# FCC Radio Test Report

## FCC ID: 2A7ZM-G2MICROPHONE

| | | |
|---|---|---|
| **Report No.** | : | TBR-C-202206-0362-3 |
| **Applicant** | : | JBU GLOBAL LLC |
| **Equipment Under Test (EUT)** | | |
| **EUT Name** | : | Presto G2 Microphone |
| **Model No.** | : | Presto G2 Microphone |
| **Series Model No.** | : | Spinto G3 Microphone, Soprano X1 Microphone |
| **Brand Name** | : | MASINGO |
| **Sample ID** | : | 202206-0362-01-03& 202206-0362-01-04 |
| **Receipt Date** | : | 2022-07-08 |
| **Test Date** | : | 2022-07-08 to 2022-07-29 |
| **Issue Date** | : | 2022-07-29 |
| **Standards** | : | FCC Part 15, Subpart C (15.236) |
| **Test Method** | : | ANSI C63.10: 2013 |
| **Conclusions** | : | **PASS** |

In the configuration tested, the EUT complied with the standards specified above,
The EUT technically complies with the FCC requirements

| | | |
|---|---|---|
| **Test/Witness Engineer** | : | Camille Li |
| **Engineer Supervisor** | | Ivan Su |
| **Engineer Manager** | : | Ray Lai |

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.



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# Contents

# Revision History

| Report No. | Version | Description | Issued Date |
|---|---|---|---|
| TBR-C-202206-0362-3 | Rev.01 | Initial issue of report | 2022-07-29 |
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# 1. General Information about EUT

## 1.1 Client Information

| | | |
|---|---|---|
| **Applicant** | : | JBU GLOBAL LLC |
| **Address** | : | 19416 NE 26th Ave, 114B, Miami, Florida 33180 |
| **Manufacturer** | : | NINGBO SUNNUO INTERNATIONAL TRADE CO., LTD |
| **Address** | : | No. 23, Jinshan Road, Taoyuan Street NINGBO Zhejiang Province 315600, China. |

## 1.2 General Description of EUT (Equipment Under Test)

| | | | |
|---|---|---|---|
| **EUT Name** | : | Presto G2 Microphone | |
| **Models No.** | : | Presto G2 Microphone, Spinto G3 Microphone, Soprano X1 Microphone | |
| **Model Difference** | : | All these models are identical in the same PCB, layout and electrical circuit, the only difference is appearance. | |
| **Product Description** | : | Operation Frequency: 490.5MHz | |
| | | Number of Channel: 1 Channels | |
| | | Max Power Output: | -20.796dBm |
| | | Antenna Gain: | 0.5dBi PCB Antenna |
| | | Equipment System: | Analogue Systems |
| **Power Rating** | : | USB Input: DC 5V, 1A<br>DC 3.7V 1200mAh by Li-ion Battery | |
| **Software Version** | : | ZH2074C-V1.7 | |
| **Hardware Version** | : | 310TX-V5.0 | |
| **Remark** | : | The antenna gain provided by the applicant, the verified for the RF conduction test and adapter provided by TOBY test lab. | |

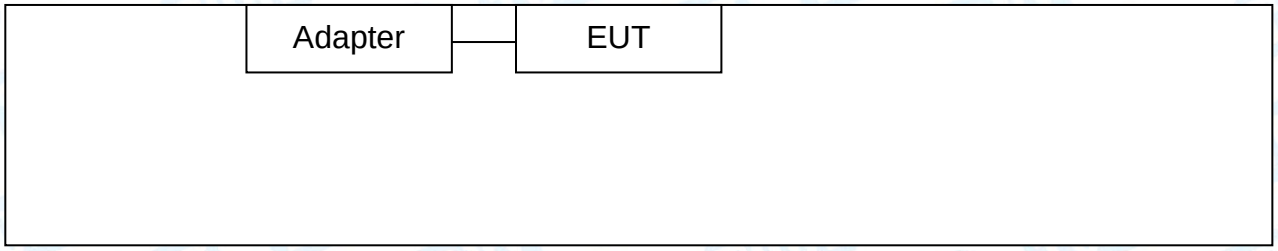
**Note:**

Applicable Standards: FCC CFR 47 Part 2, & 15, KDB 206256 D01 vO2, ANSI C63.10- 2013, ANSI C63.26 2015

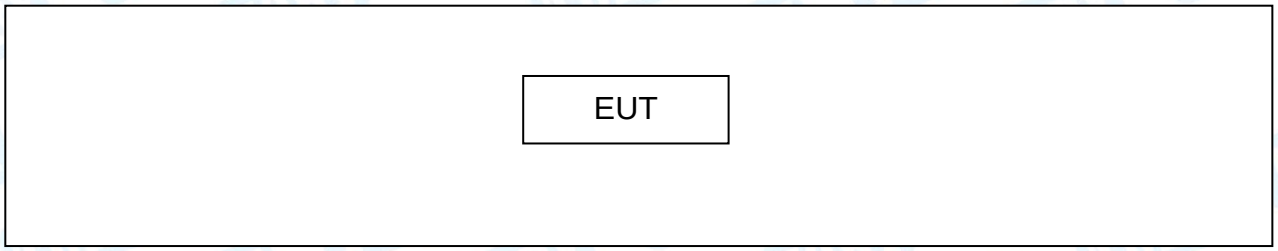
(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

## 1.3 Block Diagram Showing the Configuration of System Tested

**Charging+TX Mode**




**TX Mode**



## 1.4 Description of Support Units

| Equipment Information | | | | |
|---|---|---|---|---|
| **Name** | **Model** | **FCC ID/VOC** | **Manufacturer** | **Used "√"** |
| ADAPTER | --- | --- | --- | √ |
| **Cable Information** | | | | |
| **Number** | **Shielded Type** | **Ferrite Core** | **Length** | **Note** |
| ---- | ----- | ---- | ---- | ---- |

## 1.5 Description of Test Mode

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 follow was evaluated respectively.

| For Conducted Test | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | Charging+TX Mode |
| **For Radiated Test** | |
| Final Test Mode | Description |
| Mode 1 | TX Mode |

**Note:**

For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate.

(1)According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels.

(2)During the testing procedure, the continuously transmitting with the maximum power mode was programmed by the customer.

(3) The EUT is considered a portable unit; it was pre-tested on the positioned of each 3 axis, X-plane, Y-plane and Z-plane. 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.

## 1.6 Description of Test Software Setting

Control by pressing the button. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of RF mode.

## 1.7 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 %.

| Test Item | Parameters | Expanded Uncertainty ($U_{Lab}$) |
|---|---|---|
| Conducted Emission | Level Accuracy:<br>9kHz~150kHz<br>150kHz to 30MHz | ±3.50 dB<br>±3.10 dB |
| Radiated Emission | Level Accuracy:<br>9kHz to 30 MHz | ±4.60 dB |
| Radiated Emission | Level Accuracy:<br>30MHz to 1000 MHz | ±4.50 dB |
| Radiated Emission | Level Accuracy:<br>Above 1000MHz | ±4.20 dB |

## 1.8 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1/F.,Building 6, Rundongsheng Industrial Zone, Longzhu, Xixiang, Bao'an District, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

**CNAS (L5813)**

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

**A2LA Certificate No.: 4750.01**

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025：2017 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01.FCC Accredited Test Site Number: 854351.Designation Number: CN1223.

**IC Registration No.: (11950A)**

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A.

