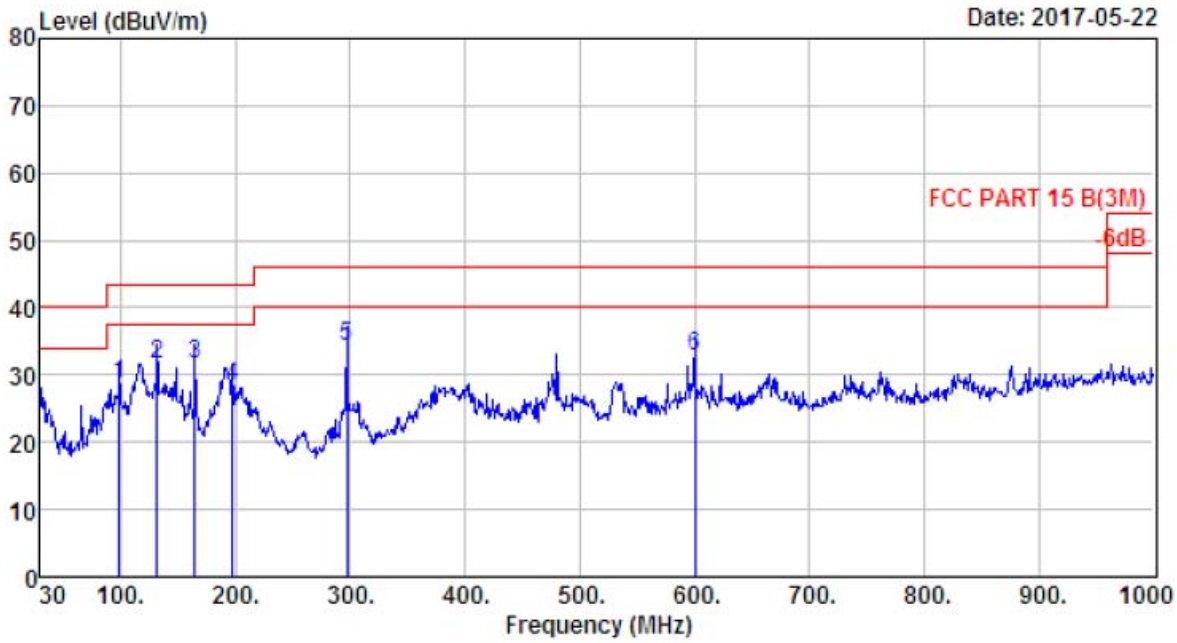

2、In Anechoic Chamber Test Setup Diagram for 1-6GHz




**Test uncertainty: ±3.62dB at a level of confidence of 95%.**

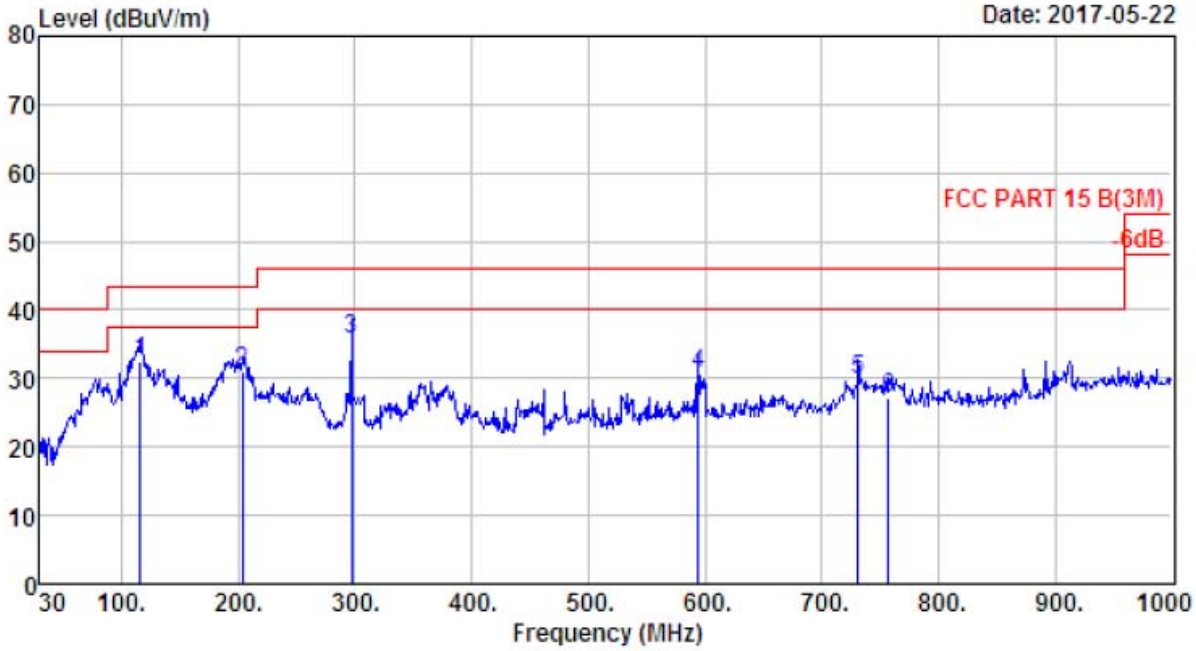
**Test Data**

30MHz-1GHz




Site no. : 1# 966 Chamber Data no. : 102
Dis. / Ant. : 3m 27137 Ant. pol. : VERTICAL
Limit : FCC PART 15 B(3M)
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Bible
EUT : LCD TV or LED TV
Power : AC 120V/60Hz
M/N : 49R80
Test Mode : HDMI (3840*2160+Running "H"Pattern)

