

**TEST REPORT**

On behalf of

Hisense Electric Co., Ltd.

Product Name: REMOTE CONTROL

Model No.: ERF2\*60(1001), ERF2\*60(1001)\*, ERF2\*60, ERF2\*60\*,  
ERF2C60H

FCC ID: W9HBRCB0010

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Date of Test : 2019.05.25-05.27  
Date of Report : 2019.05.30

The statement is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

# TABLE OF CONTENTS

|                                                                  | Page      |
|------------------------------------------------------------------|-----------|
| <b>1 SUMMARY OF STANDARDS AND RESULTS.....</b>                   | <b>5</b>  |
| 1.1 Description of Standards and Results.....                    | 5         |
| <b>2 GENERAL INFORMATION.....</b>                                | <b>6</b>  |
| 2.1 Description of Equipment Under Test.....                     | 6         |
| 2.2 Description of Test Facility .....                           | 7         |
| 2.3 Measurement Uncertainty .....                                | 7         |
| <b>3 RADIATED EMISSION TEST.....</b>                             | <b>8</b>  |
| 3.1 Test Equipment.....                                          | 8         |
| 3.2 Block Diagram of Test Setup .....                            | 8         |
| 3.3 Radiated Emission Limit [FCC Part 15 Subpart C 15.209] ..... | 9         |
| 3.4 Test Configuration.....                                      | 9         |
| 3.5 Operating Condition of EUT .....                             | 10        |
| 3.6 Test Procedures .....                                        | 10        |
| 3.7 Test Results .....                                           | 11        |
| <b>4 6 DB BANDWIDTH MEASUREMENT .....</b>                        | <b>18</b> |
| 4.1 Test Equipment.....                                          | 18        |
| 4.2 Block Diagram of Test Setup .....                            | 18        |
| 4.3 Specification Limits (§15.247(a)(2)).....                    | 18        |
| 4.4 Operating Condition of EUT .....                             | 18        |
| 4.5 Test Procedure .....                                         | 18        |
| 4.6 Test Results .....                                           | 19        |
| <b>5 MAXIMUM PEAK OUTPUT POWER MEASUREMENT .....</b>             | <b>22</b> |
| 5.1 Test Equipment.....                                          | 22        |
| 5.2 Block Diagram of Test Setup .....                            | 22        |
| 5.3 Specification Limits ((§15.247(b)(3)) .....                  | 22        |
| 5.4 Operating Condition of EUT .....                             | 22        |
| 5.5 Test Procedure .....                                         | 22        |
| 5.6 Test Results .....                                           | 23        |
| <b>6 EMISSION LIMITATIONS MEASUREMENT.....</b>                   | <b>26</b> |
| 6.1 Test Equipment.....                                          | 26        |
| 6.2 Block Diagram of Test Setup .....                            | 26        |
| 6.3 Specification Limits (§15.247(d)) .....                      | 26        |
| 6.4 Operating Condition of EUT .....                             | 26        |
| 6.5 Test Procedure.....                                          | 26        |
| 6.6 Test Results .....                                           | 28        |
| <b>7 BAND EDGES MEASUREMENT .....</b>                            | <b>35</b> |
| 7.1 Test Equipment.....                                          | 35        |
| 7.2 Block Diagram of Test Setup .....                            | 35        |
| 7.3 Specification Limits (§15.247(d)) .....                      | 35        |
| 7.4 Operating Condition of EUT .....                             | 35        |
| 7.5 Test Procedure.....                                          | 35        |
| 7.6 Test Results .....                                           | 36        |
| <b>8 POWER SPECTRAL DENSITY MEASUREMENT .....</b>                | <b>38</b> |
| 8.1 Test Equipment.....                                          | 38        |

8.2 Block Diagram of Test Setup ..... 38

8.3 Specification Limits (§15.247(e)) ..... 38

8.4 Operating Condition of EUT ..... 38

8.5 Test Procedure ..... 38

8.6 Test Results ..... 39

**9 DEVIATION TO TEST SPECIFICATIONS ..... 42**

## TEST REPORT

Applicant : Hisense Electric Co., Ltd.  
EUT Description : REMOTE CONTROL  
(A) Model No. : Refer to Sec.2.1  
(B) Power Supply : DC 3V  
(C) Test Voltage : DC 3V

### Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART C  
AND ANSI C63.10-2013*

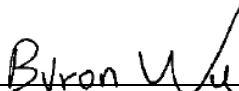
The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report also shows that the EUT (M/N: Refer to Sec2.1), which was tested is technically compliance with the FCC limits.

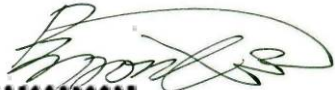
This report applies to above tested Sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

Date of Test : 2019.05.25-05.27 Date of Report : 2019.05.30

Producer :   
JAREY LU / Supervisor

Reviewer :   
BYRON WU / Deputy Assistant Manager

 For and on behalf of  
Audix Technology (Shanghai) Co., Ltd.

Signatory :   
Authorized Signature(s) BYRON KWO/Assistant General Manager

# 1 SUMMARY OF STANDARDS AND RESULTS

## 1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

| Description / Test Item                    | Test Standard                                                          | Results | Meets Limit               |
|--------------------------------------------|------------------------------------------------------------------------|---------|---------------------------|
| <b>EMISSION</b>                            |                                                                        |         |                           |
| Conducted Emission                         | FCC RULES AND REGULATIONS PART 15<br>SUBPART C<br>AND ANSI C63.10:2013 | N/A     | 15.207                    |
| Radiated Emission                          | FCC RULES AND REGULATIONS PART 15<br>SUBPART C<br>AND ANSI C63.10:2013 | Pass    | 15.209(a)<br>15.205(a)(c) |
| 6 dB Bandwidth<br>Measurement              | FCC RULES AND REGULATIONS PART 15<br>SUBPART C<br>AND ANSI C63.10:2013 | Pass    | 15.247(a)(2)              |
| Maximum Peak Output<br>Power Measurement   | FCC RULES AND REGULATIONS PART 15<br>SUBPART C<br>AND ANSI C63.10:2013 | Pass    | 15.247(b)(3)              |
| Emission Limitations<br>Measurement        | FCC RULES AND REGULATIONS PART 15<br>SUBPART C<br>AND ANSI C63.10:2013 | Pass    | 15.247(d)                 |
| Band Edge<br>Measurement                   | FCC RULES AND REGULATIONS PART 15<br>SUBPART C<br>AND ANSI C63.10:2013 | Pass    | 15.247(d)                 |
| Power Spectral Density<br>Measurement      | FCC RULES AND REGULATIONS PART 15<br>SUBPART C<br>AND ANSI C63.10:2013 | Pass    | 15.247(e)                 |
| N/A is an abbreviation for Not Applicable. |                                                                        |         |                           |

## 2 GENERAL INFORMATION

### 2.1 Description of Equipment Under Test

Description : REMOTE CONTROL

Type of EUT : ☒ Production ☐ Pre-product ☐ Pro-type

Model Number : ERF2\*60(1001),ERF2\*60(1001)\*,ERF2\*60, ERF2\*60\*, ERF2C60H

Note : The different of Models are as follows:

| M/N                                                                                          | Difference                     |
|----------------------------------------------------------------------------------------------|--------------------------------|
| ERF2*60(1001)                                                                                | different printed word of keys |
| ERF2*60(1001)*                                                                               |                                |
| ERF2*60                                                                                      |                                |
| ERF2*60*                                                                                     |                                |
| ERF2C60H                                                                                     |                                |
| Note: “*” represents “0” ~ “9” or blank or “A” ~ “Z”, for different sales area and customer. |                                |

Test Model : ERF2A60(1001)

Radio Tech : Bluetooth v4.2 BLE

Channel Freq. : 2402MHz-2480MHz

Tested Freq. : 2402MHz, 2442MHz, 2480MHz

Modulation : GFSK

Antenna Info. : Antenna Type: PCB Antenna  
Antenna Gain: 1.21 dBi  
The Antenna is permanently attached to the intentional radiator that is comply with 15.203 requirement.

Test Mode : The EUT was set at continuous TX with duty cycle 100% during all the test in the report

Applicant : Hisense Electric Co., Ltd.  
No.218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, China

Manufacturer : same as Applicant

Factory : same as Applicant

## 2.2 Description of Test Facility

Name of Firm : Audix Technology (Shanghai) Co., Ltd.

Site Location : 3F and 4F, 34Bldg, 680 Guiping Rd.,  
Caohejing Hi-Tech Park,  
Shanghai 200233, China.

Accredited by NVLAP, Lab Code : 200371-0

FCC Designation Number : CN5027

Test Firm Registration Number : 954668

## 2.3 Measurement Uncertainty

Radiated Emission Expanded Uncertainty (30-1000MHz):

U = 3.99dB

Radiated Emission Expanded Uncertainty (1000M-26.5GHz):

