# APPLICATION FOR CERTIFICATION

On Behalf of

Fanimation, INC

Ceiling Fan Remote Controller

Model No.：BTR9

FCC ID : 2ABGUCE10207

Prepared for : Fanimation, INC
10983 Bennett Pkwy, Zionsville,
Indiana, United States, 46077

Prepared by : AUDIX Technology Corporation
EMC Department
No. 53-11, Dingfu, Linkou Dist.,
New Taipei City 244, Taiwan, R.O.C.

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| | | |
|---|---|---|
| File Number | ： | C1M1311107 |
| Report Number | ： | EM-F1020883 |
| Date of Test | ： | Nov. 25 ~ Dec. 03, 2013 |
| Date of Report | ： | Dec. 03, 2013 |

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# TEST REPORT CERTIFICATION

| | | |
|---|---|---|
| Applicant | : | Fanimation, INC |
| Manufacturer #1 | : | Chungear Industrial Co., Ltd. |
| Manufacturer #2 | : | Satellite Electronic (Zhongshan) Ltd. |
| Manufacturer #3 | : | Zhongshan Amity Electronic Ltd. |
| EUT Description | : | Ceiling Fan Remote Controller |
| **FCC ID** | : | **2ABGUCE10207** |
| | (A) Model No. | : BTR9 |
| | (B) Serial No. | : N/A |
| | (C) Power Supply | : AC 120V/60Hz |
| | (D) Test Voltage | : AC 120V/60Hz |

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C, Oct. 2012
(FCC CFR 47 Part 15C, §15.205, §15.207, §15.209)
AND ANSI C63.4:2003

The device described above was tested by AUDIX Technology Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C limits.

The measurement results are contained in this test report and AUDIX Technology Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX Technology Corporation.

Date of Test: Nov. 25 ~ Dec. 03, 2013 Date of Report: Dec. 03, 2013

Producer: Annie Yu
(Annie Yu/Administrator)

Signatory: Leon Liu
(Leon Liu/Deputy General Manager)

# 1. GENERAL INFORMATION

## 1.1. Description of Device (EUT)

| | |
|---|---|
| Product | Ceiling Fan Remote Controller |
| Model Number | BTR9 |
| Serial Number | N/A |
| Applicant | Fanimation, INC<br>10983 Bennett Pkwy, Zionsville, Indiana, United States, 46077 |
| Manufacturer | #1 Chungear Industrial Co., Ltd.<br>106 Kanho Rd., Taichung, Taiwan<br>#2 Satellite Electronic (Zhongshan)., Ltd.<br>No.15, Torch Hi-Tech Industrial Development Zone, Zhong Shan City Guangdong Province China<br>#3 Zhongshan Amity Electronic Ltd.<br>No. 16 Torch Hi-Tech Industrial Development Zone, Zhong Shan City Guangdong Province China |
| FCC ID | 2ABGUCE10207 |
| Fundamental Range | 2402MHz ~ 2480MHz |
| Frequency Channel | 40 channels |
| Radio Technology | DSSS |
| ANT Gain | 6.03dBi(Peak), PCB Type |
| Data Transfer Rate | 1/2/3Mbps |
| Power Cord | Non-Shielded, Undetachable, 0.1m |
| Date of Receipt of Sample | Nov. 12, 2013 |
| Date of Test | Nov. 25 ~ Dec. 03, 2013 |

## 1.2. Tested Supporting System Details

### 1.2.1. TRANSFORMER

| | | |
|---|---|---|
| Model Number | : | FAR |
| Serial Number | : | FLR11044006014 |
| Power Cord | : | Non-Shielded, Detachable, 1.0m |

### 1.2.2. REMOTE CONT ROLLER

| | | |
|---|---|---|
| Model Number | : | TR92A |
| Serial Number | : | N/A |
| Manufacturer | : | Chungear Industrial Co., Ltd. |

## 1.3. Description of Test Facility

| | | |
|---|---|---|
| Name of Firm | : | **AUDIX Technology Corporation**<br>EMC Department<br>No. 53-11, Dingfu, Linkou Dist.,<br>New Taipei City 244, Taiwan, R.O.C. |
| Test Site<br>(C8/Semi-AC) | : | **No. 8 Shielded Room &**<br>No. 53-11, Dingfu, Linkou Dist.,<br>New Taipei City 244, Taiwan, R.O.C.<br>**Semi-Anechoic Chamber**<br>No. 53-11, Dingfu, Linkou Dist.,<br>New Taipei City 244, Taiwan, R.O.C.<br>May 14, 2009 Renewal on<br>Federal Communication Commission<br>Registration Number: 90993 |
| NVLAP Lab. Code | : | 200077-0 |
| TAF Accreditation No | : | 1724 |

## 1.4. Measurement Uncertainty

| Test Item | Frequency Range | Uncertainty (dB) |
|---|---|---|
| Conduction Test | 150kHz~30MHz | ±1.73dB |
| Radiation Test (Distance: 3m) | 30MHz~300MHz | ± 2.91dB |
| | 300MHz~1000MHz | ± 2.74dB |
| | Above 1GHz | ± 5.02dB |

Remark：Uncertainty = $ku_c(y)$

| Test Item | Uncertainty |
|---|---|
| 6dB Bandwidth | ± 0.05kHz |
| Maximum peak output power | ± 0.33dBm |
| Emission Limitations | ± 0.13dB |
| Band edges | ± 0.13dB |
| Power spectral density | ± 0.13dB |

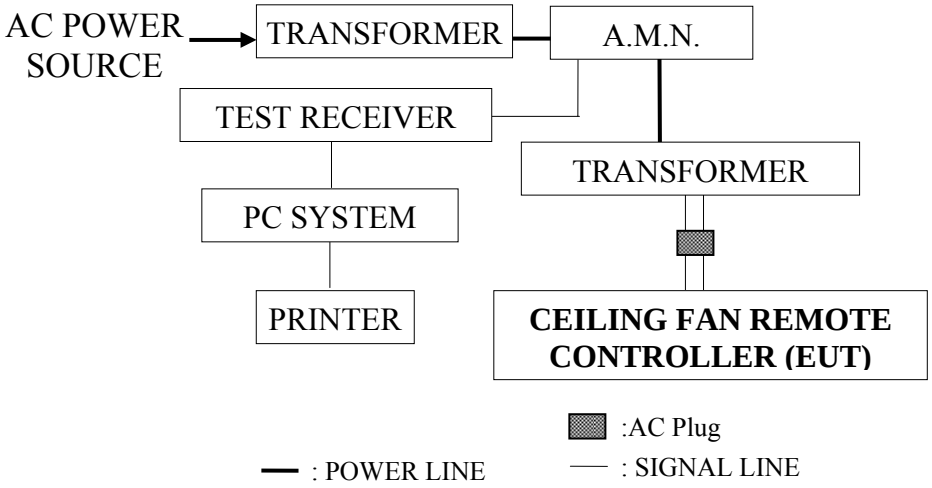
# 2. CONDUCTED EMISSION MEASUREMENT

## 2.1. Test Equipment

The following test equipment was used during the powerline conducted emission measurement: (No. 8 Shielded Room)

| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|---|
| 1. | Test Receiver | R&S | ESCS30 | 100265 | Aug. 24, 13' | Aug. 23, 14' |
| 2. | A.M.N. | R&S | ESH2-Z5 | 100366 | Mar. 19, 13' | Mar. 18, 14' |

## 2.2. Block Diagram of Test Setup




## 2.3. Powerline Conducted Emission Limit (§15.207, Class B)

| Frequency | Maximum RF Line Voltage | |
|---|---|---|
| | Quasi-Peak Level | Average Level |
| 150kHz ~ 500kHz | 66 ~ 56 dBμV | 56 ~ 46 dBμV |
| 500kHz ~ 5MHz | 56 dBμV | 46 dBμV |
| 5MHz ~ 30MHz | 60 dBμV | 50 dBμV |

Remark: 1. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary.
2. The lower limit applies at the band edges.

## 2.4. Operating Condition of EUT

2.4.1. Setup the **EUT (Ceiling Fan Remote Controller)** as shown on 2.2.

2.4.2. Turn on the power of all equipment.

2.4.3. The **EUT (Ceiling Fan Remote Controller)** was on transmitting function with the remote controller at work during all testing.

## 2.5. Test Procedure

The EUT was placed on the table which was above the ground by 80cm and transformer's power cord connected to the AC mains through an Artificial Mains Network (A.M.N.). This provided a 50 ohm coupling impedance for the measuring equipment. (Please refer to the block diagram of the test setup and photographs.) Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions simulators of the interface cables should be manipulated according to ANSI C63.4-2003 regulation during conducted measurement.

The bandwidth of the R&S Test Receiver ESCS30 was set at 9kHz.

The frequency range from 150kHz to 30MHz was checked.

All the final readings from Test Receiver were measured with the Quasi-Peak detector and Average detector. Remark: If the Average limit is met when using a Quasi-Peak detector, the Average detector is unnecessary)

## 2.6. Powerline Conducted Emission Measurement Results

**PASSED**. All emissions not reported below are too low against the prescribed limits.

The EUT was measured during this section testing and all the test results are listed in next pages.

EUT：Ceiling Fan Remote Controller Model No.：BTR9

Test Date：Nov. 28, 2013 Temperature：22℃ Humidity：50%

The details are as follows：

| Mode | Reference Test Data | |
|---|---|---|
| | Neutral | Line |
| 1. | # 2 | # 1 |

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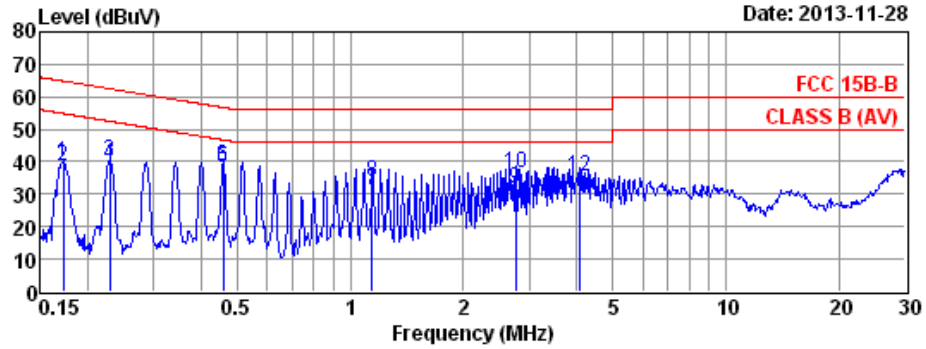
Data: 2 File: D:\test data\REPORT\2013\C1M1311XXX\C1M1311107-C-D.EM6 (2)




Site no. : No.8 Shielded Room Data no. : 2
Dis. / Ant. : ESH2-Z5 366 Ant. pol. : NEUTRAL
Limit : FCC 15B-B
Env. / Ins. : 22°C / 50% ESCS (265) Engineer : Jack_Wu
EUT : BTR9
Power Rating : 120Vac/60Hz
Test Mode : OPERATING

| | Freq. (MHz) | AMN. Factor (dB) | Cable Loss (dB) | Reading (dBµV) | Emission Level (dBµV) | Limits (dBµV) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.172 | 0.21 | 0.03 | 39.30 | 39.54 | 54.86 | 15.32 | Average |
| 2 | 0.172 | 0.21 | 0.03 | 38.51 | 38.75 | 64.86 | 26.11 | QP |
| 3 | 0.229 | 0.21 | 0.03 | 39.76 | 40.00 | 52.48 | 12.48 | Average |
| 4 | 0.229 | 0.21 | 0.03 | 39.04 | 39.28 | 62.48 | 23.20 | QP |
| 5 | 0.459 | 0.22 | 0.03 | 38.08 | 38.33 | 46.71 | 8.38 | Average |
| 6 | 0.459 | 0.22 | 0.03 | 38.30 | 38.55 | 56.71 | 18.16 | QP |
| 7 | 1.141 | 0.25 | 0.05 | 31.17 | 31.47 | 46.00 | 14.53 | Average |
| 8 | 1.141 | 0.25 | 0.05 | 33.50 | 33.80 | 56.00 | 22.20 | QP |
| 9 | 2.750 | 0.29 | 0.09 | 31.16 | 31.54 | 46.00 | 14.46 | Average |
| 10 | 2.750 | 0.29 | 0.09 | 35.94 | 36.32 | 56.00 | 19.68 | QP |
| 11 | 4.070 | 0.31 | 0.12 | 29.27 | 29.70 | 46.00 | 16.30 | Average |
| 12 | 4.070 | 0.31 | 0.12 | 35.07 | 35.50 | 56.00 | 20.50 | QP |

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Reading.
2. If the average limit is met when useing a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

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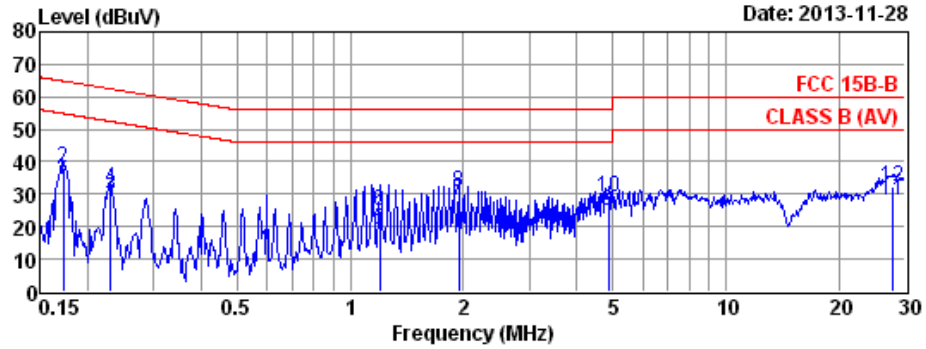
Data: 1 File: D:\test data\REPORT\2013\C1M1311XXX\C1M1311107-C-D.EM6 (2)




Site no. : No.8 Shielded Room Data no. : 1
Dis. / Ant. : ESH2-Z5 366 Ant. pol. : LINE
Limit : FCC 15B-B
Env. / Ins. : 22°C / 50% ESCS (265) Engineer : Jack_Wu
EUT : BTR9
Power Rating : 120Vac/60Hz
Test Mode : OPERATING

| | Freq. (MHz) | AMN. Factor (dB) | Cable Loss (dB) | Reading (dBµV) | Emission Level (dBµV) | Limits (dBµV) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.172 | 0.11 | 0.03 | 34.25 | 34.39 | 54.86 | 20.47 | Average |
| 2 | 0.172 | 0.11 | 0.03 | 37.76 | 37.90 | 64.86 | 26.96 | QP |
| 3 | 0.230 | 0.11 | 0.03 | 29.41 | 29.55 | 52.44 | 22.89 | Average |
| 4 | 0.230 | 0.11 | 0.03 | 31.60 | 31.74 | 62.44 | 30.70 | QP |
| 5 | 1.197 | 0.15 | 0.05 | 19.10 | 19.30 | 46.00 | 26.70 | Average |
| 6 | 1.197 | 0.15 | 0.05 | 24.68 | 24.88 | 56.00 | 31.12 | QP |
| 7 | 1.949 | 0.17 | 0.08 | 27.75 | 28.00 | 46.00 | 18.00 | Average |
| 8 | 1.949 | 0.17 | 0.08 | 30.58 | 30.83 | 56.00 | 25.17 | QP |
| 9 | 4.874 | 0.20 | 0.13 | 24.68 | 25.01 | 46.00 | 20.99 | Average |
| 10 | 4.874 | 0.20 | 0.13 | 28.63 | 28.96 | 56.00 | 27.04 | QP |
| 11 | 27.708 | 0.63 | 0.29 | 27.03 | 27.95 | 50.00 | 22.05 | Average |
| 12 | 27.708 | 0.63 | 0.29 | 31.35 | 32.27 | 60.00 | 27.73 | QP |

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Reading.
2. If the average limit is met when useing a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

# 3. RADIATED EMISSION MEASUREMENT

## 3.1. Test Equipment

The following test equipment was used during the radiated emission measurement:

### 3.1.1. For Frequency Range 30MHz~1000MHz (at Semi-Anechoic Chamber)

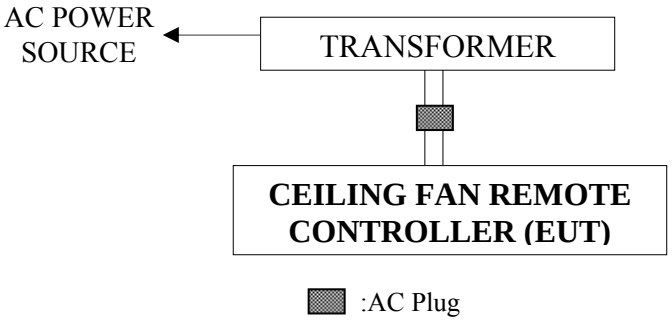
| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | Agilent | N9030A-544 | US51350140 | Jul. 30, 13’ | Jul. 29, 14’ |
| 2. | Test Receiver | R & S | ESCS30 | 100338 | Jul. 01, 13’ | Jun. 30, 14’ |
| 3. | Amplifier | HP | 8447D | 2944A06305 | Feb. 19, 13’ | Feb. 18, 14’ |
| 4. | Bilog Antenna | TESEQ | CBL6112D | 33821 | Aug. 08, 13’ | Aug. 07, 14’ |

### 3.1.2. For Frequency Above 1GHz (at Semi-Anechoic Chamber)

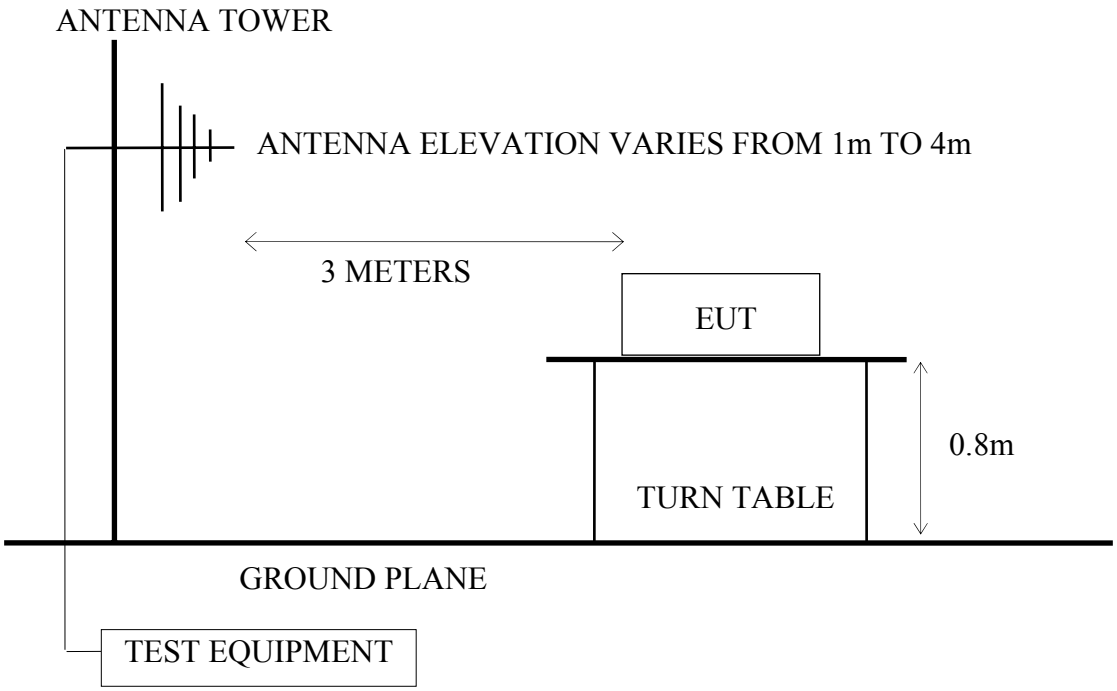
| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | Agilent | N9030A-544 | US51350140 | Jul. 30, 13’ | Jul. 29, 14’ |
| 2. | Test Receiver | R & S | ESCS30 | 100338 | Jul. 01, 13’ | Jun. 30, 14’ |
| 3. | Pre-Amplifier | HP | 8449B | 3008A02676 | Mar. 01, 13’ | Feb. 28, 14’ |
| 4. | 2.4GHz Notch Filter | K&L | 7NSL10-2441.5E130.5-00 | 1 | Jun. 13, 13’ | Jun. 12, 14’ |
| 5. | 3G High Pass Filter | Microware Circuits | H3G018G1 | 484796 | Jun. 13, 13’ | Jun. 12, 14’ |
| 6. | Horn Antenna | EMCO | 3115 | 9609-4927 | Jun. 17, 13’ | Jun. 16, 14’ |
| 7. | Horn Antenna | EMCO | 3116 | 2653 | Oct. 11, 13’ | Oct. 10, 14 ’ |

## 3.2. Test Setup

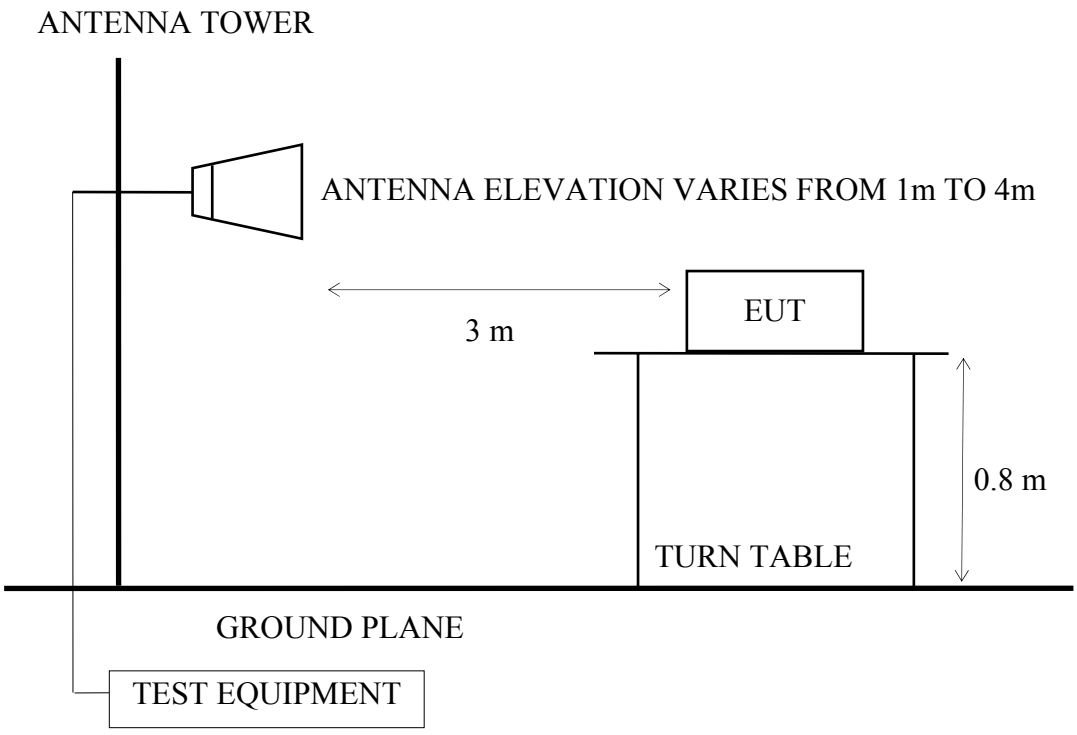
### 3.2.1. Block Diagram of connection between EUT and simulators



3.2.2. Semi-Anechoic Chamber (3m) Setup Diagram for 30-1000MHz




3.2.3. Semi-Anechoic Chamber (3m) Setup Diagram for above 1GHz



## 3.3. Radiated Emission Limits (§15.209)

| FREQUENCY MHz | DISTANCE Meters | FIELD STRENGTHS LIMITS | |
|---|---|---|---|
| | | μV/m | dBμV/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 |
| Above 1000 | 3 | 74.0 dBμV/m (Peak)<br>54.0 dBμV/m (Average) | |

Remark：(1) Emission level (dBμV/m) = 20 log Emission level (μV/m)
(2) The tighter limit applies at the edge between two frequency bands.
(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.
(4) The limits in this table are based on CFR 47 Part 15.205(a)(b) and Part 15.209 (a).
(5) The over 1GHz limit, FCC limit is used based on CFR 47 Part 15.35 (b) and Part 15.205(b) & Part 15.209(e) and Part 15.207(c).

## 3.4. Operating Condition of EUT

3.4.1. Set up the EUT (Ceiling Fan Remote Controller) and simulator as shown on 3.2.1.

3.4.2. To turn on the power of all equipments.

3.4.3. The EUT set to continuously transmit signals at 2402MHz, 2440MHz and 2480MHz during all test time.

## 3.5. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna such as calibrated biconical and log-periodical antenna or horn antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4-2003 regulation.

The bandwidth of the R&S Test Receiver was set at 120kHz. (For 30MHz to 1000MHz)

The resolution bandwidth and video bandwidth of test spectrum analyzer is 1MHz for peak detection (PK) at frequency above 1GHz.

The resolution bandwidth of test spectrum analyzer is 1MHz and the video bandwidth is 10Hz for average detection (AV) at frequency above 1GHz.

The frequency range from 30MHz to 25GHz (Up to $10^{th}$ harmonics from fundamental frequency) was checked. 30MHz to 1000MHz was measured with Quasi-Peak detector.

Pursuant to ANSI C63.4 8.3.1.2, when peak value complies with the average limit, we didn't perform measurement in average detector.

## 3.6. Test Results

**PASSED.**
(All emissions not reported for there is no emission be found.)

**For Frequency Range 30MHz~1000MHz:**

The radiation tests on three different axes (stand, lie and side), we assessed the value and we selected the worse radiation position "lie" for our measured results.

The EUT with following test modes was performed during this section testing and all the test results are listed in section 3.6.1.

EUT: Ceiling Fan Remote Controller M/N: BTR9

Test Date: Nov. 28, 2013 Temperature: 26℃ Humidity: 54%

| No. | Test Mode and Frequency | | Reference Test Data No. | |
|---|---|---|---|---|
| | | | Horizontal | Vertical |
| 1. | Transmitting | 2402MHz (CH0) | # 1 | # 2 |
| 2. | | 2440MHz (CH19) | # 1 | # 2 |
| 3. | | 2480MHz (CH39) | # 1 | # 2 |

* Above all final readings were measured with Quasi-Peak detector.

**For Frequency above 1GHz:**
The emissions (up to 25GHz) not reported for there is no signal be found.

**For Restricted Bands:**

The EUT was tested in restricted bands and all the test results are listed in section 3.6.2. (The restricted bands defined in part 15.205(a))

| No. | Test Mode and Frequency | | Reference Test Data No. | |
|---|---|---|---|---|
| | | | Horizontal | Vertical |
| 1. | Transmitting | 2402MHz (CH0) | # 1, 2 | # 7, 8 |
| 2. | | 2480MHz (CH39) | # 3, 4 | # 5, 6 |

### 3.6.1. Frequency Range 30-1000MHz

**Transmit, Frequency: 2402MHz**

Site no. : Audix NO.1 Chamber Data no. : 1
Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : HORIZONTAL
Limit : 30M-1G
Env. / Ins. : 26*C / 54% N9030A(140) Engineer : Johnny_hsueh
EUT : CEILING FAN REMOTE CONTROLLER M/N:BTR9
Power Rating : AC 120V/60Hz
Test Mode : Tx (2402MHz)

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 38.73 | 14.68 | 1.20 | 15.58 | 31.46 | 40.00 | 8.54 | Peak |
| 2 | 118.27 | 12.36 | 2.30 | 11.42 | 26.08 | 43.50 | 17.42 | Peak |
| 3 | 286.08 | 13.56 | 3.80 | 10.68 | 28.04 | 46.00 | 17.96 | Peak |
| 4 | 416.06 | 16.70 | 5.10 | 6.20 | 28.00 | 46.00 | 18.00 | Peak |
| 5 | 511.12 | 17.95 | 6.80 | 13.01 | 37.76 | 46.00 | 8.24 | Peak |
| 6 | 924.34 | 21.85 | 7.40 | 2.34 | 31.59 | 46.00 | 14.41 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

---

Site no. : Audix NO.1 Chamber Data no. : 2
Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : VERTICAL
Limit : 30M-1G
Env. / Ins. : 26*C / 54% N9030A(140) Engineer : Johnny_hsueh
EUT : CEILING FAN REMOTE CONTROLLER M/N:BTR9
Power Rating : AC 120V/60Hz
Test Mode : Tx (2402MHz)

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 30.00 | 19.80 | 1.10 | 10.50 | 31.40 | 40.00 | 8.60 | Peak |
| 2 | 104.69 | 11.75 | 2.15 | 13.17 | 27.07 | 43.50 | 16.43 | Peak |
| 3 | 140.58 | 11.65 | 2.50 | 23.71 | 37.86 | 43.50 | 5.64 | Peak |
| 4 | 187.14 | 9.66 | 2.90 | 21.04 | 33.60 | 43.50 | 9.90 | Peak |
| 5 | 301.60 | 13.95 | 3.90 | 21.39 | 39.24 | 46.00 | 6.76 | Peak |
| 6 | 967.02 | 22.17 | 7.70 | 1.02 | 30.89 | 54.00 | 23.11 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

## Transmit, Frequency: 2440MHz

Site no. : Audix NO.1 Chamber Data no. : 1
Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : HORIZONTAL
Limit : 30M-1G
Env. / Ins. : 26*C / 54% N9030A(140) Engineer : Johnny_hsueh
EUT : CEILING FAN REMOTE CONTROLLER M/N:BTR9
Power Rating : AC 120V/60Hz
Test Mode : Tx (2440MHz)

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 102.75 | 11.57 | 2.10 | 20.72 | 34.39 | 43.50 | 9.11 | Peak |
| 2 | 153.19 | 10.99 | 2.60 | 9.98 | 23.57 | 43.50 | 19.93 | Peak |
| 3 | 288.02 | 13.58 | 3.80 | 10.83 | 28.21 | 46.00 | 17.79 | Peak |
| 4 | 416.06 | 16.70 | 5.10 | 6.37 | 28.17 | 46.00 | 17.83 | Peak |
| 5 | 468.44 | 17.36 | 5.80 | 6.30 | 29.46 | 46.00 | 16.54 | Peak |
| 6 | 973.81 | 22.20 | 7.70 | 2.29 | 32.19 | 54.00 | 21.81 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

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Site no. : Audix NO.1 Chamber Data no. : 2
Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : VERTICAL
Limit : 30M-1G
Env. / Ins. : 26*C / 54% N9030A(140) Engineer : Johnny_hsueh
EUT : CEILING FAN REMOTE CONTROLLER M/N:BTR9
Power Rating : AC 120V/60Hz
Test Mode : Tx (2440MHz)

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 30.97 | 19.24 | 1.10 | 10.02 | 30.36 | 40.00 | 9.64 | Peak |
| 2 | 51.34 | 9.07 | 1.50 | 19.64 | 30.21 | 40.00 | 9.79 | Peak |
| 3 | 109.54 | 12.20 | 2.20 | 20.37 | 34.77 | 43.50 | 8.73 | Peak |
| 4 | 433.52 | 16.90 | 5.24 | 12.75 | 34.89 | 46.00 | 11.11 | Peak |
| 5 | 579.02 | 18.79 | 6.40 | 4.66 | 29.85 | 46.00 | 16.15 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

## Transmit, Frequency: 2480MHz

Site no. : Audix NO.1 Chamber Data no. : 1
Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : HORIZONTAL
Limit : 30M-1G
Env. / Ins. : 26*C / 54% N9030A(140) Engineer : Johnny_hsueh
EUT : CEILING FAN REMOTE CONTROLLER M/N:BTR9
Power Rating : AC 120V/60Hz
Test Mode : Tx (2480MHz)