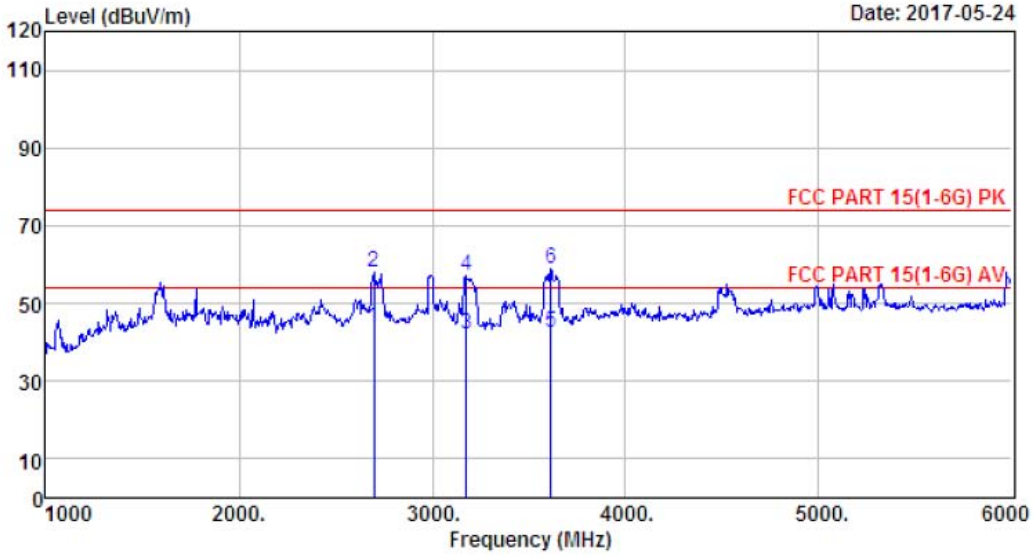
| | Freq. (MHz) | ANT Factor (dB/m) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 98.870 | 9.29 | 1.34 | 18.15 | 28.78 | 43.50 | 14.72 | QP |
| 2 | 131.850 | 11.34 | 1.50 | 18.67 | 31.51 | 43.50 | 11.99 | QP |
| 3 | 164.830 | 9.77 | 1.66 | 20.10 | 31.53 | 43.50 | 11.97 | QP |
| 4 | 197.810 | 7.71 | 1.79 | 18.98 | 28.48 | 43.50 | 15.02 | QP |
| 5 | 296.750 | 12.99 | 2.32 | 18.89 | 34.20 | 46.00 | 11.80 | QP |
| 6 | 600.360 | 19.60 | 3.44 | 9.75 | 32.79 | 46.00 | 13.21 | QP |




Site no. : 1# 966 Chamber Data no. : 103
Dis. / Ant. : 3m 27137 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 B(3M)
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Bible
EUT : LCD TV or LED TV
Power : AC 120V/60Hz
M/N : 49R80
Test Mode : HDMI (3840*2160+Running "H"Pattern)

| | Freq. (MHz) | ANT Factor (dB/m) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 116.330 | 10.98 | 1.50 | 19.95 | 32.43 | 43.50 | 11.07 | QP |
| 2 | 203.630 | 7.87 | 1.92 | 21.28 | 31.07 | 43.50 | 12.43 | QP |
| 3 | 296.750 | 12.99 | 2.32 | 20.30 | 35.61 | 46.00 | 10.39 | QP |
| 4 | 594.540 | 19.51 | 3.33 | 7.76 | 30.60 | 46.00 | 15.40 | QP |
| 5 | 731.310 | 22.17 | 3.77 | 3.81 | 29.75 | 46.00 | 16.25 | QP |
| 6 | 757.500 | 22.07 | 3.85 | 1.33 | 27.25 | 46.00 | 18.75 | QP |

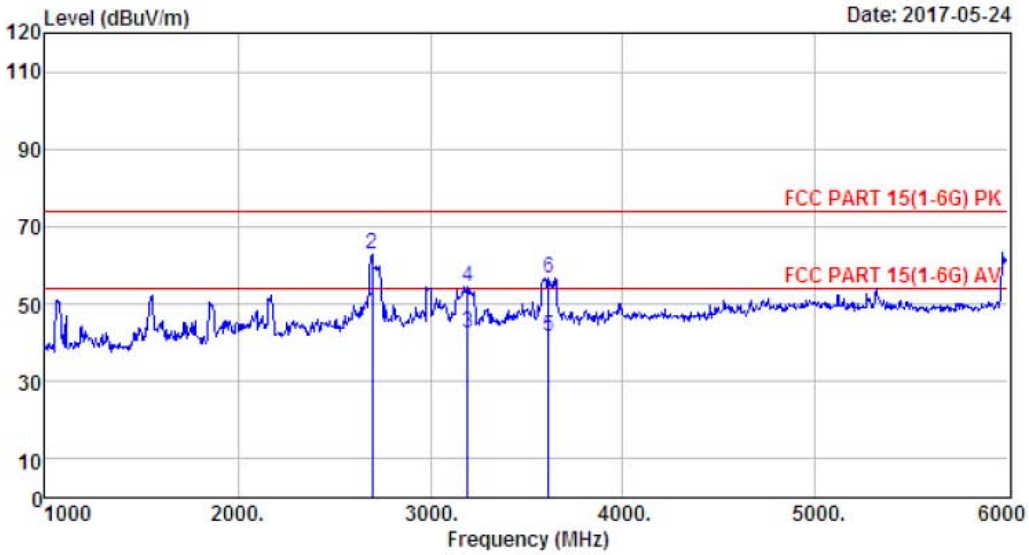
## Above 1GHz




Site no. : 1# 966 Chamber Data no. : 109
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15(1-6G) PK
Env. / Ins. : Temp:26.6';Humi:62%;Press:101.52kPa
Engineer : Bible
EUT : LCD TV or LED TV
Power : AC 120V/60Hz
M/N : 49R80
Test Mode : HDMI (3840*2160+Running "H"Pattern)