U = 4.98dB

6 dB Bandwidth Expanded Uncertainty : U =  $6 \times 10^{-8}$  MHz

Maximum Peak Output Power Expanded Uncertainty : U = 0.84 dB

Power Spectral Density Expanded Uncertainty : U = 0.38 dB

### 3 RADIATED EMISSION TEST

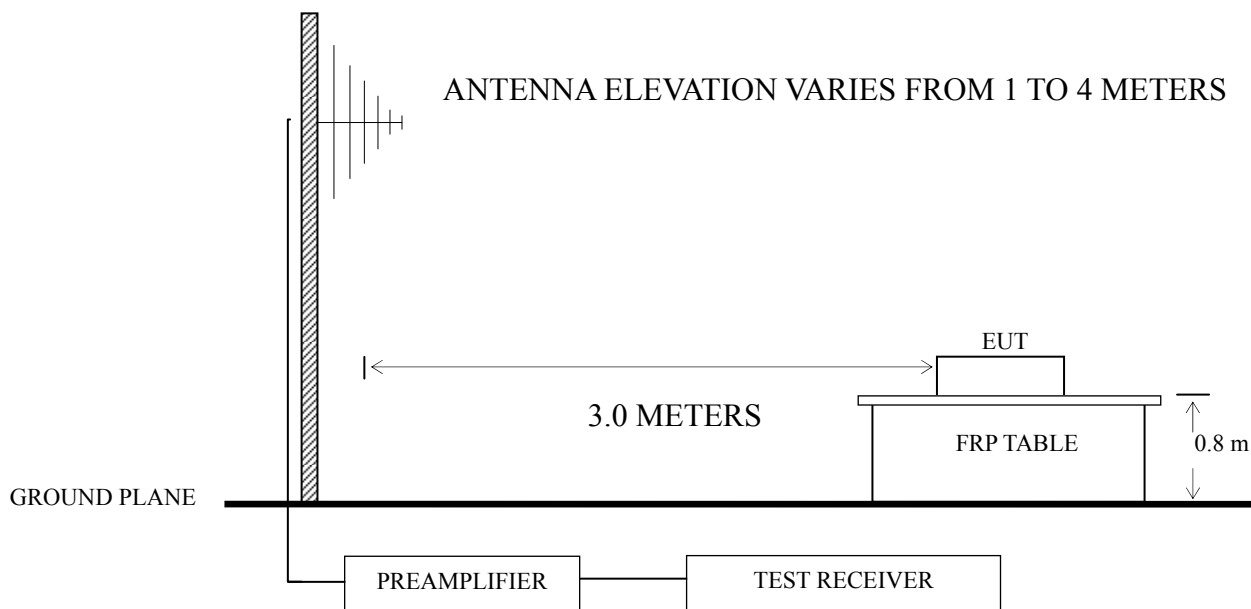
#### 3.1 Test Equipment

The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

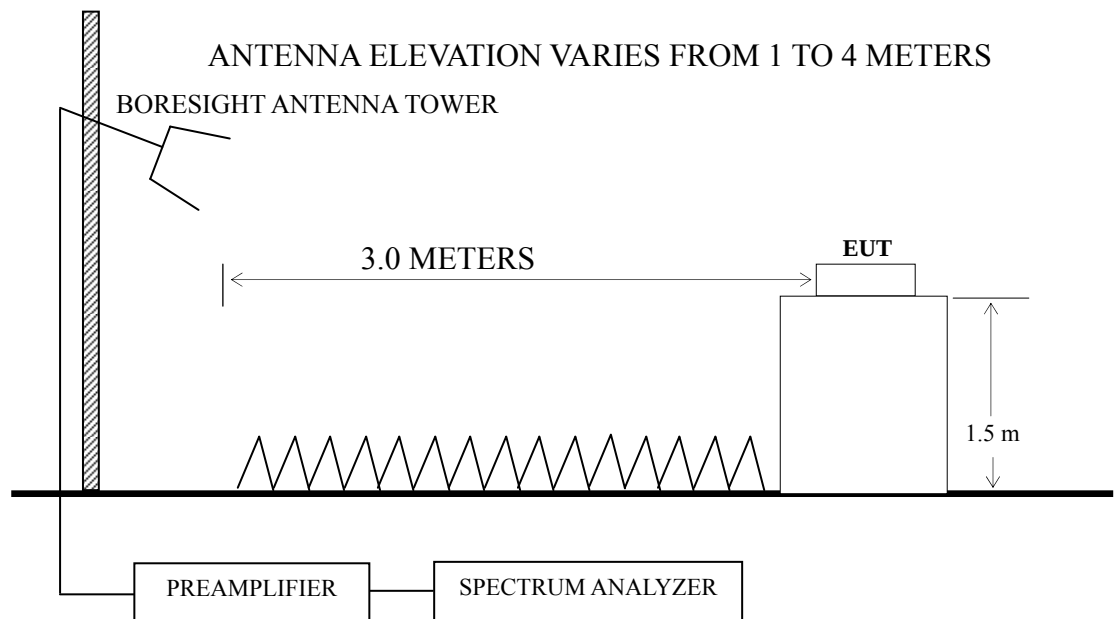
| Item | Type              | Manufacturer | Model No. | Serial No.             | Last Cal.    | Next Cal.    |
|------|-------------------|--------------|-----------|------------------------|--------------|--------------|
| 1.   | Preamplifier      | Agilent      | 8447D     | 2944A06664             | Apr 27, 2018 | Apr 26, 2019 |
| 2.   | Preamplifier      | HP           | 8449B     | 3008A00864             | Mar 8, 2019  | Mar 7, 2020  |
| 3.   | Spectrum Analyzer | Agilent      | N9010A    | MY52221182             | Jan 05, 2019 | Jan 05, 2020 |
| 4.   | Test Receiver     | R&S          | ESCI      | 101303                 | May 07, 2019 | May 06, 2020 |
| 5.   | Bi-log Antenna    | Schwarz beck | VULB 9168 | 708                    | Jul 20, 2018 | Jul 19, 2019 |
| 6.   | Horn Antenna      | EMCO         | 3115      | 9607-4878              | Jun 02, 2018 | Jun 01, 2019 |
| 7.   | Horn Antenna      | EMCO         | 3116      | 00062643               | Sep 08, 2018 | Sep 07, 2019 |
| 8.   | Software          | Audix        | E3        | SET00200<br>9912M295-2 | --           | --           |

#### 3.2 Block Diagram of Test Setup

##### 3.2.1 Below 1GHz



### 3.2.2 Above 1GHz



### 3.3 Radiated Emission Limit [FCC Part 15 Subpart C 15.209]

| Frequency (MHz) | Distance (m) | Field strength limits ( $\mu\text{V/m}$ ) |                            |
|-----------------|--------------|-------------------------------------------|----------------------------|
|                 |              | ( $\mu\text{V/m}$ )                       | $\text{dB}(\mu\text{V/m})$ |
| 30 ~ 88         | 3            | 100                                       | 40.0                       |
| 88 ~ 216        | 3            | 150                                       | 43.5                       |
| 216 ~ 960       | 3            | 200                                       | 46.0                       |
| Above 960       | 3            | 500                                       | 54.0                       |

NOTE 1 - Emission Level  $\text{dB}(\mu\text{V/m}) = 20 \log \text{Emission Level}(\mu\text{V/m})$   
 NOTE 2 - The tighter limit applies at the band edges.  
 NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.  
 NOTE 4 - The limits shown are based on Quasi-peak value detector below or equal to 1GHz and Average value detector above 1GHz.  
 NOTE 5 - Above 1 GHz, the limit on peak emission is 20 dB above the maximum permitted average emission limit applicable to the EUT

### 3.4 Test Configuration

The EUT (listed in Sec.2.1) and the simulators (listed in Sec.2.2) were installed as shown on Sec.3.2 to meet FCC requirements and operating in a manner that tends to maximize its emission level in a normal application.

### 3.5 Operating Condition of EUT

3.5.1 Setup the EUT as shown in Sec. 3.2.

3.5.2 Turn on the power of all equipment.

3.5.3 Turn the EUT on the test mode, and then test.

### 3.6 Test Procedures

Radiated emission test applies to harmonics/spurs that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. A pre-amp is necessary for this measurement. For measurement above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.

The EUT was placed on a turntable. Below 1 GHz, the table height is 80 cm above the reference ground plane. Above 1 GHz, the table height is 1.5 m. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) or Horn antenna was used as receiving antenna. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.10: 2013 requirements during radiated emission test.

The bandwidth of Test Receiver R&S ESCI was set at 120 kHz from 30MHz to 1000MHz.

The bandwidth of the VBW was set at 1MHz and RBW was set at 1MHz for peak emission measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emission above 1GHz for Spectrum Agilent N9010A.

The frequency range from 30 MHz to 25 GHz (Up to 10<sup>th</sup> harmonics from fundamental frequency) was checked.

All the test results are listed in Sec.3.7.

### 3.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

Frequency range: below 1G (Worst case emission)

| No. | Operation    | Modulation | Channel | Frequency | Data Page |
|-----|--------------|------------|---------|-----------|-----------|
| 1.  | Transmitting | BLE        | 00      | 2402 MHz  | P12       |
| 2.  | Receiving    | BLE        | --      | --        | P13       |

Frequency range: above 1G

| No. | Operation    | Modulation | Channel | Frequency | Data Page |
|-----|--------------|------------|---------|-----------|-----------|
| 1.  | Transmitting | BLE        | 00      | 2402 MHz  | P14       |
| 2.  | Transmitting | BLE        | 20      | 2442 MHz  | P14       |
| 3.  | Transmitting | BLE        | 39      | 2480 MHz  | P15       |
| 4.  | Receiving    | BLE        | 39      | 2480 MHz  | P16       |

Restricted bands:

| No. | Operation    | Modulation | Channel          | Frequency | Data Page |
|-----|--------------|------------|------------------|-----------|-----------|
| 1.  | Transmitting | BLE        | Cabinet Emission |           | P17       |

NOTE 1 – Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

NOTE 2 – “QP” means “Quasi-Peak” values

NOTE 3 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

NOTE 4 – The emission levels which not reported are too low against the official limit.

NOTE 5 – The emission levels recorded below is data of EUT configured in Lying direction, for Lying direction was the maximum emission direction during the test. The data of Side & Standing direction are too low against the official limit to be reported.

NOTE 6 – All reading are Quasi-Peak values below or equal to 1GHz, Peak and Average values above 1GHz.

For above 1GHz test, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.

NOTE 7 – The frequency range 2310-2390MHz & 2483.5-2500MHz were tested for Restricted bands.

**Worst case emission < 1GHz**EUT : REMOTE CONTROL Temperature : 22°CModel No. : ERF2A60(1001) Humidity : 51%RHTest Mode : Transmitting Date of Test : 2019.05.25

| Polarization | Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|--------------|-----------------|-----------------------|-----------------------|-----------------|--------------------------|--------------------------|------------------|-------------|--------|
| Horizontal   | 38.078          | 30.04                 | 17.9                  | 0.67            | 28.16                    | 20.45                    | 40               | 19.55       | QP     |
|              | 60.492          | 27.86                 | 18.37                 | 0.83            | 28.11                    | 18.95                    | 40               | 21.05       | QP     |
|              | 121.123         | 28.59                 | 16.5                  | 1.2             | 27.78                    | 18.51                    | 43.5             | 24.99       | QP     |
|              | 173.814         | 27.61                 | 18.6                  | 1.46            | 27.48                    | 20.19                    | 43.5             | 23.31       | QP     |
|              | 531.964         | 26.2                  | 24.42                 | 2.5             | 27.92                    | 25.2                     | 46               | 20.8        | QP     |
|              | 925.756         | 25.37                 | 28.64                 | 3.3             | 26.91                    | 30.4                     | 46               | 15.6        | QP     |
| Vertical     | 39.024          | 28.66                 | 18.08                 | 0.68            | 28.16                    | 19.26                    | 40               | 20.74       | QP     |
|              | 57.796          | 28.19                 | 18.07                 | 0.82            | 28.12                    | 18.96                    | 40               | 21.04       | QP     |
|              | 124.569         | 28.27                 | 17.55                 | 1.22            | 27.76                    | 19.28                    | 43.5             | 24.22       | QP     |
|              | 181.92          | 26.99                 | 17.93                 | 1.5             | 27.45                    | 18.97                    | 43.5             | 24.53       | QP     |
|              | 545.183         | 26.53                 | 24.5                  | 2.54            | 27.89                    | 25.68                    | 46               | 20.32       | QP     |
|              | 932.272         | 25.01                 | 28.72                 | 3.33            | 26.88                    | 30.18                    | 46               | 15.82       | QP     |

