

FCC TEST REPORT
FOR
MICA ELECTRONICS CORP /DBA VOCOPRO
Wireless Receiver
Model No.: SmartTVoke

Prepared for : MICA ELECTRONICS CORP /DBA VOCOPRO
Address : 1728 CURTISS COURT. LA VERNE, CA 91750, USA

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Date of receipt of test sample : August 11, 2015
Number of tested samples : 1
Serial number : Prototype
Date of Test : August 11, 2015 - August 26, 2015
Date of Report : August 26, 2015

FCC TEST REPORT**FCC CFR 47 PART 15 C(15.249): 2014****Report Reference No. : LCS1508110592E**

Date of Issue : August 26, 2015

Testing Laboratory Name..... : Shenzhen LCS Compliance Testing Laboratory Ltd.Address : 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue,
Bao'an District, Shenzhen, Guangdong, ChinaTesting Location/ Procedure : Full application of Harmonised standards ☒Partial application of Harmonised standards ☐Other standard testing method ☐**Applicant's Name..... : MICA ELECTRONICS CORP /DBA VOCOPRO**

Address : 1728 CURTISS COURT. LA VERNE, CA 91750, USA

Test Specification

Standard : FCC CFR 47 PART 15 C(15.249): 2014

Test Report Form No. : LCSEMC-1.0

TRF Originator : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF : Dated 2011-03

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Test Item Description. : Wireless Receiver

Trade Mark : VOCOPRO

Model/ Type reference..... : SmartTVoke

Ratings : Adapter parameter: Input: AC 100~240V, 50/60Hz, 0.3A;
Output: DC 5V, 0.5A**Result : Positive****Compiled by:**

Jacky Li/ File administrators

Supervised by:

Glin Lu/ Technique principal

Approved by:

Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : LCS1508110592EAugust 26, 2015

Date of issue

Type / Model..... : SmartTV Oke

EUT..... : Wireless Receiver

Applicant..... : MICA ELECTRONICS CORP /DBA VOCOPRO

Address..... : 1728 CURTISS COURT. LA VERNE, CA 91750, USA

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Park,Nanshan District, Shenzhen,China

Telephone..... : /

Fax..... : /

Test Result**Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT : SmartTV Oke

Model Number : Wireless Receiver

Power Supply : DC 5.0V
Adapter parameter: Input: AC 100~240V, 50/60Hz,
0.3A; Output: DC 5V, 0.5A

Frequency Range : 2402.00-2480.00MHz

Channel frequency list : 2402+2(K-1)MHz, K=1, 2, 3.....40

Channel number : 40

Modulation Technology : GFSK

Antenna Type and Gain : PCB Antenna, 0 dBi(Max.)

1.2. Host System Configuration List and Details

| Manufacturer | Description | Model | Serial Number | Certificate |
|--------------|-------------|-----------------|---------------|-------------|
| -- | Adapter | JK050050-S02USD | -- | VOC |

1.3. External I/O

| I/O Port Description | Quantity | Cable |
|----------------------|----------|------------------|
| Aux | 2 | 1.5m, Unshielded |
| USB | 1 | N/A |
| MIC | 1 | N/A |
| Fiber | 1 | 1.5m, Unshielded |

1.4. Description of Test Facility

Site Description

EMC Lab. : CNAS Registration Number. is L4595.
FCC Registration Number. is 899208.
Industry Canada Registration Number. is 9642A-1.
VCCI Registration Number. is C-4260 and R-3804.
ESMD Registration Number. is ARCB0108.
UL Registration Number. is 100571-492.
TUV SUD Registration Number. is SCN1081.
TUV RH Registration Number. is UA 50296516-001

1.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.6. Measurement Uncertainty

| Test Item | | Frequency Range | Uncertainty | Note |
|------------------------|---|-----------------|---------------------|------|
| Radiation Uncertainty | : | 9KHz~30MHz | $\pm 3.10\text{dB}$ | (1) |
| | | 30MHz~200MHz | $\pm 2.96\text{dB}$ | (1) |
| | | 200MHz~1000MHz | $\pm 3.10\text{dB}$ | (1) |
| | | 1GHz~26.5GHz | $\pm 4.00\text{dB}$ | (1) |
| Conduction Uncertainty | : | 150kHz~30MHz | $\pm 1.63\text{dB}$ | (1) |
| Power disturbance | : | 30MHz~300MHz | $\pm 1.60\text{dB}$ | (1) |

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

1.7. Description Of Test Modes

The EUT operates in the unlicensed ISM band at 2.4GHz. The following operating modes were applied for the related test items. And the new battery is used during the measurement.

The EUT received DC 5.0V power from AC/DC adapter. All test modes were tested, only the result of the worst case was recorded in the report.

The EUT is considered a portable unit; it was pre-tested on the positioned of each 3 axis. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.

| Mode of Operations | Transmitting Frequency (MHz) |
|------------------------|------------------------------|
| GFSK | 2402 |
| | 2440 |
| | 2480 |
| For Conducted Emission | |
| Test Mode | TX Mode |
| For Radiated Emission | |
| Test Mode | TX Mode |

Note: The EUT is designed to use DC 5.0V for power supply.

2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd..

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209 and 15.249 under the FCC Rules Part 15 Subpart C.

2.3. General Test Procedures

2.3.1 Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10-2013

3. CONNECTION DIAGRAM OF TEST SYSTEM

3.1. Justification

The system was configured for testing in a continuous transmit condition.

3.2. EUT Exercise Software

N/A

3.3. Special Accessories

N/A

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST RESULTS

| FCC Rules | Description Of Test | Result |
|---|--------------------------------|-----------|
| §15.203 | Antenna Requirement | Compliant |
| §15.207(a) | Conduction Emissions | Compliant |
| §15.205(a), §15.209(a), §15.249(a), §15.249(c) | Radiated Emissions Measurement | Compliant |
| §15.249 | Band Edges Measurement | Compliant |
| §15.249, §15.215 | 20 dB Bandwidth | Compliant |

