

# TEST REPORT

of

FCC Part 15 Subpart C §15.209, §15.231  
IC RSS-210 Issue 9, RSS-Gen Issue 5

FCC ID: TQ8-FOB-4F44  
IC Certification: 5074A-FOB4F44

1. Equipment Under Test : FOB SMART KEY
2. Model Name : FOB-4F44
3. Variant Mode Name(s) : -
4. Applicant : Hyundai Mobis Co., Ltd.
5. Manufacturer : Hyundai Mobis Co., Ltd.
6. Date of Receipt : 2020.02.19
7. Date of Test(s) : 2020.02.28 ~ 2020.03.02
8. Date of Issue : 2020.03.16

In the configuration tested, the EUT complied with the standards specified above. This test report does not assure KOLAS accreditation.

- 1) The results of this test report are effective only to the items tested.
- 2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.

Tested by:



Jinhyoung Cho

Technical  
Manager:



Jungmin Yang

**SGS Korea Co., Ltd. Gunpo Laboratory**

# INDEX

| <u>Table of Contents</u>                                    | Page |
|-------------------------------------------------------------|------|
| 1. General Information -----                                | 3    |
| 2. Field Strength of Fundamental and Spurious Emission----- | 6    |
| 3. Bandwidth of Operation Frequency-----                    | 16   |
| 4. Occupied Bandwidth-----                                  | 18   |
| 5. Transmission Time-----                                   | 20   |
| 6. Duty Cycle Correction Factor-----                        | 22   |
| 7. Antenna Requirement-----                                 | 24   |

## 1. General Information

### 1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- 4, LS-ro 182beon-gil. Gunpo-si, Gyeonggi-do, Korea, 15807
- Designation number: KR0150

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.

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### 1.2. Details of Applicant

Applicant : Hyundai Mobis Co., Ltd.

Address : 203, Teheran-ro, Gangnam-gu, Seoul, South Korea, 135-977

Contact Person : Choe, Seung-hoon

Phone No. : +82 31 260 0098

### 1.3. Details of Manufacturer

Company : Same as above

Address : Same as above

### 1.4. Description of EUT

|                   |                                |
|-------------------|--------------------------------|
| Kind of Product   | FOB SMART KEY                  |
| Model Name        | FOB-4F44                       |
| Power Supply      | DC 3.0 V                       |
| Frequency Range   | Tx: 433.92 MHz, Rx: 125.00 kHz |
| Modulation Type   | FSK                            |
| Number of Channel | 1                              |
| Antenna Type      | PCB Pattern Antenna            |

## 1.5. Test Equipment List

| Equipment                | Manufacturer                | Model                                | S/N                    | Cal. Date     | Cal. Interval | Cal. Due      |
|--------------------------|-----------------------------|--------------------------------------|------------------------|---------------|---------------|---------------|
| Signal Generator         | R&S                         | SMBV100A                             | 259067                 | Jun. 10, 2019 | Annual        | Jun. 10, 2020 |
| Spectrum Analyzer        | R&S                         | FSV30                                | 103455                 | Dec. 22, 2019 | Annual        | Dec. 22, 2020 |
| Spectrum Analyzer        | Agilent                     | N9020A                               | MY53421758             | Sep. 11, 2019 | Annual        | Sep. 11, 2020 |
| Preamplifier             | H.P.                        | 8447F                                | 2944A03909             | Aug. 07, 2019 | Annual        | Aug. 07, 2020 |
| Signal Conditioning Unit | R&S                         | SCU-18                               | 10117                  | Jun. 12, 2019 | Annual        | Jun. 12, 2020 |
| High Pass Filter         | Mini-Circuits               | NHP-800+                             | VUU16801113-2          | Jun. 05, 2019 | Annual        | Jun. 05, 2020 |
| High Pass Filter         | Wainwright Instrument GmbH  | WHKX10-900-1000-18000-40ss           | 7                      | Mar. 12, 2019 | Annual        | Mar. 12, 2020 |
| Loop Antenna             | Schwarzbeck Mess-Elektronik | FMZB 1519                            | 1519-039               | Aug. 22, 2019 | Biennial      | Aug. 22, 2021 |
| Bilog Antenna            | Schwarzbeck Mess-Elektronik | VULB9163                             | 396                    | Mar. 21, 2019 | Biennial      | Mar. 21, 2021 |
| Horn Antenna             | R&S                         | HF906                                | 100326                 | Feb. 14, 2020 | Annual        | Feb. 14, 2021 |
| Test Receiver            | R&S                         | ESU26                                | 100109                 | Feb. 18, 2020 | Annual        | Feb. 18, 2021 |
| Controller               | Innco systems GmbH          | CONTROLLER CO3000-4P                 | CO3000/963/38 330516/L | N.C.R.        | N/A           | N.C.R.        |
| Turn Table               | Innco systems GmbH          | DS 1200 S                            | N/A                    | N.C.R.        | N/A           | N.C.R.        |
| Antenna Master           | Innco systems GmbH          | MA4640-XP-ET                         | MA4640/536/38 330516/L | N.C.R.        | N/A           | N.C.R.        |
| Anechoic Chamber         | SY Corporation              | L × W × H<br>(9.6 m × 6.4 m × 6.6 m) | N/A                    | N.C.R.        | N/A           | N.C.R.        |
| Coaxial Cable            | SUCOFLEX                    | 104 (3 m)                            | MY3258414              | Jan. 28, 2020 | Semi-annual   | Jul. 28, 2020 |
| Coaxial Cable            | SUCOFLEX                    | 104 (10 m)                           | MY3145814              | Jan. 28, 2020 | Semi-annual   | Jul. 28, 2020 |
| Coaxial Cable            | Rosenberger                 | LA1-C006-1500                        | 131014 01/20           | Feb. 23, 2020 | Semi-annual   | Aug. 23, 2020 |

