



**Shenzhen Global Test Service Co.,Ltd.**

No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

## FCC PART 15 SUBPART C TEST REPORT

### FCC PART 15.247

**Report Reference No. ....: GTS20200529012-3-4**

**FCC ID. ....: 2AW75RDM-900S05**

Compiled by

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Date of issue .....: Aug.20, 2020

**Representative Laboratory Name.: Shenzhen Global Test Service Co.,Ltd.**

Address .....: No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong, China

**Applicant's name.....: Beijing RFAD Technology Co., Ltd**

Address .....: No. 20-8, Changliu Road, Machikou Town, Changping District, Beijing, China

**Test specification .....**

Standard.....: **FCC Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz**

TRF Originator.....: Shenzhen Global Test Service Co.,Ltd.

Master TRF .....: Dated 2014-12

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**Test item description .....** **UHF RFID Reader**

Trade Mark.....: N/A

Manufacturer .....: Beijing RFAD Technology Co., Ltd

Model/Type reference .....: RDM-900S05

Listed Models .....: RDM-900S04,RDM-900S06,RDM-900S07,RDM-900S0A, RDM-900S03,RDR-9F01C

Modulation Type.....: ASK

Operation Frequency .....: From 902.75MHz to 927.25MHz

Hardware Version .....: RDM-900S05-2019-10-06

Software Version.....: V3.7

Rating .....: DC 5.0V

Result .....: **PASS**

**TEST REPORT**

|                                                    |                               |
|----------------------------------------------------|-------------------------------|
| <b>Test Report No. :</b> <b>GTS20200529012-3-4</b> | Aug.20, 2020<br>Date of issue |
|----------------------------------------------------|-------------------------------|

Equipment under Test : UHF RFID Reader

Model /Type : RDM-900S05

Listed Models : RDM-900S04,RDM-900S06,RDM-900S07,RDM-900S0A,  
RDM-900S03, RDR-9F01C

**Applicant** : **Beijing RFAD Technology Co., Ltd**

Address : No. 20-8, Changliu Road, Machikou Town, Changping District,  
Beijing,China

**Manufacturer** : **Beijing RFAD Technology Co., Ltd**

Address : No. 20-8, Changliu Road, Machikou Town, Changping District,  
Beijing,China

|                     |             |
|---------------------|-------------|
| <b>Test Result:</b> | <b>PASS</b> |
|---------------------|-------------|

The test report merely corresponds to the test sample.

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

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## **1. TEST STANDARDS**

The tests were performed according to following standards:

[FCC Rules Part 15.247](#): Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

[ANSI C63.10-2013](#): American National Standard for Testing Unlicensed Wireless Devices

[DA 00-705](#): Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems

## 2. SUMMARY

### 2.1. General Remarks

|                                |   |              |
|--------------------------------|---|--------------|
| Date of receipt of test sample | : | Jul.23, 2019 |
|                                |   |              |
| Testing commenced on           | : | Jul.23, 2019 |
|                                |   |              |
| Testing concluded on           | : | Aug.20, 2020 |

### 2.2. Product Description

|                       |                                                                                                           |
|-----------------------|-----------------------------------------------------------------------------------------------------------|
| Product Name:         | UHF RFID Reader                                                                                           |
| Trade Mark:           | N/A                                                                                                       |
| Model/Type reference: | RDM-900S05                                                                                                |
| List Model:           | RDM-900S04,RDM-900S06,RDM-900S07,RDM-900S0A,RDM-900S03,<br>RDR-9F01C                                      |
| Model Declaration     | PCB board, structure and internal of these model(s) are the same, So<br>no additional models were tested. |
| Power supply:         | DC 5.0V                                                                                                   |
| Sample ID             | GTS20200529012-3-1#&GTS20200529012-3-2#                                                                   |
| RFID                  |                                                                                                           |
| Operation frequency   | 902.75-927.25MHz                                                                                          |
| Channel Number        | 50 Channels                                                                                               |
| Channel Spacing       | 0.5MHz                                                                                                    |
| Modulation Type       | ASK                                                                                                       |
| Antenna Type          | RFID Support Eight Same External Antenna, Not Support MIMO Technology;                                    |
| Antenna Gain          | 4.0dBi(Max.)                                                                                              |

### 2.3. Equipment Under Test

#### Power supply system utilised

|                      |   |                                                                   |                                   |
|----------------------|---|-------------------------------------------------------------------|-----------------------------------|
| Power supply voltage | : | <input type="radio"/> 230V / 50 Hz                                | <input type="radio"/> 120V / 60Hz |
|                      |   | <input type="radio"/> 12 V DC                                     | <input type="radio"/> 24 V DC     |
|                      |   | <input checked="" type="radio"/> Other (specified in blank below) |                                   |

DC 5.0V

### 2.4. Short description of the Equipment under Test (EUT)

This is a UHF RFID Reader

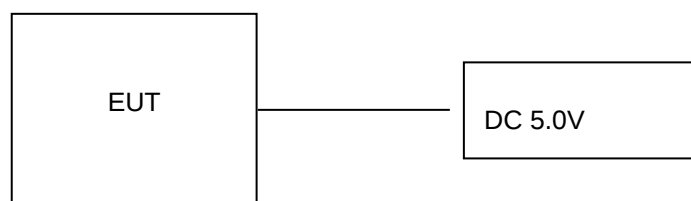
For more details, refer to the user's manual of the EUT.

## 2.5. EUT operation mode

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing .There are 50 channels provided to the EUT. Channel 01/25/50 was selected to test.

| Channel | Frequency(MHz) | Channel | Frequency(MHz) |
|---------|----------------|---------|----------------|
| 01      | 902.75         | 26      | 915.25         |
| 02      | 903.25         | 27      | 915.75         |
| 03      | 903.75         | 28      | 916.25         |
| --      | --             | --      | --             |
| --      | --             | --      | --             |
| 24      | 914.25         | 49      | 926.75         |
| 25      | 914.75         | 50      | 927.25         |

## 2.6. Block Diagram of Test Setup



## 2.7. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2AW75RDM-900S05** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

## 2.8. EUT Exercise Software

The system was configured for testing in a continuous transmits condition and change test channels by software (UHFDemo 1.0.0.0) provided by application.

## 2.9. Special Accessories

| Manufacturer | Description | Model             | Serial Number | Certificate |
|--------------|-------------|-------------------|---------------|-------------|
| Delippo      | Adapter     | D08120050         | --            | SDOC        |
| TOSHIBA      | PC          | Satellite S40Dt-A | --            | SDOC        |

**Note: The Adapter and PC is only used for auxiliary testing.**

## 2.10. External I/O Cable

| I/O Port Description | Quantity | Cable |
|----------------------|----------|-------|
| DC IN Port           | 1        | N/A   |

## 2.11. Modifications

No modifications were implemented to meet testing criteria.

### 3. TEST ENVIRONMENT

#### 3.1. Address of the test laboratory

**Shenzhen Global Test Service Co.,Ltd.**

No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong, China, China.

#### 3.2. Test Facility

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

CNAS (No. CNAS L8169)

Shenzhen Global Test Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2019 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA (Certificate No. 4758.01)

Shenzhen Global Test Service Co., Ltd. has been assessed by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4758.01.

Industry Canada Registration Number. is 24189.

FCC Designation Number is CN1234.

FCC Registered Test Site Number is 165725.

#### 3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

|                       |              |
|-----------------------|--------------|
| Temperature:          | 15-35 ° C    |
|                       |              |
| Humidity:             | 30-60 %      |
|                       |              |
| Atmospheric pressure: | 950-1050mbar |

#### 3.4. Statement of the measurement uncertainty

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

Hereafter the best measurement capability for Shenzhen GTS laboratory is reported:

| Test                  | Range      | Measurement Uncertainty | Notes |
|-----------------------|------------|-------------------------|-------|
| Radiated Emission     | 30~1000MHz | 4.10 dB                 | (1)   |
| Radiated Emission     | 1~18GHz    | 4.32 dB                 | (1)   |
| Radiated Emission     | 18-40GHz   | 5.54 dB                 | (1)   |
| Conducted Disturbance | 0.15~30MHz | 3.12 dB                 | (1)   |

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

### 3.5. Summary of measurement results

| Applied Standard: FCC Part 15 Subpart C |                                           |                                            |           |        |
|-----------------------------------------|-------------------------------------------|--------------------------------------------|-----------|--------|
| FCC Rules                               | Description of Test                       | Test Sample                                | Result    | Remark |
| §15.247(b)(2)                           | Maximum Conducted Output Power            | GTS20200529012-3-1#                        | Compliant | Note 1 |
| §15.247(c)                              | Frequency Separation And 20 dB Bandwidth  | GTS20200529012-3-1#                        | Compliant | Note 1 |
| §15.247(b)(2)                           | Number Of Hopping Frequency               | GTS20200529012-3-1#                        | Compliant | Note 1 |
| §15.247(a)(1)(i)                        | Time Of Occupancy (Dwell Time)            | GTS20200529012-3-1#                        | Compliant | Note 1 |
| §15.209, §15.247(d)                     | Radiated and Conducted Spurious Emissions | GTS20200529012-3-1#                        | Compliant | Note 1 |
| §15.205                                 | Emissions at Restricted Band              | GTS20200529012-3-1#                        | Compliant | Note 1 |
| §15.207(a)                              | Conducted Emissions                       | GTS20200529012-3-1#<br>GTS20200529012-3-2# | Compliant | Note 1 |
| §15.203                                 | Antenna Requirements                      | GTS20200529012-3-1#                        | Compliant | Note 1 |
| §15.247(i)§2.1091                       | RF Exposure                               | N/A                                        | Compliant | Note 1 |

Remark:

1. The measurement uncertainty is not included in the test result.
2. NA = Not Applicable; NP = Not Performed
3. Note 1 – Test results inside test report;
4. Note 2 – Test results in other test report (RF Exposure Report).
5. There are eight antenna ports, every port has been tested, and list the worst result(Antenna 1) in this report.

### 3.6. Equipments Used during the Test

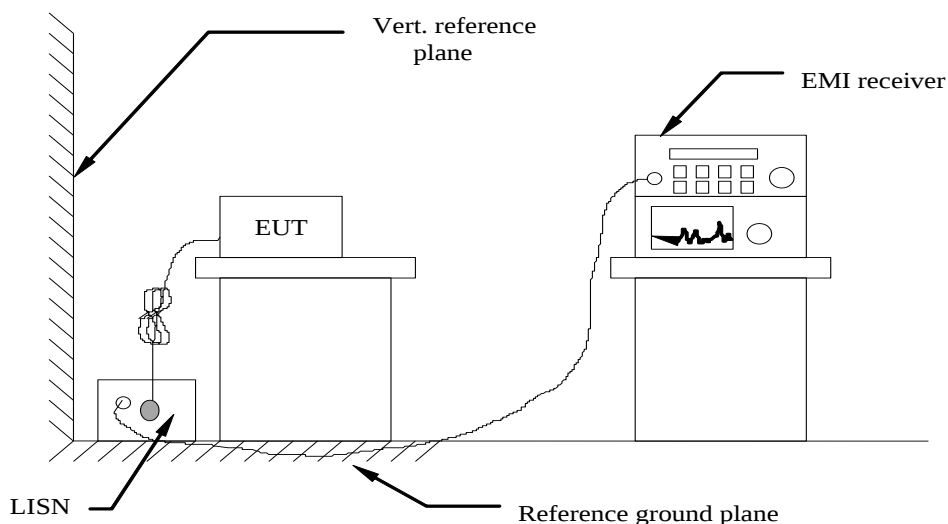
| Test Equipment             | Manufacturer                      | Model No.             | Serial No.      | Calibration Date | Calibration Due Date |
|----------------------------|-----------------------------------|-----------------------|-----------------|------------------|----------------------|
| LISN                       | R&S                               | ENV216                | 3560.6550.08    | 2019/09/20       | 2020/09/19           |
| LISN                       | R&S                               | ESH2-Z5               | 893606/008      | 2019/09/20       | 2020/09/19           |
| EMI Test Receiver          | R&S                               | ESPI3                 | 101841-cd       | 2019/09/20       | 2020/09/19           |
| EMI Test Receiver          | R&S                               | ESCI7                 | 101102          | 2019/09/20       | 2020/09/19           |
| Spectrum Analyzer          | Agilent                           | N9020A                | MY48010425      | 2019/09/20       | 2020/09/19           |
| Spectrum Analyzer          | R&S                               | FSV40                 | 100019          | 2019/09/20       | 2020/09/19           |
| Vector Signal generator    | Agilent                           | N5181A                | MY49060502      | 2019/09/20       | 2020/09/19           |
| Signal generator           | Agilent                           | E4421B                | 3610AO1069      | 2019/09/20       | 2020/09/19           |
| Climate Chamber            | ESPEC                             | EL-10KA               | A20120523       | 2019/09/20       | 2020/09/19           |
| Controller                 | EM Electronics                    | Controller EM 1000    | N/A             | N/A              | N/A                  |
| Horn Antenna               | Schwarzbeck                       | BBHA 9120D            | 01622           | 2019/09/23       | 2020/09/22           |
| Active Loop Antenna        | Beijing Da Ze Technology Co.,Ltd. | ZN30900C              | 15006           | 2019/10/12       | 2020/10/11           |
| Bilog Antenna              | Schwarzbeck                       | VULB9163              | 000976          | 2020/05/25       | 2021/05/24           |
| Broadband Horn Antenna     | SCHWARZBECK                       | BBHA 9170             | 791             | 2019/09/20       | 2020/09/19           |
| Amplifier                  | Schwarzbeck                       | BBV 9743              | #202            | 2019/09/20       | 2020/09/19           |
| Amplifier                  | Schwarzbeck                       | BBV9179               | 9719-025        | 2019/09/20       | 2020/09/19           |
| Amplifier                  | EMCI                              | EMC051845B            | 980355          | 2019/09/20       | 2020/09/19           |
| Temperature/Humidity Meter | Gangxing                          | CTH-608               | 02              | 2019/09/20       | 2020/09/19           |
| High-Pass Filter           | K&L                               | 9SH10-2700/X12750-O/O | KL142031        | 2019/09/20       | 2020/09/19           |
| High-Pass Filter           | K&L                               | 41H10-1375/U12750-O/O | KL142032        | 2019/09/20       | 2020/09/19           |
| RF Cable(below 1GHz)       | HUBER+SUHNER                      | RG214                 | RE01            | 2019/09/20       | 2020/09/19           |
| RF Cable(above 1GHz)       | HUBER+SUHNER                      | RG214                 | RE02            | 2019/09/20       | 2020/09/19           |
| Data acquisition card      | Agilent                           | U2531A                | TW53323507      | 2019/09/20       | 2020/09/19           |
| Power Sensor               | Agilent                           | U2021XA               | MY5365004       | 2019/09/20       | 2020/09/19           |
| Test Control Unit          | Tonscend                          | JS0806-1              | 178060067       | 2020/06/19       | 2021/06/18           |
| Automated filter bank      | Tonscend                          | JS0806-F              | 19F8060177      | 2020/06/19       | 2021/06/18           |
| EMI Test Software          | Tonscend                          | JS1120-1              | Ver 2.6.8.0518  | /                | /                    |
| EMI Test Software          | Tonscend                          | JS1120-3              | Ver 2.5.77.0418 | /                | /                    |
| EMI Test Software          | Tonscend                          | JS32-CE               | Ver 2.5         | /                | /                    |
| EMI Test Software          | Tonscend                          | JS32-RE               | Ver 2.5.1.8     | /                | /                    |

Note: The Cal.Interval was one year.

