

Application for FCC Certificate  
On Behalf of  
Hisense Electric Co., Ltd.

LED LCD TV

| Model No.                                                      | Brand   |
|----------------------------------------------------------------|---------|
| 50K20D, 50K21D, 50K22D, 50K23D,<br>50K24D, 50K25D, 50H3, 50H3C | Hisense |

FCC ID : W9HLCDF0038

Prepared For : Hisense Electric Co., Ltd.  
No.218 Qianwangang Road, Economy & Technology  
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Prepared By : Audix Technology (Shanghai) Co., Ltd.  
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Report No. : ACI-F14038  
Date of Test : Feb 19, 2014  
Date of Report : Mar 03, 2014

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## TEST REPORT FOR FCC CERTIFICATE

Applicant : Hisense Electric Co., Ltd.  
Manufacturer : Hisense Electric Co., Ltd.  
Factory #1 : Hisense Electric Co., Ltd.  
Factory #2 : Tatung Mexico S.A. de C.V.  
EUT Description : LED LCD TV

| Model No.       | Brand   | Power Supply |
|-----------------|---------|--------------|
| Refer to Sec2.1 | Hisense | 120V/60Hz    |

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 2013  
AND ANSI C63.4-2003*

The device described above is tested by Audix Technology (Shanghai) 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 (Class B) limits both radiated and conducted emissions.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report shows that the EUT (M/N: Refer to Sec2.1) which was tested in 3m anechoic chamber Feb 19, 2014 is technically compliance with the FCC official limits also.

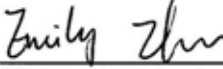
This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

This report contains data that are not covered by the NVLAP accreditation.

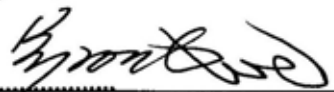
This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

***The test results for EUT's TV functions are contained in No.F14037, a Verification report.***

Date of Test : Feb 19, 2014 Date of Report : Mar 03, 2014

Producer :   
EMILY ZHU / Assistant

Review :   
For and on behalf of SAMMY CHEN / Deputy Manager  
 Audix Technology (Shanghai) Co., Ltd.

Signatory :   
Authorized Signature EMC BYRON KWO / Assistant General Manager

# 1 SUMMARY OF STANDARDS AND RESULTS

## 1.1 Description of Standards and Results

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

| Description of Test Item                       | Standard                                                                           | Limits               | Results |
|------------------------------------------------|------------------------------------------------------------------------------------|----------------------|---------|
| <b>EMISSION</b>                                |                                                                                    |                      |         |
| Conducted Disturbance<br>at the Mains Terminal | FCC RULES AND REGULATIONS PART<br>15 SUBPART B OCTOBER 2013<br>AND ANSI C63.4-2003 | 15.107(a)<br>Class B | Pass    |
| Radiated Disturbance                           | FCC RULES AND REGULATIONS PART<br>15 SUBPART B OCTOBER 2013<br>AND ANSI C63.4-2003 | 15.109(a)<br>Class B | Pass    |

## 2 GENERAL INFORMATION

### 2.1 Description of Equipment Under Test

|                |   |                                                                                                                       |
|----------------|---|-----------------------------------------------------------------------------------------------------------------------|
| Description    | : | LED LCD TV                                                                                                            |
| Type of EUT    | : | <input checked="" type="checkbox"/> Production <input type="checkbox"/> Pre-product <input type="checkbox"/> Pro-type |
| Model No.      | : | 50K20D, 50K21D, 50K22D, 50K23D, 50K24D, 50K25D, 50H3, 50H3C                                                           |
| Note           | : | The above models are all the same except for model name.<br>50K20D model is tested and recorded in the report.        |
| Brand Name     | : | Hisense                                                                                                               |
| Applicant      | : | Hisense Electric Co., Ltd.<br>No.218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, China          |
| Manufacturer   | : | Hisense Electric Co., Ltd.<br>No.218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, China          |
| Factory #1     | : | Hisense Electric Co., Ltd.<br>No.218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, China          |
| Factory #2     | : | Tatung Mexico S.A. de C.V.<br>Miguel Catalán 420, Parque Industrial Rio Bravo, Cd. Juarez, Chih., CP 32557            |
| LCD Panel      | : | Manufacturer : Hisense<br>M/N : HD500DF-B52(100)\S1                                                                   |
| Max Resolution | : | 1920*1080@60Hz                                                                                                        |
| HDMI Cable     | : | Shielded, Detachable, 1.00m                                                                                           |
| Power Cord     | : | Unshielded, Detachable, 1.80m                                                                                         |

**Remark:**

The EUT is a LED LCD TV which input/output ports as follows:

**Bottom Port:**

- (1) One USB Port : Connected with U-Disk
- (2) One component of Audio/YPbPr Audio Port : Connected with DVD PLAYER
- (3) One component of Video/YPbPr Port : Connected with DVD PLAYER
- (4) One HDMI1/ARC Port : Connected with PC

**Side Port:**

- (1) One HDMI2/MHL Port : Connected with Smart Mobile Phone
- (2) One DVI AUDIO IN Port : Connected with PC
- (3) One AUDIO OUT Port : Connected with Earphone
- (4) One ANT/CABLE IN Port : Connected with Antenna or ATSC SG / TV SG
- (5) One DIGITAL AUDIO OUT Port : Connected with DVD PLAYER

## 2.2 Peripherals

### 2.2.1 PC

Manufacturer : HP  
Model Number : dx7200MT  
Serial Number : CNG622017W  
Power Cord : Unshielded, Detachable, 1.8m  
Certificate : FCC DoC; CE/EMC; VCCI; C-Tick; BSMI, 3C, MIC

### 2.2.2 Printer

Manufacturer : HP  
Model Number : C3990A  
Serial Number : JPZX020487  
Data Cable : Shielded, detachable, 1.5m  
Certificate : GS, CE/EMC, C-Tick, FCC DoC

### 2.2.3 Keyboard

Manufacturer : Microsoft  
Model Number : RT2300  
Serial Number : 7668200662248  
Data Cable : Shielded, Undetachable , 1.8m  
Certificate : CE/EMC, FCC DoC, VCCI, MIC, C-Tick, BSMI