## 1.6. Summary of Test Results

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC Part15 subpart C, IC RSS-210 Issue 9 and RSS-Gen Issue 5 |                                                            |                                                                              |                   |
|--------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------|-------------------|
| Section in FCC                                                                 | Section in IC                                              | Test Item                                                                    | Result            |
| 15.209(a)<br>15.231(b)                                                         | RSS-210 Issue 9<br>A.1, Table A1<br>RSS-Gen Issue 5<br>8.9 | Radiated emission,<br>Spurious Emission and<br>Field Strength of Fundamental | Complied          |
| 15.231(c)                                                                      | -                                                          | Bandwidth of Operation Frequency                                             | Complied          |
| 15.231(a)                                                                      | RSS-210 Issue 9<br>A.1.1                                   | Transmission Time                                                            | Complied          |
| -                                                                              | RSS-210 Issue 9<br>A.1.3<br>RSS-Gen Issue 5<br>6.7         | Occupied Bandwidth                                                           | Complied          |
| 15.207                                                                         | RSS-Gen Issue 5<br>8.8                                     | AC Power Line Conducted Emission                                             | N/A <sup>1)</sup> |

### Note;

- 1) The AC power line test was not performed because the EUT use battery power for operation and which do not operate from the AC power lines.

## 1.7. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Parameter                          | Uncertainty |
|------------------------------------|-------------|
| Occupied Bandwidth                 | ± 9.66 kHz  |
| Radiated Emission, 9 kHz to 30 MHz | ± 3.59 dB   |
| Radiated Emission, below 1 GHz     | ± 5.88 dB   |
| Radiated Emission, above 1 GHz     | ± 5.94 dB   |

Uncertainty figures are valid to a confidence level of 95 %.

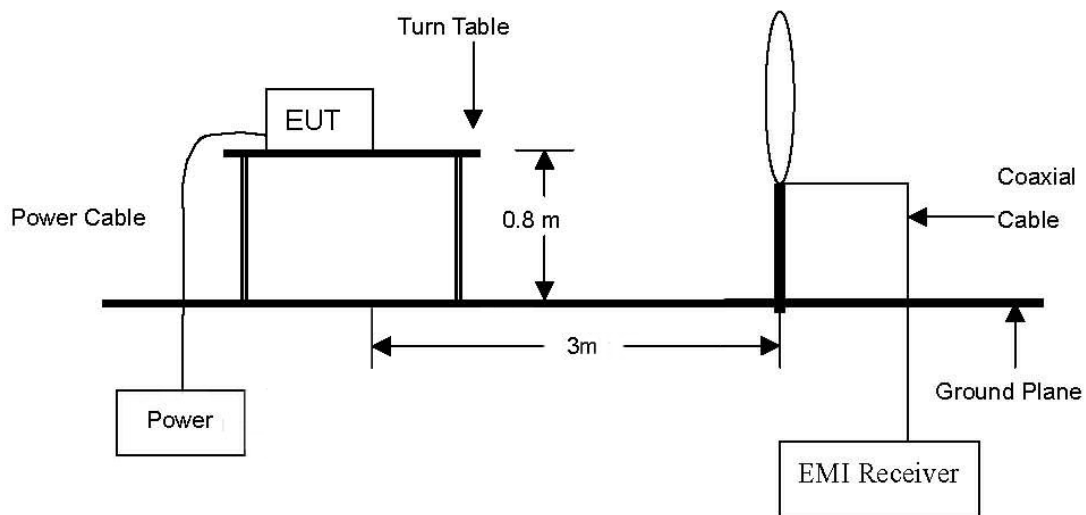
## 1.8. Test Report Revision

| Revision | Report Number        | Date of Issue | Description |
|----------|----------------------|---------------|-------------|
| 0        | F690501-RF-RTL000389 | 2020.03.16    | Initial     |

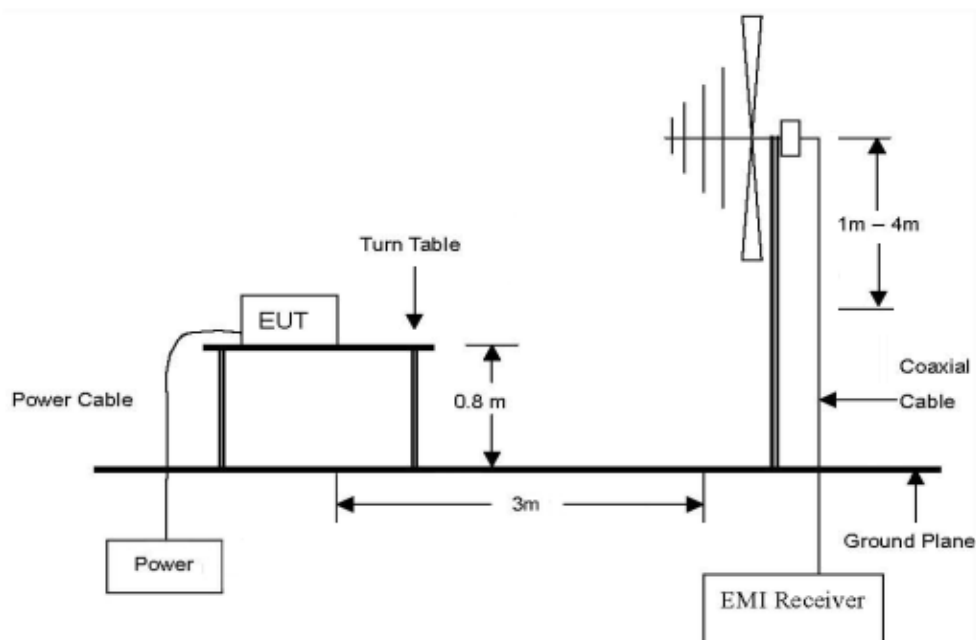
## 2. Field Strength of Fundamental and Spurious Emission