# 2. Test Summary

| FCC Part 15 Subpart C(15.236) | | | | |
|---|---|---|---|---|
| **Standard Section** | **Test Item** | **Test Sample(s)** | **Judgment** | **Remark** |
| 15.207(a) | Conducted Emission | 202206-0362-01-03 | PASS | N/A |
| 15.236(d)(2) | RF Power Output | 202206-0362-01-04 | PASS | N/A |
| 15.236(f)(2) | Occupied Bandwidth | 202206-0362-01-04 | PASS | N/A |
| 15.236(g) 8.3 of ETSI EN 300 422-1 | Emission Mask | 202206-0362-01-04 | PASS | N/A |
| 15.236(g) 8.4 of ETSI EN 300 422-1 | Radiated Spurious Emission | 202206-0362-01-04 | PASS | N/A |
| 15.236(f)(3) | Frequency Stability vs. Temperature Frequency Stability vs. Voltage | 202206-0362-01-04 | PASS | N/A |
| **Note:** N/A is an abbreviation for Not Applicable. | | | | |

# 3. Test Software

| Test Item | Test Software | Manufacturer | Version No. |
|---|---|---|---|
| Conducted Emission | EZ-EMC | EZ | CDI-03A2 |
| Radiation Emission | EZ-EMC | EZ | FA-03A2RE |

# 4. Test Equipment

| Conducted Emission Test | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Last Cal.** | **Cal. Due Date** |
| EMI Test Receiver | Rohde & Schwarz | ESCI | 100321 | Jun. 23, 2022 | Jun. 22, 2023 |
| RF Switching Unit | Compliance Direction Systems Inc | RSU-A4 | 34403 | Jun. 23, 2022 | Jun. 22, 2023 |
| AMN | SCHWARZBECK | NNBL 8226-2 | 8226-2/164 | Jun. 22, 2022 | Jun. 21, 2023 |
| LISN | Rohde & Schwarz | ENV216 | 101131 | Jun. 22, 2022 | Jun. 21, 2023 |
| **Radiation Emission Test** | | | | | |
| **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Last Cal.** | **Cal. Due Date** |
| Spectrum Analyzer | Agilent | E4407B | MY45106456 | Jun. 23, 2022 | Jun. 22, 2023 |
| EMI Test Receiver | Rohde & Schwarz | ESPI | 100010/007 | Jun. 23, 2022 | Jun. 22, 2023 |
| Spectrum Analyzer | Rohde & Schwarz | FSV40-N | 102197 | Jun. 23, 2022 | Jun. 22, 2023 |
| Bilog Antenna | ETS-LINDGREN | 3142E | 00117537 | Feb. 28, 2022 | Feb. 27, 2024 |
| Horn Antenna | ETS-LINDGREN | 3117 | 00143207 | Feb. 28, 2022 | Feb. 27, 2024 |
| Horn Antenna | ETS-LINDGREN | BBHA 9170 | BBHA9170582 | Feb. 28, 2022 | Feb. 27, 2024 |
| Loop Antenna | SCHWARZBECK | FMZB 1519 B | 1519B-059 | Feb. 26, 2022 | Feb.25, 2024 |
| Pre-amplifier | Sonoma | 310N | 185903 | Feb. 24, 2022 | Feb. 23, 2023 |
| Pre-amplifier | HP | 8449B | 3008A00849 | Feb. 24, 2022 | Feb. 23, 2023 |
| Pre-amplifier | SKET | LNPA_1840G-50 | SK201904032 | Feb. 24, 2022 | Feb. 23, 2023 |
| Cable | HUBER+SUHNER | 100 | SUCOFLEX | Feb. 24, 2022 | Feb. 23, 2023 |
| Positioning Controller | ETS-LINDGREN | 2090 | N/A | N/A | N/A |
| **Antenna Conducted Emission** | | | | | |
| **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Last Cal.** | **Cal. Due Date** |
| Spectrum Analyzer | Agilent | E4407B | MY45106456 | Jun. 23, 2022 | Jun. 22, 2023 |
| Spectrum Analyzer | Rohde & Schwarz | FSV40-N | 102197 | Jun. 23, 2022 | Jun. 22, 2023 |
| MXA Signal Analyzer | Agilent | N9020A | MY49100060 | Sep. 10, 2021 | Sep. 09, 2022 |
| Vector Signal Generator | Agilent | N5182A | MY50141294 | Sep. 10, 2021 | Sep. 09, 2022 |
| Analog Signal Generator | Agilent | N5181A | MY50141953 | Sep. 10, 2021 | Sep. 09, 2022 |
| RF Power Sensor | DARE!! Instruments | RadiPowerRPR3006W | 17I00015SNO26 | Sep. 10, 2021 | Sep. 09, 2022 |
| | DARE!! Instruments | RadiPowerRPR3006W | 17I00015SNO29 | Sep. 10, 2021 | Sep. 09, 2022 |
| | DARE!! Instruments | RadiPowerRPR3006W | 17I00015SNO31 | Sep. 10, 2021 | Sep. 09, 2022 |
| | DARE!! Instruments | RadiPowerRPR3006W | 17I00015SNO33 | Sep. 10, 2021 | Sep. 09, 2022 |

# 5. Conducted Emission Test

## 5.1 Test Standard and Limit

### 5.1.1 Test Standard

FCC Part 15.207

### 5.1.2 Test Limit

**Conducted Emission Test Limit**

| Frequency | Maximum RF Line Voltage (dBμV) | |
|---|---|---|
| | Quasi-peak Level | Average Level |
| 150kHz~500kHz | 66 ~ 56 * | 56 ~ 46 * |
| 500kHz~5MHz | 56 | 46 |
| 5MHz~30MHz | 60 | 50 |

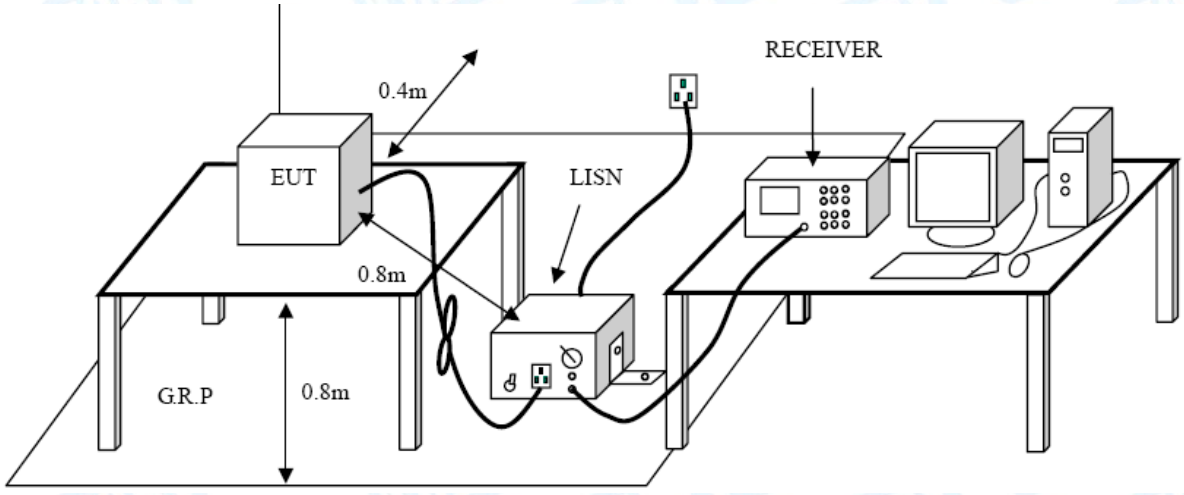
Notes:

(1) *Decreasing linearly with logarithm of the frequency.

