# FCC RADIO TEST REPORT
# FCC ID: 2AZOA-HCTR-G3

**Product:** Hybrid tv box

**Trade Mark:** HomeCaster

**Model No.:** HCTR-G3

**Family Model:** HCTR-G2

**Report No.:** S21032401601004

**Issue Date:** Apr. 23.2021

**Prepared for**

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**Prepared by**

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## TEST RESULT CERTIFICATION

| | | |
|---|---|---|
| **Applicant's name** | : | DigiCAP Co., Ltd. |
| Address | : | D&C CAMPUS, 11, Magokjungang 8-ro 7-gil, Gangseo-gu Seoul, South Korea. |
| **Manufacturer's Name** | : | Videostrong Technology Co., Ltd |
| Address | : | 6th floor East bulding ,Lushi industrial Ban' an 28 Zone , Shenzhen China . |

**Product description**

| | | |
|---|---|---|
| Product name | : | Hybrid tv box |
| Model and/or type reference | : | HCTR-G3 |
| Family Model | : | HCTR-G2 |
| **Standards** | : | FCC Part15.407 |
| Test procedure | | ANSI C63.10-2013 and KDB 789033 D02 General UNII Test Procedures New Rules v02r01 |

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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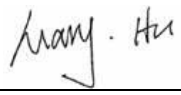
**Date of Test** .....

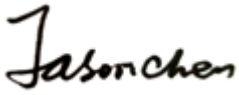
Date (s) of performance of tests ..... 24 Mar. 2021 ~ 23 Apr.2021

Date of Issue ..... 23 Apr.2021

Test Result ..... **Pass**

Testing Engineer : 

(Mary Hu)

Technical Manager : 

(Jason Chen)

Authorized Signatory : 

(Alex Li)

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**Revision History**

| Report No. | Version | Description | Issued Date |
|---|---|---|---|
| S21032401601004 | Rev.01 | Initial issue of report | 23 Apr.2021 |
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## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| FCC Part15 (15.407) , Subpart E | | | |
|---|---|---|---|
| Standard Section | Test Item | Judgment | Remark |
| 15.207 | AC Power Line Conducted Emissions | PASS | |
| 15.209(a),<br>15.407 (b)(1)<br>15.407 (b)(4)<br>15.407 (b)(8) | Spurious Radiated Emissions | PASS | |
| 15.407 (a)(1)<br>15.407 (a)(3) | 26 dB and 99% Emission Bandwidth | PASS | |
| 15.407(e) | Minimum 6 dB bandwidth | PASS | |
| 15.407 (a)(1)<br>15.407 (a)(3) | Maximum Conducted Output Power | PASS | |
| 15.407(b)(1)<br>15.407(b)(4) | Band Edge | PASS | |
| 15.407 (a)(1)<br>15.407 (a)(3) | Power Spectral Density | PASS | |
| 15.407(b) | Spurious Emissions at Antenna Terminals | PASS | |
| 15.203 | Antenna Requirement | PASS | |

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

(2) This device operates with a duty cycle greater than 99%

## 1.1 FACILITIES AND ACCREDITATIONS

FACILITIES

All measurement facilities used to collect the measurement data are located at
1/F, Building E, Fenda Science Park Sanwei, Xixiang, Bao'an District
Shenzhen, Guangdong, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

| | | |
|---|---|---|
| CNAS-Lab. | : | The Certificate Registration Number is L5516. |
| IC-Registration | | The Certificate Registration Number is 9270A. |
| | | CAB identifier:CN0074 |
| FCC- Accredited | | Test Firm Registration Number: 463705. |
| | | Designation Number: CN1184 |
| A2LA-Lab. | | The Certificate Registration Number is 4298.01 |
| Name of Firm | : | Shenzhen NTEK Testing Technology Co., Ltd. |
| Site Location | : | 1/F, Building E, Fenda Science Park Sanwei, Xixiang, Bao'an District Shenzhen, Guangdong, China |

## 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

| No. | Item | Uncertainty |
|---|---|---|
| 1 | Conducted Emission Test | ±2.80dB |
| 2 | RF power, conducted | ±0.16dB |
| 3 | Spurious emissions, conducted | ±0.21dB |
| 4 | All emissions, radiated(30MHz~1GHz) | ±2.64dB |
| 5 | All emissions, radiated(1GHz~6GHz) | ±2.40dB |
| 6 | All emissions, radiated(＞6GHz) | ±2.52dB |
| 7 | Temperature | ±0.5°C |
| 8 | Humidity | ±2% |

# 2. GENERAL INFORMATION

## 2.1 GENERAL DESCRIPTION OF EUT

| | |
|---|---|
| Equipment | Hybrid tv box |
| Trade Mark | HomeCaster |
| Model Name | HCTR-G3 |
| Family Model | HCTR-G2 |
| Model Difference | All models are the same circuit and RF module, except the Model |
| FCC ID | 2AZOA-HCTR-G3 |
| Product Description | <table><tr><td>Mode Supported</td><td>☒802.11a<br>☒802.11n(HT20)<br>☒802.11n(HT40)<br>☒802.11ac(HT20)<br>☒802.11ac(HT40)<br>☒802.11ac(HT80)</td></tr><tr><td>Data Rate</td><td>802.11a: 6,9,12,18,24,36,48,54Mbps;<br>802.11n(HT20/HT40):MCS0-MCS15;<br>802.11ac(VHT20): NSS1, MCS0-MCS8<br>802.11ac(VHT40/VHT80):NSS1, MCS0-MCS9</td></tr><tr><td>Modulation</td><td>OFDM with BPSK/QPSK/16QAM/64QAM</td></tr><tr><td>Operating Frequency Range</td><td>☒ U-NII-1: 5150 MHz ~5250MHz<br>☐ U-NII-2A: 5250MHz~5350MHz<br>☐ U-NII-2C: 5470MHz~5725MHz<br>☒ U-NII-3: 5725 MHz ~5850 MHz</td></tr><tr><td>Function:</td><td>☐Outdoor AP ☐Indoor AP ☐Fixed P2P<br>☒Client</td></tr><tr><td>Antenna Type</td><td>FPC Antenna</td></tr><tr><td>Antenna Gain</td><td>Antenna : 3dBi</td></tr></table><br>Based on the application, features, or specification exhibited in User's Manual, More details of EUT technical specification, please refer to the User's Manual. |
| Ratings | DC 12V from adapter |
| Adapter | ☒Adapter supply:<br>Model:TEKA-TB120100US<br>Input:AC 100-240V~50/60Hz 0.35A MAX<br>Output:12.0V⎓1.0A |
| Battery | N/A |
| Connecting I/O Port(s) | Please refer to the User's Manual |
| HW Version | V1.1 |
| SW Version | v0.1 |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. Frequency and Channel list for 802.11a/n/ac(20MHz) band I (5180-5240MHz):

| 802.11a/n/ac( 20MHz) Carrier Frequency Channel | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 36 | 5180 | 44 | 5220 | - | - | - | - |
| 40 | 5200 | 48 | 5240 | - | - | - | - |

Frequency and Channel list for 802.11n/ac(40MHz) band I (5190-5230MHz):

| 802.11n/ac(40MHz) Carrier Frequency Channel | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 38 | 5190 | - | - | - | - | - | - |
| 46 | 5230 | - | - | - | - | - | - |

Frequency and Channel list for 802.11ac(80MHz) band I (5210MHz):

| 802.11ac(80MHz) Carrier Frequency Channel | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 42 | 5210 | - | - | - | - | - | - |

Frequency and Channel list for 802.11a/n/ac(20 MHz) band IV (5745-5825MHz):

| 802.11a/n/ac( 20 MHz) Carrier Frequency Channel | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 149 | 5745 | 153 | 5765 | 157 | 5785 | 161 | 5805 |
| 165 | 5825 | - | - | - | - | - | - |

Frequency and Channel list for 802.11n/ac(40MHz) band IV (5755-5795MHz):

| 802.11n/ac(40MHz) Carrier Frequency Channel | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 151 | 5755 | 159 | 5795 | - | - |

Frequency and Channel list for 802.11ac(80MHz) band IV (5775MHz):

| 802.11ac(80MHz) Carrier Frequency Channel | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 155 | 5775 | | | - | - |

## 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| Pretest Mode | Description |
|---|---|
| Mode 1 | Normal Link Mode |
| Mode 2 | 802.11a/n/ac20 CH36/CH40/CH48/CH149/CH157/CH165 |
| Mode 3 | 802.11n40/ac40 CH38/CH46CH151/CH159 |
| Mode 4 | 802.11ac80 CH42/CH155 |

| **For Radiated Emission** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | Normal Link Mode |
| Mode 2 | 802.11a/n/ac20 CH36/CH40/CH48/CH149/CH157/CH165 |
| Mode 3 | 802.11n40/ac40 CH38/CH46CH151/CH159 |
| Mode 4 | 802.11ac80 CH42/CH155 |

| **For AC Conducted Emission** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | Normal Link Mode |

| **For Conducted Test Cases** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | Normal Link Mode |
| Mode 2 | 802.11a/n/ac20 CH36/CH40/CH48/CH149/CH157/CH165 |
| Mode 3 | 802.11n40/ac40 CH38/CH46CH151/CH159 |
| Mode 4 | 802.11ac80 CH42/CH155 |

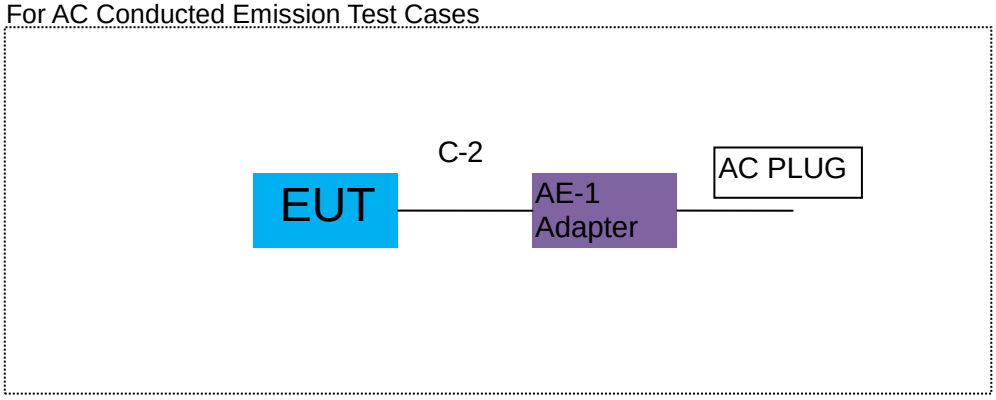
Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

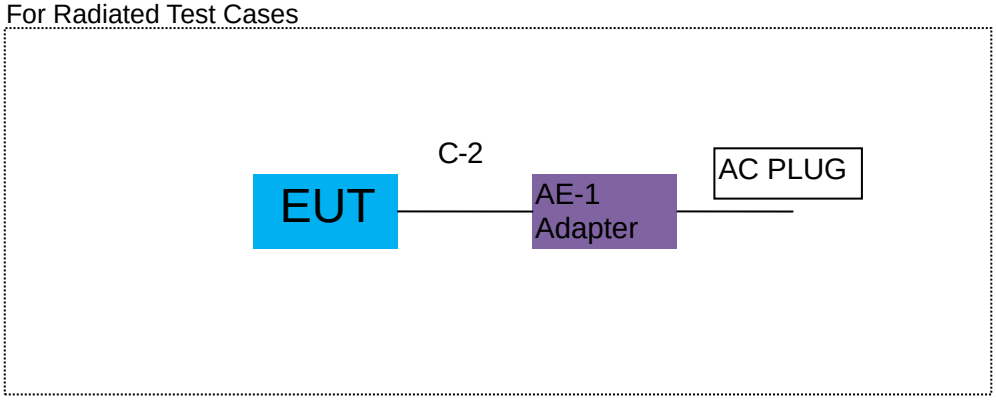
(2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

## 2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

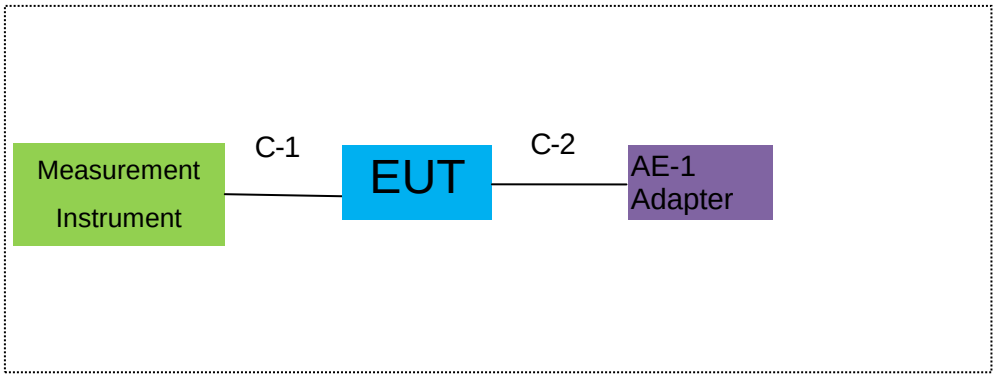
For AC Conducted Emission Test Cases




For Radiated Test Cases




For Conducted Test Cases




Note: 1. The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

## 2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment | Mfr/Brand | Model/Type No. | Series No. | Note |
|---|---|---|---|---|---|
| AE-1 | Adapter | TEKA | TEKA-TB120100US | N/A | Peripherals |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| Item | Cable Type | Shielded Type | Ferrite Core | Length |
|---|---|---|---|---|
| C-1 | RF Cable | YES | NO | 0.1m |
| C-2 | Power cable | NO | NO | 1.0m |
| | | | | |
| | | | | |
| | | | | |

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.
(3) During the battery power test, the battery is fully charged.