### 2.1. Test Setup

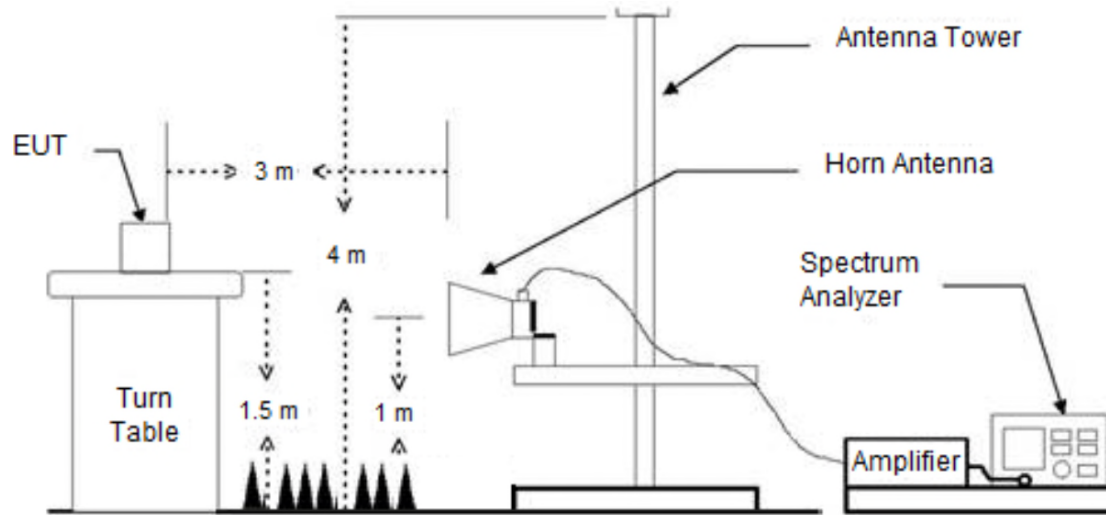
The diagram below shows the test setup that is utilized to make the measurements for emission below 30 MHz.



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz.



The diagram below shows the test setup that is utilized to make the measurements for emission. The spurious emissions were investigated from 1 GHz to the 10<sup>th</sup> harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.



## 2.2. Limit

### 2.2.1. FCC

#### 2.2.1.1. Radiated Emission Limits; general requirements.

According to §15.209(a), except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meter) |
|-----------------|-----------------------------------|------------------------------|
| 0.009-0.490     | 2 400/F(kHz)                      | 300                          |
| 0.490-1.705     | 24 000/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                            |

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

#### 2.2.1.2. Periodic Operation in the band 40.66-40.70 MHz and above 70 MHz

According to §15.231(b), in addition to the provisions of Section §15.205, the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

| Fundamental Frequency (MHz) | Field Strength of Fundamental (microvolts/meter) | Field Strength of Spurious Emissions (microvolts/meter) |
|-----------------------------|--------------------------------------------------|---------------------------------------------------------|
| 40.66-40.70                 | 2,250                                            | 225                                                     |
| 70-130                      | 1,250                                            | 125                                                     |
| 130-174                     | <sup>1</sup> 1,250 to 3,750                      | <sup>1</sup> 125 to 375                                 |
| 174-260                     | 3,750                                            | 375                                                     |
| 260-470                     | <sup>1</sup> 3,750 to 12,500                     | <sup>1</sup> 375 to 1,250                               |
| Above 470                   | 12,500                                           | 1,250                                                   |

<sup>1</sup>linear interpolations

Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz,  $\mu V/m$  at 3 meters =  $56.81818(F) - 6136.3636$ ; for the band 260-470 MHz,  $\mu V/m$  at 3 meters =  $41.6667(F) - 7083.3333$ . The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.



## 2.2.2. IC

### 2.2.2.1. Transmitter Emission Limits

According to RSS-Gen Issue 5, 8.9.

Except where otherwise indicated in the applicable RSS, radiated emissions shall comply with the field strength limits shown in table 5 and table 6. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission.

**Table 5 - General field strength limits at frequencies above 30 MHz**

| Frequency (MHz) | Field Strength ( $\mu V/m$ at 3 m) |
|-----------------|------------------------------------|
| 30-88           | 100                                |
| 88-216          | 150                                |
| 216-960         | 200                                |
| Above 960       | 500                                |

**Table 6 - General field strength limits at frequencies below 30 MHz**

| Frequency              | Magnetic Field Strength (H-Field) ( $\mu A/m$ ) | Measurement Distance (m) |
|------------------------|-------------------------------------------------|--------------------------|
| 9-490 kHz <sup>1</sup> | 6.37/F (F in kHz)                               | 300                      |
| 490-1 705 kHz          | 63.7/F (F in kHz)                               | 30                       |
| 1.705-30 MHz           | 0.08                                            | 30                       |

**Note 1:** The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

### 2.2.2.2. Momentarily Operated Devices

According to A.1 of RSS-210 Issue 9.

The frequency bands and field strength limits in tables A1 and A2 of this annex are reserved exclusively for the transmission of a control signal, such as that used with alarm systems, door openers, remote switches, etc. Data may be sent with a control signal. Radio control of toys or model aircraft, as well as continuous transmissions, such as voice or video, are not permitted, except as provided in Section A.1.4 below.