## 4. TEST CONDITIONS AND RESULTS

### 4.1. AC Power Conducted Emission

#### TEST CONFIGURATION



#### TEST PROCEDURE

- 1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10-2013.
- 2 Support equipment, if needed, was placed as per ANSI C63.10-2013.
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013.
- 4 The EUT received DC 5V power, the adapter received AC120V/60Hz or AC 240V/50Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5 All support equipments received AC power from a second LISN, if any.
- 6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8 During the above scans, the emissions were maximized by cable manipulation.

#### AC Power Conducted Emission Limit

For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following :

| 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        |

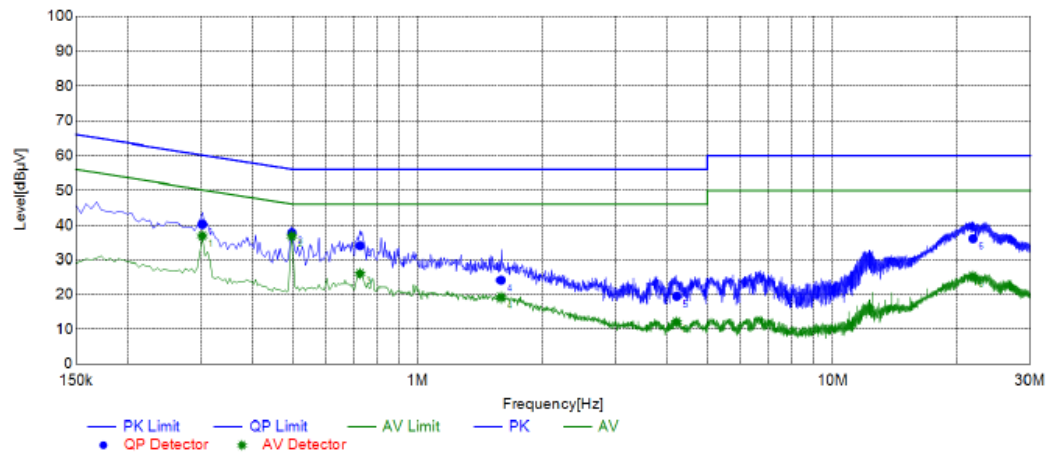
\* Decreases with the logarithm of the frequency.

**TEST RESULTS**

Remark: We measured Conducted Emission at ASK mode in AC 120V/60Hz and AC 240V/50Hz, the worst case was recorded .

|               |          |                |       |
|---------------|----------|----------------|-------|
| Temperature   | 23.6℃    | Humidity       | 53.9% |
| Test Engineer | Moon Tan | Configurations | RFID  |

|               |              |              |   |
|---------------|--------------|--------------|---|
| Power supply: | AC 120V/60Hz | Polarization | L |
|---------------|--------------|--------------|---|

**Test Graph****Final Data List**

| NO. | Frequency<br>[MHz] | QP<br>Reading<br>[dBμV] | AVG.<br>Reading<br>[dBμV] | Factor<br>[dB] | QP<br>Result<br>[dBμV] | AVG.<br>Result<br>[dBμV] | QP<br>Limit<br>[dBμV] | AVG.<br>Limit<br>[dBμV] | QP<br>Margin<br>[dB] | AVG.<br>Margin<br>[dB] | Line | Remark |
|-----|--------------------|-------------------------|---------------------------|----------------|------------------------|--------------------------|-----------------------|-------------------------|----------------------|------------------------|------|--------|
| 1   | 0.3026             | 30.29                   | 26.96                     | 9.97           | 40.26                  | 36.93                    | 60.17                 | 50.17                   | 19.91                | 13.24                  | L1   | PASS   |
| 2   | 0.4974             | 27.80                   | 26.83                     | 10.06          | 37.86                  | 36.89                    | 56.04                 | 46.04                   | 18.18                | 9.15                   | L1   | PASS   |
| 3   | 0.7269             | 24.00                   | 16.05                     | 10.06          | 34.06                  | 26.11                    | 56.00                 | 46.00                   | 21.94                | 19.89                  | L1   | PASS   |
| 4   | 1.5872             | 14.05                   | 9.04                      | 10.12          | 24.17                  | 19.16                    | 56.00                 | 46.00                   | 31.83                | 26.84                  | L1   | PASS   |
| 5   | 4.2185             | 9.01                    | 1.67                      | 10.42          | 19.43                  | 12.09                    | 56.00                 | 46.00                   | 36.57                | 33.91                  | L1   | PASS   |
| 6   | 21.8110            | 24.56                   | 13.69                     | 11.57          | 36.13                  | 25.26                    | 60.00                 | 50.00                   | 23.87                | 24.74                  | L1   | PASS   |

Note: 1. Result (dBμV) = Reading (dBμV) + Factor (dB).

2. Factor (dB) = Cable loss (dB) + LISN Factor (dB).

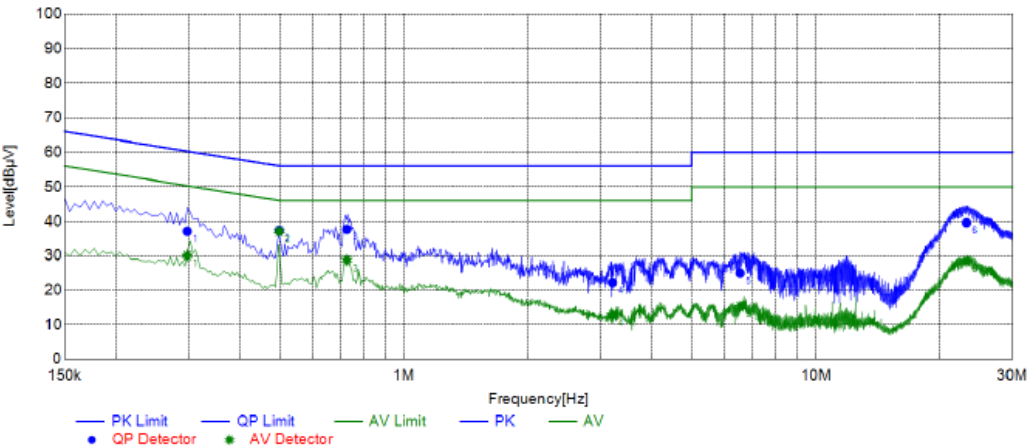
Power supply:

AC 120V/60Hz

Polarization

N

Test Graph



| Final Data List |                    |                         |                           |                |                        |                          |                       |                         |                      |                        |      |        |
|-----------------|--------------------|-------------------------|---------------------------|----------------|------------------------|--------------------------|-----------------------|-------------------------|----------------------|------------------------|------|--------|
| NO.             | Frequency<br>[MHz] | QP<br>Reading<br>[dBµV] | AVG.<br>Reading<br>[dBµV] | Factor<br>[dB] | QP<br>Result<br>[dBµV] | AVG.<br>Result<br>[dBµV] | QP<br>Limit<br>[dBµV] | AVG.<br>Limit<br>[dBµV] | QP<br>Margin<br>[dB] | AVG.<br>Margin<br>[dB] | Line | Remark |
| 1               | 0.2977             | 27.18                   | 20.05                     | 9.97           | 37.15                  | 30.02                    | 60.31                 | 50.31                   | 23.16                | 20.29                  | N    | PASS   |
| 2               | 0.4980             | 27.32                   | 27.06                     | 10.06          | 37.38                  | 37.12                    | 56.03                 | 46.03                   | 18.65                | 8.91                   | N    | PASS   |
| 3               | 0.7272             | 27.65                   | 18.68                     | 10.06          | 37.71                  | 28.74                    | 56.00                 | 46.00                   | 18.29                | 17.26                  | N    | PASS   |
| 4               | 3.2034             | 11.87                   | 2.63                      | 10.31          | 22.18                  | 12.94                    | 56.00                 | 46.00                   | 33.82                | 33.06                  | N    | PASS   |
| 5               | 6.5412             | 14.44                   | 4.71                      | 10.56          | 25.00                  | 15.27                    | 60.00                 | 50.00                   | 35.00                | 34.73                  | N    | PASS   |
| 6               | 23.2131            | 28.02                   | 16.88                     | 11.56          | 39.58                  | 28.44                    | 60.00                 | 50.00                   | 20.42                | 21.56                  | N    | PASS   |

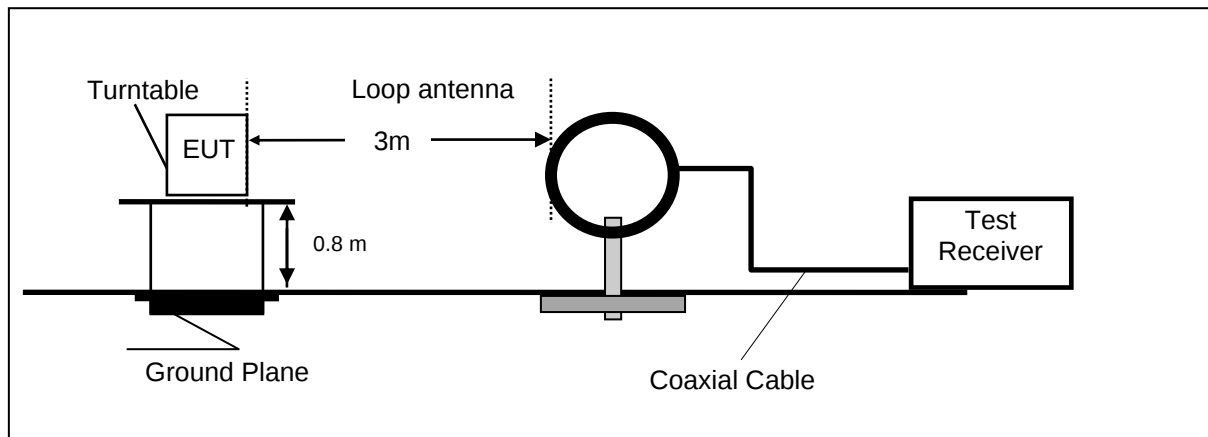
Note: 1. Result (dBµV) = Reading (dBµV) + Factor (dB).