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 94.02 | 10.16 | 2.00 | 15.88 | 28.04 | 43.50 | 15.46 | Peak |
| 2 | 153.19 | 10.99 | 2.60 | 10.81 | 24.40 | 43.50 | 19.10 | Peak |
| 3 | 222.06 | 10.80 | 3.30 | 14.71 | 28.81 | 46.00 | 17.19 | Peak |
| 4 | 290.93 | 13.63 | 3.90 | 11.01 | 28.54 | 46.00 | 17.46 | Peak |
| 5 | 468.44 | 17.36 | 5.80 | 6.67 | 29.83 | 46.00 | 16.17 | Peak |
| 6 | 932.10 | 21.92 | 7.50 | 1.40 | 30.82 | 46.00 | 15.18 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

---

Site no. : Audix NO.1 Chamber Data no. : 2
Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : VERTICAL
Limit : 30M-1G
Env. / Ins. : 26*C / 54% N9030A(140) Engineer : Johnny_hsueh
EUT : CEILING FAN REMOTE CONTROLLER M/N:BTR9
Power Rating : AC 120V/60Hz
Test Mode : Tx (2480MHz)

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 30.00 | 19.80 | 1.10 | 10.67 | 31.57 | 40.00 | 8.43 | Peak |
| 2 | 104.69 | 11.75 | 2.15 | 18.95 | 32.85 | 43.50 | 10.65 | Peak |
| 3 | 132.82 | 12.05 | 2.40 | 15.74 | 30.19 | 43.50 | 13.31 | Peak |
| 4 | 149.31 | 11.25 | 2.60 | 13.80 | 27.65 | 43.50 | 15.85 | Peak |
| 5 | 377.26 | 15.96 | 4.60 | 4.32 | 24.88 | 46.00 | 21.12 | Peak |

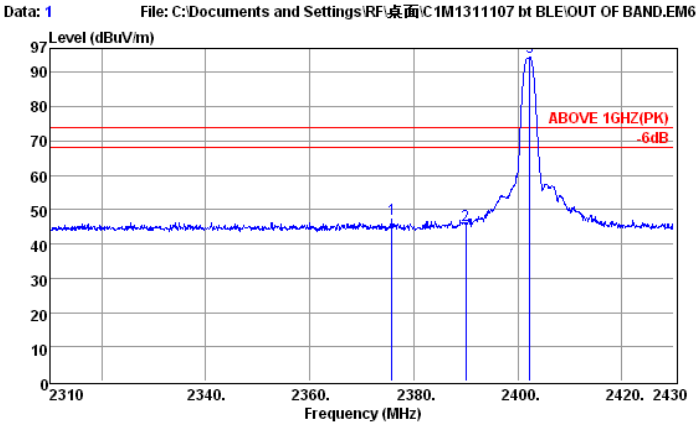
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

### 3.6.2. Restricted Bands Measurement Results

Date of Test： Nov. 28, 2013 Temperature： 26℃

EUT： Ceiling Fan Remote Controller Humidity： 54%

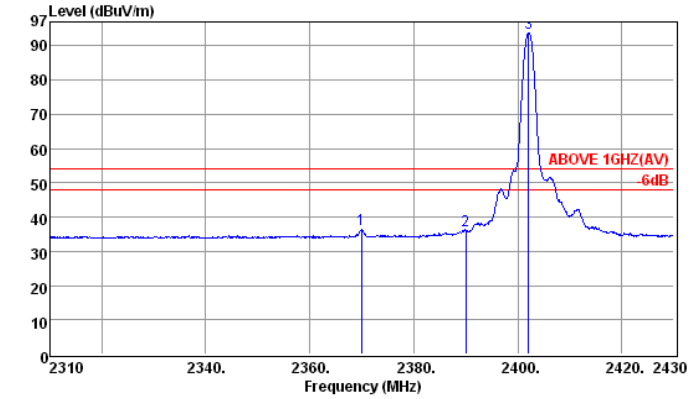
Test Mode： Transmitting Mode, Frequency: 2402MHz (CH0)




Site no. : Audix NO.1 Chamber Data no. : 1
Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
Limit : ABOVE 1GHZ(PK)
Env. / Ins. : 26*C / 54% N9030A(140) Engineer : Johnny_hsueh
EUT : CEILING FAN REMOTE CONTROLLER M/N:BTR9
Power Rating : AC 120V/60Hz
Test Mode : Tx (2402MHz)

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 2375.76 | 28.43 | 6.32 | 12.67 | 47.42 | 74.00 | 26.58 | Peak |
| 2 | 2390.04 | 28.47 | 6.34 | 10.71 | 45.52 | 74.00 | 28.48 | Peak |
| 3 | 2402.28 | 28.47 | 6.36 | 59.54 | 94.37 | 74.00 | -20.37 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.




Site no. : Audix NO.1 Chamber Data no. : 2
Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
Limit : ABOVE 1GHZ(AV)
Env. / Ins. : 26*C / 54% N9030A(140) Engineer : Johnny_hsueh
EUT : CEILING FAN REMOTE CONTROLLER M/N:BTR9
Power Rating : AC 120V/60Hz
Test Mode : Tx (2402MHz)

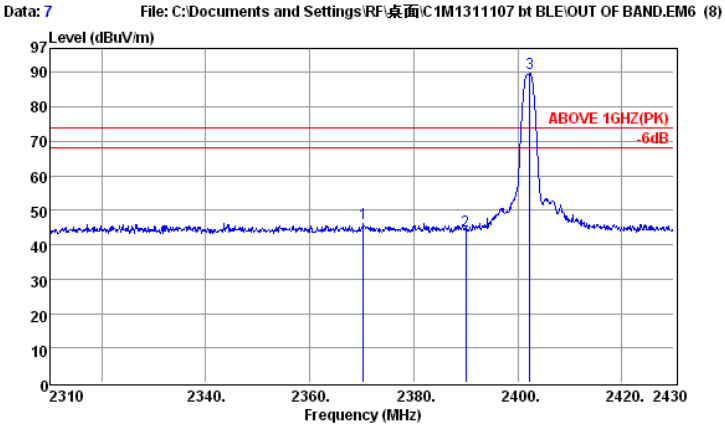
| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 2370.00 | 28.43 | 6.31 | 1.58 | 36.32 | 54.00 | 17.68 | Average |
| 2 | 2390.04 | 28.47 | 6.34 | 1.15 | 35.96 | 54.00 | 18.04 | Average |
| 3 | 2402.04 | 28.47 | 6.36 | 58.97 | 93.80 | 54.00 | -39.80 | Average |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Date of Test： Nov. 28, 2013 Temperature： 26℃

EUT： Ceiling Fan Remote Controller Humidity： 54%

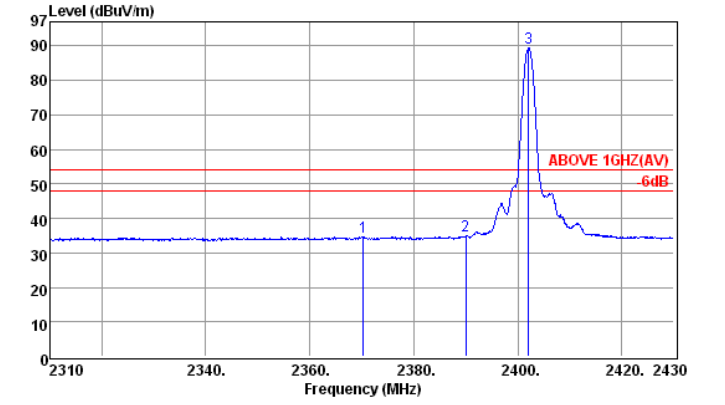
Test Mode： Transmitting Mode, Frequency: 2402MHz (CH0)




Site no. : Audix NO.1 Chamber Data no. : 7
Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
Limit : ABOVE 1GHZ(PK)
Env. / Ins. : 26*C / 54% N9030A(140) Engineer : Johnny_hsueh
EUT : CEILING FAN REMOTE CONTROLLER M/N:BTR9
Power Rating : AC 120V/60Hz
Test Mode : Tx (2402MHz)

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 2370.24 | 28.43 | 6.31 | 11.48 | 46.22 | 74.00 | 27.78 | Peak |
| 2 | 2390.04 | 28.47 | 6.34 | 9.20 | 44.01 | 74.00 | 29.99 | Peak |
| 3 | 2402.28 | 28.47 | 6.36 | 55.02 | 89.85 | 74.00 | -15.85 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.




Site no. : Audix NO.1 Chamber Data no. : 8
Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
Limit : ABOVE 1GHZ(AV)
Env. / Ins. : 26*C / 54% N9030A(140) Engineer : Johnny_hsueh
EUT : CEILING FAN REMOTE CONTROLLER M/N:BTR9
Power Rating : AC 120V/60Hz
Test Mode : Tx (2402MHz)

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 2370.24 | 28.43 | 6.31 | 0.08 | 34.77 | 54.00 | 19.23 | Average |
| 2 | 2390.04 | 28.47 | 6.34 | 0.11 | 34.92 | 54.00 | 19.08 | Average |
| 3 | 2402.04 | 28.47 | 6.36 | 54.55 | 89.38 | 54.00 | -35.38 | Average |

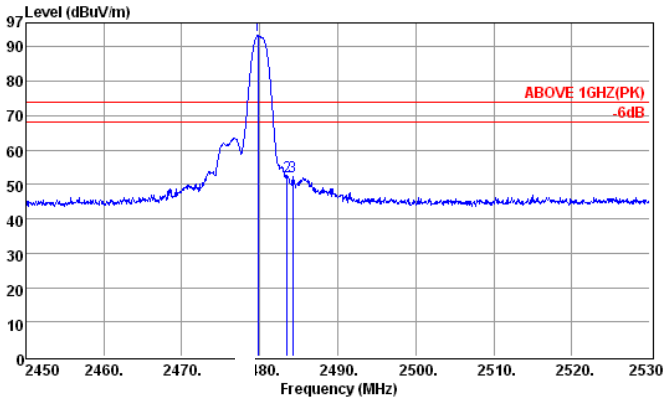
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Date of Test： Nov. 28, 2013 Temperature： 26℃

EUT： Ceiling Fan Remote Controller Humidity： 54%

Test Mode： Transmitting Mode, Frequency: 2480MHz (CH39)

Data: 3 File: C:\Documents and Settings\RF\桌面\C1M1311107 bt BLE\OUT OF BAND.EM6 (8)

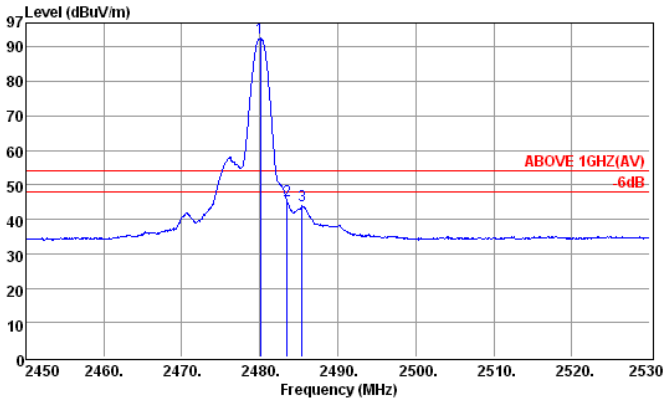



Site no. : Audix NO.1 Chamber Data no. : 3
Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
Limit : ABOVE 1GHZ(PK)
Env. / Ins. : 26*C / 54% N9030A(140) Engineer : Johnny_hsueh
EUT : CEILING FAN REMOTE CONTROLLER M/N:BTR9
Power Rating : AC 120V/60Hz
Test Mode : Tx (2480MHz)

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 2479.76 | 28.66 | 6.44 | 58.16 | 93.26 | 74.00 | -19.26 | Peak |
| 2 | 2483.52 | 28.66 | 6.45 | 17.30 | 52.41 | 74.00 | 21.59 | Peak |
| 3 | 2484.24 | 28.66 | 6.45 | 17.31 | 52.42 | 74.00 | 21.58 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Data: 4 File: C:\Documents and Settings\RF\桌面\C1M1311107 bt BLE\OUT OF BAND.EM6 (8)




Site no. : Audix NO.1 Chamber Data no. : 4
Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
Limit : ABOVE 1GHZ(AV)
Env. / Ins. : 26*C / 54% N9030A(140) Engineer : Johnny_hsueh
EUT : CEILING FAN REMOTE CONTROLLER M/N:BTR9
Power Rating : AC 120V/60Hz
Test Mode : Tx (2480MHz)

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 2480.08 | 28.66 | 6.44 | 57.41 | 92.51 | 54.00 | -38.51 | Average |
| 2 | 2483.52 | 28.66 | 6.45 | 10.36 | 45.47 | 54.00 | 8.53 | Average |
| 3 | 2485.44 | 28.66 | 6.45 | 8.71 | 43.82 | 54.00 | 10.18 | Average |

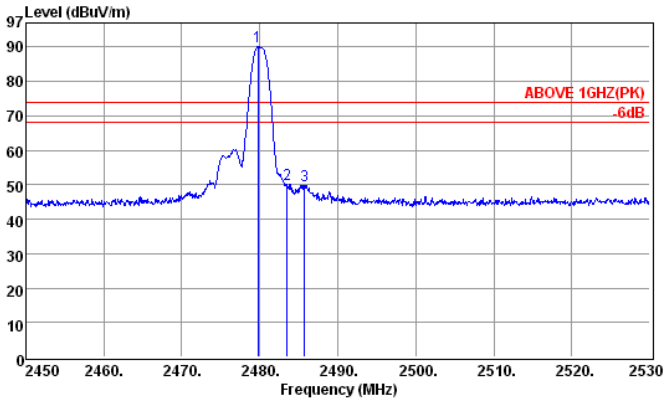
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Date of Test： Nov. 28, 2013 Temperature： 26℃

EUT： Ceiling Fan Remote Controller Humidity： 54%

Test Mode： Transmitting Mode, Frequency: 2480MHz (CH39)

Data: 5 File: C:\Documents and Settings\RF\桌面\C1M1311107 bt BLE\OUT OF BAND.EM6 (8)

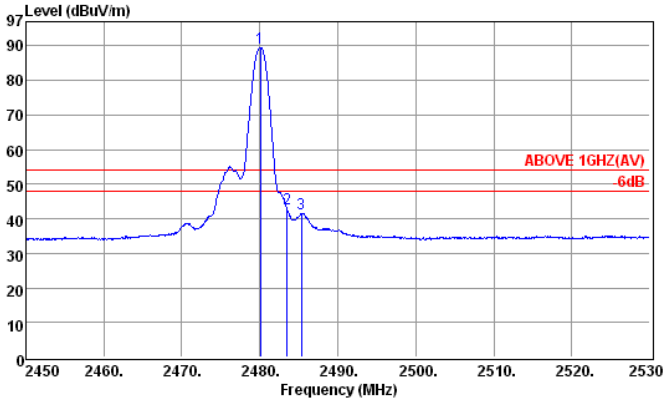



Site no. : Audix NO.1 Chamber Data no. : 5
Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
Limit : ABOVE 1GHZ(PK)
Env. / Ins. : 26*C / 54% N9030A(140) Engineer : Johnny_hsueh
EUT : CEILING FAN REMOTE CONTROLLER M/N:BTR9
Power Rating : AC 120V/60Hz
Test Mode : Tx (2480MHz)

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 2479.76 | 28.66 | 6.44 | 55.03 | 90.13 | 74.00 | -16.13 | Peak |
| 2 | 2483.52 | 28.66 | 6.45 | 14.92 | 50.03 | 74.00 | 23.97 | Peak |
| 3 | 2485.76 | 28.66 | 6.45 | 14.80 | 49.91 | 74.00 | 24.09 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Data: 6 File: C:\Documents and Settings\RF\桌面\C1M1311107 bt BLE\OUT OF BAND.EM6 (8)




Site no. : Audix NO.1 Chamber Data no. : 6
Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
Limit : ABOVE 1GHZ(AV)
Env. / Ins. : 26*C / 54% N9030A(140) Engineer : Johnny_hsueh
EUT : CEILING FAN REMOTE CONTROLLER M/N:BTR9
Power Rating : AC 120V/60Hz
Test Mode : Tx (2480MHz)

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 2480.08 | 28.66 | 6.44 | 54.49 | 89.59 | 54.00 | -35.59 | Average |
| 2 | 2483.52 | 28.66 | 6.45 | 7.82 | 42.93 | 54.00 | 11.07 | Average |
| 3 | 2485.86 | 28.66 | 6.45 | 6.49 | 41.60 | 54.00 | 12.40 | Average |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

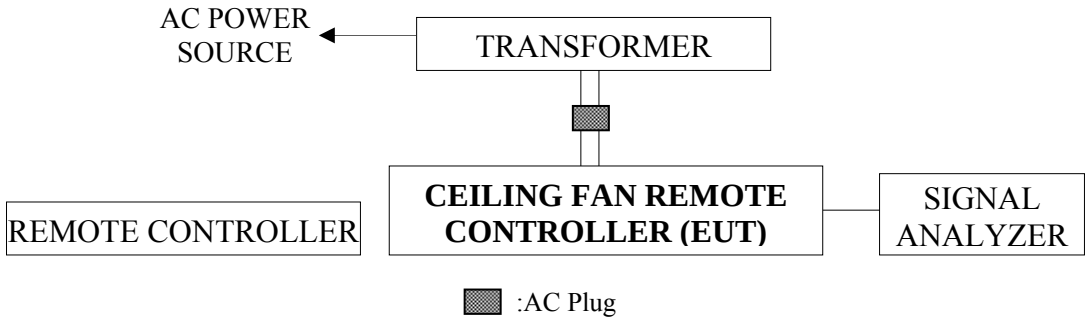
# 4. 6dB BANDWIDTH MEASUREMENT

## 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 | N9030A-544 | US51350140 | Jul. 30, 13' | Jul. 29, 14' |

## 4.2. Block Diagram of Test Setup




## 4.3. Specification Limits [§15.247(a)(2)]

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

## 4.4. Operating Condition of EUT

4.4.1. Set up the EUT and simulator as shown on 4.2.

4.4.2. To turn on the power of all equipment.

4.4.3. The **EUT (Ceiling Fan Remote Controller)** was on transmitting function with the remote controller at work during all testing.