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Amp Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2700.00 | 27.87 | 7.66 | 36.34 | 44.65 | 43.84 | 54.00 | 10.16 | Average |
| 2 | 2700.00 | 27.87 | 7.66 | 36.34 | 58.65 | 57.84 | 74.00 | 16.16 | Peak |
| 3 | 3175.00 | 28.26 | 8.93 | 36.37 | 41.44 | 42.26 | 54.00 | 11.74 | Average |
| 4 | 3175.00 | 28.26 | 8.93 | 36.37 | 56.44 | 57.26 | 74.00 | 16.74 | Peak |
| 5 | 3615.00 | 28.80 | 9.22 | 36.31 | 41.02 | 42.73 | 54.00 | 11.27 | Average |
| 6 | 3615.00 | 28.80 | 9.22 | 36.31 | 57.02 | 58.73 | 74.00 | 15.27 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.




```
Site no.       : 1# 966 Chamber              Data no.  : 108
Dis. / Ant.    : 3m   ANT 1-18G              Ant. pol. : VERTICAL
Limit          : FCC PART 15(1-6G) PK
Env. / Ins.    : Temp:26.6';Humi:62%;Press:101.52kPa
Engineer       : Bible
EUT            : LCD TV or LED TV
Power          : AC 120V/60Hz
M/N            : 49R80
Test Mode      : HDMI (3840*2160+Running "H"Pattern)
```

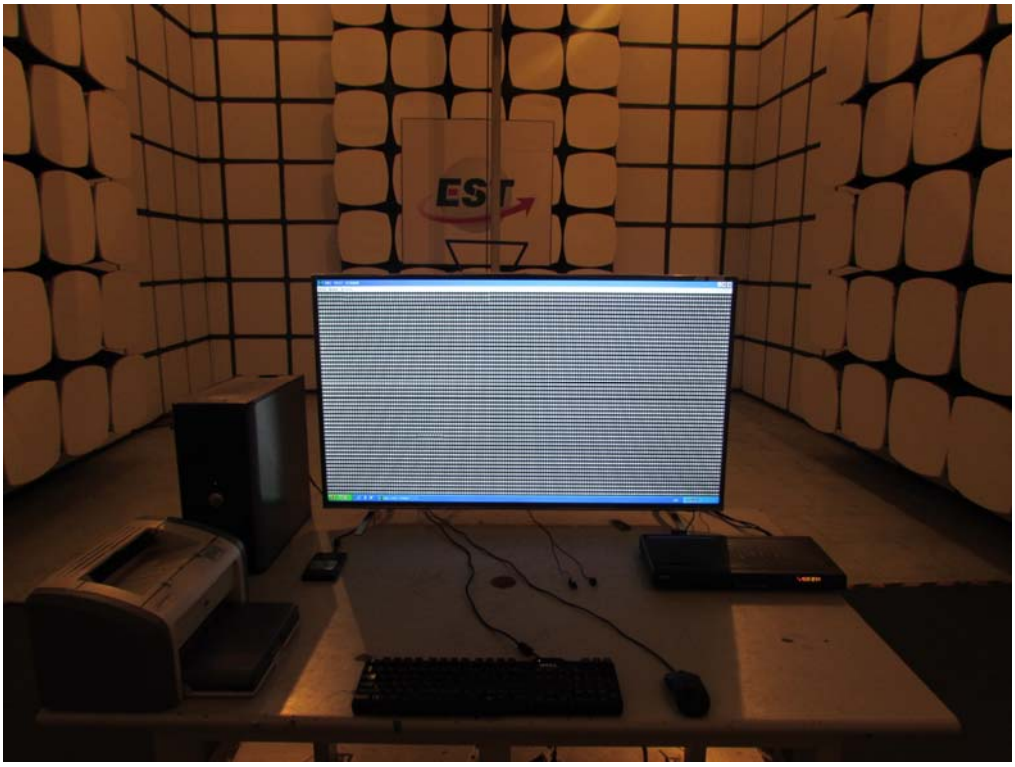
| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Amp Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2700.00 | 27.87 | 7.66 | 36.34 | 48.48 | 47.67 | 54.00 | 6.33 | Average |
| 2 | 2700.00 | 27.87 | 7.66 | 36.34 | 63.48 | 62.67 | 74.00 | 11.33 | Peak |
| 3 | 3195.00 | 28.23 | 8.91 | 36.30 | 41.81 | 42.65 | 54.00 | 11.35 | Average |
| 4 | 3195.00 | 28.23 | 8.91 | 36.30 | 53.81 | 54.65 | 74.00 | 19.35 | Peak |
| 5 | 3615.00 | 28.80 | 9.22 | 36.31 | 40.07 | 41.78 | 54.00 | 12.22 | Average |
| 6 | 3615.00 | 28.80 | 9.22 | 36.31 | 55.07 | 56.78 | 74.00 | 17.22 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