2. Factor (dB) = Cable loss (dB) + LISN Factor (dB).

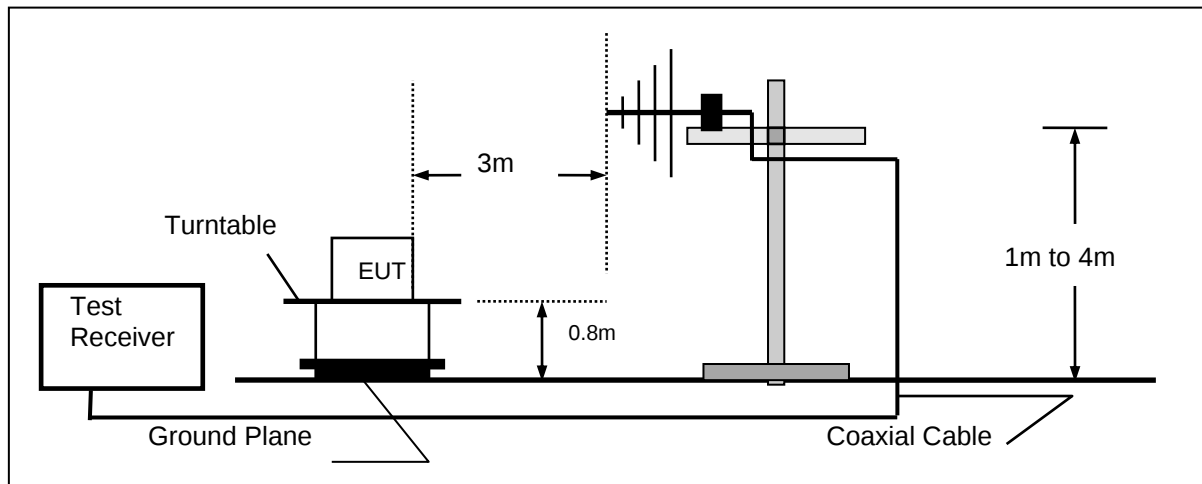
## 4.2. Radiated Emission

### TEST CONFIGURATION

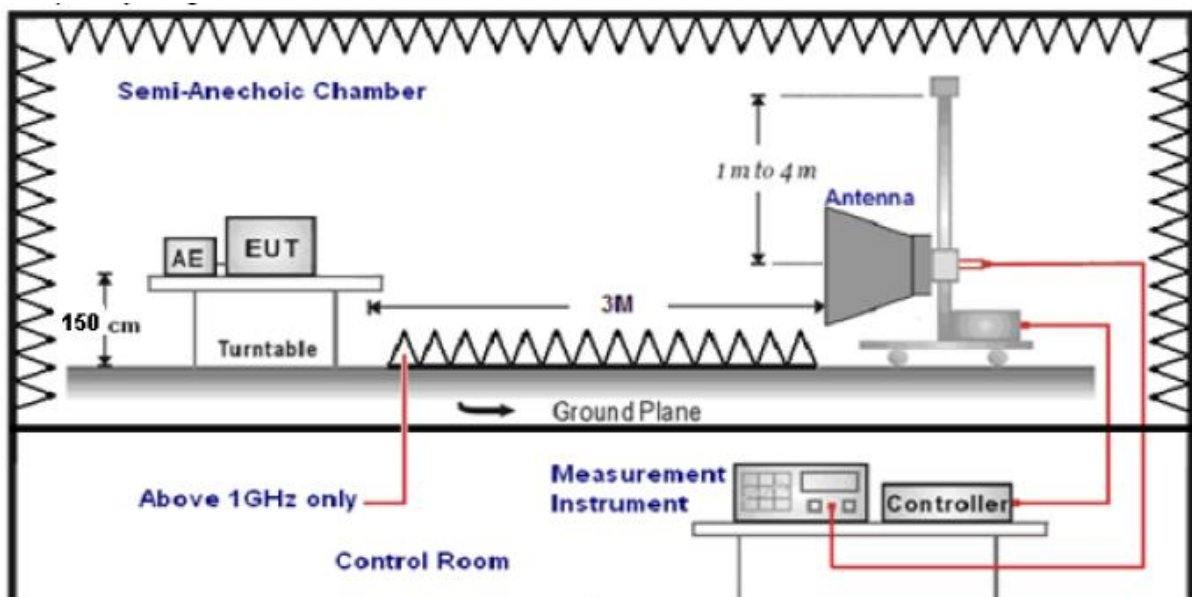
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



**TEST PROCEDURE**

1. The EUT was placed on a turn table which is 0.8m above ground plane when testing frequency range 9 KHz –1GHz;the EUT was placed on a turn table which is 1.5m above ground plane when testing frequency range 1GHz – 25GHz.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. The EUT minimum operation frequency was 32.768KHz and maximum operation frequency was 2480MHz.so radiated emission test frequency band from 9KHz to 25GHz.
6. The distance between test antenna and EUT as following table states:

| Test Frequency range | Test Antenna Type          | Test Distance |
|----------------------|----------------------------|---------------|
| 9KHz-30MHz           | Active Loop Antenna        | 3             |
| 30MHz-1GHz           | Ultra-Broadband Antenna    | 3             |
| 1GHz-18GHz           | Double Ridged Horn Antenna | 3             |
| 18GHz-25GHz          | Horn Antenna               | 1             |

7. Setting test receiver/spectrum as following table states:

| Test Frequency range | Test Receiver/Spectrum Setting                                                                            | Detector |
|----------------------|-----------------------------------------------------------------------------------------------------------|----------|
| 9KHz-150KHz          | RBW=200Hz/VBW=3KHz, Sweep time=Auto                                                                       | QP       |
| 150KHz-30MHz         | RBW=9KHz/VBW=100KHz, Sweep time=Auto                                                                      | QP       |
| 30MHz-1GHz           | RBW=120KHz/VBW=1000KHz, Sweep time=Auto                                                                   | QP       |
| 1GHz-40GHz           | Peak Value: RBW=1MHz/VBW=3MHz,<br>Sweep time=Auto<br>Average Value: RBW=1MHz/VBW=10Hz,<br>Sweep time=Auto | Peak     |

**Field Strength Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

|                           |                                            |
|---------------------------|--------------------------------------------|
| Where FS = Field Strength | CL = Cable Attenuation Factor (Cable Loss) |
| RA = Reading Amplitude    | AG = Amplifier Gain                        |
| AF = Antenna Factor       |                                            |

$$\text{Transd} = AF + CL - AG$$

**RADIATION LIMIT**

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission from intentional radiators at a distance of 3 meters shall not exceed the following table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power.

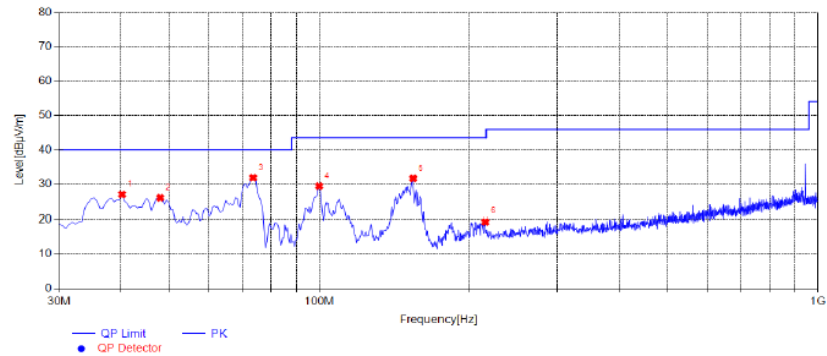
The pre-test have done for the EUT in three axes and found the worst emission at position shown in test setup photos.

| Frequency (MHz) | Distance (Meters) | Radiated (dBµV/m)                            | Radiated (µV/m)       |
|-----------------|-------------------|----------------------------------------------|-----------------------|
| 0.009-0.49      | 3                 | $20\log(2400/F(\text{KHz})) + 40\log(300/3)$ | $2400/F(\text{KHz})$  |
| 0.49-1.705      | 3                 | $20\log(24000/F(\text{KHz})) + 40\log(30/3)$ | $24000/F(\text{KHz})$ |
| 1.705-30        | 3                 | $20\log(30) + 40\log(30/3)$                  | 30                    |
| 30-88           | 3                 | 40.0                                         | 100                   |
| 88-216          | 3                 | 43.5                                         | 150                   |
| 216-960         | 3                 | 46.0                                         | 200                   |
| Above 960       | 3                 | 54.0                                         | 500                   |

**TEST RESULTS**

Remark: We measured Radiated Emission at ASK mode from 30MHz to 25GHz and recorded worst case at ASK mode.

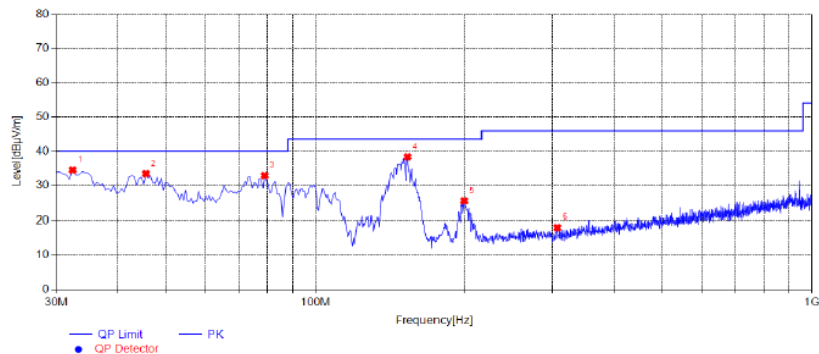
|               |          |                |       |
|---------------|----------|----------------|-------|
| Temperature   | 23.5°C   | Humidity       | 54.2% |
| Test Engineer | Moon Tan | Configurations | RFID  |

**For 30MHz-1GHz****Horizontal****Test Graph****Suspected List**

| NO. | Frequency [MHz] | Reading [dBμV/m] | Factor [dB] | Result [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Detector | Polarity   | Remark |
|-----|-----------------|------------------|-------------|-----------------|----------------|-------------|-------------|-----------|----------|------------|--------|
| 1   | 40.1850         | 34.53            | -7.48       | 27.05           | 40.00          | 12.95       | 100         | 120       | PK       | Horizontal | PASS   |
| 2   | 47.9450         | 32.56            | -6.49       | 26.07           | 40.00          | 13.93       | 100         | 10        | PK       | Horizontal | PASS   |
| 3   | 73.6500         | 44.31            | -12.43      | 31.88           | 40.00          | 8.12        | 100         | 310       | PK       | Horizontal | PASS   |
| 4   | 99.8400         | 37.99            | -8.49       | 29.50           | 43.50          | 14.00       | 100         | 240       | PK       | Horizontal | PASS   |
| 5   | 154.1600        | 44.25            | -12.56      | 31.69           | 43.50          | 11.81       | 100         | 350       | PK       | Horizontal | PASS   |
| 6   | 215.2700        | 28.81            | -9.48       | 19.33           | 43.50          | 24.17       | 100         | 330       | PK       | Horizontal | PASS   |

Note: 1. Result (dBμV/m) = Reading(dBμV/m) + Factor (dB) .

2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB).

**Vertical****Test Graph****Suspected List**

| NO. | Frequency [MHz] | Reading [dBμV/m] | Factor [dB] | Result [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Detector | Polarity | Remark |
|-----|-----------------|------------------|-------------|-----------------|----------------|-------------|-------------|-----------|----------|----------|--------|
| 1   | 32.4250         | 44.37            | -9.81       | 34.56           | 40.00          | 5.44        | 100         | 80        | PK       | Vertical | PASS   |
| 2   | 45.5200         | 39.87            | -6.44       | 33.43           | 40.00          | 6.57        | 100         | 80        | PK       | Vertical | PASS   |
| 3   | 78.9850         | 45.75            | -12.82      | 32.93           | 40.00          | 7.07        | 100         | 90        | PK       | Vertical | PASS   |
| 4   | 153.1900        | 50.81            | -12.42      | 38.39           | 43.50          | 5.11        | 100         | 120       | PK       | Vertical | PASS   |
| 5   | 199.2650        | 34.72            | -9.14       | 25.58           | 43.50          | 17.92       | 100         | 80        | PK       | Vertical | PASS   |
| 6   | 306.9350        | 25.37            | -7.32       | 18.05           | 46.00          | 27.95       | 100         | 120       | PK       | Vertical | PASS   |

Note: 1. Result (dBμV/m) = Reading(dBμV/m) + Factor (dB) .

2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB).

## For 1GHz to 25GHz

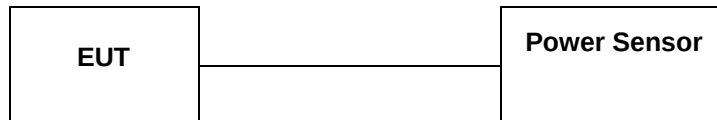
| Frequency | Meter Reading | Antenna Factor | Cable loss | Preamp factor | Emission Level | Limits   | Margin | Detector Type | Comment    |
|-----------|---------------|----------------|------------|---------------|----------------|----------|--------|---------------|------------|
| (MHz)     | (dBμV)        | (dB)           | (dB)       | (dB)          | (dBμV/m)       | (dBμV/m) | (dB)   |               |            |
| TX-902.75 |               |                |            |               |                |          |        |               |            |
| 1805.5    | 49.49         | 32.44          | 30.25      | 7.95          | 59.63          | 74.00    | -14.37 | Pk            | Vertical   |
| 1805.5    | 36.18         | 32.44          | 30.25      | 7.95          | 46.32          | 54.00    | -7.68  | AV            | Vertical   |
| 1805.5    | 54.20         | 32.44          | 30.25      | 7.95          | 64.34          | 74.00    | -9.66  | Pk            | Horizontal |
| 1805.5    | 35.43         | 32.44          | 30.25      | 7.95          | 45.57          | 54.00    | -8.43  | AV            | Horizontal |
| TX-914.75 |               |                |            |               |                |          |        |               |            |
| 1829.5    | 49.11         | 32.52          | 30.31      | 8.12          | 59.44          | 74.00    | -14.56 | Pk            | Vertical   |
| 1829.5    | 36.65         | 32.52          | 30.31      | 8.12          | 46.98          | 54.00    | -7.02  | AV            | Vertical   |
| 1829.5    | 52.19         | 32.52          | 30.31      | 8.12          | 62.52          | 74.00    | -11.48 | Pk            | Horizontal |
| 1829.5    | 35.75         | 32.52          | 30.31      | 8.12          | 46.08          | 54.00    | -7.92  | AV            | Horizontal |
| TX-927.25 |               |                |            |               |                |          |        |               |            |
| 1854.5    | 51.03         | 32.68          | 30.27      | 7.88          | 61.32          | 74.00    | -12.68 | Pk            | Vertical   |
| 1854.5    | 36.26         | 32.68          | 30.27      | 7.88          | 46.55          | 54.00    | -7.45  | AV            | Vertical   |
| 1854.5    | 49.54         | 32.68          | 30.27      | 7.88          | 59.83          | 74.00    | -14.17 | Pk            | Horizontal |
| 1854.5    | 31.40         | 32.68          | 30.27      | 7.88          | 41.69          | 54.00    | -12.31 | AV            | Horizontal |

## REMARKS:

1. Emission level (dBμV/m) = Raw Value (dBμV) + Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Factor
3. Margin value = Limit value - Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.

### 4.3. Maximum Peak Output Power

#### TEST CONFIGURATION



#### TEST PROCEDURE

According to ANSI C63.10:2013 Maximum peak conducted output power for HFSS devices:

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the HFSS bandwidth and shall utilize a fast-responding diode detector.