5. SUMMARY OF TEST EQUIPMENT

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|------|--------------------------|--------------------|----------------------------------|-------------|------------|------------|
| 1 | Power Sensor | R&S | NRV-Z51 | 100458 | 2015-06-18 | 2016-06-17 |
| 2 | Power Sensor | R&S | NRV-Z32 | 10057 | 2015-06-18 | 2016-06-17 |
| 3 | Power Meter | R&S | NRVS | 100444 | 2015-06-18 | 2016-06-17 |
| 4 | DC Filter | MPE | 23872C | N/A | 2015-06-18 | 2016-06-17 |
| 5 | RF Cable | Harbour Industries | 1452 | N/A | 2015-06-18 | 2016-06-17 |
| 6 | SMA Connector | Harbour Industries | 9625 | N/A | 2015-06-18 | 2016-06-17 |
| 7 | Spectrum Analyzer | Agilent | N9020A | MY50510140 | 2014-10-27 | 2015-10-26 |
| 8 | Signal analyzer | Agilent | E4448A(External mixers to 40GHz) | US44300469 | 2015-06-16 | 2016-06-15 |
| 9 | RF Cable | Hubersuhne | Sucoflex104 | FP2RX2 | 2015-06-18 | 2016-06-17 |
| 10 | 3m Semi Anechoic Chamber | SIDT FRANKONIA | SAC-3M | 03CH03-HY | 2015-06-18 | 2016-06-17 |
| 11 | Amplifier | SCHAFFNER | COA9231A | 18667 | 2015-06-18 | 2016-06-17 |
| 12 | Amplifier | Agilent | 8449B | 3008A02120 | 2015-06-16 | 2016-06-15 |
| 13 | Amplifier | MITEQ | AMF-6F-260400 | 9121372 | 2015-06-16 | 2016-06-15 |
| 14 | Loop Antenna | R&S | HFH2-Z2 | 860004/001 | 2015-06-18 | 2016-06-17 |
| 15 | By-log Antenna | SCHWARZBECK | VULB9163 | 9163-470 | 2015-06-10 | 2016-06-09 |
| 16 | Horn Antenna | EMCO | 3115 | 6741 | 2015-06-10 | 2016-06-09 |
| 17 | Horn Antenna | SCHWARZBECK | BBHA9170 | BBHA9170154 | 2015-06-10 | 2016-06-09 |
| 18 | RF Cable-R03m | Jye Bao | RG142 | CB021 | 2015-06-18 | 2016-06-17 |
| 19 | RF Cable-HIGH | SUHNER | SUCOFLEX 106 | 03CH03-HY | 2015-06-18 | 2016-06-17 |
| 20 | EMI Test Receiver | ROHDE & SCHWARZ | ESCI | 101142 | 2015-06-18 | 2016-06-17 |
| 21 | EMI Test Receiver | ROHDE & SCHWARZ | ESPI | 101840 | 2015-06-18 | 2016-06-17 |
| 22 | Artificial Mains | ROHDE & SCHWARZ | ENV216 | 101288 | 2015-06-18 | 2016-06-17 |
| 23 | EMI Test Software | AUDIX | E3 | N/A | 2015-06-18 | 2016-06-17 |
| 24 | Spectrum Analyzer | Agilent | E4407B | MY41440292 | 2015-06-16 | 2016-06-15 |

6. ANTENNA REQUIREMENT

6.1. Standard Applicable

According to §15.203 & RSS-Gen, Antenna requirement.

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be re-placed by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

6.2. Antenna Connected Construction

6.2.1. Standard Applicable

According to § 15.203 & RSS-Gen, 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.

6.2.2. Antenna Connector Construction

The directional gains of antenna used for transmitting is 0dBi, and the antenna is connect to PCB board and no consideration of replacement. Please see EUT photo for details.

6.2.3. Results: Compliance.

7. RADIATED EMISSION MEASUREMENT

7.1. Standard Applicable

1. Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.
2. 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) and 15.249 limit in the table below has to be followed.

| Fundamental Frequency | Field Strength of fundamental (millivolts/meter) | Field Strength of harmonics (microvolts/meter) |
|-----------------------|--|--|
| 902-928MHz | 50 | 500 |
| 2400-2483.5MHz | 50 | 500 |
| 5725-5875MHz | 50 | 500 |
| 24.0-24.25GHz | 250 | 2500 |

| Frequencies (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|-------------------|-----------------------------------|-------------------------------|
| 0.009~0.490 | 2400/F(KHz) | 300 |
| 0.490~1.705 | 24000/F(KHz) | 30 |
| 1.705~30.0 | 30 | 30 |
| 30~88 | 100 | 3 |
| 88~216 | 150 | 3 |
| 216~960 | 200 | 3 |
| Above 960 | 500 | 3 |

7.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

| Spectrum 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 |

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

7.3. Test Procedure

1) Sequence of testing 9 kHz to 30 MHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
- If the EUT is a floor standing device, it is placed on the ground.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Premeasurement:

- The turntable rotates from 0 ° to 315 ° using 45 ° steps.
- The antenna height is 1.5 meter.
- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0 ° to 360 °) and by rotating the elevation axes (0 ° to 360 °).
- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

2) Sequence of testing 30 MHz to 1 GHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Premeasurement:

- The turntable rotates from 0 ° to 315 ° using 45 ° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 to 3 meter.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ($\pm 45^\circ$) and antenna movement between 1 and 4 meter.
- The final measurement will be done with QP detector with an EMI receiver.
- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1 GHz to 12.75 GHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Premeasurement:

- The turntable rotates from 0 ° to 315 ° using 45 ° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height is 1.5 meter.
- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum found antenna polarisation and turntable position of the premeasurement the software maximizes the peaks by rotating the turntable position (0 ° to 360 °). This measurement is repeated for different EUT-table positions (0 ° to 150 ° in 30 °-steps). This procedure is repeated for both antenna polarisations.
- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and RMS detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

4) Sequence of testing above 12.75 GHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 1 meter.
- The EUT was set into operation.

Premeasurement:

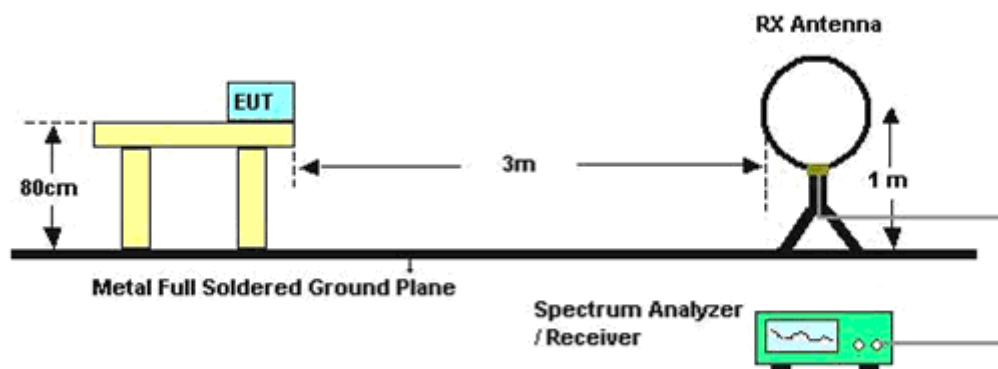
- The antenna is moved spherical over the EUT in different polarisations of the antenna.

Final measurement:

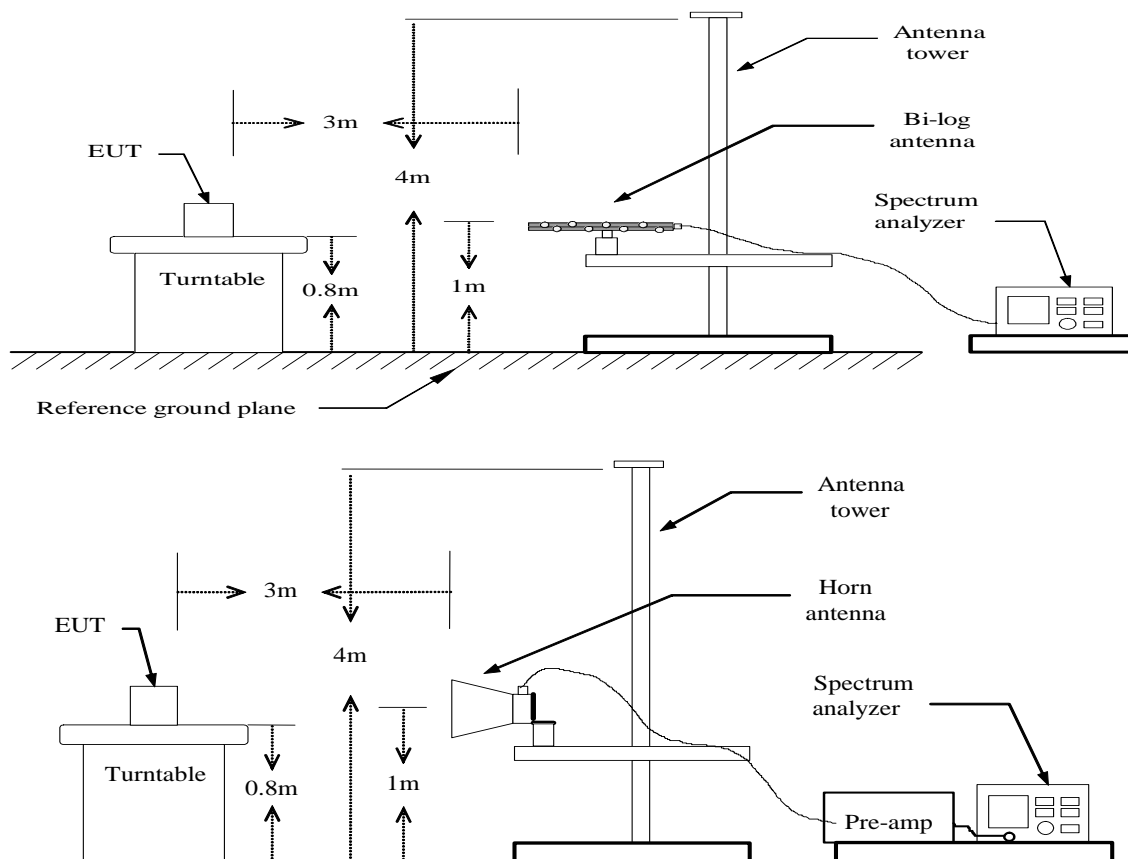
- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and RMS detector.
- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

7.4. Block Diagram of Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz



Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor = $20 \log (\text{specific distance [3m]} / \text{test distance [1.5m]})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

7.5. Test Results

Results of Radiated Emissions (9kHz~30MHz)

| Frequency (MHz) | Level (dBuV) | Over Limit (dB) | Over Limit (dBuV) | Remark |
|-----------------|--------------|-----------------|-------------------|----------|
| | | | | See Note |

Note:

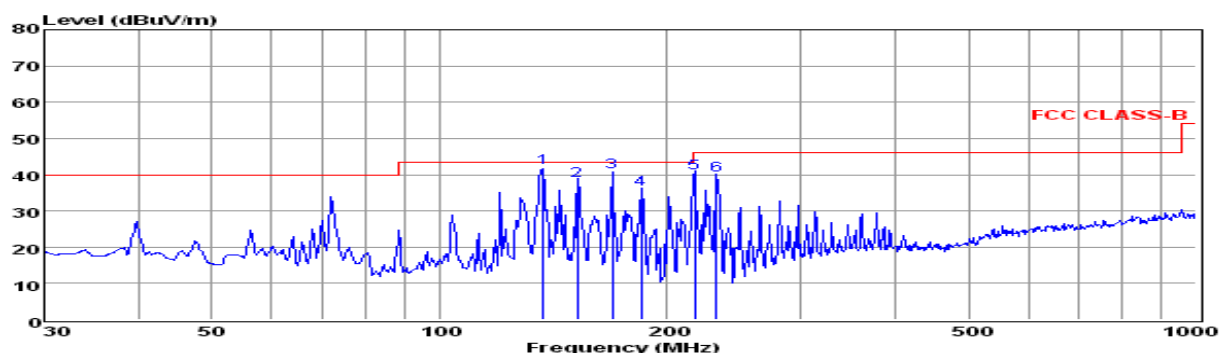
The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

Results of Radiated Emissions (30MHz~1000MHz)

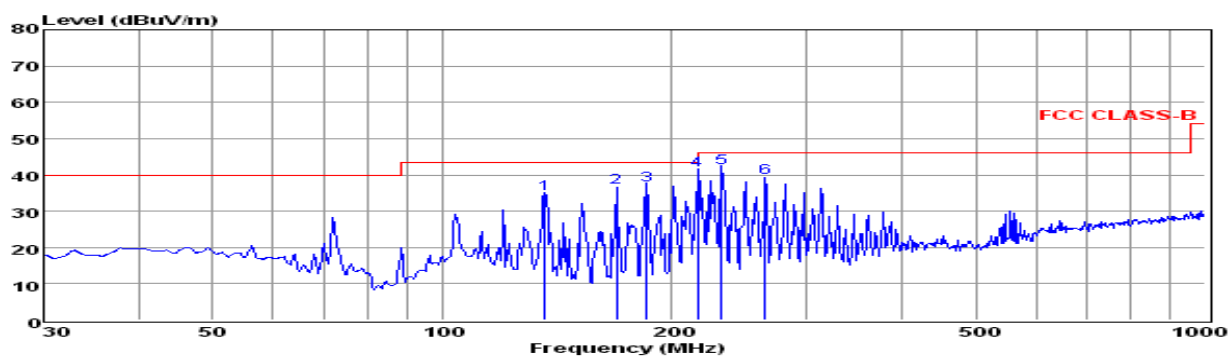
Test Mode (Low 2402MHz)



Env./Ins: 24°C/56%
 EUT: Wireless Microphone
 M/N: SmartTVoke
 Power Rating: AC 120V/60Hz
 Test Mode: TX-2402
 Operator: Jacky
 Memo:
 pol: VERTICAL

| | Freq | Reading | CabLos | Antfac | Measured | Limit | Over | Remark |
|---|--------|---------|--------|--------|----------|--------|-------|--------|
| | MHz | dBuV | dB | dB/m | dBuV/m | dBuV/m | dB | |
| 1 | 136.94 | 32.95 | 0.70 | 8.42 | 42.07 | 43.50 | -1.43 | QP |
| 2 | 152.13 | 29.15 | 0.73 | 8.35 | 38.23 | 43.50 | -5.27 | QP |
| 3 | 169.01 | 31.14 | 0.80 | 8.94 | 40.88 | 43.50 | -2.62 | QP |
| 4 | 184.49 | 25.07 | 0.70 | 10.08 | 35.85 | 43.50 | -7.65 | QP |
| 5 | 217.54 | 28.38 | 0.88 | 11.12 | 40.38 | 46.00 | -5.62 | QP |
| 6 | 232.53 | 27.23 | 0.98 | 11.76 | 39.97 | 46.00 | -6.03 | QP |

Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that are 20dB below the official limit are not reported