(2) The lower limit shall apply at the transition frequencies.

(3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

## 5.2 Test Setup



## 5.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected 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.

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 40 cm long.

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.

LISN is at least 80 cm from nearest part of EUT chassis.

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

## 5.4 Deviation From Test Standard

No deviation

## 5.5 EUT Operating Mode

Please refer to the description of test mode.

## 5.6 Test Data

Please refer to the Attachment A.

# 6. RF Output Power Test

## 6.1 Test Standard and Limit

6.1.1 Test Standard:
FCC Part 15.236(d)(1)

6.1.2 Test Limit

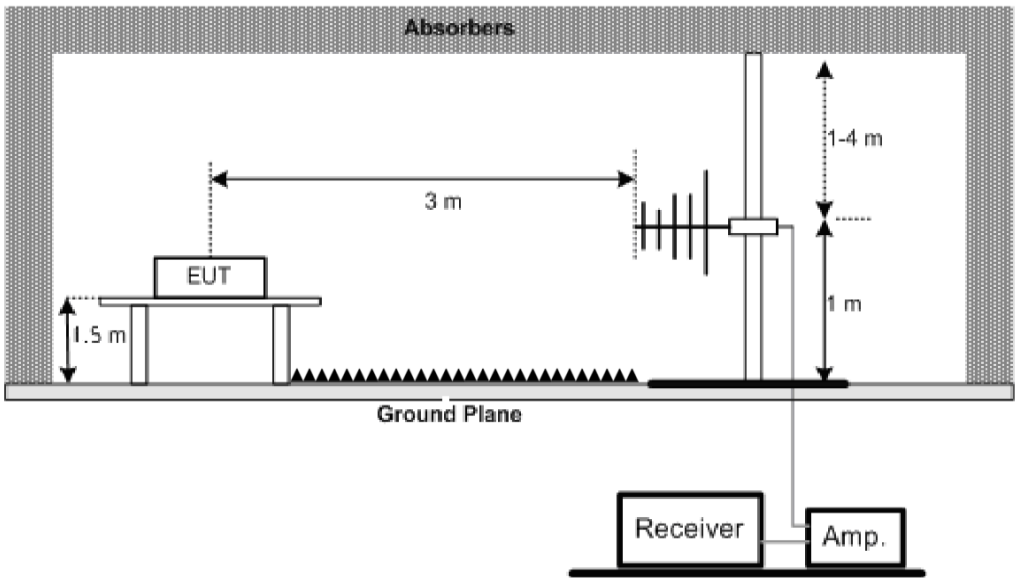
(d) The maximum radiated power shall not exceed the following values:

(1) In the bands allocated and assigned for broadcast television and in the 600 MHz service band: 50 mW EIRP

**Procedure:** KDB 971168 D01 Average Power Measurements section 5.2.1

Power Limit 50mW= 16.98dBm

## 6.2 Test Setup




## 6.3 Test Procedure

1. The EUT was placed on the top of the turntable in chamber.
2. The test shall be made in the transmitting mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. This measurement shall be repeated with the transmitter in standby mode where applicable.
4. For spurious emissions measurement, the broad band bi-log receiving antenna was placed 3 meters far away from the turntable.

5. The broadband receiving antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization. Each recorded suspected value is indicated as Read Level (Raw).
6. Replace the EUT by standard antenna and feed the RF port by signal generator.
7. Adjust the frequency of the signal generator to the suspected emission and slightly rotate the turntable to locate the position with maximum reading.
8. Adjust the power level of the signal generator to reach the same reading with Read Level (Raw).
9. The level of the spurious emission is the power level of (8) plus the gain of the standard antenna in dBi and minus the loss of the cable used between the signal generator and the standard antenna.
10. The measurement shall be repeated at the lowest and the highest channel of the stated frequency range.

## 6.4 Deviation From Test Standard

No deviation

## 6.5 EUT Operating Condition

The EUT was set to Continual Transmitting in maximum power, and new batteries are used during testing.

## 6.6 Test Data

Please refer to the Attachment B.

# 7. Bandwidth Test

## 7.1 Test Standard and Requirement

7.1.1 Test Standard

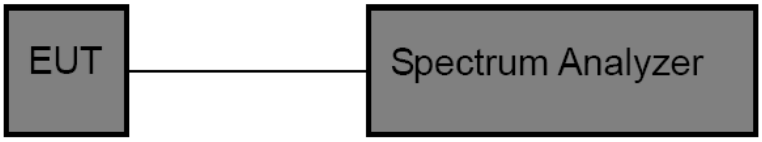
FCC Part 15.236(f)(2)

71.2 Test Limit

One or more adjacent 25 kHz segments within the assignable frequencies may be combined to form a channel whose maximum bandwidth shall not exceed 200 kHz. The operating bandwidth shall not exceed 200 kHz.

7.1.3 Requirement: ANSI C63.26 sec. 5.4.3

## 7.2 Test Setup




## 7.2 Test Procedure

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

(2) Spectrum Setting:

Bandwidth: RBW=10 kHz, VBW=30kHz.

(3) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst –case (i.e the widest) bandwidth.

## 7.4 Deviation From Test Standard

No deviation

## 7.5 EUT Operating Condition

The EUT was set to continuously transmitting for the Bandwidth Test.

## 7.6 Test Data

Please refer to the Attachment C.

# 8. Emission Mask Test

## 8.1 Test Standard

(g) Emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in §8.3 of ETSI EN 300 422-1 V1.4.2 (2011-08), *Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement.* Emissions outside of this band shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 V1.4.2 (2011-08).

## 8.2 Test Limit

The transmitter output spectrum shall be within the mask defined in figure 4. This mask may also be used for analogue.

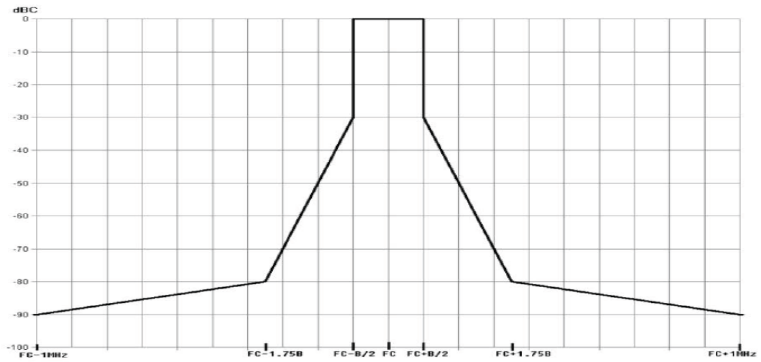
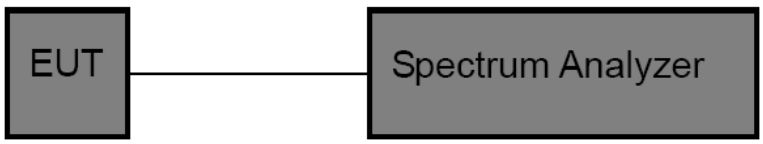



**Figure 4: Spectrum mask for digital systems below 1 GHz**

## 8.3 Test Setup




## 8.4 Test Procedure

Measure the "Maximum Relative Level (dBc) at Specified Carrier Offsets" with the following spectrum analyser setup:

- Centre Frequency = fc
- Span ≥ 5 × B
- Detector = RMS
- Trace Mode = Peak Hold
- RBW&VBW = 1 kHz
- Sweep time ≥ 2 s

## 8.5 Deviation From Test Standard

No deviation

## 8.6 Test Data

Please refer to the Attachment D.