The maximum Average conducted output power may be measured using a wideband RF power meter with a thermocouple detector or equivalent. The power meter shall have a video bandwidth that is greater than or equal to the HFSS bandwidth and shall utilize a fast-responding diode detector.

#### LIMIT

According to §15.247(b)(2), For frequency hopping systems operating in the 902–928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

#### TEST RESULTS

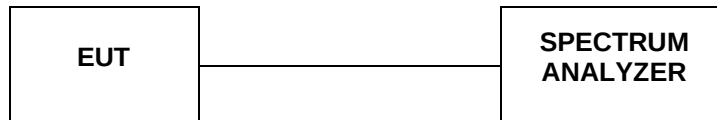
|               |          |                |       |
|---------------|----------|----------------|-------|
| Temperature   | 23.9°C   | Humidity       | 54.1% |
| Test Engineer | Moon Tan | Configurations | RFID  |

| Modulation | Channel | Peak Output power (dBm) | Average Output power (dBm) | Limit (dBm) | Result |
|------------|---------|-------------------------|----------------------------|-------------|--------|
| ASK        | 01      | 26.83                   | 24.12                      | 30.0        | Pass   |
|            | 25      | 27.09                   | 24.56                      |             |        |
|            | 50      | 27.01                   | 24.63                      |             |        |

Note: The test results including the cable lose.

#### 4.4. 20dB Bandwidth

##### TEST CONFIGURATION



##### TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW=30KHz and VBW=100KHz. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

##### LIMIT

According to §15.247(i), For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

##### TEST RESULTS

|               |          |                |       |
|---------------|----------|----------------|-------|
| Temperature   | 23.9℃    | Humidity       | 54.1% |
| Test Engineer | Moon Tan | Configurations | RFID  |

| Modulation | Channel | 20dB Bandwidth (MHz) | Result |
|------------|---------|----------------------|--------|
| ASK        | 01      | 0.1198               | PASS   |
|            | 25      | 0.1219               | PASS   |
|            | 50      | 0.1221               | PASS   |

Test plot as follows:

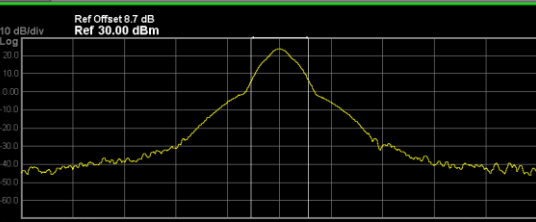
ASK

Keysight Spectrum Analyzer - Occupied BW

Center Freq: 902.750000 MHz  
Trig: Free Run  
Avg/Hold: >10/10  
Radio Std: None  
Radio Device: BTS

Mech Atten 40 dB  
#F Gain: Low  
#Atten: 40 dB

Ref Offset 8.7 dB  
Ref 30.00 dBm



Center 902.8 MHz  
#Res BW 3 kHz  
#VBW 10 kHz  
Sweep 1.4 ms

| Occupied Bandwidth  |           | Total Power    |           |
|---------------------|-----------|----------------|-----------|
| 110.32 kHz          |           | 24.9 dBm       |           |
| Transmit Freq Error | 1.379 kHz | % of OBW Power | 99.00 %   |
| x dB Bandwidth      | 119.8 kHz | x dB           | -20.00 dB |

MSG STATUS

Trace/Detector

Clear Write

Average

Max Hold

Min Hold

Detector Average ▶  
Auto Man

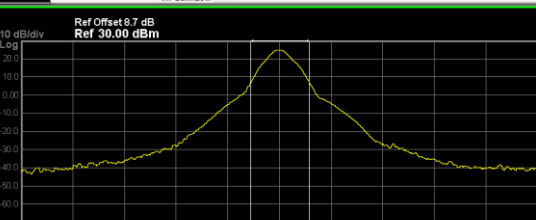
Channel 01

Keysight Spectrum Analyzer - Occupied BW

Center Freq: 914.750000 MHz  
Trig: Free Run  
Avg/Hold: >10/10  
Radio Std: None  
Radio Device: BTS

Mech Atten 40 dB  
#F Gain: Low  
#Atten: 40 dB

Ref Offset 8.7 dB  
Ref 30.00 dBm



Center 914.8 MHz  
#Res BW 3 kHz  
#VBW 10 kHz  
Sweep 1.4 ms

| Occupied Bandwidth  |           | Total Power    |           |
|---------------------|-----------|----------------|-----------|
| 111.41 kHz          |           | 26.1 dBm       |           |
| Transmit Freq Error | 1.524 kHz | % of OBW Power | 99.00 %   |
| x dB Bandwidth      | 121.9 kHz | x dB           | -20.00 dB |

MSG STATUS

Trace/Detector

Clear Write

Average

Max Hold

Min Hold

Detector Average ▶  
Auto Man

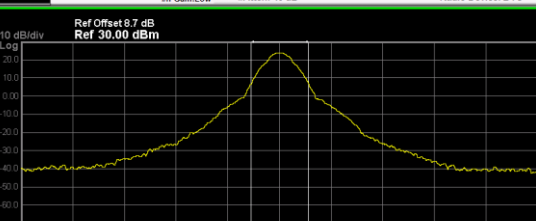
Channel 25

Keysight Spectrum Analyzer - Occupied BW

Center Freq: 927.250000 MHz  
Trig: Free Run  
Avg/Hold: >10/10  
Radio Std: None  
Radio Device: BTS

Mech Atten 40 dB  
#F Gain: Low  
#Atten: 40 dB

Ref Offset 8.7 dB  
Ref 30.00 dBm



Center 927.3 MHz  
#Res BW 3 kHz  
#VBW 10 kHz  
Sweep 1.4 ms

| Occupied Bandwidth  |           | Total Power    |           |
|---------------------|-----------|----------------|-----------|
| 110.56 kHz          |           | 25.4 dBm       |           |
| Transmit Freq Error | 951 Hz    | % of OBW Power | 99.00 %   |
| x dB Bandwidth      | 122.1 kHz | x dB           | -20.00 dB |

MSG STATUS

Frequency

Center Freq  
927.250000 MHz

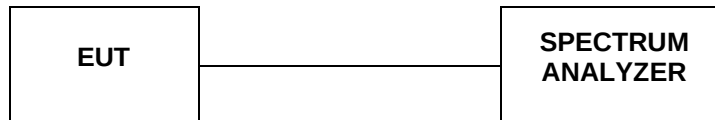
CF Step  
100.000 kHz  
Auto Man

Freq Offset  
0 Hz

Channel 50

## 4.5. Frequency Separation

### TEST CONFIGURATION



### TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW=30KHz and VBW=100KHz.

### LIMIT

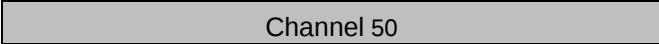
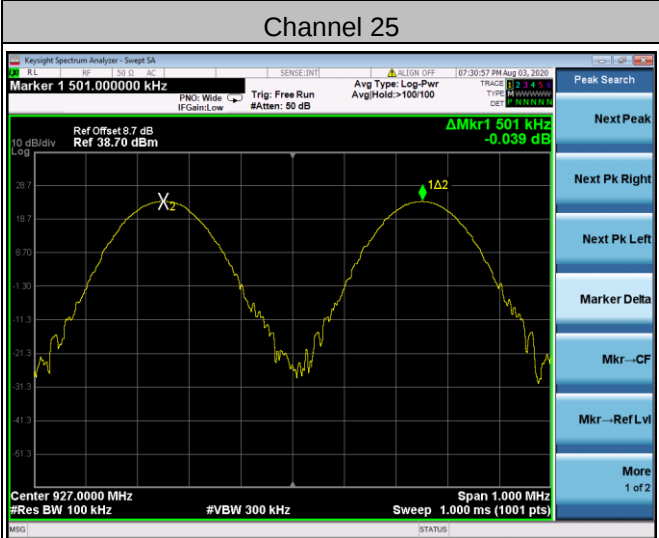
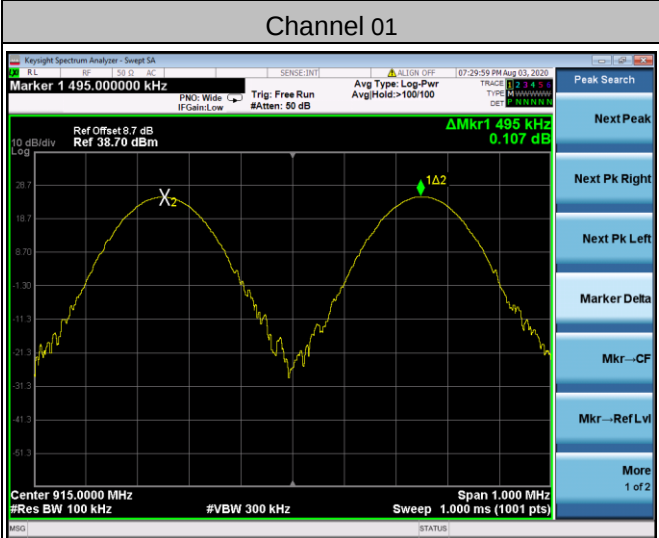
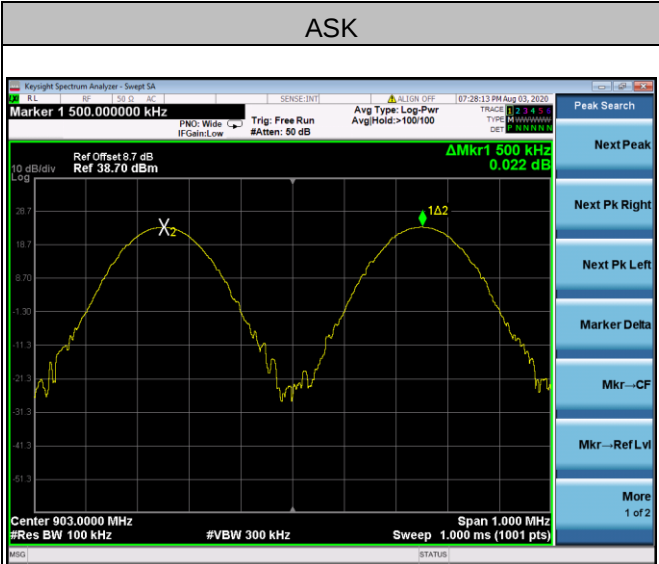
According to 15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25KHz or the  $2/3 \times 20\text{dB}$  bandwidth of the hopping channel, whichever is greater.

### TEST RESULTS

|               |          |                |       |
|---------------|----------|----------------|-------|
| Temperature   | 23.9°C   | Humidity       | 54.1% |
| Test Engineer | Moon Tan | Configurations | RFID  |

| Modulation | Channel | Ch. Separation (MHz) | Limit (MHz)   | Result   |
|------------|---------|----------------------|---------------|----------|
| ASK        | 01      | 0.500                | $\geq 0.1198$ | Complies |
|            | 25      | 0.495                | $\geq 0.1219$ | Complies |
|            | 50      | 0.501                | $\geq 0.1221$ | Complies |

**Ch. Separation Limits: > 20dB bandwidth**



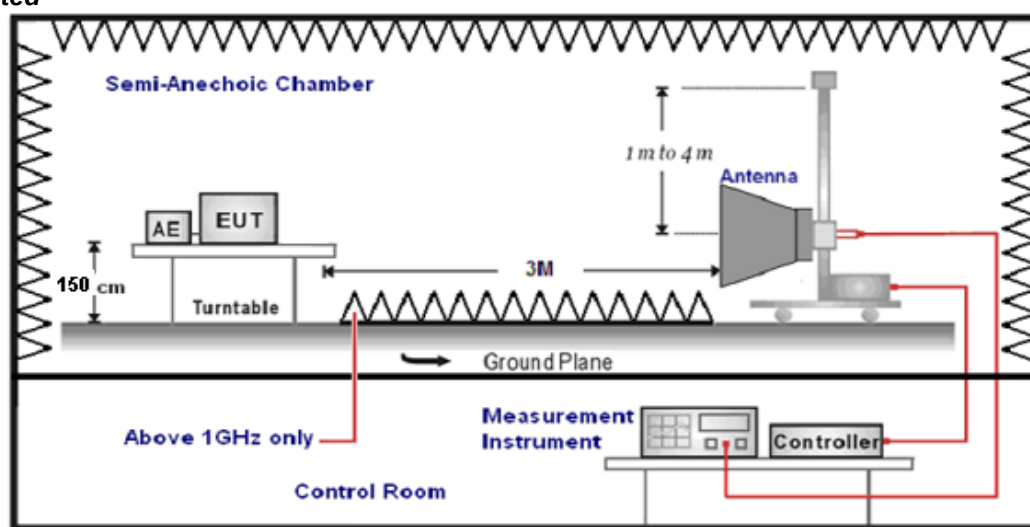
## 4.6. Band Edge Compliance of RF Emission

### TEST REQUIREMENT

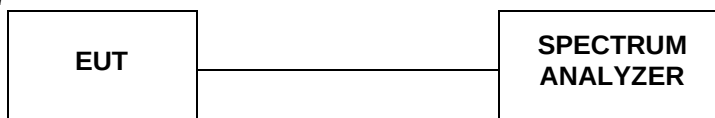
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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)).

### TEST CONFIGURATION

#### *For Radiated*



#### *For Conducted*



### TEST PROCEDURE

1. The EUT was placed on a turn table which is 1.5m above ground plane.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed..
5. The distance between test antenna and EUT was 3 meter:
6. Setting test receiver/spectrum as following table states:

| Test Frequency range | Test Receiver/Spectrum Setting                                                                            | Detector |
|----------------------|-----------------------------------------------------------------------------------------------------------|----------|
| 1GHz-40GHz           | Peak Value: RBW=1MHz/VBW=3MHz,<br>Sweep time=Auto<br>Average Value: RBW=1MHz/VBW=10Hz,<br>Sweep time=Auto | Peak     |

### LIMIT

Below -20dB of the highest emission level in operating band.

