

# TEST REPORT

**Application No.:** KSCR2109000028AT  
**FCC ID:** 2ADTD-D1243093  
**Applicant:** Hangzhou Hikvision Digital Technology Co., Ltd.  
**Address of Applicant:** No. 555, Qianmo Road, Binjiang District, Hangzhou  
**Manufacturer:** Hangzhou Hikvision Digital Technology Co., Ltd.  
**Address of Manufacturer:** No. 555, Qianmo Road, Binjiang District, Hangzhou  
**Factory:**  
 1. Hangzhou Hikvision Electronics Co., Ltd.  
 2. Hangzhou Hikvision Technology Co., Ltd.  
 3. CHONGQING HIKVISION TECHNOLOGY CO., LTD.  
**Address of Factory:**  
 1. No.299, Qiushi Road, Tonglu Economic Development Zone, Tonglu County, Hangzhou, Zhejiang.  
 2. No.700 Dongliu Road, Binjiang District, Hangzhou 310052, China  
 3. Building 18, Louyu Area, C area, Jianqiao industrial park, Chongqing

**Equipment Under Test (EUT):**

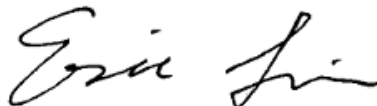
**EUT Name:** Wireless Magnet Detector  
**Model No.:** DS-PDMC-EG2-WA; DS-PDMC-EG2-WAUHK; DS-PDMC-EG2-WACKV; DS-PDMC-EG2-WAUVS; DS-PDMC-EG2-WAKVO; DS-PDMC-EG2-WAHUN<sup>□</sup>

<sup>□</sup> Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.

**Trade mark:** HIKVISION  
**Standard(s) :** 47 CFR Part 15, Subpart C 15.247  
**Date of Receipt:** 2021-09-08  
**Date of Test:** 2021-09-09 to 2021-10-11  
**Date of Issue:** 2021-10-11

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

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



Eric Lin  
Laboratory 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.



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| Revision Record |             |            |        |
|-----------------|-------------|------------|--------|
| Version         | Description | Date       | Remark |
| 00              | Original    | 2021-10-11 | /      |
|                 |             |            |        |
|                 |             |            |        |

|                          |  |                                      |  |
|--------------------------|--|--------------------------------------|--|
| Authorized for issue by: |  |                                      |  |
|                          |  | <i>Damon Zhou</i>                    |  |
|                          |  | <b>Damon Zhou / Project Engineer</b> |  |
|                          |  | <i>Eric Lin</i>                      |  |
|                          |  | <b>Eric Lin / Reviewer</b>           |  |



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## 2 Test Summary

| Radio Spectrum Technical Requirement   |                                  |        |  |        |
|--|----------------------------------|--------|--|--------|
| Item   | Standard                         | Method | Requirement                                      | Result |
| Antenna Requirement  | 47 CFR Part 15, Subpart C 15.247 | N/A    | 47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)  | Pass   |
| Other requirements<br>Frequency Hopping<br>Spread Spectrum<br>System Hopping<br>Sequence | 47 CFR Part 15, Subpart C 15.247 | N/A    | 47 CFR Part 15, Subpart C 15.247(a)(1), (g), (h) | Pass   |

| Radio Spectrum Matter Part                            |                                  |  |  |        |
|---|----------------------------------|--|--|--------|
| Item  | Standard                         | Method                                 | Requirement                                  | Result |
| Conducted Peak Output Power                           | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 7.8.5       | 47 CFR Part 15, Subpart C 15.247(b)(2)       | Pass   |
| 20dB Bandwidth  | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 7.8.7       | 47 CFR Part 15, Subpart C 15.247(a)(1)       | Pass   |
| Carrier Frequencies Separation                        | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 7.8.2       | 47 CFR Part 15, Subpart C 15.247a(1)         | Pass   |
| Hopping Channel Number                                | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 7.8.3       | 47 CFR Part 15, Subpart C 15.247a(1)(i)      | Pass   |
| Dwell Time  | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 7.8.4       | 47 CFR Part 15, Subpart C 15.247a(1)(i)      | Pass   |
| Conducted Band Edges Measurement                      | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 7.8.6       | 47 CFR Part 15, Subpart C 15.247(d)          | Pass   |
| Conducted Spurious Emissions                          | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 7.8.8       | 47 CFR Part 15, Subpart C 15.247(d)          | Pass   |
| Radiated Emissions which fall in the restricted bands | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 6.10.5      | 47 CFR Part 15, Subpart C 15.205 & 15.209    | Pass   |
| Radiated Spurious Emissions                           | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 6.4,6.5,6.6 | 47 CFR Part 15, Subpart C 15.209 & 15.247(d) | Pass   |

### Declaration of EUT Family Grouping:

Note: There are series models mentioned in this report, and they are the similar in electrical and electronic characters. Only the model DS-PDMC-EG2-WA was tested since their differences were the model number and appearance.



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## 4 General Information

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

|                      |   |
|----------------------|---|
| Power supply:        | DC 3.0V 70mA Max by Lithium Battery     |
| Test voltage:        | DC 3.0V                                 |
| Operation Frequency: | 912.5MHz ~ 917.4MHz                     |
| Spectrum Spread:     | Frequency Hopping Spread Spectrum(FHSS) |
| Number of Channels:  | 50                                      |
| Channel Spacing:     | 100kHz                                  |
| Modulation Type:     | FSK                                     |
| Antenna Gain:        | -0.2dBi (Provided by manufacturer)      |
| Antenna Type:        | PCB Antenna                             |

### 4.2 Description of Support Units

| Description | Manufacturer | Model No. | Serial No.           |
|-------------|--------------|-----------|----------------------|
| Note Book   | Acer         | ZQT       | NXM0QCN01031403EE876 |

### 4.3 Measurement Uncertainty

| No. | Item                            | Measurement Uncertainty |
|-----|---------------------------------|-------------------------|
| 1   | Radio Frequency                 | 8.4 x 10 <sup>-8</sup>  |
| 2   | Timeout                         | 2s                      |
| 3   | Duty Cycle                      | 0.37%                   |
| 4   | Occupied Bandwidth              | 3%                      |
| 5   | RF Conducted Power              | 0.6dB                   |
| 6   | RF Power Density                | 2.9dB                   |
| 7   | Conducted Spurious Emissions    | 0.75dB                  |
| 8   | RF Radiated Power               | 4.2dB (Below 1GHz)      |
|     |                                 | 4.1dB (Above 1GHz)      |
| 9   | Radiated Spurious Emission Test | 4.2dB (Below 30MHz)     |
|     |                                 | 4.6dB (30MHz-1GHz)      |
|     |                                 | 4.8dB (1GHz-18GHz)      |
|     |                                 | 5.5dB (Above 18GHz)     |
| 10  | Temperature Test                | 1°C                     |
| 11  | Humidity Test                   | 3%                      |
| 12  | Supply Voltages                 | 1.5%                    |
| 13  | Time                            | 3%                      |

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



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#### 4.4 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

#### 4.5 Test Facility

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

- **CNAS (No. CNAS L4354)**

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017 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.

- **A2LA (Certificate No. 2541.01)**

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

- **FCC (Designation Number: CN1172)**

Compliance Certification Services Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

- **ISED (CAB Identifier: CN0072)**

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development (ISED) Canada as an accredited testing laboratory.

CAB Identifier: CN0072.

- **VCCI (Member No.: 1938)**

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600,C-11707, T-11499, G-10216 respectively.

#### 4.6 Deviation from Standards

None

#### 4.7 Abnormalities from Standard Conditions

None



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## 5 Equipment List

| Item                     | Equipment                            | Manufacturer  | Model       | Serial Number | Cal Date                 | Cal. Due Date            |
|--------------------------|--------------------------------------|---------------|-------------|---------------|--------------------------|--------------------------|
| <b>RF Conducted Test</b> |                                      |               |             |               |                          |                          |
| 1                        | Spectrum Analyzer                    | Agilent       | E4446A      | MY44020154    | 04/16/2021               | 04/15/2022               |
| 2                        | Spectrum Analyzer                    | Keysight      | N9020A      | MY55370209    | 12/02/2020               | 12/01/2021               |
| 3                        | Spectrum Analyzer                    | Keysight      | N9010A      | MY56480443    | 02/01/2021               | 01/31/2022               |
| 4                        | Signal Generator                     | Agilent       | N5182A      | MY50142015    | 09/25/2020<br>08/27/2021 | 09/25/2021<br>08/26/2022 |
| 5                        | Radio Communication Test Station     | Anritsu       | MT8000A     | 6262012849    | N/A                      | N/A                      |
| 6                        | Radio Communication Analyzer         | Anritsu       | MT8821C     | 6201692222    | N/A                      | N/A                      |
| 7                        | Universal Radio Communication Tester | R&S           | CMW500      | 159275        | 10/19/2020               | 10/18/2021               |
| 8                        | Universal Radio Communication Tester | R&S           | CMW500      | 167239        | 04/16/2021               | 04/15/2022               |
| 9                        | Power Meter                          | Anritsu       | ML2495A     | 1445010       | 04/15/2021               | 04/14/2022               |
| 10                       | Switcher                             | CCSRF         | FY562       | KUS2001M001-3 | 10/19/2020               | 10/18/2021               |
| 11                       | AC Power Source                      | EXTECH        | 6605        | 1570106       | N.C.R                    | N.C.R                    |
| 12                       | DC Power Supply                      | Aglient       | E3632A      | MY50340053    | N.C.R                    | N.C.R                    |
| 13                       | 6dB Attenuator                       | Mini-Circuits | NAT-6-2W    | 15542-1       | N.C.R                    | N.C.R                    |
| 14                       | Power Divider                        | AI SI         | IOWOPE2068  | PE2068        | N.C.R                    | N.C.R                    |
| 15                       | Filter                               | MICRO-TRONICS | BRM50701    | 5             | N.C.R                    | N.C.R                    |
| 16                       | Conducted test cable                 | /             | RF01-RF04   | /             | 04/15/2021               | 04/14/2022               |
| 17                       | Software                             | BST           | TST-PASS    | N/A           | N/A                      | N/A                      |
| 18                       | Temp. / Humidity Chamber             | TERCHY        | MHK-120AK   | X30109        | 04/15/2021               | 04/14/2022               |
| 19                       | Thermometer                          | Anymetre      | TH603       | CCS007        | 10/16/2020               | 10/15/2021               |
| <b>RF Radiated Test</b>  |                                      |               |             |               |                          |                          |
| 1                        | Spectrum Analyzer                    | R&S           | FSV40       | 101493        | 10/19/2020               | 10/18/2021               |
| 2                        | Signal Generator                     | Agilent       | E8257C      | MY43321570    | 10/19/2020               | 10/18/2021               |
| 3                        | Loop Antenna                         | Schwarzbeck   | HXYZ9170    | 9170-108      | 02/22/2021               | 02/21/2022               |
| 4                        | Bilog Antenna                        | TESEQ         | CBL 6112D   | 35403         | 06/21/2021               | 06/20/2023               |
| 5                        | Bilog Antenna                        | SCHWARZBECK   | VULB9160    | 9160-3342     | 04/13/2021               | 04/12/2023               |
| 6                        | Horn-antenna(1-18GHz)                | Schwarzbeck   | BBHA9120D   | 267           | 10/26/2020               | 10/25/2022               |
| 7                        | Horn-antenna(1-18GHz)                | ETS-LINDGREN  | 3117        | 00143290      | 02/22/2021               | 02/21/2023               |
| 8                        | Horn Antenna(18-40GHz)               | Schwarzbeck   | BBHA9170    | BBHA9170171   | 02/22/2021               | 02/21/2022               |
| 9                        | Pre-Amplifier(30MHz~18GHz)           | LNA           | /           | /             | 04/15/2021               | 04/14/2022               |
| 10                       | Amplifier(18~40GHz)                  | COM-POWER     | PAM-840A    | 461332        | 10/23/2020               | 10/22/2021               |
| 11                       | Low Pass Filter                      | MICRO-TRONICS | VLFX-950    | RV142900829   | N.C.R                    | N.C.R                    |
| 12                       | High Pass Filter                     | Mini-Circuits | VHF-1200    | 15542         | N.C.R                    | N.C.R                    |
| 13                       | Filter (5450MHz~5770 MHz)            | MICRO-TRONICS | BRC50704-01 | 2             | N.C.R                    | N.C.R                    |
| 14                       | Filter (5690 MHz~5930 MHz)           | MICRO-TRONICS | BRC50705-01 | 4             | N.C.R                    | N.C.R                    |
| 15                       | Filter (5150 MHz~5350 MHz)           | MICRO-TRONICS | BRC50703-01 | 2             | N.C.R                    | N.C.R                    |
| 16                       | Filter (885 MHz~915 MHz)             | MICRO-TRONICS | BRM14698    | 1             | N.C.R                    | N.C.R                    |
| 17                       | Filter (815 MHz~860 MHz)             | MICRO-TRONICS | BRM14697    | 1             | N.C.R                    | N.C.R                    |
| 18                       | Filter (1745 MHz~1910 MHz)           | MICRO-TRONICS | BRM14700    | 1             | N.C.R                    | N.C.R                    |
| 19                       | Filter (1922 MHz~1977 MHz)           | MICRO-TRONICS | BRM50715    | 1             | N.C.R                    | N.C.R                    |
| 20                       | Filter (2550 MHz)                    | MICRO-TRONICS | HPM13362    | 5             | N.C.R                    | N.C.R                    |