# 9. Radiated Spurious Emission Test

## 9.1 Test Standard and Limit

### 9.1.1 Test Standard: FCC Part 15.236(g)

Requirement: ETSI EN 300 422-1 V1.4.2

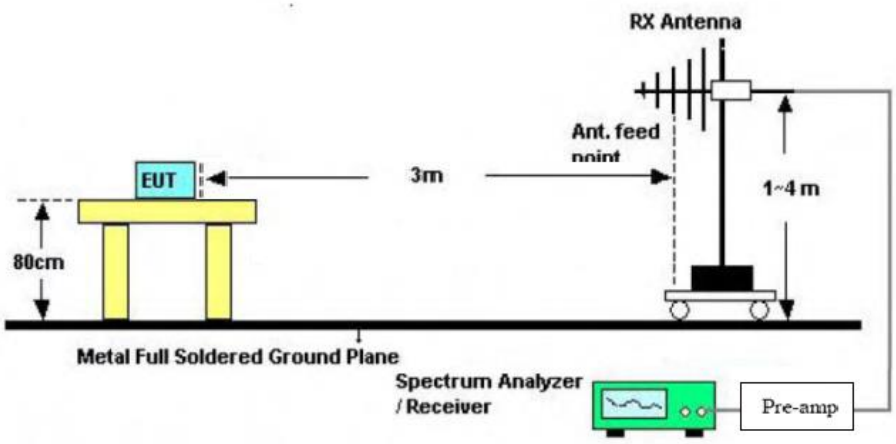
(g) Emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in §8.3 of ETSI EN 300 422-1 V1.4.2 (2011-08), *Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement*. Emissions outside of this band shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 V1.4.2 (2011-08).

### 9.1.2 Limits

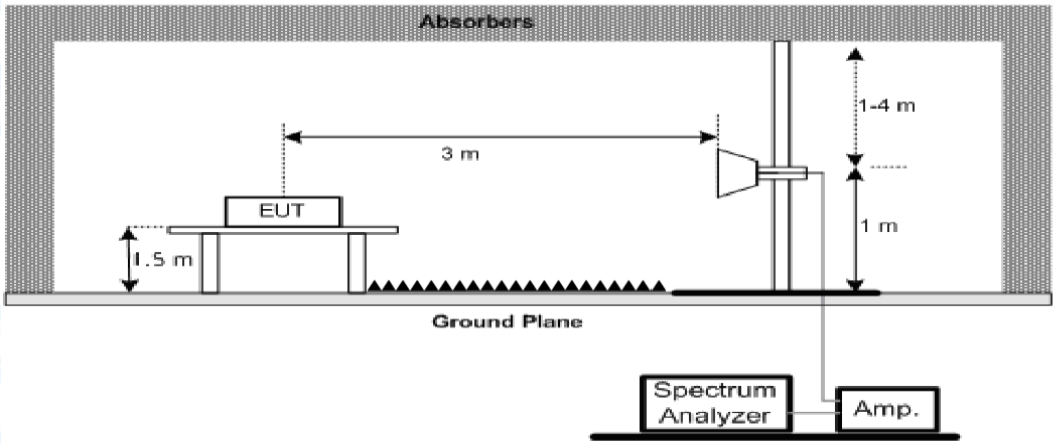
| State | Frequency | | |
|---|---|---|---|
| | 47 MHz to 74 MHz<br>87,5 MHz to 137 MHz<br>174 MHz to 230 MHz<br>470 MHz to 862 MHz | Other Frequencies below 1 000 MHz | Frequencies above 1 000 MHz |
| Operation | 4 nW | 250 nW | 1 µW |
| Standby | 2 nW | 2 nW | 20 nW |

## 9.2 Test Setup

A. Radiated Emission Test Set-Up Frequency Below 1 GHz.



B. Radiated Emission Test Set-Up Frequency Above1 GHz.




## 9.3 Test Procedure

1. The EUT was placed on the top of the turntable in chamber.
2. The test shall be made in the transmitting mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. This measurement shall be repeated with the transmitter in standby mode where applicable.
4. For spurious emissions measurement, the broad band bi-log receiving antenna was placed 3 meters far away from the turntable.
5. The broadband receiving antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization. Each recorded suspected value is indicated as Read Level (Raw).
6. Replace the EUT by standard antenna and feed the RF port by signal generator.
7. Adjust the frequency of the signal generator to the suspected emission and slightly rotate the turntable to locate the position with maximum reading.
8. Adjust the power level of the signal generator to reach the same reading with Read Level (Raw).
9. The level of the spurious emission is the power level of (8) plus the gain of the standard antenna in dBi and minus the loss of the cable used between the signal generator and the standard antenna.
10. The measurement shall be repeated at the lowest and the highest channel of the stated frequency range.

## 9.4 Deviation From Test Standard

No deviation

## 9.5 Test Data

Please refer to the Attachment E.

# 10. Frequency stability

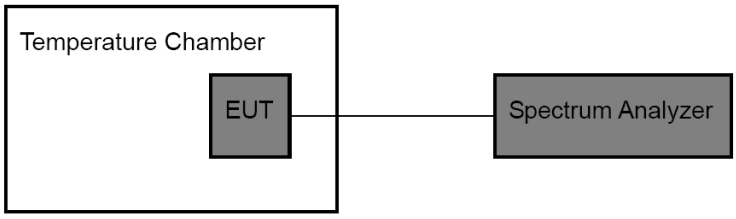
## 10.1 Test Standard and Limit

### 10.1.1 Test Standard: FCC 15.236(f)(3)

### 10.1.2 Test Limit

The frequency tolerance of the carrier signal shall be maintained within ±0.005% of the operating frequency over a temperature variation of −20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. Battery operated equipment shall be tested using a new battery.

## 10.2 Test Setup




## 10.3 Test Procedure

The test was conducted as follows: The transmitter was placed in the temperature chamber at 25 ºC and allowed to stabilize for one hour. The transmitter was keyed ON for one minute during which four frequency readings were recorded at 15-second intervals. The worst case number used in the table below. The assigned channel frequency was considered to be the reference frequency. The temperature was then reduced to -20 ºC after which the transmitter was again allowed to stabilize for one hour. The transmitter was keyed ON for one minute, and again frequency readings were noted at 15-second intervals. The worst-case number was again used in the table below. This procedure was repeated in 10-degree increments up to + 50 ºC.

