



**SGS-CSTC Standards Technical Services Co.,  
Ltd. Shanghai Branch**

Report No.: SHEM190601456701

Page: 1 of 24

## TEST REPORT

**Application No.:** SHEM1906014567CR  
**FCC ID:** 2APV2-CSK3A  
**IC:** 23928-CSK3A  
**Applicant:** Hangzhou Ezviz Software Co., Ltd.  
**Address of Applicant:** Floor 16, Unit B, Building 1, No. 555, Qianmo Road, Binjiang District, Hangzhou City, Zhejiang Province  
**Manufacturer:** Hangzhou Ezviz Software Co., Ltd.  
**Address of Manufacturer:** Floor 16, Unit B, Building 1, No. 555, Qianmo Road, Binjiang District, Hangzhou City, Zhejiang Province  
**Factory:** Hangzhou Hikvision Electronics Co., Ltd.  
**Address of Factory:** No. 299, Qiushi Road, Tonglu Economic Development Zone, Tonglu County, Hangzhou.  
**Equipment Under Test (EUT):**  
**EUT Name:** Smart Wireless Alarm Panel  
**Model No.:** CS-K3-A, CS-K3-C  
Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.  
**Trade mark:** eZVIZ  
**Standard(s) :** 47 CFR Part 15, Subpart C 15.249  
RSS-210 Issue 9 , August 2016  
RSS-Gen Issue 5, April 2018  
**Date of Receipt:** 2019-06-25  
**Date of Test:** 2019-06-26 to 2019-07-01  
**Date of Issue:** 2019-08-07

|                     |               |
|---------------------|---------------|
| <b>Test Result:</b> | <b>Pass *</b> |
|---------------------|---------------|

\* In the configuration tested, the EUT complied with the standards specified above.

Parlan Zhan

Parlan Zhan  
E&E Section Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.  
**Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com**

SGS-CSTC Standards Technical Services Co., Ltd.  
Testing Center EMC Laboratory

NO. 588 West Jindu Road, Songjiang District, Shanghai, China 201612  
中国·上海·松江区金都西路588号 邮编: 201612

t(86-21) 61915666 f(86-21) 61915678 www.sgsgroup.com.cn  
t(86-21) 61915666 f(86-21) 61915678 e sgs.china@sgs.com



| Revision Record |             |            |        |
|-----------------|-------------|------------|--------|
| Version         | Description | Date       | Remark |
| 00              | Original    | 2019-08-07 | /      |
|                 |             |            |        |
|                 |             |            |        |

|                          |  |                                |  |  |
|--------------------------|--|--------------------------------|--|--|
| Authorized for issue by: |  |                                |  |  |
|                          |  | Vincent Zhu                    |  |  |
|                          |  | Vincent Zhu / Project Engineer |  |  |
|                          |  | Parlam Zhan                    |  |  |
|                          |  | Parlam Zhan / Reviewer         |  |  |

## 2 Test Summary

| Radio Spectrum Technical Requirement |                                  |                       |        |        |
|--------------------------------------|----------------------------------|-----------------------|--------|--------|
| Item                                 | FCC Requirement                  | IC Requirement        | Method | Result |
| Antenna Requirement                  | 47 CFR Part 15, Subpart C 15.249 | RSS-Gen Section 8.1.3 | N/A    | Pass   |

| Radio Spectrum Matter Part                           |                                  |                                                              |                                        |        |
|------------------------------------------------------|----------------------------------|--------------------------------------------------------------|----------------------------------------|--------|
| Item                                                 | FCC Requirement                  | IC Requirement                                               | Method                                 | Result |
| Conducted Emissions at AC Power Line (150kHz-30MHz)  | 47 CFR Part 15, Subpart C 15.249 | RSS-Gen Issue 4 Section 7.2.4                                | ANSI C63.10 (2013) Section 6.2         | Pass   |
| 20dB Bandwidth                                       | 47 CFR Part 15, Subpart C 15.249 | RSS-210 Issue 9 Annex 8                                      | ANSI C63.10 (2013) Section 6.9         | Pass   |
| Field Strength of the Fundamental Signal (15.249(a)) | 47 CFR Part 15, Subpart C 15.249 | RSS-210 Issue 9 Annex 2.9 (a)                                | ANSI C63.10 (2013) Section 6.5&6.6     | Pass   |
| Restricted Band Around Fundamental Frequency         | 47 CFR Part 15, Subpart C 15.249 | RSS-Gen Issue 4 Section 4.9<br>RSS-Gen Issue 4 Section 7.2.2 | ANSI C63.10 (2013) Section 6.4&6.5&6.6 | Pass   |
| Radiated Emissions                                   | 47 CFR Part 15, Subpart C 15.249 | RSS-Gen Issue 4 Section 4.9<br>RSS-Gen Issue 4 Section 7.2.2 | ANSI C63.10 (2013) Section 6.4&6.5&6.6 | Pass   |
| 99% Bandwidth                                        | RSS-247 Issue 2, February 2017   | RSS-Gen Section 6.6                                          | ANSI C63.10 Section 6.9.3              | Pass   |
| Frequency Stability                                  | -                                | RSS-Gen Section 8.11                                         | RSS-Gen Section 6.11                   | Pass   |

Note 1: Frequency stability requested in RSS GEN S8.11 has been complied since the result of band edge can demonstrate.

### Declaration of EUT Family Grouping:

Note2: There are series models mentioned in this report, and they are the identical in electrical and electronic characters. Only the model CS-K3-A was tested since their differences were the model number, trade name and appearance.