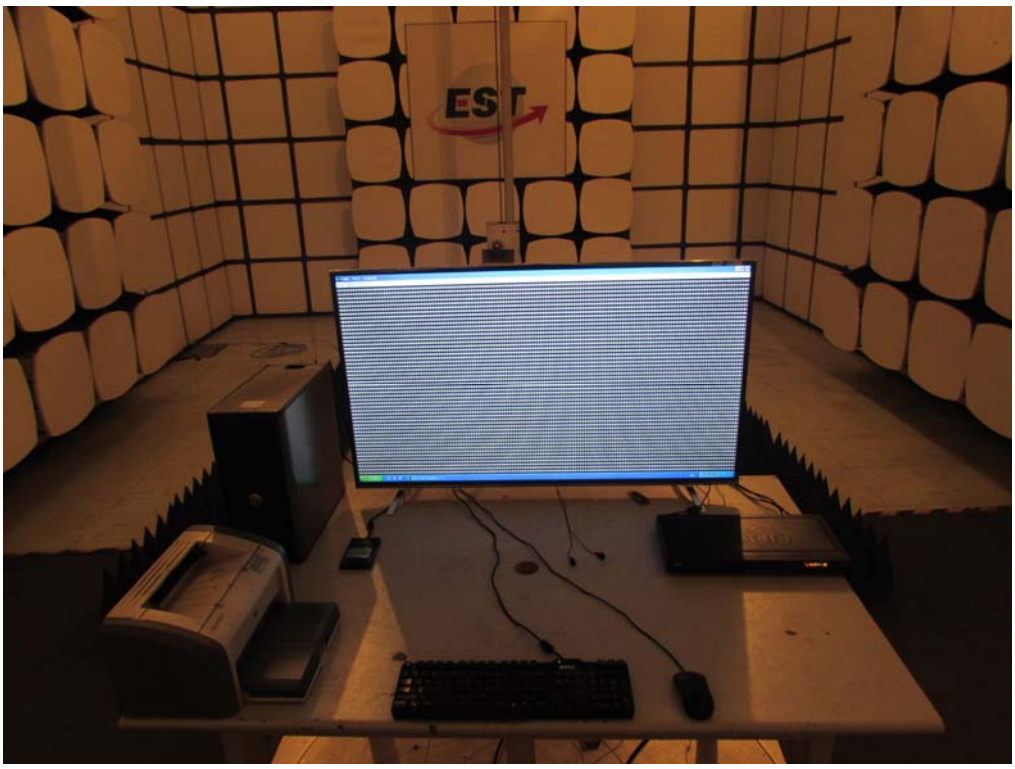
# 5. PHOTOGRAPHS OF TEST SET-UP

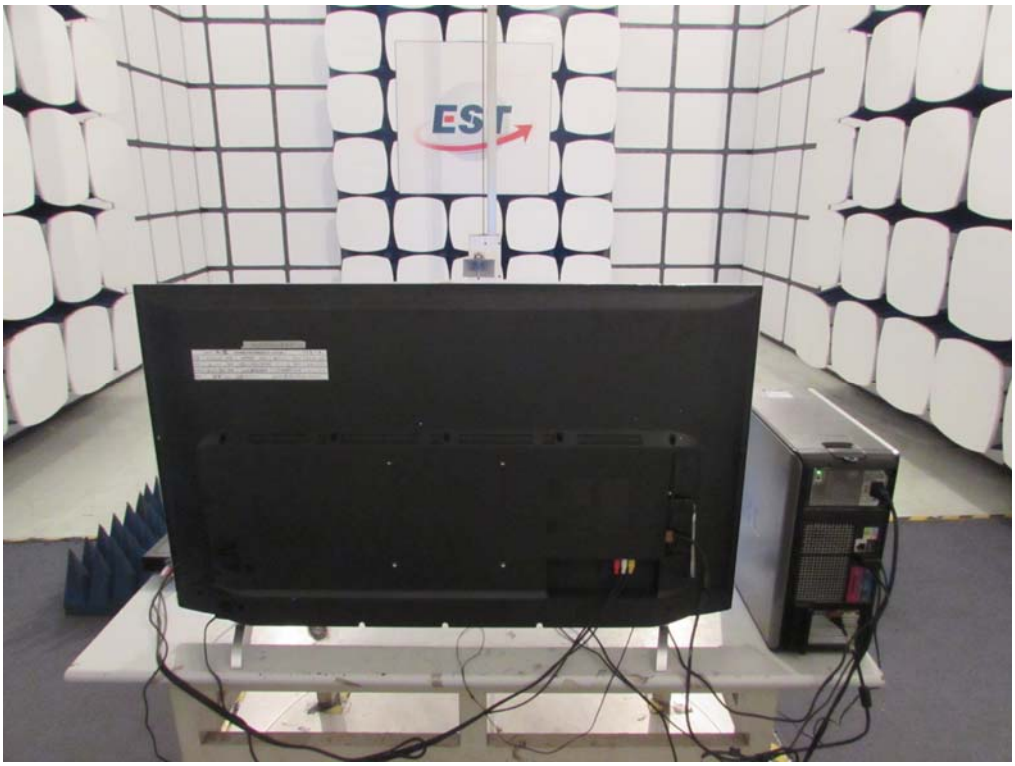
5.1. Set-up for conducted emission at the mains terminals test