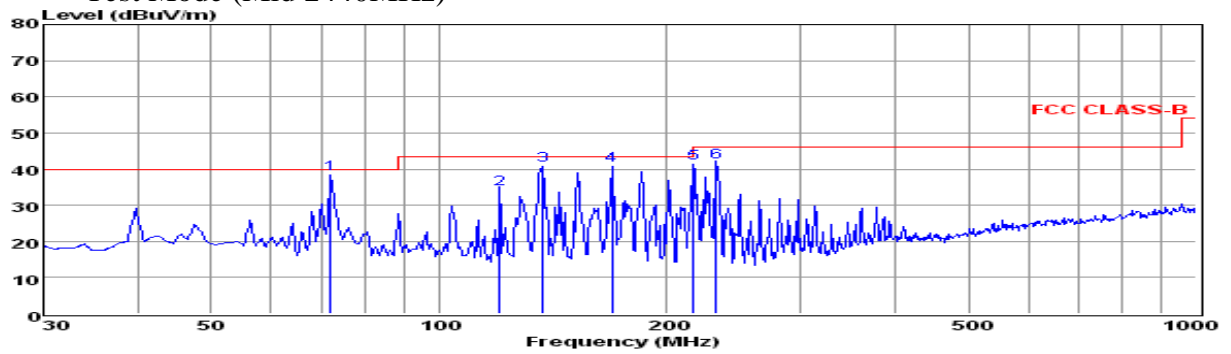


Env./Ins: 24°C/56%
 EUT: Wireless Microphone
 M/N: SmartTVoke
 Power Rating: AC 120V/60Hz
 Test Mode: TX-2402
 Operator: Jacky
 Memo:
 pol: HORIZONTAL

| | Freq | Reading | CabLos | Antfac | Measured | Limit | Over | Remark |
|---|--------|---------|--------|--------|----------|--------|-------|--------|
| | MHz | dBuV | dB | dB/m | dBuV/m | dBuV/m | dB | |
| 1 | 136.46 | 25.51 | 0.70 | 8.45 | 34.66 | 43.50 | -8.84 | QP |
| 2 | 169.01 | 26.88 | 0.80 | 8.94 | 36.62 | 43.50 | -6.88 | QP |
| 3 | 185.14 | 26.49 | 0.70 | 10.13 | 37.32 | 43.50 | -6.18 | QP |
| 4 | 216.02 | 29.35 | 0.88 | 11.07 | 41.30 | 46.00 | -4.70 | QP |
| 5 | 232.53 | 29.25 | 0.98 | 11.76 | 41.99 | 46.00 | -4.01 | QP |
| 6 | 264.75 | 26.09 | 1.03 | 12.20 | 39.32 | 46.00 | -6.68 | QP |

Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that are 20dB below the official limit are not reported

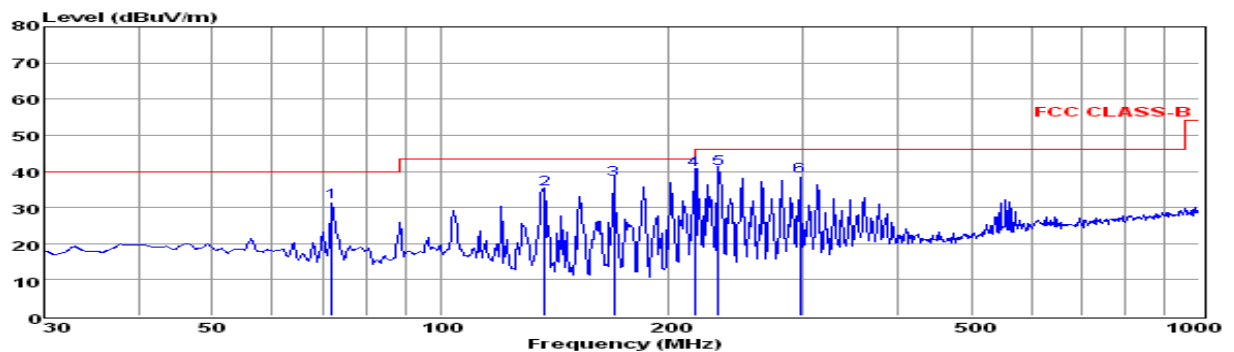
Test Mode (Mid 2440MHz)



Env./Ins: 24°C/56%
 EUT: Wireless Microphone
 M/N: SmartTVoke
 Power Rating: AC 120V/60Hz
 Test Mode: TX-2440
 Operator: Jacky
 Memo:
 pol: VERTICAL

| | Freq | Reading | CabLos | Antfac | Measured | Limit | Over | Remark |
|---|--------|---------|--------|--------|----------|--------|-------|--------|
| | MHz | dBuV | dB | dB/m | dBuV/m | dBuV/m | dB | |
| 1 | 71.83 | 29.80 | 0.55 | 8.34 | 38.69 | 40.00 | -1.31 | QP |
| 2 | 120.28 | 23.30 | 0.64 | 10.44 | 34.38 | 43.50 | -9.12 | QP |
| 3 | 136.94 | 31.77 | 0.70 | 8.42 | 40.89 | 43.50 | -2.61 | QP |
| 4 | 169.01 | 31.19 | 0.80 | 8.94 | 40.93 | 43.50 | -2.57 | QP |
| 5 | 216.78 | 29.61 | 0.88 | 11.10 | 41.59 | 46.00 | -4.41 | QP |
| 6 | 232.53 | 29.19 | 0.98 | 11.76 | 41.93 | 46.00 | -4.07 | QP |

Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that at 20db blow the official limit are not reported

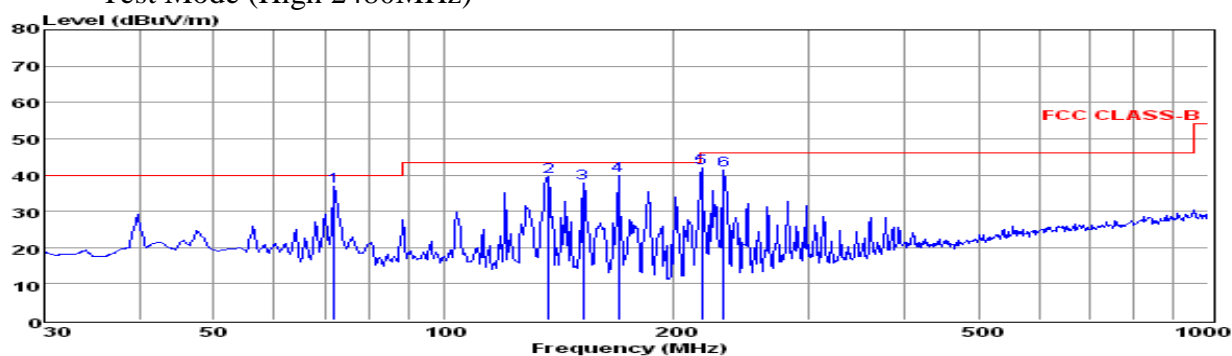


Env./Ins: 24°C/56%
 EUT: Wireless Microphone
 M/N: SmartTVoke
 Power Rating: AC 120V/60Hz
 Test Mode: TX-2440
 Operator: Jacky
 Memo:
 pol: HORIZONTAL

| | Freq | Reading | CabLos | Antfac | Measured | Limit | Over | Remark |
|---|--------|---------|--------|--------|----------|--------|-------|--------|
| | MHz | dBuV | dB | dB/m | dBuV/m | dBuV/m | dB | |
| 1 | 71.83 | 22.64 | 0.55 | 8.34 | 31.53 | 40.00 | -8.47 | QP |
| 2 | 136.94 | 26.05 | 0.70 | 8.42 | 35.17 | 43.50 | -8.33 | QP |
| 3 | 169.01 | 28.03 | 0.80 | 8.94 | 37.77 | 43.50 | -5.73 | QP |
| 4 | 216.02 | 28.45 | 0.88 | 11.07 | 40.40 | 46.00 | -5.60 | QP |
| 5 | 232.53 | 28.09 | 0.98 | 11.76 | 40.83 | 46.00 | -5.17 | QP |
| 6 | 297.22 | 24.49 | 1.12 | 13.01 | 38.62 | 46.00 | -7.38 | QP |

Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that at 20db blow the official limit are not reported

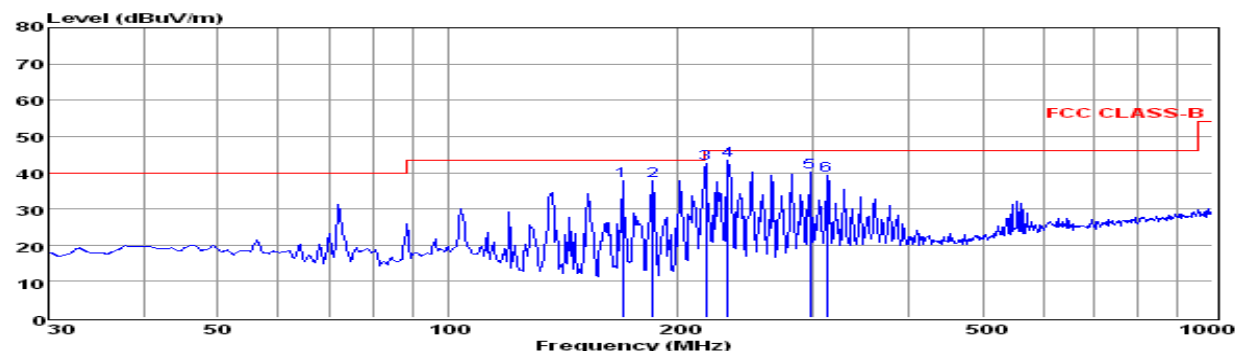
Test Mode (High 2480MHz)



Env./Ins: 24°C/56%
 EUT: Wireless Microphone
 M/N: SmartTVoke
 Power Rating: AC 120V/60Hz
 Test Mode: TX-2480
 Operator: Jacky
 Memo:
 pol: VERTICAL

| | Freq | Reading | CabLos | Antfac | Measured | Limit | Over | Remark |
|---|--------|---------|--------|--------|----------|--------|-------|--------|
| | MHz | dBuV | dB | dB/m | dBuV/m | dBuV/m | dB | |
| 1 | 71.83 | 28.12 | 0.55 | 8.34 | 37.01 | 40.00 | -2.99 | QP |
| 2 | 136.94 | 30.54 | 0.70 | 8.42 | 39.66 | 43.50 | -3.84 | QP |
| 3 | 152.13 | 28.80 | 0.73 | 8.35 | 37.88 | 43.50 | -5.62 | QP |
| 4 | 169.01 | 30.00 | 0.80 | 8.94 | 39.74 | 43.50 | -3.76 | QP |
| 5 | 217.54 | 29.94 | 0.88 | 11.12 | 41.94 | 46.00 | -4.06 | QP |
| 6 | 232.53 | 28.54 | 0.98 | 11.76 | 41.28 | 46.00 | -4.72 | QP |

Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that are 20db below the official limit are not reported



Env./Ins: 24°C/56%
 EUT: Wireless Receiver
 M/N: SmartTVoke
 Power Rating: AC 120V/60Hz
 Test Mode: TX-2480
 Operator: Jacky
 Memo:
 pol: HORIZONTAL

| | Freq | Reading | CabLos | Antfac | Measured | Limit | Over | Remark |
|---|--------|---------|--------|--------|----------|--------|-------|--------|
| | MHz | dBuV | dB | dB/m | dBuV/m | dBuV/m | dB | |
| 1 | 169.01 | 27.89 | 0.80 | 8.94 | 37.63 | 43.50 | -5.87 | QP |
| 2 | 185.14 | 26.88 | 0.70 | 10.13 | 37.71 | 43.50 | -5.79 | QP |
| 3 | 217.54 | 30.60 | 0.88 | 11.12 | 42.60 | 46.00 | -3.40 | QP |
| 4 | 232.53 | 30.71 | 0.98 | 11.76 | 43.45 | 46.00 | -2.55 | QP |
| 5 | 297.22 | 26.05 | 1.12 | 13.01 | 40.18 | 46.00 | -5.82 | QP |
| 6 | 313.28 | 24.88 | 1.09 | 13.24 | 39.21 | 46.00 | -6.79 | QP |

Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that are 20db below the official limit are not reported

Above 1GHz

| Field Strength Of Fundamental-Low channel | | | | | | |
|---|------|-----------------------------|------------------------------|---------------------|--------------------|--------|
| Frequency (MHz) | Pol. | Measure Result (PK, dBuV/m) | Measure Result (AVG, dBuV/m) | Peak Limit (dBuV/m) | AVG Limit (dBuV/m) | Result |
| 2402 | H | 95.78 | 89.44 | 114 | 94 | Pass |
| 2402 | V | 91.45 | 86.26 | 114 | 94 | Pass |

| Field Strength Of Fundamental-Middle channel | | | | | | |
|--|------|-----------------------------|------------------------------|---------------------|--------------------|--------|
| Frequency (MHz) | Pol. | Measure Result (PK, dBuV/m) | Measure Result (AVG, dBuV/m) | Peak Limit (dBuV/m) | AVG Limit (dBuV/m) | Result |
| 2440 | H | 95.22 | 89.23 | 114 | 94 | Pass |
| 2440 | V | 91.14 | 86.13 | 114 | 94 | Pass |

| Field Strength Of Fundamental-High channel | | | | | | |
|--|------|-----------------------------|------------------------------|---------------------|--------------------|--------|
| Frequency (MHz) | Pol. | Measure Result (PK, dBuV/m) | Measure Result (AVG, dBuV/m) | Peak Limit (dBuV/m) | AVG Limit (dBuV/m) | Result |
| 2480 | H | 95.02 | 89.19 | 114 | 94 | Pass |
| 2480 | V | 91.07 | 86.16 | 114 | 94 | Pass |

The worst test result for Tx-Low Channel:

| Freq. MHz | Reading dBuV | Ant. Fac dB/m | Pre. Fac. dB | Cab. Loss dB | Measured dBuV/m | Limit dBuV/m | Margin dB | Remark | Pol. |
|-----------|--------------|---------------|--------------|--------------|-----------------|--------------|-----------|---------|------------|
| 4804.63 | 56.30 | 33.06 | 35.04 | 3.94 | 58.26 | 74 | -15.74 | Peak | Horizontal |
| 4804.63 | 40.45 | 33.06 | 35.04 | 3.94 | 42.41 | 54 | -11.59 | Average | Horizontal |
| 4804.63 | 52.82 | 33.06 | 35.04 | 3.94 | 54.78 | 74 | -19.22 | Peak | Vertical |
| 4804.63 | 38.27 | 33.06 | 35.04 | 3.94 | 40.23 | 54 | -13.77 | Average | Vertical |