## 2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation& Conducted Test equipment

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until | Calibration period |
|---|---|---|---|---|---|---|---|
| 1 | Spectrum Analyzer | Aglient | E4407B | MY45108040 | 2020.11.9 | 2021.11.8 | 1 year |
| 2 | Spectrum Analyzer | Agilent | N9020A | MY49100060 | 2020.05.11 | 2021.05.10 | 1 year |
| 3 | Spectrum Analyzer | R&S | FSV40 | 101417 | 2020.08.07 | 2021.08.06 | 1 year |
| 4 | Test Receiver | R&S | ESPI7 | 101318 | 2020.05.11 | 2021.05.10 | 1 year |
| 5 | Bilog Antenna | TESEQ | CBL6111D | 31216 | 2021.03.29 | 2022.03.28 | 1 year |
| 6 | 50Ω Coaxial Switch | Anritsu | MP59B | 6200983705 | 2020.05.11 | 2023.05.10 | 3 year |
| 7 | Horn Antenna | EM | EM-AH-10180 | 2011071402 | 2021.03.29 | 2022.03.28 | 1 year |
| 8 | Amplifier | EMC | EMC051835SE | 980246 | 2020.7.13 | 2021.07.12 | 1 year |
| 9 | Active Loop Antenna | SCHWARZBECK | FMZB 1519 B | 055 | 2020.11.20 | 2021.11.19 | 1 year |
| 10 | Power Meter | DARE | RPR3006W | 15I00041SNO84 | 2020.11.20 | 2021.11.19 | 1 year |
| 11 | USB RF Power Sensor | DARE | RPR3006W | 15I00041SNO84 | 2020.07.13 | 2021.07.12 | 1 year |
| 12 | Test Cable (9KHz-30MHz) | N/A | R-01 | N/A | N/A | N/A | N/A |
| 13 | Test Cable (30MHz-1GHz) | N/A | R-02 | N/A | 2020.7.13 | 2021.7.12 | 1 year |
| 14 | High Test Cable(1G-40GHz) | N/A | R-03 | N/A | N/A | N/A | 3 year |
| 15 | High Test Cable(1G-40GHz) | N/A | R-04 | N/A | N/A | N/A | N/A |
| 16 | Filter | TRILTHIC | 2400MHz | 29 | 2020.04.07 | 2023.04.06 | 3 year |
| 17 | temporary antenna connector (Note) | NTS | R001 | N/A | N/A | N/A | N/A |
| 18 | Low Noise Amplifier | B&Z | BZ-P540-550850-452727 | 16476-11729 | 2021.04.1 | 2022.03.31 | 1 year |
| 19 | Broadband Horn Antenna | SCHWARZBECK | BBHA 9170 | 803 | 2020.11.20 | 2021.11.19 | 1 year |
| 20 | Thermal Chamber | Ten Billion | TTC-B3C | TBN-960502 | 2020.05.11 | 2021.05.10 | 1 year |

Note:
We will use the temporary antenna connector (soldered on the PCB board) When conducted test
And this temporary antenna connector is listed within the instrument list

AC Conduction Test equipment

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until | Calibration period |
|---|---|---|---|---|---|---|---|
| 1 | Test Receiver | R&S | ESCI | 101160 | 2020.05.11 | 2021.05.10 | 1 year |
| 2 | LISN | R&S | ENV216 | 101313 | 2020.05.11 | 2021.05.10 | 1 year |
| 3 | LISN | SCHWARZBECK | NNLK 8129 | 8129245 | 2020.05.11 | 2021.05.10 | 1 year |
| 4 | 50Ω Coaxial Switch | ANRITSU CORP | MP59B | 6200983704 | 2020.05.11 | 2023.05.10 | 3 year |
| 5 | Test Cable (9KHz-30MHz) | N/A | C01 | N/A | 2020.05.11 | 2023.05.10 | 3 year |
| 6 | Test Cable (9KHz-30MHz) | N/A | C02 | N/A | 2019.6.28 | 2022.6.27 | 3 year |
| 7 | Test Cable (9KHz-30MHz) | N/A | C03 | N/A | N/A | N/A | N/A |

Note: Each piece of equipment is scheduled for calibration once a year except the Test Cable& Aux Equipment which is scheduled for calibration every 3 years.

# 3. EMC EMISSION TEST

## 3.1 CONDUCTED EMISSION MEASUREMENT

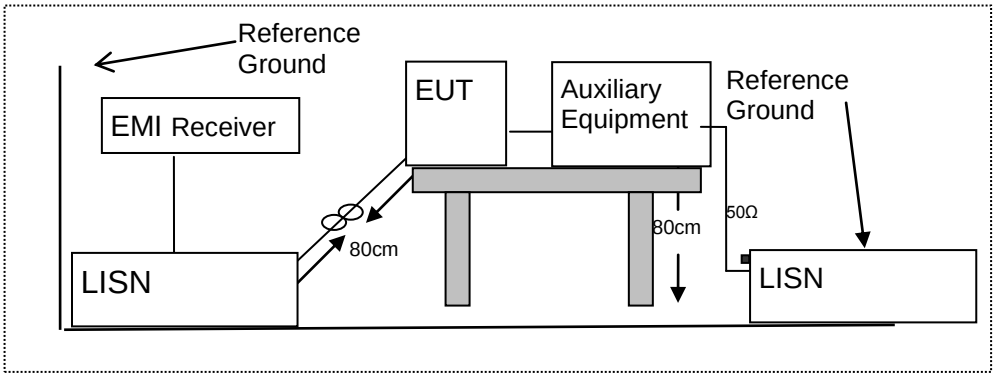
### **3.1.1** APPLICABLE STANDARD

According to FCC Part 15.207(a)

### 3.1.2 CONFORMANCE LIMIT

| Frequency(MHz) | Conducted Emission Limit | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66-56* | 56-46* |
| 0.5-5.0 | 56 | 46 |
| 5.0-30.0 | 60 | 50 |
| Note: 1. *Decreases with the logarithm of the frequency<br>2. The lower limit shall apply at the transition frequencies<br>3. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz. | | |

### 3.1.3 TEST CONFIGURATION




### 3.1.4 TEST PROCEDURE

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

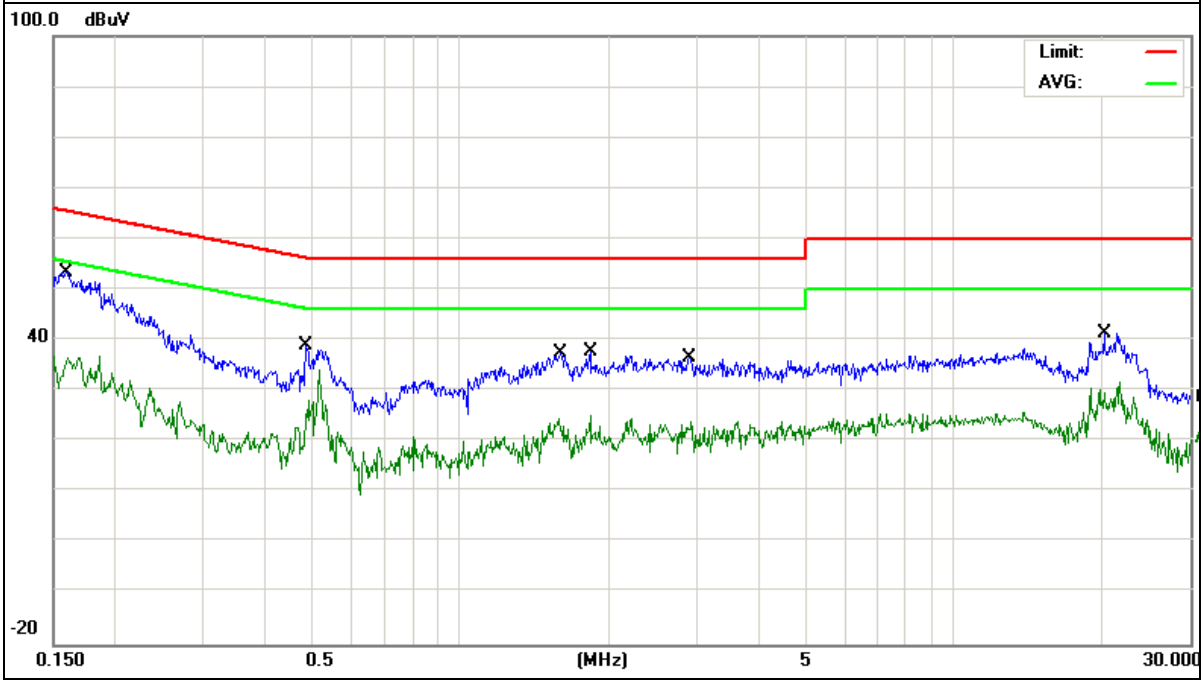
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room.
2. The EUT was placed on a table which is 0.8m above ground plane.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40cm long.
5. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
6. LISN at least 80 cm from nearest part of EUT chassis.
7. The frequency range from 150KHz to 30MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth(IF bandwidth=9KHz) with Maximum Hold Mode
9. For the actual test configuration, please refer to the related Item –EUT Test Photos.

| | | | |
|---|---|---|---|
| EUT： | Hybrid tv box | Model Name. ： | HCTR-G3 |
| Temperature： | 23.5 ℃ | Relative Humidity： | 45% |
| Pressure： | 1010hPa | Phase： | L |
| Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz | Test Mode： | Mode 1(5.2G) |

| Frequency | Reading Level | Correct Factor | Measure-ment | Limits | Margin | Remark |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV) | (dBμV) | (dB) | |
| 0.1590 | 43.94 | 9.56 | 53.50 | 65.51 | -12.01 | QP |
| 0.1590 | 27.31 | 9.56 | 36.87 | 55.51 | -18.64 | AVG |
| 0.4863 | 29.35 | 9.55 | 38.90 | 56.23 | -17.33 | QP |
| 0.4863 | 24.53 | 9.55 | 34.08 | 46.23 | -12.15 | AVG |
| 1.5980 | 27.99 | 9.58 | 37.57 | 56.00 | -18.43 | QP |
| 1.5980 | 14.97 | 9.58 | 24.55 | 46.00 | -21.45 | AVG |
| 1.8340 | 28.11 | 9.58 | 37.69 | 56.00 | -18.31 | QP |
| 1.8340 | 15.50 | 9.58 | 25.08 | 46.00 | -20.92 | AVG |
| 2.9060 | 26.97 | 9.60 | 36.57 | 56.00 | -19.43 | QP |
| 2.9060 | 14.31 | 9.60 | 23.91 | 46.00 | -22.09 | AVG |
| 20.0659 | 31.46 | 9.94 | 41.40 | 60.00 | -18.60 | QP |
| 20.0659 | 21.69 | 9.94 | 31.63 | 50.00 | -18.37 | AVG |

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

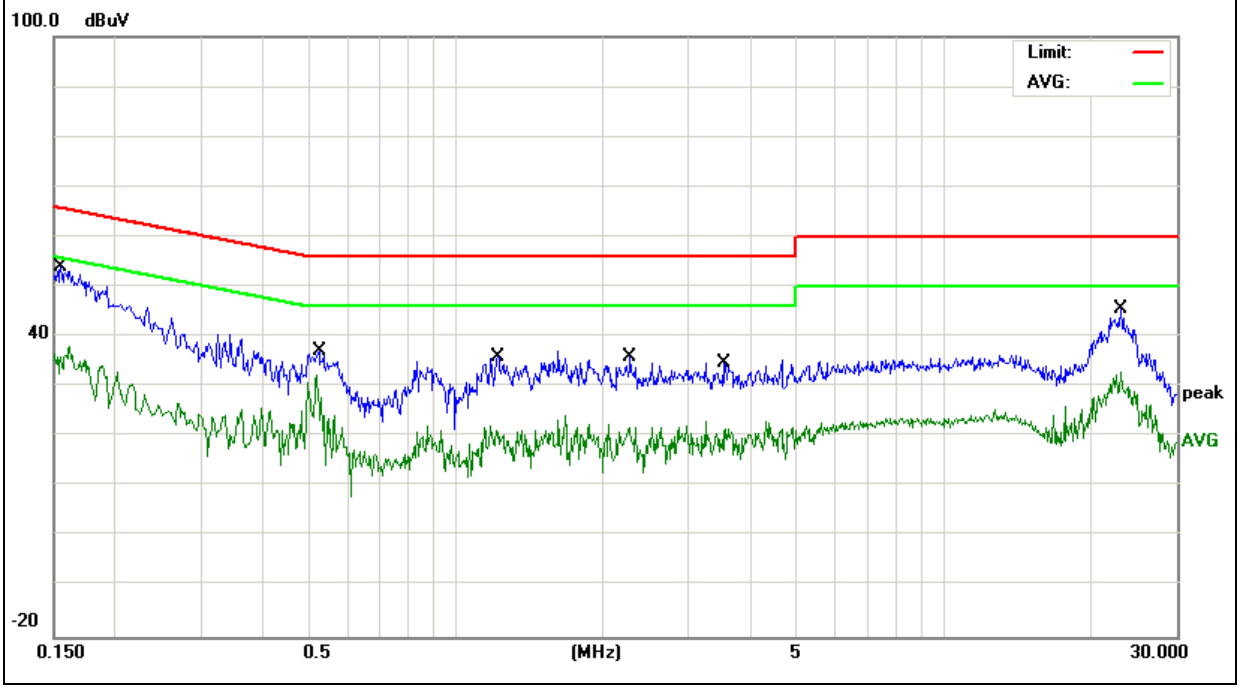


| | | | |
|---|---|---|---|
| EUT： | Hybrid tv box | Model Name. ： | HCTR-G3 |
| Temperature： | 23.5 ℃ | Relative Humidity： | 45% |
| Pressure： | 1010hPa | Phase： | N |
| Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz | Test Mode： | Mode 1(5.2G) |

| Frequency | Reading Level | Correct Factor | Measure-ment | Limits | Margin | Remark |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV) | (dBμV) | (dB) | |
| 0.1547 | 44.45 | 9.55 | 54.00 | 65.74 | -11.74 | QP |
| 0.1547 | 28.54 | 9.55 | 38.09 | 55.74 | -17.65 | AVG |
| 0.5260 | 27.56 | 9.54 | 37.10 | 56.00 | -18.90 | QP |
| 0.5260 | 22.66 | 9.54 | 32.20 | 46.00 | -13.80 | AVG |
| 1.2219 | 26.40 | 9.55 | 35.95 | 56.00 | -20.05 | QP |
| 1.2219 | 12.69 | 9.55 | 22.24 | 46.00 | -23.76 | AVG |
| 2.2740 | 26.28 | 9.57 | 35.85 | 56.00 | -20.15 | QP |
| 2.2740 | 12.43 | 9.57 | 22.00 | 46.00 | -24.00 | AVG |
| 3.5379 | 25.29 | 9.59 | 34.88 | 56.00 | -21.12 | QP |
| 3.5379 | 13.53 | 9.59 | 23.12 | 46.00 | -22.88 | AVG |
| 23.1259 | 35.54 | 9.91 | 45.45 | 60.00 | -14.55 | QP |
| 23.1259 | 22.95 | 9.91 | 32.86 | 50.00 | -17.14 | AVG |