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|    |                            |               |              |     |            |            |
|----|----------------------------|---------------|--------------|-----|------------|------------|
| 21 | Filter (1532 MHz~1845 MHz) | MICRO-TRONICS | BRM50713     | 1   | N.C.R      | N.C.R      |
| 22 | Filter (2.4GHz)            | MICRO-TRONICS | BRM50701     | 5   | N.C.R      | N.C.R      |
| 23 | RE test cable              | /             | RE01-RE04    | /   | 04/15/2021 | 04/14/2022 |
| 24 | Software                   | Faratronic    | EZ_EMV-v 3A1 | N/A | N/A        | N/A        |



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## 6 Radio Spectrum Technical Requirement

### 6.1 Antenna Requirement

#### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)

#### 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.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is PCB antenna on the main PCB and no consideration of replacement. The best case gain of the antenna is -0.2dBi.



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## 6.2 Other requirements Frequency Hopping Spread Spectrum System Hopping Sequence

### 6.2.1 Test Requirement:

47 CFR Part 15, Subpart C 15.247(a)(1), (g), (h)

### 6.2.2 Conclusion

Standard Requirement:

The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.

The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

Compliance for section 15.247(a)(1): According to Technical Specification, when transmitting continuously, device radios will hop over 50 frequency channels. They will select the transmit frequency from a pseudorandom sequence stored in a frequency hopping table. This ensures the equally usage of all channels

An example of Pseudorandom Frequency Hopping Sequence as follow:

Each frequency used equally on the average by each transmitter.

According to Technical Specification, the receivers are designed to have input and IF bandwidths that match the hopping channel bandwidths of any transmitters and shift frequencies in synchronization with the transmitted signals.

Compliance for section 15.247(g): According to Technical Specification, the device uses a single side band modulation with a fully suppressed carrier, where a subcarrier is modulated. The offset of this SSB subcarrier is related to the central frequency "F0" of each declared 100 KHz channel in which the device is hopping 50 channels for continuous transmission.

Compliance for section 15.247(h): According to Technical specification, When the radio switches on, it starts on the first channel of the declared hopping list. Transmission can stop before going over the 50 channels if the message is short. No individual channel will ever be used more often than it is allowed.

The system is designed not have the ability to coordinated with other FHSS System in an effort to avoid the simultaneous occupancy of individual hopping frequencies by multiple transmitter.



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## 7 Radio Spectrum Matter Test Results

### 7.1 Conducted Peak Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(2)  
Test Method: ANSI C63.10 (2013) Section 7.8.5  
Limit:

| Frequency Range (MHz) | Output power of the intentional radiator(watt)         |
|-----------------------|--|
| 902-928               | 1 for $\geq 50$ hopping channels                       |
|                       | 0.25 for $25 \leq$ hopping channels $< 50$             |
|                       | 1 for digital modulation                               |
| 2400-2483.5           | 1 for $\geq 75$ non-overlapping hopping channels       |
|                       | 0.125 for all other frequency hopping systems          |
|                       | 1 for digital modulation                               |
| 5725-5850             | 1 for frequency hopping systems and digital modulation |



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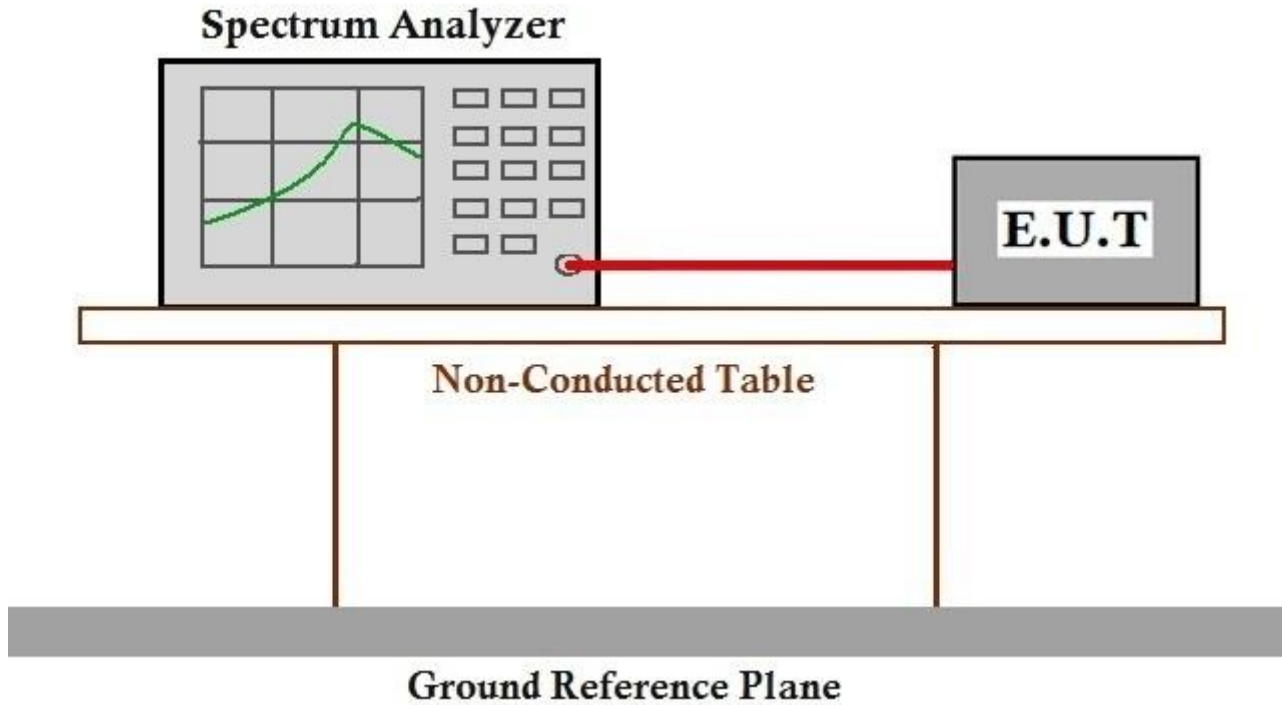
**7.1.1 E.U.T. Operation**

Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

Test mode a: TX\_non-Hop mode\_Keep the EUT in transmitting with modulation mode.

**7.1.2 Test Setup Diagram**



**7.1.3 Measurement Procedure and Data**

The detailed test data see: Appendix A for KSCR210900002801AT



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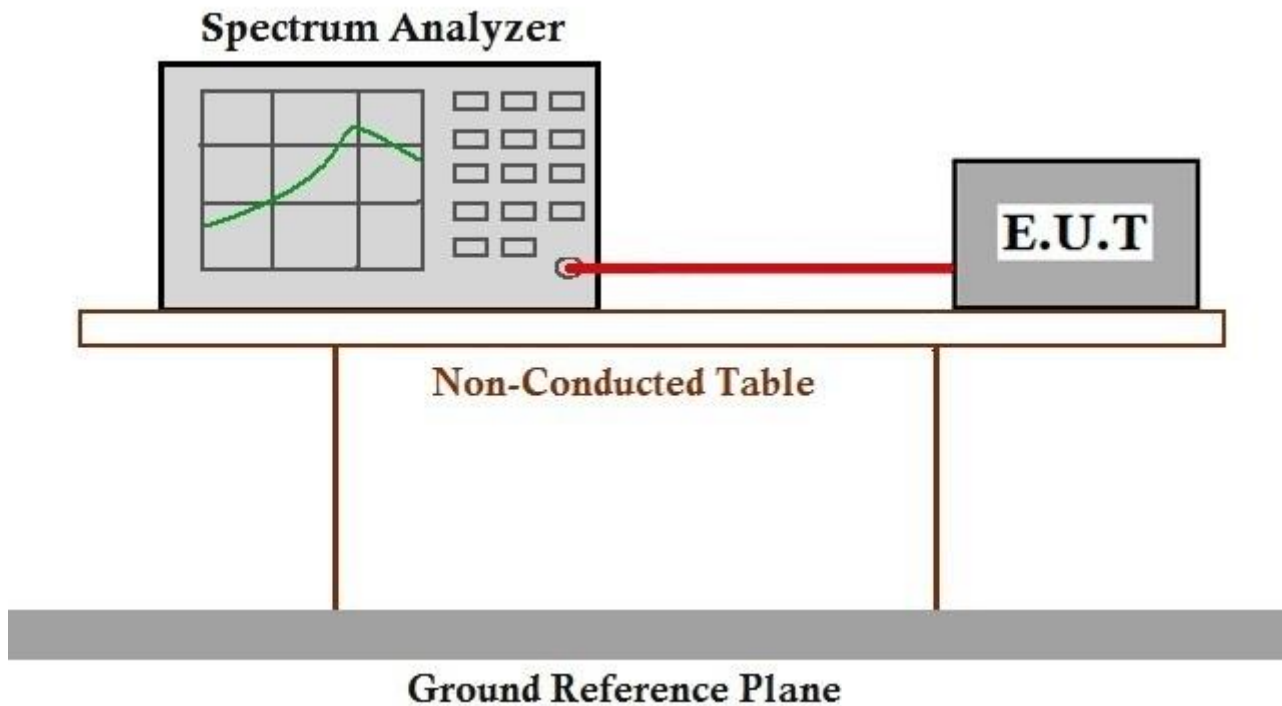
**7.2 20dB Bandwidth**

Test Requirement 47 CFR Part 15, Subpart C 15.247(a)(1)  
Test Method: ANSI C63.10 (2013) Section 7.8.7

**7.2.1 E.U.T. Operation**

Operating Environment:  
Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar  
Test mode a: TX\_non-Hop mode\_Keep the EUT in transmitting with modulation mode.