5.2. Set-up for radiated emission test (30-1000MHz)



5.3. Set-up for radiated emission test (Above 1GHz)





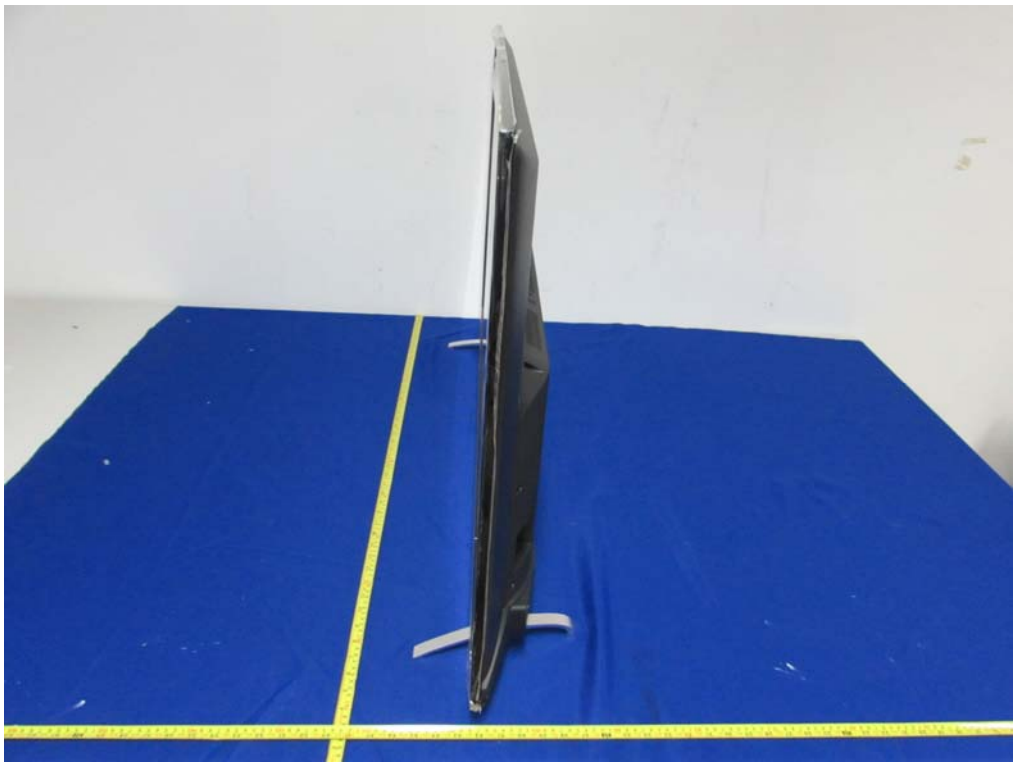
# 6. PHOTOGRAPHS OF THE EUT

**External Photos**

M/N: 49R80