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

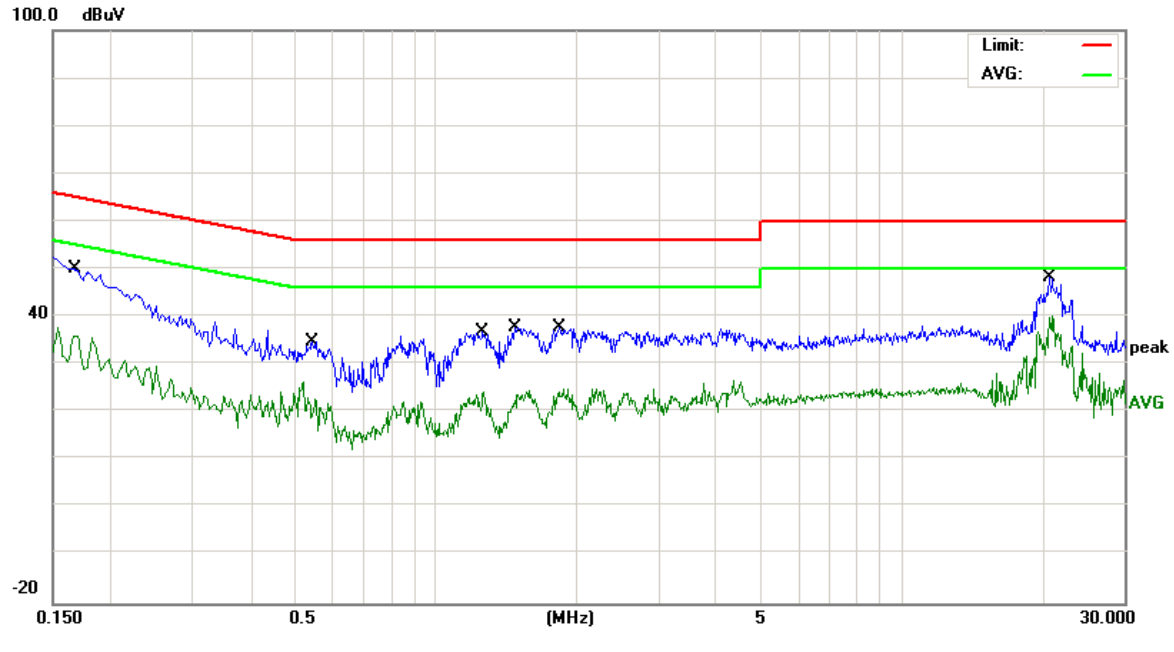


| | | | |
|---|---|---|---|
| EUT： | Hybrid tv box | Model Name. ： | HCTR-G3 |
| Temperature： | 23.5 ℃ | Relative Humidity： | 45% |
| Pressure： | 1010hPa | Phase： | L |
| Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz | Test Mode： | Mode 1(5.8G) |

| Frequency | Reading Level | Correct Factor | Measure-ment | Limits | Margin | Remark |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV) | (dBμV) | (dB) | |
| 0.1685 | 40.16 | 9.56 | 49.72 | 65.03 | -15.31 | QP |
| 0.1685 | 28.09 | 9.56 | 37.65 | 55.03 | -17.38 | AVG |
| 0.5420 | 25.35 | 9.55 | 34.90 | 56.00 | -21.10 | QP |
| 0.5420 | 16.92 | 9.55 | 26.47 | 46.00 | -19.53 | AVG |
| 1.2620 | 27.32 | 9.56 | 36.88 | 56.00 | -19.12 | QP |
| 1.2620 | 14.72 | 9.56 | 24.28 | 46.00 | -21.72 | AVG |
| 1.4779 | 28.32 | 9.56 | 37.88 | 56.00 | -18.12 | QP |
| 1.4779 | 15.07 | 9.56 | 24.63 | 46.00 | -21.37 | AVG |
| 1.8460 | 28.08 | 9.58 | 37.66 | 56.00 | -18.34 | QP |
| 1.8460 | 15.28 | 9.58 | 24.86 | 46.00 | -21.14 | AVG |
| 20.8060 | 38.26 | 9.94 | 48.20 | 60.00 | -11.80 | QP |
| 20.8060 | 30.08 | 9.94 | 40.02 | 50.00 | -9.98 | AVG |

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

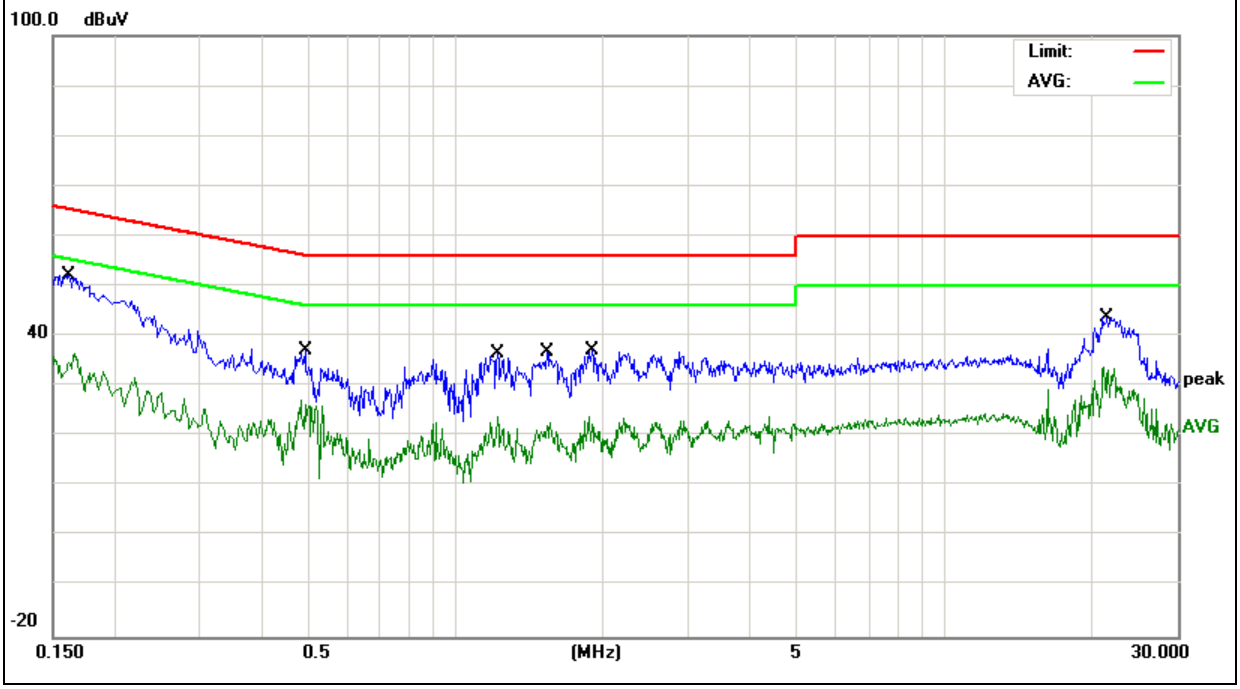


| | | | |
|---|---|---|---|
| EUT： | Hybrid tv box | Model Name. ： | HCTR-G3 |
| Temperature： | 23.5 ℃ | Relative Humidity： | 45% |
| Pressure： | 1010hPa | Phase： | N |
| Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz | Test Mode： | Mode 1(5.8G) |

| Frequency | Reading Level | Correct Factor | Measure-ment | Limits | Margin | Remark |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV) | (dBμV) | (dB) | |
| 0.1620 | 42.75 | 9.55 | 52.30 | 65.36 | -13.06 | QP |
| 0.1620 | 26.98 | 9.55 | 36.53 | 55.36 | -18.83 | AVG |
| 0.4939 | 27.47 | 9.54 | 37.01 | 56.10 | -19.09 | QP |
| 0.4939 | 17.67 | 9.54 | 27.21 | 46.10 | -18.89 | AVG |
| 1.2179 | 27.04 | 9.55 | 36.59 | 56.00 | -19.41 | QP |
| 1.2179 | 14.47 | 9.55 | 24.02 | 46.00 | -21.98 | AVG |
| 1.5420 | 27.37 | 9.57 | 36.94 | 56.00 | -19.06 | QP |
| 1.5420 | 13.10 | 9.57 | 22.67 | 46.00 | -23.33 | AVG |
| 1.9059 | 27.68 | 9.57 | 37.25 | 56.00 | -18.75 | QP |
| 1.9059 | 14.42 | 9.57 | 23.99 | 46.00 | -22.01 | AVG |
| 21.5019 | 33.79 | 9.91 | 43.70 | 60.00 | -16.30 | QP |
| 21.5019 | 24.09 | 9.91 | 34.00 | 50.00 | -16.00 | AVG |

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



## 3.2 RADIATED EMISSION MEASUREMENT

### 3.2.1 APPLICABLE STANDARD

According to FCC Part 15.407(b)(9) and 15.209

### 3.2.2 CONFORMANCE LIMIT

According to FCC Part 15.407(b) (9): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
According to FCC Part15.205, Restricted bands

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090-0.110 | 16.42-16.423 | 399.9-410 | 4.5-5.15 |
| 0.495-0.505 | 16.69475-16.69525 | 608-614 | 5.35-5.46 |
| 2.1735-2.1905 | 16.80425-16.80475 | 960-1240 | 7.25-7.75 |
| 4.125-4.128 | 25.5-25.67 | 1300-1427 | 8.025-8.5 |
| 4.17725-4.17775 | 37.5-38.25 | 1435-1626.5 | 9.0-9.2 |
| 4.20725-4.20775 | 73-74.6 | 1645.5-1646.5 | 9.3-9.5 |
| 6.215-6.218 | 74.8-75.2 | 1660-1710 | 10.6-12.7 |
| 6.26775-6.26825 | 123-138 | 2200-2300 | 14.47-14.5 |
| 8.291-8.294 | 149.9-150.05 | 2310-2390 | 15.35-16.2 |
| 8.362-8.366 | 156.52475-156.52525 | 2483.5-2500 | 17.7-21.4 |
| 8.37625-8.38675 | 156.7-156.9 | 2690-2900 | 22.01-23.12 |
| 8.41425-8.41475 | 162.0125-167.17 | 3260-3267 | 23.6-24.0 |
| 12.29-12.293 | 167.72-173.2 | 3332-3339 | 31.2-31.8 |
| 12.51975-12.52025 | 240-285 | 3345.8-3358 | 36.43-36.5 |
| 12.57675-12.57725 | 322-335.4 | 3600-4400 | (2) |
| 13.36-13.41 | | | |

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

| Restricted Frequency(MHz) | Field Strength (μV/m) | Field Strength (dBμV/m) | Measurement Distance |
|---|---|---|---|
| 0.009~0.490 | 2400/F(KHz) | 20 log (uV/m) | 300 |
| 0.490~1.705 | 24000/F(KHz) | 20 log (uV/m) | 30 |
| 1.705~30.0 | 30 | 29.5 | 30 |
| 30-88 | 100 | 40 | 3 |
| 88-216 | 150 | 43.5 | 3 |
| 216-960 | 200 | 46 | 3 |
| Above 960 | 500 | 54 | 3 |

Limits of Radiated Emission Measurement(Above 1000MHz)

| Frequency(MHz) | Class B (dBuV/m) (at 3M) | |
|---|---|---|
| | PEAK | AVERAGE |
| Above 1000 | 74 | 54 |

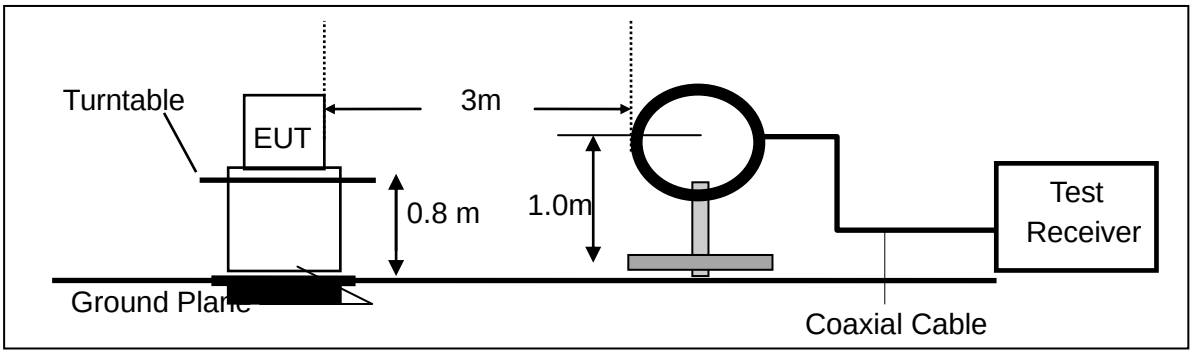
Remark :1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. For Frequency 9kHz~30MHz:
Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.
For Frequency above 30MHz:
Distance extrapolation factor =20log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

### 3.2.3 MEASURING INSTRUMENTS

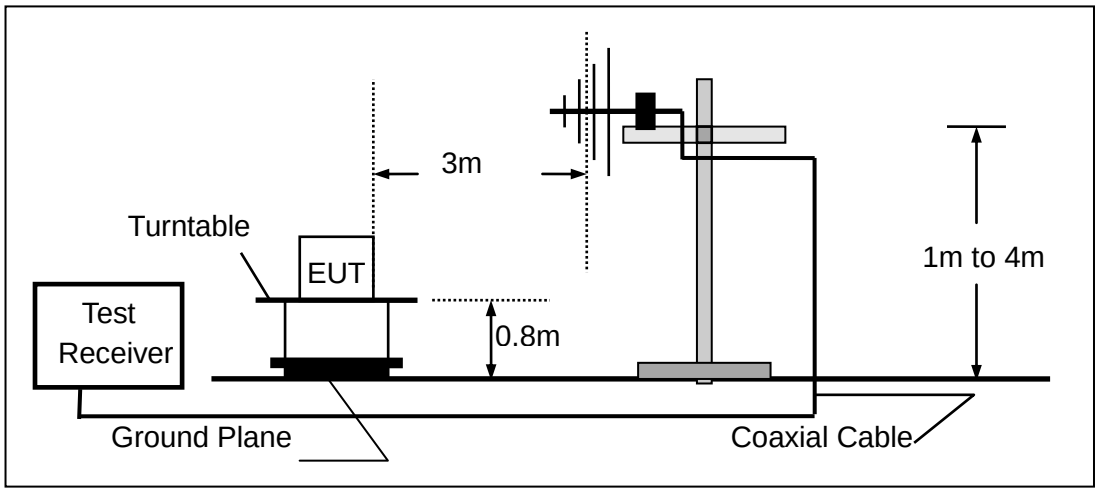
The Measuring equipment is listed in the section 6.3 of this test report.