**Table A1 - Permissible Field Strength Limits for Momentarily Operated Devices**

| Fundamental Frequency (MHz),<br>Excluding Restricted Frequency Bands<br>Specified in RSS-Gen | Field Strength of<br>the Fundamental Emissions<br>( $\mu\text{V/m}$ at 3 m) |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 70-130                                                                                       | 1,250                                                                       |
| 130-174                                                                                      | 1,250 to 3,750*                                                             |
| 174-260 <sup>(Note 1)</sup>                                                                  | 3,750                                                                       |
| 260-470 <sup>(Note 1)</sup>                                                                  | 3,750 to 12,500*                                                            |
| Above 470                                                                                    | 12,500                                                                      |

\* Linear interpolation with frequency, f, in MHz:

For 130-174 MHz: Frequency Strength ( $\mu\text{V/m}$ ) = (56.82 x f) - 6136

For 260-470 MHz: Frequency Strength ( $\mu\text{V/m}$ ) = (41.67 x f) - 7083

**Note 1:** Frequency bands 225-328.6 MHz and 335.4-399.9 MHz are designated for the exclusive use of the Government of Canada. Manufacturers should be aware of possible harmful interference and degradation of their licence-exempt radio equipment in these frequency bands.

## 2.3. Test Procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.10-2013.

### 2.3.1. Test Procedures for emission below 30 MHz

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

### 2.3.2. Test Procedures for emission from 30 MHz to 1 000 MHz

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 3 meter away from the interference-receiving antenna.
- The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.

### 2.3.3. Test Procedures for emission above 1 GHz

- The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1 GHz.

## 2.4. Test Result

Ambient temperature : (23 ± 1) °C

Relative humidity : 47 % R.H.

### 2.4.1. Field Strength of Fundamental

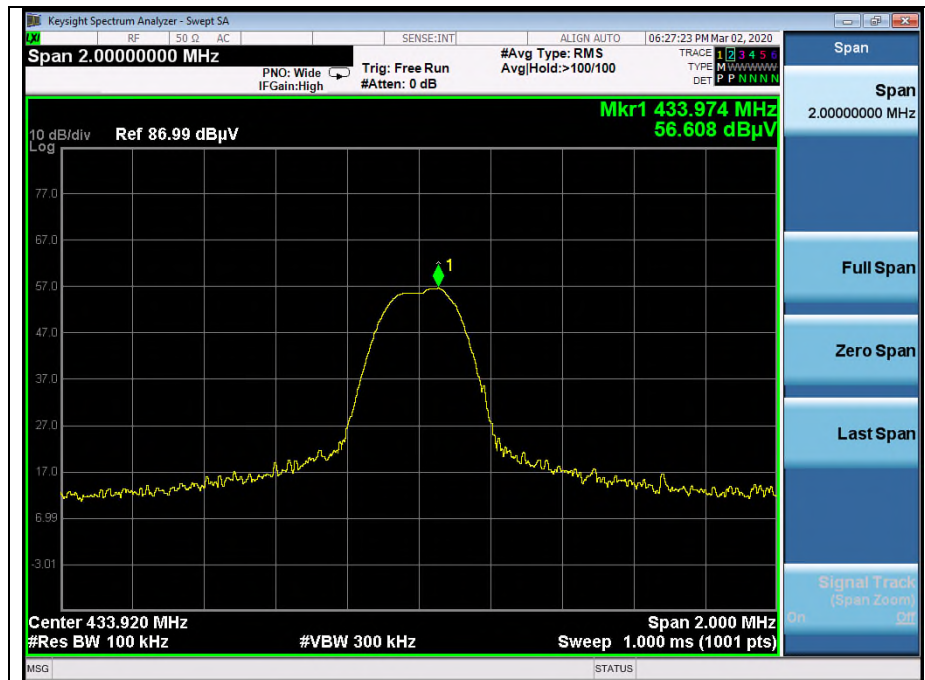
All emissions tested both horizontal and vertical. The following table shows the highest levels of radiated emissions on the worst polarization.

| Frequency (MHz) | Reading (dBμV) | Detect Mode | Ant. Pol. | AF (dB/m) | CL (dB) | DF (dB) | Result (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------|----------------|-------------|-----------|-----------|---------|---------|-----------------|----------------|-------------|
| 433.97          | 56.61          | Peak        | H         | 22.18     | 4.01    | -       | 82.80           | 100.83         | 18.03       |
|                 | -              | -           | -         | -         | -       | -6.94   | 75.86           | 80.83          | 4.97        |

#### Remark;

- To get a maximum emission level from the EUT, the EUT is manipulated through three orthogonal planes (X, Y, Z). Worst orthogonal plan of EUT is **X – axis**.  
Definition of DUT for three orthogonal planes is described in the test setup photos.
- 3 m Limit (dBμV/m) =  $20\log [41.67(F_{MHz}) - 7083] = 80.83$
- Peak Result = Reading + Antenna Factor + Cable Loss
- Average Result = Peak Result + DF
- DF (Duty Cycle Correction Factor):  $20\log (T_{on} / 100 \text{ ms}) = 20\log (45 / 100) = -6.94$   
-  $T_{on} = 45 \text{ ms}$ .  
-  $T_{on+off} = 100 \text{ ms}$  (pulse train is 100 ms instead of 165.50 ms).

#### - Test plot



## 2.4.2. Radiated Spurious Emission

The following table shows the highest levels of radiated emissions.  
 The frequency spectrum from 9 kHz to 4 400 MHz was investigated.