**7.2.2 Test Setup Diagram**



**7.2.3 Measurement Procedure and Data**

The detailed test data see: Appendix A for KSCR210900002801AT



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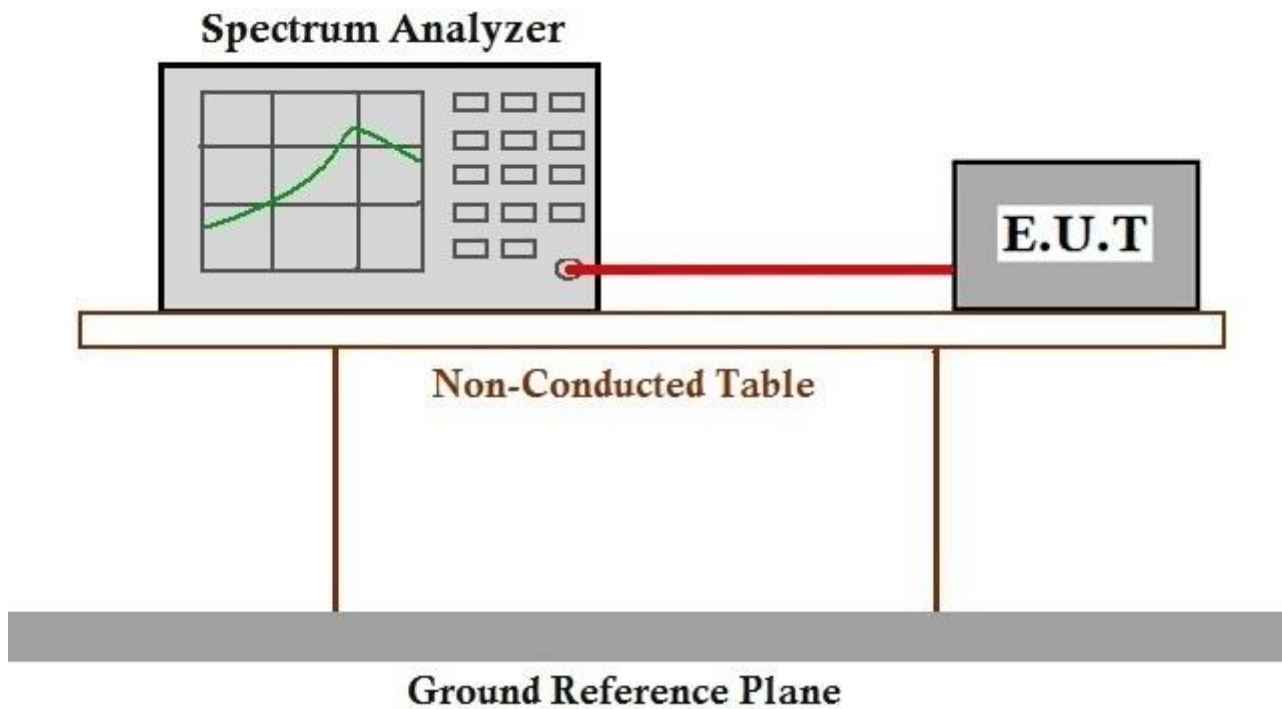
### 7.3 Carrier Frequencies Separation

Test Requirement 47 CFR Part 15, Subpart C 15.247a(1)  
 Test Method: ANSI C63.10 (2013) Section 7.8.2  
 Limit: Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

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

Operating Environment:  
 Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar  
 Test mode b: TX\_Hop mode\_Keep the EUT in transmitting with modulation mode.

#### 7.3.2 Test Setup Diagram



#### 7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix A for KSCR210900002801AT



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### 7.4 Hopping Channel Number

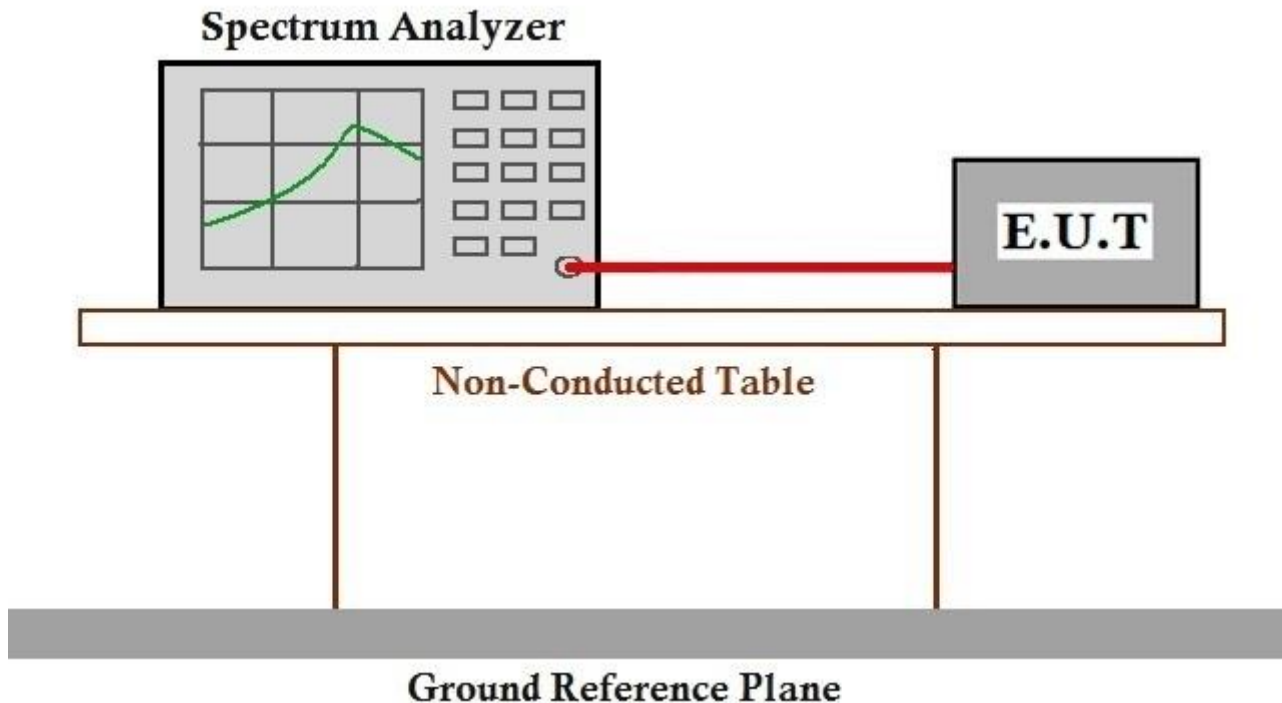
Test Requirement 47 CFR Part 15, Subpart C 15.247a(1)(i)  
Test Method: ANSI C63.10 (2013) Section 7.8.3  
Limit:

| Frequency range(MHz) | Number of hopping channels (minimum) |
|----------------------|--------------------------------------|
| 902-928              | 50 for 20dB bandwidth <250kHz        |
|                      | 25 for 20dB bandwidth ≥250kHz        |
| 2400-2483.5          | 15                                   |
| 5725-5850            | 75                                   |

#### 7.4.1 E.U.T. Operation

Operating Environment:  
Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar  
Test mode b: TX\_Hop mode\_Keep the EUT in transmitting with modulation mode.

#### 7.4.2 Test Setup Diagram



#### 7.4.3 Measurement Procedure and Data

The detailed test data see: Appendix A for KSCR210900002801AT



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**7.5 Dwell Time**

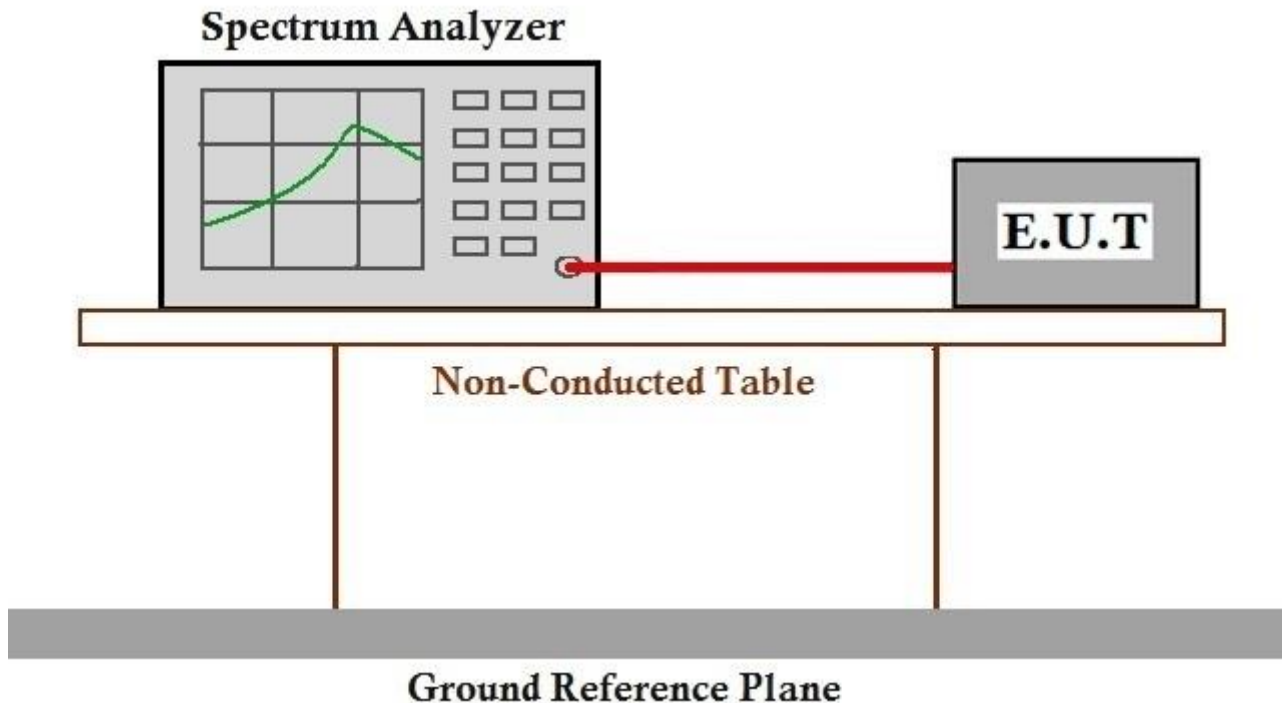
Test Requirement 47 CFR Part 15, Subpart C 15.247a(1)(i)  
Test Method: ANSI C63.10 (2013) Section 7.8.4  
Limit:

| Frequency(MHz) | Limit   |
|----------------|---|
| 902-928        | 0.4S within a 20S period(20dB bandwidth<250kHz)                           |
|                | 0.4S within a 10S period(20dB bandwidth≥250kHz)                           |
| 2400-2483.5    | 0.4S within a period of 0.4S multiplied by the number of hopping channels |
| 5725-5850      | 0.4S within a 30S period  |

**7.5.1 E.U.T. Operation**

Operating Environment:  
Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar  
Test mode b: TX\_Hop mode\_Keep the EUT in transmitting with modulation mode.