### 3 Contents

|                                                                | Page |
|----------------------------------------------------------------|------|
| 1 COVER PAGE .....                                             | 1    |
| 2 TEST SUMMARY .....                                           | 3    |
| 3 CONTENTS .....                                               | 4    |
| 4 GENERAL INFORMATION .....                                    | 5    |
| 4.1 DETAILS OF E.U.T. ....                                     | 5    |
| 4.2 DESCRIPTION OF SUPPORT UNITS .....                         | 5    |
| 4.3 MEASUREMENT UNCERTAINTY .....                              | 6    |
| 4.4 TEST LOCATION .....                                        | 7    |
| 4.5 TEST FACILITY .....                                        | 7    |
| 4.6 DEVIATION FROM STANDARDS .....                             | 7    |
| 4.7 ABNORMALITIES FROM STANDARD CONDITIONS .....               | 7    |
| 5 EQUIPMENT LIST .....                                         | 8    |
| 6 RADIO SPECTRUM TECHNICAL REQUIREMENT .....                   | 9    |
| 6.1 ANTENNA REQUIREMENT .....                                  | 9    |
| 7 RADIO SPECTRUM MATTER TEST RESULTS .....                     | 10   |
| 7.1 CONDUCTED EMISSIONS AT AC POWER LINE (150kHz-30MHz) .....  | 10   |
| 7.2 20dB BANDWIDTH .....                                       | 13   |
| 7.3 FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL (15.249(A)) ..... | 14   |
| 7.4 RESTRICTED BAND AROUND FUNDAMENTAL FREQUENCY .....         | 15   |
| 7.5 RADIATED EMISSIONS .....                                   | 18   |
| 7.6 99% BANDWIDTH .....                                        | 22   |
| 8 EQUIPMENT UNDER TEST PICTURES .....                          | 24   |
| 9 EUT CONSTRUCTIONAL DETAILS .....                             | 24   |



## **4 General Information**

### **4.1 Details of E.U.T.**

|                     |                                          |
|---------------------|------------------------------------------|
| Power supply:       | DC 5V by adapter                         |
|                     | Adapter:                                 |
|                     | Model.:ADS-5RE-06 05050EPCU/EPC          |
|                     | Input:100~240V~50/60Hz 150mA             |
|                     | Battery:                                 |
|                     | Rechargeable Li-ion battery 3.7V 2000mAh |
| Test voltage:       | AC 120V 60Hz                             |
| Cable:              | DC Cable 1.5m for adapter                |
| Antenna Type        | PCB Antenna                              |
| Modulation Type     | FSK                                      |
| Number of Channels  | 1                                        |
| Operation Frequency | 915MHz                                   |
| Antenna Gain:       | -1 dBi                                   |

### **4.2 Description of Support Units**

The EUT has been tested as an independent unit.

#### 4.3 Measurement Uncertainty

| No. | Item                            | Measurement Uncertainty   |
|-----|---------------------------------|---------------------------|
| 1   | Radio Frequency                 | $\pm 8.4 \times 10^{-8}$  |
| 2   | Timeout                         | $\pm 2s$                  |
| 3   | Duty cycle                      | $\pm 0.37\%$              |
| 4   | Occupied Bandwidth              | $\pm 3\%$                 |
| 5   | RF conducted power              | $\pm 0.6dB$               |
| 6   | RF power density                | $\pm 2.84dB$              |
| 7   | Conducted Spurious emissions    | $\pm 0.75dB$              |
| 8   | RF Radiated power               | $\pm 4.6dB$ (Below 1GHz)  |
|     |                                 | $\pm 4.1dB$ (Above 1GHz)  |
| 9   | Radiated Spurious emission test | $\pm 4.2dB$ (Below 30MHz) |
|     |                                 | $\pm 4.4dB$ (30MHz-1GHz)  |
|     |                                 | $\pm 4.8dB$ (1GHz-18GHz)  |
|     |                                 | $\pm 5.2dB$ (Above 18GHz) |
| 10  | Temperature test                | $\pm 1^{\circ}C$          |
| 11  | Humidity test                   | $\pm 3\%$                 |
| 12  | Supply voltages                 | $\pm 1.5\%$               |
| 13  | Time                            | $\pm 3\%$                 |

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

#### 4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.

#### 4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **NVLAP (Certificate No. 201034-0)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). Certificate No. 201034-0.

- **FCC –Designation Number: CN5033**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN5033. Test Firm Registration Number: 479755.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

IC Registration No.: 8617A-1. CAB identifier: CN0020.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

#### 4.6 Deviation from Standards

None

#### 4.7 Abnormalities from Standard Conditions

None

## 5 Equipment List

| Equipment                 | Manufacturer | Model No         | Inventory No | Cal Date   | Cal Due Date |
|---------------------------|--------------|------------------|--------------|------------|--------------|
| <b>Radiated Test</b>      |              |                  |              |            |              |
| EMI test Receiver         | R&S          | ESU40            | SHEM051-1    | 2018-12-20 | 2019-12-19   |
| Spectrum Analyzer         | R&S          | FSP-30           | SHEM002-1    | 2018-12-20 | 2019-12-19   |
| Loop Antenna (9kHz-30MHz) | Schwarzbeck  | FMZB1519         | SHEM135-1    | 2017-04-10 | 2020-04-09   |
| Antenna (25MHz-2GHz)      | Schwarzbeck  | VULB9168         | SHEM048-1    | 2017-02-28 | 2020-02-27   |
| Antenna (25MHz-3GHz)      | Schwarzbeck  | HL562            | SHEM010-1    | 2017-02-28 | 2020-02-27   |
| Horn Antenna (1-8GHz)     | Schwarzbeck  | HF906            | SHEM009-1    | 2017-10-24 | 2020-10-23   |
| Horn Antenna (1-18GHz)    | Schwarzbeck  | BBHA9120D        | SHEM050-1    | 2017-01-14 | 2020-01-13   |
| Horn Antenna (14-40GHz)   | Schwarzbeck  | BBHA 9170        | SHEM049-1    | 2017-12-03 | 2020-12-02   |
| Pre-amplifier (9kHz-2GHz) | CLAVIIO      | BDLNA-0001       | SHEM164-1    | 2018-08-13 | 2019-08-12   |
| Pre-amplifier (1-18GHz)   | CLAVIIO      | BDLNA-0118       | SHEM050-2    | 2018-08-13 | 2019-08-12   |
| High-amplifier (14-40GHz) | Schwarzbeck  | 10001            | SHEM049-2    | 2018-12-20 | 2019-12-19   |
| Signal Generator          | R&S          | SMR40            | SHEM058-1    | 2018-08-13 | 2019-08-12   |
| Band Filter               | LORCH        | 9BRX-875/X150    | SHEM156-1    | /          | /            |
| Band Filter               | LORCH        | 13BRX-1950/X500  | SHEM083-2    | /          | /            |
| Band Filter               | LORCH        | 5BRX-2400/X200   | SHEM155-1    | /          | /            |
| Band Filter               | LORCH        | 5BRX-5500/X1000  | SHEM157-2    | /          | /            |
| High pass Filter          | Wainwright   | WHK3.0/18G       | SHEM157-1    | /          | /            |
| High pass Filter          | Wainwright   | WHKS1700         | SHEM157-3    | /          | /            |
| Semi/Fully Anechoic       | ST           | 11*6*6M          | SHEM078-2    | 2017-07-22 | 2020-07-21   |
| RE test Cable             | /            | RE01, RE02, RE06 | /            | 2018-12-26 | 2019-12-25   |