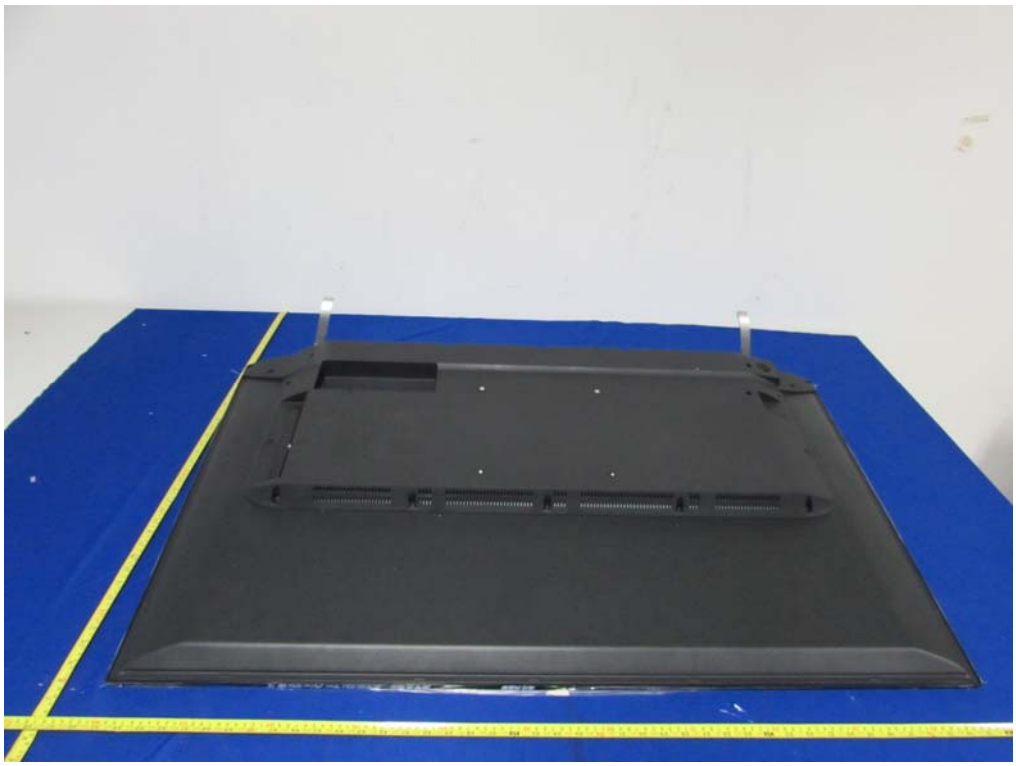
**External Photos**

M/N: 49R80



**External Photos**

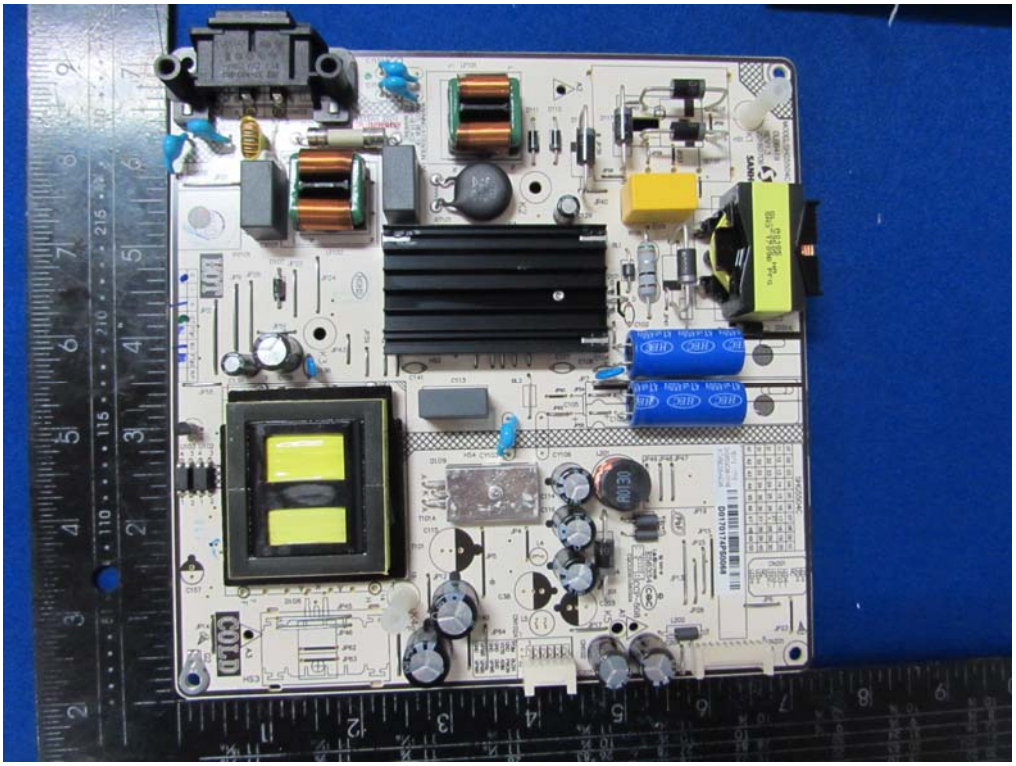
M/N: 49R80



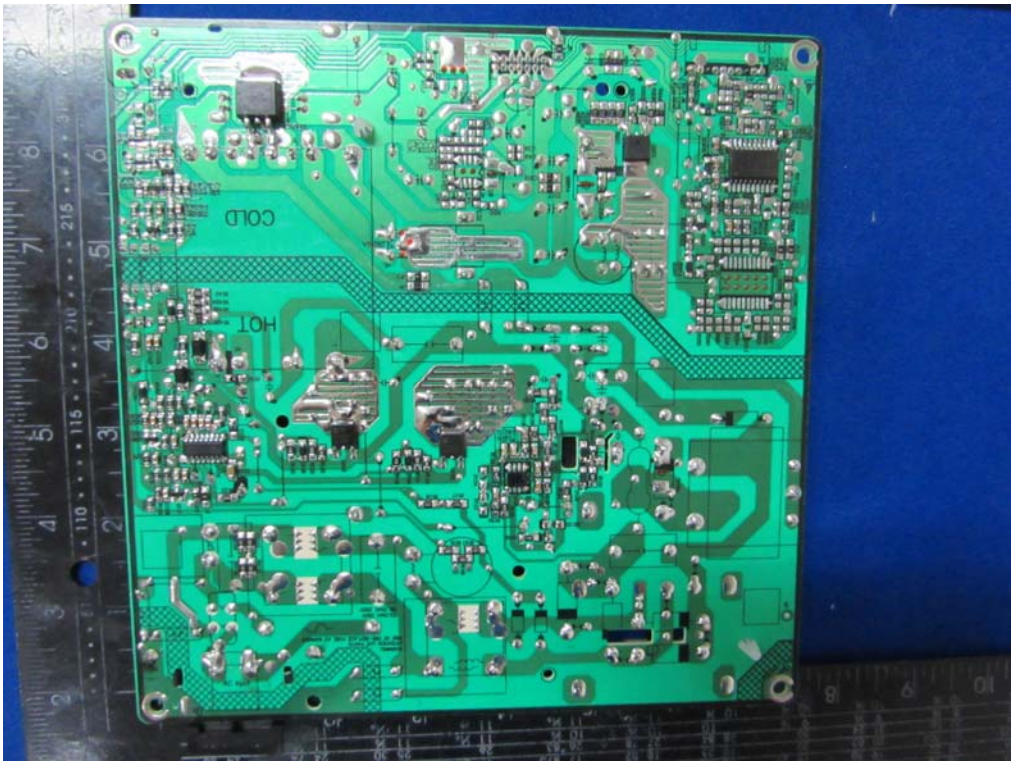