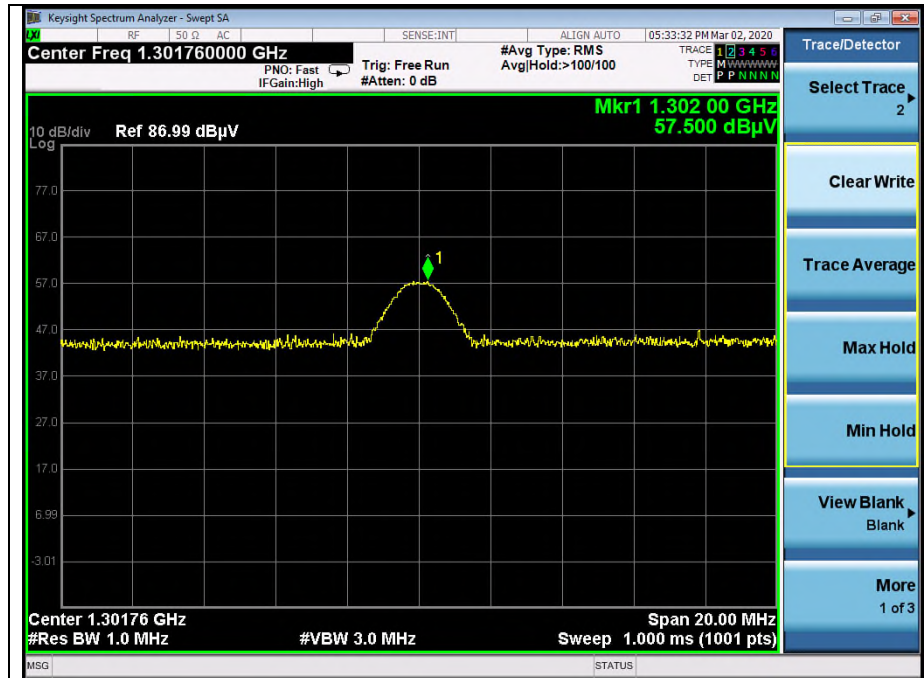
| Radiated Emissions |                |             | Ant.      | Correction Factors |             |         | Total           | Limit          |             |
|--------------------|----------------|-------------|-----------|--------------------|-------------|---------|-----------------|----------------|-------------|
| Frequency (MHz)    | Reading (dBμV) | Detect Mode | Ant. Pol. | AF (dB/m)          | AMP+CL (dB) | DF (dB) | Result (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
| *1 302.00          | 57.50          | Peak        | H         | 25.29              | -39.28      | -       | 43.51           | 74.00          | 30.49       |
| *1 302.00          | -              | -           | -         | -                  | -           | -6.94   | 36.57           | 54.00          | 17.43       |
| *3 904.96          | 55.82          | Peak        | H         | 32.48              | -33.90      | -       | 54.40           | 74.00          | 19.60       |
| *3 904.96          | -              | -           | -         | -                  | -           | -6.94   | <b>47.46</b>    | 54.00          | 6.54        |
| *4 339.66          | 55.00          | Peak        | V         | 32.18              | -33.63      | -       | 53.55           | 74.00          | 20.45       |
| *4 339.66          | -              | -           | -         | -                  | -           | -6.94   | 46.61           | 54.00          | 7.39        |

### Remark;

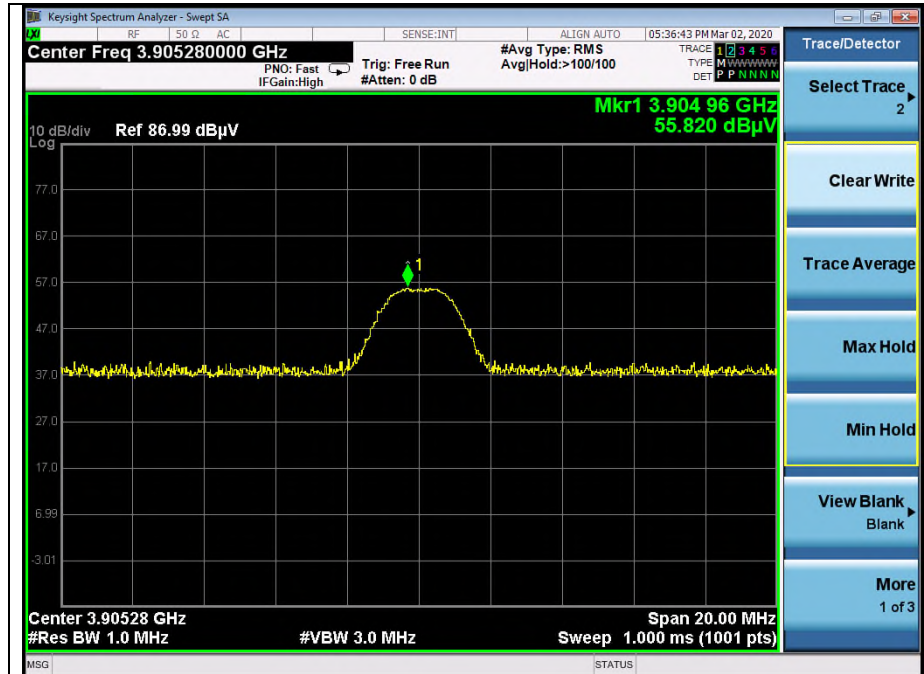
- To get a maximum emission level from the EUT, the EUT is manipulated through three orthogonal planes (X, Y, Z).
- 3 m Limit (dBμV/m) =  $20\log [41.67(F_{MHz}) - 7083] - 20$  dBμV/m = 60.83 dBμV/m.
- Correction Factors = AF + AMP + CL + DF.
- Peak Result = Reading + Correction Factors.
- Average Result = Peak Result + DF.
- DF (Duty Cycle Correction Factor):  $20\log (T_{on} / 100 \text{ ms}) = 20\log (45 / 100) = -6.94$   
 -  $T_{on} = 45 \text{ ms}$ .  
 -  $T_{on+off} = 100 \text{ ms}$  (pulse train is 100 ms instead of 165.50 ms).
- "\*" means the restricted band.
- According to § 15.31(o), Emission levels are not reported much lower than the limits by over 20 dB.