## 6 Radio Spectrum Technical Requirement

### 6.1 Antenna Requirement

#### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

Limit:

15.203 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

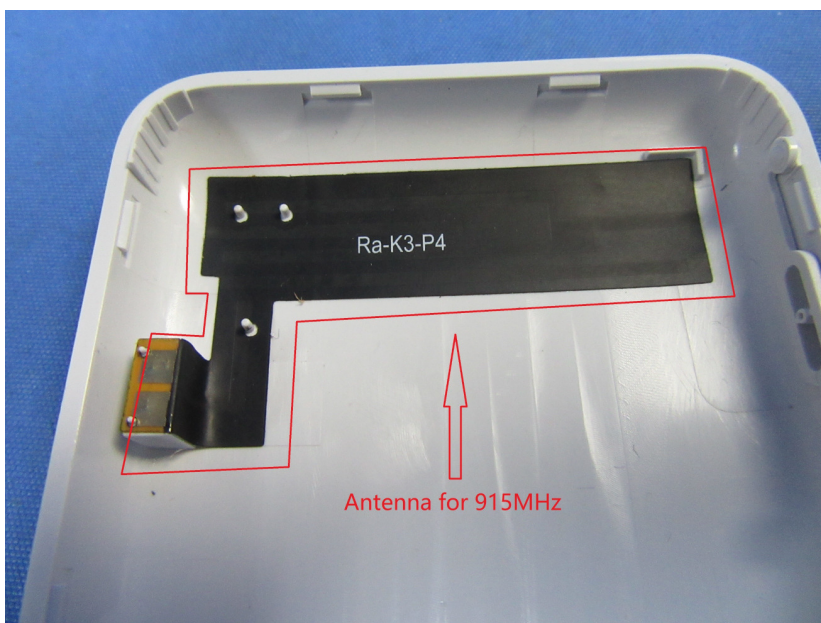
#### 6.1.2 Conclusion

Standard 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is PCB antenna, the antenna gain is -1dBi and no consideration of replacement.



## 7 Radio Spectrum Matter Test Results

### 7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207  
Test Method: ANSI C63.10 (2013) Section 6.2  
Limit:

| Frequency range (MHz) | Limit (dBuV) |           |
|-----------------------|--------------|-----------|
|                       | Quasi-peak   | Average   |
| 0.15-0.5              | 66 to 56*    | 56 to 46* |
| 0.5-5                 | 56           | 46        |
| 5-30                  | 60           | 50        |

\* Decreases with the logarithm of the frequency.

#### 7.1.1 E.U.T. Operation

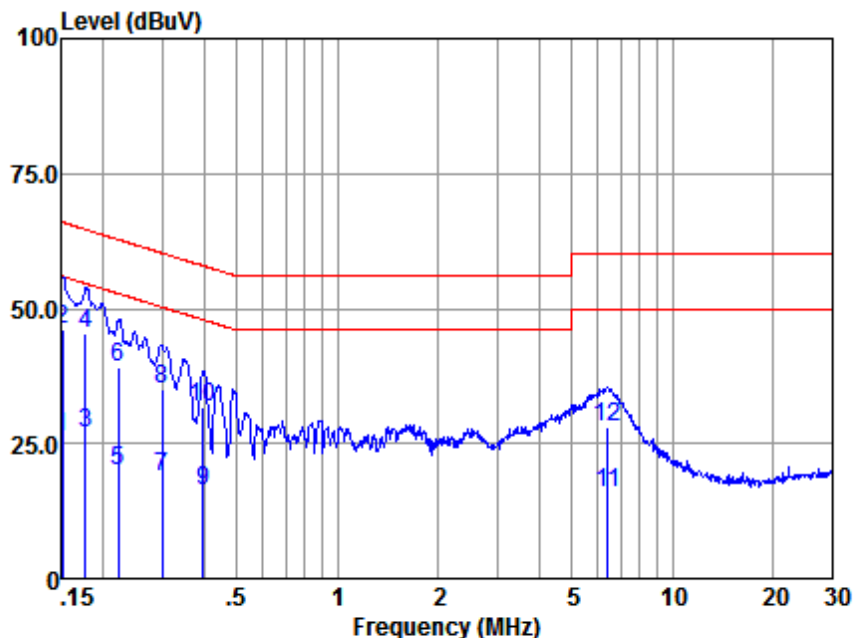
Operating Environment:

Temperature: 20 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar  
Test mode a:Charge + TX mode\_Keep the EUT in charging and transmitting with modulation mode.