## 2.2.4 Mouse

Manufacturer : Microsoft  
Model Number : RT2300  
Serial Number : 6965712071551  
Data Cable : Shielded, Undetachable, 1.8m.  
Certificate : CE/EMC, FCC DoC, VCCI, MIC, C-Tick,  
BSMI

## 2.2.5 Modem

Manufacturer : TP-LINK  
Model Number : TM-EC5658V  
Serial Number : 07123301053  
Data Cable : Shielded, Detachable, 1.8m  
Certificate : FCC DoC, CE/EMC, CCC

## 2.2.6 TV Signal Generator

Manufacturer : FLUKE  
Model Number : 54200m01  
Serial Number : 814008  
Data Cable : Shielded, detachable, 2.0m  
Power Cord : Unshielded, detachable, 2.0m  
Certificate : CE/EMC, FCC DoC, CCC

## 2.2.7 ATSC Signal Generator

Manufacturer : SENCORE  
Model Number : ATSC997  
Serial Number : 6790071

## 2.2.8 DVD PLAYER

Manufacturer : PHILIPS  
Model Number : DVP3986K/93  
Serial Number : KX1A0902120108  
Certificate : FCC DoC, CE/EMC, CCC

## 2.2.9 Smart Mobile Phone

Manufacturer : SAMSUNG  
Model Number : GT-I9100G  
Serial Number : RV1C2250B7J  
Certificate : CE/EMC, CCC

## 2.2.10 Earphone

Manufacturer : Skullcandy  
Model Number : FMJ

## 2.2.11 U-DISK

Manufacturer : LG  
Model Number : 1GB

## 2.3 Description of Test Facility

Site Description (No.3 3m Chamber) : Sept. 17, 1998 file on  
Mar 16, 2012 Renewed  
Federal Communications Commission  
FCC Engineering Laboratory  
7435 Oakland Mills Road  
Columbia, MD 21046, USA

Name of Firm : Audix Technology (Shanghai) Co., Ltd.

Site Location : 3F 34Bldg 680 Guiping Rd,  
Caohejing Hi-Tech Park,  
Shanghai 200233, China

NVLAP Lab Code : 200371-0

## 2.4 Measurement Uncertainty

Conducted Emission Expanded Uncertainty: U = 3.02 dB

Radiated Emission Expanded Uncertainty (30-200MHz):  
U = 4.17 dB (Horizontal)  
U = 4.02 dB (Vertical)

Radiated Emission Expanded Uncertainty (200M-1GHz):  
U = 3.38 dB (Horizontal)  
U = 3.28 dB (Vertical)

Radiated Emission Expanded Uncertainty (Above 1GHz):  
U = 4.68 dB (Horizontal)  
U = 4.87 dB (Vertical)

### 3 CONDUCTED EMISSION TEST

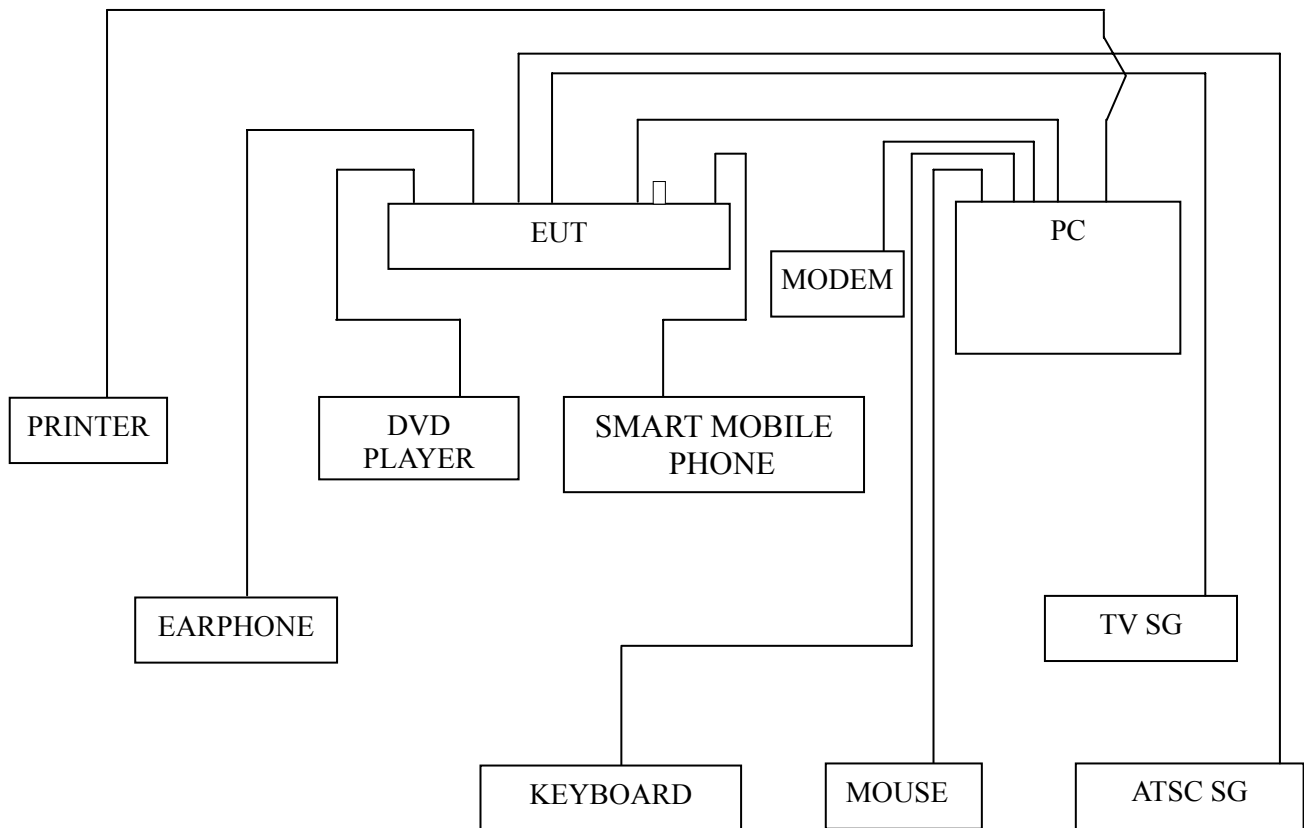
#### 3.1 Test Equipment

The following test equipments are used during the conducted emission test in a shielded room:

| Item | Type                                        | Manufacturer | Model No. | Serial No.  | Last Cal.    | Next Cal.    |
|------|---------------------------------------------|--------------|-----------|-------------|--------------|--------------|
| 1.   | Test Receiver                               | R&S          | ESCI      | 100841      | Mar 20, 2013 | Mar 19, 2014 |
| 2.   | Artificial Mains Network (AMN)              | R&S          | ESH2-Z5   | 843890/011  | Feb 25, 2014 | Feb 24, 2015 |
| 3.   | Line Impedance Stabilization Network (LISN) | Kyoritsu     | KNW-407   | 8-1280-4    | Mar 20, 2013 | Mar 19, 2014 |
| 4.   | 50 $\Omega$ Coaxial Switch                  | Anritsu      | MP59B     | 6200426389  | Sep 18, 2013 | Mar 17, 2014 |
| 5.   | 50 $\Omega$ Terminator                      | Anritsu      | BNC       | 001         | Mar 20, 2013 | Mar 19, 2014 |
| 6.   | Software                                    | Audix        | E3        | 6.2009-1-15 | --           | --           |

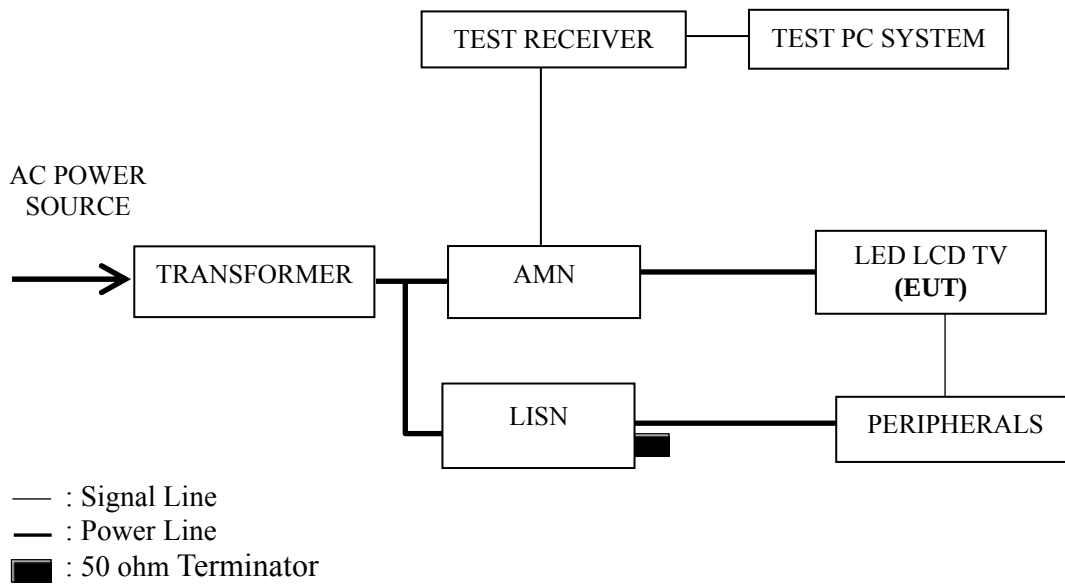
#### 3.2 Block Diagram of Test Setup

##### 3.2.1 EUT & Peripherals



□ : U-Disk

### 3.2.2 Conducted Disturbance Test Setup



### 3.3 Conducted Emission Limit [FCC Part 15 Subpart B 15.107(a)]

| Frequency Range (MHz)                                                                                                                                                           | Limits dB (μV) |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------|
|                                                                                                                                                                                 | Quasi-peak     | Average |
| 0.15 ~ 0.5                                                                                                                                                                      | 66~56          | 56~46   |
| 0.5 ~ 5                                                                                                                                                                         | 56             | 46      |
| 5 ~ 30                                                                                                                                                                          | 60             | 50      |
| NOTE 1 – The lower limit shall apply at the transition frequencies.<br>NOTE 2 – The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz~0.50 MHz |                |         |

### 3.4 Test Configuration

The EUT (listed in Sec.2.1) and the peripherals (listed in Sec 2.2) were installed as shown on Sec.3.2 to meet FCC requirement and operating in a manner that tends to maximize its emission level in a normal application.

### 3.5 Operating Condition of EUT

3.5.1 Setup the EUT and peripherals as shown in Sec. 3.2.

3.5.2 Turn on the power of all equipments and the EUT.

3.5.3 Set the contrast & brightness of EUT to maximum.

3.5.4 PC system ran the self-test program “EMC Test” by windows XP and sent “H” characters to EUT through graphic card, the EUT’s screen displayed and filled with “H” pattern by its resolution (Via HDMI Input).

3.5.5 In USB Play mode, set the EUT play digital media from U-Disk.

3.5.6 The other peripherals devices were driven and operated during the test.

3.5.7 The test modes are as follows:

| Test Mode           |
|---------------------|
| HDMI 1920*1080@60Hz |
| HDMI 1280*1024@60Hz |
| HDMI 640*480@60Hz   |
| USB Play            |

### 3.6 Test Procedures

The EUT and peripherals were connected to the power mains through an Artificial Mains Network (AMN). This provided a 50 ohm coupling impedance for the measuring equipment.

Both sides of AC line (Line & Neutral) were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed or manipulated according to ANSI C63.4:2003 during conducted emission test.

The bandwidth of R&S Test Receiver ESCI was set at 9 kHz.

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

The test modes were done on conducted disturbance test and all the test results are listed in Sec. 3.7.

### 3.7 Test Results

#### < PASS >

The frequency and amplitude of the highest conducted emission relative to the limit is reported. All emissions not reported below are too low against the prescribed limits.

| Test Mode           | Data Page |
|---------------------|-----------|
| HDMI 1920*1080@60Hz | P13       |
| HDMI 1280*1024@60Hz | P14       |
| HDMI 640*480@60Hz   | P15       |
| USB Play            | P16       |

NOTE 1 – Factor = Cable Loss + AMN Factor.