## 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 1.5% EBW, VBW≥3xRBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.
The measurement guideline was according to KDB 558074 D01 V03.

## 4.6. Test Results

**PASSED.** All the test results are attached in next pages.

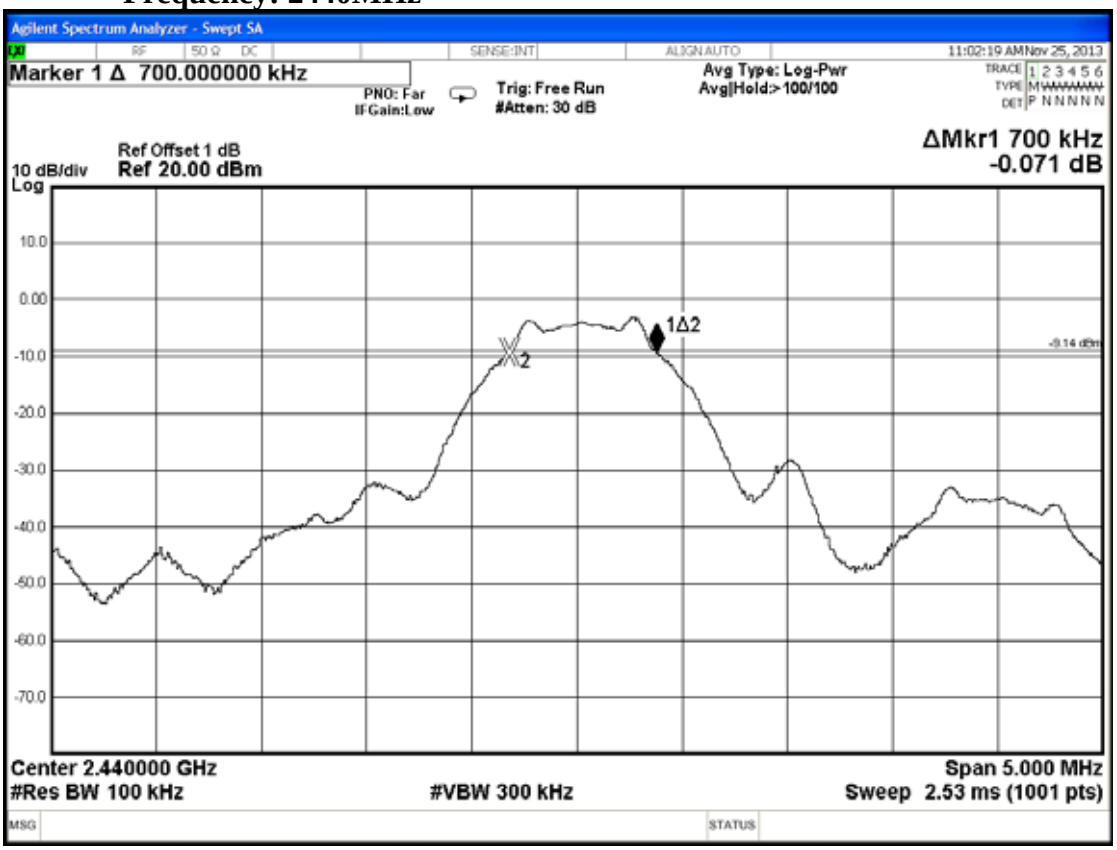
Test Date : Nov. 25, 2013 Temperature : 26℃ Humidity : 54%

| Mode | Channel | Frequency | **6dB Bandwidth** |
|---|---|---|---|
| 1. | CH0 | 2402MHz | **0.710MHz** |
| 2. | CH19 | 2440MHz | **0.700MHz** |
| 3. | CH39 | 2480MHz | **0.735MHz** |

**[Limit: least 500kHz]**

**Frequency: 2402MHz**


**Frequency: 2440MHz**



**Frequency: 2480MHz**

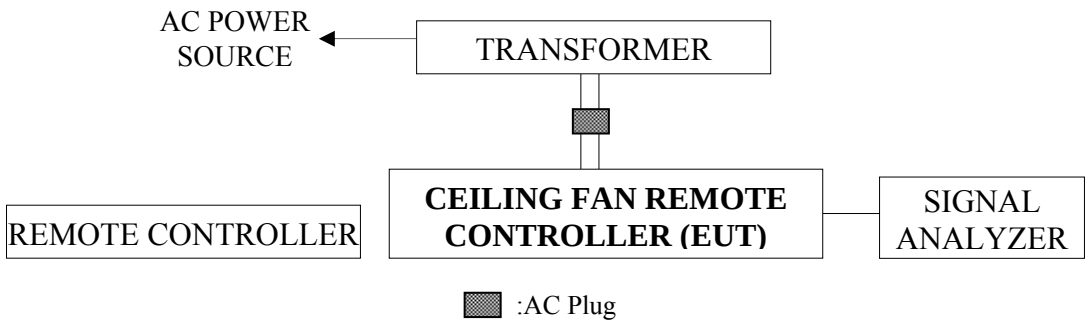
# 5. MAXIMUM PEAK OUTPUT POWER MEASUREMENT

## 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. | Power Meter | Anritsu | ML2495A | 1145008 | Oct. 23, 13' | Oct. 22, 14' |
| 2. | Power Sensor | Anritsu | MA2411B | 1126096 | Oct. 23, 13' | Oct. 22, 14' |

## 5.2. Block Diagram of Test Setup




## 5.3. Specification Limits [§15.247(b)-(3)]

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5MHz is: 1Watt. (30dBm)
Pursuant to 15.247(b)-(4), the antenna gain has 0.3dB exceed 6 dBi, thus the conducted output power limit shall be reduced by the amount 0.3dB.

## 5.4. Operating Condition of EUT

5.4.1. Set up the EUT and simulator as shown on 5.2.

5.4.2. To turn on the power of all equipment.

5.4.3. The **EUT (Ceiling Fan Remote Controller)** was on transmitting function with the remote controller at work during all testing.

## 5.5. Test Procedure

The transmitter output was connected to the power sensor and record the reading of power meter.

The measurement guideline was according to KDB 558074 D01 V03.

## 5.6. Test Results

**PASSED.** All the test results are listed below.

Test Date : Nov. 25, 2013 Temperature : 26℃ Humidity : 54%

| Mode | Channel | Frequency | Output Power(dBm) | |
|---|---|---|---|---|
| | | | **Peak** | **Average** |
| 1. | CH0 | 2402MHz | **-0.59** | **-1.5** |
| 2. | CH19 | 2440MHz | **-1.71** | **-2.94** |
| 3. | CH39 | 2480MHz | **-3.11** | **-4.53** |

**[Limit: 1Watt. (30dBm)]**

# 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 Monitor | Agilent | N9030A-544 | US51350140 | Jul. 30, 13’ | Jul. 29, 14’ |

## 6.2. Block Diagram of Test Setup

The same as section.4.2

## 6.3. Specification Limits (§15.247(c))

6.3.1.The highest level should be at least 20 dB below that in the 100kHz bandwidth.

6.3.2. The reference level for determining limit of emission limitations is according to the value measured indicated in plots at section 6.6.

## 6.4. Operating Condition of EUT

6.4.1. Set up the EUT and simulator as shown on 4.2.

6.4.2. To turn on the power of all equipment.

6.4.3. The **EUT (Ceiling Fan Remote Controller)** was on transmitting function with the remote controller at work during all testing.

## 6.5. Test Procedure

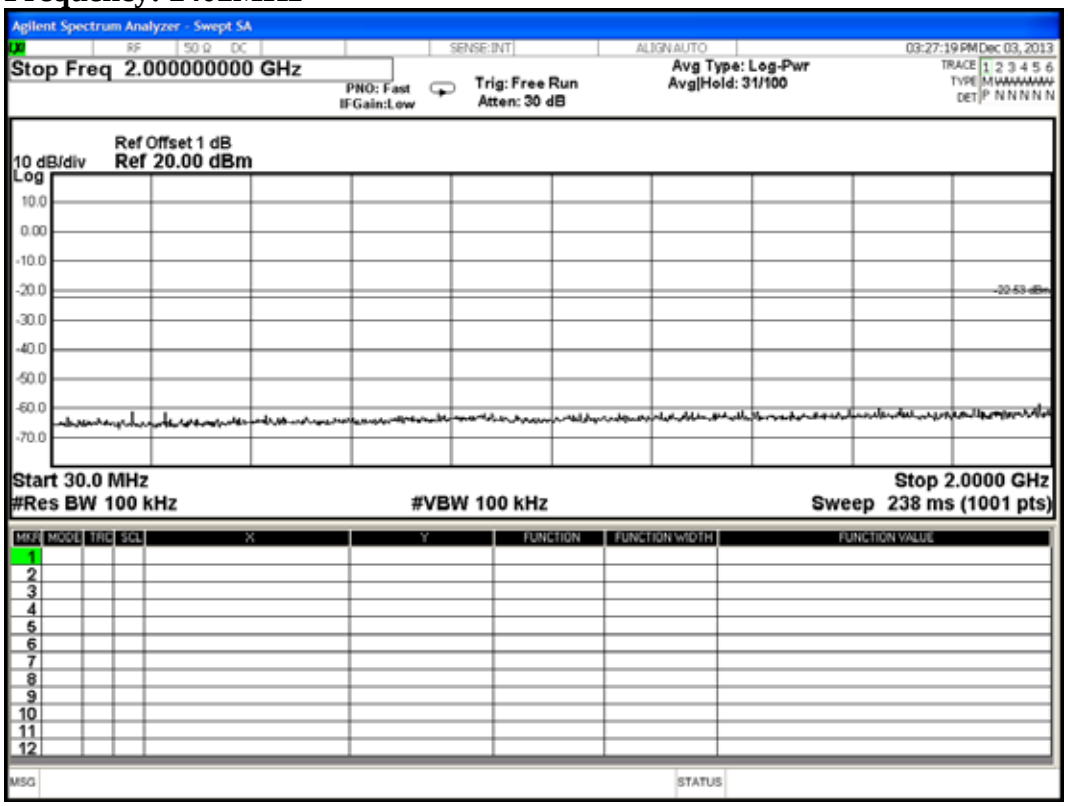
The RF output of EUT was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 100kHz RBW and 100kHz VBW.
The measurement guideline was according to KDB 558074 D01 V03.

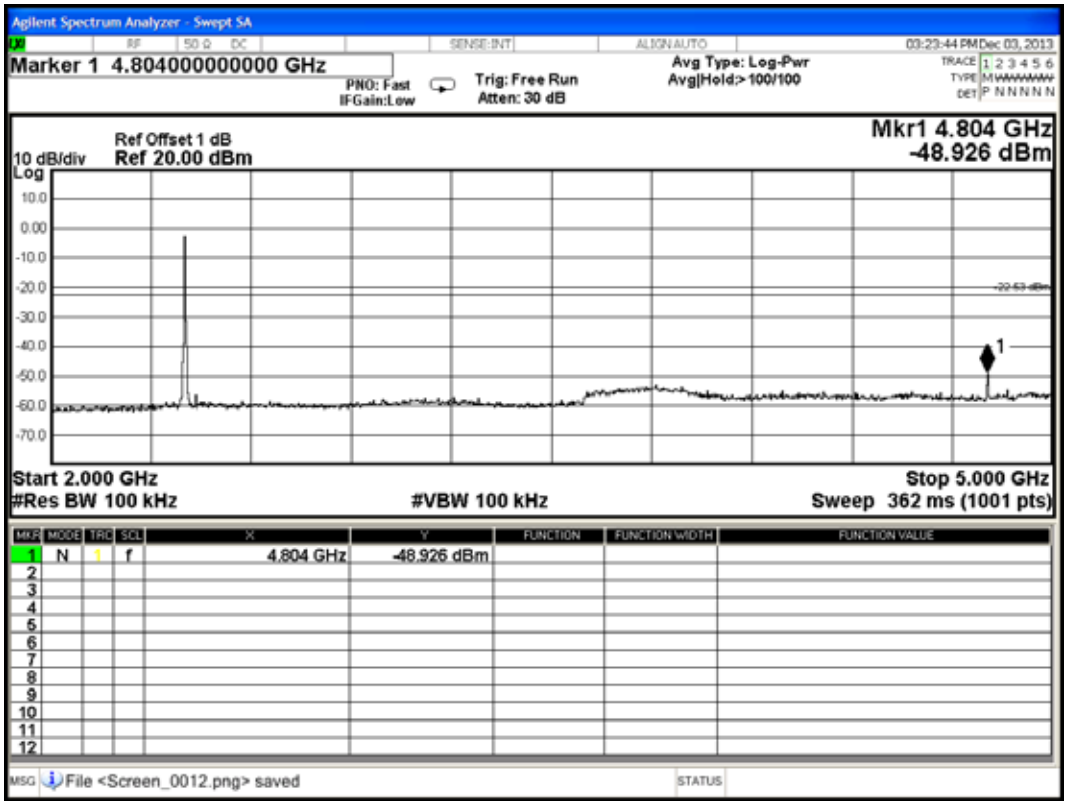
## 6.6. Test Results

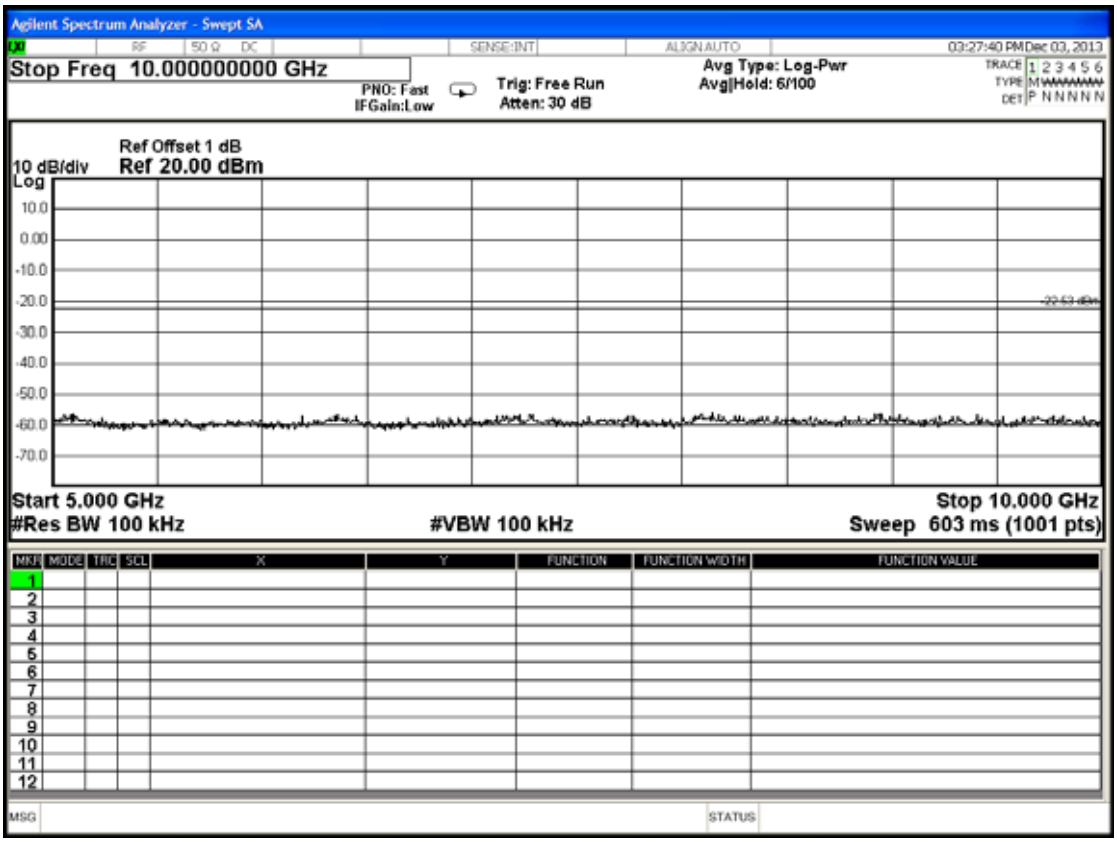
**PASSED.** The testing data was attached in the next pages.