TEST ENGINEER: Jarey

EUT : REMOTE CONTROL Temperature : 22°C

Model No. : ERF2A60(1001) Humidity : 51%RH

Test Mode : Receiving Date of Test : 2019.05.25

| Polarization | Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|--------------|-----------------|-----------------------|-----------------------|-----------------|--------------------------|--------------------------|------------------|-------------|--------|
| Horizontal   | 37.68           | 30.01                 | 17.82                 | 0.67            | 28.16                    | 20.34                    | 40               | 19.66       | QP     |
|              | 65.343          | 30.01                 | 16.7                  | 0.87            | 28.1                     | 19.48                    | 40               | 20.52       | QP     |
|              | 131.758         | 27.74                 | 18.27                 | 1.26            | 27.71                    | 19.56                    | 43.5             | 23.94       | QP     |
|              | 185.138         | 28.63                 | 17.31                 | 1.52            | 27.43                    | 20.03                    | 43.5             | 23.47       | QP     |
|              | 478.846         | 26.93                 | 23.1                  | 2.37            | 27.94                    | 24.46                    | 46               | 21.54       | QP     |
|              | 893.857         | 25.84                 | 28.5                  | 3.25            | 27.02                    | 30.57                    | 46               | 15.43       | QP     |
| Vertical     | 39.024          | 28.66                 | 18.08                 | 0.68            | 28.16                    | 19.26                    | 40               | 20.74       | QP     |
|              | 57.796          | 28.19                 | 18.07                 | 0.82            | 28.12                    | 18.96                    | 40               | 21.04       | QP     |
|              | 124.569         | 28.27                 | 17.55                 | 1.22            | 27.76                    | 19.28                    | 43.5             | 24.22       | QP     |
|              | 181.92          | 26.99                 | 17.93                 | 1.5             | 27.45                    | 18.97                    | 43.5             | 24.53       | QP     |
|              | 545.183         | 26.53                 | 24.5                  | 2.54            | 27.89                    | 25.68                    | 46               | 20.32       | QP     |
|              | 932.272         | 25.01                 | 28.72                 | 3.33            | 26.88                    | 30.18                    | 46               | 15.82       | QP     |

TEST ENGINEER: Jarey

**Radiated Emission > 1GHz**

EUT : REMOTE CONTROL Temperature : 22°C

Model No. : ERF2A60(1001) Humidity : 51%RH

Test Mode : Transmitting Date of Test : 2019.05.25

**CH00 (2402MHz)**

| Polarization | Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|--------------|-----------------|-----------------------|-----------------------|-----------------|--------------------|--------------------------|------------------|-------------|--------|
| Horizontal   | 1483.178        | 46.37                 | 26.21                 | 4.16            | 37.72              | 39.02                    | 74               | 34.98       | Peak   |
|              | 1965.002        | 46.86                 | 28.26                 | 4.66            | 36.94              | 42.84                    | 74               | 31.16       | Peak   |
|              | 2827.012        | 45.63                 | 30.05                 | 5.65            | 36.78              | 44.55                    | 74               | 29.45       | Peak   |
|              | 3916.979        | 44.58                 | 32.29                 | 6.79            | 35.86              | 47.8                     | 74               | 26.2        | Peak   |
|              | 4821.884        | 42.68                 | 33.89                 | 7.53            | 36.3               | 47.8                     | 74               | 26.2        | Peak   |
|              | 5830.433        | 40.96                 | 35.03                 | 8.59            | 36.94              | 47.64                    | 74               | 26.36       | Peak   |
| Vertical     | 1607.719        | 46.03                 | 26.79                 | 4.32            | 37.52              | 39.62                    | 74               | 34.38       | Peak   |
|              | 2126.188        | 46.34                 | 28.57                 | 4.87            | 36.88              | 42.9                     | 74               | 31.1        | Peak   |
|              | 2862.693        | 46.09                 | 30.2                  | 5.69            | 36.78              | 45.2                     | 74               | 28.8        | Peak   |
|              | 3530.356        | 44.59                 | 31.66                 | 6.42            | 36.23              | 46.44                    | 74               | 27.56       | Peak   |
|              | 4424.514        | 43.13                 | 32.98                 | 7.21            | 36.03              | 47.29                    | 74               | 26.71       | Peak   |
|              | 5819.996        | 41.62                 | 35.03                 | 8.59            | 36.94              | 48.3                     | 74               | 25.7        | Peak   |

**CH20 (2442MHz)**

| Polarization | Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|--------------|-----------------|-----------------------|-----------------------|-----------------|--------------------|--------------------------|------------------|-------------|--------|
| Horizontal   | 1512.7          | 46.99                 | 26.37                 | 4.19            | 37.68              | 39.87                    | 74               | 34.13       | Peak   |
|              | 2033.049        | 45.97                 | 28.45                 | 4.75            | 36.89              | 42.28                    | 74               | 31.72       | Peak   |
|              | 2791.777        | 45.99                 | 29.95                 | 5.65            | 36.79              | 44.8                     | 74               | 29.2        | Peak   |
|              | 3875.095        | 44.23                 | 32.21                 | 6.74            | 35.88              | 47.3                     | 74               | 26.7        | Peak   |
|              | 4944.37         | 43.05                 | 34.18                 | 7.64            | 36.39              | 48.48                    | 74               | 25.52       | Peak   |
|              | 5935.842        | 39.82                 | 35.13                 | 8.77            | 37.02              | 46.7                     | 74               | 27.3        | Peak   |
| Vertical     | 1648.558        | 46.4                  | 26.93                 | 4.34            | 37.47              | 40.2                     | 74               | 33.8        | Peak   |
|              | 2188.024        | 45.71                 | 28.67                 | 4.95            | 36.87              | 42.46                    | 74               | 31.54       | Peak   |
|              | 2919.675        | 46.07                 | 30.35                 | 5.77            | 36.77              | 45.42                    | 74               | 28.58       | Peak   |
|              | 3731.996        | 44.37                 | 31.99                 | 6.63            | 36.03              | 46.96                    | 74               | 27.04       | Peak   |
|              | 4677.225        | 43.22                 | 33.51                 | 7.42            | 36.2               | 47.95                    | 74               | 26.05       | Peak   |
|              | 5967.835        | 40.96                 | 35.17                 | 8.77            | 37.03              | 47.87                    | 74               | 26.13       | Peak   |

**CH39 (2480MHz)**

| Polarization | Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|--------------|-----------------|-----------------------|-----------------------|-----------------|--------------------|--------------------------|------------------|-------------|--------|
| Horizontal   | 1443.846        | 46.58                 | 26.02                 | 4.11            | 37.8               | 38.91                    | 74               | 35.09       | Peak   |
|              | 2107.225        | 46.91                 | 28.54                 | 4.83            | 36.89              | 43.39                    | 74               | 30.61       | Peak   |
|              | 2862.693        | 45.95                 | 30.2                  | 5.69            | 36.78              | 45.06                    | 74               | 28.94       | Peak   |
|              | 4045.367        | 44.06                 | 32.47                 | 6.89            | 35.78              | 47.64                    | 74               | 26.36       | Peak   |
|              | 5115.591        | 43.13                 | 34.39                 | 7.78            | 36.48              | 48.82                    | 74               | 25.18       | Peak   |
|              | 5893.452        | 41.2                  | 35.1                  | 8.68            | 36.99              | 47.99                    | 74               | 26.01       | Peak   |
| Vertical     | 1559.486        | 46.25                 | 26.58                 | 4.24            | 37.6               | 39.47                    | 74               | 34.53       | Peak   |
|              | 2160.753        | 46.21                 | 28.62                 | 4.91            | 36.87              | 42.87                    | 74               | 31.13       | Peak   |
|              | 2967.138        | 46.54                 | 30.5                  | 5.81            | 36.76              | 46.09                    | 74               | 27.91       | Peak   |
|              | 3698.711        | 44.91                 | 31.93                 | 6.58            | 36.06              | 47.36                    | 74               | 26.64       | Peak   |
|              | 4536.905        | 43.32                 | 33.18                 | 7.32            | 36.12              | 47.7                     | 74               | 26.3        | Peak   |
|              | 5882.902        | 40.39                 | 35.08                 | 8.68            | 36.97              | 47.18                    | 74               | 26.82       | Peak   |

TEST ENGINEER: Jarey

EUT : REMOTE CONTROL Temperature : 22°C

Model No. : ERF2A60(1001) Humidity : 51%RH

Test Mode : Receiving Date of Test : 2019.05.25

| Polarization | Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|--------------|-----------------|-----------------------|-----------------------|-----------------|--------------------|--------------------------|------------------|-------------|--------|
| Horizontal   | 1395.52         | 46.66                 | 25.74                 | 4.06            | 37.84              | 38.62                    | 74               | 35.38       | Peak   |
|              | 1923.203        | 46.78                 | 28.05                 | 4.63            | 37.02              | 42.44                    | 74               | 31.56       | Peak   |
|              | 2956.525        | 46.32                 | 30.45                 | 5.77            | 36.76              | 45.78                    | 74               | 28.22       | Peak   |
|              | 4103.771        | 43.42                 | 32.56                 | 6.95            | 35.83              | 47.1                     | 74               | 26.9        | Peak   |
|              | 5060.89         | 42.86                 | 34.35                 | 7.78            | 36.45              | 48.54                    | 74               | 25.46       | Peak   |
|              | 5788.796        | 41.05                 | 34.99                 | 8.59            | 36.92              | 47.71                    | 74               | 26.29       | Peak   |
| Vertical     | 1520.854        | 46.67                 | 26.44                 | 4.21            | 37.68              | 39.64                    | 74               | 34.36       | Peak   |
|              | 2107.225        | 46.51                 | 28.54                 | 4.83            | 36.89              | 42.99                    | 74               | 31.01       | Peak   |
|              | 3009.976        | 45.98                 | 30.6                  | 5.85            | 36.73              | 45.7                     | 74               | 28.3        | Peak   |
|              | 3626.526        | 44.16                 | 31.82                 | 6.53            | 36.13              | 46.38                    | 74               | 27.62       | Peak   |
|              | 4594.167        | 43.08                 | 33.31                 | 7.37            | 36.15              | 47.61                    | 74               | 26.39       | Peak   |
|              | 5925.216        | 40.63                 | 35.13                 | 8.68            | 37                 | 47.44                    | 74               | 26.56       | Peak   |