NOTE 2 – Emission Level = Meter Reading + Factor.

NOTE 3 – “QP” means “Quasi-Peak” values, “AV” means “Average” values.

NOTE 4 – The worst case is for HDMI 1920\*1080@60Hz test mode. The worst emission is detected at 7.422 MHz (Average Value) with corrected signal level of 40.75 dB (μV) (limit is 50.00 dB (μV)), when the Neutral of the EUT is connected to AMN.

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K20D Humidity : 48%RH

Test Mode : HDMI 1920\*1080@60Hz Date of Test : Feb 19, 2014

| Test Line | Frequency (MHz) | Meter Reading dB(μV) | Factor (dB) | Emission Level dB(μV) | Limits dB(μV) | Margin (dB) | Remark |
|-----------|-----------------|----------------------|-------------|-----------------------|---------------|-------------|--------|
| Line      | 0.186           | 45.60                | 0.13        | 45.73                 | 64.21         | 18.48       | QP     |
|           | 0.421           | 39.90                | -0.01       | 39.89                 | 57.43         | 17.54       |        |
|           | 0.631           | 40.30                | 0.06        | 40.36                 | 56.00         | 15.64       |        |
|           | 0.774           | 37.80                | 0.09        | 37.89                 | 56.00         | 18.11       |        |
|           | 1.470           | 38.30                | 0.06        | 38.36                 | 56.00         | 17.64       |        |
|           | 7.395           | 48.30                | 0.26        | 48.56                 | 60.00         | 11.44       |        |
|           | 0.186           | 34.60                | 0.13        | 34.73                 | 54.21         | 19.48       | AV     |
|           | 0.421           | 28.60                | -0.01       | 28.59                 | 47.43         | 18.84       |        |
|           | 0.631           | 28.50                | 0.06        | 28.56                 | 46.00         | 17.44       |        |
|           | 0.774           | 23.60                | 0.09        | 23.69                 | 46.00         | 22.31       |        |
|           | 1.470           | 26.30                | 0.06        | 26.36                 | 46.00         | 19.64       |        |
|           | 7.395           | 39.40                | 0.26        | 39.66                 | 50.00         | 10.34       |        |
| Neutral   | 0.191           | 47.70                | 0.19        | 47.89                 | 64.01         | 16.12       | QP     |
|           | 0.420           | 44.09                | 0.22        | 44.31                 | 57.44         | 13.13       |        |
|           | 0.631           | 42.50                | 0.14        | 42.64                 | 56.00         | 13.36       |        |
|           | 0.825           | 39.20                | 0.14        | 39.34                 | 56.00         | 16.66       |        |
|           | 1.685           | 37.91                | 0.16        | 38.07                 | 56.00         | 17.93       |        |
|           | 7.422           | 49.59                | 0.36        | 49.95                 | 60.00         | 10.05       |        |
|           | 0.191           | 34.30                | 0.19        | 34.49                 | 54.01         | 19.52       | AV     |
|           | 0.420           | 31.89                | 0.22        | 32.11                 | 47.44         | 15.33       |        |
|           | 0.631           | 29.80                | 0.14        | 29.94                 | 46.00         | 16.06       |        |
|           | 0.825           | 23.30                | 0.14        | 23.44                 | 46.00         | 22.56       |        |
|           | 1.685           | 28.51                | 0.16        | 28.67                 | 46.00         | 17.33       |        |
|           | <b>7.422</b>    | <b>40.39</b>         | <b>0.36</b> | <b>40.75</b>          | <b>50.00</b>  | <b>9.25</b> |        |

TEST ENGINEER: ERIC TANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K20D Humidity : 48%RH

Test Mode : HDMI 1280\*1024@60Hz Date of Test : Feb 19, 2014

| Test Line | Frequency (MHz) | Meter Reading dB(μV) | Factor (dB) | Emission Level dB(μV) | Limits dB(μV) | Margin (dB) | Remark |
|-----------|-----------------|----------------------|-------------|-----------------------|---------------|-------------|--------|
| Line      | 0.181           | 45.99                | 0.14        | 46.13                 | 64.42         | 18.29       | QP     |
|           | 0.419           | 40.00                | -0.01       | 39.99                 | 57.46         | 17.47       |        |
|           | 0.765           | 37.80                | 0.09        | 37.89                 | 56.00         | 18.11       |        |
|           | 1.461           | 35.60                | 0.06        | 35.66                 | 56.00         | 20.34       |        |
|           | 2.729           | 33.30                | 0.10        | 33.40                 | 56.00         | 22.60       |        |
|           | 7.301           | 48.30                | 0.26        | 48.56                 | 60.00         | 11.44       |        |
|           | 0.181           | 34.79                | 0.14        | 34.93                 | 54.42         | 19.49       | AV     |
|           | 0.419           | 28.70                | -0.01       | 28.69                 | 47.46         | 18.77       |        |
|           | 0.765           | 33.50                | 0.09        | 33.59                 | 46.00         | 12.41       |        |
|           | 1.461           | 25.20                | 0.06        | 25.26                 | 46.00         | 20.74       |        |
|           | 2.729           | 24.30                | 0.10        | 24.40                 | 46.00         | 21.60       |        |
|           | 7.301           | 39.70                | 0.26        | 39.96                 | 50.00         | 10.04       |        |
| Neutral   | 0.196           | 47.60                | 0.20        | 47.80                 | 63.77         | 15.97       | QP     |
|           | 0.420           | 44.19                | 0.22        | 44.41                 | 57.45         | 13.04       |        |
|           | 0.632           | 42.10                | 0.14        | 42.24                 | 56.00         | 13.76       |        |
|           | 0.828           | 39.30                | 0.14        | 39.44                 | 56.00         | 16.56       |        |
|           | 1.424           | 38.00                | 0.17        | 38.17                 | 56.00         | 17.83       |        |
|           | 7.180           | 49.40                | 0.34        | 49.74                 | 60.00         | 10.26       |        |
|           | 0.196           | 34.00                | 0.20        | 34.20                 | 53.77         | 19.57       | AV     |
|           | 0.420           | 31.89                | 0.22        | 32.11                 | 47.45         | 15.34       |        |
|           | 0.632           | 29.60                | 0.14        | 29.74                 | 46.00         | 16.26       |        |
|           | 0.828           | 23.60                | 0.14        | 23.74                 | 46.00         | 22.26       |        |
|           | 1.424           | 28.00                | 0.17        | 28.17                 | 46.00         | 17.83       |        |
|           | <b>7.180</b>    | <b>40.20</b>         | <b>0.34</b> | <b>40.54</b>          | <b>50.00</b>  | <b>9.46</b> |        |