#### 7.1.2 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
  - 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
  - 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
  - 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
  - 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.
- Remark: LISN=Read Level+ Cable Loss+ LISN Factor

Mode:a; Line:Live Line

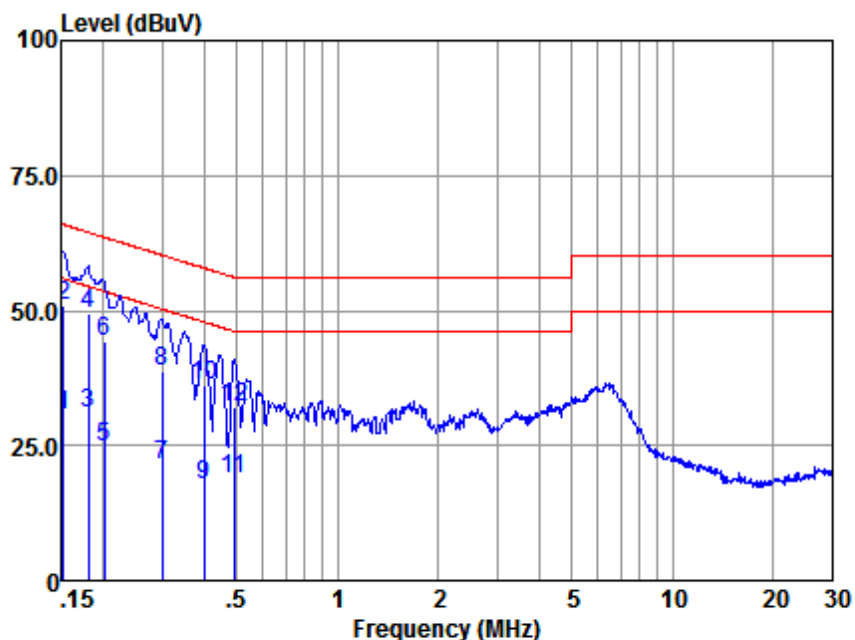


LISN : LINE  
EUT/Project No : 14565CR  
Test Mode : a

|    | Freq<br>(MHz) | Read<br>level<br>(dBuV) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Emission<br>Level<br>(dBuV) | Limit<br>(dBuV) | Over<br>Limit<br>(dB) | Remark  |
|----|---------------|-------------------------|------------------------|-----------------------|-----------------------------|-----------------|-----------------------|---------|
| 1  | 0.15          | 16.20                   | 0.09                   | 10.00                 | 26.29                       | 55.96           | -29.67                | Average |
| 2  | 0.15          | 36.19                   | 0.09                   | 10.00                 | 46.28                       | 65.96           | -19.68                | QP      |
| 3  | 0.18          | 16.72                   | 0.08                   | 10.00                 | 26.80                       | 54.64           | -27.84                | Average |
| 4  | 0.18          | 35.28                   | 0.08                   | 10.00                 | 45.36                       | 64.64           | -19.28                | QP      |
| 5  | 0.22          | 9.94                    | 0.07                   | 10.00                 | 20.01                       | 52.74           | -32.73                | Average |
| 6  | 0.22          | 28.90                   | 0.07                   | 10.00                 | 38.97                       | 62.74           | -23.77                | QP      |
| 7  | 0.30          | 8.92                    | 0.07                   | 10.00                 | 18.99                       | 50.28           | -31.29                | Average |
| 8  | 0.30          | 24.90                   | 0.07                   | 10.00                 | 34.97                       | 60.28           | -25.31                | QP      |
| 9  | 0.40          | 6.15                    | 0.08                   | 10.00                 | 16.23                       | 47.95           | -31.72                | Average |
| 10 | 0.40          | 21.61                   | 0.08                   | 10.00                 | 31.69                       | 57.95           | -26.26                | QP      |
| 11 | 6.42          | 5.29                    | 0.17                   | 10.30                 | 15.76                       | 50.00           | -34.24                | Average |
| 12 | 6.42          | 17.43                   | 0.17                   | 10.30                 | 27.90                       | 60.00           | -32.10                | QP      |

Notes: Emission Level = Read Level + LISN Factor + Cable loss

Mode:a; Line:Neutral Line



LISN : NEUTRAL  
EUT/Project No : 14565CR  
Test Mode : a

|    | Freq<br>(MHz) | Read<br>level<br>(dBuV) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Emission<br>Level<br>(dBuV) | Limit<br>(dBuV) | Over<br>Limit<br>(dB) | Remark  |
|----|---------------|-------------------------|------------------------|-----------------------|-----------------------------|-----------------|-----------------------|---------|
| 1  | 0.15          | 20.52                   | 0.07                   | 10.00                 | 30.59                       | 55.91           | -25.32                | Average |
| 2  | 0.15          | 40.96                   | 0.07                   | 10.00                 | 51.03                       | 65.91           | -14.88                | QP      |
| 3  | 0.18          | 21.00                   | 0.06                   | 10.00                 | 31.06                       | 54.50           | -23.44                | Average |
| 4  | 0.18          | 39.38                   | 0.06                   | 10.00                 | 49.44                       | 64.50           | -15.06                | QP      |
| 5  | 0.20          | 14.73                   | 0.06                   | 10.00                 | 24.79                       | 53.58           | -28.79                | Average |
| 6  | 0.20          | 34.05                   | 0.06                   | 10.00                 | 44.11                       | 63.58           | -19.47                | QP      |
| 7  | 0.30          | 11.50                   | 0.06                   | 10.00                 | 21.56                       | 50.24           | -28.68                | Average |
| 8  | 0.30          | 28.73                   | 0.06                   | 10.00                 | 38.79                       | 60.24           | -21.45                | QP      |
| 9  | 0.40          | 7.56                    | 0.06                   | 10.00                 | 17.62                       | 47.86           | -30.24                | Average |
| 10 | 0.40          | 26.19                   | 0.06                   | 10.00                 | 36.25                       | 57.86           | -21.61                | QP      |
| 11 | 0.49          | 8.90                    | 0.06                   | 10.00                 | 18.96                       | 46.19           | -27.23                | Average |
| 12 | 0.49          | 21.96                   | 0.06                   | 10.00                 | 32.02                       | 56.19           | -24.17                | QP      |

Notes: Emission Level = Read Level + LISN Factor + Cable loss



## 7.2 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215  
Test Method: ANSI C63.10 (2013) Section 6.9  
Limit: N/A