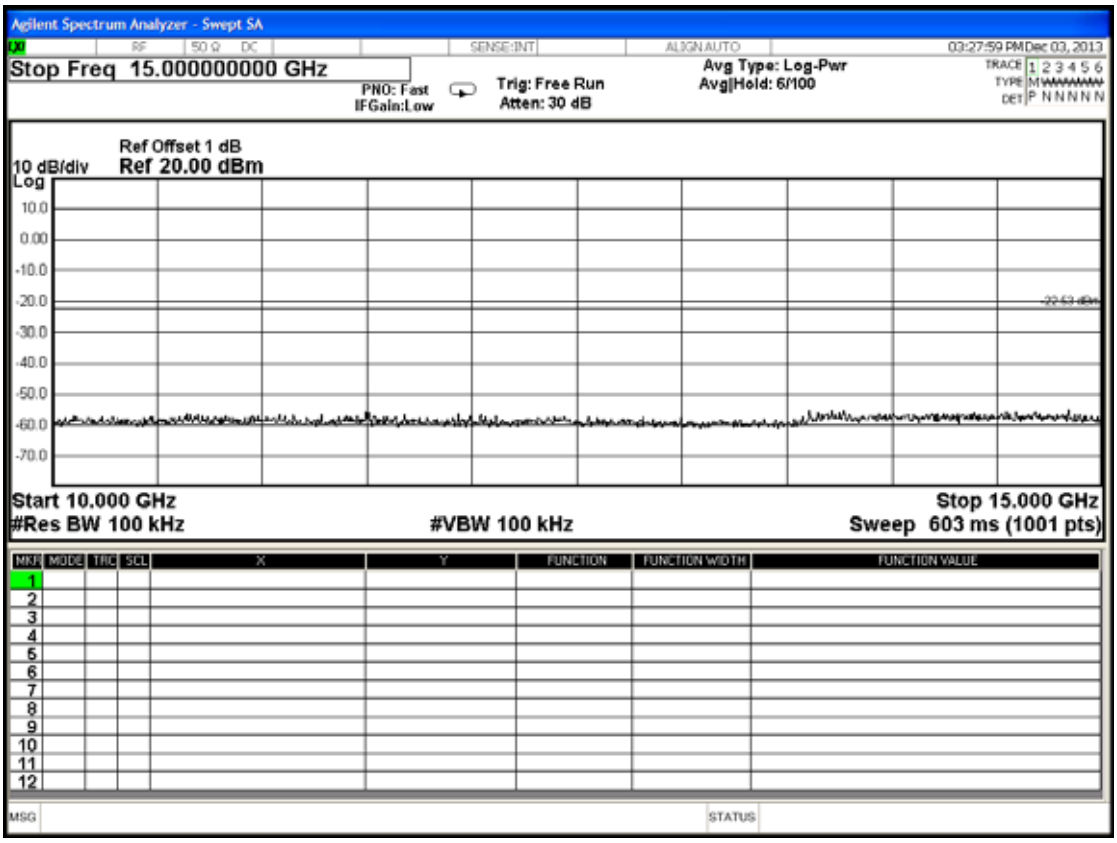
(Test Date : Dec. 03, 2013 Temperature : 25℃ Humidity : 55%)
**Remark: Reference level please refers to power spectral density measurement.**

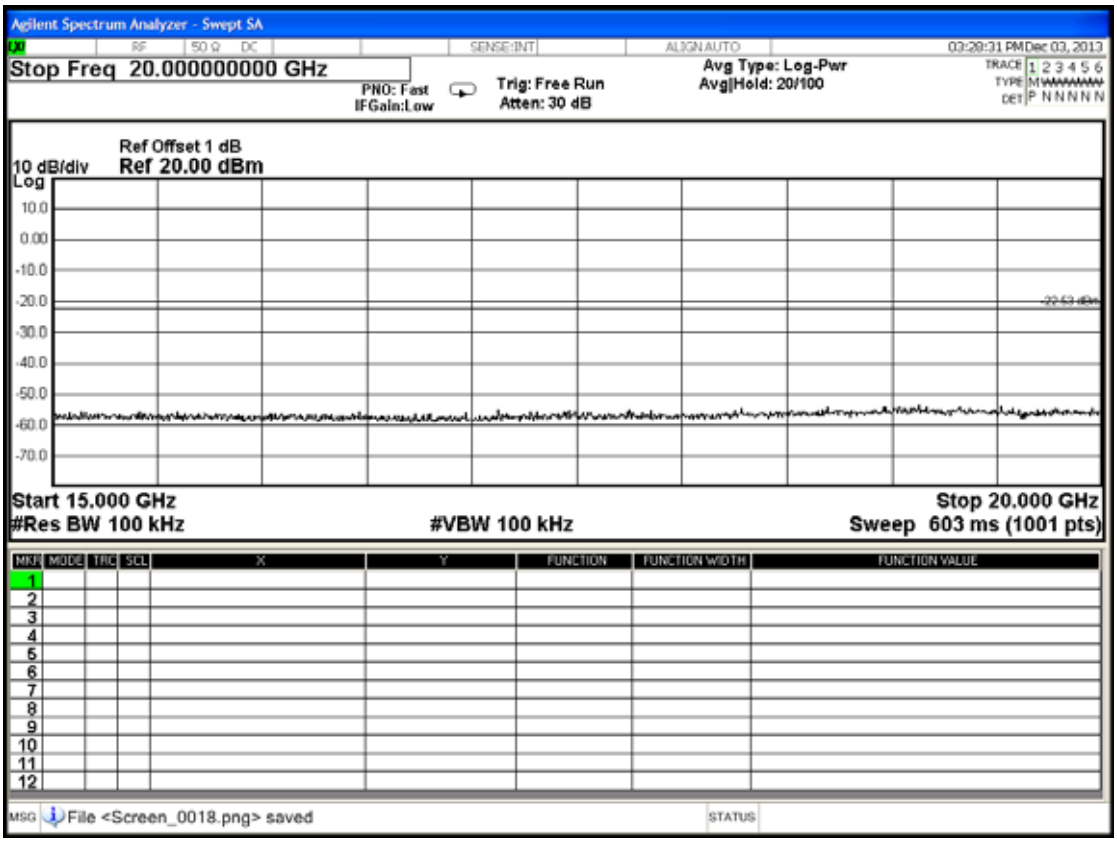
**Frequency: 2402MHz**

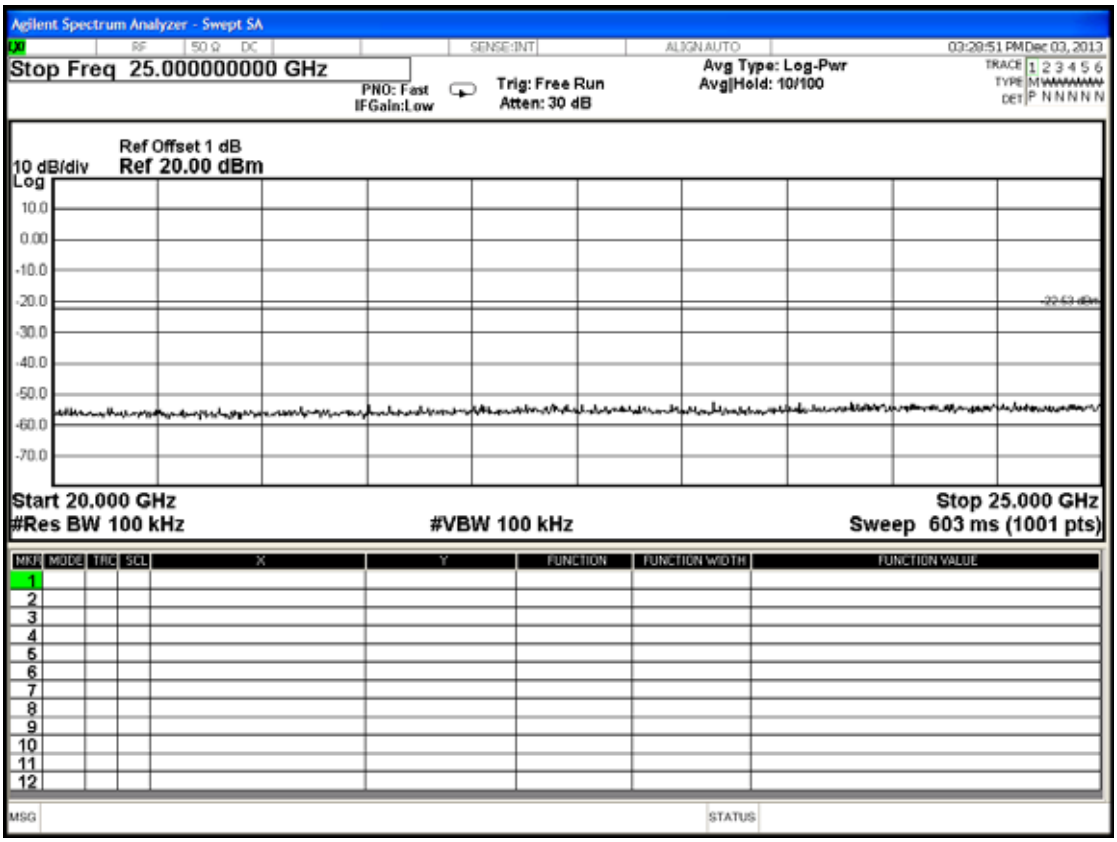


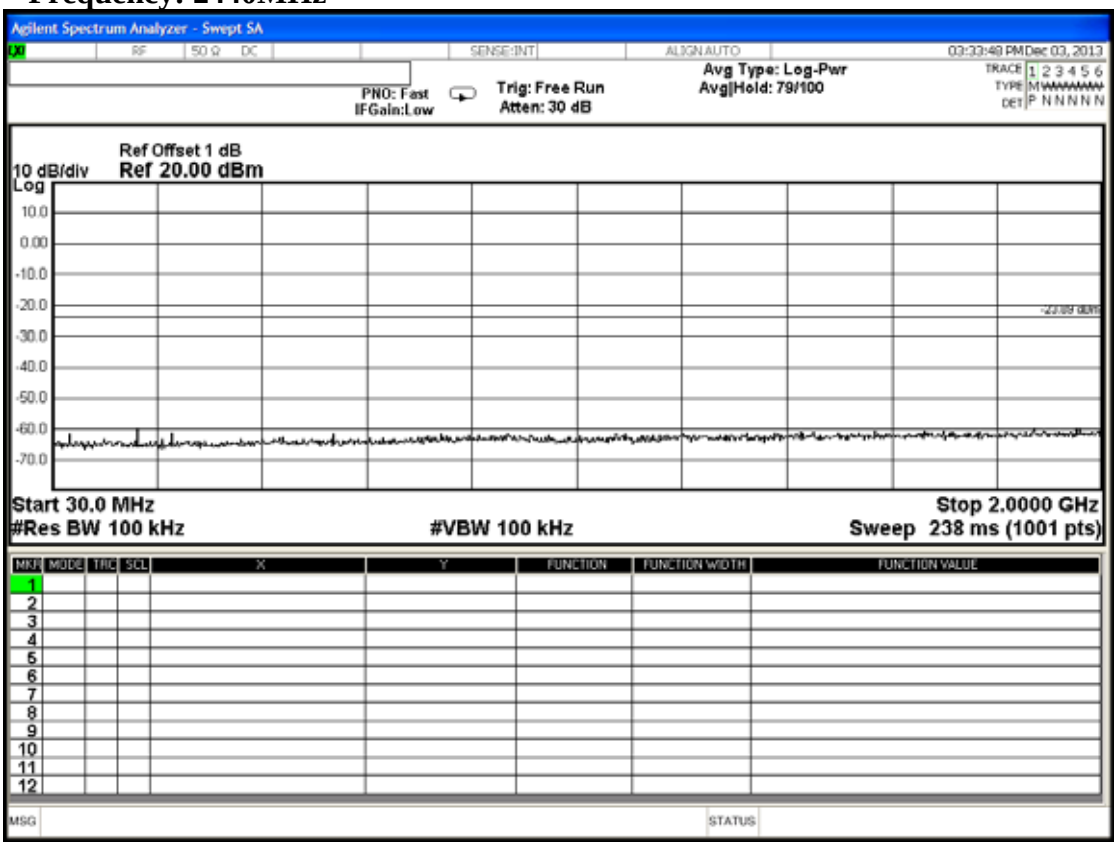

Agilent Spectrum Analyzer - Swept SA
Stop Freq 10.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 6/100
03:27:40 PM Dec 03, 2013
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 10.000 GHz
Sweep 603 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1
2
3
4
5
6
7
8
9
10
11
12
MSG
STATUS