**7.5.2 Test Setup Diagram**



**7.5.3 Measurement Procedure and Data**

The detailed test data see: Appendix A for KSCR210900002801AT



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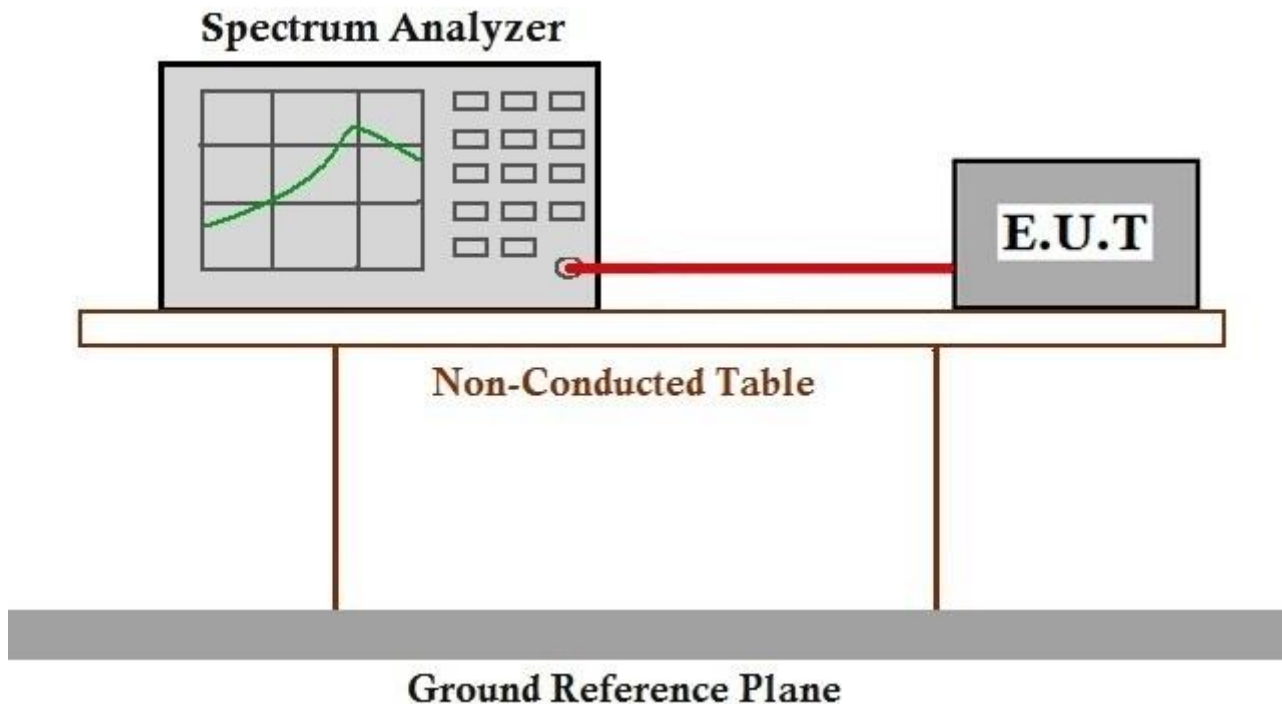
### 7.6 Conducted Band Edges Measurement

Test Requirement: 47 CFR Part 15, Subpart C 15.247(d)  
 Test Method: ANSI C63.10 (2013) Section 7.8.6  
 Limit: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c))

#### 7.6.1 E.U.T. Operation

Operating Environment:  
 Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar  
 Test mode  
 a: TX\_non-Hop mode\_Keep the EUT in transmitting with modulation mode.  
 b: TX\_Hop mode\_Keep the EUT in transmitting with modulation mode.

#### 7.6.2 Test Setup Diagram



#### 7.6.3 Measurement Procedure and Data

The detailed test data see: Appendix A for KSCR210900002801AT



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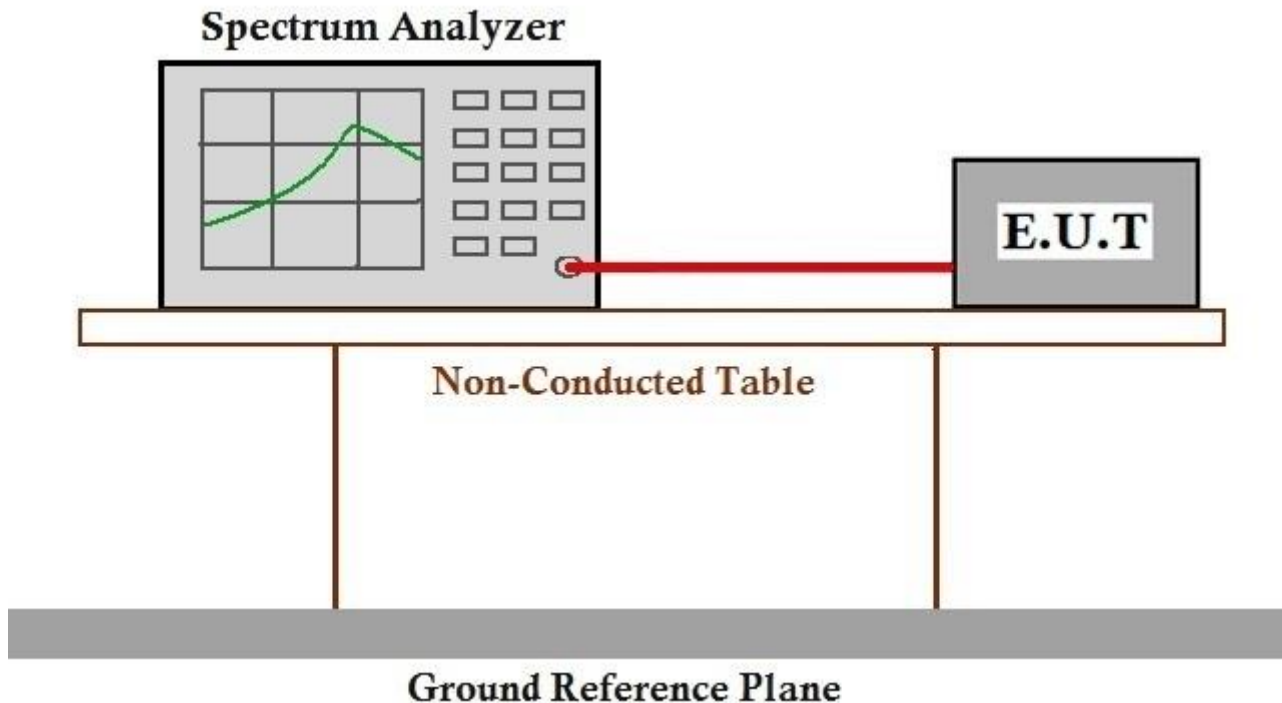
### 7.7 Conducted Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)  
 Test Method: ANSI C63.10 (2013) Section 7.8.8  
 Limit: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c))

#### 7.7.1 E.U.T. Operation

Operating Environment:  
 Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar  
 Test mode a: TX\_non-Hop mode\_Keep the EUT in transmitting with modulation mode.

#### 7.7.2 Test Setup Diagram



#### 7.7.3 Measurement Procedure and Data

The detailed test data see: Appendix A for KSCR210900002801AT



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### 7.8 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209  
Test Method: ANSI C63.10 (2013) Section 6.10.5  
Limit:

| Frequency (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                             |

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

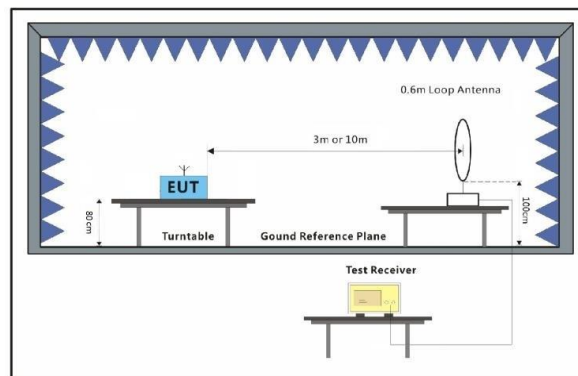
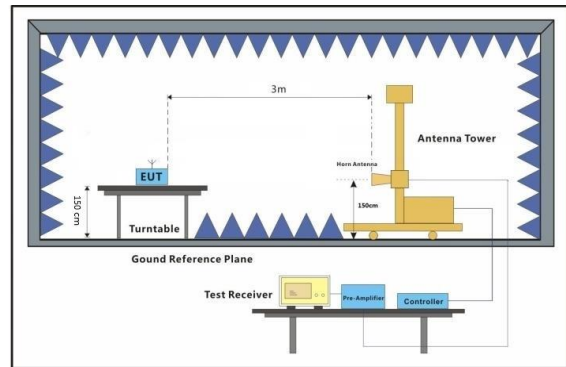
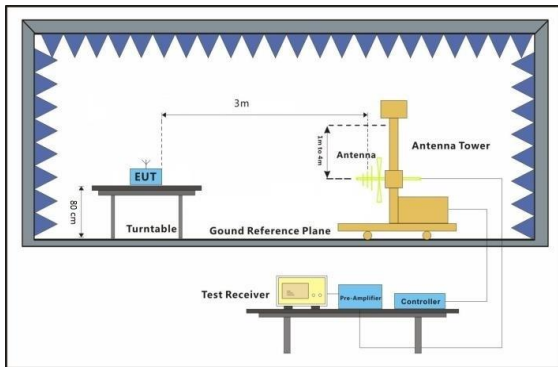
#### 7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

Test mode a: TX\_non-Hop mode\_Keep the EUT in transmitting with modulation mode.