TEST ENGINEER: ERIC TANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K20D Humidity : 48%RH

Test Mode : HDMI 640\*480@60Hz Date of Test : Feb 19, 2014

| Test Line | Frequency (MHz) | Meter Reading dB(μV) | Factor (dB) | Emission Level dB(μV) | Limits dB(μV) | Margin (dB)  | Remark |
|-----------|-----------------|----------------------|-------------|-----------------------|---------------|--------------|--------|
| Line      | 0.179           | 46.19                | 0.14        | 46.33                 | 64.54         | 18.21        | QP     |
|           | 0.418           | 39.90                | -0.01       | 39.89                 | 57.49         | 17.60        |        |
|           | 0.630           | 40.30                | 0.06        | 40.36                 | 56.00         | 15.64        |        |
|           | 0.766           | 38.20                | 0.09        | 38.29                 | 56.00         | 17.71        |        |
|           | 1.678           | 38.51                | 0.06        | 38.57                 | 56.00         | 17.43        |        |
|           | 7.185           | 47.80                | 0.26        | 48.06                 | 60.00         | 11.94        |        |
|           | 0.179           | 34.79                | 0.14        | 34.93                 | 54.54         | 19.61        | AV     |
|           | 0.418           | 28.90                | -0.01       | 28.89                 | 47.49         | 18.60        |        |
|           | 0.630           | 28.60                | 0.06        | 28.66                 | 46.00         | 17.34        |        |
|           | 0.766           | 24.00                | 0.09        | 24.09                 | 46.00         | 21.91        |        |
|           | 1.678           | 28.21                | 0.06        | 28.27                 | 46.00         | 17.73        |        |
|           | <b>7.185</b>    | <b>39.60</b>         | <b>0.26</b> | <b>39.86</b>          | <b>50.00</b>  | <b>10.14</b> |        |
| Neutral   | 0.181           | 47.89                | 0.19        | 48.08                 | 64.44         | 16.36        | QP     |
|           | 0.419           | 43.89                | 0.22        | 44.11                 | 57.46         | 13.35        |        |
|           | 0.622           | 41.00                | 0.15        | 41.15                 | 56.00         | 14.85        |        |
|           | 0.827           | 39.50                | 0.14        | 39.64                 | 56.00         | 16.36        |        |
|           | 1.689           | 38.01                | 0.16        | 38.17                 | 56.00         | 17.83        |        |
|           | 7.185           | 47.80                | 0.34        | 48.14                 | 60.00         | 11.86        |        |
|           | 0.181           | 36.39                | 0.19        | 36.58                 | 54.44         | 17.86        | AV     |
|           | 0.419           | 31.89                | 0.22        | 32.11                 | 47.46         | 15.35        |        |
|           | 0.622           | 28.80                | 0.15        | 28.95                 | 46.00         | 17.05        |        |
|           | 0.827           | 24.20                | 0.14        | 24.34                 | 46.00         | 21.66        |        |
|           | 1.689           | 28.51                | 0.16        | 28.67                 | 46.00         | 17.33        |        |
|           | 7.185           | 39.40                | 0.34        | 39.74                 | 50.00         | 10.26        |        |

TEST ENGINEER: ERIC TANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K20D Humidity : 48%RH

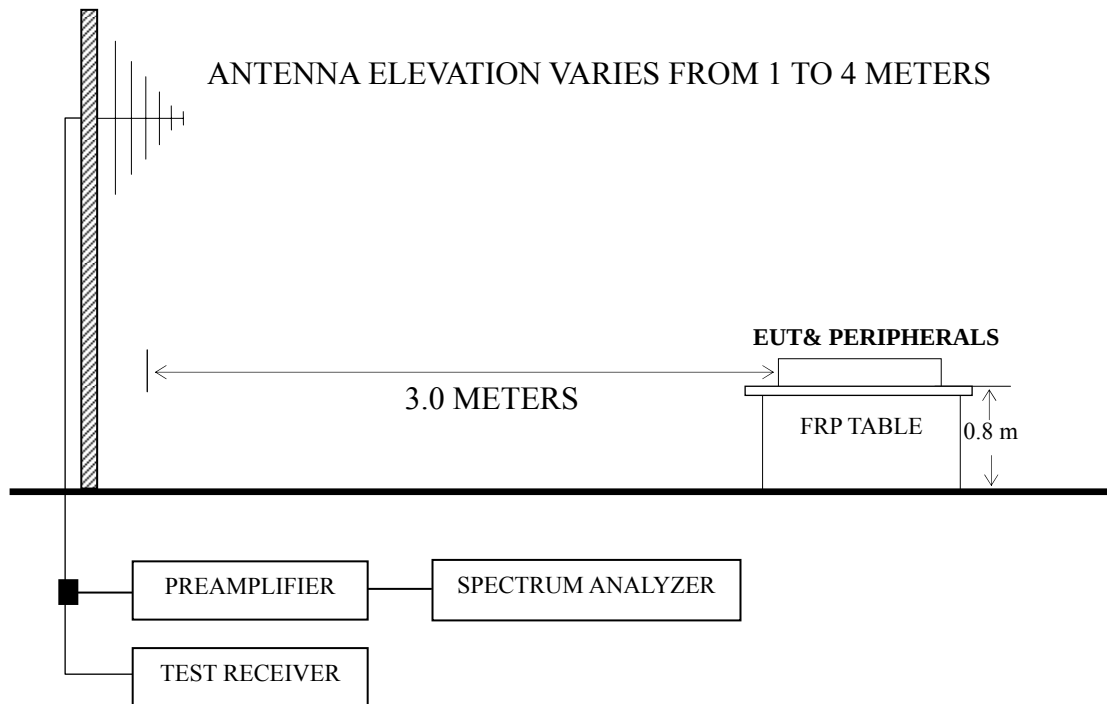
Test Mode : USB Play Date of Test : Feb 19, 2014