TEST ENGINEER: Jarey

**Emissions in restricted frequency bands:**

EUT : REMOTE CONTROL Temperature : 22°C

Model No. : ERF2A60(1001) Humidity : 51%RH

Test Mode : Transmitting Date of Test : 2019.05.25

| Polarization | Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark  |
|--------------|-----------------|-----------------------|-----------------------|-----------------|--------------------|--------------------------|------------------|-------------|---------|
| Horizontal   | 2330.501        | 45.81                 | 28.86                 | 5.12            | 36.85              | 42.94                    | 74               | 31.06       | Peak    |
|              | 2330.501        | 34.57                 | 28.86                 | 5.12            | 36.85              | 31.7                     | 54               | 22.3        | Average |
|              | 2368.704        | 46.03                 | 28.93                 | 5.16            | 36.85              | 43.27                    | 74               | 30.73       | Peak    |
|              | 2368.704        | 35.11                 | 28.93                 | 5.16            | 36.85              | 32.35                    | 54               | 21.65       | Average |
|              | 2483.793        | 45.68                 | 29.08                 | 5.28            | 36.83              | 43.21                    | 74               | 30.79       | Peak    |
|              | 2483.793        | 34.46                 | 29.08                 | 5.28            | 36.83              | 31.99                    | 54               | 22.01       | Average |
|              | 2498.75         | 46.03                 | 29.1                  | 5.32            | 36.83              | 43.62                    | 74               | 30.38       | Peak    |
|              | 2498.75         | 35.41                 | 29.1                  | 5.32            | 36.83              | 33                       | 54               | 21          | Average |
| Vertical     | 2320.225        | 45.59                 | 28.86                 | 5.12            | 36.85              | 42.72                    | 74               | 31.28       | Peak    |
|              | 2320.225        | 34.12                 | 28.86                 | 5.12            | 36.85              | 31.25                    | 54               | 22.75       | Average |
|              | 2369.099        | 46.33                 | 28.93                 | 5.16            | 36.85              | 43.57                    | 74               | 30.43       | Peak    |
|              | 2369.099        | 35.62                 | 28.93                 | 5.16            | 36.85              | 32.86                    | 54               | 21.14       | Average |
|              | 2486.902        | 45.11                 | 29.08                 | 5.32            | 36.83              | 42.68                    | 74               | 31.32       | Peak    |
|              | 2486.902        | 34.44                 | 29.08                 | 5.32            | 36.83              | 32.01                    | 54               | 21.99       | Average |
|              | 2496.667        | 45.63                 | 29.1                  | 5.32            | 36.83              | 43.22                    | 74               | 30.78       | Peak    |
|              | 2496.667        | 35.32                 | 29.1                  | 5.32            | 36.83              | 32.91                    | 54               | 21.09       | Average |

TEST ENGINEER: Jarey

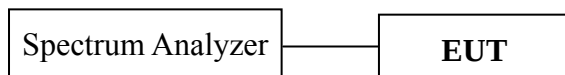
## 4 6 dB BANDWIDTH MEASUREMENT

### 4.1 Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

| Item | Type              | Manufacturer | Model No. | Serial No. | Last Cal.    | Next Cal.    |
|------|-------------------|--------------|-----------|------------|--------------|--------------|
| 1.   | Spectrum Analyzer | Agilent      | N9010A    | MY52221182 | Jan 05, 2019 | Jan 05, 2020 |

### 4.2 Block Diagram of Test Setup



### 4.3 Specification Limits (§15.247(a)(2))

The minimum 6 dB bandwidth shall be at least 500 kHz.

### 4.4 Operating Condition of EUT

The switch ON/OFF was used to enable the EUT to change the channel one by one.

### 4.5 Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with settings: RBW = 100kHz, VBW  $\geq 3 \times$  RBW.

The 6 dB bandwidth is defined as the total spectrum the power of which is lower than peak power minus 6 dB .

The test procedure is defined in ANSI C63.10-2013 (the 11.8.2 Measurement Procedure “Option 2” was used).

## 4.6 Test Results

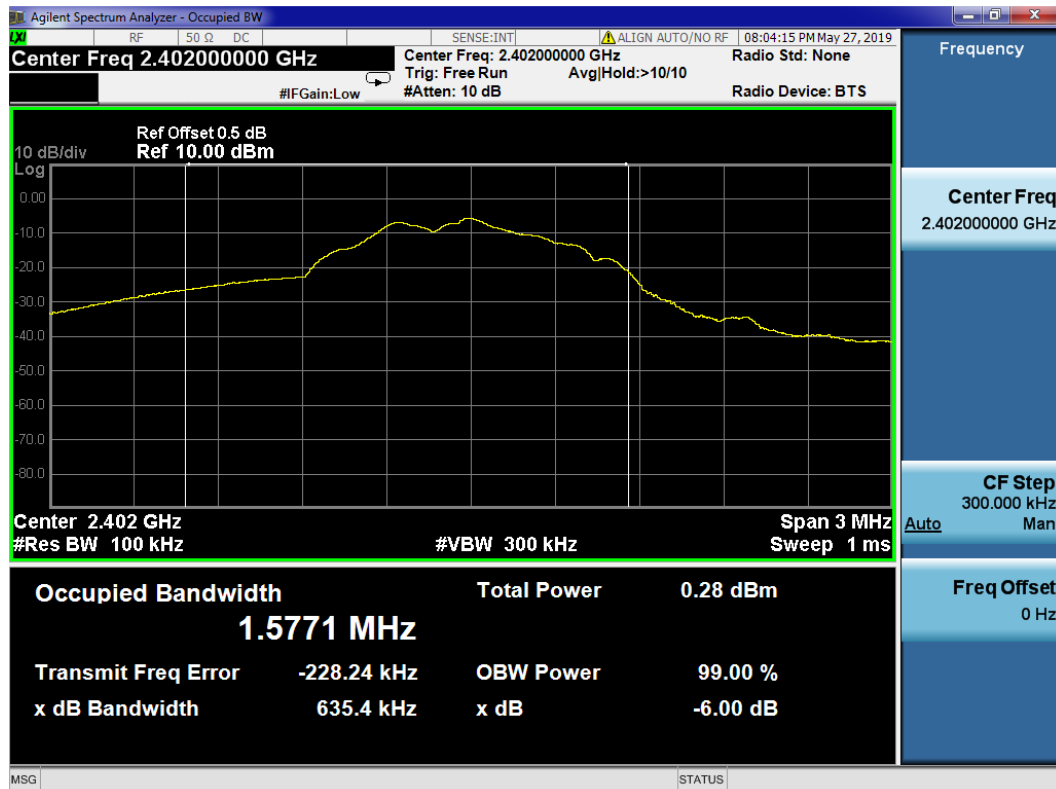
### **PASSED.**

All the test results are attached in next pages.

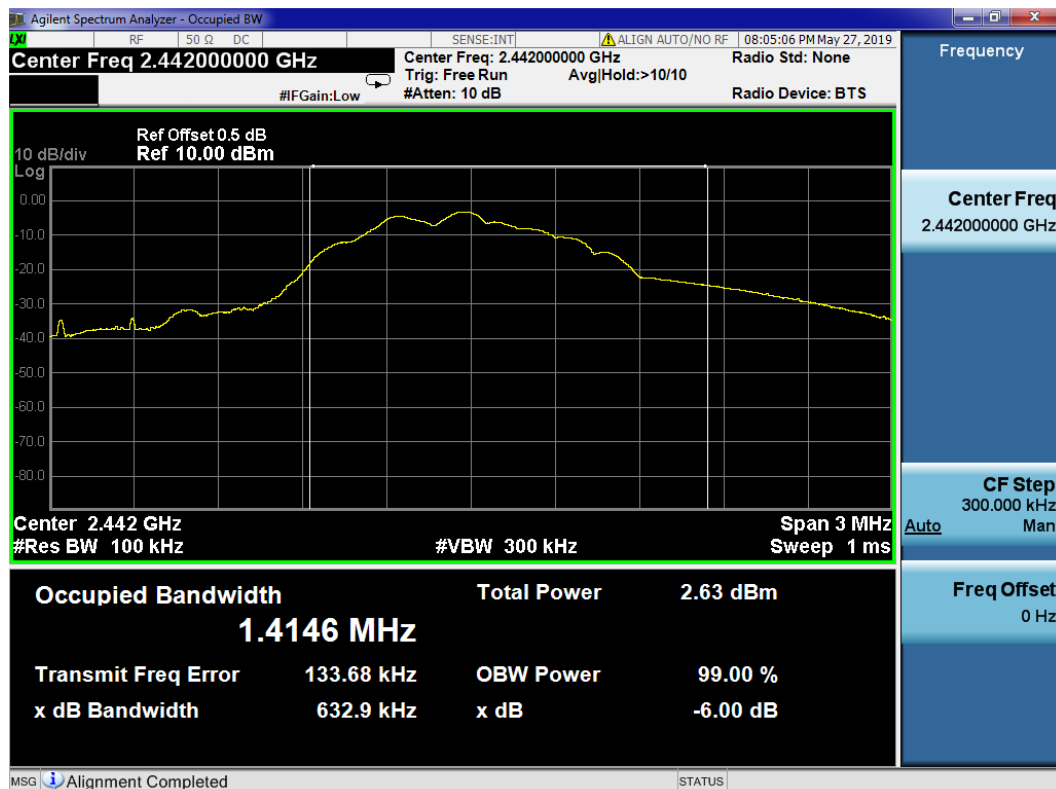
(Test Date: 2019.05.27 Temperature: 23°C Humidity: 51 %)

| Modulation | Channel | Frequency<br>(MHz) | 6dB Bandwidth<br>(kHz) | Limit   |
|------------|---------|--------------------|------------------------|---------|
| BLE        | 00      | 2402               | <b>635.4</b>           | 500 kHz |
|            | 20      | 2442               | <b>632.9</b>           | 500 kHz |
|            | 39      | 2480               | <b>640.4</b>           | 500 kHz |

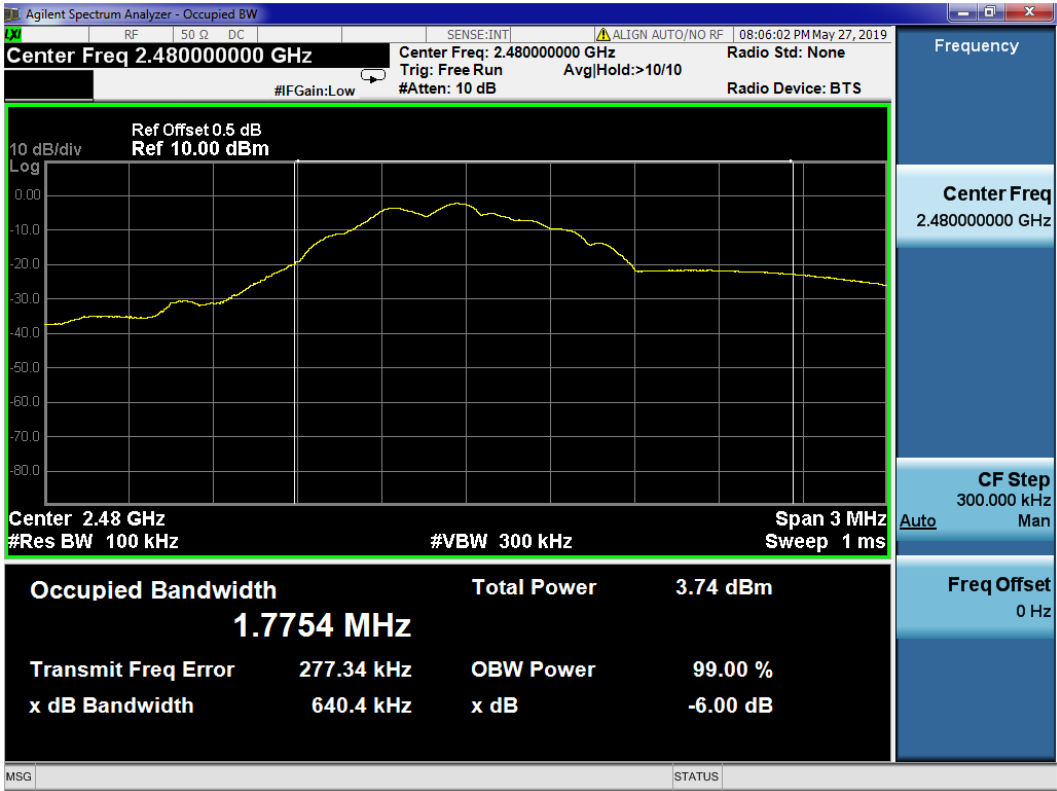
## CH00 (2402 MHz)



## CH20 (2442 MHz)



CH39 (2480 MHz)



## 5 MAXIMUM PEAK OUTPUT POWER MEASUREMENT

### 5.1 Test Equipment

The following test equipment was used during the maximum peak output power measurement:

| Item | Type              | Manufacturer | Model No. | Serial No. | Last Cal.    | Next Cal.    |
|------|-------------------|--------------|-----------|------------|--------------|--------------|
| 1.   | Spectrum Analyzer | Agilent      | N9010A    | MY52221182 | Jan 05, 2019 | Jan 05, 2020 |

### 5.2 Block Diagram of Test Setup

The Same as Section. 4.2.