#### 7.8.2 Test Setup Diagram



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### 7.8.3 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 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



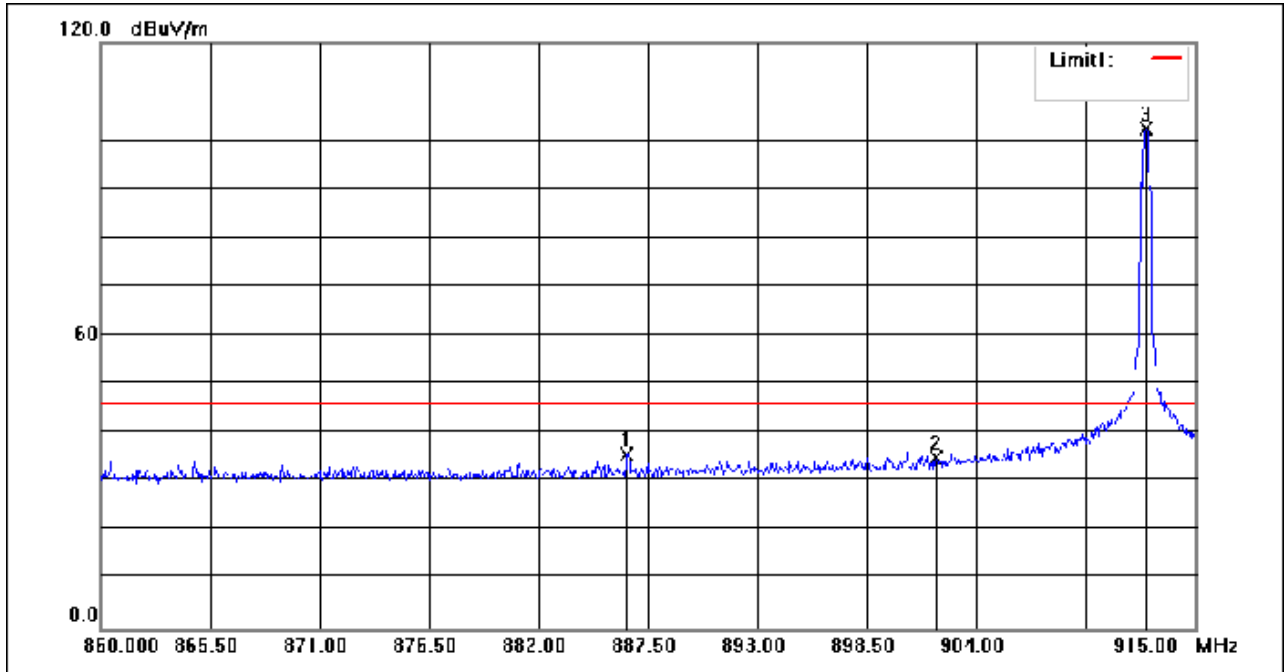
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Mode: a; Polarization: Horizontal; Modulation: FSK; Channel: Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 886.4550        | 7.17           | 28.51                   | 35.68           | 46.00          | -10.32      | QP     |
| 2   | 902.0000        | 6.33           | 28.70                   | 35.03           | 46.00          | -10.97      | QP     |
| 3   | 912.5250        | 73.54          | 28.83                   | 102.37          | N/A            | N/A         | peak   |



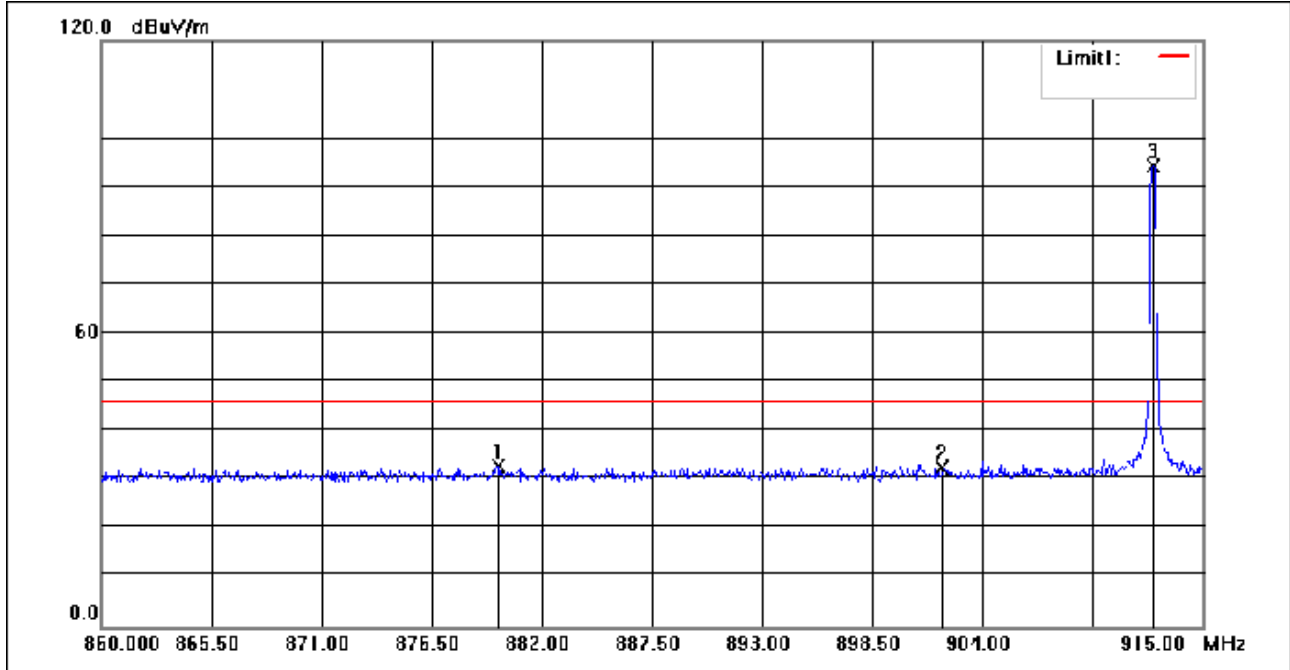
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Mode: a; Polarization: Vertical; Modulation: FSK; Channel: Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 879.8000        | 4.39           | 28.43                   | 32.82           | 46.00          | -13.18      | QP     |
| 2   | 902.0000        | 3.86           | 28.70                   | 32.56           | 46.00          | -13.44      | QP     |
| 3   | 912.5250        | 65.50          | 28.83                   | 94.33           | N/A            | N/A         | peak   |

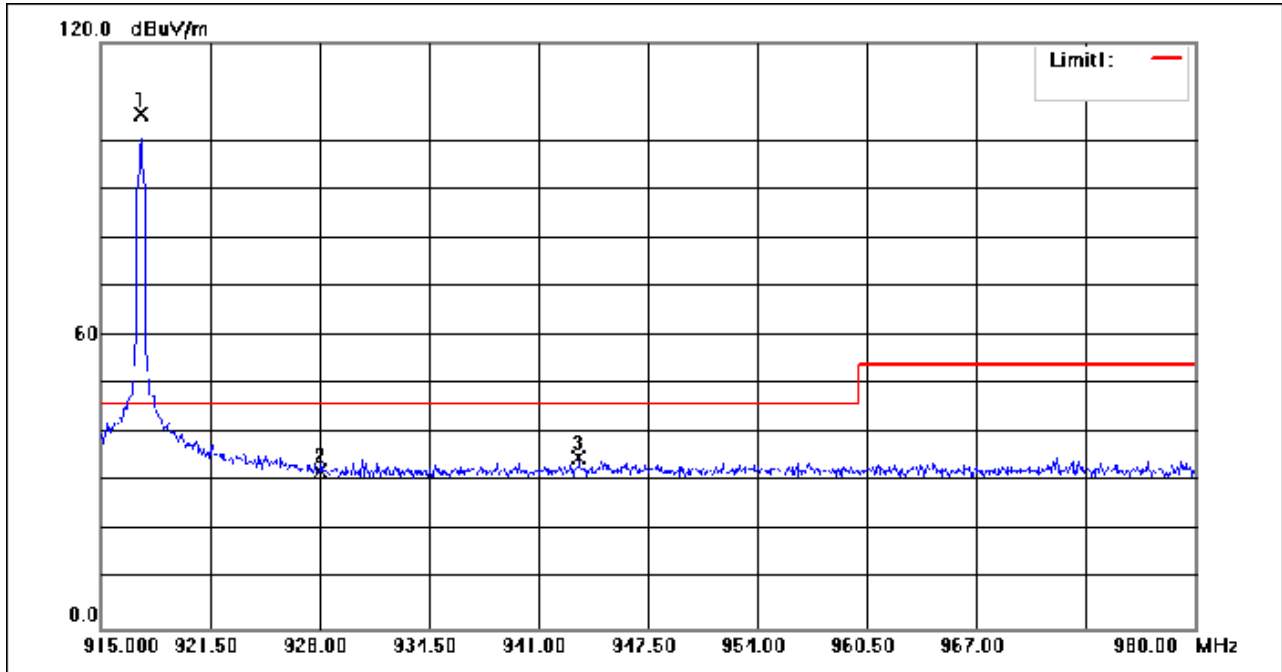


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Mode: a; Polarization: Horizontal; Modulation: FSK; Channel: High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 917.4050        | 76.53          | 28.89                   | 105.42          | N/A            | N/A         | peak   |
| 2   | 928.0000        | 3.37           | 29.02                   | 32.39           | 46.00          | -13.61      | QP     |
| 3   | 943.4050        | 5.80           | 29.22                   | 35.02           | 46.00          | -10.98      | QP     |



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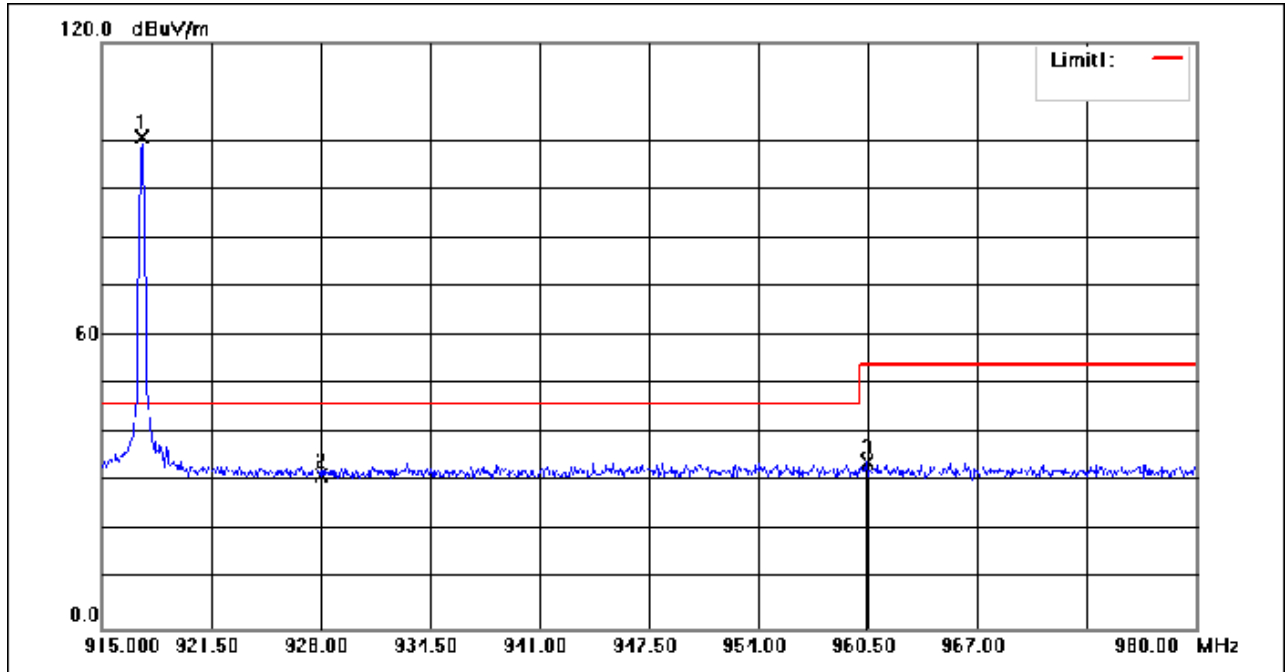
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Mode: a; Polarization: Vertical; Modulation: FSK; Channel: High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|-------------------------|-----------------|----------------|-------------|--------|
| 1   | 917.3400        | 71.63          | 28.89                   | 100.52          | N/A            | N/A         | peak   |
| 2   | 928.0000        | 2.35           | 29.02                   | 31.37           | 46.00          | -14.63      | QP     |
| 3   | 960.4350        | 4.90           | 29.28                   | 34.18           | 54.00          | -19.82      | QP     |