| Test Line | Frequency (MHz) | Meter Reading dB(μV) | Factor (dB) | Emission Level dB(μV) | Limits dB(μV) | Margin (dB) | Remark |
|-----------|-----------------|----------------------|-------------|-----------------------|---------------|-------------|--------|
| Line      | 0.178           | 46.20                | 0.13        | 46.33                 | 64.59         | 18.26       | QP     |
|           | 0.417           | 40.00                | -0.01       | 39.99                 | 57.50         | 17.51       |        |
|           | 0.621           | 39.30                | 0.05        | 39.35                 | 56.00         | 16.65       |        |
|           | 0.768           | 38.00                | 0.09        | 38.09                 | 56.00         | 17.91       |        |
|           | 1.684           | 38.81                | 0.06        | 38.87                 | 56.00         | 17.13       |        |
|           | 7.259           | 46.80                | 0.26        | 47.06                 | 60.00         | 12.94       |        |
|           | 0.178           | 34.50                | 0.13        | 34.63                 | 54.59         | 19.96       | AV     |
|           | 0.417           | 29.00                | -0.01       | 28.99                 | 47.50         | 18.51       |        |
|           | 0.621           | 28.00                | 0.05        | 28.05                 | 46.00         | 17.95       |        |
|           | 0.768           | 24.40                | 0.09        | 24.49                 | 46.00         | 21.51       |        |
|           | 1.684           | 28.71                | 0.06        | 28.77                 | 46.00         | 17.23       |        |
|           | 7.259           | 39.50                | 0.26        | 39.76                 | 50.00         | 10.24       |        |
| Neutral   | 0.190           | 47.80                | 0.19        | 47.99                 | 64.05         | 16.06       | QP     |
|           | 0.419           | 43.79                | 0.22        | 44.01                 | 57.48         | 13.47       |        |
|           | 0.614           | 40.20                | 0.15        | 40.35                 | 56.00         | 15.65       |        |
|           | 0.771           | 38.50                | 0.13        | 38.63                 | 56.00         | 17.37       |        |
|           | 1.690           | 38.31                | 0.16        | 38.47                 | 56.00         | 17.53       |        |
|           | 7.181           | 48.10                | 0.34        | 48.44                 | 60.00         | 11.56       |        |
|           | 0.190           | 35.30                | 0.19        | 35.49                 | 54.05         | 18.56       | AV     |
|           | 0.419           | 31.89                | 0.22        | 32.11                 | 47.48         | 15.37       |        |
|           | 0.614           | 28.40                | 0.15        | 28.55                 | 46.00         | 17.45       |        |
|           | 0.771           | 24.20                | 0.13        | 24.33                 | 46.00         | 21.67       |        |
|           | 1.690           | 28.21                | 0.16        | 28.37                 | 46.00         | 17.63       |        |
|           | <b>7.181</b>    | <b>40.00</b>         | <b>0.34</b> | <b>40.34</b>          | <b>50.00</b>  | <b>9.66</b> |        |

TEST ENGINEER: ERIC TANG



#### 4.2.2 Radiated emission test setup



■ : 50 ohm Coaxial Switch

#### 4.3 Radiated Emission Limit [FCC Part 15 Subpart B 15.109(a)]

| Frequency<br>(MHz) | Distance<br>(m) | Field strength limits |                        |
|--------------------|-----------------|-----------------------|------------------------|
|                    |                 | ( $\mu\text{V/m}$ )   | dB ( $\mu\text{V/m}$ ) |
| 30 ~ 88            | 3               | 100                   | 40.0                   |
| 88 ~ 216           | 3               | 150                   | 43.5                   |
| 216 ~ 960          | 3               | 200                   | 46.0                   |
| Above 960          | 3               | 500                   | 54.0                   |

NOTE 1 - Emission Level dB ( $\mu\text{V/m}$ ) = 20 log Emission Level ( $\mu\text{V/m}$ )

NOTE 2 - The tighter limit applies at the band edges.

NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

NOTE 4 - The limits shown are based on Quasi-peak value detector.

NOTE 5 - Above 1 GHz, the limit on peak emission is 20 dB above the maximum permitted average emission limit applicable to the EUT.

#### 4.4 Test Configuration

The configuration of the EUT and peripherals are same as those used in conducted emission test.

Please refer to Sec.3.4.

#### 4.5 Operating Condition of EUT

Same as conducted emission test which is listed in Sec.3.5, except for the test setup replaced by Sec.4.2.

## 4.6 Test Procedures

The EUT and peripherals were placed on a FRP turntable that is 0.8 meter above ground. The FRP turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. Broadband antenna (Calibrated Bilog Antenna) was used as receiving antenna. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.4:2003 requirements during radiated emission test.

The I.F. bandwidth of Test Receiver R&S ESCI was set at 120 kHz.

The frequency range from 30 MHz to 1000MHz was checked for all test modes.

The frequency range from 1 GHz to 2 GHz was checked for the maximum resolution test mode.

The test modes were done on radiated disturbance test and all the test results are listed in Sec.4.7.

## 4.7 Test Results

**<PASS>**

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

| Test Mode           | Data Page |
|---------------------|-----------|
| HDMI 1920*1080@60Hz | P21 – P22 |
| HDMI 1280*1024@60Hz | P23       |
| HDMI 640*480@60Hz   | P24       |
| USB Play            | P25       |

NOTE 1 – Emission Level = Antenna Factor + Cable Loss + Meter Reading. (< 1GHz);

Emission Level = Antenna Factor + Cable Loss – Preamp Factor + Meter Reading. (> 1GHz)

NOTE 2 – All readings are Quasi-Peak values below or equal to 1GHz, Peak and Average values above 1GHz.