### 5.3 Specification Limits ((§15.247(b)(3))

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5 MHz is: 1 Watt. (30 dBm)

### 5.4 Operating Condition of EUT

The switch ON/OFF was used to enable the EUT to change the channel one by one.

### 5.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:

- a)  $RBW \geq DTS \text{ Bandwidth}$ .
- b)  $VBW \geq [3 \times RBW]$ .
- c)  $Span \geq [3 \times RBW]$ .
- d) Sweep time = auto.
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

The test procedure is defined in ANSI C63.10-2013 ( 11.9.1.1 Measurement Procedure “  $RBW \geq DTS \text{ bandwidth}$ ” was used).

## 5.6 Test Results

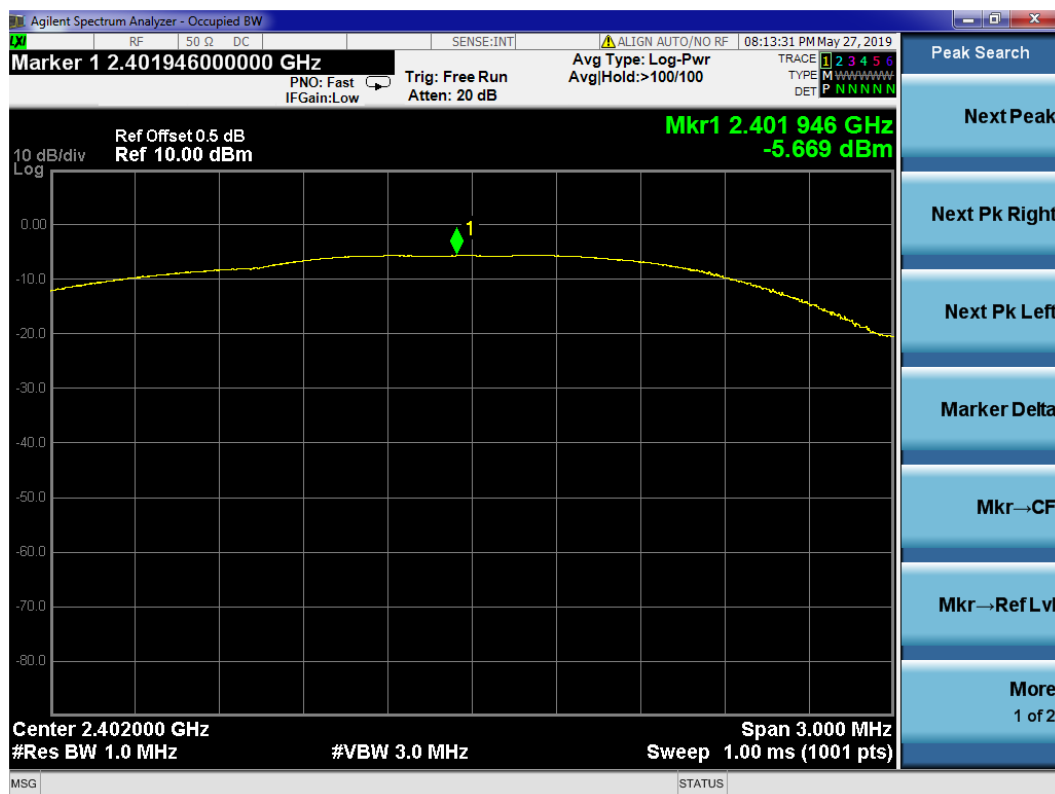
### **PASSED.**

All the test results are listed below.

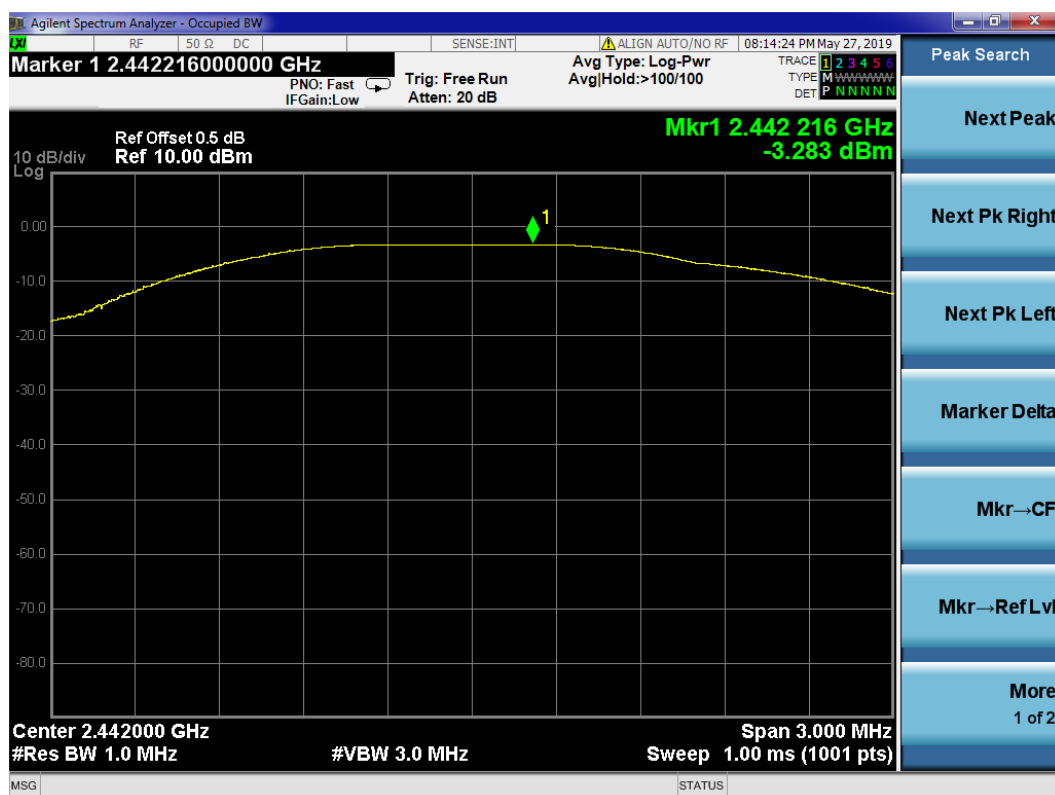
(Test Date: 2019.05.27 Temperature: 23°C Humidity: 51 %)

| Modulation | Channel | Frequency (MHz) | Peak Output Power (dBm) | Limit  |
|------------|---------|-----------------|-------------------------|--------|
| BLE        | 00      | 2402 MHz        | <b>-5.669</b>           | 30 dBm |
|            | 20      | 2442 MHz        | <b>-3.283</b>           | 30 dBm |
|            | 39      | 2480 MHz        | <b>-2.236</b>           | 30 dBm |

## CH00 (2402 MHz)



## CH20 (2442 MHz)



CH39 (2480 MHz)



## 6 EMISSION LIMITATIONS MEASUREMENT

### 6.1 Test Equipment

The following test equipment was used during the emission limitations test :

| Item | Type              | Manufacturer | Model No. | Serial No. | Last Cal.    | Next Cal.    |
|------|-------------------|--------------|-----------|------------|--------------|--------------|
| 1.   | Spectrum Analyzer | Agilent      | N9010A    | MY52221182 | Jan 05, 2019 | Jan 05, 2020 |

### 6.2 Block Diagram of Test Setup

The Same as Section. 4.2.

### 6.3 Specification Limits (§15.247(d))

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)). (※This test result attaching to Section. 3.7)

### 6.4 Operating Condition of EUT

The switch ON/OFF was used to enable the EUT to change the channel one by one.

### 6.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

Establish a reference level by using the following procedure:

- Set instrument center frequency to DTS channel center frequency.
- Set the span to  $\geq 1.5$  times the DTS bandwidth.
- Set the RBW = 100 kHz.
- Set the VBW  $\geq [3 \times \text{RBW}]$ .
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

Establish an emission level by using the following procedure:

- Set the center frequency and span to encompass frequency range to be

measured.

b) Set the RBW = 100 kHz.

c) Set the VBW  $\geq [3 \times \text{RBW}]$ .

d) Detector = peak.

e) Sweep time = auto couple.

f) Trace mode = max hold.

g) Allow trace to fully stabilize.

h) Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

Scan up through 10<sup>th</sup> harmonic.

The test procedure is defined in ANSI C63.10-2013 (11.11.2 Reference level measurement and 11.11.3 Emission level measurement was used).

## 6.6 Test Results

### **PASSED.**

The test data was attached in the next pages.