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### 7.9 Radiated Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.247(d)  
Test Method: ANSI C63.10 (2013) Section 6.4,6.5,6.6  
Limit:

| Frequency (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                             |

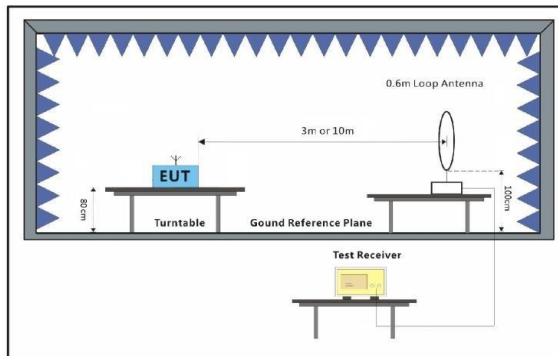
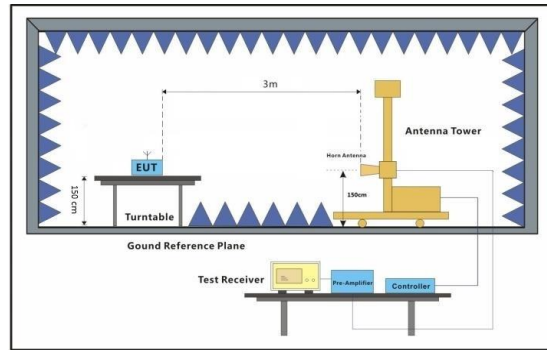
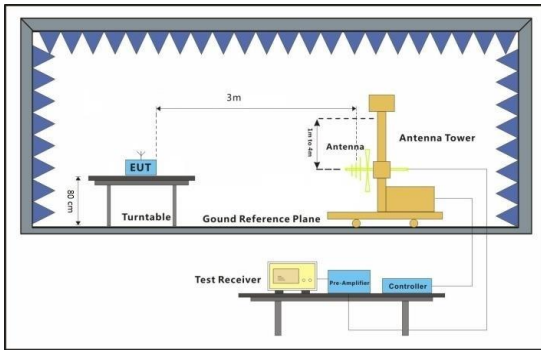
Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

#### 7.9.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar  
Test mode a: TX\_non-Hop mode\_Keep the EUT in transmitting with modulation mode.

#### 7.9.2 Test Setup Diagram



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### 7.9.3 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:

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:  
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
- 3) Scan from 9kHz to 10GHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- 4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



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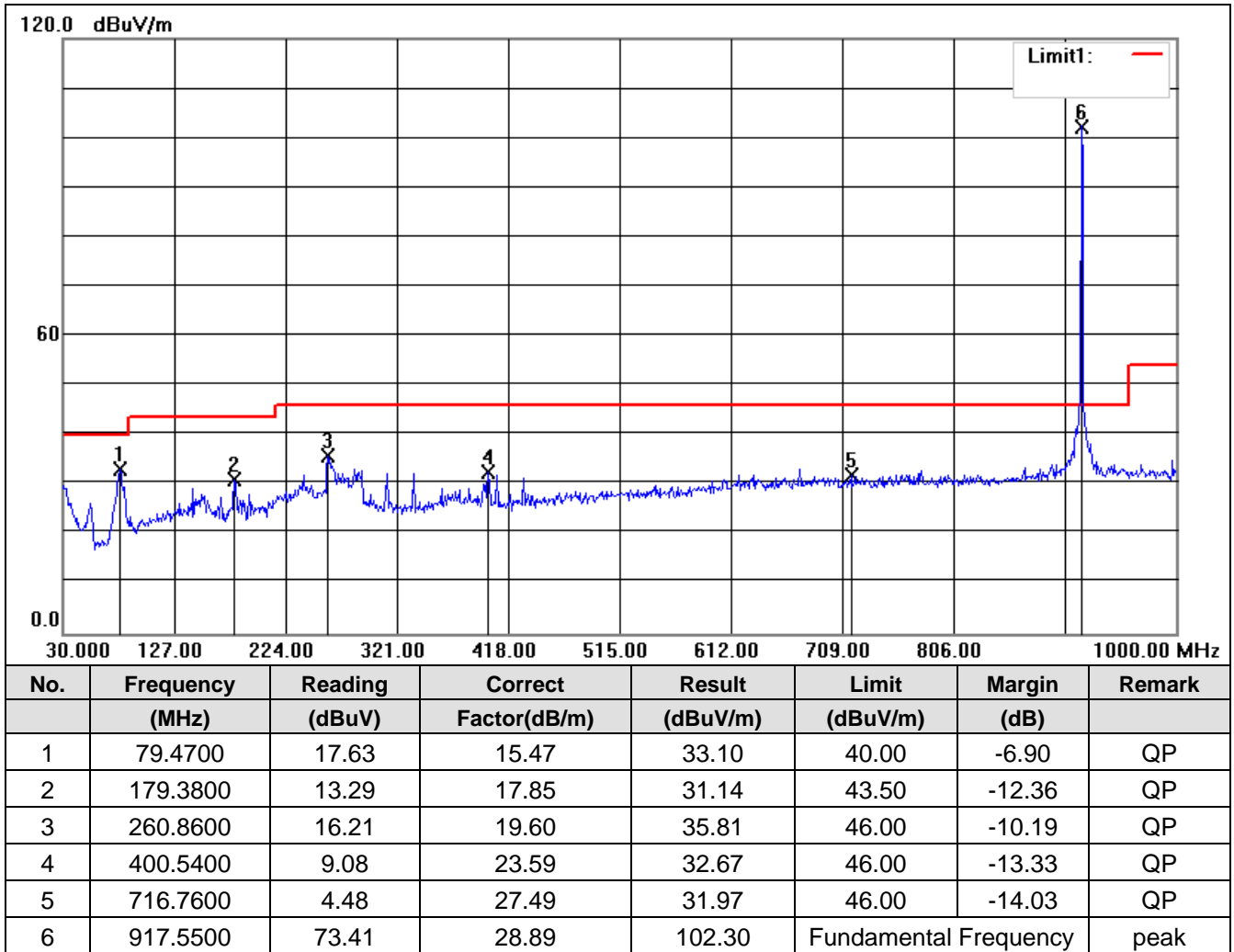
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**30-1000MHz**

Mode: a; Polarization: Horizontal; Modulation: FSK; Channel: Low

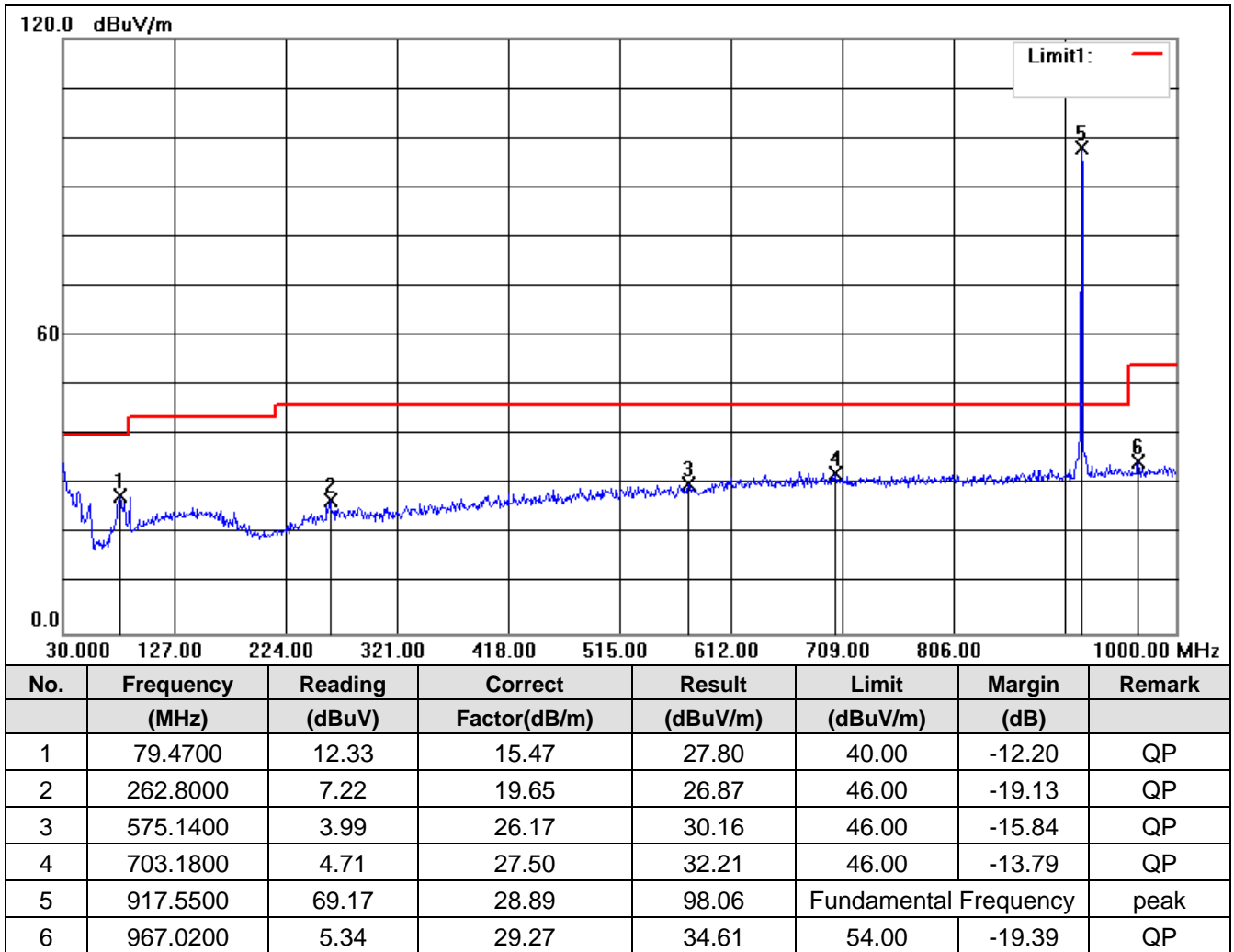


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Mode: a; Polarization: Vertical; Modulation: FSK; Channel: Low