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)

**TEST RESULTS**

Remark: we measured all conditions and recorded worst case at report.

**4.6.1 For Radiated Bandedge Measurement**

Remark: we tested radiated bandedge at both hopping and no-hopping modes, recorded worst case at no-hopping mode

|               |          |                |       |
|---------------|----------|----------------|-------|
| Temperature   | 23.5°C   | Humidity       | 54.2% |
| Test Engineer | Moon Tan | Configurations | RFID  |

**ASK**

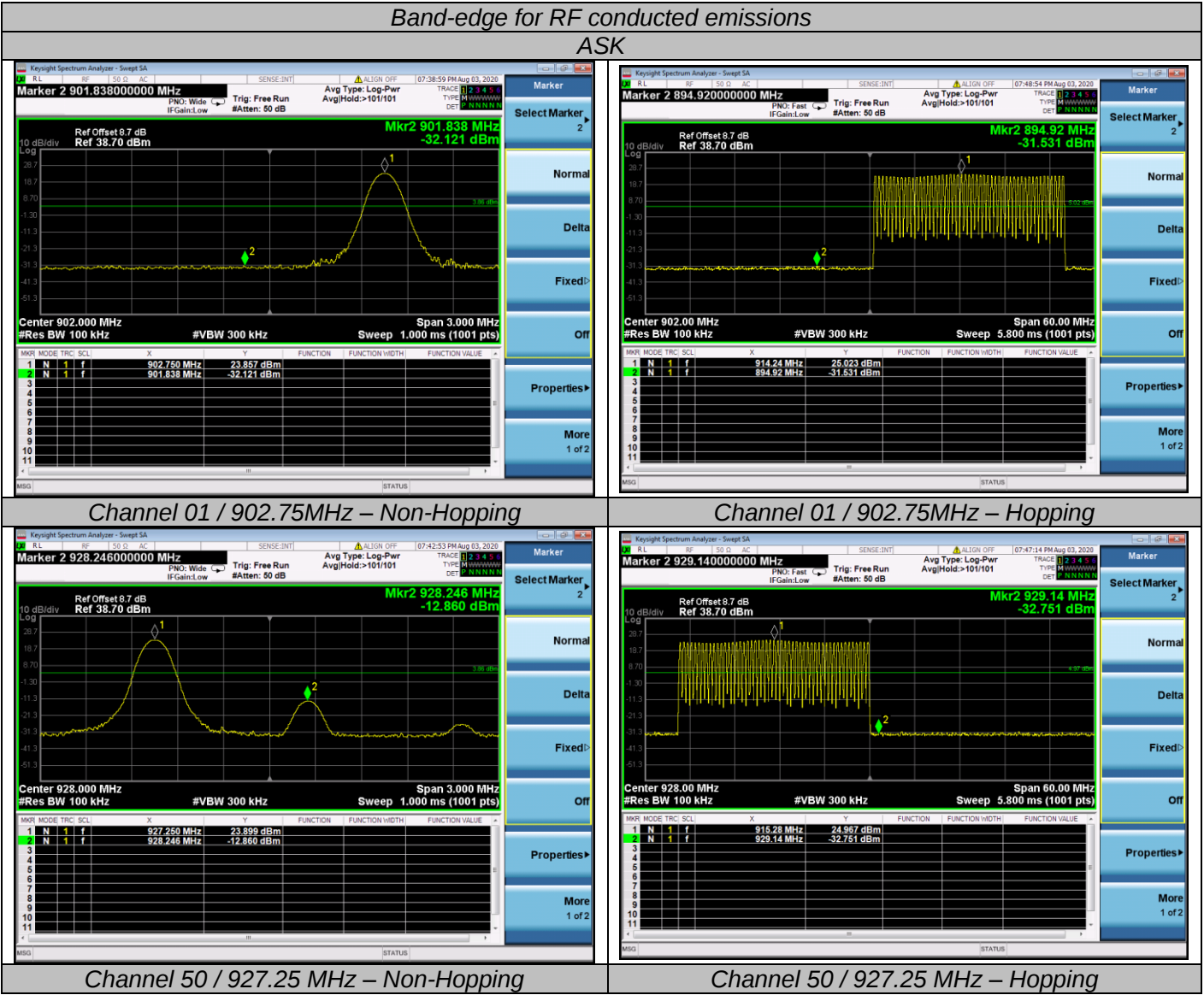
| Frequency(MHz): |                         |    | 902.75         |             |                    | Polarity:            |                  |                       | HORIZONTAL        |               |                          |
|-----------------|-------------------------|----|----------------|-------------|--------------------|----------------------|------------------|-----------------------|-------------------|---------------|--------------------------|
| Frequency (MHz) | Emission Level (dBuV/m) |    | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-amplifier | Correction Factor (dB/m) |
| 902.00          | 45.15                   | PK | 74.00          | -28.85      | 1                  | 125                  | 50.46            | 27.49                 | 3.32              | 36.12         | -5.31                    |
| 902.00          | 34.21                   | AV | 54.00          | -19.79      | 1                  | 125                  | 39.52            | 27.49                 | 3.32              | 36.12         | -5.31                    |
| Frequency(MHz): |                         |    | 902.75         |             |                    | Polarity:            |                  |                       | VERTICAL          |               |                          |
| Frequency (MHz) | Emission Level (dBuV/m) |    | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-amplifier | Correction Factor (dB/m) |
| 902.00          | 49.98                   | PK | 74.00          | -24.02      | 1                  | 222                  | 55.70            | 27.49                 | 3.32              | 36.12         | -5.31                    |
| 902.00          | 36.29                   | AV | 54.00          | -17.71      | 1                  | 222                  | 42.01            | 27.49                 | 3.32              | 36.12         | -5.31                    |
| Frequency(MHz): |                         |    | 927.25         |             |                    | Polarity:            |                  |                       | HORIZONTAL        |               |                          |
| Frequency (MHz) | Emission Level (dBuV/m) |    | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-amplifier | Correction Factor (dB/m) |
| 928.00          | 45.49                   | PK | 74.00          | -28.51      | 1                  | 89                   | 50.80            | 27.45                 | 3.38              | 36.55         | -5.72                    |
| 928.00          | 34.04                   | AV | 54.00          | -19.96      | 1                  | 89                   | 39.35            | 27.45                 | 3.38              | 36.55         | -5.72                    |
| Frequency(MHz): |                         |    | 927.25         |             |                    | Polarity:            |                  |                       | VERTICAL          |               |                          |
| Frequency (MHz) | Emission Level (dBuV/m) |    | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-amplifier | Correction Factor (dB/m) |
| 928.00          | 49.42                   | PK | 74.00          | -24.58      | 1                  | 236                  | 55.14            | 27.45                 | 3.38              | 36.55         | -5.72                    |
| 928.00          | 36.62                   | AV | 54.00          | -17.38      | 1                  | 236                  | 42.34            | 27.45                 | 3.38              | 36.55         | -5.72                    |

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Factor
3. Margin value = Limit value - Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.

4.6.2 For Conducted Bandedge Measurement

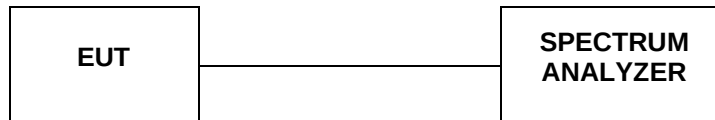
|               |          |                |       |
|---------------|----------|----------------|-------|
| Temperature   | 23.9°C   | Humidity       | 54.1% |
| Test Engineer | Moon Tan | Configurations | RFID  |



NOTE: Hopping enabled and disabled have evaluated, and the worst data was reported.

## 4.7. Number of hopping frequency

### TEST CONFIGURATION



### TEST PROCEDURE

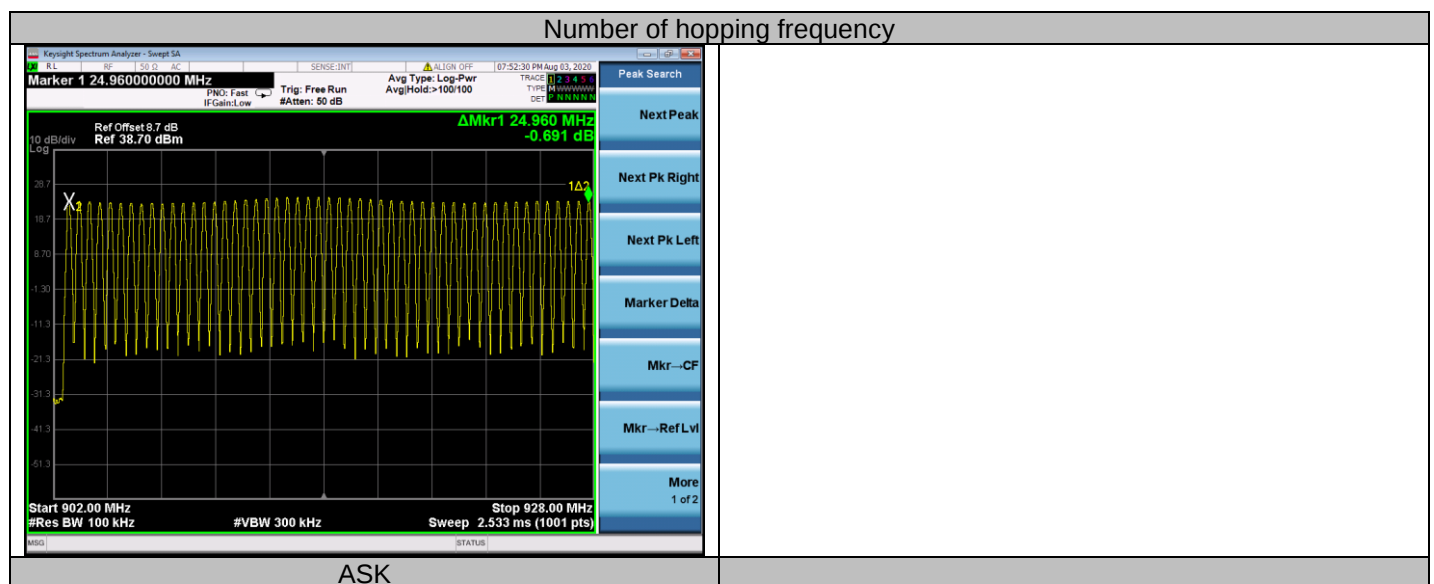
The transmitter output was connected to the spectrum analyzer through an attenuator. Set spectrum analyzer start 902MHz to 928MHz with RBW=1MHz and VBW=3MHz.

### LIMIT

According to §15.247(b)(2), For frequency hopping systems operating in the 902–928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

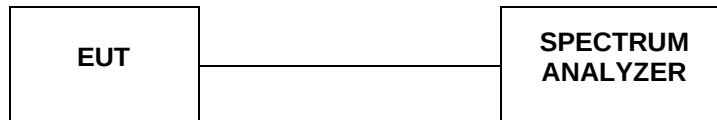
|               |          |                |       |
|---------------|----------|----------------|-------|
| Temperature   | 23.9°C   | Humidity       | 54.1% |
| Test Engineer | Moon Tan | Configurations | RFID  |

| Modulation | Number of Hopping Channel | Limit | Result |
|------------|---------------------------|-------|--------|
| ASK        | 50                        | ≥50   | Pass   |



#### 4.8. Time Of Occupancy(Dwell Time)

##### TEST CONFIGURATION



##### TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. Set center frequency of spectrum analyzer=operating frequency with RBW=1MHz and VBW=3MHz,Span=0Hz.

##### LIMIT

According to §15.247(a)(1)(i), For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

##### TEST RESULTS

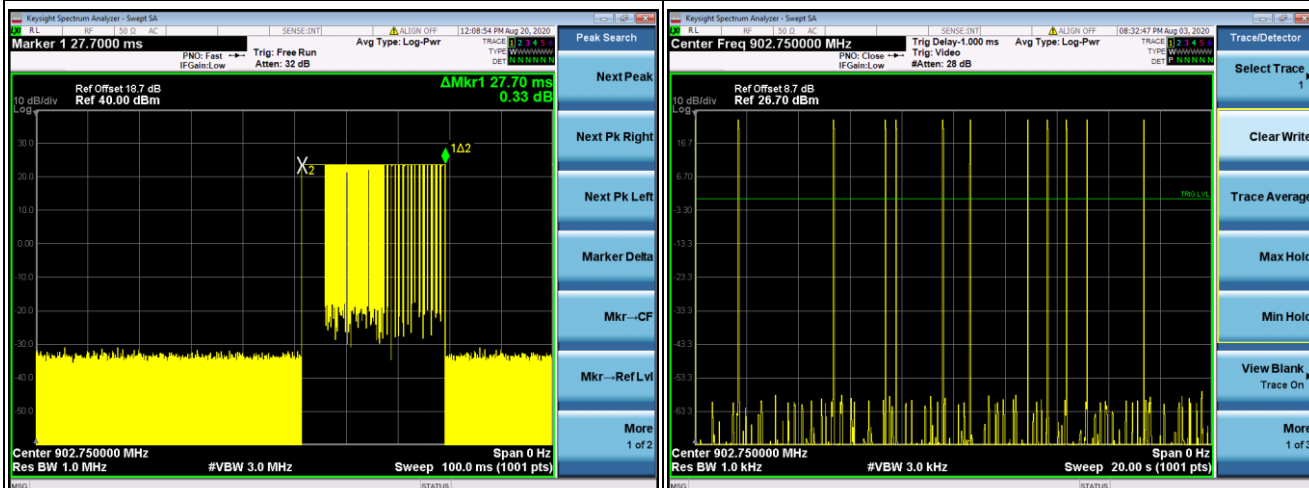
|               |          |                |       |
|---------------|----------|----------------|-------|
| Temperature   | 23.9°C   | Humidity       | 54.1% |
| Test Engineer | Moon Tan | Configurations | RFID  |

| Modulation | Channel | Frequency  | Pulse Duration | Dwell Time | Limits |
|------------|---------|------------|----------------|------------|--------|
|            |         |            | (ms)           | (s)        | (s)    |
| ASK        | 01      | 902.75 MHz | 27.70          | 0.33       | 0.4    |
|            | 25      | 914.75 MHz | 27.80          | 0.28       | 0.4    |
|            | 50      | 927.25 MHz | 27.80          | 0.31       | 0.4    |