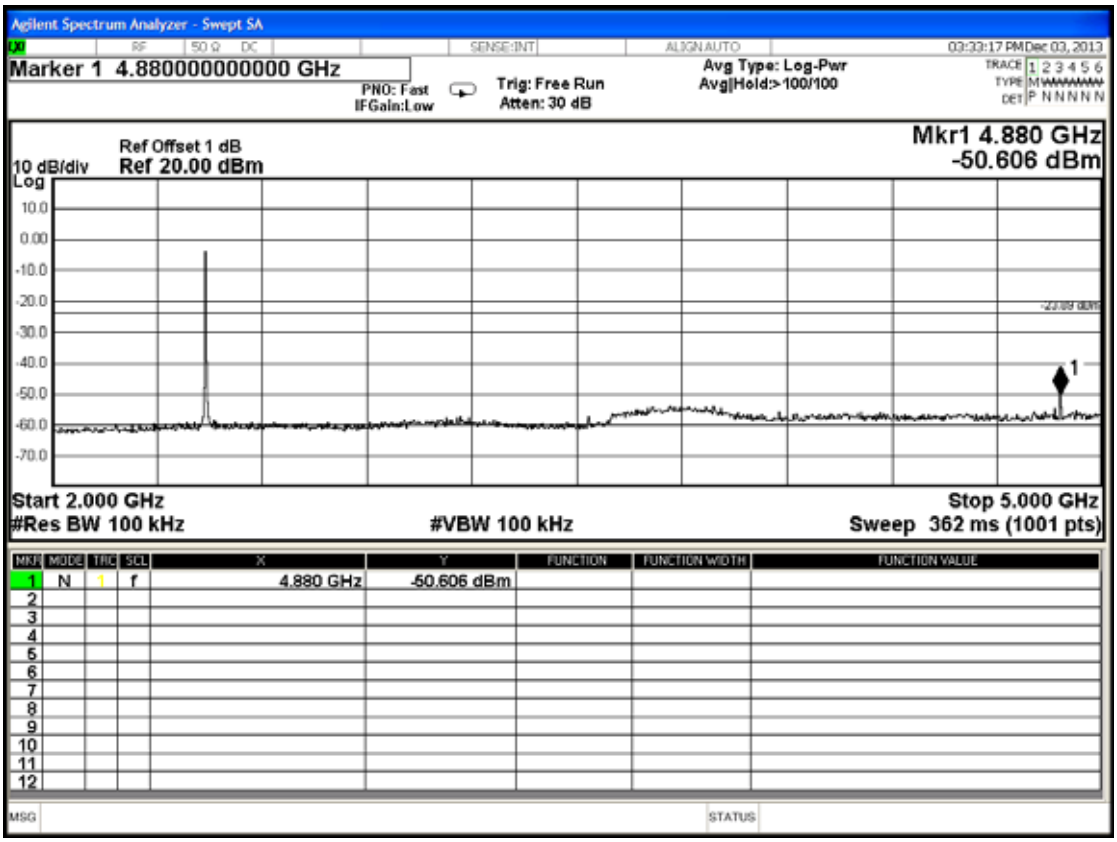

Agilent Spectrum Analyzer - Swept SA
Stop Freq 15.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 6/100
03:27:59 PM Dec 03, 2013
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 10.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 15.000 GHz
Sweep 603 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1
2
3
4
5
6
7
8
9
10
11
12
MSG
STATUS

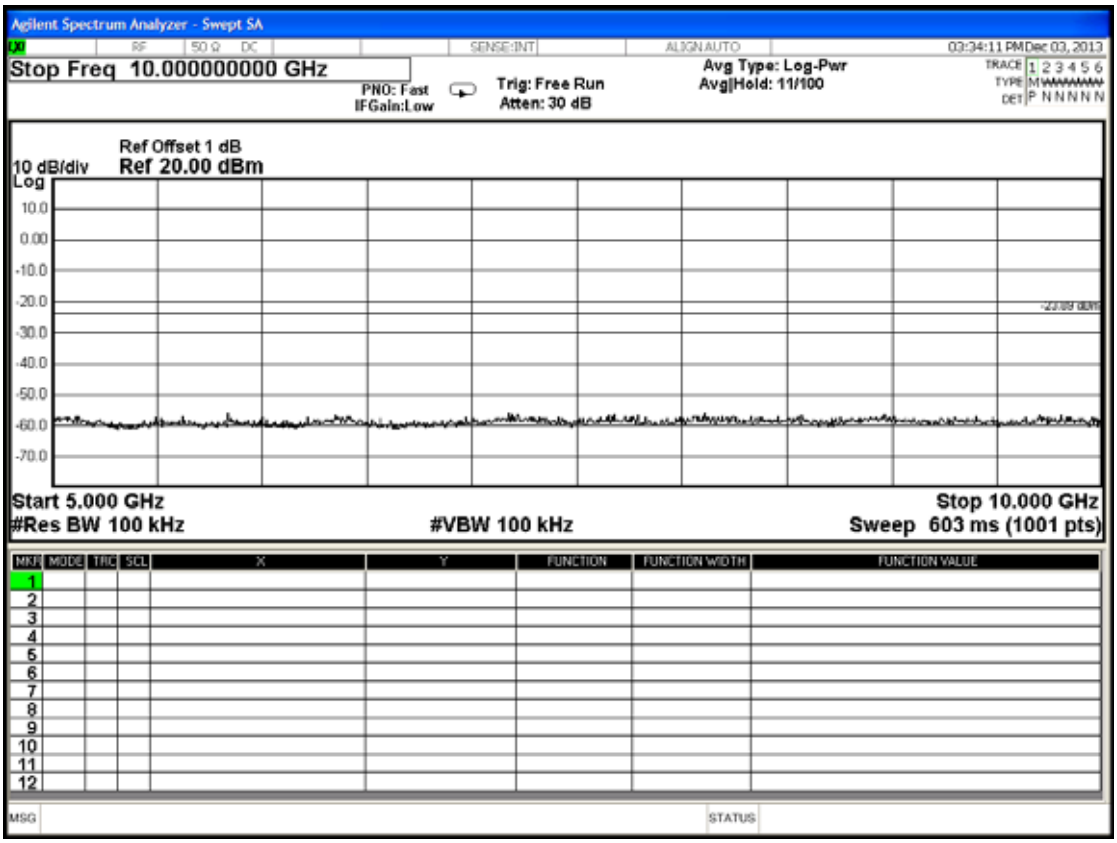

Agilent Spectrum Analyzer - Swept SA
Stop Freq 20.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 20/100
03:28:31 PM Dec 03, 2013
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-22.63 dBm
Start 15.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 20.000 GHz
Sweep 603 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1
2
3
4
5
6
7
8
9
10
11
12
MSG
File <Screen_0018.png> saved
STATUS

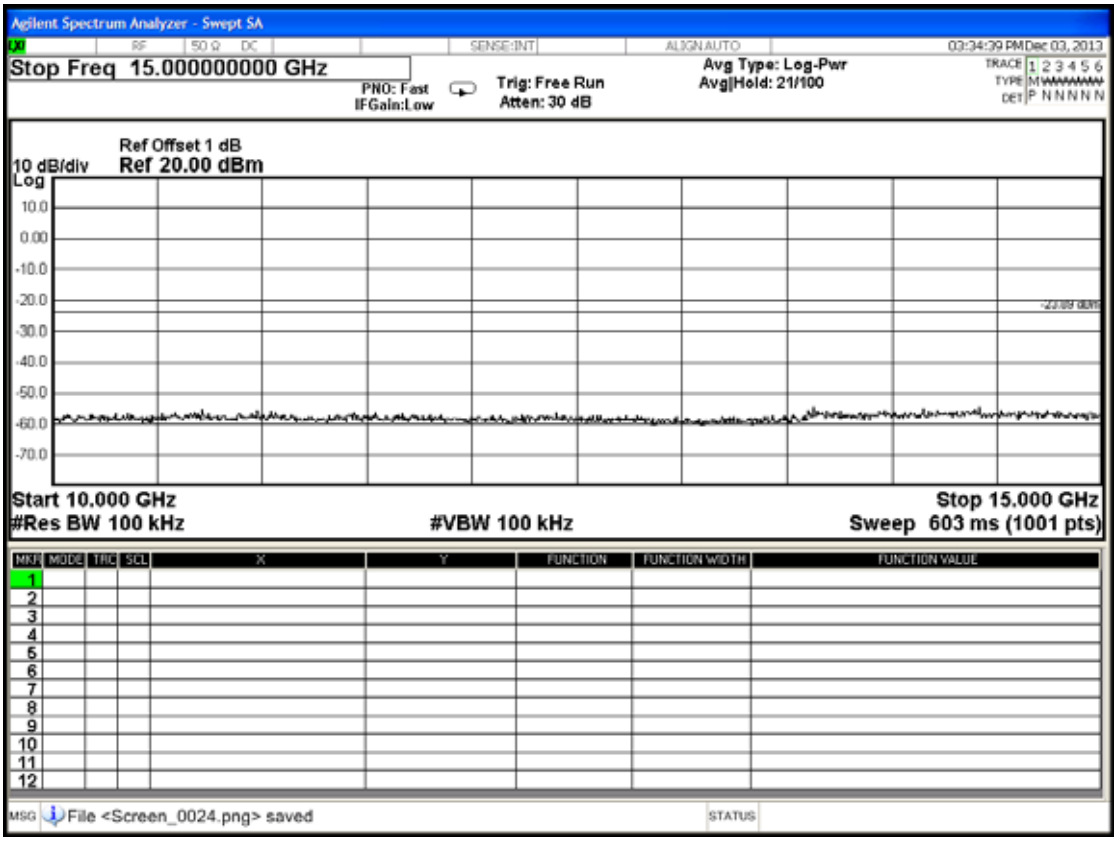

Agilent Spectrum Analyzer - Swept SA
Stop Freq 25.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/100
03:28:51 PM Dec 03, 2013
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-22.63 dBm
Start 20.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 25.000 GHz
Sweep 603 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1
2
3
4
5
6
7
8
9
10
11
12
MSG
STATUS

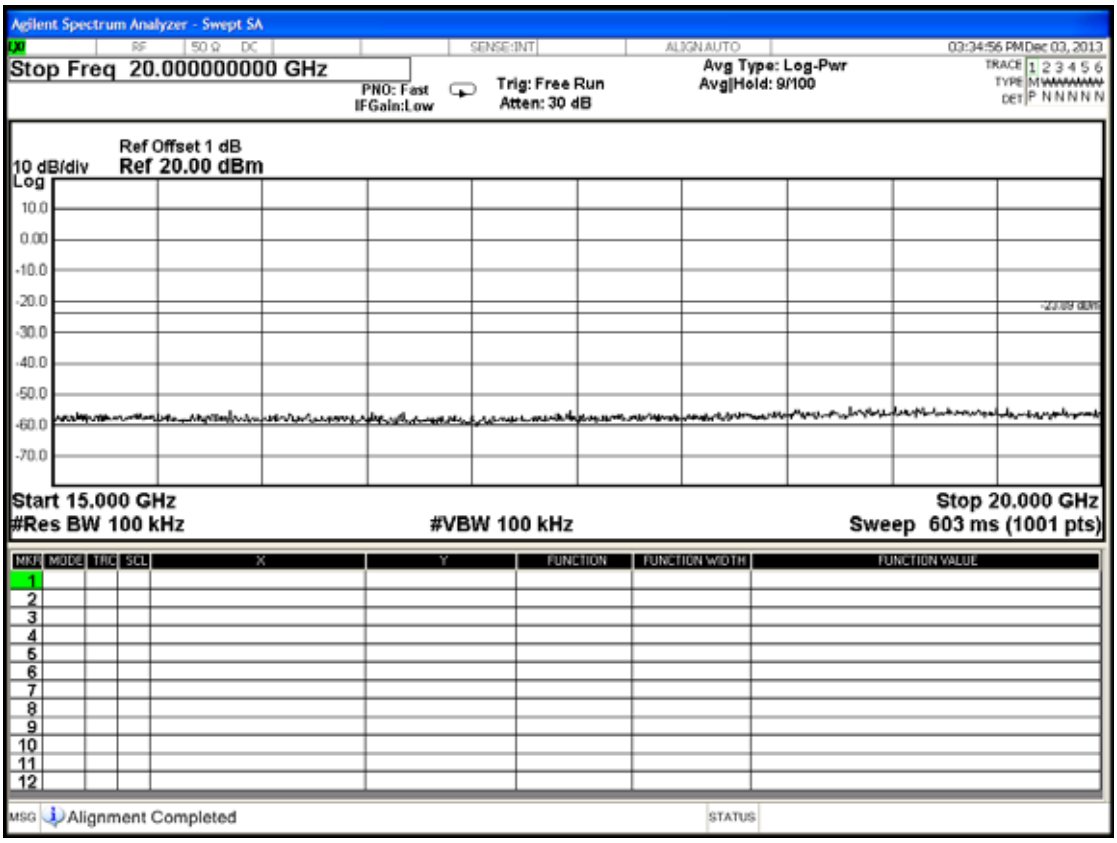
**Frequency: 2440MHz**

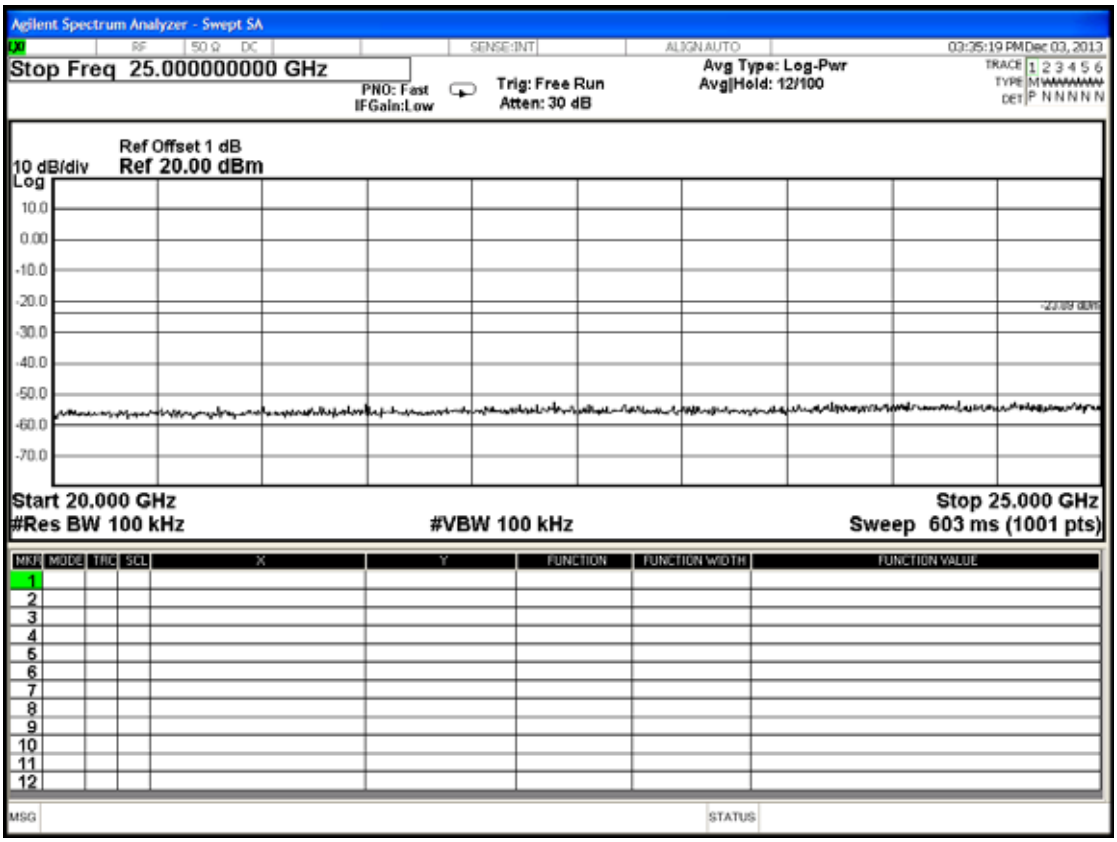


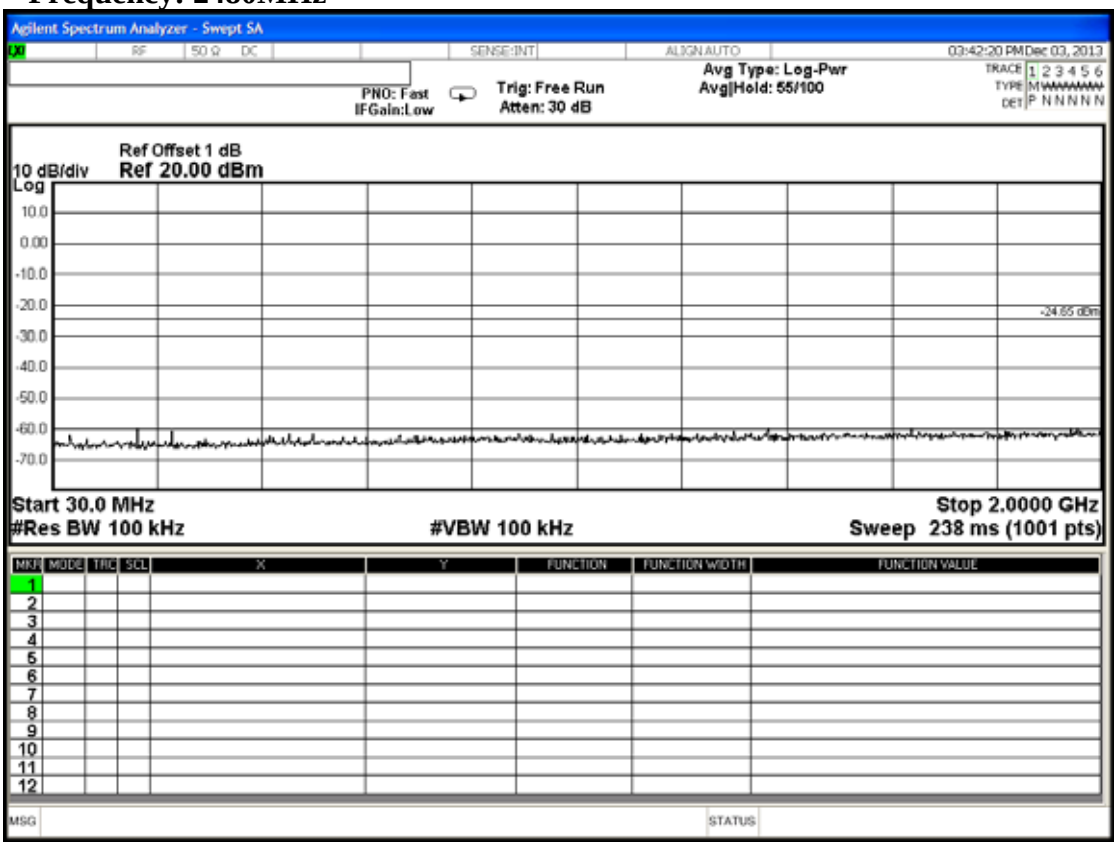

Agilent Spectrum Analyzer - Swept SA
Stop Freq 10.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 11/100
03:34:11 PM Dec 03, 2013
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
Start 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 10.000 GHz
Sweep 603 ms (1001 pts)
MSG
STATUS