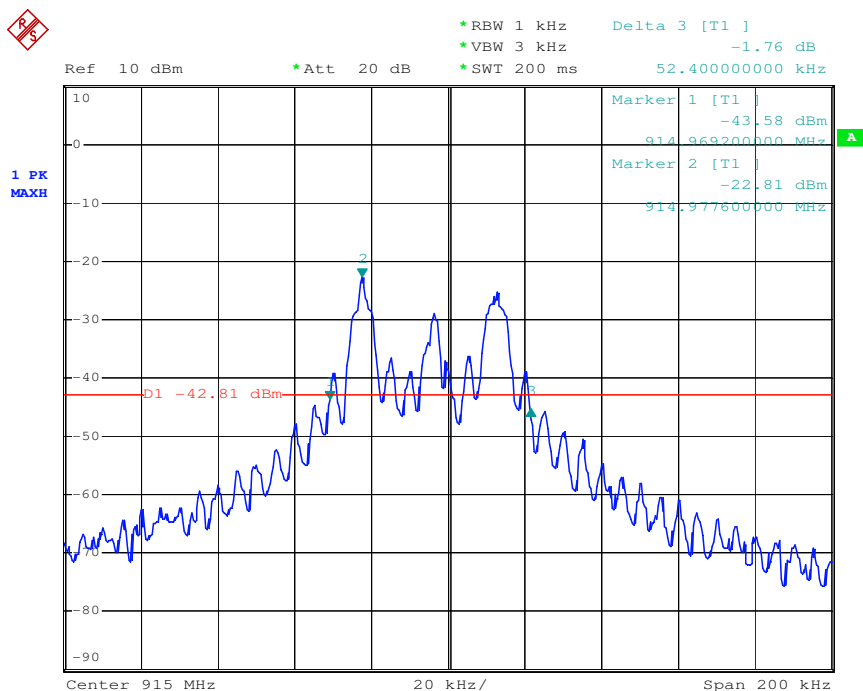
### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 20 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar  
Test mode a:Charge + TX mode\_Keep the EUT in charging and transmitting with modulation mode.

### 7.2.2 Measurement Procedure and Data

| Frequency (MHz) | Bandwidth (MHz) | Result |
|-----------------|-----------------|--------|
| 915             | 0.052           | PASS   |



Date: 28.JUN.2019 12:09:17

### 7.3 Field Strength of the Fundamental Signal (15.249(a))

Test Requirement 47 CFR Part 15, Subpart C 15.249(a)

Test Method: ANSI C63.10 (2013) Section 6.5&6.6

Limit:

| Frequency   | Limit (dBuV/m @3m) | Remark     |
|-------------|--------------------|------------|
| 902-928 MHz | 94.0               | Quasi-Peak |
|             | 114.0              | Peak Value |

#### 7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a:Charge + TX mode\_Keep the EUT in charging and transmitting with modulation mode.

#### 7.3.2 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.

i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

| Frequency (MHz) | Read Level (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Detector | Polarization |
|-----------------|-------------------|---------------|----------------|---------------------|-----------------|----------|--------------|
| 915             | 106.52            | -14.04        | 92.48          | 94.00               | -1.52           | Peak     | Horizontal   |
|                 | 101.06            | -14.04        | 87.02          | 94.00               | -6.98           | Peak     | Vertical     |

Remark:

1) The basic equation with a sample calculation is as follows: Level = Read Level + Factor.

(The Factor is calculated by adding the Antenna Factor, Cable Loss and Preamp Factor)

If the Peak value below the AV Limit, the AV test doesn't perform for this submission.

## 7.4 Restricted Band Around Fundamental Frequency

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6

Limit:

| Frequency     | Limit (dBuV/m @3m) | Remark           |
|---------------|--------------------|------------------|
| 30MHz-88MHz   | 40.0               | Quasi-peak Value |
| 88MHz-216MHz  | 43.5               | Quasi-peak Value |
| 216MHz-960MHz | 46.0               | Quasi-peak Value |
| 960MHz-1GHz   | 54.0               | Quasi-peak Value |
| Above 1GHz    | 54.0               | Average Value    |
| Above 1GHz    | 74.0               | Peak Value       |

Emission 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.

### 7.4.1 E.U.T. Operation

Operating Environment:

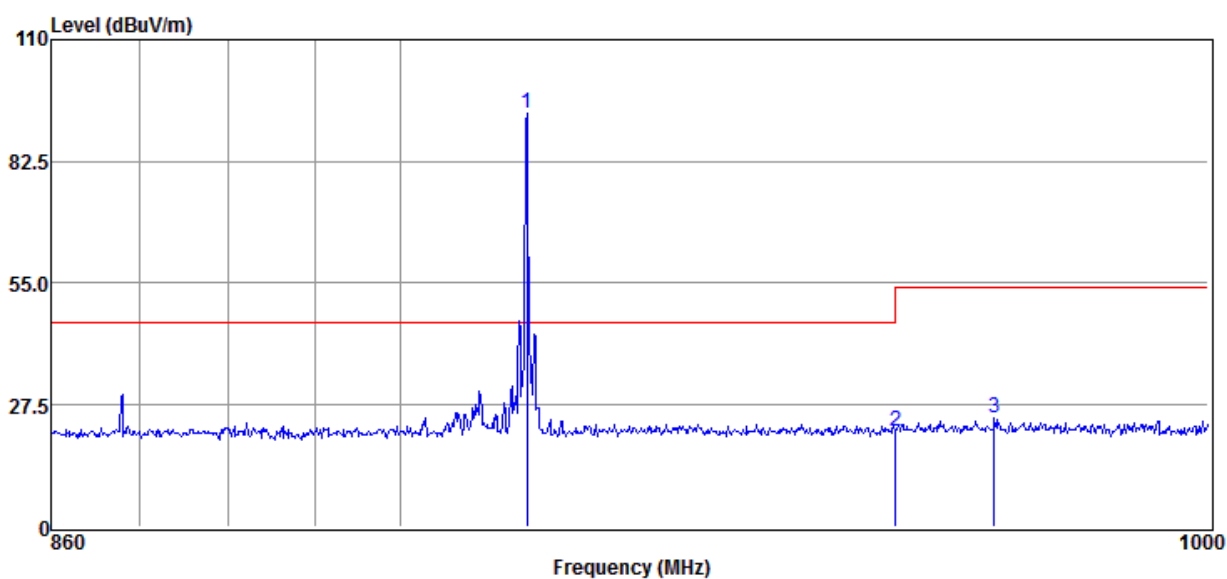
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a: Charge + TX mode\_Keep the EUT in charging and transmitting with modulation mode.