3.2.4 TEST CONFIGURATION

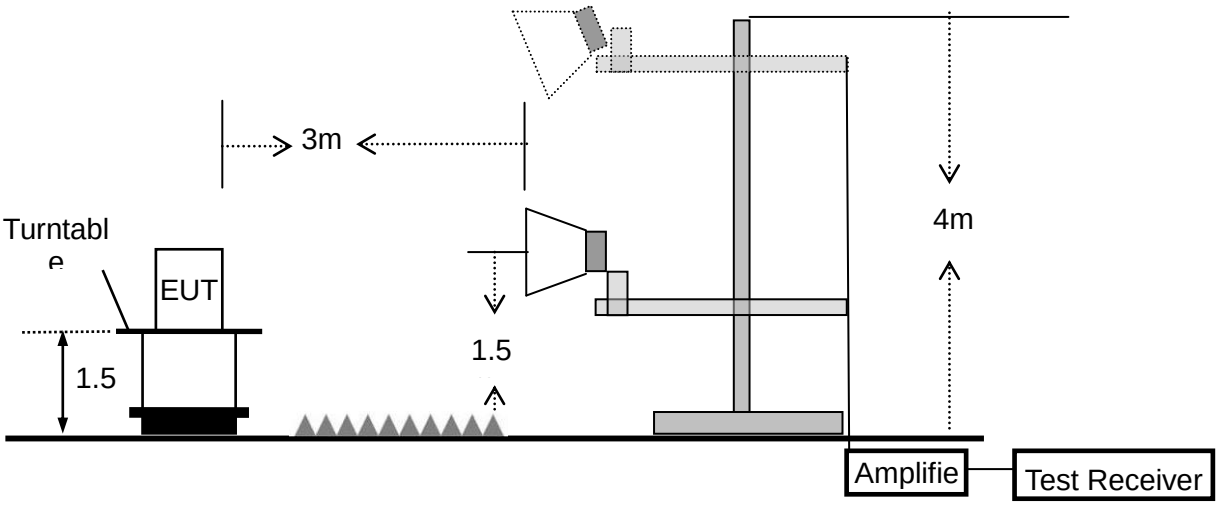
(a) For radiated emissions below 30MHz




(b) For radiated emissions from 30MHz to 1000MHz




(c) For radiated emissions above 1000MHz



### 3.2.5 TEST PROCEDURE

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2013. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.
This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT.
Use the following spectrum analyzer settings:

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start Frequency | 1000 MHz |
| Stop Frequency | 10th carrier harmonic |
| RB / VB (emission in restricted band) | 1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average |

| Receiver Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start ~ Stop Frequency | 9kHz~150kHz / RB 200Hz for QP |
| Start ~ Stop Frequency | 150kHz~30MHz / RB 9kHz for QP |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB 120kHz for QP |

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

| Frequency Band (MHz) | Function | Resolution bandwidth | Video Bandwidth |
|---|---|---|---|
| 30 to 1000 | QP | 120 kHz | 300 kHz |
| Above 1000 | Peak | 1 MHz | 1 MHz |
| | Average | 1 MHz | 10 Hz |

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10*lg(100 [kHz]/narrower RBW [kHz]). , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

### 3.2.6 TEST RESULTS (9KHZ – 30 MHZ)

| | | | |
|---|---|---|---|
| EUT： | Hybrid tv box | Model Name ： | HCTR-G3 |
| Temperature： | 26 ℃ | Relative Humidity： | 54% |
| Pressure： | 1010 hPa | Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz |
| Test Mode ： | TX | Polarization : | -- |

| Freq. | Reading | Limit | Margin | State |
|---|---|---|---|---|
| (MHz) | (dBuV/m) | (dBuV/m) | (dB) | P/F |
| -- | -- | -- | -- | N/A |
| -- | -- | -- | -- | N/A |

**NOTE:**

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

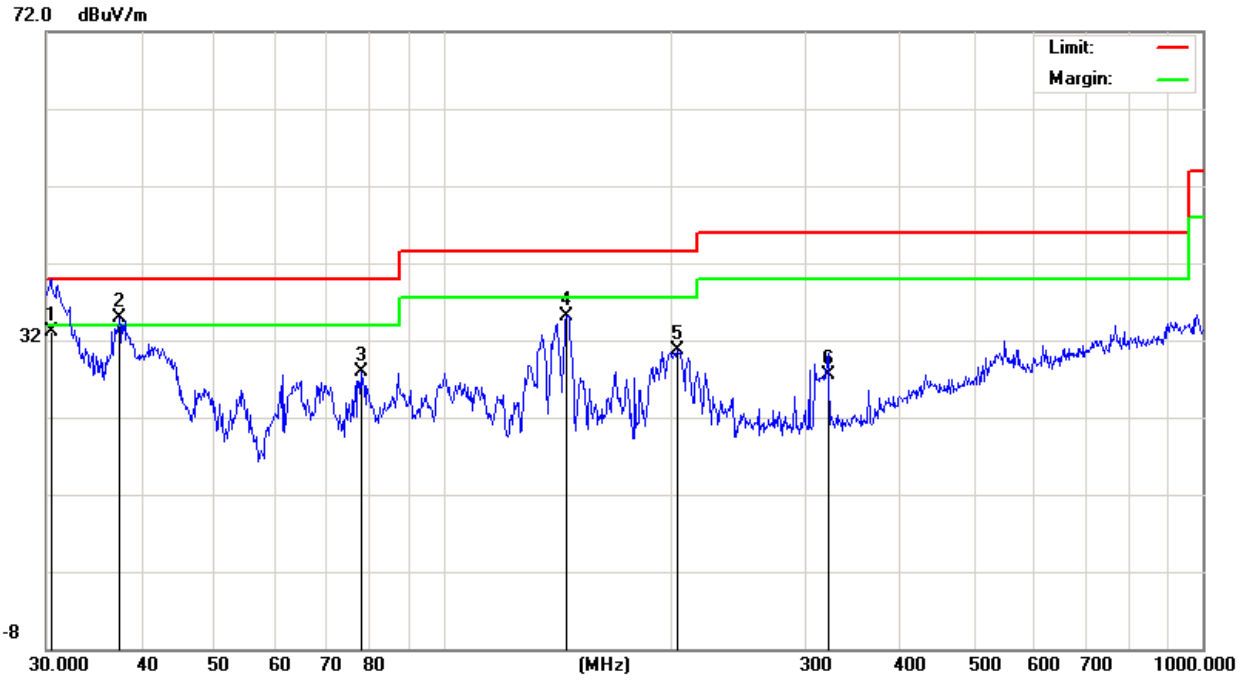
### 3.2.7 TEST RESULTS (30MHZ – 1GHZ)

| | | | |
|---|---|---|---|
| EUT： | Hybrid tv box | Model Name ： | HCTR-G3 |
| Temperature： | 25.2 | Relative Humidity： | 55 |
| Pressure： | 1010 hPa | Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz |
| Test Mode ： | TX(5.2G)- 802.11n20 (Low CH) | | |

| Polar (H/V) | Frequency (MHz) | Meter Reading (dBuV) | Factor (dB) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| V | 30.4238 | 14.12 | 19.08 | 33.20 | 40.00 | -6.80 | QP |
| V | 37.4165 | 21.99 | 13.01 | 35.00 | 40.00 | -5.00 | QP |
| V | 77.8654 | 18.42 | 9.49 | 27.91 | 40.00 | -12.09 | QP |
| V | 145.3506 | 24.55 | 10.57 | 35.12 | 43.50 | -8.38 | QP |
| V | 203.5228 | 19.04 | 11.70 | 30.74 | 43.50 | -12.76 | QP |
| V | 322.1886 | 11.81 | 15.60 | 27.41 | 46.00 | -18.59 | QP |

**Remark:**

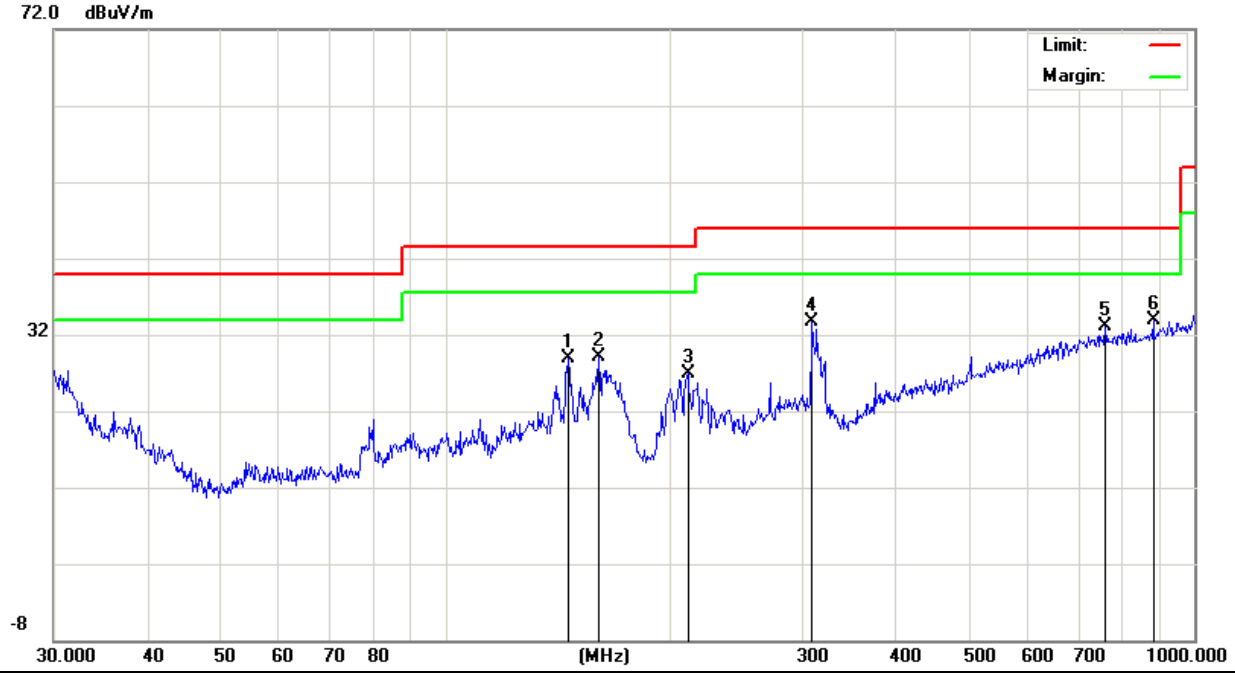
Emission Level= Meter Reading+ Factor, Margin= Emission Level - Limit



| Polar (H/V) | Frequency (MHz) | Meter Reading (dBuV) | Factor (dB) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| H | 145.8611 | 18.44 | 10.46 | 28.90 | 43.50 | -14.60 | QP |
| H | 160.3456 | 18.61 | 10.47 | 29.08 | 43.50 | -14.42 | QP |
| H | 210.7860 | 15.03 | 11.85 | 26.88 | 43.50 | -16.62 | QP |
| H | 308.9126 | 18.32 | 15.34 | 33.66 | 46.00 | -12.34 | QP |
| H | 760.7036 | 7.82 | 25.23 | 33.05 | 46.00 | -12.95 | QP |
| H | 881.4067 | 8.00 | 25.93 | 33.93 | 46.00 | -12.07 | QP |

**Remark:**

Emission Level= Meter Reading+ Factor, Margin= Emission Level - Limit

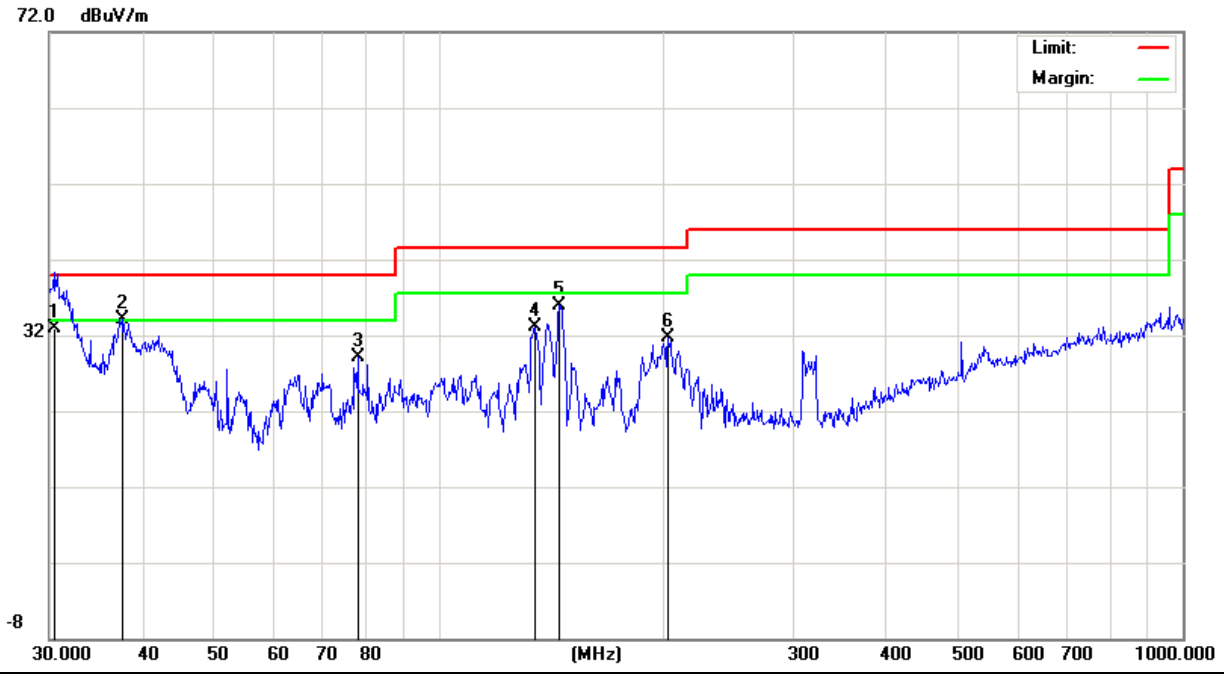


| | | | |
|---|---|---|---|
| EUT： | Hybrid tv box | Model Name ： | HCTR-G3 |
| Temperature： | 25.2 | Relative Humidity： | 55 |
| Pressure： | 1010 hPa | Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz |
| Test Mode ： | TX(5.8G) - 802.11ac20 (Low CH) | | |

| Polar (H/V) | Frequency (MHz) | Meter Reading (dBuV) | Factor (dB) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| V | 30.4238 | 13.82 | 19.08 | 32.90 | 40.00 | -7.10 | QP |
| V | 37.5479 | 21.16 | 12.91 | 34.07 | 40.00 | -5.93 | QP |
| V | 77.8654 | 19.61 | 9.49 | 29.10 | 40.00 | -10.90 | QP |
| V | 134.5592 | 22.56 | 10.53 | 33.09 | 43.50 | -10.41 | QP |
| V | 145.3506 | 25.36 | 10.57 | 35.93 | 43.50 | -7.57 | QP |
| V | 203.5228 | 20.05 | 11.70 | 31.75 | 43.50 | -11.75 | QP |