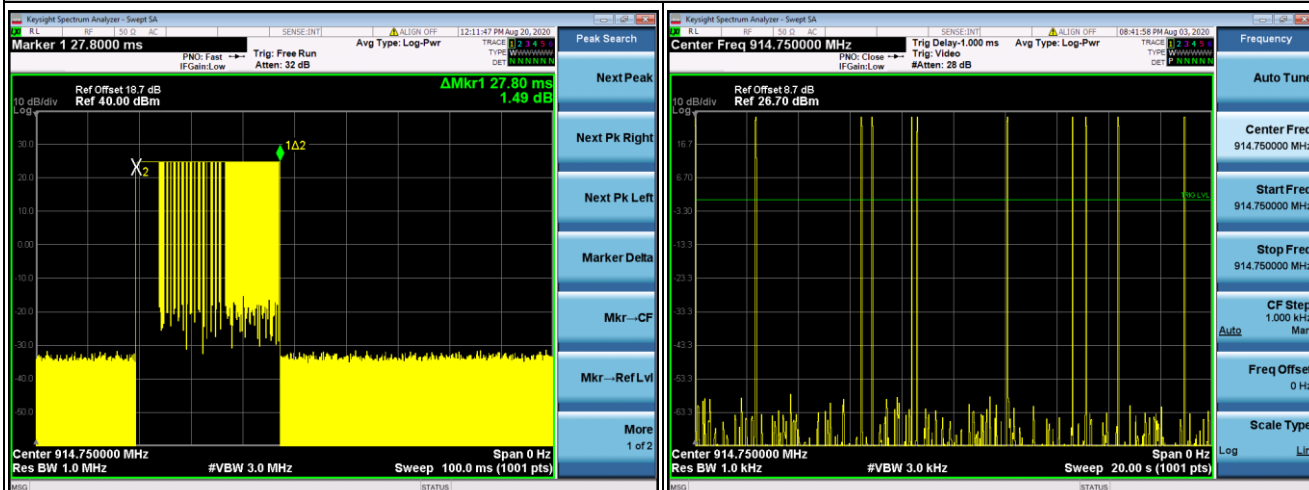
##### *Remark:*

1. The Dwell Time=Burst Width\*Total Hops. The detailed calculations are showed as follows:
2. Test results including cable loss;
3. please refer to following plots;
4. Measured at difference Packet Type for each mode and recorded woest case for each mode.
5. Dwell Time Calculate formula:  
Dwell time=Pulse time (ms) ×20 second pulse count
6. Measured at low, middle and high channel, recorded worst at middle channel;

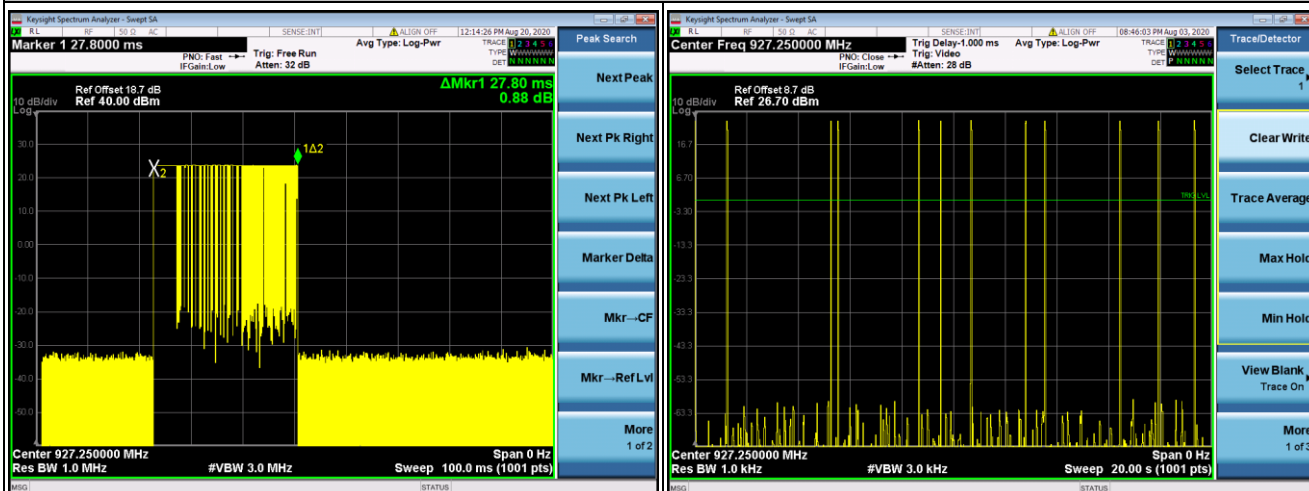
## ASK



## Channel 01



## Channel 25



## Channel 50

## 4.9. Antenna Requirement

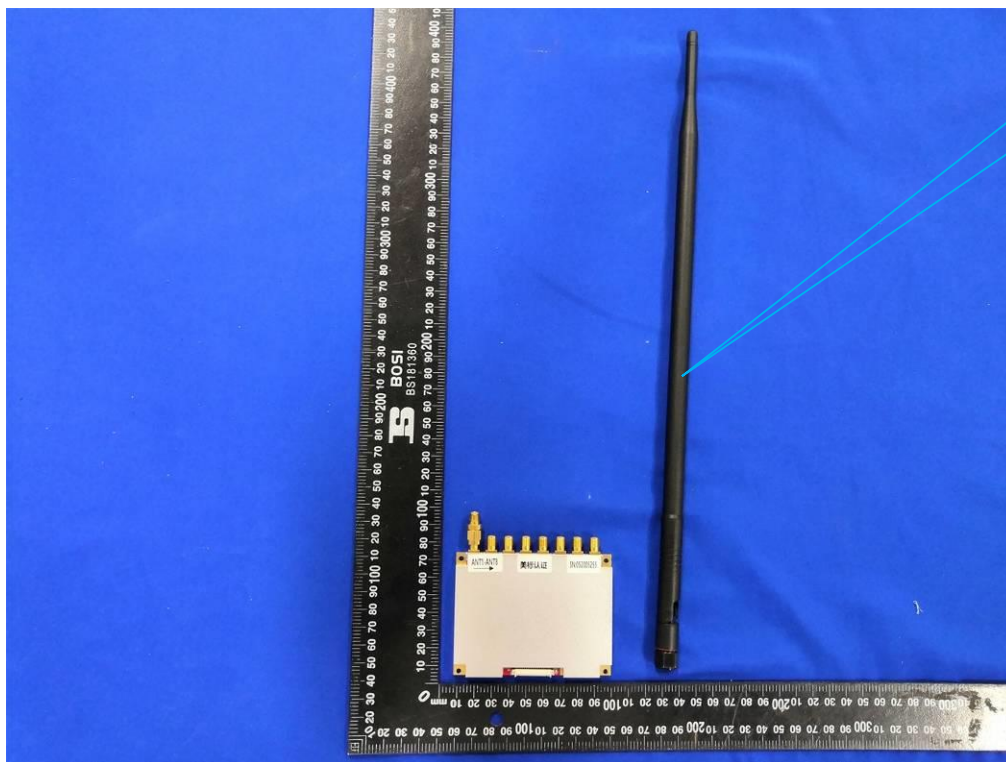
### Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### Test Result

The antenna used for this product is External Antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 4.0dBi.