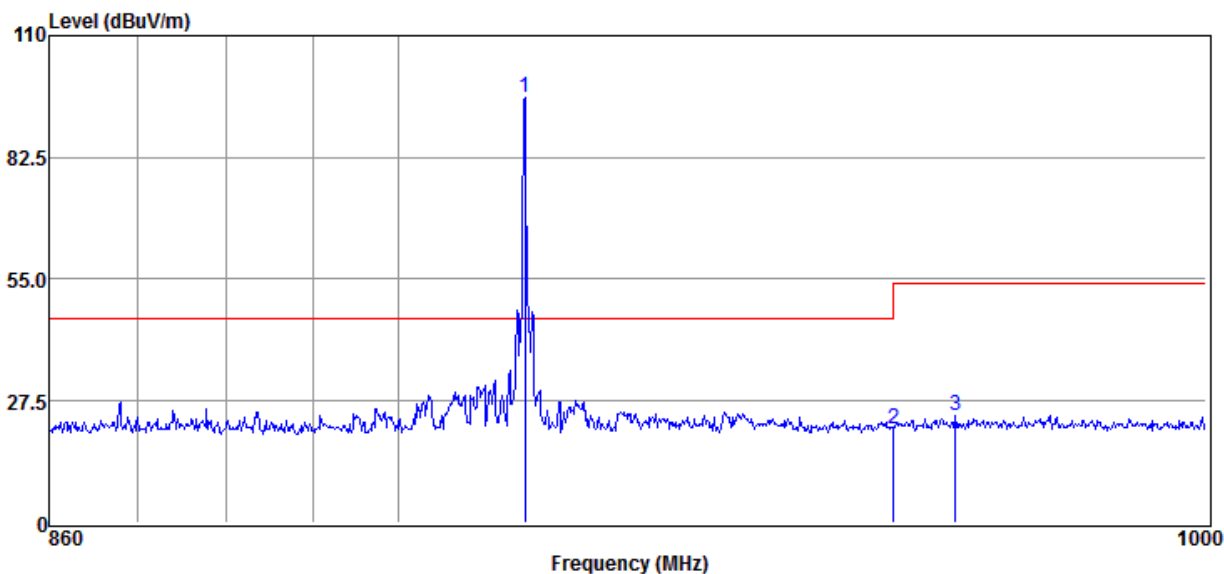
### 7.4.2 Measurement Procedure and Data

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- Test the EUT in the lowest channel, the middle channel, the Highest channel.
- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- Repeat above procedures until all frequencies measured was complete.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



| MK. | Frequency (MHz) | Reading (dBuV/m) | Corrected factor(dB) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector | Polarization |
|-----|-----------------|------------------|----------------------|-----------------|----------------|-----------------|----------|--------------|
| 1   | 914.997         | 107.23           | -21.43               | -14.04          | 46.00          | 47.19           | Peak     | Vertical     |
| 2   | 960.000         | 34.63            | -20.44               | -13.27          | 46.00          | -24.64          | Peak     | Vertical     |
| 3   | 972.483         | 37.35            | -20.3                | -12.86          | 54.00          | -29.51          | Peak     | Vertical     |



| MK. | Frequency (MHz) | Reading (dBuV/m) | Corrected factor(dB) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector | Polarization |
|-----|-----------------|------------------|----------------------|-----------------|----------------|-----------------|----------|--------------|
| 1   | 914.997         | 110.14           | -14.04               | 96.10           | 46.00          | 50.10           | Peak     | Horizontal   |
| 2   | 960.000         | 34.37            | -13.27               | 21.10           | 46.00          | -24.90          | Peak     | Horizontal   |
| 3   | 967.801         | 37.18            | -13.01               | 24.17           | 46.00          | -29.83          | Peak     | Horizontal   |

## 7.5 Radiated Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)  
Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6  
Limit:

| Frequency(MHz) | Field strength<br>(microvolts/meter) | Limit<br>(dBuV/m) | Detector | Measurement Distance<br>(meters) |
|----------------|--------------------------------------|-------------------|----------|----------------------------------|
| 0.009-0.490    | 2400/F(kHz)                          | -                 | -        | 300                              |
| 0.490-1.705    | 24000/F(kHz)                         | -                 | -        | 30                               |
| 1.705-30       | 30                                   | -                 | -        | 30                               |
| 30-88          | 100                                  | 40.0              | QP       | 3                                |
| 88-216         | 150                                  | 43.5              | QP       | 3                                |
| 216-960        | 200                                  | 46.0              | QP       | 3                                |
| 960-1000       | 500                                  | 54.0              | QP       | 3                                |
| Above 1000     | 500                                  | 54.0              | AV       | 3                                |

### 7.5.1 E.U.T. Operation

Operating Environment:

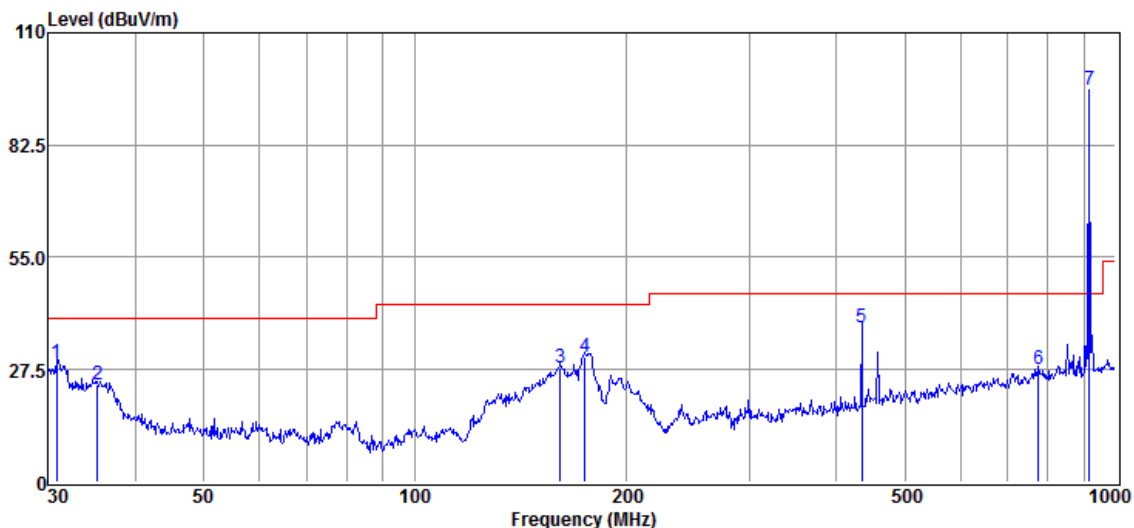
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a: Charge + TX mode\_Keep the EUT in charging and transmitting with modulation mode.