**Remark:**

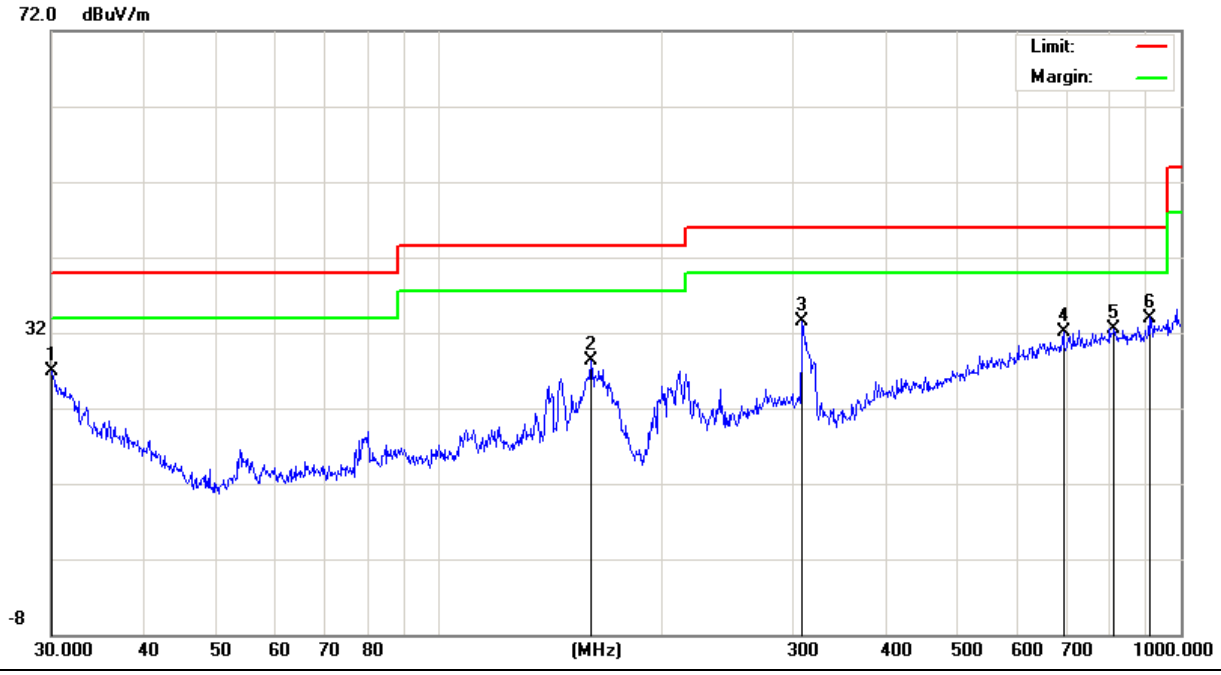
Emission Level= Meter Reading+ Factor, Margin= Emission Level - Limit



| Polar (H/V) | Frequency (MHz) | Meter Reading (dBuV) | Factor (dB) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| H | 30.1052 | 7.34 | 19.50 | 26.84 | 40.00 | -13.16 | QP |
| H | 160.3455 | 17.85 | 10.47 | 28.32 | 43.50 | -15.18 | QP |
| H | 308.9125 | 18.10 | 15.34 | 33.44 | 46.00 | -12.56 | QP |
| H | 694.4174 | 7.71 | 24.33 | 32.04 | 46.00 | -13.96 | QP |
| H | 813.1114 | 6.65 | 25.79 | 32.44 | 46.00 | -13.56 | QP |
| H | 906.4823 | 7.72 | 26.28 | 34.00 | 46.00 | -12.00 | QP |

**Remark:**

Emission Level= Meter Reading+ Factor, Margin= Emission Level - Limit




Note:All modes have been tested, just the the worst mode has been recorded in the report.

### 3.2.8 TEST RESULTS (1GHz-18GHz)

| EUT： | Hybrid tv box | Model Name. ： | HCTR-G3 |
|---|---|---|---|
| Temperature： | 20 ℃ | Relative Humidity： | 48% |
| Pressure： | 1010 hPa | Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz |
| Test Mode ： | TX(5.2G) - 802.11n20 _5180~5240MHz | | |

| Polar | Frequency | Meter Reading | Cable loss | Antenna Factor | Preamp Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|---|---|---|
| (H/V) | (MHz) | (dBuV) | (dB) | dB/m | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| Low Channel (5180 MHz)-Above 1G | | | | | | | | | |
| Vertical | 3015 | 64.37 | 5.94 | 35.40 | 44.00 | 61.71 | 68.2 | -6.49 | Pk |
| Vertical | 10380 | 60.83 | 8.46 | 39.75 | 44.50 | 64.54 | 68.2 | -3.66 | Pk |
| Vertical | 15570 | 63.45 | 10.12 | 38.80 | 44.10 | 68.27 | 74 | -5.73 | Pk |
| Vertical | 15570 | 43.29 | 10.12 | 38.80 | 42.70 | 49.51 | 54 | -4.49 | AV |
| Horizontal | 2981 | 65.02 | 5.94 | 35.18 | 44.00 | 62.14 | 68.2 | -6.06 | Pk |
| Horizontal | 10380 | 62.02 | 8.46 | 38.71 | 44.50 | 64.69 | 68.2 | -3.51 | Pk |
| Horizontal | 15570 | 62.35 | 10.12 | 38.38 | 44.10 | 66.75 | 74 | -7.25 | Pk |
| Horizontal | 15570 | 41.53 | 10.12 | 38.38 | 44.10 | 45.93 | 54 | -8.07 | AV |
| Middle Channel (5200 MHz)-Above 1G | | | | | | | | | |
| Vertical | 3561 | 64.75 | 6.48 | 36.35 | 44.05 | 63.53 | 68.2 | -4.67 | Pk |
| Vertical | 10460 | 62.97 | 8.47 | 37.88 | 44.51 | 64.81 | 68.2 | -3.39 | Pk |
| Vertical | 15690 | 60.87 | 10.12 | 38.8 | 44.1 | 65.69 | 74 | -8.31 | Pk |
| Vertical | 15690 | 44.09 | 10.12 | 38.8 | 42.7 | 50.31 | 54 | -3.69 | AV |
| Horizontal | 3363 | 64.15 | 6.48 | 36.37 | 44.05 | 62.95 | 68.2 | -5.25 | Pk |
| Horizontal | 10400 | 60.85 | 8.47 | 38.64 | 44.5 | 63.46 | 68.2 | -4.74 | Pk |
| Horizontal | 15600 | 61.76 | 10.12 | 38.38 | 44.1 | 66.16 | 74 | -7.84 | Pk |
| Horizontal | 15600 | 46.12 | 10.12 | 38.38 | 44.1 | 50.52 | 54 | -3.48 | AV |
| High Channel (5240 MHz)-Above 1G | | | | | | | | | |
| Vertical | 3926 | 63.99 | 7.1 | 37.24 | 43.5 | 64.83 | 74 | -9.17 | Pk |
| Vertical | 3926 | 46.18 | 7.1 | 37.24 | 43.5 | 47.02 | 54 | -6.98 | AV |
| Vertical | 10480 | 63.18 | 8.46 | 37.68 | 44.5 | 64.82 | 68.2 | -3.38 | Pk |
| Vertical | 15720 | 58.67 | 10.12 | 38.8 | 44.1 | 63.49 | 74 | -10.51 | Pk |
| Vertical | 15720 | 35.77 | 10.12 | 38.8 | 42.7 | 41.99 | 54 | -12.01 | AV |
| Horizontal | 3885 | 67.40 | 7.1 | 37.24 | 43.5 | 68.24 | 74 | -5.76 | Pk |
| Horizontal | 3885 | 42.72 | 7.1 | 37.24 | 43.5 | 43.56 | 54 | -10.44 | AV |
| Horizontal | 10480 | 60.06 | 8.46 | 38.57 | 44.5 | 62.59 | 68.2 | -5.61 | Pk |
| Horizontal | 15720 | 61.68 | 10.12 | 38.38 | 44.1 | 66.08 | 74 | -7.92 | Pk |
| Horizontal | 15720 | 41.82 | 10.12 | 38.38 | 44.1 | 46.22 | 54 | -7.78 | AV |

Note:"802.11n20 (5G)" mode is the worst mode. PK value is lower than the Average value limit, So average didn't record.

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

| EUT： | Hybrid tv box | Model Name. ： | HCTR-G3 |
|---|---|---|---|
| Temperature： | 20 ℃ | Relative Humidity： | 48% |
| Pressure： | 1010 hPa | Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz |
| Test Mode ： | TX (5.8G) -- 802.11ac20 _5745~5825MHz | | |

| Polar | Frequency | Meter Reading | Cable loss | Antenna Factor | Preamp Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|---|---|---|
| (H/V) | (MHz) | (dBuV) | (dB) | dB/m | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| Low Channel (5745 MHz)-Above 1G | | | | | | | | | |
| Vertical | 2806 | 67.41 | 5.94 | 35.40 | 44.00 | 64.75 | 74.00 | -9.25 | Pk |
| Vertical | 2806 | 45.48 | 5.94 | 35.40 | 44.00 | 42.82 | 54.00 | -11.18 | AV |
| Vertical | 11490 | 62.24 | 8.46 | 39.75 | 44.50 | 65.95 | 74.00 | -8.05 | Pk |
| Vertical | 11490 | 43.58 | 8.46 | 39.75 | 44.50 | 47.29 | 54.00 | -6.71 | AV |
| Vertical | 17235 | 52.35 | 10.12 | 38.80 | 44.10 | 57.17 | 68.20 | -11.03 | Pk |
| Horizontal | 2911 | 60.74 | 5.94 | 35.18 | 44.00 | 57.86 | 68.20 | -10.34 | Pk |
| Horizontal | 11490 | 62.44 | 8.46 | 38.71 | 44.50 | 65.11 | 74.00 | -8.89 | Pk |
| Horizontal | 11490 | 39.04 | 8.46 | 38.71 | 44.50 | 41.71 | 54.00 | -12.29 | AV |
| Horizontal | 17235 | 54.43 | 10.12 | 38.38 | 44.10 | 58.83 | 68.20 | -9.37 | Pk |
| middle Channel (5785 MHz)-Above 1G | | | | | | | | | |
| Vertical | 3763 | 62.81 | 6.48 | 36.35 | 44.05 | 61.59 | 74.00 | -12.41 | Pk |
| Vertical | 3763 | 43.83 | 6.48 | 36.35 | 44.05 | 42.61 | 54.00 | -11.39 | AV |
| Vertical | 11570 | 63.42 | 8.47 | 37.88 | 44.51 | 65.26 | 74.00 | -8.74 | Pk |
| Vertical | 11570 | 41.65 | 8.47 | 37.88 | 44.51 | 43.49 | 54.00 | -10.51 | AV |
| Vertical | 17355 | 57.82 | 10.12 | 38.8 | 44.10 | 62.64 | 68.20 | -5.56 | Pk |
| Horizontal | 3561 | 51.60 | 6.48 | 36.37 | 44.05 | 50.40 | 68.20 | -17.80 | Pk |
| Horizontal | 11570 | 57.39 | 8.47 | 38.64 | 44.50 | 60.00 | 74.00 | -14.00 | Pk |
| Horizontal | 11570 | 40.72 | 8.47 | 38.64 | 44.50 | 43.33 | 54.00 | -10.67 | AV |
| Horizontal | 17355 | 55.68 | 10.12 | 38.38 | 44.10 | 60.08 | 68.20 | -8.12 | Pk |
| High Channel (5825 MHz)-Above 1G | | | | | | | | | |
| Vertical | 3907 | 60.31 | 7.10 | 37.24 | 43.50 | 61.15 | 74.00 | -12.85 | Pk |
| Vertical | 3907 | 43.11 | 7.10 | 37.24 | 43.50 | 43.95 | 54.00 | -10.05 | AV |
| Vertical | 11650 | 60.02 | 8.46 | 37.68 | 44.50 | 61.66 | 74.00 | -12.34 | Pk |
| Vertical | 11650 | 40.41 | 8.46 | 37.68 | 44.50 | 42.05 | 54.00 | -11.95 | AV |
| Vertical | 17475 | 52.77 | 10.12 | 38.8 | 44.10 | 57.59 | 68.20 | -10.61 | Pk |
| Horizontal | 3912 | 60.59 | 7.10 | 37.24 | 43.50 | 61.43 | 74.00 | -12.57 | Pk |
| Horizontal | 3912 | 39.65 | 7.10 | 37.24 | 43.50 | 40.49 | 54.00 | -13.51 | AV |
| Horizontal | 11650 | 60.64 | 8.46 | 38.57 | 44.50 | 63.17 | 74.00 | -10.83 | Pk |
| Horizontal | 11650 | 44.69 | 8.46 | 38.57 | 44.50 | 47.22 | 54.00 | -6.78 | AV |
| Horizontal | 17475 | 53.89 | 10.12 | 38.38 | 44.10 | 58.29 | 68.20 | -9.91 | Pk |

Note:"802.11ac20(5G)" mode is the worst mode. PK value is lower than the Average value limit, So average didn't record.