**External Photos**

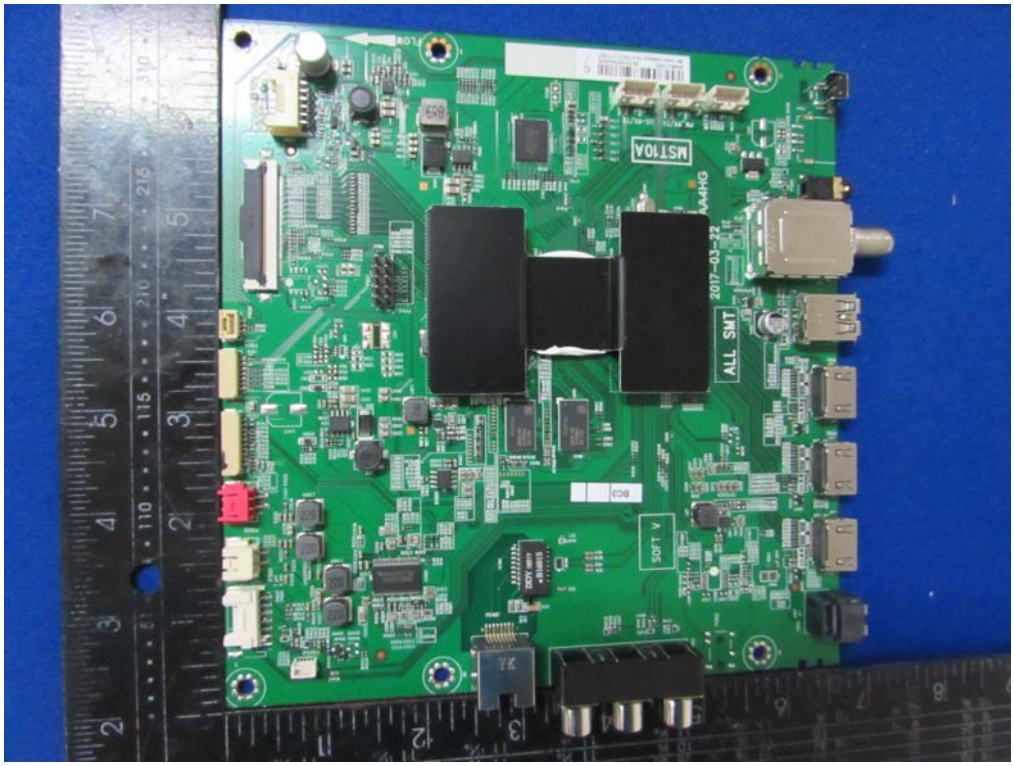
M/N: 49R80

**Internal Photos**
**M/N: 49R80**

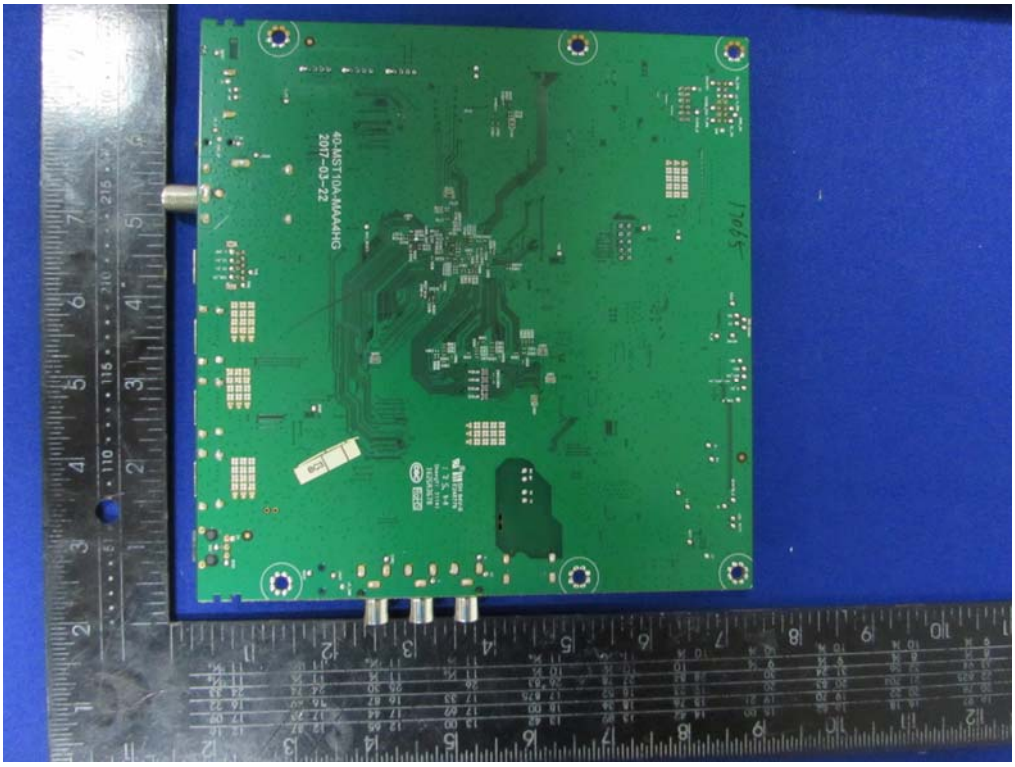


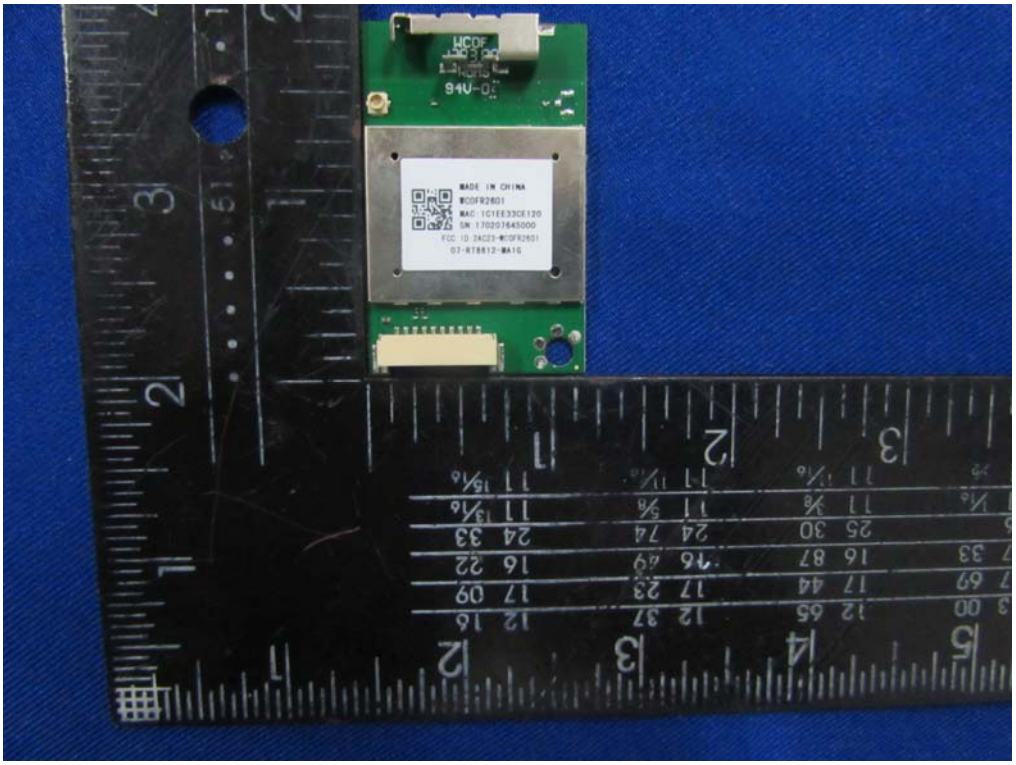