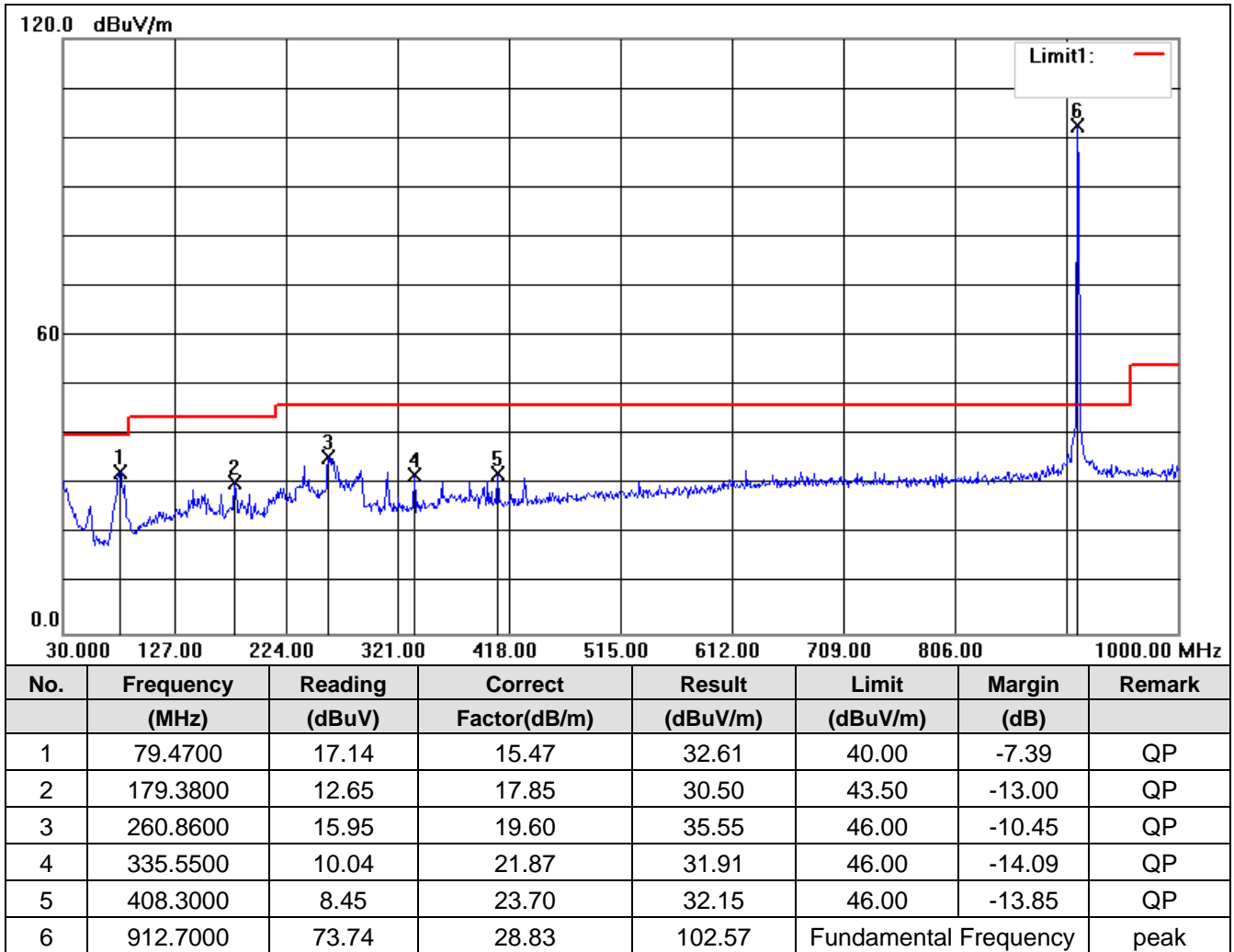
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Mode: a; Polarization: Horizontal; Modulation: FSK; Channel: High



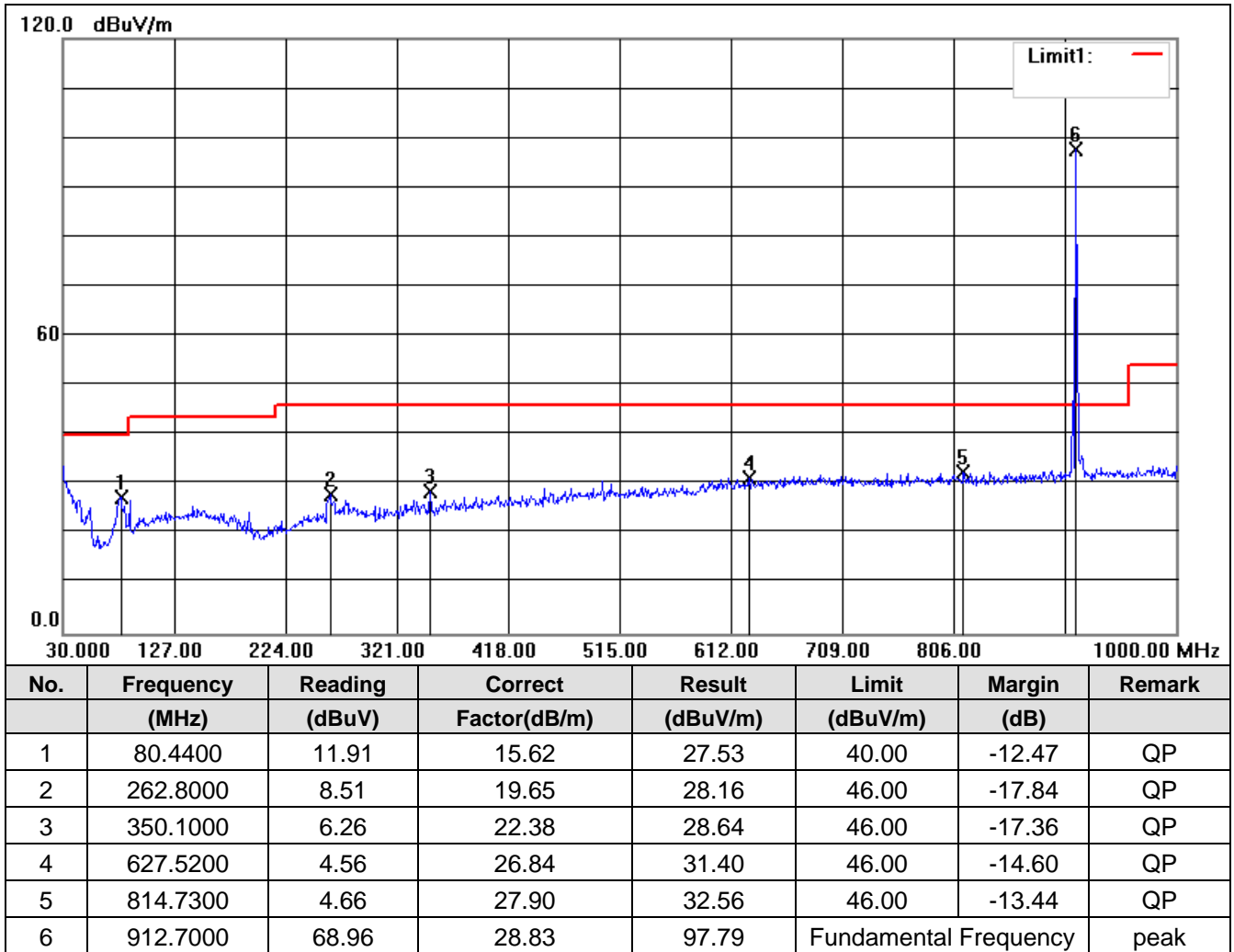
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Mode: a; Polarization: Vertical; Modulation: FSK; Channel: High



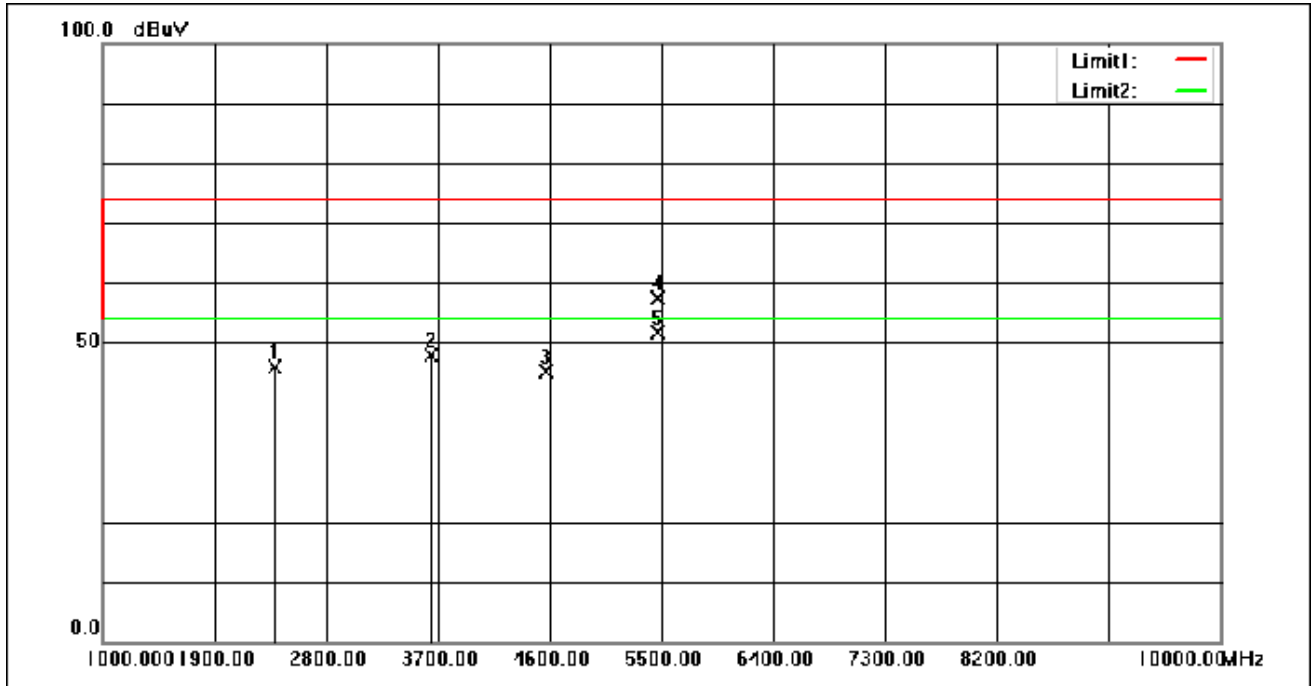
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**1000-10000MHz**