## 10.4 Deviation From Test Standard

No deviation

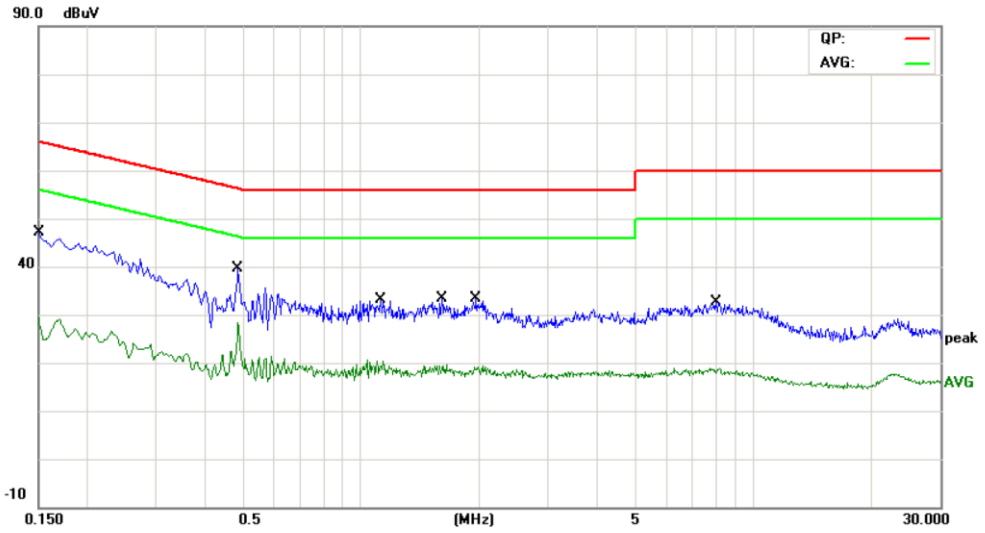
## 10.5 Test Data

Please refer to the Attachment F.

# Attachment A-- Conducted Emission Test Data

Remark: All channels have been tested and Shows only the worst channels.

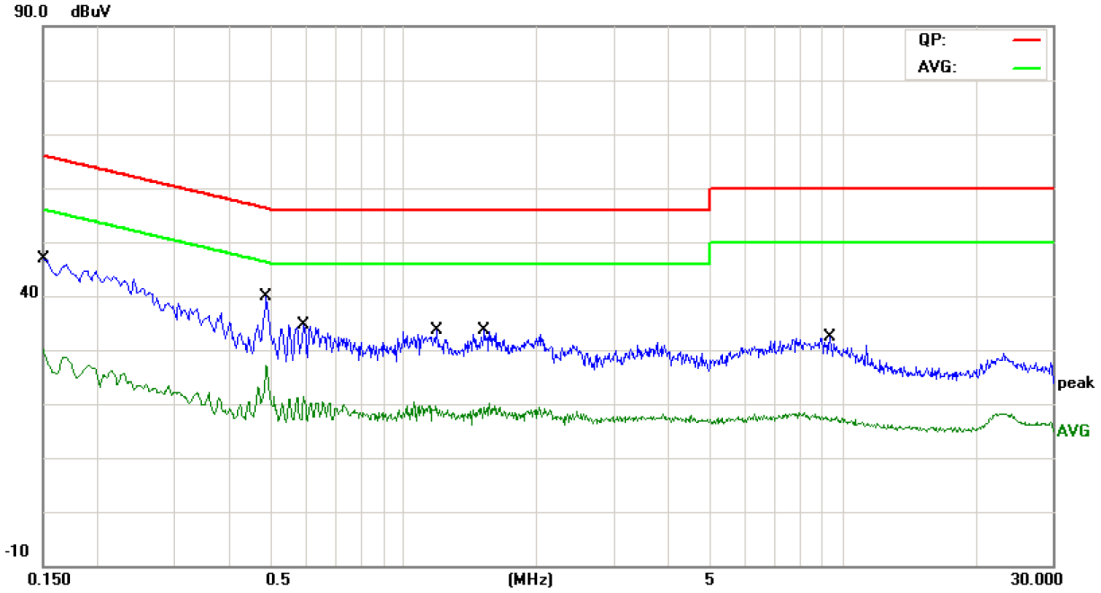
| | | | |
|---|---|---|---|
| **Temperature:** | 23.3℃ | **Relative Humidity:** | 41% |
| **Test Voltage:** | AC 120V/60Hz | | |
| **Terminal:** | Line | | |
| **Test Mode:** | Mode 1(Charging + TX Mode) | | |
| **Remark:** | Only worst case is reported | | |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector |
| 1 | | 0.1500 | 34.77 | 9.70 | 44.47 | 65.99 | -21.52 | QP |
| 2 | | 0.1500 | 18.85 | 9.70 | 28.55 | 55.99 | -27.44 | AVG |
| 3 | | 0.4860 | 26.95 | 9.70 | 36.65 | 56.24 | -19.59 | QP |
| 4 | * | 0.4860 | 17.54 | 9.70 | 27.24 | 46.24 | -19.00 | AVG |
| 5 | | 1.1180 | 18.54 | 9.79 | 28.33 | 56.00 | -27.67 | QP |
| 6 | | 1.1180 | 9.55 | 9.79 | 19.34 | 46.00 | -26.66 | AVG |
| 7 | | 1.6019 | 17.51 | 9.74 | 27.25 | 56.00 | -28.75 | QP |
| 8 | | 1.6019 | 8.73 | 9.74 | 18.47 | 46.00 | -27.53 | AVG |
| 9 | | 1.9620 | 16.27 | 9.70 | 25.97 | 56.00 | -30.03 | QP |
| 10 | | 1.9620 | 7.86 | 9.70 | 17.56 | 46.00 | -28.44 | AVG |
| 11 | | 8.0219 | 14.92 | 9.80 | 24.72 | 60.00 | -35.28 | QP |
| 12 | | 8.0219 | 7.32 | 9.80 | 17.12 | 50.00 | -32.88 | AVG |

**Remark:**
**1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)**
**2. Margin (dB) =QuasiPeak/Average (dBuV)-Limit (dBuV)**

| Temperature: | 23.3℃ | Relative Humidity: | 41% |
|---|---|---|---|
| Test Voltage: | AC 120V/60Hz | | |
| Terminal: | Neutral | | |
| Test Mode: | Mode 1(Charging + TX Mode) | | |
| Remark: | Only worst case is reported | | |