NOTE 3 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

NOTE 4 – The worst case is for HDMI 1920\*1080@60Hz test mode. The worst emission at horizontal polarization was detected at 924.340 MHz with corrected signal level of 43.38dB ( $\mu\text{V/m}$ ) (limit is 46.00 dB ( $\mu\text{V/m}$ )), when the antenna was 2.00 m height and the turntable was at 225°. The worst emission at vertical polarization was detected at 70.740 MHz with corrected signal level of 36.61 dB ( $\mu\text{V/m}$ ) (limit is 40.00 dB ( $\mu\text{V/m}$ )), when the antenna was 1.90 m height and the turntable was at 150°.

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K20D Humidity : 60%RH

Test Mode : HDMI 1920\*1080@60Hz Date of Test : Feb 19, 2014

| Polarization | Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|--------------|-----------------|-----------------------|-----------------------|-----------------|--------------------------|--------------------------|------------------|-------------|--------|
| Horizontal   | 70.740          | 29.67                 | 5.89                  | 0.94            | --                       | 36.50                    | 40.00            | 3.50        | QP     |
|              | 136.700         | 24.13                 | 10.74                 | 1.58            | --                       | 36.45                    | 43.50            | 7.05        |        |
|              | 296.750         | 20.08                 | 12.55                 | 2.52            | --                       | 35.15                    | 46.00            | 10.85       |        |
|              | 571.260         | 17.89                 | 19.25                 | 3.14            | --                       | 40.28                    | 46.00            | 5.72        |        |
|              | 740.040         | 16.28                 | 18.90                 | 3.57            | --                       | 38.75                    | 46.00            | 7.25        |        |
|              | <b>924.340</b>  | <b>19.29</b>          | <b>19.50</b>          | <b>4.59</b>     | --                       | <b>43.38</b>             | <b>46.00</b>     | <b>2.62</b> |        |
|              | 1125.000        | 47.60                 | 24.19                 | 5.03            | 37.92                    | 38.90                    | 74.00            | 35.10       | PK     |
|              | 1236.000        | 47.58                 | 24.70                 | 5.20            | 37.65                    | 39.83                    | 74.00            | 34.17       |        |
|              | 1410.000        | 45.94                 | 25.36                 | 5.59            | 37.16                    | 39.73                    | 74.00            | 34.27       |        |
|              | 1595.000        | 47.82                 | 26.66                 | 5.66            | 36.70                    | 43.44                    | 74.00            | 30.56       |        |
|              | 1752.000        | 47.30                 | 28.56                 | 6.06            | 36.42                    | 45.50                    | 74.00            | 28.50       |        |
|              | 1824.000        | 48.98                 | 29.40                 | 6.16            | 36.32                    | 48.22                    | 74.00            | 25.78       |        |
|              | 1125.000        | 34.54                 | 24.19                 | 5.03            | 37.92                    | 25.84                    | 54.00            | 28.16       | AV     |
|              | 1236.000        | 34.88                 | 24.70                 | 5.20            | 37.65                    | 27.13                    | 54.00            | 26.87       |        |
|              | 1410.000        | 32.28                 | 25.36                 | 5.59            | 37.16                    | 26.07                    | 54.00            | 27.93       |        |
|              | 1595.000        | 34.59                 | 26.66                 | 5.66            | 36.70                    | 30.21                    | 54.00            | 23.79       |        |
|              | 1752.000        | 34.67                 | 28.56                 | 6.06            | 36.42                    | 32.87                    | 54.00            | 21.13       |        |
|              | 1824.000        | 35.78                 | 29.40                 | 6.16            | 36.32                    | 35.02                    | 54.00            | 18.98       |        |

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K20D Humidity : 60%RH

Test Mode : HDMI 1920\*1080@60Hz Date of Test : Feb 19, 2014

| Polarization | Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|--------------|-----------------|-----------------------|-----------------------|-----------------|--------------------|--------------------------|------------------|-------------|--------|
| Vertical     | <b>70.740</b>   | <b>29.78</b>          | <b>5.89</b>           | <b>0.94</b>     | --                 | <b>36.61</b>             | <b>40.00</b>     | <b>3.39</b> | QP     |
|              | 146.400         | 24.21                 | 10.25                 | 1.62            | --                 | 36.08                    | 43.50            | 7.42        |        |
|              | 296.750         | 20.52                 | 12.55                 | 2.52            | --                 | 35.59                    | 46.00            | 10.41       |        |
|              | 592.600         | 20.44                 | 18.60                 | 3.20            | --                 | 42.24                    | 46.00            | 3.76        |        |
|              | 740.040         | 14.86                 | 18.90                 | 3.57            | --                 | 37.33                    | 46.00            | 8.67        |        |
|              | 924.340         | 18.15                 | 19.50                 | 4.59            | --                 | 42.24                    | 46.00            | 3.76        |        |
|              | 1016.000        | 47.18                 | 23.75                 | 4.91            | 38.16              | 37.68                    | 74.00            | 36.32       | PK     |
|              | 1080.000        | 46.28                 | 24.01                 | 4.98            | 38.02              | 37.25                    | 74.00            | 36.75       |        |
|              | 1203.000        | 45.79                 | 24.55                 | 5.15            | 37.73              | 37.76                    | 74.00            | 36.24       |        |
|              | 1428.000        | 45.55                 | 25.41                 | 5.60            | 37.11              | 39.45                    | 74.00            | 34.55       |        |
|              | 1508.000        | 45.06                 | 25.69                 | 5.64            | 36.89              | 39.50                    | 74.00            | 34.50       |        |
|              | 1862.000        | 46.34                 | 29.79                 | 6.17            | 36.26              | 46.04                    | 74.00            | 27.96       |        |
|              | 1016.000        | 34.53                 | 23.75                 | 4.91            | 38.16              | 25.03                    | 74.00            | 48.97       | AV     |
|              | 1080.000        | 33.53                 | 24.01                 | 4.98            | 38.02              | 24.50                    | 74.00            | 49.50       |        |
|              | 1203.000        | 32.00                 | 24.55                 | 5.15            | 37.73              | 23.97                    | 74.00            | 50.03       |        |
|              | 1428.000        | 32.13                 | 25.41                 | 5.60            | 37.11              | 26.03                    | 74.00            | 47.97       |        |
|              | 1508.000        | 32.69                 | 25.69                 | 5.64            | 36.89              | 27.13                    | 74.00            | 46.87       |        |
|              | 1862.000        | 33.43                 | 29.79                 | 6.17            | 36.26              | 33.13                    | 74.00            | 40.87       |        |