Mode: a; Polarization: Horizontal; Modulation: FSK; Channel: Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|---------------|--------------|-------------|--------|
| 1   | 2386.000        | 57.29          | -11.46                | 45.83         | 74.00        | -28.17      | peak   |
| 2   | 3646.000        | 55.06          | -7.24                 | 47.82         | 74.00        | -26.18      | peak   |
| 3   | 4564.000        | 49.56          | -4.54                 | 45.02         | 74.00        | -28.98      | peak   |
| 4   | 5473.000        | 59.52          | -2.16                 | 57.36         | 74.00        | -16.64      | peak   |
| 5   | 5473.000        | 53.80          | -2.16                 | 51.64         | 54.00        | -2.36       | AVG    |

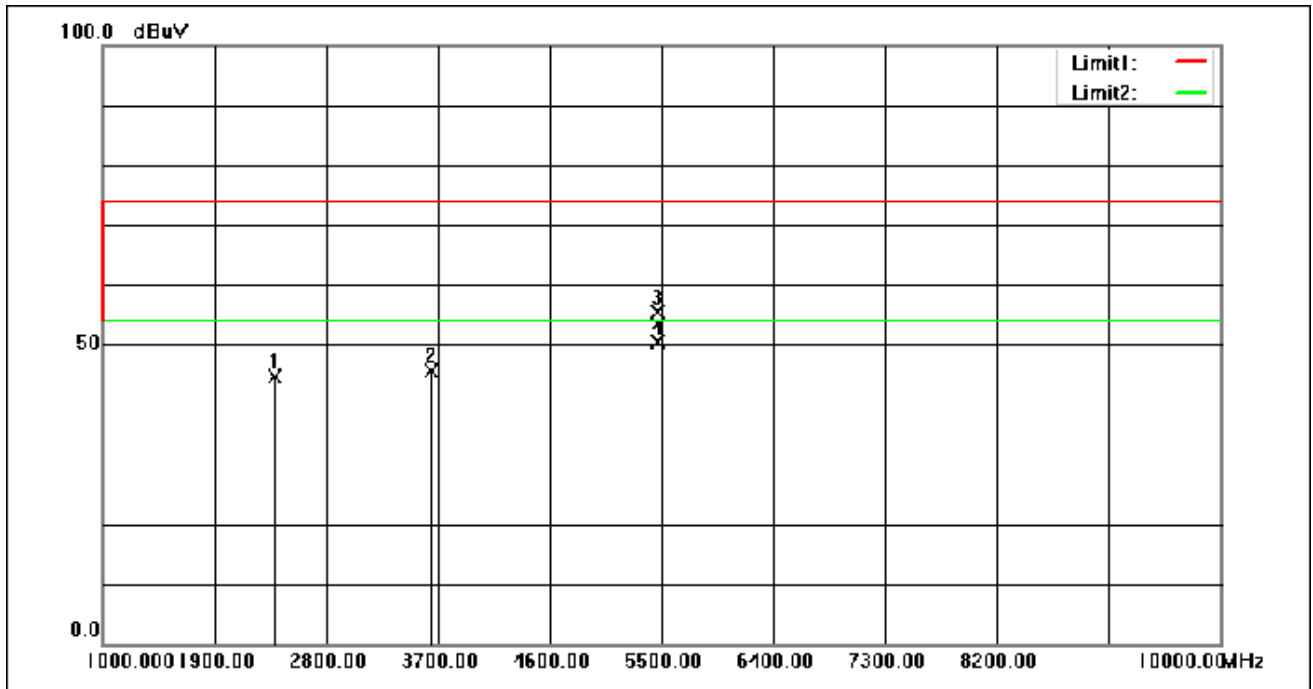


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Mode: a; Polarization: Vertical; Modulation: FSK; Channel: Low



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|---------------|--------------|-------------|--------|
| 1   | 2386.000        | 56.11          | -11.46                | 44.65         | 74.00        | -29.35      | peak   |
| 2   | 3646.000        | 52.96          | -7.24                 | 45.72         | 74.00        | -28.28      | peak   |
| 3   | 5473.000        | 57.44          | -2.16                 | 55.28         | 74.00        | -18.72      | peak   |
| 4   | 5473.000        | 52.64          | -2.16                 | 50.48         | 54.00        | -3.52       | AVG    |

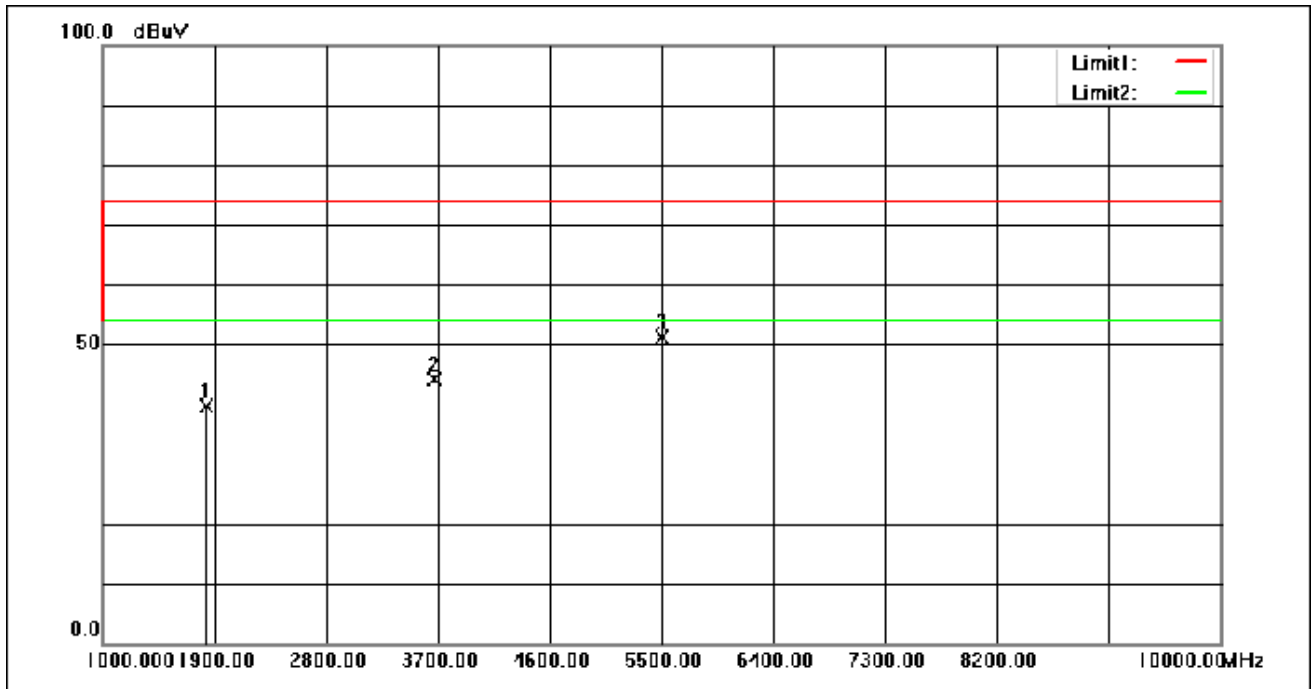


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Mode: a; Polarization: Horizontal; Modulation: FSK; Channel: High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|---------------|--------------|-------------|--------|
| 1   | 1828.000        | 53.06          | -13.53                | 39.53         | 74.00        | -34.47      | peak   |
| 2   | 3664.000        | 51.27          | -7.15                 | 44.12         | 74.00        | -29.88      | peak   |
| 3   | 5509.000        | 53.17          | -2.10                 | 51.07         | 74.00        | -22.93      | peak   |



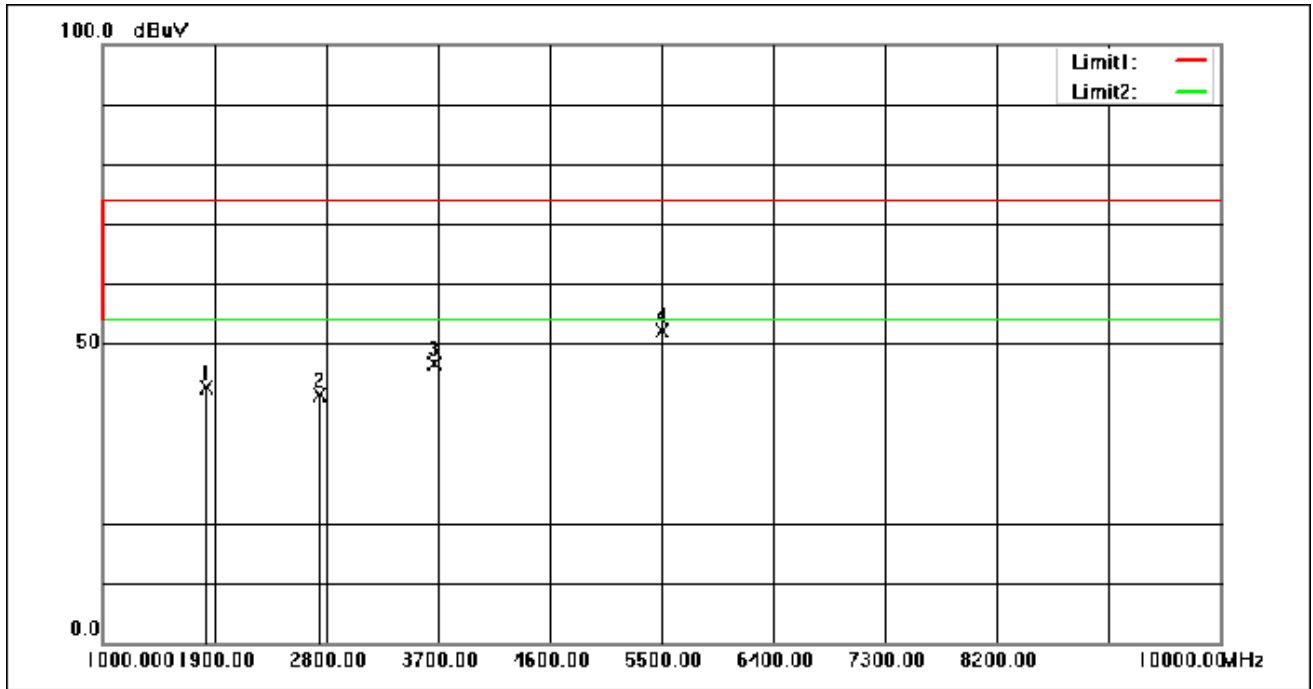
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Mode: a; Polarization: Vertical; Modulation: FSK; Channel: High



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor(dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|-----|-----------------|----------------|-----------------------|---------------|--------------|-------------|--------|
| 1   | 1828.000        | 56.22          | -13.53                | 42.69         | 74.00        | -31.31      | peak   |
| 2   | 2746.000        | 51.35          | -9.93                 | 41.42         | 74.00        | -32.58      | peak   |
| 3   | 3664.000        | 53.85          | -7.15                 | 46.70         | 74.00        | -27.30      | peak   |
| 4   | 5509.000        | 54.11          | -2.10                 | 52.01         | 74.00        | -21.99      | peak   |



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## 8 Test Setup Photographs

Refer to the < Test Setup photos-FCC>.

## 9 EUT Constructional Details

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

- End of the Report -



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