The worst test result for Tx-Middle Channel:

| Freq. MHz | Reading dBuV | Ant. Fac dB/m | Pre. Fac. dB | Cab. Loss dB | Measured dBuV/m | Limit dBuV/m | Margin dB | Remark | Pol. |
|-----------|--------------|---------------|--------------|--------------|-----------------|--------------|-----------|---------|------------|
| 4880.78 | 56.66 | 33.16 | 35.15 | 3.96 | 58.63 | 74 | -15.37 | Peak | Horizontal |
| 4880.78 | 40.18 | 33.16 | 35.15 | 3.96 | 42.15 | 54 | -11.85 | Average | Horizontal |
| 4880.78 | 52.61 | 33.16 | 35.15 | 3.96 | 54.58 | 74 | -19.42 | Peak | Vertical |
| 4880.78 | 38.56 | 33.16 | 35.15 | 3.96 | 40.53 | 54 | -13.47 | Average | Vertical |

The worst test result for Tx-High Channel:

| Freq. MHz | Reading dBuV | Ant. Fac dB/m | Pre. Fac. dB | Cab. Loss dB | Measured dBuV/m | Limit dBuV/m | Margin dB | Remark | Pol. |
|-----------|--------------|---------------|--------------|--------------|-----------------|--------------|-----------|---------|------------|
| 4960.55 | 56.13 | 33.26 | 35.14 | 3.98 | 58.23 | 74 | -15.77 | Peak | Horizontal |
| 4960.55 | 40.35 | 33.26 | 35.14 | 3.98 | 42.45 | 54 | -11.55 | Average | Horizontal |
| 4960.55 | 52.61 | 33.26 | 35.14 | 3.98 | 54.71 | 74 | -19.29 | Peak | Vertical |
| 4960.55 | 37.96 | 33.26 | 35.14 | 3.98 | 40.06 | 54 | -13.94 | Average | Vertical |

Notes:

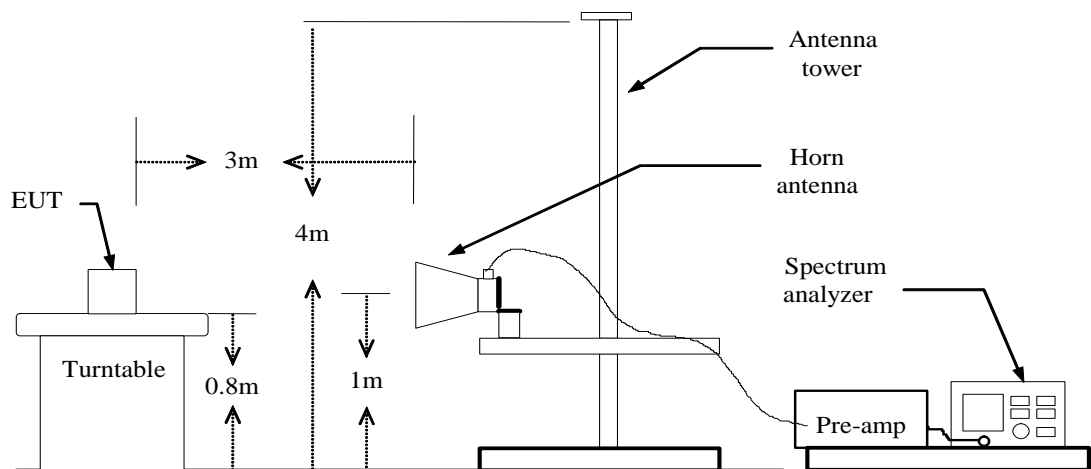
1. Measuring frequencies from 9k~10th harmonic (ex. 26GHz), No emission found between lowest internal used/generated frequency to 30 MHz.
2. Radiated emissions measured in frequency range from 9k~10th harmonic (ex. 26GHz) were made with an instrument using Peak detector mode.
3. 18~25GHz at least have 20dB margin. No recording in the test report.

8. BANDEDGES MEASUREMENT

8.1. Standard Applicable

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

8.2. Block Diagram of Test Setup



8.3. Test Procedure

The EUT is placed on a turntable, which is 0.8m above the ground plane. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

Peak: RBW=VBW=1MHz / Sweep=AUTO

Repeat the procedures until the peak versus polarization are measured.

8.4. Test Results

Only record the worst test case as following:

Tx-2402

| Freq. MHz | Reading Level dBuV | Ant. Fac. dB/m | Pre. Fac. dB | Cab. Loss dB | Measured dBuV/m | Limit dBuV/m | Margin dB | Remark | Pol. |
|-----------|--------------------|----------------|--------------|--------------|-----------------|--------------|-----------|---------|------------|
| 2390.00 | 48.90 | 32.89 | 35.16 | 3.51 | 50.14 | 74 | -23.86 | Peak | Horizontal |
| 2390.00 | 35.53 | 32.89 | 35.16 | 3.51 | 36.77 | 54 | -17.23 | Average | Horizontal |
| 2400.00 | 51.38 | 32.92 | 35.16 | 3.54 | 52.68 | 74 | -21.32 | Peak | Horizontal |
| 2400.00 | 36.13 | 32.92 | 35.16 | 3.54 | 37.43 | 54 | -16.57 | Average | Horizontal |
| 2390.00 | 48.01 | 32.89 | 35.16 | 3.51 | 49.25 | 74 | -24.75 | Peak | Vertical |
| 2390.00 | 33.91 | 32.89 | 35.16 | 3.51 | 35.15 | 54 | -18.85 | Average | Vertical |
| 2400.00 | 50.05 | 32.92 | 35.16 | 3.54 | 51.35 | 74 | -22.65 | Peak | Vertical |
| 2400.00 | 34.80 | 32.92 | 35.16 | 3.54 | 36.10 | 54 | -17.90 | Average | Vertical |

Tx-2480

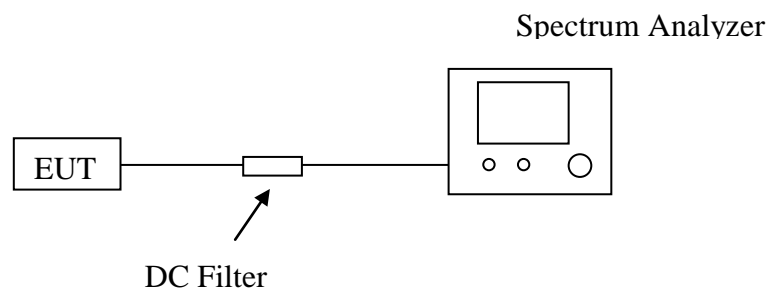
| Freq. MHz | Reading Level dBuV | Ant. Fac. dB/m | Pre. Fac. dB | Cab. Loss dB | Measured dBuV/m | Limit dBuV/m | Margin dB | Remark | Pol. |
|-----------|--------------------|----------------|--------------|--------------|-----------------|--------------|-----------|---------|------------|
| 2483.50 | 48.78 | 33.06 | 35.18 | 3.60 | 50.26 | 74 | -23.74 | Peak | Horizontal |
| 2483.50 | 36.38 | 33.06 | 35.18 | 3.60 | 37.86 | 54 | -16.14 | Average | Horizontal |
| 2483.50 | 46.67 | 33.06 | 35.18 | 3.60 | 48.15 | 74 | -25.85 | Peak | Vertical |
| 2483.50 | 35.26 | 33.06 | 35.18 | 3.60 | 36.74 | 54 | -17.26 | Average | Vertical |

9. 20 DB BANDWIDTH MEASUREMENT

9.1. Standard Applicable

According to §15.215 & RSS-210.