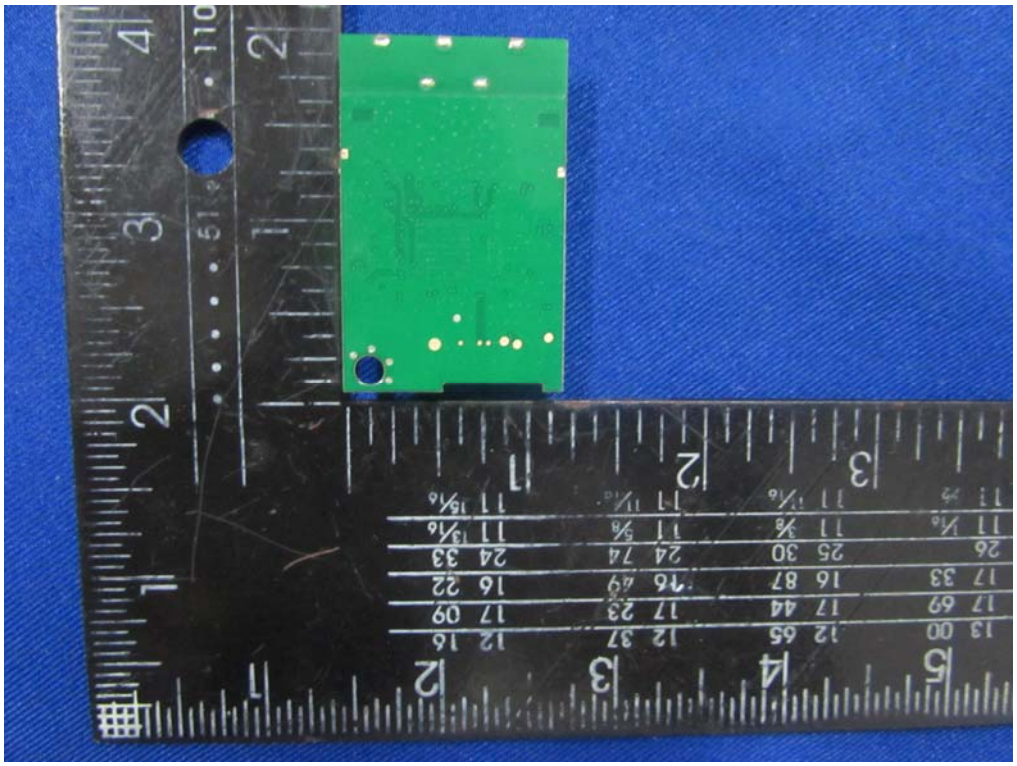
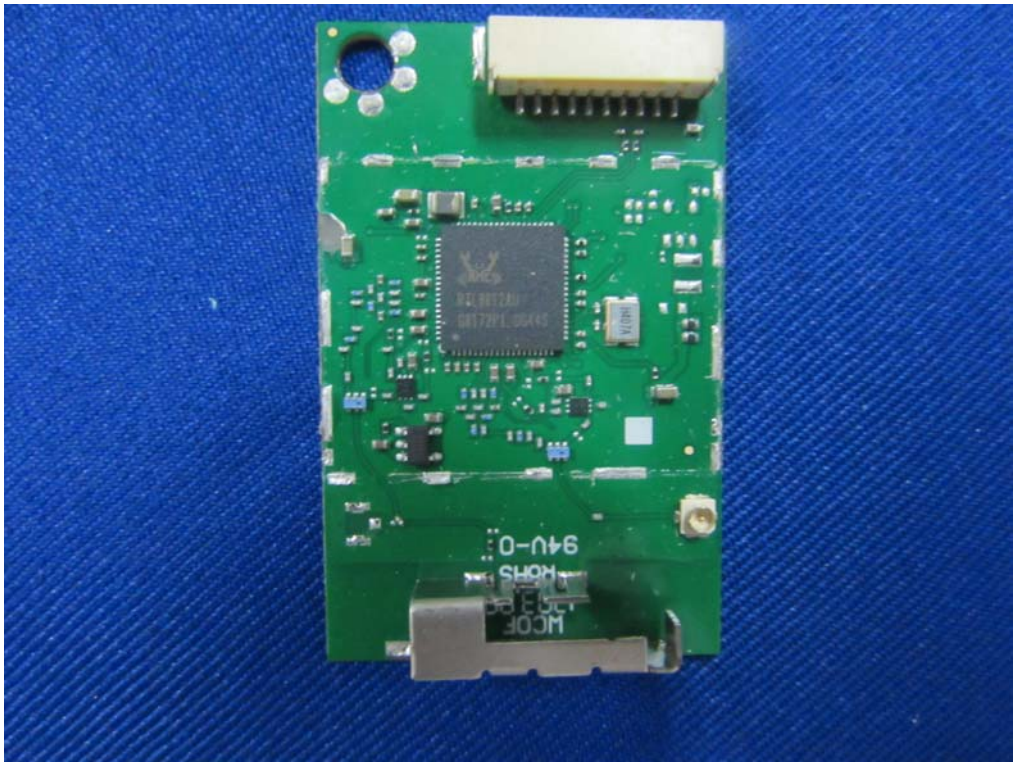
**Internal Photos**
**M/N: 49R80**



**Internal Photos**
**M/N: 49R80**





**Internal Photos**
**M/N: 49R80**