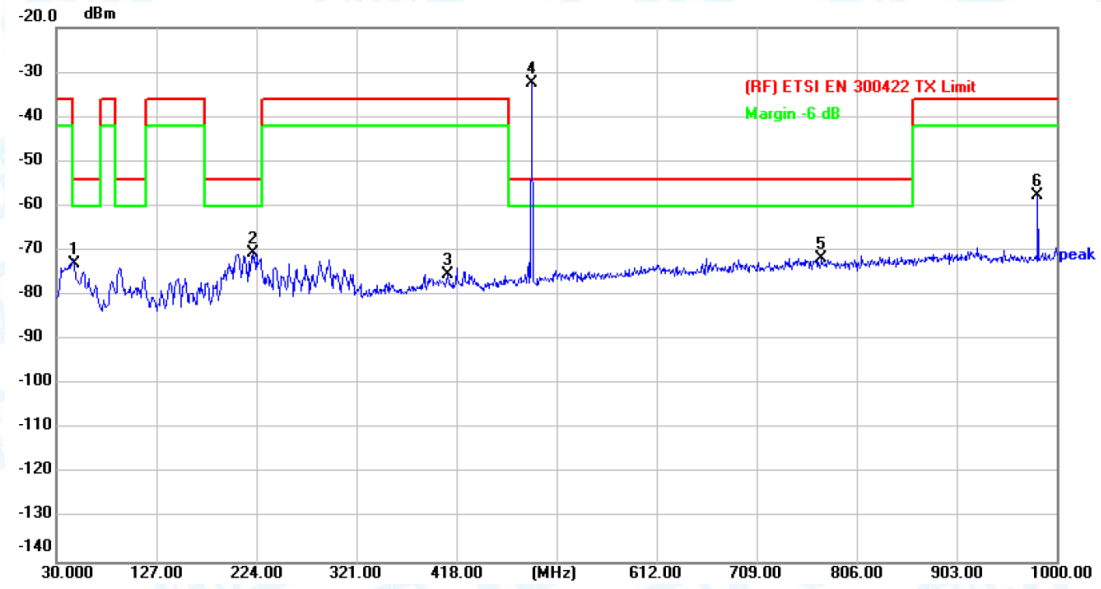



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector |
| 1 | | 0.1500 | 34.40 | 9.80 | 44.20 | 65.99 | -21.79 | QP |
| 2 | | 0.1500 | 18.07 | 9.80 | 27.87 | 55.99 | -28.12 | AVG |
| 3 | | 0.4860 | 27.60 | 9.80 | 37.40 | 56.24 | -18.84 | QP |
| 4 | * | 0.4860 | 18.00 | 9.80 | 27.80 | 46.24 | -18.44 | AVG |
| 5 | | 0.5899 | 21.25 | 9.80 | 31.05 | 56.00 | -24.95 | QP |
| 6 | | 0.5899 | 10.68 | 9.80 | 20.48 | 46.00 | -25.52 | AVG |
| 7 | | 1.1860 | 17.37 | 9.80 | 27.17 | 56.00 | -28.83 | QP |
| 8 | | 1.1860 | 8.37 | 9.80 | 18.17 | 46.00 | -27.83 | AVG |
| 9 | | 1.5220 | 18.53 | 9.80 | 28.33 | 56.00 | -27.67 | QP |
| 10 | | 1.5220 | 8.86 | 9.80 | 18.66 | 46.00 | -27.34 | AVG |
| 11 | | 9.3500 | 14.54 | 9.90 | 24.44 | 60.00 | -35.56 | QP |
| 12 | | 9.3500 | 6.55 | 9.90 | 16.45 | 50.00 | -33.55 | AVG |

**Remark:**
**1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)**
**2. Margin (dB) =QuasiPeak/Average (dBuV)-Limit (dBuV)**

# Attachment B--Power Output Test Data

| Frequency (MHz) | Radiated RF power(dBm) | Limit | Margin (dB) |
|---|---|---|---|
| 490.5 | -32.43 | 50mw (16.98dBm) | -49.41 |

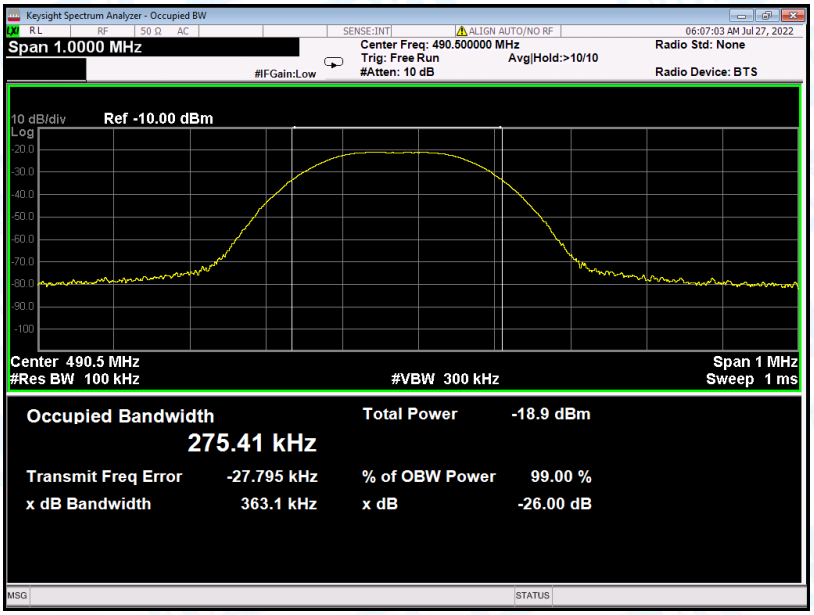



| No. | Frequency (MHz) | Reading (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 47.4600 | -64.08 | -9.02 | -73.10 | -54.00 | -19.10 | peak |
| 2 | 220.1200 | -58.66 | -11.87 | -70.53 | -54.00 | -16.53 | peak |
| 3 | 409.2700 | -68.30 | -7.07 | -75.37 | -36.00 | -39.37 | peak |
| 4 * | 490.7500 | -26.45 | -5.98 | -32.43 | Fundamental Frquency | | peak |
| 5 | 772.0500 | -70.38 | -1.47 | -71.85 | -54.00 | -17.85 | peak |
| 6 | 981.5700 | -57.64 | 0.08 | -57.56 | -36.00 | -21.56 | peak |

# Attachment C--Bandwidth Test Data

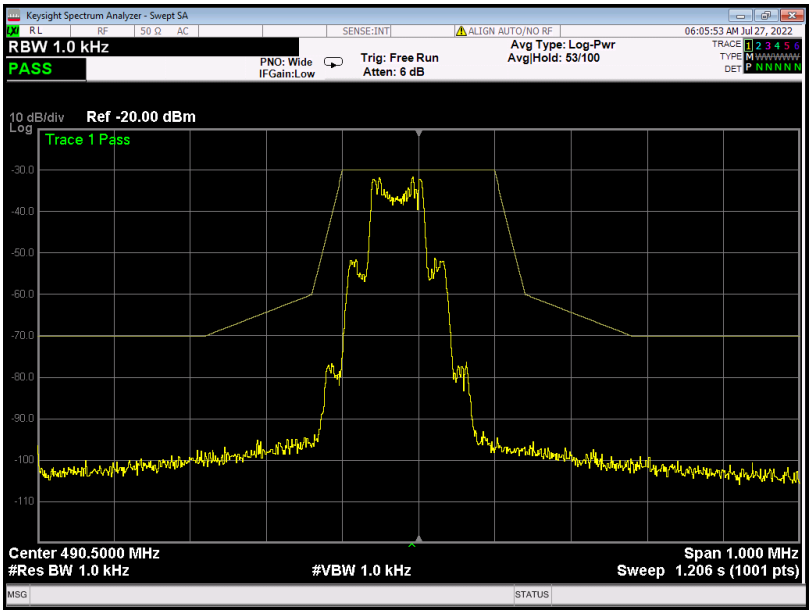
| Channel Frequency (MHz) | 99% Bandwidth (KHz) | 26dB Bandwidth (KHz) |
|---|---|---|
| 490.5 | 275.41 | 363.1 |

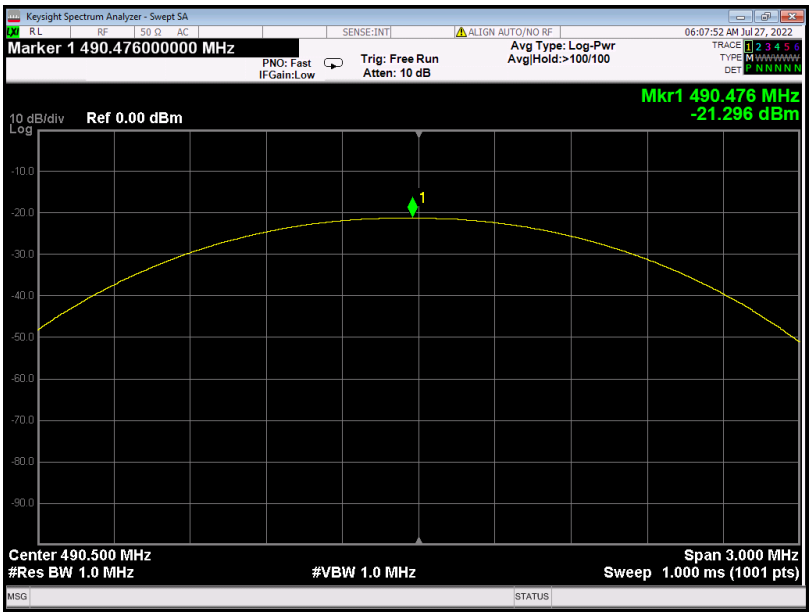
490.5**MHz**



# Attachment D--Emission Mask Test Data

| Temperature： | 26°C | Relative Humidity: | 60% |
|---|---|---|---|
| Pressure: | 1010 hPa | Test Voltage : | DC 3.7V (Normal) |
| Test Mode : | TX 490.5MHz | | |
| Result: | PASS | | |