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value

has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

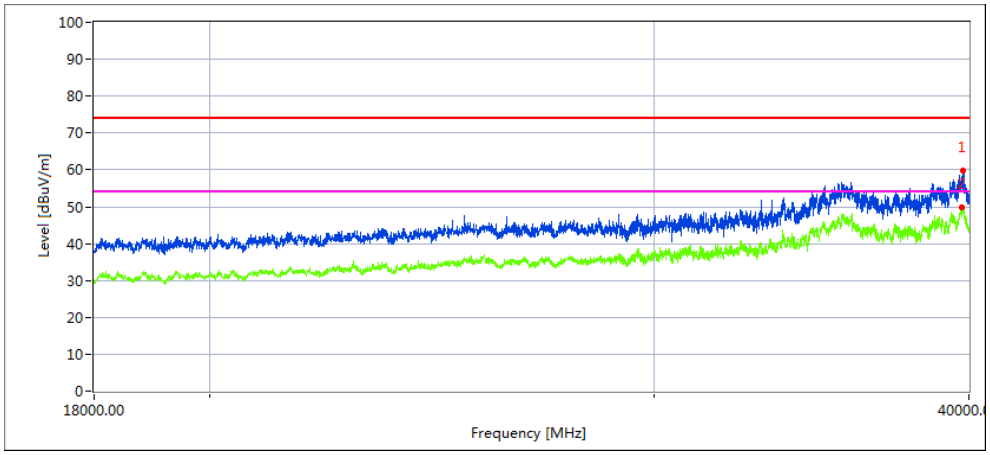
### 3.2.10 TEST ESULTS (18GHz-40GHz)

| | | | |
|---|---|---|---|
| EUT： | Hybrid tv box | Model Name. ： | HCTR-G3 |
| Temperature： | 20 ℃ | Relative Humidity： | 48% |
| Pressure： | 1010 hPa | Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz |
| Test Mode ： | TX (5.2G)-802.11ac20 5180MHz~5240MHz;<br>TX (5.8G)-802.11n20 5745MHz~5825MHz | | |

All the modulation modes have been tested, and the worst result was report as below:

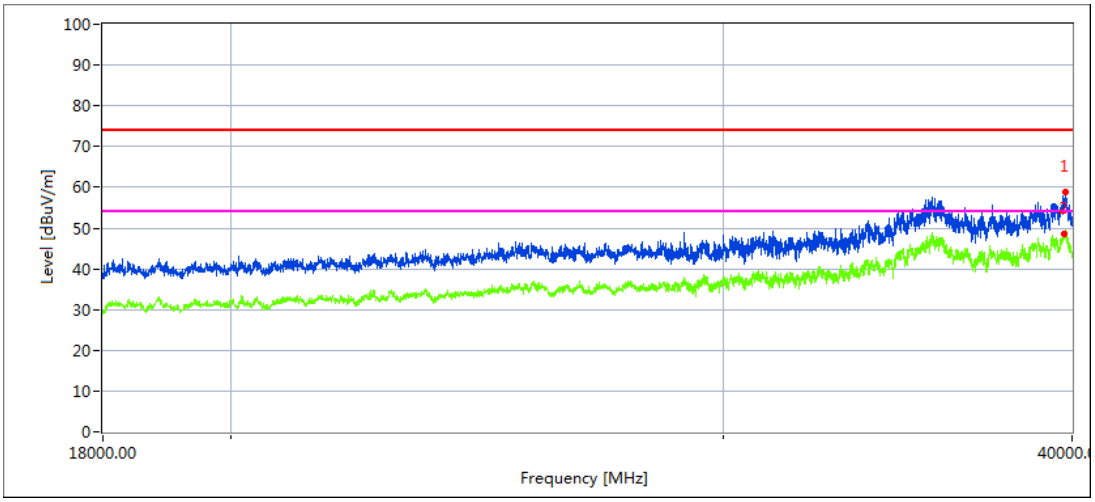
Low Channel (5180 MHz)-Above 1G

Horizontal




| Frequency | Meter Reading | Cable loss | Antenna Factor | Preamp Factor | Emission Level | Limits | Margin | Remark |
|---|---|---|---|---|---|---|---|---|
| 39733.954 | 38.83 | 20.09 | 44.1 | 43.22 | 59.8 | 68.2 | -8.4 | Peak |
| 39772.68 | 37.81 | 20.09 | 44.1 | 43.22 | 48 | 54 | -6.0 | AVG |

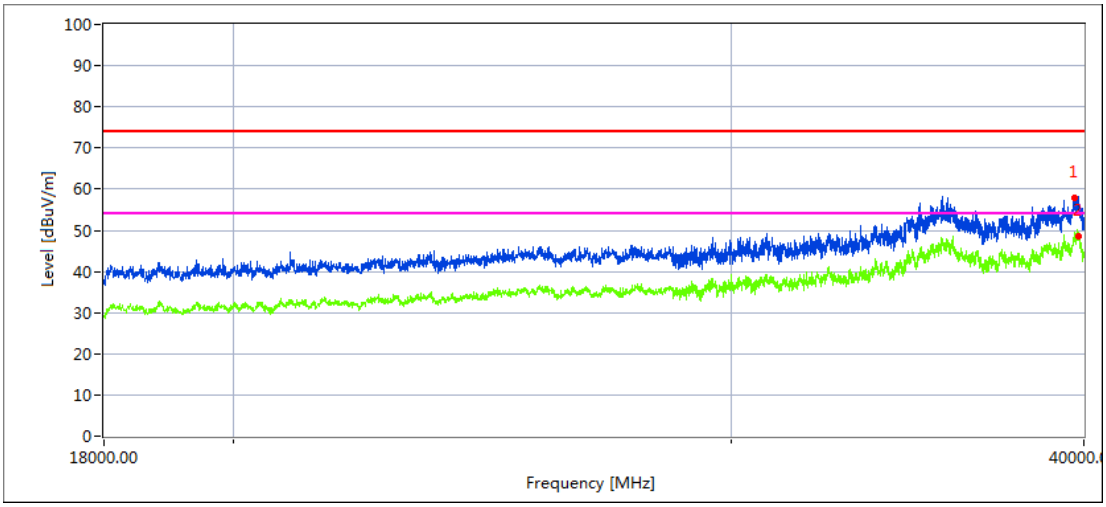
Vertical




| Frequency | Meter Reading | Cable loss | Antenna Factor | Preamp Factor | Emission Level | Limits | Margin | Remark |
|---|---|---|---|---|---|---|---|---|
| 39795.968 | 35.13 | 20.09 | 44.1 | 43.22 | 56.1 | 74 | -17.9 | Peak |
| 39744.430 | 36.41 | 20.09 | 44.1 | 43.22 | 46.6 | 54 | -7.4 | AVG |

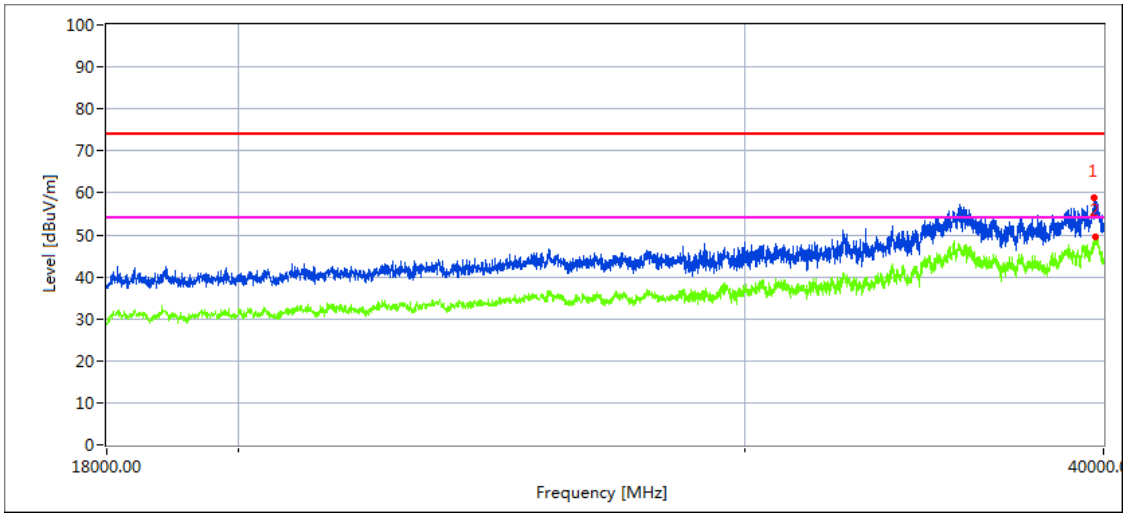
## High Channel (5240 MHz)-Above 1G

Horizontal




| Frequency | Meter Reading | Cable loss | Antenna Factor | Preamp Factor | Emission Level | Limits | Margin | Remark |
|---|---|---|---|---|---|---|---|---|
| 39703.444 | 33.23 | 20.09 | 44.1 | 43.22 | 54.2 | 74 | -19.8 | Peak |
| 39810.708 | 35.21 | 20.09 | 44.1 | 43.22 | 45.4 | 54 | -8.6 | AVG |

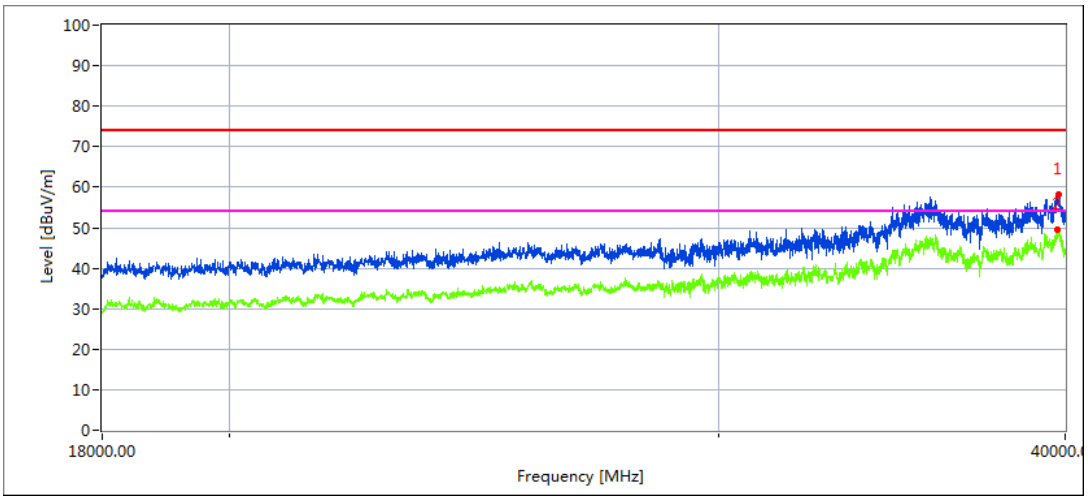
Vertical




| Frequency | Meter Reading | Cable loss | Antenna Factor | Preamp Factor | Emission Level | Limits | Margin | Remark |
|---|---|---|---|---|---|---|---|---|
| 39695.222 | 36.82 | 20.09 | 44.07 | 43.48 | 57.5 | 74 | -16.5 | Peak |
| 39727.584 | 38.54 | 20.09 | 44.07 | 43.48 | 48.7 | 54 | -5.3 | AVG |

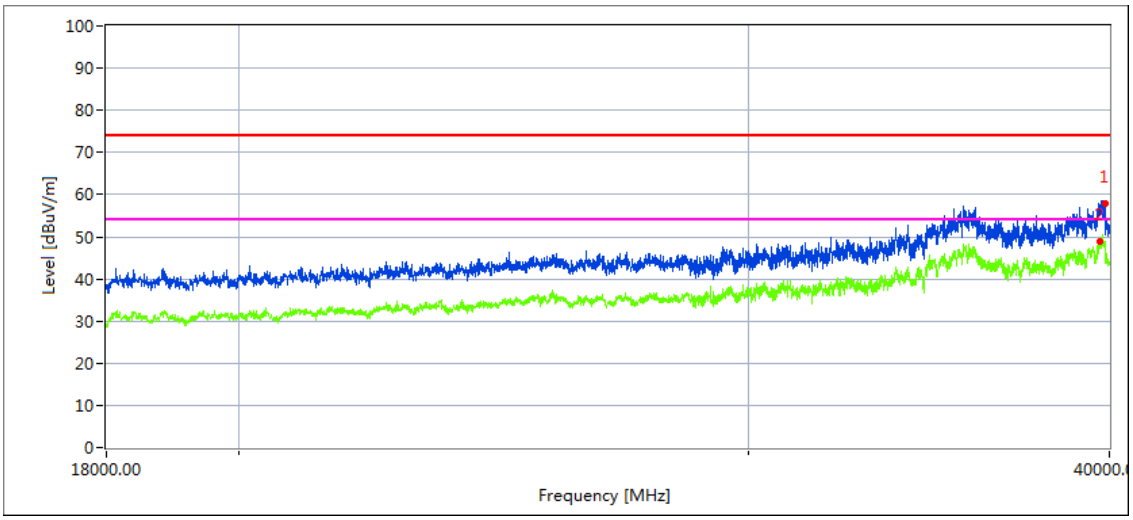
## Low Channel (5745 MHz)-Above 1G

Horizontal




| Frequency | Meter Reading | Cable loss | Antenna Factor | Preamp Factor | Emission Level | Limits | Margin | Remark |
|---|---|---|---|---|---|---|---|---|
| 39792.598 | 36.13 | 20.09 | 44.1 | 43.22 | 57.1 | 74 | -16.9 | Peak |
| 39754.520 | 36.81 | 20.09 | 44.1 | 43.22 | 47 | 54 | -7.0 | AVG |

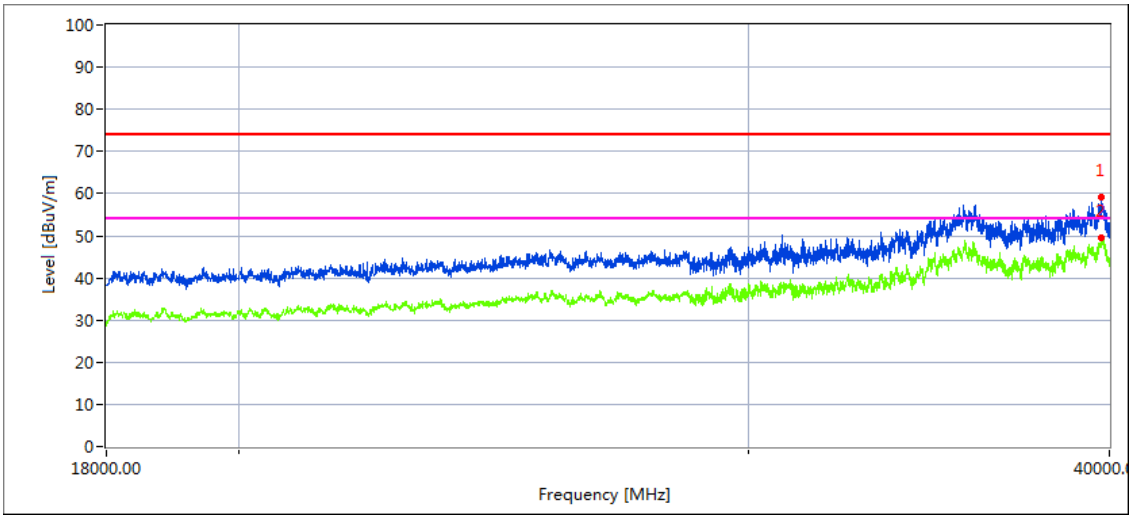
Vertical




| Frequency | Meter Reading | Cable loss | Antenna Factor | Preamp Factor | Emission Level | Limits | Margin | Remark |
|---|---|---|---|---|---|---|---|---|
| 39849.346 | 34.93 | 20.09 | 44.1 | 43.22 | 55.9 | 74 | -18.1 | Peak |
| 39710.458 | 35.01 | 20.09 | 44.1 | 43.22 | 45.2 | 54 | -8.8 | AVG |