(Test Date: 2019.05.27 Temperature: 23°C Humidity: 51 %)

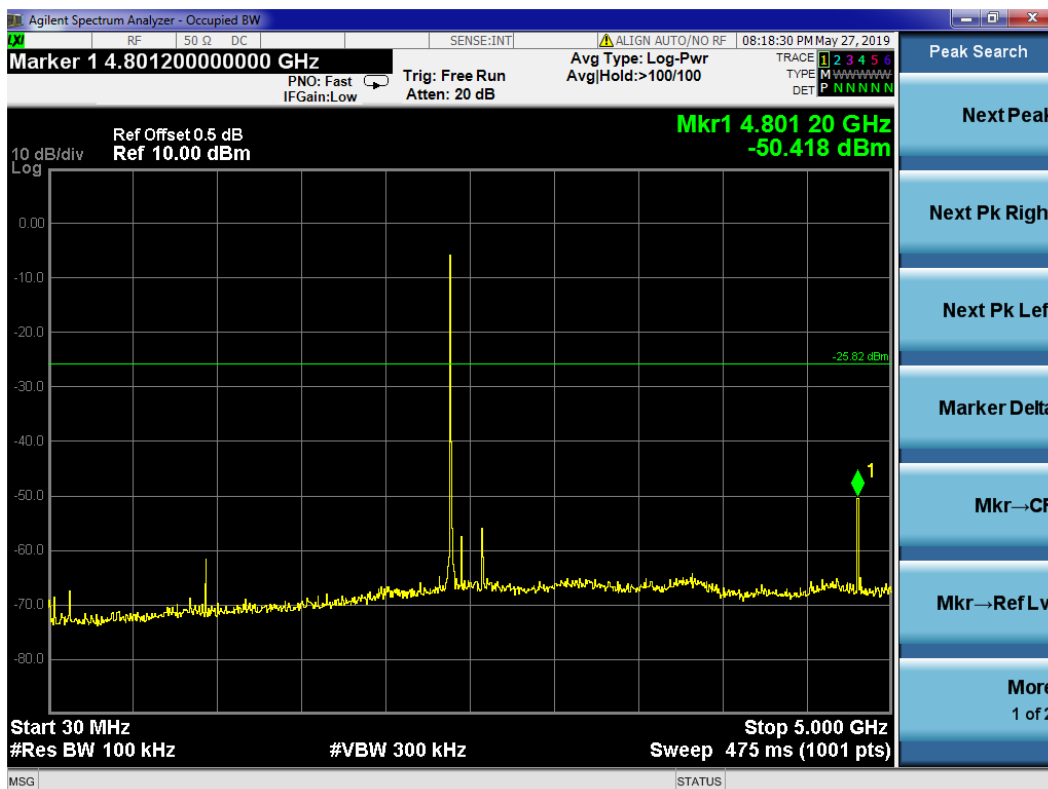
| Modulation | Channel | Frequency<br>(MHz) | Data Page |
|------------|---------|--------------------|-----------|
| BLE        | 00      | 2402 MHz           | P29-30    |
|            | 20      | 2442 MHz           | P31-32    |
|            | 39      | 2480 MHz           | P33-34    |

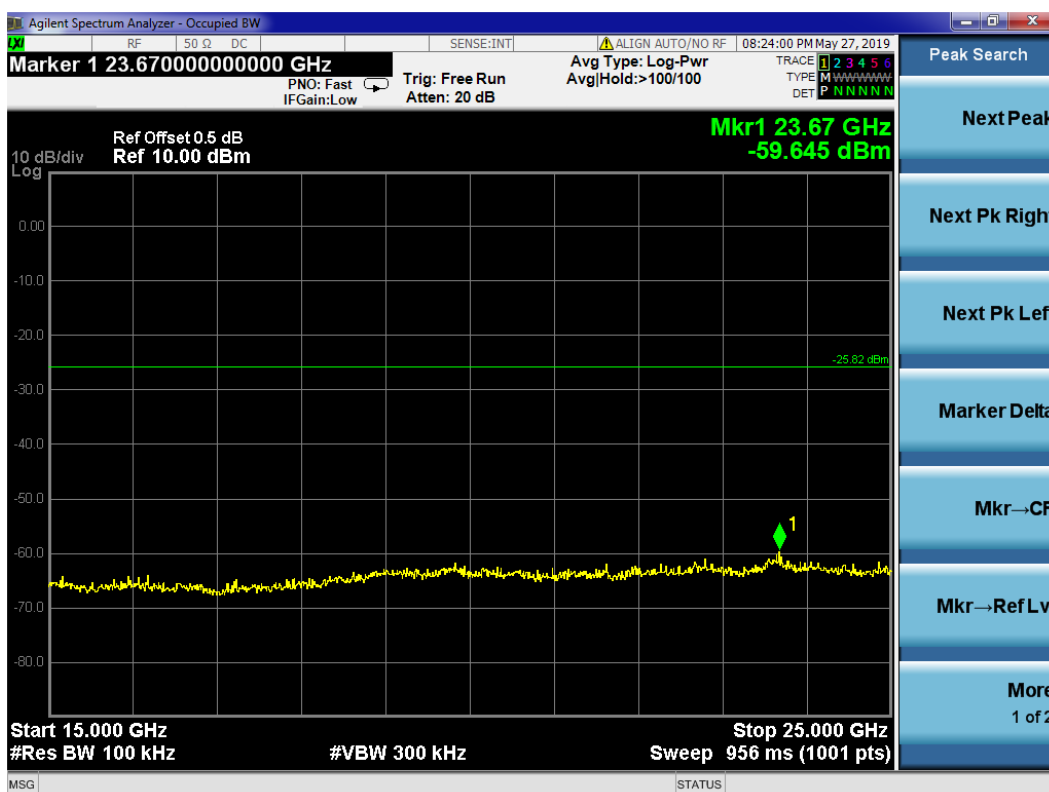
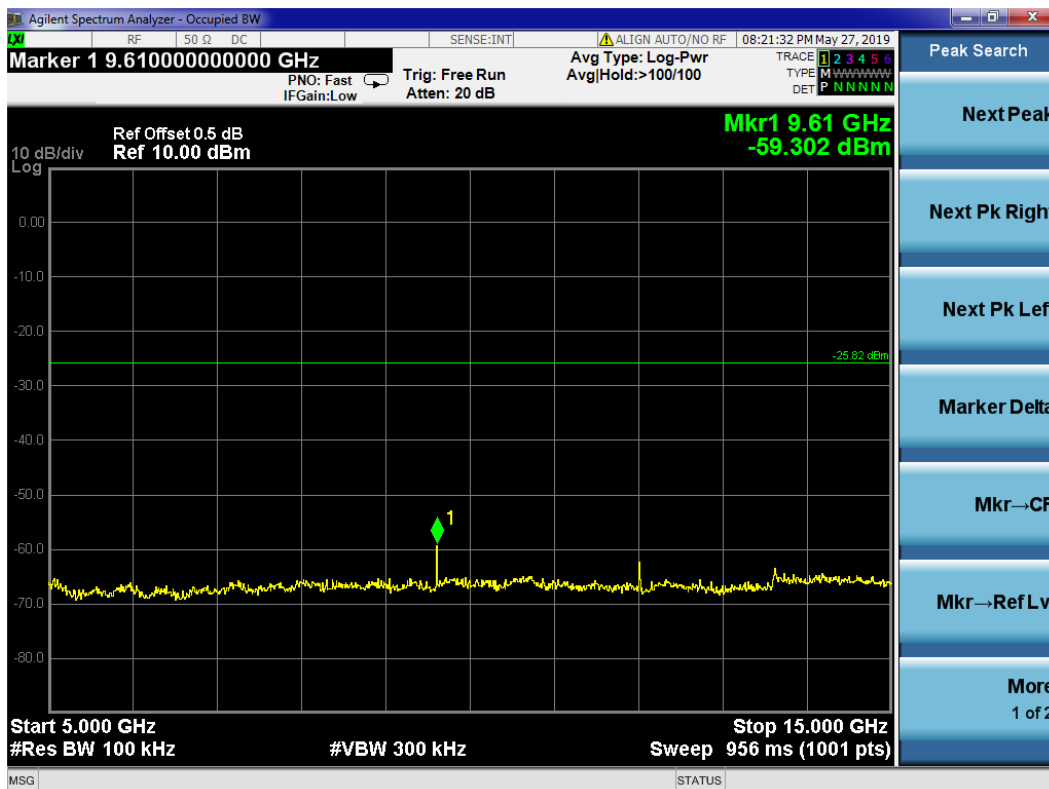
## CH00 (2402 MHz)