## - Test plots

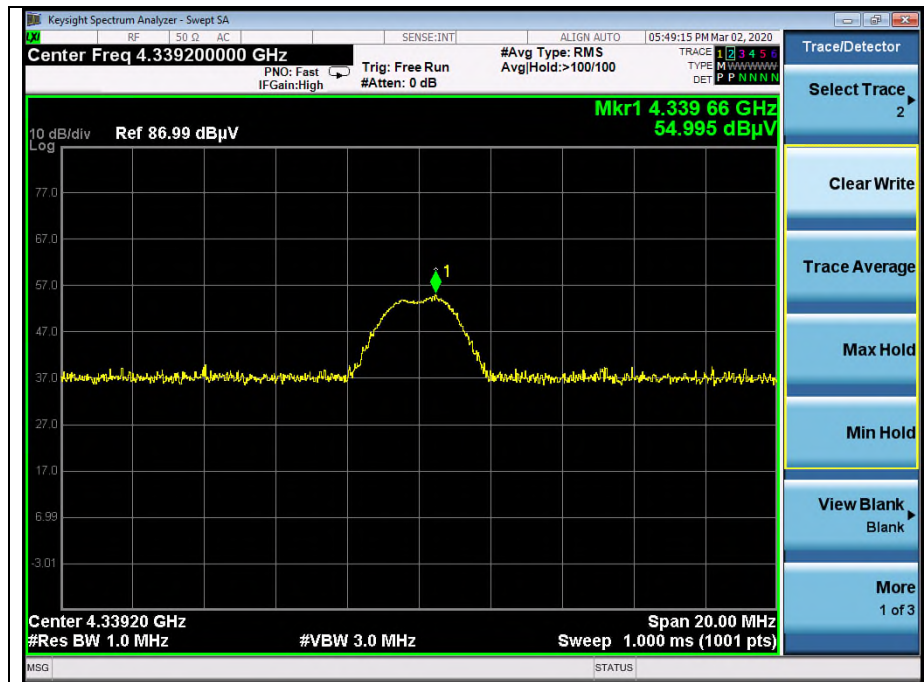
### 3<sup>rd</sup> Harmonic



### 9<sup>th</sup> Harmonic

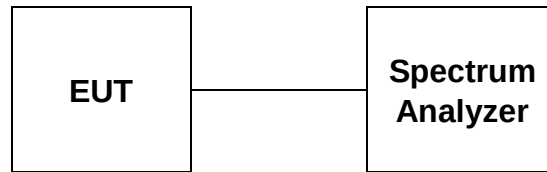


## 10<sup>th</sup> Harmonic



### 3. Bandwidth of Operation Frequency

#### 3.1. Test Setup



#### 3.2. Limit

According to §15.231(c), the bandwidth of the emission shall be no wider than 0.25 % of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5 % of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

#### 3.3. Test Procedure

1. The transmitter output is connected to the spectrum analyzer.
2. The resolution bandwidth (RBW) shall be in the range of 1 % to 5 % of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3 x RBW.
3. The bandwidth of fundamental frequency was measured and recorded.



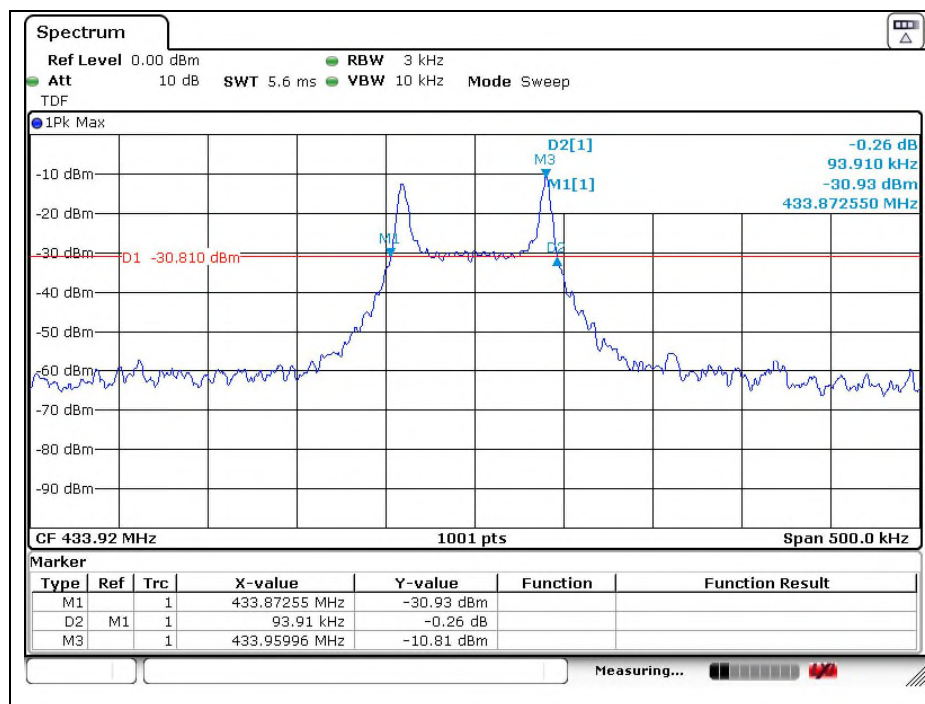
### 3.4. Test Result

Ambient temperature : (23 ± 1) °C

Relative humidity : 47 % R.H.