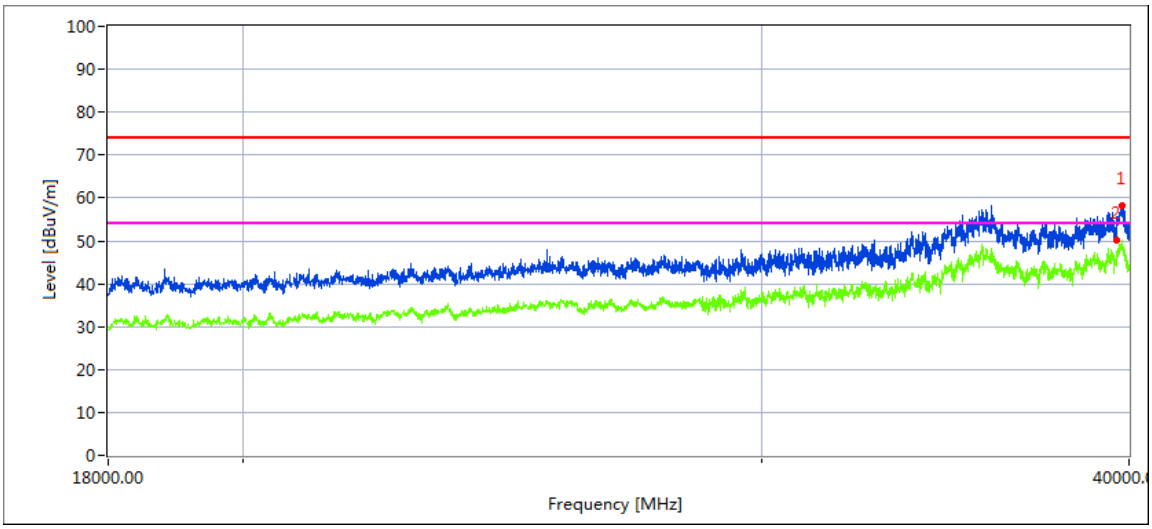
## High Channel (5825 MHz)-Above 1G

Horizontal




| Frequency | Meter Reading | Cable loss | Antenna Factor | Preamp Factor | Emission Level | Limits | Margin | Remark |
|---|---|---|---|---|---|---|---|---|
| 39794.598 | 35.63 | 20.09 | 44.1 | 43.22 | 56.6 | 74 | -17.4 | Peak |
| 39776.004 | 37.11 | 20.09 | 44.1 | 43.22 | 47.3 | 54 | -6.7 | AVG |

Vertical




| Frequency | Meter Reading | Cable loss | Antenna Factor | Preamp Factor | Emission Level | Limits | Margin | Remark |
|---|---|---|---|---|---|---|---|---|
| 39775.044 | 36.33 | 20.09 | 44.1 | 43.22 | 57.3 | 74 | -16.7 | Peak |
| 39600.636 | 34.01 | 20.09 | 44.1 | 43.22 | 44.2 | 54 | -9.8 | AVG |

3.2.11 Spurious Emission in Restricted Band 4.5GHz~5.150 GHz& 5.350GHz~5460GHz

| | | | |
|---|---|---|---|
| EUT： | Hybrid tv box | Model Name. ： | HCTR-G3 |
| Temperature： | 20 ℃ | Relative Humidity： | 48% |
| Pressure： | 1010 hPa | Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz |
| Test Mode ： | TX (5.2G)-802.11n20 5150MHz~5250MHz, | | |

All the modulation modes have been tested, The report just record the worst data mode.

| Frequency | Meter Reading | Cable Loss | Antenna Factor | Preamp Factor | Emission Level | Limits | Margin | Detector | Comment |
|---|---|---|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | dB/m | (dB) | (dBμV/m) | (dBμV/m) | (dB) | Type | |
| 5.2G WIFI-802.11a Mode | | | | | | | | | |
| 4500 | 63.51 | 5.2 | 35.6 | 44.2 | 60.11 | 74 | -13.89 | Pk | Horizontal |
| 4500 | 47.06 | 5.2 | 35.6 | 44.2 | 43.66 | 54 | -10.34 | AV | Horizontal |
| 4500 | 55.04 | 5.2 | 35.6 | 44.2 | 51.64 | 74 | -22.36 | Pk | Horizontal |
| 4500 | 41.45 | 5.2 | 35.6 | 44.2 | 38.05 | 54 | -15.95 | AV | Horizontal |
| 5150 | 70.63 | 5.36 | 35.66 | 44.22 | 67.43 | 74 | -6.57 | Pk | Horizontal |
| 5150 | 53.60 | 5.36 | 35.66 | 44.22 | 50.40 | 54 | -3.60 | AV | Horizontal |
| 5150 | 71.55 | 5.36 | 35.66 | 44.22 | 68.35 | 74 | -5.65 | Pk | Vertical |
| 5150 | 52.59 | 5.36 | 35.66 | 44.22 | 49.39 | 54 | -4.61 | AV | Vertical |
| 5350 | 62.79 | 5.68 | 35.68 | 44.22 | 59.93 | 74 | -14.07 | Pk | Vertical |
| 5350 | 43.18 | 5.68 | 35.68 | 44.22 | 40.32 | 54 | -13.68 | AV | Vertical |
| 5350 | 55.85 | 5.68 | 35.68 | 44.22 | 52.99 | 74 | -21.01 | Pk | Horizontal |
| 5350 | 39.82 | 5.68 | 35.68 | 44.22 | 36.96 | 54 | -17.04 | AV | Horizontal |

Note: (1) Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor

(2) “802.11n20 ” mode is the worst mode. When PK value is lower than the Average value limit, average don't record.

# 4. POWER SPECTRAL DENSITY TEST

## 4.1 APPLIED PROCEDURES / LIMIT

**According to FCC §15.407(a)**

For the band 5.15-5.25 GHz,

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz

(3)For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

,

## 4.2 TEST PROCEDURE

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.I.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

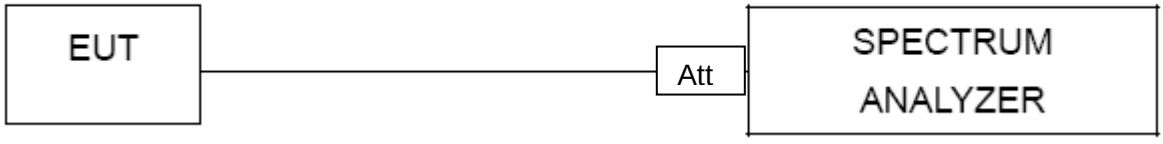
e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

## 4.3 DEVIATION FROM STANDARD

No deviation.

## 4.4 TEST SETUP




## 4.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

## 4.6 TEST RESULTS

| | | | |
|---|---|---|---|
| EUT： | Hybrid tv box | Model Name ： | HCTR-G3 |
| Temperature： | 26 ℃ | Relative Humidity： | 54% |
| Pressure： | 1015 hPa | Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz |
| Test Mode ： | TX Frequency Band 1 (5150-5250MHz), Band 2 (5745-5825MHz) | | |

Test data reference attachment.

# 5. 26DB & 99% EMISSION BANDWIDTH

## 5.1 APPLIED PROCEDURES / LIMIT

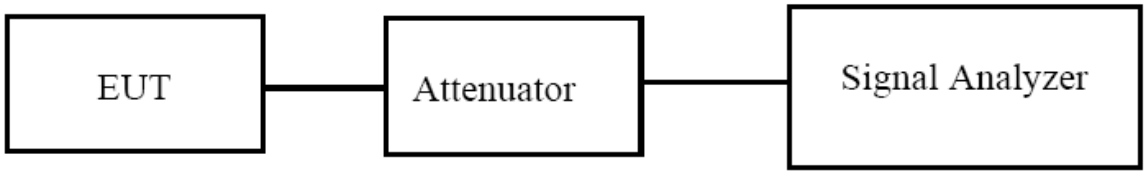
The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

## 5.2 TEST PROCEDURE

a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 · RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.



### 5.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

### 5.4 TEST RESULTS

| | | | |
|---|---|---|---|
| EUT： | Hybrid tv box | Model Name ： | HCTR-G3 |
| Temperature： | 26 ℃ | Relative Humidity： | 54% |
| Pressure： | 1012 hPa | Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz |
| Test Mode ： | TX Frequency Band 1 (5150-5250MHz), Band 2 (5745-5825MHz) | | |

Test data reference attachment.

# 6. MINIMUM 6 DB BANDWIDTH

## 6.1 APPLIED PROCEDURES / LIMIT

**According to FCC §15.407(e)**

(e) Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

## 6.2 TEST PROCEDURE

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

a) Set RBW = 100 kHz.

b) Set the video bandwidth (VBW) ≥ 3 × RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Sweep = auto couple.

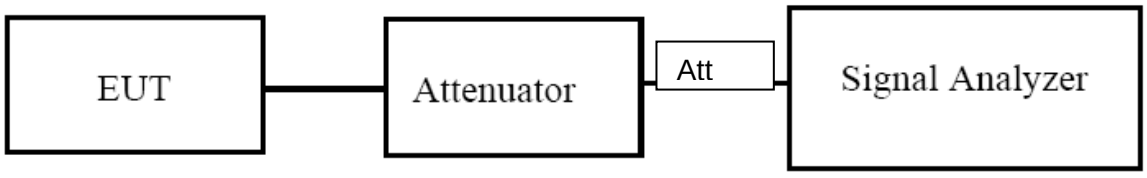
f) Allow the trace to stabilize.

g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

## 6.3 DEVIATION FROM STANDARD

No deviation.

## 6.4 TEST SETUP




## 6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

## 6.6 TEST RESULTS

| | | | |
|---|---|---|---|
| EUT： | Hybrid tv box | Model Name ： | HCTR-G3 |
| Temperature： | 26 ℃ | Relative Humidity： | 54% |
| Pressure： | 1012 hPa | Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz |
| Test Mode ： | TX (5G) Mode Frequency Band 2 (5725-5850MHz) | | |

Test data reference attachment.

# 7. MAXIMUM CONDUCTED OUTPUT POWER

## 7.1 PPLIED PROCEDURES / LIMIT

**According to FCC §15.407**

The maximum conduced output power should not exceed:

| Frequency Band(MHz) | Limit |
|---|---|
| 5150~5250 | 1W |
| 5725~5850 | 1W |

7.2 TEST PROCEDURE

· Method PM is Measurement using an RF average power meter. The procedure for this method is as follows:

a) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the following conditions are satisfied:

1) The EUT is configured to transmit continuously, or to transmit with a constant duty cycle.

2) At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.

3) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

b) If the transmitter does not transmit continuously, measure the duty cycle D of the transmitter output signal as described in 12.2.

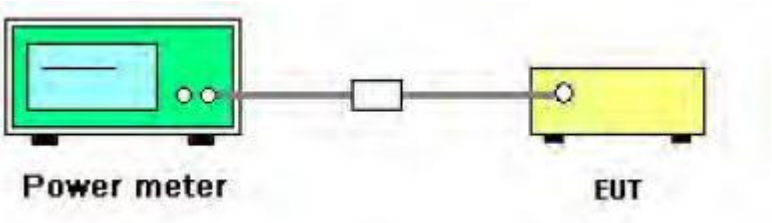
c) Measure the average power of the transmitter. This measurement is an average over both the ON and OFF periods of the transmitter.

d) Adjust the measurement in dBm by adding [10 log (1 / D)], where D is the duty cycle {e.g., [10 log (1 / 0.25)], if the duty cycle is 25%}.

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP




6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

## 7.5 TEST RESULTS

| | | | |
|---|---|---|---|
| EUT： | Hybrid tv box | Model Name ： | HCTR-G3 |
| Temperature： | 26 ℃ | Relative Humidity： | 54% |
| Pressure： | 1012 hPa | Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz |
| Test Mode ： | TX Frequency Band 1 (5150-5250MHz), Band 2 (5745-5825MHz) | | |

Test data reference attachment.

# 8. OUT OF BAND EMISSIONS

## 8.1 APPLICABLE STANDARD

**According to FCC §15.407(b)**

Undesirable emission limits. Except as shown in paragraph (b)(8) (9) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(2) For transmitters operating in the 5.725-5.85 GHz band: For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

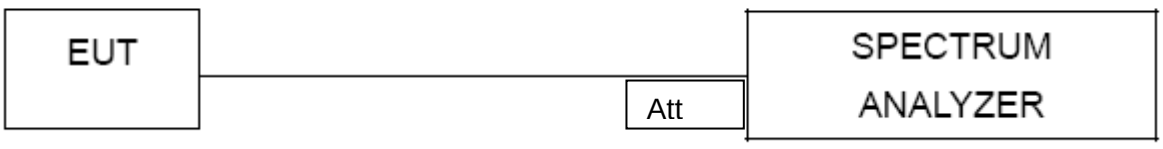
## 8.2 TEST PROCEDURE

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

## 8.3 DEVIATION FROM STANDARD

No deviation.

## 8.4 TEST SETUP




## 8.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

## 8.6 TEST RESULTS

| | | | |
|---|---|---|---|
| EUT： | Hybrid tv box | Model Name ： | HCTR-G3 |
| Temperature： | 26 ℃ | Relative Humidity： | 54% |
| Pressure： | 1012 hPa | Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz |

Test data reference attachment.