## 5. Test Setup Photos of the EUT

### Radiated Emission Test

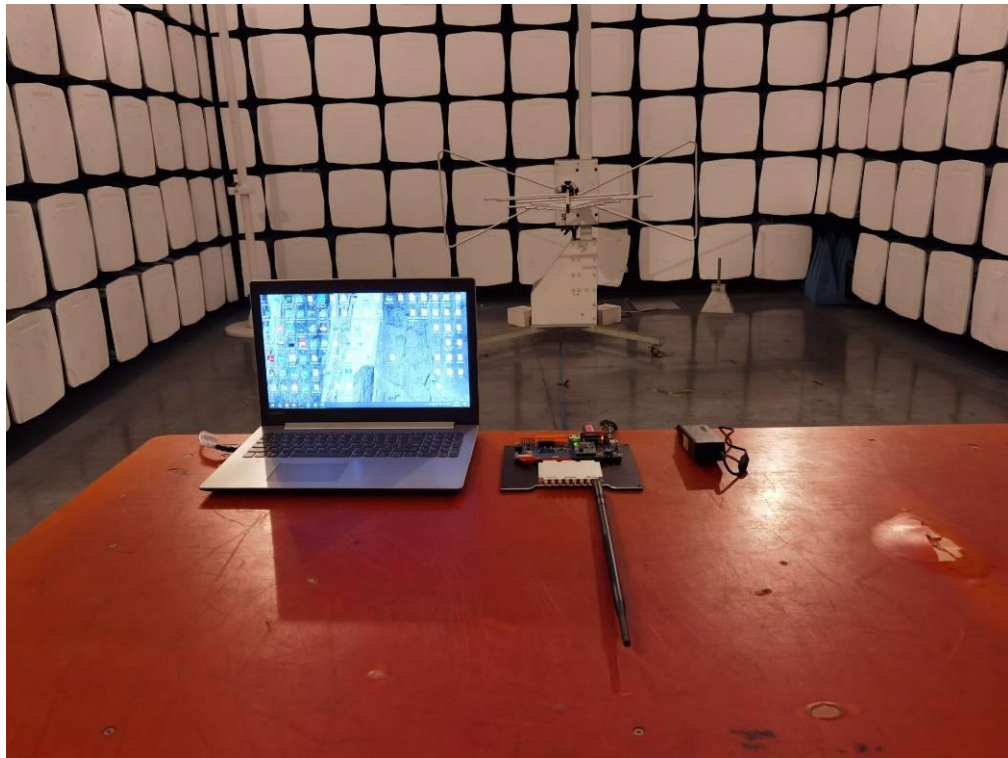


Fig.1



Fig.2

### Conducted Emission



Fig.3

## 6. External and Internal Photos of the EUT

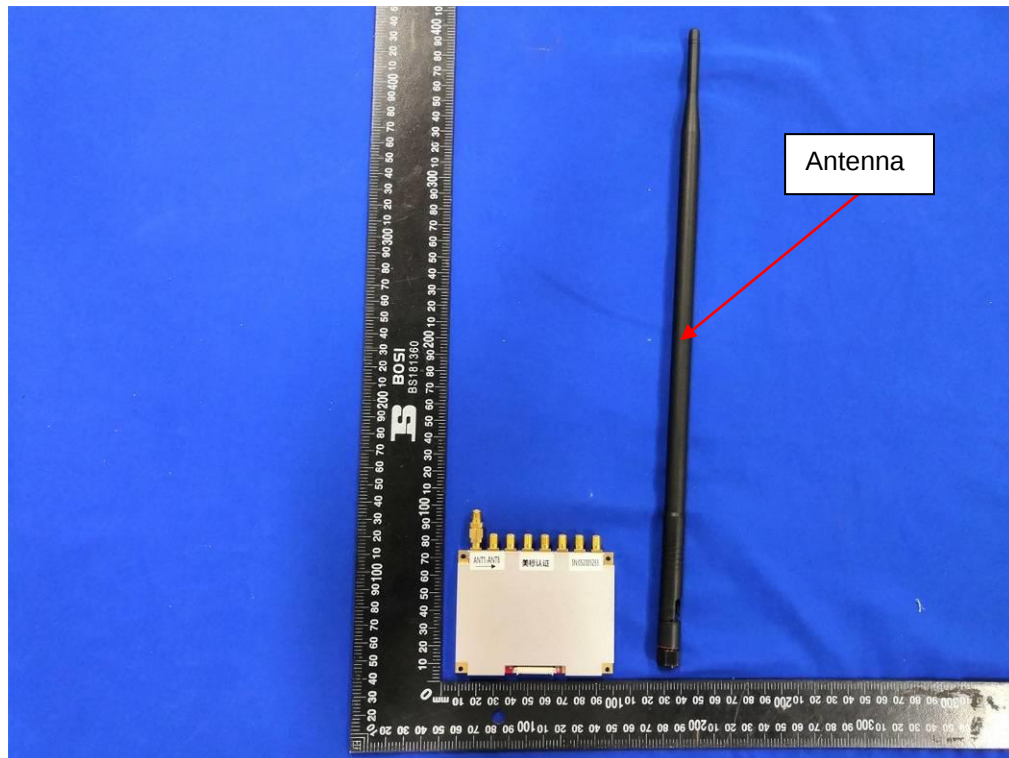


Fig. 1

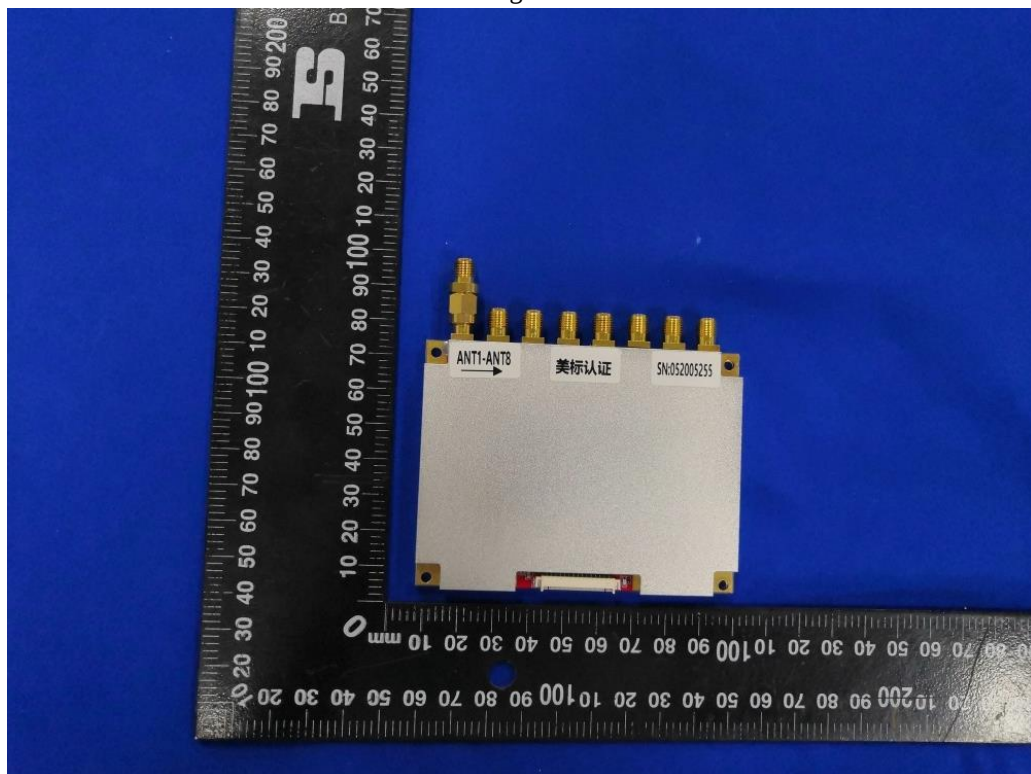


Fig. 2

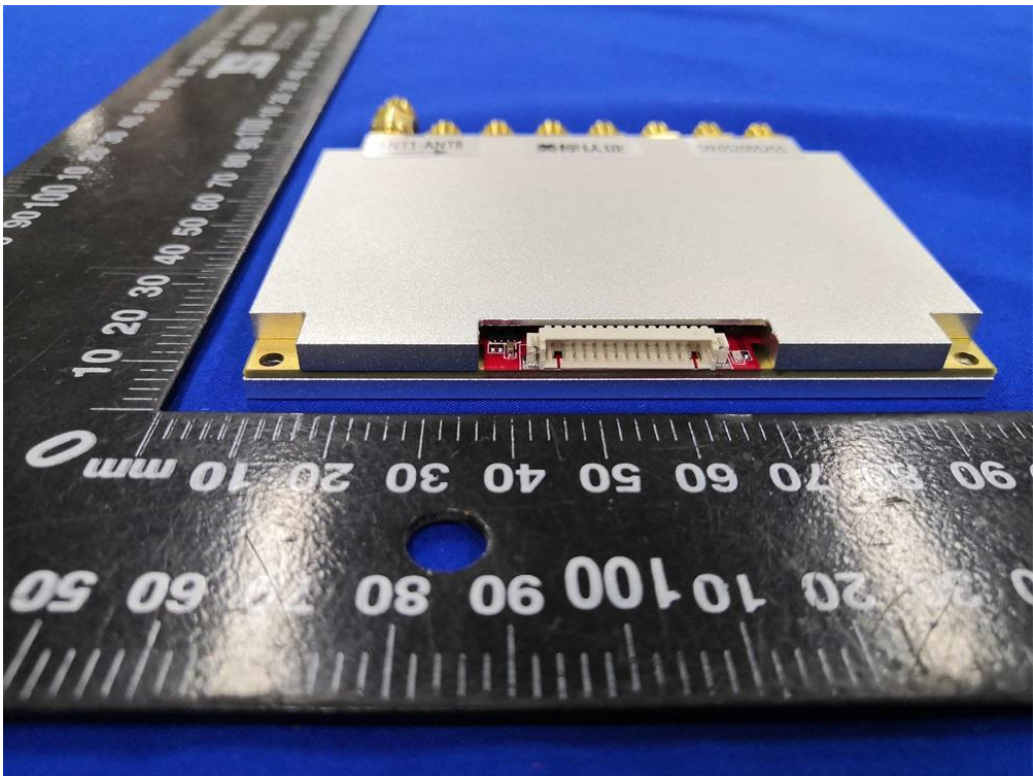


Fig. 3

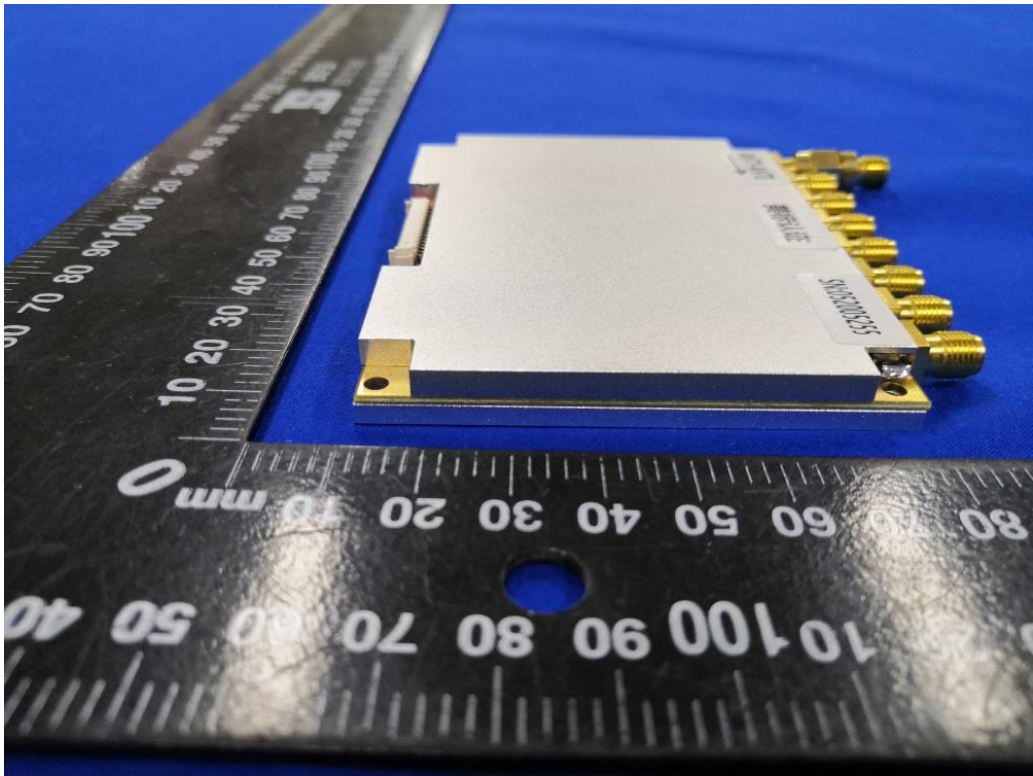


Fig. 4