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K20D Humidity : 60%RH

Test Mode : HDMI 1280\*1024@60Hz Date of Test : Feb 19, 2014

| Polarization | Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) |
|--------------|-----------------|-----------------------|-----------------------|-----------------|--------------------------|------------------|-------------|
| Horizontal   | <b>70.740</b>   | <b>28.49</b>          | <b>5.89</b>           | <b>0.94</b>     | <b>35.32</b>             | <b>40.00</b>     | <b>4.68</b> |
|              | 136.700         | 24.41                 | 10.74                 | 1.58            | 36.73                    | 43.50            | 6.77        |
|              | 296.750         | 25.91                 | 12.55                 | 2.52            | 40.98                    | 46.00            | 5.02        |
|              | 542.160         | 14.72                 | 19.48                 | 3.08            | 37.28                    | 46.00            | 8.72        |
|              | 571.260         | 18.26                 | 19.25                 | 3.14            | 40.65                    | 46.00            | 5.35        |
|              | 941.800         | 17.05                 | 19.40                 | 4.68            | 41.13                    | 46.00            | 4.87        |
| Vertical     | 68.800          | 28.91                 | 5.56                  | 0.92            | 35.39                    | 40.00            | 4.61        |
|              | 146.400         | 24.51                 | 10.25                 | 1.62            | 36.38                    | 43.50            | 7.12        |
|              | 289.960         | 21.03                 | 12.90                 | 2.46            | 36.39                    | 46.00            | 9.61        |
|              | 590.660         | 20.16                 | 18.60                 | 3.18            | 41.94                    | 46.00            | 4.06        |
|              | 807.940         | 12.74                 | 20.07                 | 3.70            | 36.51                    | 46.00            | 9.49        |
|              | <b>941.800</b>  | <b>17.66</b>          | <b>19.40</b>          | <b>4.68</b>     | <b>41.74</b>             | <b>46.00</b>     | <b>4.26</b> |

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K20D Humidity : 60%RH

Test Mode : HDMI 640\*480@60Hz Date of Test : Feb 19, 2014

| Polarization | Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) |
|--------------|-----------------|-----------------------|-----------------------|-----------------|--------------------------|------------------|-------------|
| Horizontal   | <b>70.293</b>   | <b>29.00</b>          | <b>5.84</b>           | <b>0.94</b>     | <b>35.78</b>             | <b>40.00</b>     | <b>4.22</b> |
|              | 146.400         | 24.95                 | 10.25                 | 1.62            | 36.82                    | 43.50            | 6.68        |
|              | 224.000         | 26.49                 | 8.47                  | 2.08            | 37.04                    | 46.00            | 8.96        |
|              | 299.660         | 24.20                 | 12.50                 | 2.55            | 39.25                    | 46.00            | 6.75        |
|              | 571.260         | 17.52                 | 19.25                 | 3.14            | 39.91                    | 46.00            | 6.09        |
|              | 895.240         | 15.29                 | 19.47                 | 4.43            | 39.19                    | 46.00            | 6.81        |
| Vertical     | <b>70.740</b>   | <b>29.35</b>          | <b>5.89</b>           | <b>0.94</b>     | <b>36.18</b>             | <b>40.00</b>     | <b>3.82</b> |
|              | 146.400         | 23.66                 | 10.25                 | 1.62            | 35.53                    | 43.50            | 7.97        |
|              | 296.750         | 23.88                 | 12.55                 | 2.52            | 38.95                    | 46.00            | 7.05        |
|              | 590.660         | 17.98                 | 18.60                 | 3.18            | 39.76                    | 46.00            | 6.24        |
|              | 652.740         | 12.32                 | 18.55                 | 3.38            | 34.25                    | 46.00            | 11.75       |
|              | 934.040         | 14.30                 | 19.20                 | 4.63            | 38.13                    | 46.00            | 7.87        |

TEST ENGINEER: NEAL WANG

EUT : LED LCD TV Temperature : 22°C

Model No. : 50K20D Humidity : 60%RH

Test Mode : USB Play Date of Test : Feb 19, 2014

| Polarization | Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) |
|--------------|-----------------|-----------------------|-----------------------|-----------------|--------------------------|------------------|-------------|
| Horizontal   | <b>79.470</b>   | <b>23.97</b>          | <b>6.76</b>           | <b>1.06</b>     | <b>31.79</b>             | <b>40.00</b>     | <b>8.21</b> |
|              | 144.460         | 21.53                 | 10.30                 | 1.61            | 33.44                    | 43.50            | 10.06       |
|              | 244.370         | 19.52                 | 11.15                 | 2.18            | 32.85                    | 46.00            | 13.15       |
|              | 311.300         | 16.34                 | 13.37                 | 2.56            | 32.27                    | 46.00            | 13.73       |
|              | 578.050         | 15.60                 | 18.95                 | 3.16            | 37.71                    | 46.00            | 8.29        |
|              | 704.150         | 8.98                  | 20.13                 | 3.55            | 32.66                    | 46.00            | 13.34       |
| Vertical     | 31.940          | 14.18                 | 16.50                 | 0.68            | 31.36                    | 40.00            | 8.64        |
|              | 136.700         | 22.10                 | 10.74                 | 1.58            | 34.42                    | 43.50            | 9.08        |
|              | 234.670         | 21.02                 | 10.00                 | 2.13            | 33.15                    | 46.00            | 12.85       |
|              | 290.930         | 18.99                 | 12.83                 | 2.49            | 34.31                    | 46.00            | 11.69       |
|              | <b>578.050</b>  | <b>18.40</b>          | <b>18.95</b>          | <b>3.16</b>     | <b>40.51</b>             | <b>46.00</b>     | <b>5.49</b> |
|              | 855.470         | 9.55                  | 20.80                 | 4.08            | 34.43                    | 46.00            | 11.57       |

TEST ENGINEER: NEAL WANG

## **5 DEVIATION TO TEST SPECIFICATIONS**

None.