## 9. Frequency Stability Measurement

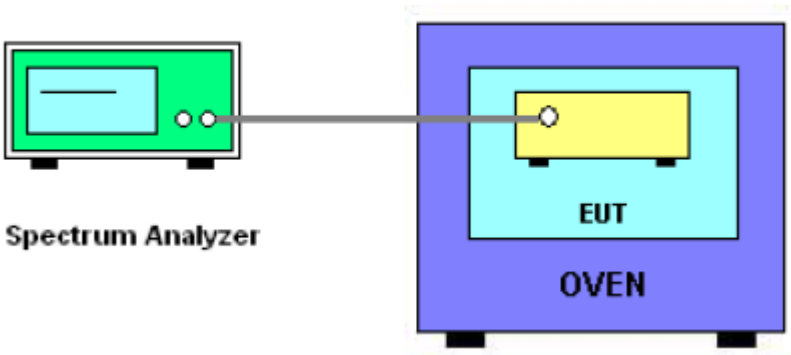
### 9.1 LIMIT

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

### 9.2 TEST PROCEDURES

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × $10_6$ ppm and the limit is less than ±20ppm (IEEE 802.11nspecification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is -20°C~70°C.

### 9.3 TEST SETUP LAYOUT




### 9.4 EUT OPERATION DURING TEST

1. The EUT was programmed to be in continuously un-modulation transmitting mode.
2. The has two antennas, and the worst data is Antenna 1, only shown Antenna 1 Plot.

9.5 TEST RESULTS

| EUT： | Hybrid tv box | Model Name. ： | HCTR-G3 |
|---|---|---|---|
| Temperature： | 25 ℃ | Relative Humidity： | 56% |
| Pressure： | 1012 hPa | Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz |
| Test Mode ： | TX Frequency Band I (5150-5250MHz) | | |

Voltage vs. Frequency Stability

| TEST CONDITIONS | | | | Reference Frequency：5180MHz | | | |
|---|---|---|---|---|---|---|---|
| | | | | f | fc | Max. Deviation (MHz) | Max. Deviation (ppm) |
| T nom (°C) | 20 | V nom (V) | 12.00 | 5180.0003 | 5180 | 0.0003 | 0.0595 |
| | | V max (V) | 12.75 | 5180.0012 | 5180 | 0.0012 | 0.2411 |
| | | V min (V) | 11.25 | 5180.0012 | 5180 | 0.0012 | 0.2221 |
| Limits | | | | Within 5150-5250MHz | | | |
| Result | | | | Complies | | | |

Temperature vs. Frequency Stability

| TEST CONDITIONS | | | | Reference Frequency：5180MHz | | | |
|---|---|---|---|---|---|---|---|
| | | | | f | fc | Max. Deviation (MHz) | Max. Deviation (ppm) |
| V nom (V) | 5 | T (°C) | -20 | 5180.0009 | 5180 | 0.0009 | 0.1687 |
| | | T (°C) | -10 | 5180.0020 | 5180 | 0.0020 | 0.3776 |
| | | T (°C) | 0 | 5180.0011 | 5180 | 0.0011 | 0.2156 |
| | | T (°C) | 10 | 5180.0002 | 5180 | 0.0002 | 0.0331 |
| | | T (°C) | 20 | 5180.0012 | 5180 | 0.0012 | 0.2312 |
| | | T (°C) | 30 | 5180.0009 | 5180 | 0.0009 | 0.1804 |
| | | T (°C) | 40 | 5180.0006 | 5180 | 0.0006 | 0.1205 |
| | | T (°C) | 50 | 5180.0018 | 5180 | 0.0018 | 0.3390 |
| | | T (°C) | 60 | 5180.0011 | 5180 | 0.0011 | 0.2073 |
| | | T (°C) | 70 | 5180.0002 | 5180 | 0.0002 | 0.0446 |
| Limits | | | | Within 5150-5250MHz | | | |
| Result | | | | Complies | | | |

Voltage vs. Frequency Stability

| TEST CONDITIONS | | | | Reference Frequency：5200MHz | | | |
|---|---|---|---|---|---|---|---|
| | | | | f | fc | Max. Deviation (MHz) | Max. Deviation (ppm) |
| T nom (°C) | 20 | V nom (V) | 12.00 | 5200.0009 | 5200 | 0.0009 | 0.1684 |
| | | V max (V) | 12.75 | 5200.0006 | 5200 | 0.0006 | 0.1225 |
| | | V min (V) | 11.25 | 5200.0004 | 5200 | 0.0004 | 0.0726 |
| Limits | | | | Within 5150-5250MHz | | | |
| Result | | | | Complies | | | |

Temperature vs. Frequency Stability

| TEST CONDITIONS | | | | Reference Frequency：5200MHz | | | |
|---|---|---|---|---|---|---|---|
| | | | | f | fc | Max. Deviation (MHz) | Max. Deviation (ppm) |
| V nom (V) | 5 | T (°C) | -20 | 5200.0015 | 5200 | 0.0015 | 0.2827 |
| | | T (°C) | -10 | 5200.0017 | 5200 | 0.0017 | 0.3346 |
| | | T (°C) | 0 | 5200.0010 | 5200 | 0.0010 | 0.1834 |
| | | T (°C) | 10 | 5200.0011 | 5200 | 0.0011 | 0.2184 |
| | | T (°C) | 20 | 5200.0019 | 5200 | 0.0019 | 0.3679 |
| | | T (°C) | 30 | 5200.0013 | 5200 | 0.0013 | 0.2419 |
| | | T (°C) | 40 | 5200.0013 | 5200 | 0.0013 | 0.2566 |
| | | T (°C) | 50 | 5200.0017 | 5200 | 0.0017 | 0.3239 |
| | | T (°C) | 60 | 5200.0007 | 5200 | 0.0007 | 0.1360 |
| | | T (°C) | 70 | 5200.0008 | 5200 | 0.0008 | 0.1620 |
| Limits | | | | Within 5150-5250MHz | | | |
| Result | | | | Complies | | | |

Voltage vs. Frequency Stability

| TEST CONDITIONS | | | | Reference Frequency：5240MHz | | | |
|---|---|---|---|---|---|---|---|
| | | | | f | fc | Max. Deviation (MHz) | Max. Deviation (ppm) |
| T nom (°C) | 20 | V nom (V) | 12.00 | 5240.0003 | 5240 | 0.0003 | 0.0562 |
| | | V max (V) | 12.75 | 5240.0018 | 5240 | 0.0018 | 0.3430 |
| | | V min (V) | 11.25 | 5240.0012 | 5240 | 0.0012 | 0.2208 |
| Limits | | | | Within 5150-5250MHz | | | |
| Result | | | | Complies | | | |

Temperature vs. Frequency Stability

| TEST CONDITIONS | | | | Reference Frequency：5240MHz | | | |
|---|---|---|---|---|---|---|---|
| | | | | f | fc | Max. Deviation (MHz) | Max. Deviation (ppm) |
| V nom (V) | 5 | T (°C) | -20 | 5240.0002 | 5240 | 0.0002 | 0.0379 |
| | | T (°C) | -10 | 5240.0019 | 5240 | 0.0019 | 0.3634 |
| | | T (°C) | 0 | 5240.0013 | 5240 | 0.0013 | 0.2391 |
| | | T (°C) | 10 | 5240.0016 | 5240 | 0.0016 | 0.3070 |
| | | T (°C) | 20 | 5240.0006 | 5240 | 0.0006 | 0.1221 |
| | | T (°C) | 30 | 5240.0011 | 5240 | 0.0011 | 0.2011 |
| | | T (°C) | 40 | 5240.0009 | 5240 | 0.0009 | 0.1732 |
| | | T (°C) | 50 | 5240.0003 | 5240 | 0.0003 | 0.0619 |
| | | T (°C) | 60 | 5240.0012 | 5240 | 0.0012 | 0.2210 |
| | | T (°C) | 70 | 5240.0005 | 5240 | 0.0005 | 0.0863 |
| Limits | | | | Within 5150-5250MHz | | | |
| Result | | | | Complies | | | |

| | | | |
|---|---|---|---|
| EUT： | Hybrid tv box | Model Name. ： | HCTR-G3 |
| Temperature： | 25 ℃ | Relative Humidity： | 56% |
| Pressure： | 1012 hPa | Test Voltage ： | DC 12V powered by Adapter AC 120V/60Hz |
| Test Mode ： | TX Frequency(5745-5850MHz) | | |

Voltage vs. Frequency Stability

| TEST CONDITIONS | | | | Reference Frequency：5745MHz | | | |
|---|---|---|---|---|---|---|---|
| | | | | f | fc | Max. Deviation (MHz) | Max. Deviation (ppm) |
| T nom (°C) | 20 | V nom (V) | 12.00 | 5745.0001 | 5745 | 0.0001 | 0.0142 |
| | | V max (V) | 12.75 | 5745.0012 | 5745 | 0.0012 | 0.2171 |
| | | V min (V) | 11.25 | 5745.0011 | 5745 | 0.0011 | 0.1857 |
| Limits | | | | Within 5745-5850MHz | | | |
| Result | | | | Complies | | | |

Temperature vs. Frequency Stability

| TEST CONDITIONS | | | | Reference Frequency：5745MHz | | | |
|---|---|---|---|---|---|---|---|
| | | | | f | fc | Max. Deviation (MHz) | Max. Deviation (ppm) |
| V nom (V) | 5 | T (°C) | -20 | 5745.0009 | 5745 | 0.0009 | 0.1611 |
| | | T (°C) | -10 | 5745.0012 | 5745 | 0.0012 | 0.2144 |
| | | T (°C) | 0 | 5745.0012 | 5745 | 0.0012 | 0.2093 |
| | | T (°C) | 10 | 5745.0000 | 5745 | 0.0000 | 0.0015 |
| | | T (°C) | 20 | 5745.0018 | 5745 | 0.0018 | 0.3085 |
| | | T (°C) | 30 | 5745.0009 | 5745 | 0.0009 | 0.1494 |
| | | T (°C) | 40 | 5745.0015 | 5745 | 0.0015 | 0.2589 |
| | | T (°C) | 50 | 5745.0018 | 5745 | 0.0018 | 0.3168 |
| | | T (°C) | 60 | 5745.0006 | 5745 | 0.0006 | 0.1054 |
| | | T (°C) | 70 | 5745.0009 | 5745 | 0.0009 | 0.1612 |
| Limits | | | | Within 5745-5850MHz | | | |
| Result | | | | Complies | | | |

Voltage vs. Frequency Stability

| TEST CONDITIONS | | | | Reference Frequency：5785MHz | | | |
|---|---|---|---|---|---|---|---|
| | | | | f | fc | Max. Deviation (MHz) | Max. Deviation (ppm) |
| T nom (°C) | 20 | V nom (V) | 12.00 | 5785.0009 | 5785 | 0.00093 | -0.1602 |
| | | V max (V) | 12.75 | 5785.0002 | 5785 | 0.00018 | -0.0314 |
| | | V min (V) | 11.25 | 5785.0005 | 5785 | 0.00047 | -0.0810 |
| Limits | | | | Within 5745-5850MHz | | | |
| Result | | | | Complies | | | |

Temperature vs. Frequency Stability

| TEST CONDITIONS | | | | Reference Frequency：5785MHz | | | |
|---|---|---|---|---|---|---|---|
| | | | | f | fc | Max. Deviation (MHz) | Max. Deviation (ppm) |
| V nom (V) | 5 | T (°C) | -20 | 5785.0007 | 5785 | 0.0007 | 0.1268 |
| | | T (°C) | -10 | 5785.0019 | 5785 | 0.0019 | 0.3343 |
| | | T (°C) | 0 | 5785.0006 | 5785 | 0.0006 | 0.1085 |
| | | T (°C) | 10 | 5785.0008 | 5785 | 0.0008 | 0.1330 |
| | | T (°C) | 20 | 5785.0019 | 5785 | 0.0019 | 0.3263 |
| | | T (°C) | 30 | 5785.0012 | 5785 | 0.0012 | 0.2014 |
| | | T (°C) | 40 | 5785.0006 | 5785 | 0.0006 | 0.1071 |
| | | T (°C) | 50 | 5785.0001 | 5785 | 0.0001 | 0.0126 |
| | | T (°C) | 60 | 5785.0008 | 5785 | 0.0008 | 0.1445 |
| | | T (°C) | 70 | 5785.0009 | 5785 | 0.0009 | 0.1620 |
| Limits | | | | Within 5745-5850MHz | | | |
| Result | | | | Complies | | | |

Voltage vs. Frequency Stability

| TEST CONDITIONS | | | | Reference Frequency：5825MHz | | | |
|---|---|---|---|---|---|---|---|
| | | | | f | fc | Max. Deviation (MHz) | Max. Deviation (ppm) |
| T nom (°C) | 20 | V nom (V) | 12.00 | 5825.0004 | 5825 | 0.0004 | 0.0613 |
| | | V max (V) | 12.75 | 5825.0014 | 5825 | 0.0014 | 0.2475 |
| | | V min (V) | 11.25 | 5825.0012 | 5825 | 0.0012 | 0.1993 |
| Limits | | | | Within 5745-5850MHz | | | |
| Result | | | | Complies | | | |

Temperature vs. Frequency Stability

| TEST CONDITIONS | | | | Reference Frequency：5825MHz | | | |
|---|---|---|---|---|---|---|---|
| | | | | f | fc | Max. Deviation (MHz) | Max. Deviation (ppm) |
| V nom (V) | 5 | T (°C) | -20 | | 5825 | 0.0018 | 0.3089 |
| | | T (°C) | -10 | 5825.0005 | 5825 | 0.0005 | 0.0888 |
| | | T (°C) | 0 | 5825.0015 | 5825 | 0.0015 | 0.2524 |
| | | T (°C) | 10 | 5825.0001 | 5825 | 0.0001 | 0.0132 |
| | | T (°C) | 20 | 5825.0014 | 5825 | 0.0014 | 0.2484 |
| | | T (°C) | 30 | 5825.0014 | 5825 | 0.0014 | 0.2384 |
| | | T (°C) | 40 | 5825.0012 | 5825 | 0.0012 | 0.2108 |
| | | T (°C) | 50 | 5825.0019 | 5825 | 0.0019 | 0.3181 |
| | | T (°C) | 60 | 5825.0013 | 5825 | 0.0013 | 0.2235 |
| | | T (°C) | 70 | 5825.0017 | 5825 | 0.0017 | 0.2988 |
| Limits | | | | Within 5745-5850MHz | | | |
| Result | | | | Complies | | | |

# 10. ANTENNA REQUIREMENT

## 10.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

## 10.2 EUT ANTENNA

The EUT antenna is permanent attached Antenna: FPC Antenna (Gain: 3dBi),
It comply with the standard requirement.

END OF REPORT