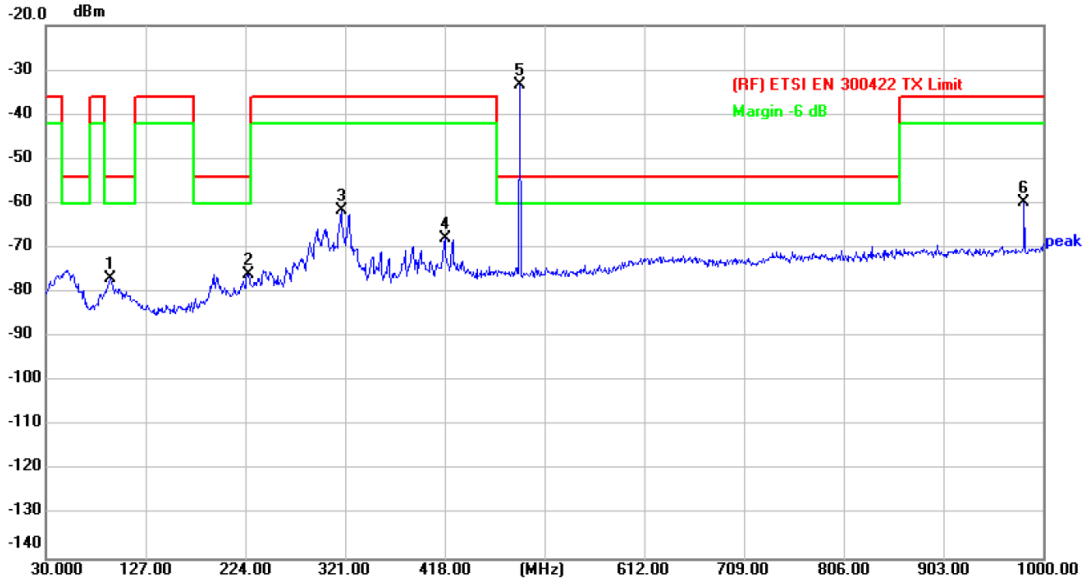




REF reference plot

# Attachment E--Radiated Spurious Emission Test Date

## Below 1 GHz

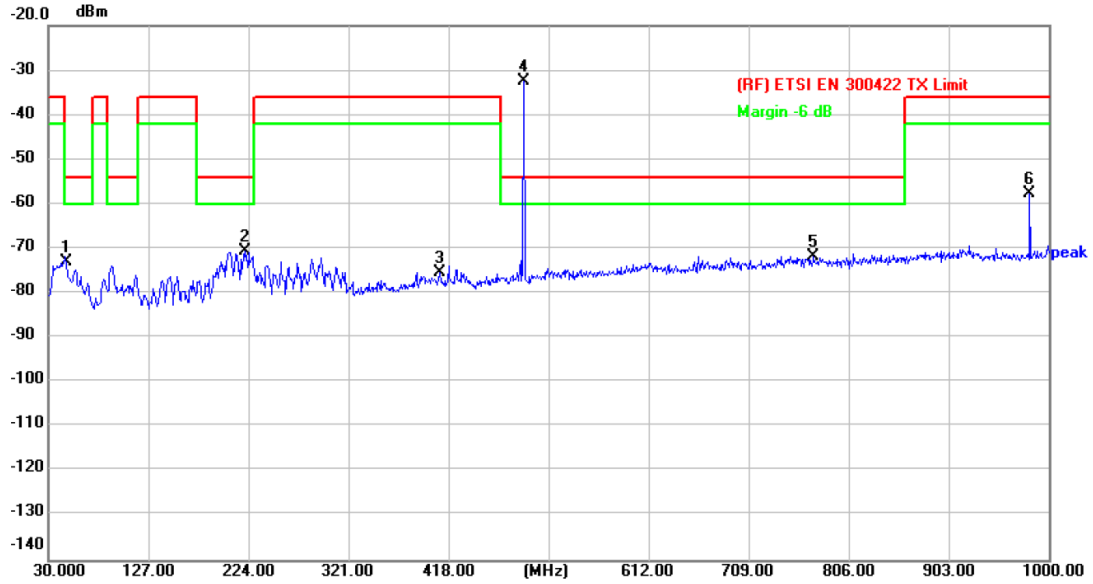
| | | | |
|---|---|---|---|
| **Temperature:** | 25 ℃ | **Relative Humidity:** | 55% |
| **Test Voltage:** | DC 3.7V | | |
| **Ant. Pol.** | Horizontal | | |
| **Test Mode:** | TX Mode 490.5MHz | | |
| **Remark:** | All channels were tested and only the worst channels were shown in the report. | | |




| No. | Frequency (MHz) | Reading (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 92.0800 | -66.18 | -10.71 | -76.89 | -54.00 | -22.89 | peak |
| 2 | 226.9100 | -66.05 | -9.82 | -75.87 | -54.00 | -21.87 | peak |
| 3 | 317.1200 | -53.28 | -8.26 | -61.54 | -36.00 | -25.54 | peak |
| 4 | 418.0000 | -60.68 | -7.19 | -67.87 | -36.00 | -31.87 | peak |
| 5 * | 490.7500 | -27.44 | -5.92 | -33.36 | Fundamental Frequency | | eak |
| 6 | 981.5700 | -59.74 | 0.11 | -59.63 | -36.00 | -23.63 | peak |

**Emission Level= Read Level+ Correct Factor**

| | | | |
|---|---|---|---|
| **Temperature:** | 25 ℃ | **Relative Humidity:** | 55% |
| **Test Voltage:** | DC 3.7V | | |
| **Ant. Pol.** | Vertical | | |
| **Test Mode:** | TX Mode 490.5MHz | | |
| **Remark:** | All channels were tested and only the worst channels were shown in the report. | | |