Reference level



Emission level



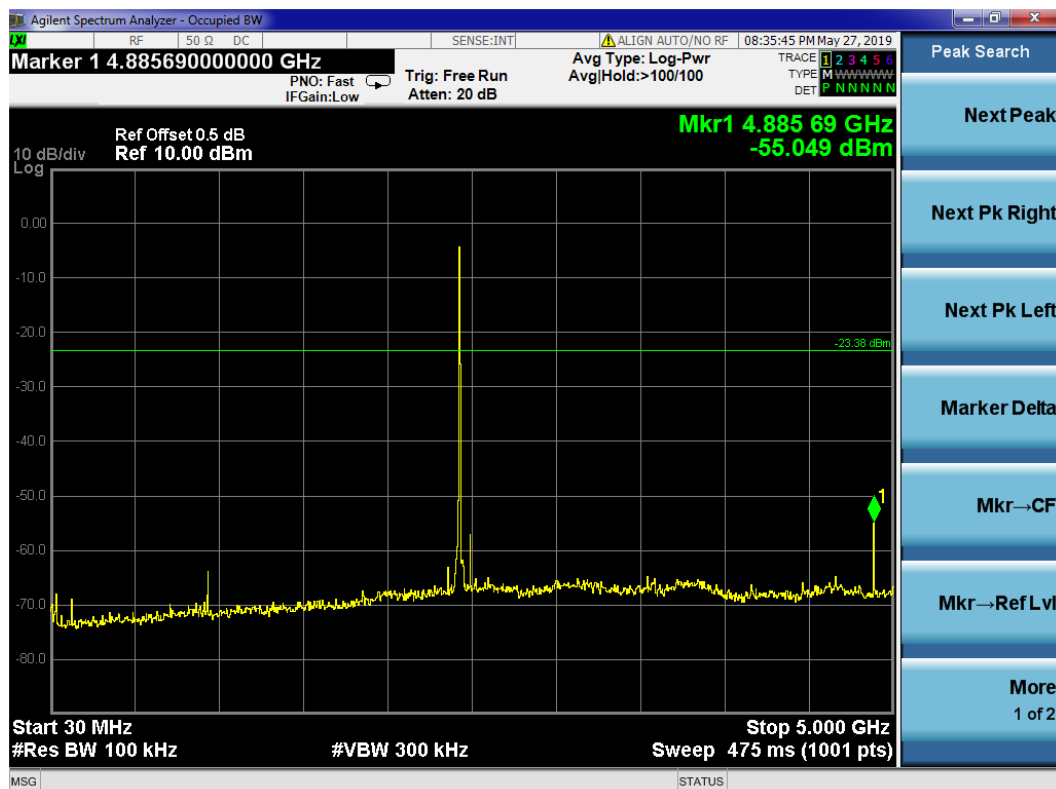


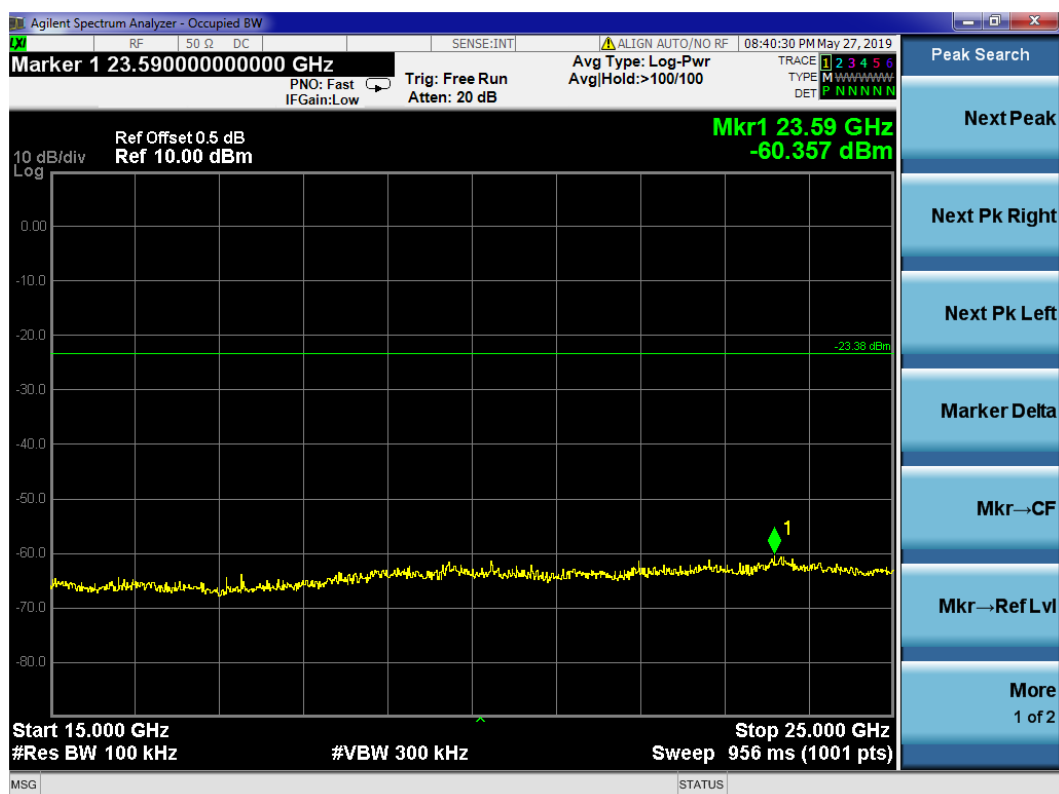
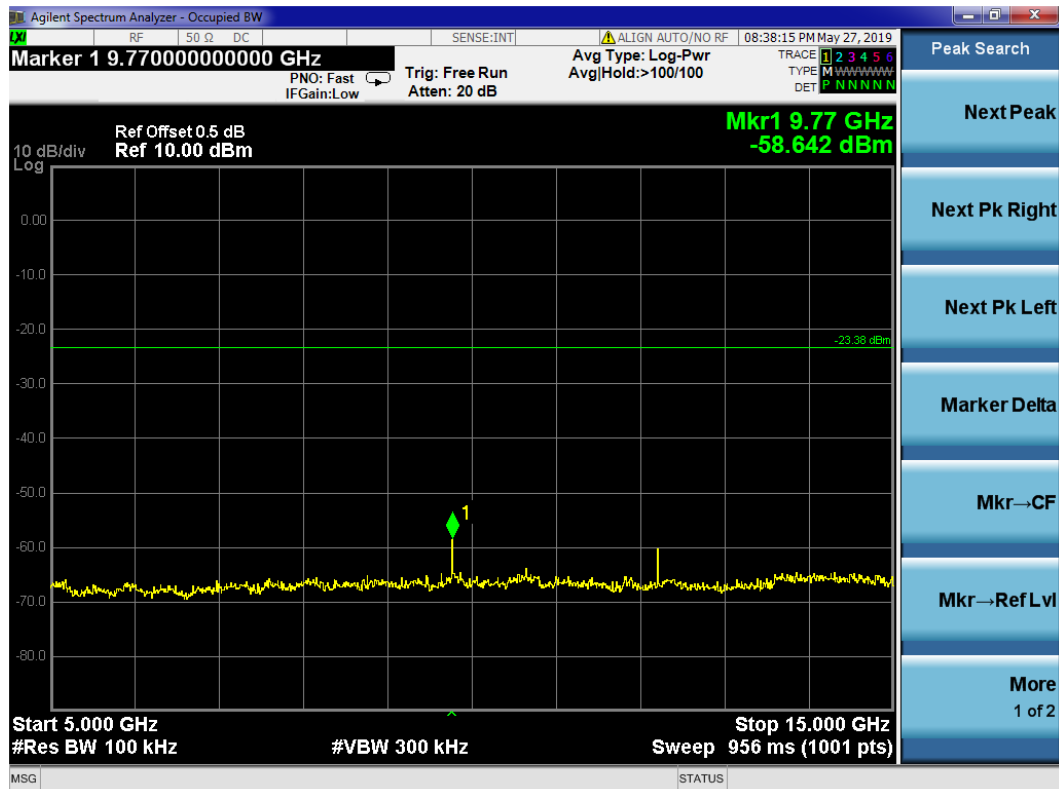
## CH20 (2442 MHz)