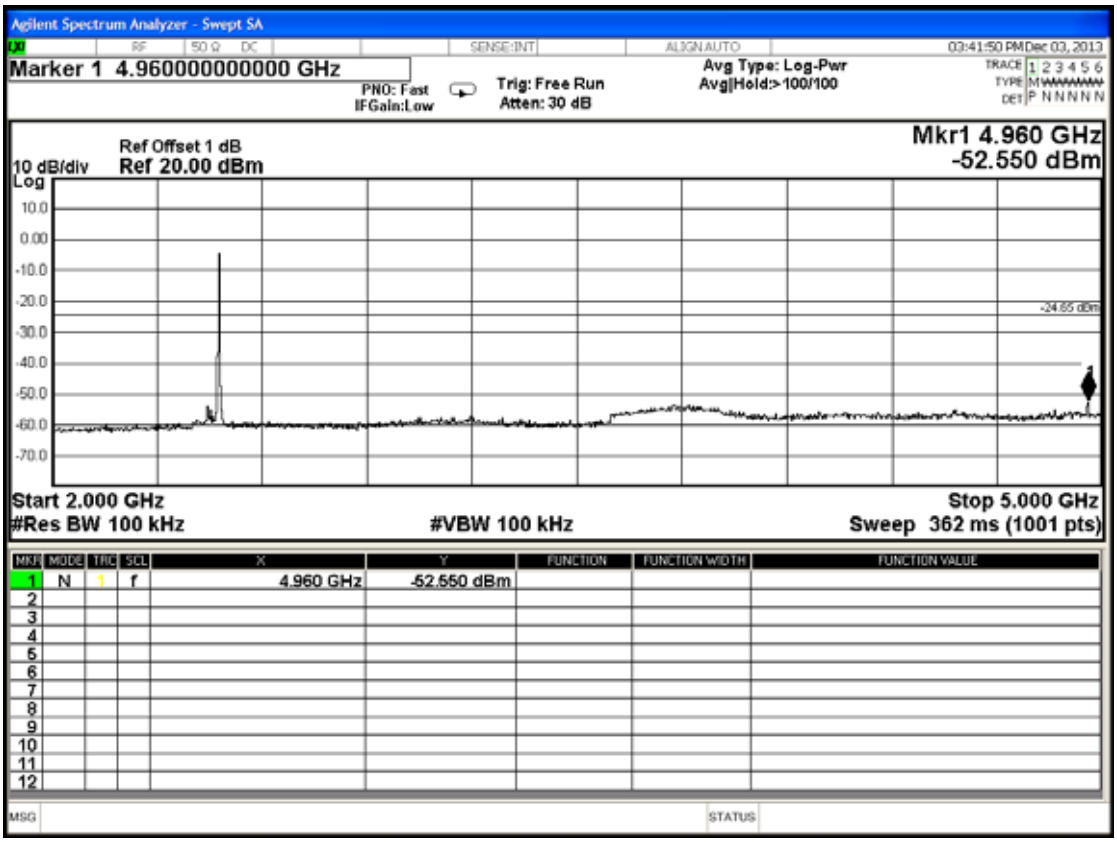

Agilent Spectrum Analyzer - Swept SA
Stop Freq 15.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 21/100
03:34:39 PM Dec 03, 2013
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
Start 10.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 15.000 GHz
Sweep 603 ms (1001 pts)
MSG
File <Screen_0024.png> saved
STATUS

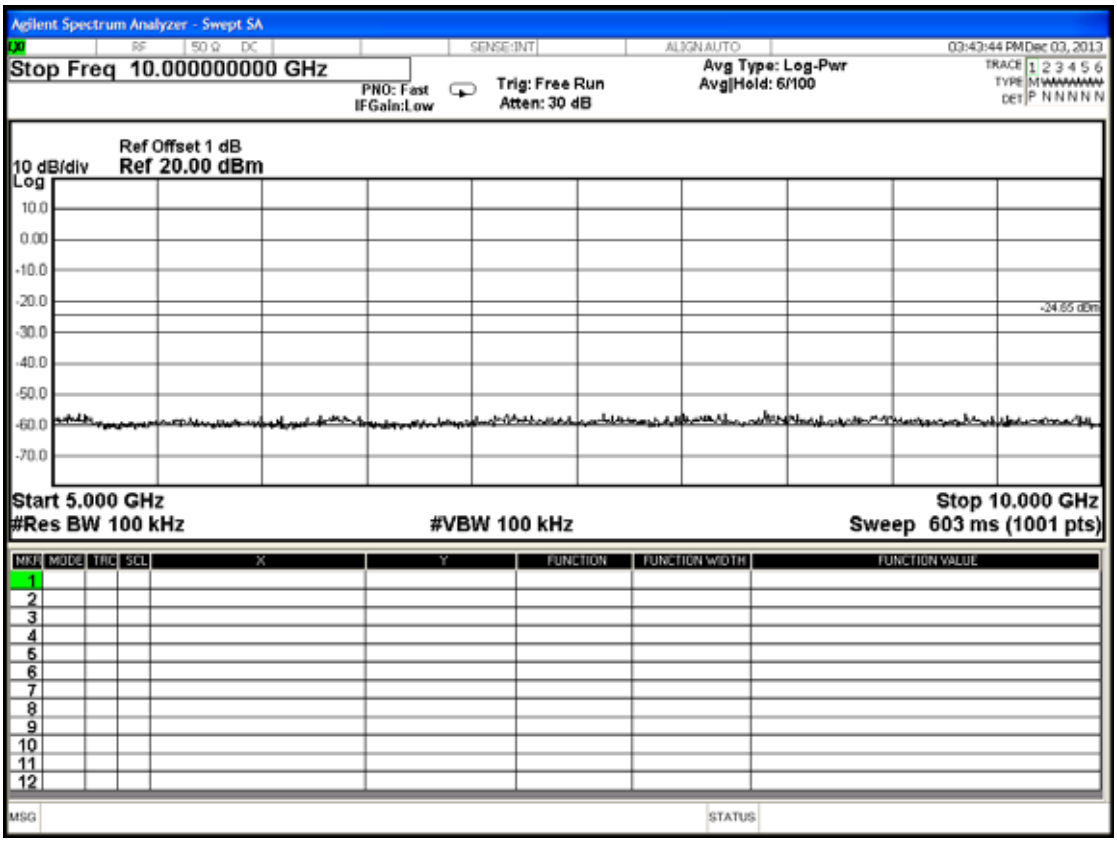

Agilent Spectrum Analyzer - Swept SA
Stop Freq 20.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 9/100
03:34:56 PM Dec 03, 2013
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
Start 15.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 20.000 GHz
Sweep 603 ms (1001 pts)
Alignment Completed

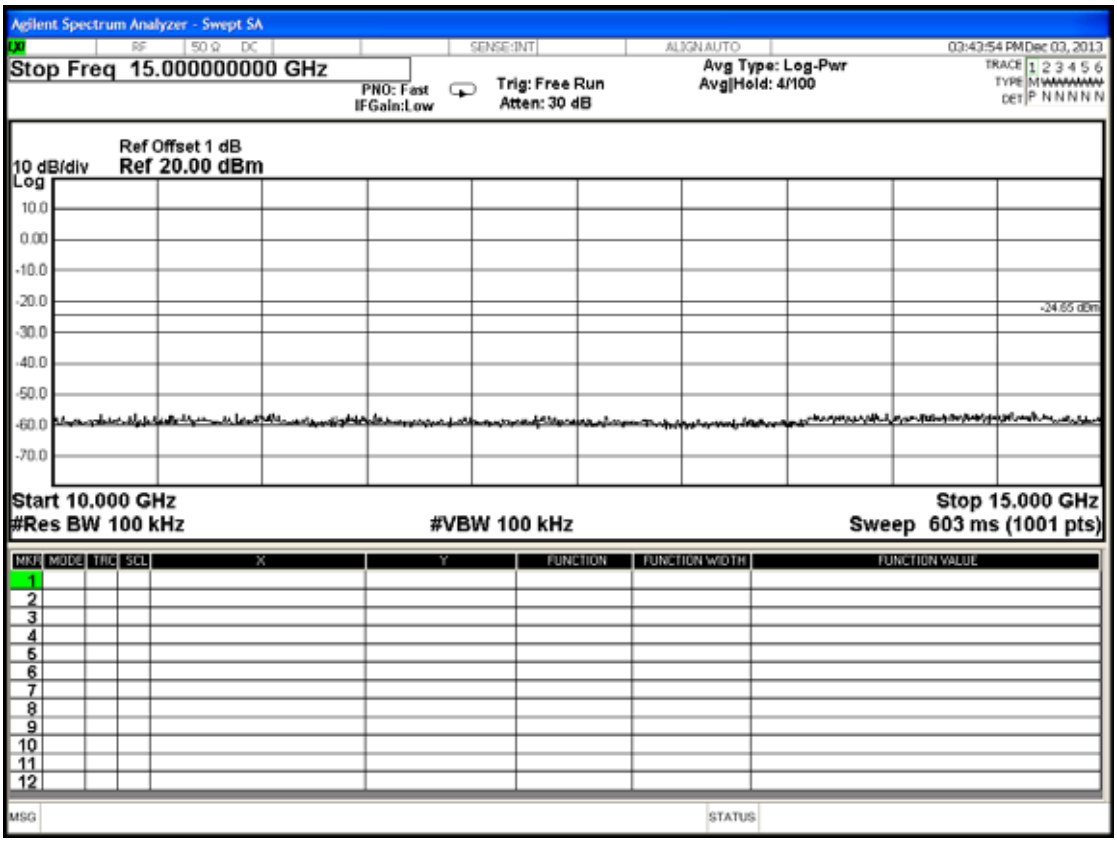

Agilent Spectrum Analyzer - Swept SA
Stop Freq 25.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 12/100
03:35:19 PM Dec 03, 2013
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
Start 20.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 25.000 GHz
Sweep 603 ms (1001 pts)