### 7.5.2 Measurement Procedure and Data

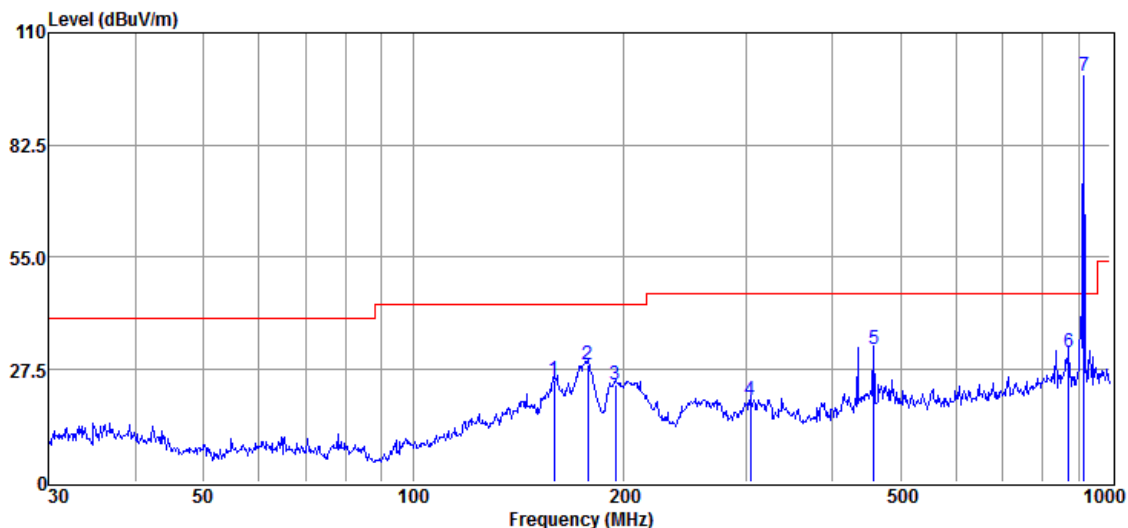
For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.

30MHz-1GHz:  
Vertical:



| Item   | Freq.   | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Result Level | Limit Line         | Over Limit | Detector |
|--------|---------|------------|----------------|---------------|------------|--------------|--------------------|------------|----------|
| (Mark) | (MHz)   | (dBμV)     | (dB/m)         | (dB)          | (dB)       | (dBμV/m)     | (dBμV/m)           | (dB)       |          |
| 1      | 30.853  | 55.73      | 15.40          | 42.37         | 0.50       | 29.26        | 40.00              | -10.74     | QP       |
| 2      | 35.251  | 49.93      | 15.86          | 42.35         | 0.24       | 23.68        | 40.00              | -16.32     | QP       |
| 3      | 161.474 | 55.93      | 12.89          | 42.22         | 1.46       | 28.06        | 43.50              | -15.44     | QP       |
| 4      | 175.037 | 59.48      | 11.75          | 42.20         | 1.60       | 30.63        | 43.50              | -12.87     | QP       |
| 5      | 434.065 | 60.72      | 15.87          | 41.81         | 3.12       | 37.90        | 46.00              | -8.10      | QP       |
| 6      | 776.878 | 43.59      | 21.55          | 41.99         | 4.30       | 27.45        | 46.00              | -18.55     | QP       |
| 7      | 916.069 | 101.06     | 22.85          | 41.61         | 4.72       | 87.02        | Fundamental signal |            |          |

Horizontal:



| Item   | Freq.   | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Result Level | Limit Line         | Over Limit | Detector |
|--------|---------|------------|----------------|---------------|------------|--------------|--------------------|------------|----------|
| (Mark) | (MHz)   | (dBμV)     | (dB/m)         | (dB)          | (dB)       | (dBμV/m)     | (dBμV/m)           | (dB)       |          |
| 1      | 159.225 | 52.85      | 13.01          | 42.22         | 1.44       | 25.08        | 43.50              | -18.42     | QP       |
| 2      | 178.133 | 57.58      | 11.85          | 42.20         | 1.63       | 28.86        | 43.50              | -14.64     | QP       |
| 3      | 195.136 | 54.61      | 9.81           | 42.18         | 1.72       | 23.96        | 43.50              | -19.54     | QP       |
| 4      | 304.610 | 46.25      | 13.29          | 42.09         | 2.58       | 20.03        | 46.00              | -25.97     | QP       |
| 5      | 457.507 | 54.51      | 16.39          | 41.74         | 3.23       | 32.39        | 46.00              | -13.61     | QP       |
| 6      | 872.183 | 46.63      | 22.48          | 41.74         | 4.56       | 31.93        | 46.00              | -14.07     | QP       |
| 7      | 916.069 | 106.52     | 22.85          | 41.61         | 4.72       | 92.48        | Fundamental signal |            |          |

Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor.