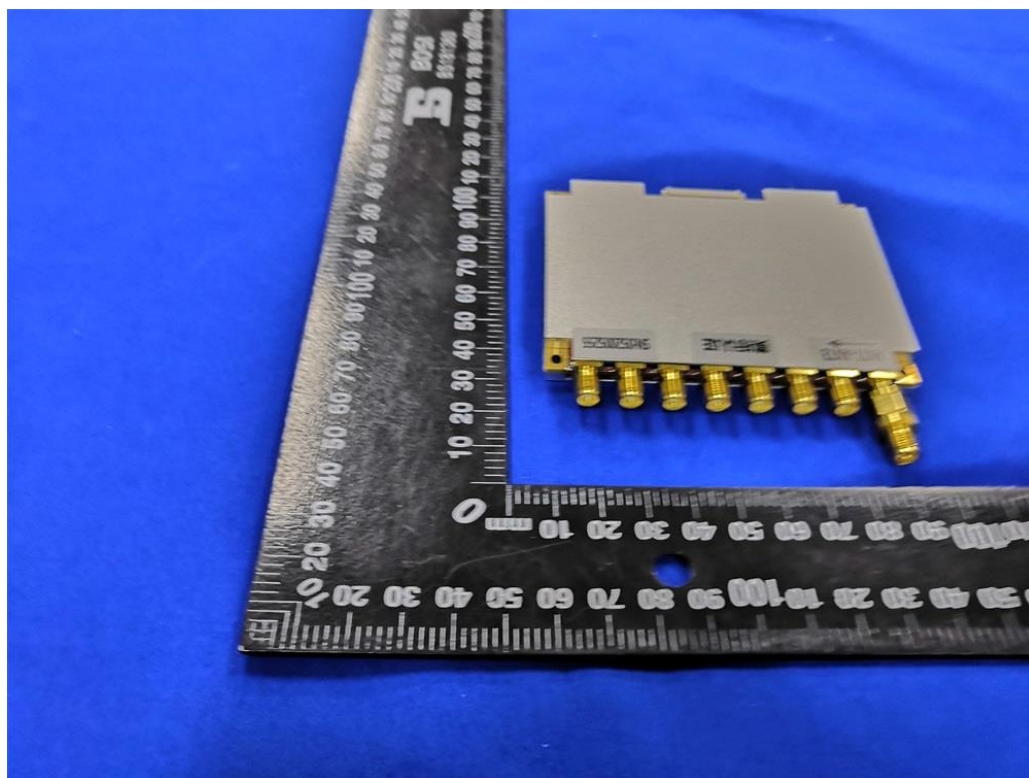


Fig. 5

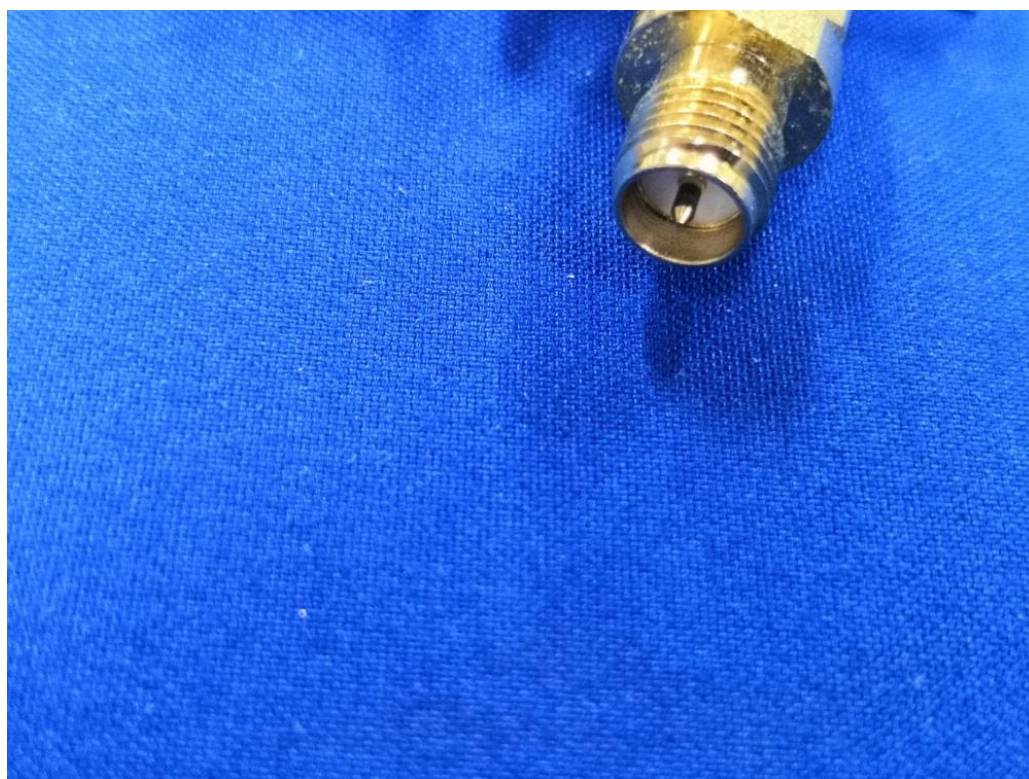


Fig. 6

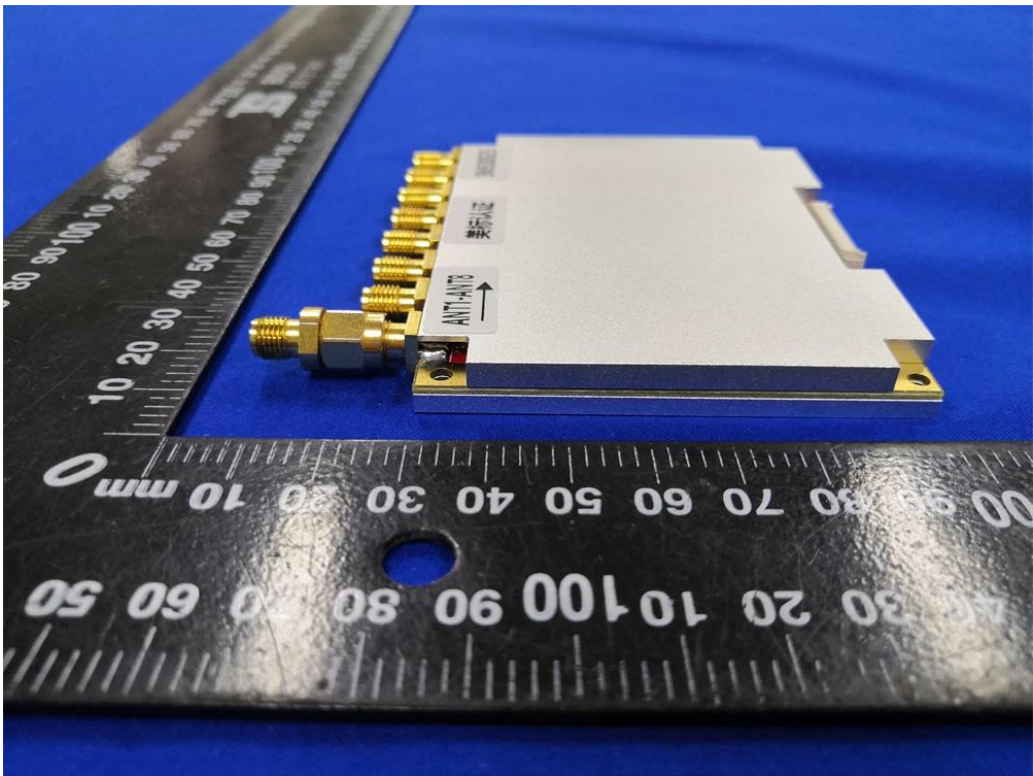


Fig. 7

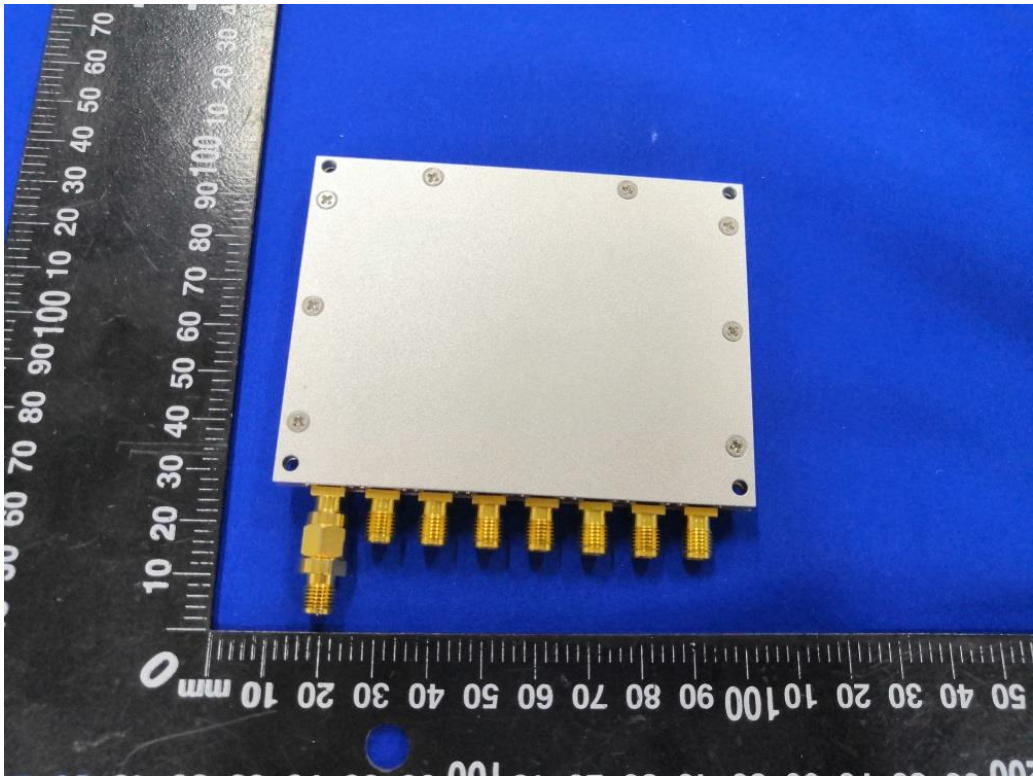


Fig. 8

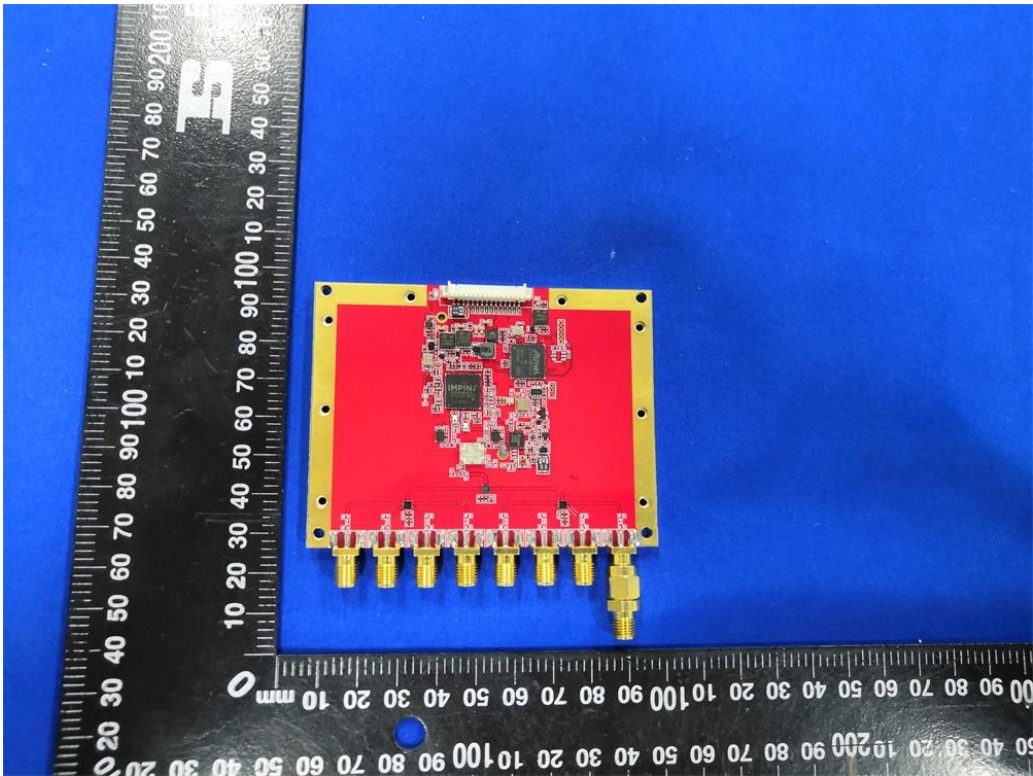


Fig. 9

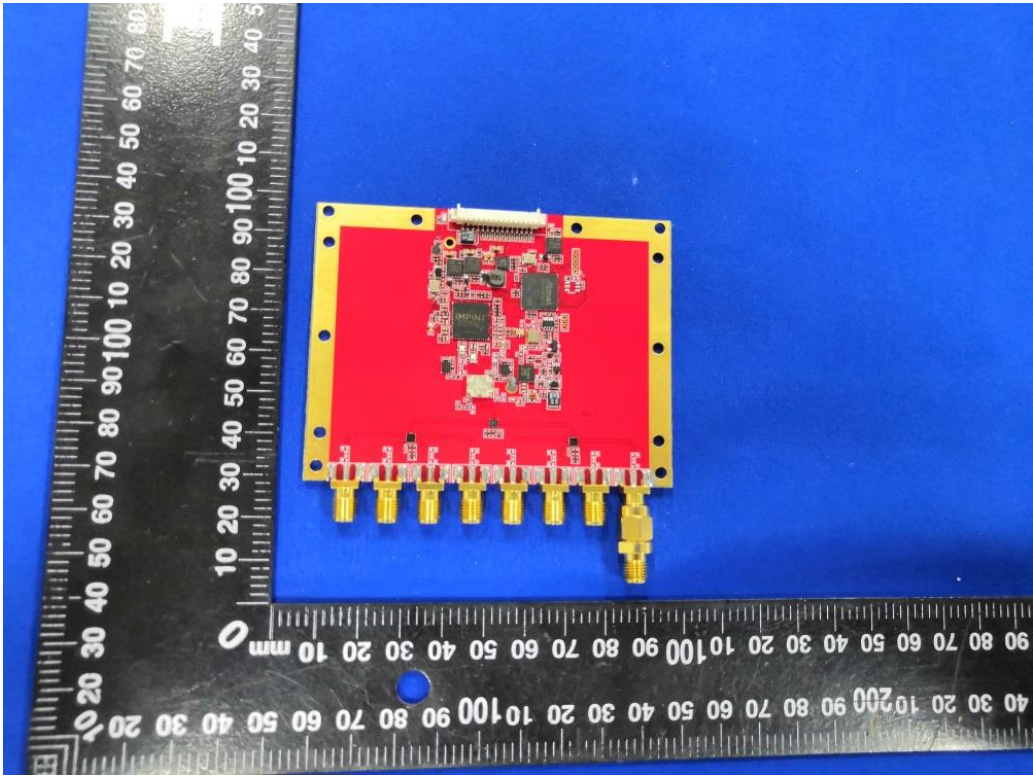


Fig. 10

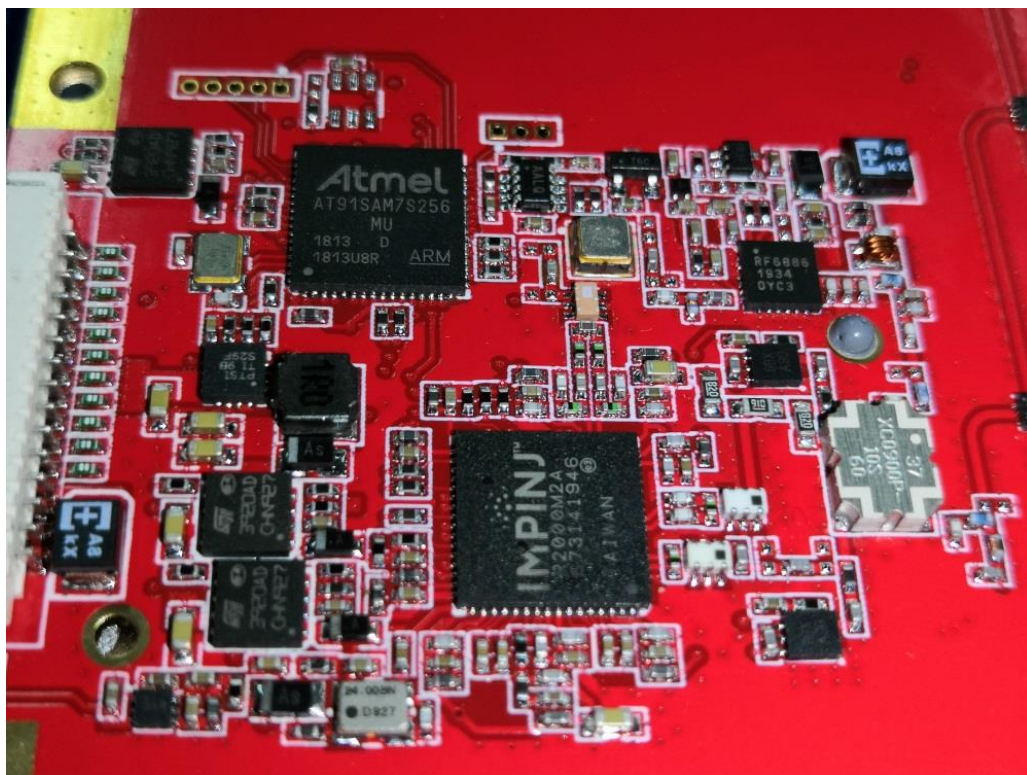


Fig. 11

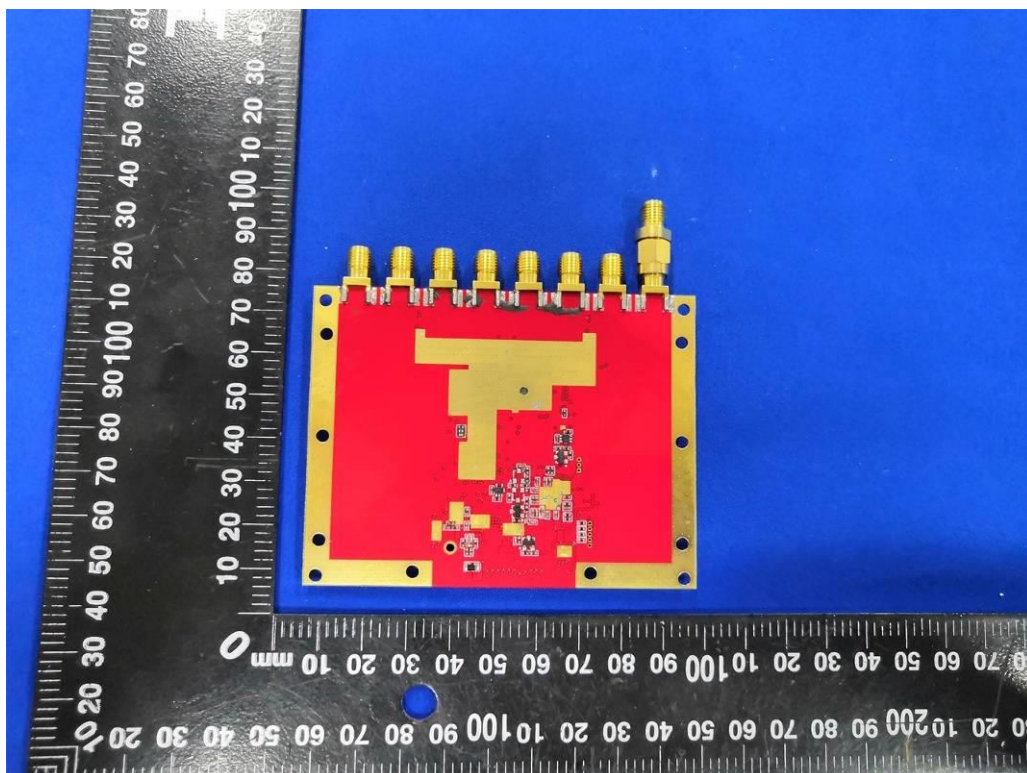


Fig. 12

.....End of Report.....