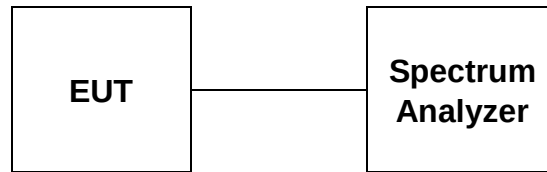
| Frequency (MHz) | Bandwidth of Operation Frequency (kHz) | Limit (kHz) | Remark                                          |
|-----------------|----------------------------------------|-------------|-------------------------------------------------|
| 433.92          | 93.91                                  | 1 084.80    | The point 20 dB down from the modulated carrier |

#### - Test plot



## 4. Occupied Bandwidth

### 4.1. Test Setup



### 4.2. Limit

According to A.1.3 of RSS-210 Issue 9, the 99 % bandwidth of momentarily operated devices shall be less or equal to 0.25 % of the centre frequency for devices operating between 70 MHz and 900 MHz. For devices operating above 900 MHz, the 99 % bandwidth shall be less or equal to 0.5 % of the centre frequency.

### 4.3. Test Procedure

1. The transmitter output is connected to the spectrum analyzer.
2. The resolution bandwidth (RBW) shall be in the range of 1 % to 5 % of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3 x RBW.
3. The bandwidth of fundamental frequency was measured and recorded.

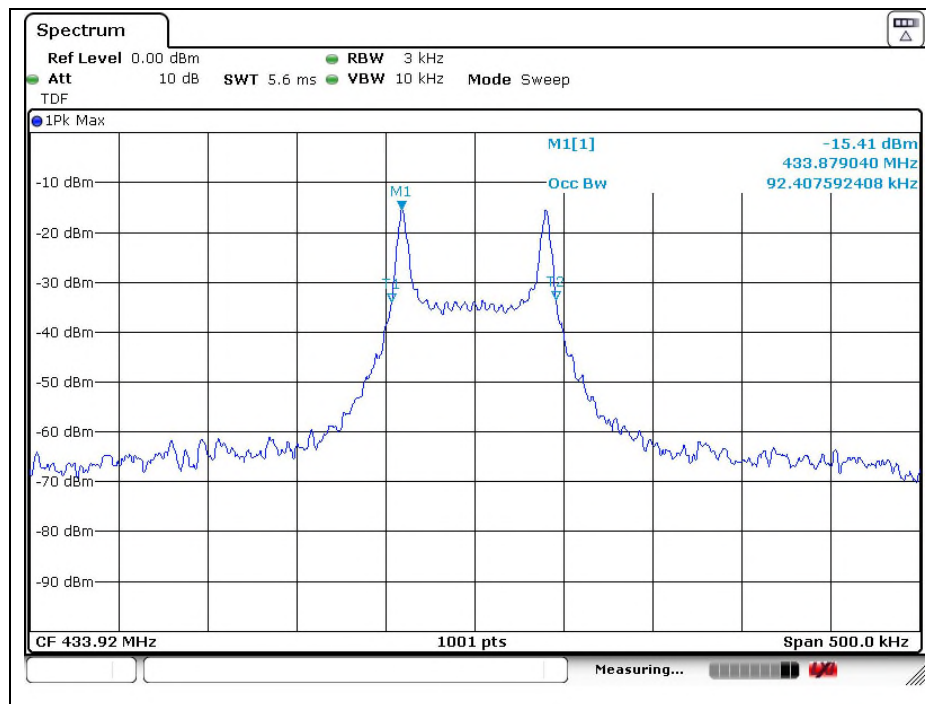
#### 4.4. Test Result

Ambient temperature : (23 ± 1) °C

Relative humidity : 47 % R.H.

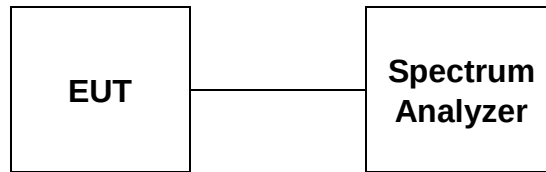
| Frequency (MHz) | Occupied Bandwidth (kHz) | Limit (kHz) | Remark                  |
|-----------------|--------------------------|-------------|-------------------------|
| 433.92          | 92.41                    | 1 084.80    | 99 % Occupied bandwidth |

#### - Test plot



## 5. Transmission Time

### 5.1. Test Setup



### 5.2. Limit

#### 5.2.1. FCC

According to §15.231(a)(1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

#### 5.2.2. IC

According to A1.1(a) of RSS-210 Issue 9, a manually operated transmitter shall be equipped with a push-to-operate switch and be under manual control at all times during transmission. When released, the transmitter shall cease transmission within no more than 5 seconds of being released.

### 5.3. Test Procedure

1. The transmitter output is connected to the spectrum analyzer.
2. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using RBW = 1 MHz, VBW = 1 MHz, Span = 0 Hz, Sweep Time = 10 sec.
3. The bandwidth of fundamental frequency was measured and recorded.