Above 1GHz:

| Mark | Frequency<br>(MHz) | Reading<br>(dBuV) | Factor<br>(dB) | Emission<br>(dBuV/m) | Limit<br>(dBuV/m) | Over Limit<br>(dB) | Detector | Polarization |
|------|--------------------|-------------------|----------------|----------------------|-------------------|--------------------|----------|--------------|
| 1    | 1830               | 57.78             | -4.42          | 53.36                | 54                | -0.64              | peak     | Horizontal   |
| 2    | 2745               | 44.12             | -1.58          | 42.54                | 54                | -11.46             | peak     | Horizontal   |
| 3    | 3660               | 44.30             | 2.59           | 46.89                | 54                | -7.11              | peak     | Horizontal   |
| 4    | 1830               | 58.05             | -4.42          | 53.63                | 54                | -0.37              | peak     | Vertical     |
| 5    | 2745               | 46.35             | -1.58          | 44.77                | 54                | -9.23              | peak     | Vertical     |
| 6    | 3660               | 45.80             | 2.59           | 48.39                | 54                | -5.61              | peak     | Vertical     |

## 7.6 99% Bandwidth

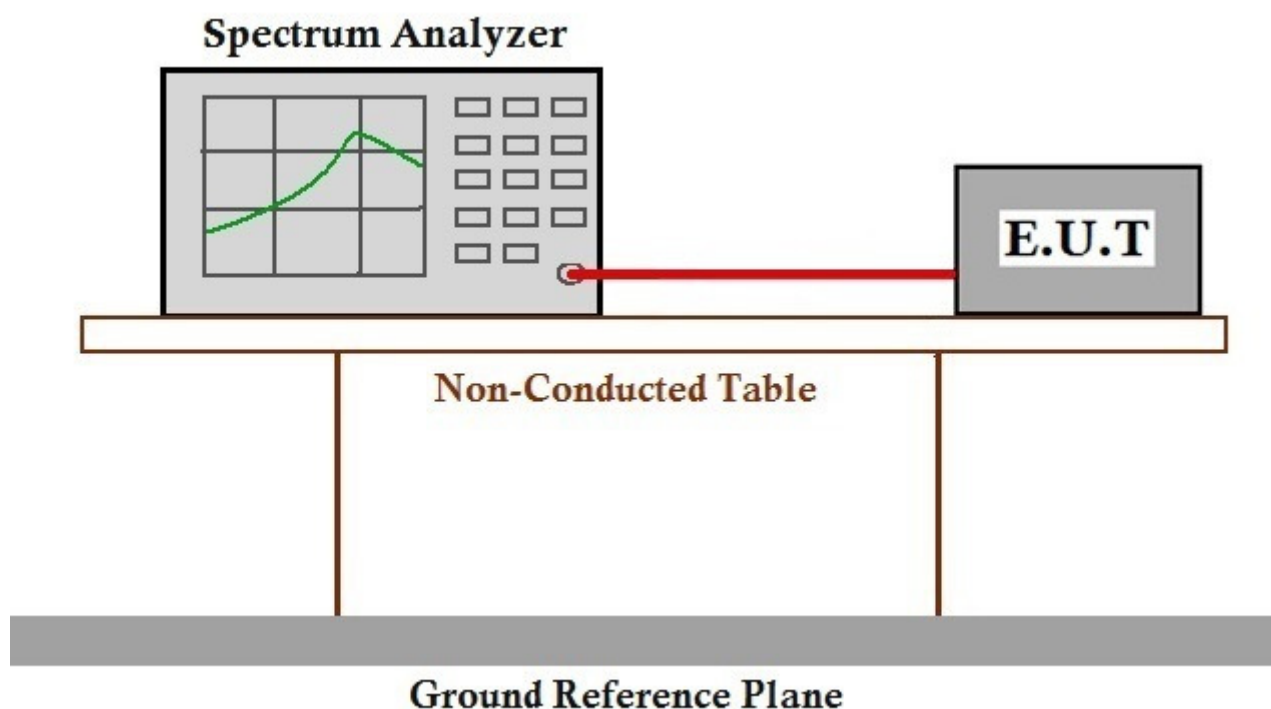
Test Requirement RSS-Gen Section 6.6  
Test Method: ANSI C63.10 Section 6.9.3

### 7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 20 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar  
Test mode a: Charge + TX mode\_Keep the EUT in charging and transmitting with modulation mode.

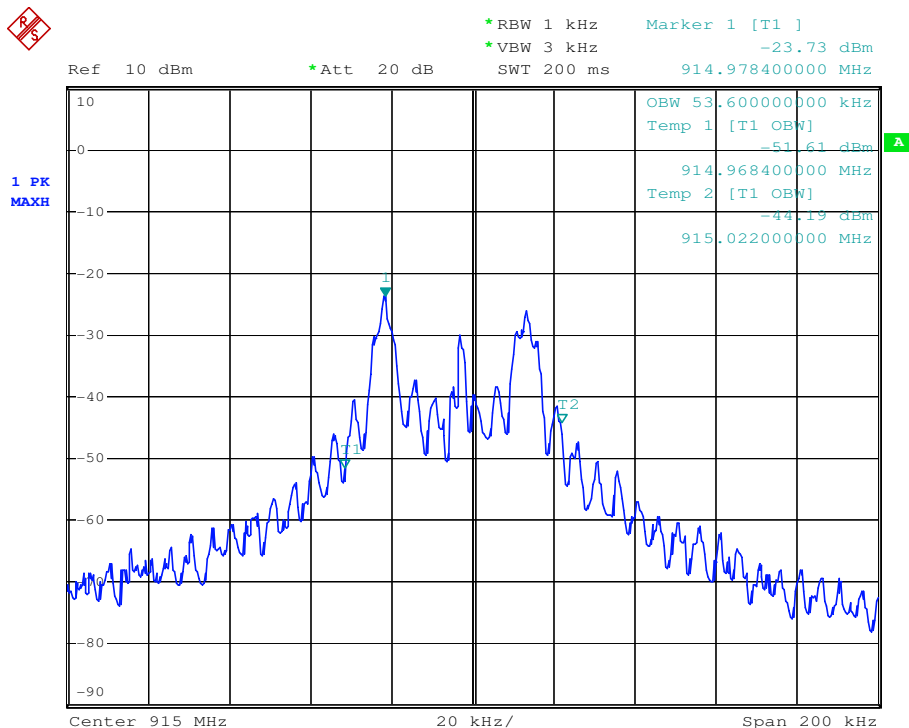
### 7.6.2 Test Setup Diagram



### 7.6.3 Measurement Procedure and Data



| Frequency (MHz) | Bandwidth (MHz) | Result |
|-----------------|-----------------|--------|
| 915             | 0.054           | PASS   |





## **8 Equipment Under Test Pictures**

Refer to the < Test Setup Photos-FCC >

## **9 EUT Constructional Details**

Refer to the < External Photos > & < Internal Photos >.

**- End of the Report -**