Reference level



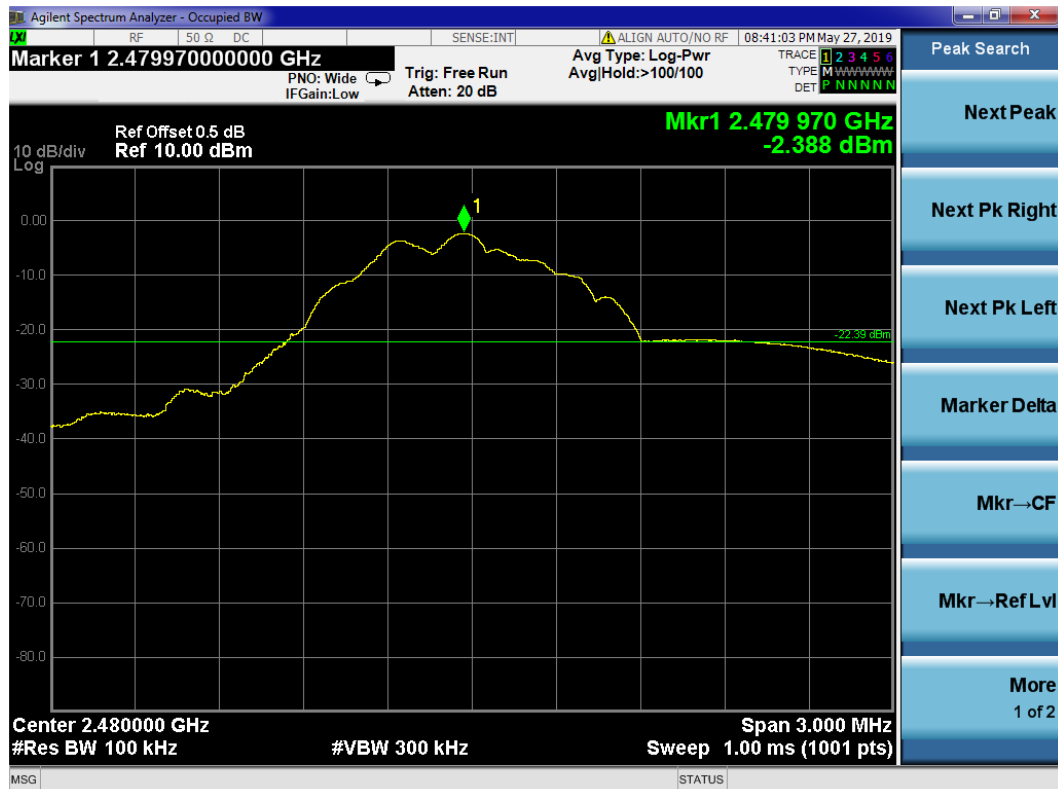
Emission level



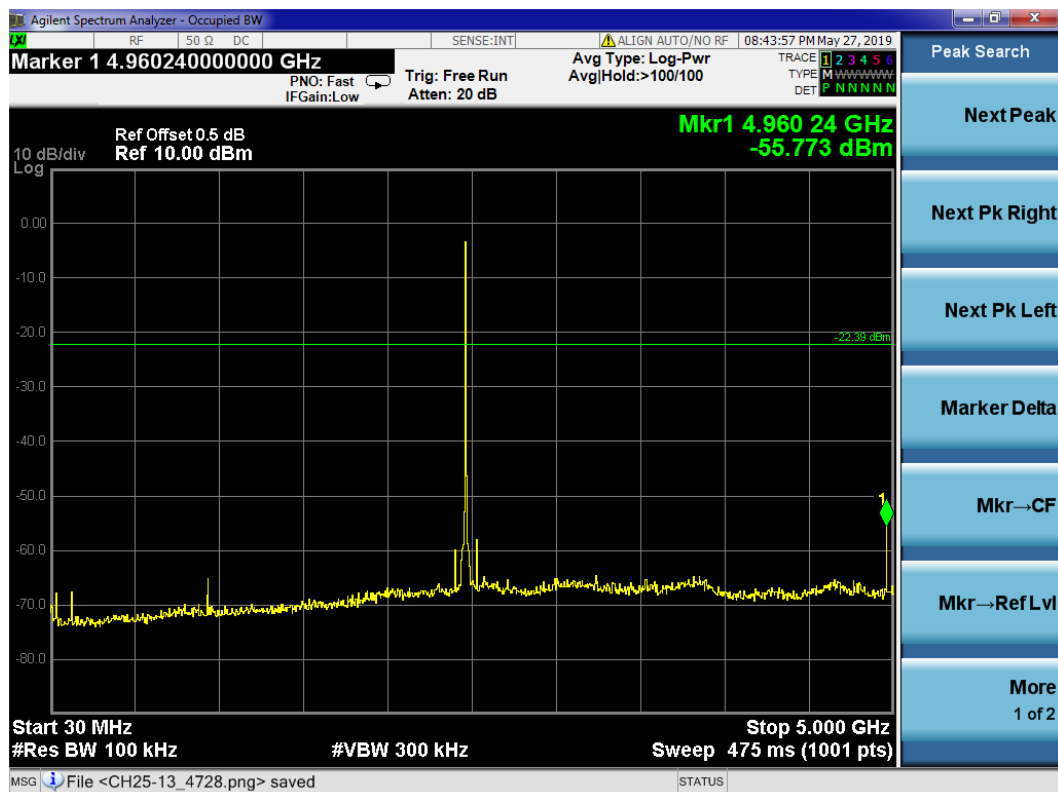


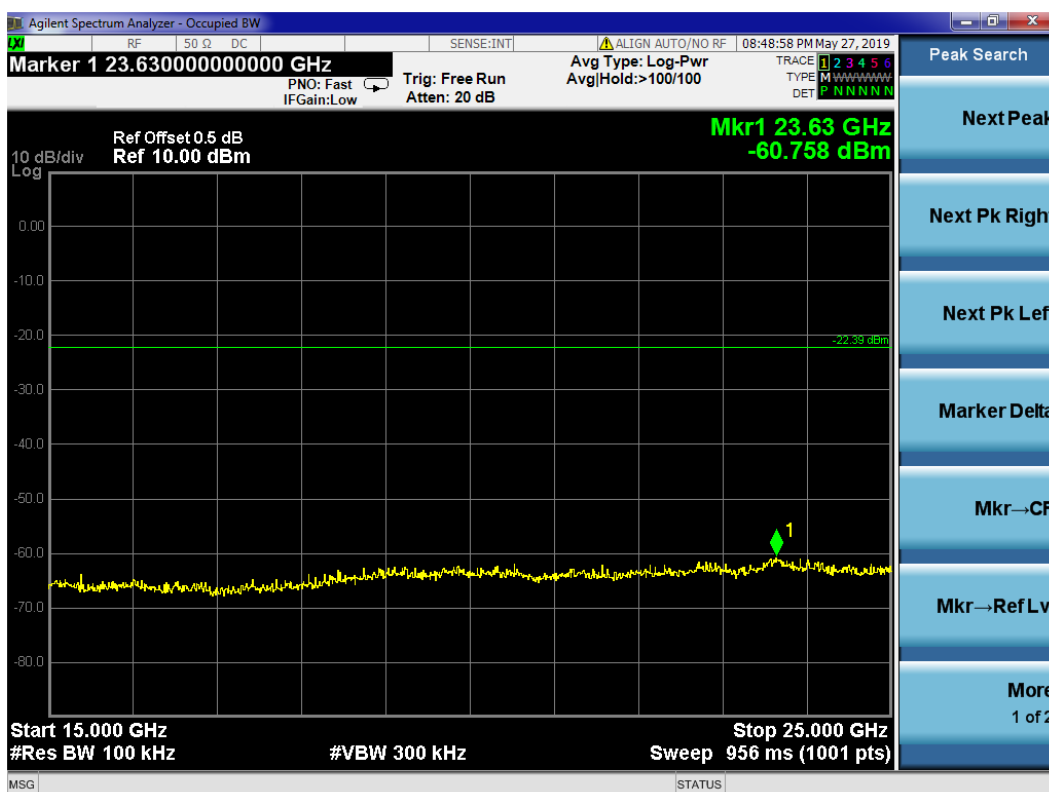
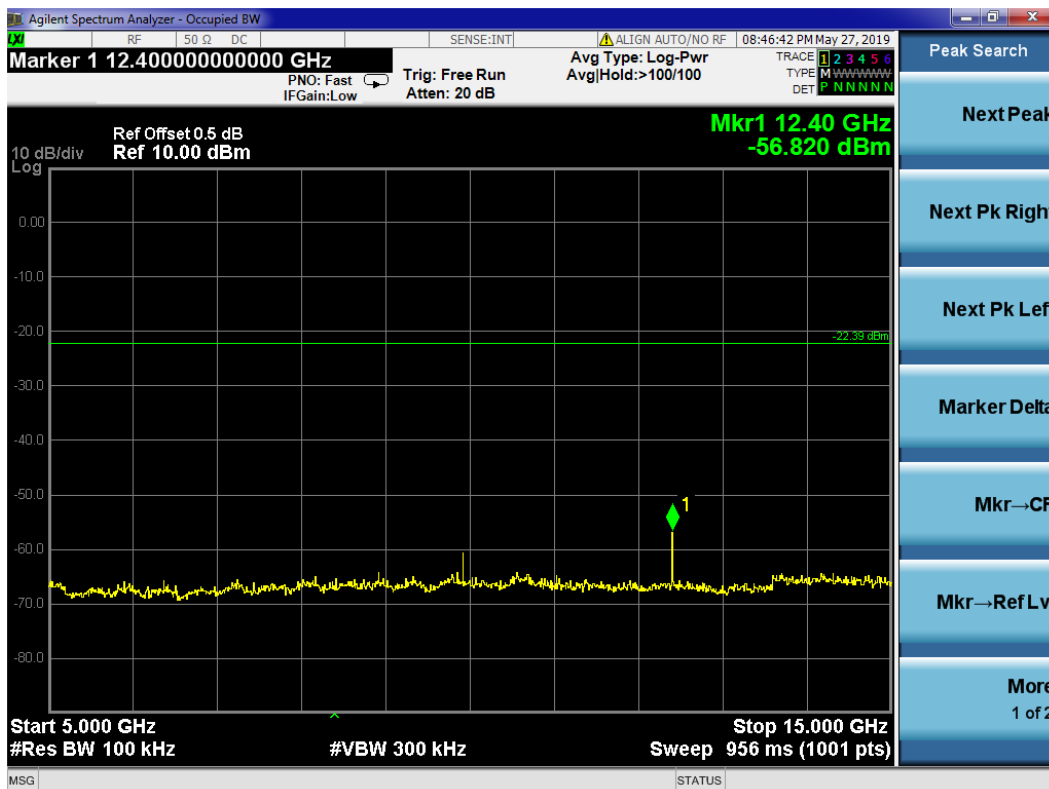
## CH39 (2480 MHz)

Reference level



Emission level





## 7 BAND EDGES MEASUREMENT

### 7.1 Test Equipment

The following test equipment was used during the band edges measurement:

| Item | Type              | Manufacturer | Model No. | Serial No. | Last Cal.    | Next Cal.    |
|------|-------------------|--------------|-----------|------------|--------------|--------------|
| 1.   | Spectrum Analyzer | Agilent      | N9010A    | MY52221182 | Jan 05, 2019 | Jan 05, 2020 |

### 7.2 Block Diagram of Test Setup

The Same as section.4.2.

### 7.3 Specification Limits (§15.247(d))

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.

### 7.4 Operating Condition of EUT

The switch ON/OFF was used to enable the EUT to change the channel one by one.

### 7.5 Test Procedure

The transmitter output was connected to the spectrum analyzer. Set RBW of Test Receiver to 100kHz and VBW to 300kHz with suitable frequency span including 100kHz bandwidth from band edge.

The test procedure is defined in ANSI C63.10-2013 (11.11.3 Emission level measurement was used).

## 7.6 Test Results

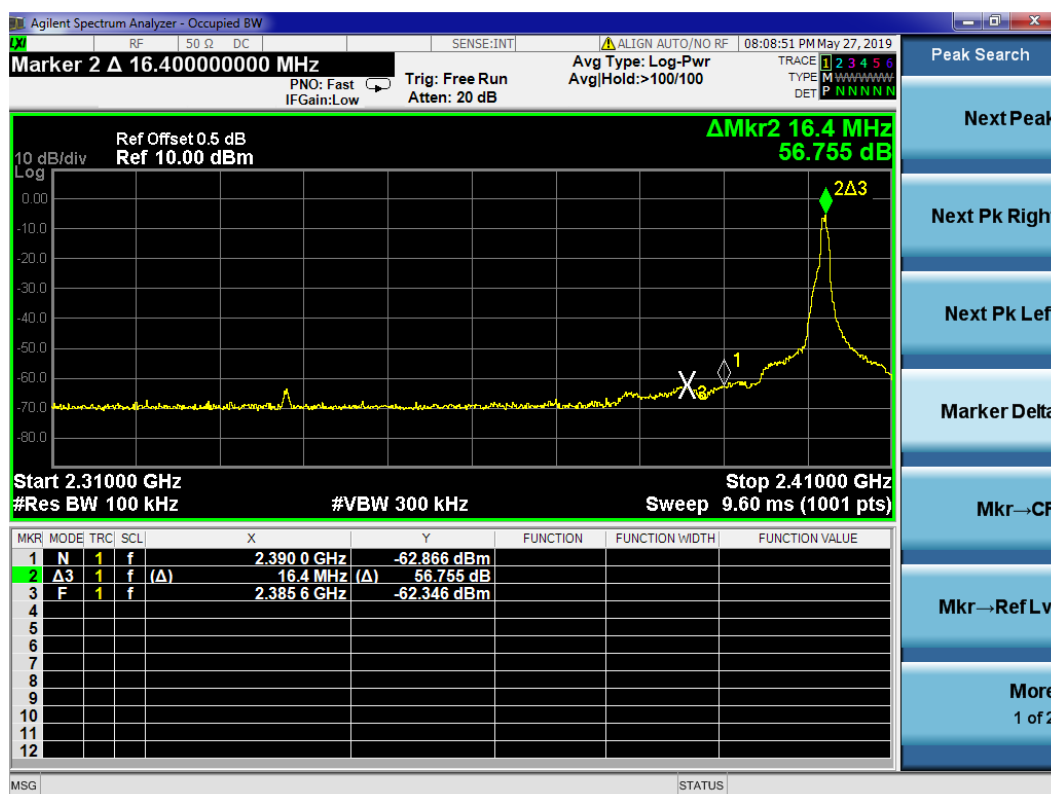
### **PASSED.**

All the test results are attached in next pages.

(Test Date: 2019.05.27 Temperature: 23°C Humidity: 51 %)

| Modulation | Location        | Channel | Frequency (MHz) | Delta Marker (dB) | Result                                                              |
|------------|-----------------|---------|-----------------|-------------------|---------------------------------------------------------------------|
| BLE        | Below Band Edge | 00      | 2402            | 56.755            | More than <b>20 dB</b> below the highest level of the desired power |
|            | Upper Band Edge | 39      | 2480            | 47.266            |                                                                     |

## CH00 2402MHz (Below Edge 2390 MHz)



## CH39 2480MHz (Upper Edge 2483.5 MHz)



## 8 POWER SPECTRAL DENSITY MEASUREMENT

### 8.1 Test Equipment

The following test equipment was used during the power spectral density measurement:

| Item | Type              | Manufacturer | Model No. | Serial No. | Last Cal.    | Next Cal.    |
|------|-------------------|--------------|-----------|------------|--------------|--------------|
| 1.   | Spectrum Analyzer | Agilent      | N9010A    | MY52221182 | Jan 05, 2019 | Jan 05, 2020 |

### 8.2 Block Diagram of Test Setup

The Same as section 4.2.

### 8.3 Specification Limits (§15.247(e))

The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band.

### 8.4 Operating Condition of EUT

The switch ON/OFF was used to enable the EUT to change the channel one by one.

### 8.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- Set the VBW  $\geq [3 \times \text{RBW}]$ .
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.
- If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

The test procedure is defined in ANSI C63.10-2013 ( 11.10.2 Measurement Procedure “Method PKPSD (peak PSD)” was used).

## 8.6 Test Results

### **PASSED.**

All the test results are attached in next pages.

(Test Date: 2019.05.27 Temperature: 23°C Humidity: 51 %)

| Modulation | Channel | Frequency (MHz) | Power Spectral Density (dBm) | Limit |
|------------|---------|-----------------|------------------------------|-------|
| BLE        | 00      | 2402            | <b>-5.818</b>                | 8 dBm |
|            | 20      | 2442            | <b>-3.378</b>                | 8 dBm |
|            | 39      | 2480            | <b>-2.388</b>                | 8 dBm |

## CH00 2402 MHz



## CH20 2442 MHz



CH39 2480 MHz



## **9 DEVIATION TO TEST SPECIFICATIONS**

None.