9.2. Block Diagram of Test Setup



9.3. Test Procedure

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW \geq 1% of the 20 dB bandwidth

VBW \geq RBW

Sweep = auto

Detector function = peak

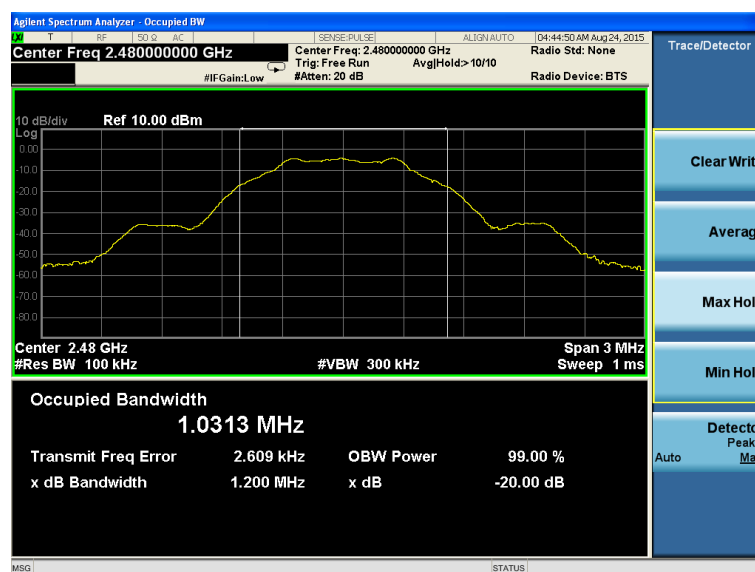
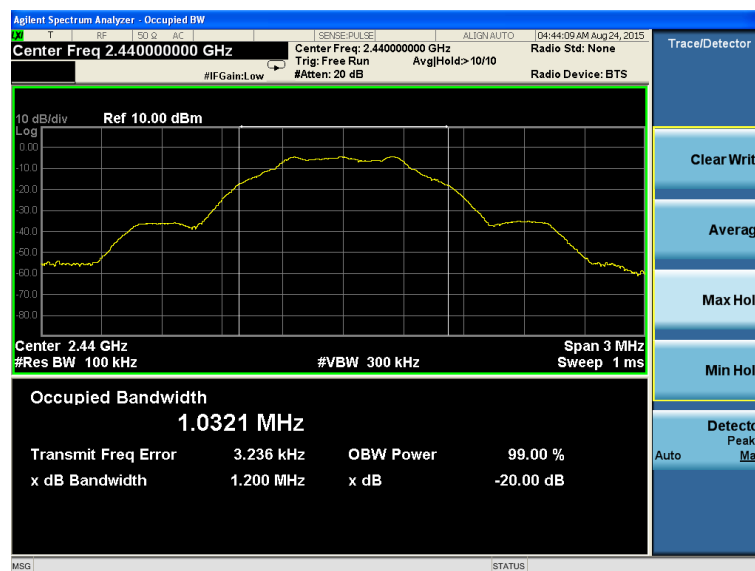
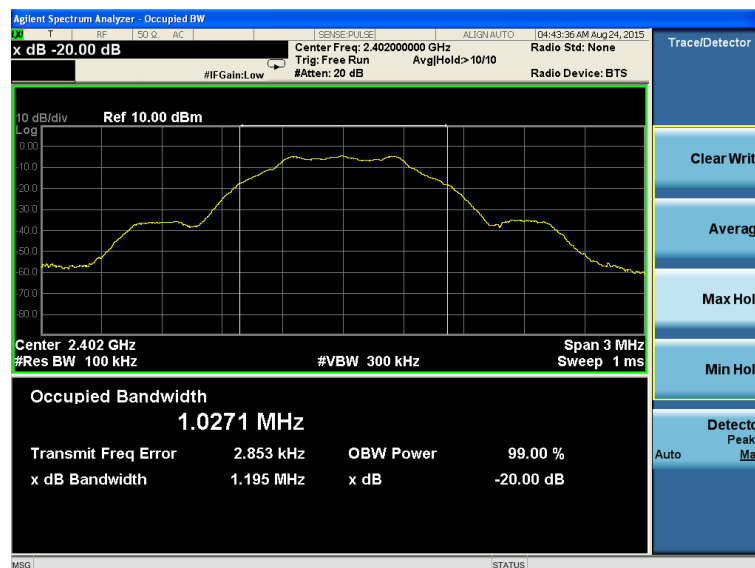
Trace = max hold

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

9.4. Test Results

Please refer to the following page.

Result: Pass



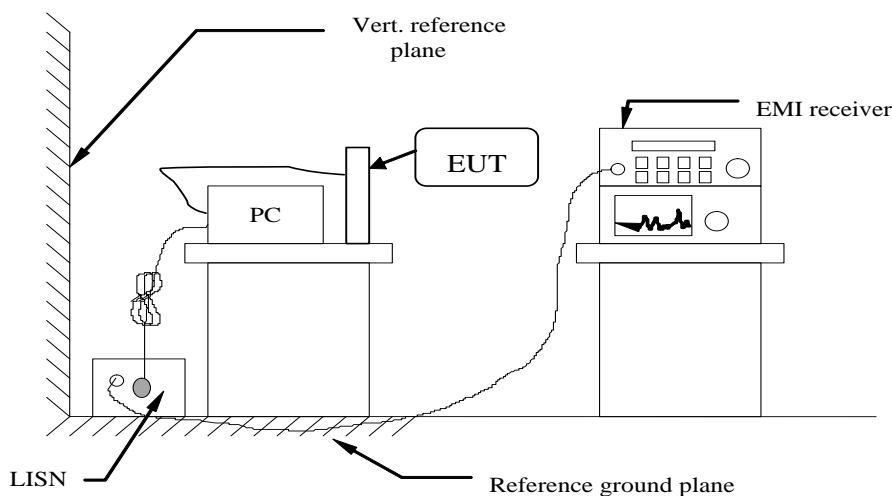
10. POWER LINE CONDUCTED EMISSIONS

10.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

| Frequency Range (MHz) | Limits (dB μ V) | |
|-----------------------|---------------------|----------|
| | Quasi-peak | Average |
| 0.15 to 0.50 | 66 to 56 | 56 to 46 |
| 0.50 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |

10.2 Block Diagram of Test Setup

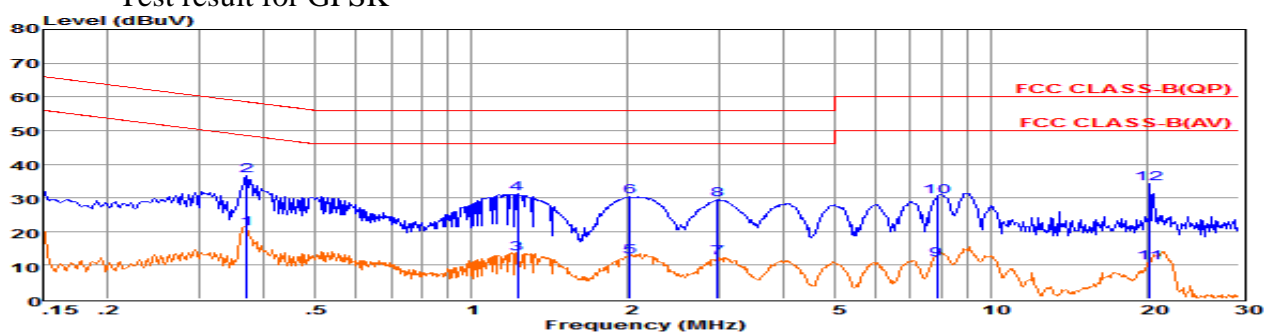


10.3 Test Results

PASS.

The test data please refer to following page.

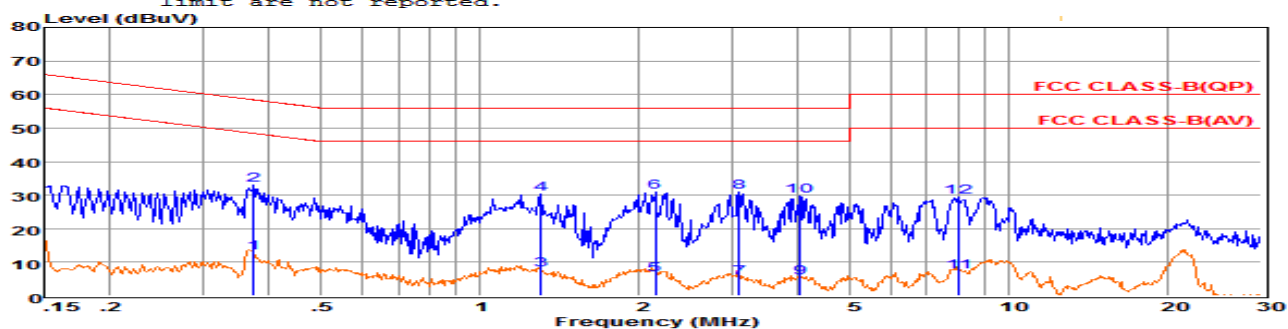
Test result for GFSK



Env. Ins: 24*/56%
EUT: Wireless Receiver
M/N: SmartIVOke
Power Rating: AC 120V/60Hz
Test Mode: TX
Operator: Jacky
Memo:
Pol: LINE

| | Freq | Reading | LisnFac | CabLos | Atten_Fac | Measured | Limit | Over | Remark |
|----|----------|---------|---------|--------|-----------|----------|-------|--------|---------|
| | MHz | dBuV | dB | dB | dB | dBuV | dBuV | dB | |
| 1 | 0.36920 | 1.25 | 9.62 | 0.03 | 10.00 | 20.90 | 48.52 | -27.62 | Average |
| 2 | 0.36920 | 16.96 | 9.62 | 0.03 | 10.00 | 36.61 | 58.52 | -21.91 | QP |
| 3 | 1.22914 | -6.22 | 9.63 | 0.05 | 10.00 | 13.46 | 46.00 | -32.54 | Average |
| 4 | 1.22914 | 11.54 | 9.63 | 0.05 | 10.00 | 31.22 | 56.00 | -24.78 | QP |
| 5 | 2.02254 | -7.22 | 9.64 | 0.05 | 10.00 | 12.47 | 46.00 | -33.53 | Average |
| 6 | 2.02254 | 10.71 | 9.64 | 0.05 | 10.00 | 30.40 | 56.00 | -25.60 | QP |
| 7 | 2.97764 | -7.57 | 9.64 | 0.06 | 10.00 | 12.13 | 46.00 | -33.87 | Average |
| 8 | 2.97764 | 9.75 | 9.64 | 0.06 | 10.00 | 29.45 | 56.00 | -26.55 | QP |
| 9 | 7.85165 | -8.09 | 9.68 | 0.07 | 10.00 | 11.66 | 50.00 | -38.34 | Average |
| 10 | 7.85165 | 10.48 | 9.68 | 0.07 | 10.00 | 30.23 | 60.00 | -29.77 | QP |
| 11 | 20.16248 | -9.27 | 9.76 | 0.12 | 10.00 | 10.61 | 50.00 | -39.39 | Average |
| 12 | 20.16248 | 14.24 | 9.76 | 0.12 | 10.00 | 34.12 | 60.00 | -25.88 | QP |

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
2. The emission levels that are 20dB below the official limit are not reported.



Env. Ins: 24*/56%
EUT: Wireless Receiver
M/N: SmartIVOke
Power Rating: AC 120V/60Hz
Test Mode: TX
Operator: Jacky
Memo:
Pol: NEUTRAL

| | Freq | Reading | LisnFac | CabLos | Atten_Fac | Measured | Limit | Over | Remark |
|----|---------|---------|---------|--------|-----------|----------|-------|--------|---------|
| | MHz | dBuV | dB | dB | dB | dBuV | dBuV | dB | |
| 1 | 0.37314 | -6.75 | 9.61 | 0.04 | 10.00 | 12.90 | 48.43 | -35.53 | Average |
| 2 | 0.37314 | 13.36 | 9.61 | 0.04 | 10.00 | 33.01 | 58.43 | -25.42 | QP |
| 3 | 1.30290 | -11.84 | 9.63 | 0.05 | 10.00 | 7.84 | 46.00 | -38.16 | Average |
| 4 | 1.30290 | 10.53 | 9.63 | 0.05 | 10.00 | 30.21 | 56.00 | -25.79 | QP |
| 5 | 2.14392 | -13.48 | 9.63 | 0.05 | 10.00 | 6.20 | 46.00 | -39.80 | Average |
| 6 | 2.14392 | 11.24 | 9.63 | 0.05 | 10.00 | 30.92 | 56.00 | -25.08 | QP |
| 7 | 3.09015 | -14.34 | 9.64 | 0.06 | 10.00 | 5.36 | 46.00 | -40.64 | Average |
| 8 | 3.09015 | 11.15 | 9.64 | 0.06 | 10.00 | 30.85 | 56.00 | -25.15 | QP |
| 9 | 4.02746 | -14.42 | 9.65 | 0.06 | 10.00 | 5.29 | 46.00 | -40.71 | Average |
| 10 | 4.02746 | 10.03 | 9.65 | 0.06 | 10.00 | 29.74 | 56.00 | -26.26 | QP |
| 11 | 8.06243 | -12.63 | 9.70 | 0.07 | 10.00 | 7.14 | 50.00 | -42.86 | Average |
| 12 | 8.06243 | 9.61 | 9.70 | 0.07 | 10.00 | 29.38 | 60.00 | -30.62 | QP |

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
2. The emission levels that are 20dB below the official limit are not reported.

-----THE END OF REPORT-----