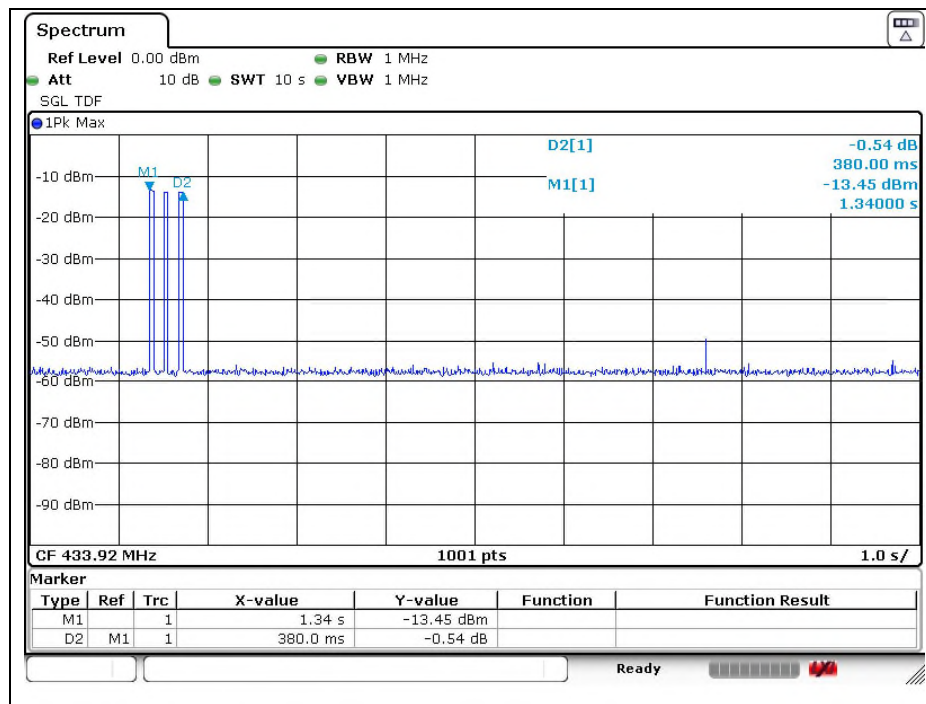
## 5.4. Test Result

Ambient temperature : (23 ± 1) °C

Relative humidity : 47 % R.H.

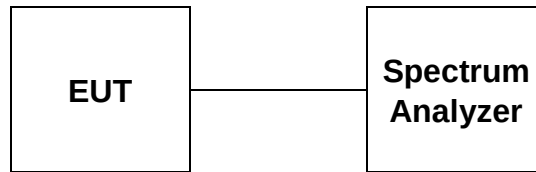
| Frequency<br>(MHz) | Transmission Time<br>(sec) | Limit<br>(sec)      | Remark |
|--------------------|----------------------------|---------------------|--------|
| 433.92             | 0.38                       | Same or less than 5 | Pass   |

### - Test plot



## 6. Duty Cycle Correction Factor

### 6.1. Test Setup



### 6.2. Limit

None (No dedicated Limit specified in the Rules).

### 6.3. Test Procedure

1. The transmitter output is connected to the spectrum analyzer.
2. Set center frequency of spectrum analyzer = operating frequency.
3. Set the spectrum analyzer as RBW = 1 MHz, VBW = Auto, Span = 0 Hz, Sweep Time = 0.5 sec.

## 6.4. Test Result

Ambient temperature : (23 ± 1) °C

Relative humidity : 47 % R.H.

### CALCULATION:

Average Reading = Peak Reading (dB $\mu$ V/m) + 20log (Duty Cycle).

In order to determine possible Maximum Modulation percentage, alternations are made to the EUT.  
We measured;

| T <sub>on+off</sub> | T <sub>on</sub> | M % = (T <sub>on</sub> / T <sub>on+off</sub> ) * 100 % | Duty Correction Factor |
|---------------------|-----------------|--------------------------------------------------------|------------------------|
| 100 ms              | 45 ms           | 45                                                     | -6.94 dB               |

T<sub>on+off</sub> = 100 ms.

T<sub>on</sub> = 41.74 ms.

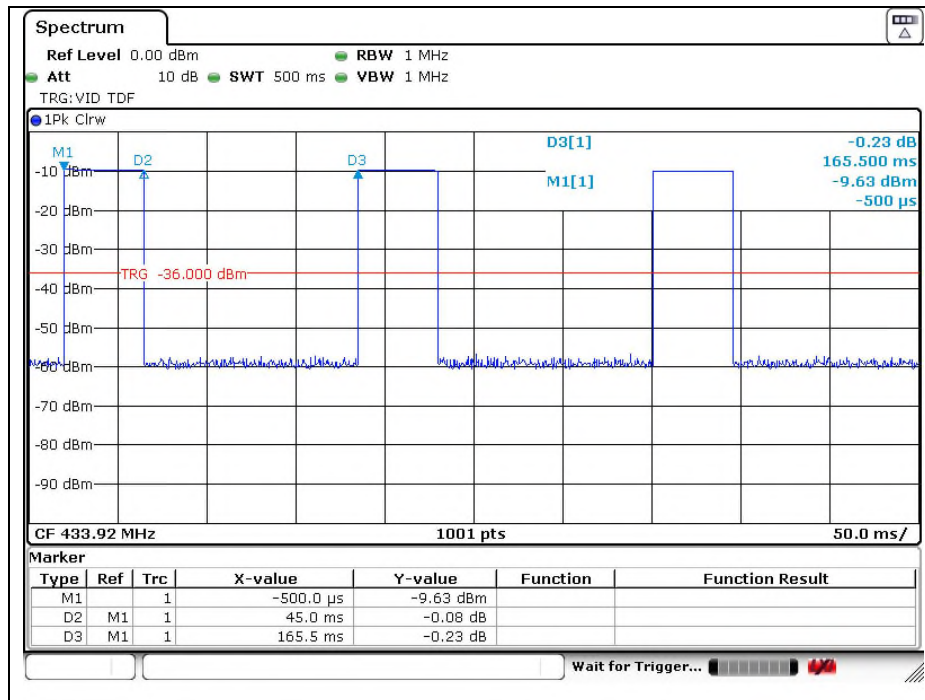
Duty Cycle = 20log (T<sub>on</sub> / T<sub>on+off</sub>) = 20log (0.45) = -6.94 dB.

### Remark;

- T<sub>on</sub> = 45 ms.

- T<sub>on+off</sub> = 100 ms (pulse train is 100 ms instead of 165.50 ms).

### - Test plot



## **7. Antenna Requirement**

### **7.1. 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.

### **7.2. Antenna Connected Construction**

Antenna used in this product is PCB Pattern Antenna with gain of -20.35 dB i.

**- End of the Test Report -**