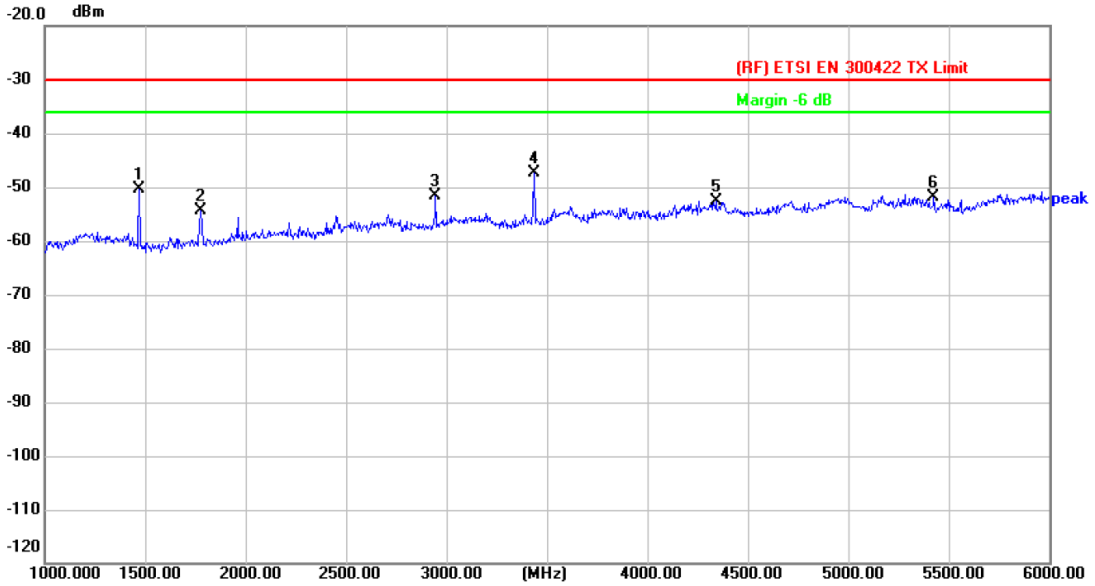



| No. | Frequency (MHz) | Reading (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 47.4600 | -64.08 | -9.02 | -73.10 | -54.00 | -19.10 | peak |
| 2 | 220.1200 | -58.66 | -11.87 | -70.53 | -54.00 | -16.53 | peak |
| 3 | 409.2700 | -68.30 | -7.07 | -75.37 | -36.00 | -39.37 | peak |
| 4 * | 490.7500 | -26.45 | -5.98 | -32.43 | Fundamental Frequency | | peak |
| 5 | 772.0500 | -70.38 | -1.47 | -71.85 | -54.00 | -17.85 | peak |
| 6 | 981.5700 | -57.64 | 0.08 | -57.56 | -36.00 | -21.56 | peak |

**Emission Level= Read Level+ Correct Factor**

## Above 1 GHz

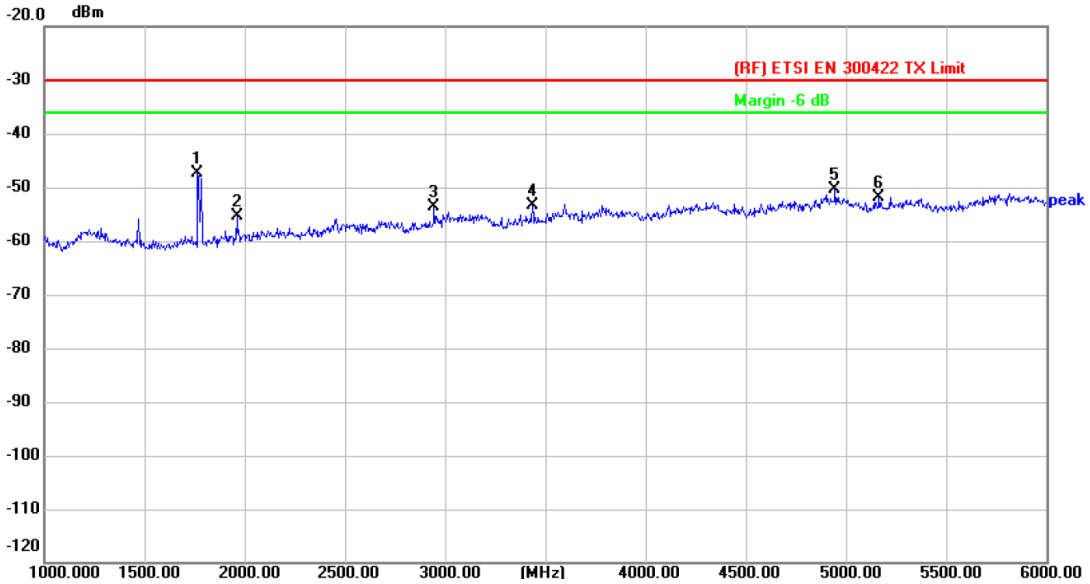
| | | | |
|---|---|---|---|
| **Temperature:** | 25 ℃ | **Relative Humidity:** | 55% |
| **Test Voltage:** | DC 3.7V | | |
| **Ant. Pol.** | Horizontal | | |
| **Test Mode:** | TX Mode 490.5MHz | | |
| **Remark:** | All channels were tested and only the worst channels were shown in the report. | | |




| No. | Frequency (MHz) | Reading (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 1470.000 | -42.84 | -7.58 | -50.42 | -30.00 | -20.42 | peak |
| 2 | 1775.000 | -47.83 | -6.51 | -54.34 | -30.00 | -24.34 | peak |
| 3 | 2945.000 | -48.59 | -2.94 | -51.53 | -30.00 | -21.53 | peak |
| 4 * | 3435.000 | -45.54 | -1.85 | -47.39 | -30.00 | -17.39 | peak |
| 5 | 4340.000 | -53.70 | 1.05 | -52.65 | -30.00 | -22.65 | peak |
| 6 | 5425.000 | -54.77 | 2.82 | -51.95 | -30.00 | -21.95 | peak |

**Emission Level= Read Level+ Correct Factor**

| Temperature: | 25 ℃ | Relative Humidity: | 55% |
|---|---|---|---|
| Test Voltage: | DC 3.7V | | |
| Ant. Pol. | Vertical | | |
| Test Mode: | TX Mode 490.5MHz | | |
| Remark: | All channels were tested and only the worst channels were shown in the report. | | |




| No. | Frequency (MHz) | Reading (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 * | 1765.000 | -40.88 | -6.41 | -47.29 | -30.00 | -17.29 | peak |
| 2 | 1960.000 | -50.22 | -5.24 | -55.46 | -30.00 | -25.46 | peak |
| 3 | 2945.000 | -51.07 | -2.64 | -53.71 | -30.00 | -23.71 | peak |
| 4 | 3435.000 | -51.61 | -1.71 | -53.32 | -30.00 | -23.32 | peak |
| 5 | 4945.000 | -53.51 | 3.03 | -50.48 | -30.00 | -20.48 | peak |
| 6 | 5165.000 | -54.94 | 3.12 | -51.82 | -30.00 | -21.82 | peak |

**Emission Level= Read Level+ Correct Factor**

# Attachment F--Frequency Stability Test Data

| | | | |
|---|---|---|---|
| **Pressure:** | 1010 hPa | **Test Voltage :** | DC 3.7V (Normal) |
| **Test Mode :** | TX 490.5MHz (Modulation) | | |
| **Remark:** | All channels were tested and only the worst channels were shown in the report. | | |

| Test Conditions | Measurement Frequency(MHz) | Test Voltage | Measurement Frequency(MHz) |
|---|---|---|---|
| -30°C | 490.5 | 85% | 490.480 |
| -20°C | 490.5 | 90% | 490.480 |
| -10°C | 490.5 | 95% | 490.480 |
| 0°C | 490.5 | 100% | 490.480 |
| 10°C | 490.5 | 105% | 490.480 |
| 20°C | 490.5 | 110% | 490.480 |
| 30°C | 490.5 | 115% | 490.480 |
| 40°C | 490.5 | | |
| 50°C | 490.5 | | |
| Max. Deviation Frequency | | | 0.02 |
| Max. Frequency Error | | | 0.0041% |
| Limits | | | ±0.005% |
| Result | | | PASS |

**Note: The frequency tolerance of the carrier signal shall be maintained within ±0.005% of the operating frequency.**

**-----END OF REPORT----**