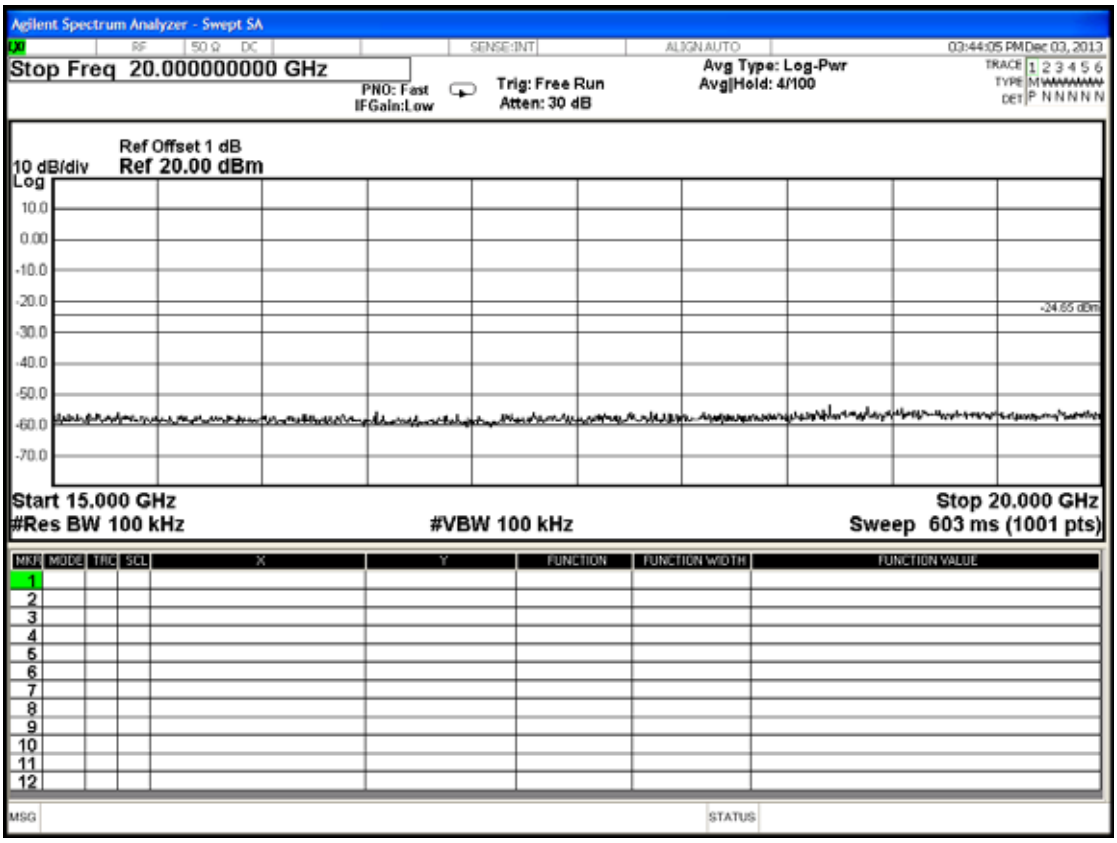
**Frequency: 2480MHz**

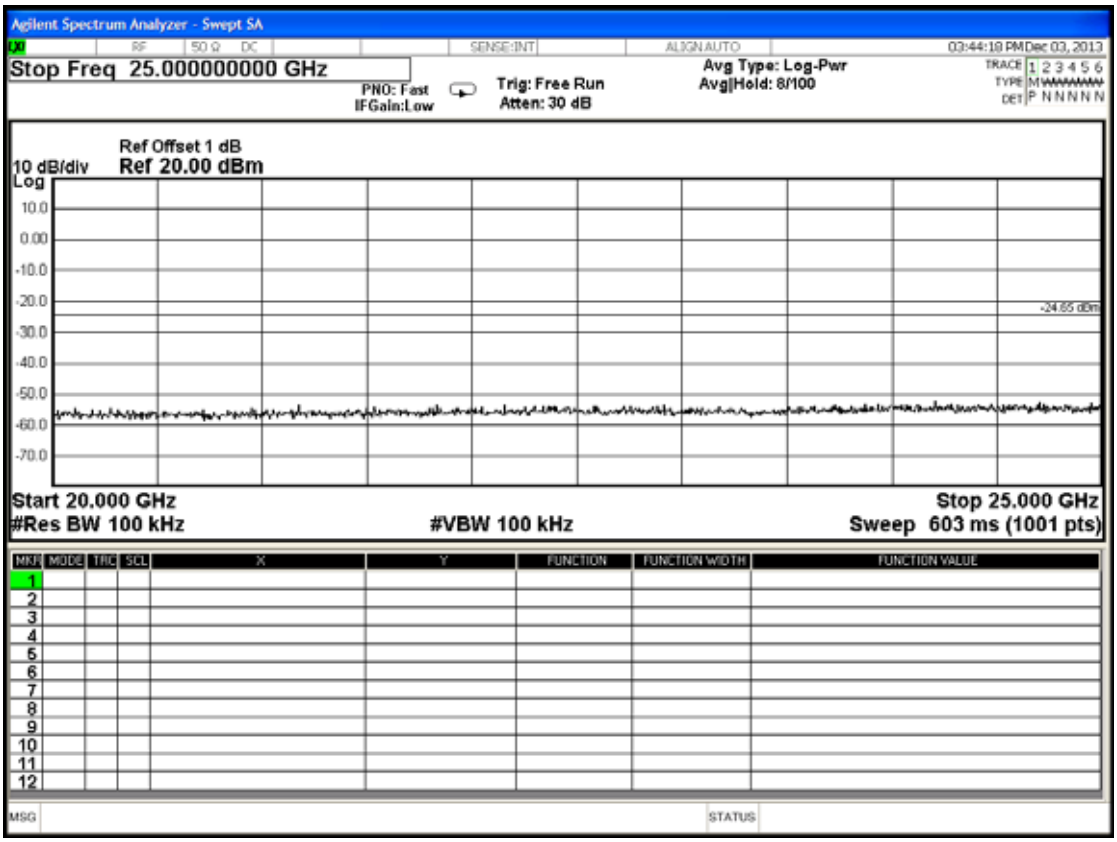



Agilent Spectrum Analyzer - Swept SA
Stop Freq 10.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 6/100
03:43:44 PM Dec 03, 2013
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
-24.65 dBm
Start 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 10.000 GHz
Sweep 603 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Stop Freq 15.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 4/100
03:43:54 PM Dec 03, 2013
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
-24.65 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 15.000 GHz
Sweep 603 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Stop Freq 20.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 4/100
03:44:05 PM Dec 03, 2013
Ref Offset 1 dB
10 dB/div
Log
Ref 20.00 dBm
-24.65 dBm
Start 15.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 20.000 GHz
Sweep 603 ms (1001 pts)
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Stop Freq 25.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 8/100
03:44:19 PM Dec 03, 2013
Ref Offset 1 dB
10 dB/div
Log
Ref 20.00 dBm
-24.65 dBm
Start 20.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 25.000 GHz
Sweep 603 ms (1001 pts)
MSG
STATUS

# 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 | N9030A-544 | US51350140 | Jul. 30, 13' | Jul. 29, 14' |

## 7.2. Block Diagram of Test Setup

The same as section.4.2.

## 7.3. Specification Limits [§15.247(c)]

The highest level should be at least 20 dB below reference level as measured in section 8.6.

## 7.4. Operating Condition of EUT

7.4.1. Set up the EUT and simulator as shown on 4.2.

7.4.2. To turn on the power of all equipment.

7.4.3. The **EUT (Ceiling Fan Remote Controller)** was on transmitting function with the remote controller at work during all testing.

## 7.5. Test Procedure

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

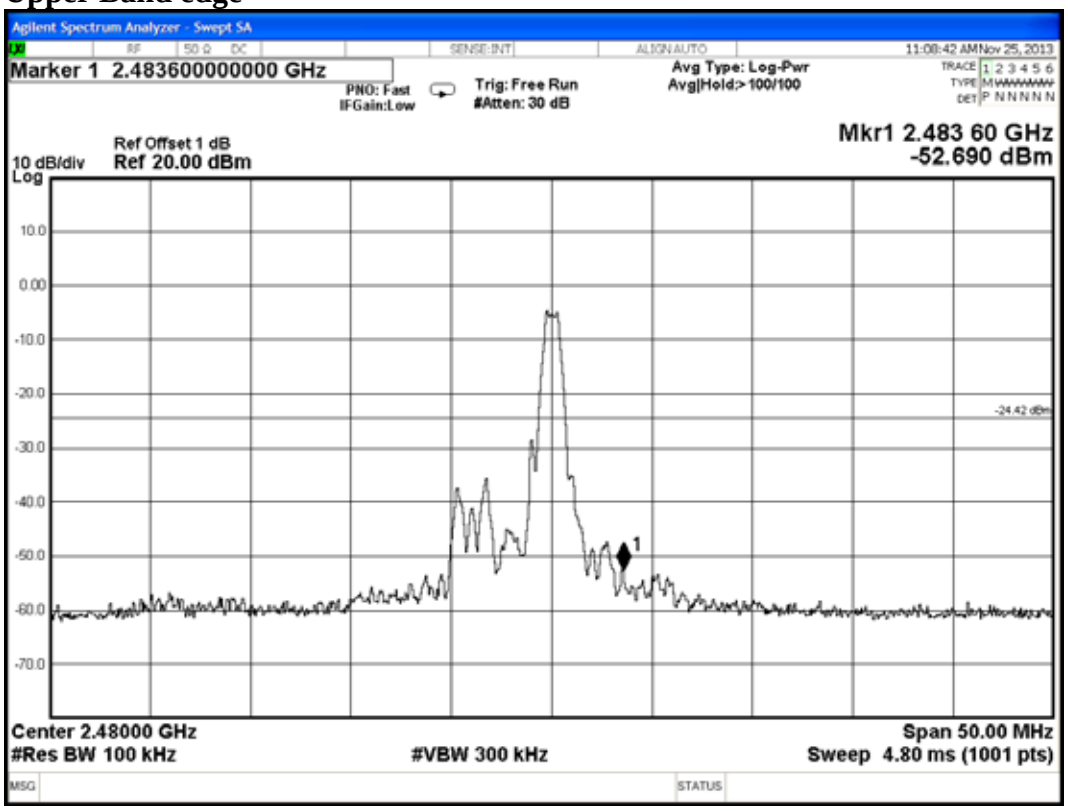
The measurement guideline was according to KDB 558074 D01 V03.

## 7.6. Test Results

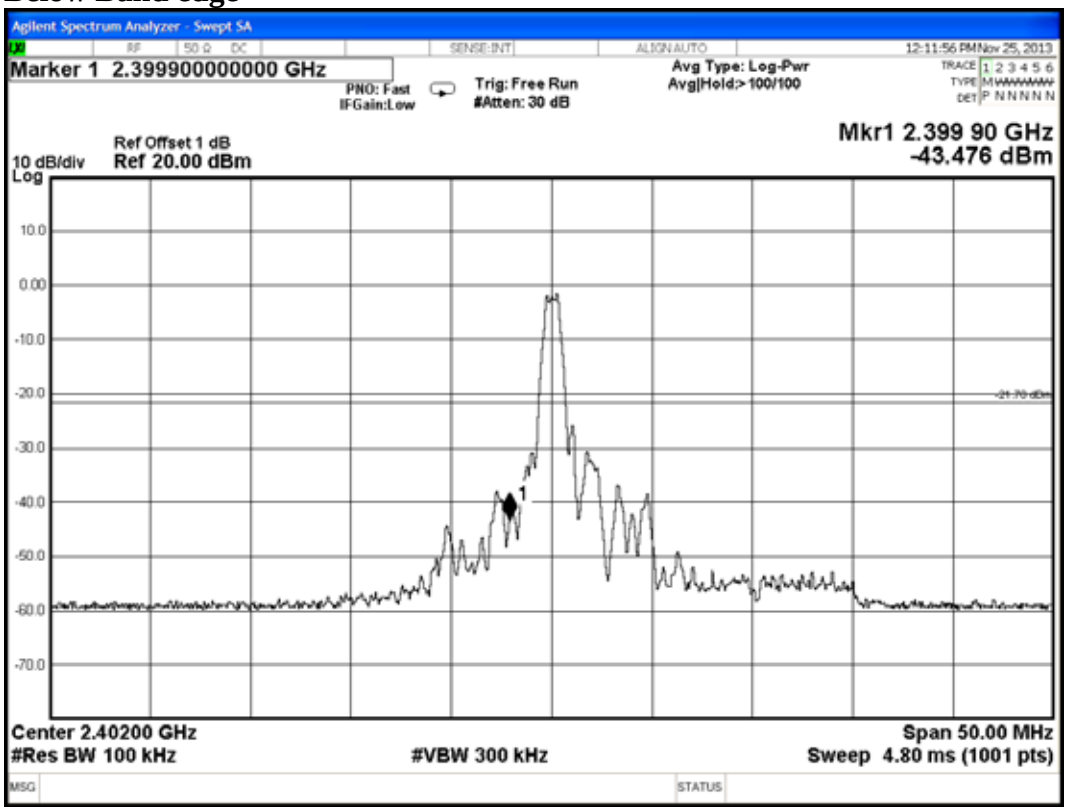
**PASSED.** All the test results are attached in next pages.

Test Date : Nov. 25, 2013 Temperature : 26℃ Humidity : 54%

**Upper Band edge**




**Below Band edge**



# 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 | N9030A-544 | US51350140 | Jul. 30, 13' | Jul. 29, 14' |

## 8.2. Block Diagram of Test Setup

The same as section.4.2.

## 8.3. Specification Limits [§15.247(d), RSS-210 §A8.2 (b)]

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

## 8.4. Operating Condition of EUT

8.4.1. Set up the EUT and simulator as shown on 4.2.

8.4.2. To turn on the power of all equipment.

8.4.3. The **EUT (Ceiling Fan Remote Controller)** was on transmitting function with the remote controller at work during all testing.

## 8.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using 100kHz RBW and ≥300kHz VBW, set sweep time = Auto.

The measurement guideline was according to KDB 558074 D01v03 Peak PSD is used.

## 8.6. Test Results

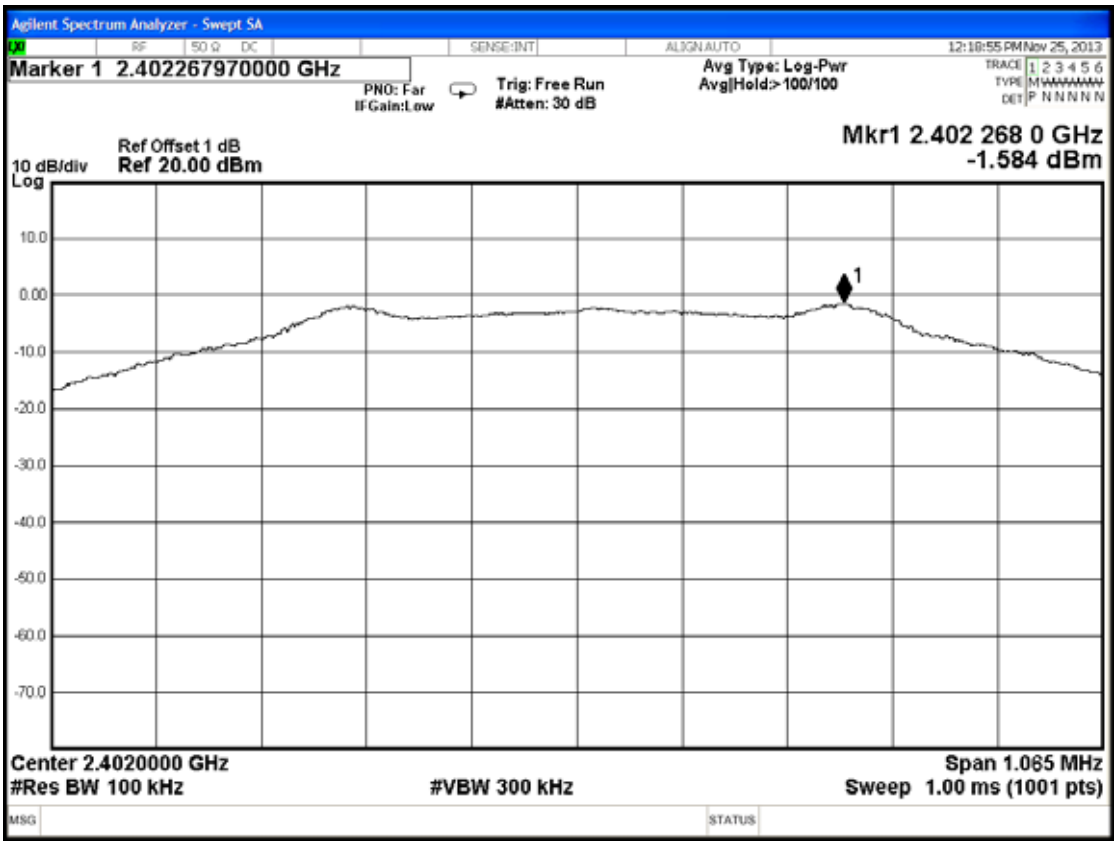
**PASSED.** All the test results are attached in next pages.

Test Date : Nov. 25, 2013 Temperature : 26℃ Humidity : 54%

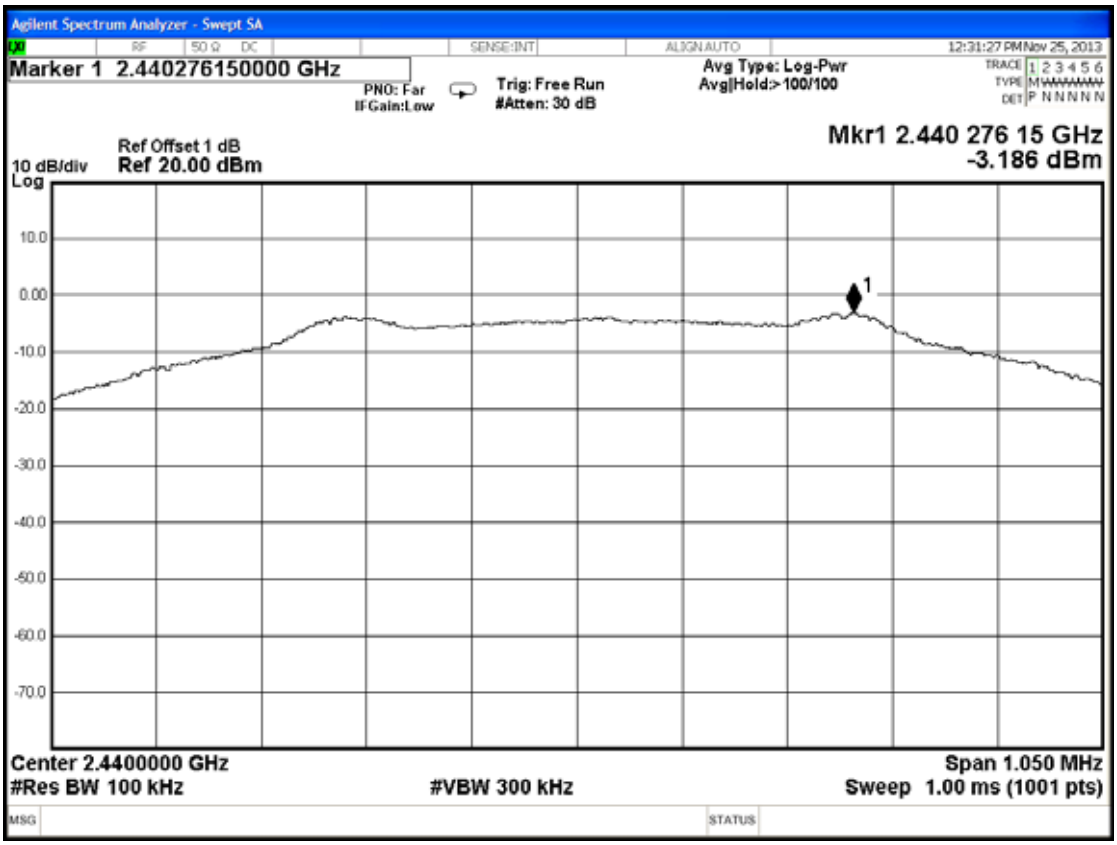
| Mode | Channel | Frequency | **Power Spectral Density (dBm)** |
|---|---|---|---|
| 1. | CH0 | 2402MHz | **-1.584** |
| 2. | CH19 | 2440MHz | **-3.186** |
| 3. | CH39 | 2480MHz | **-4.488** |

**[Limit: 4dBm]**

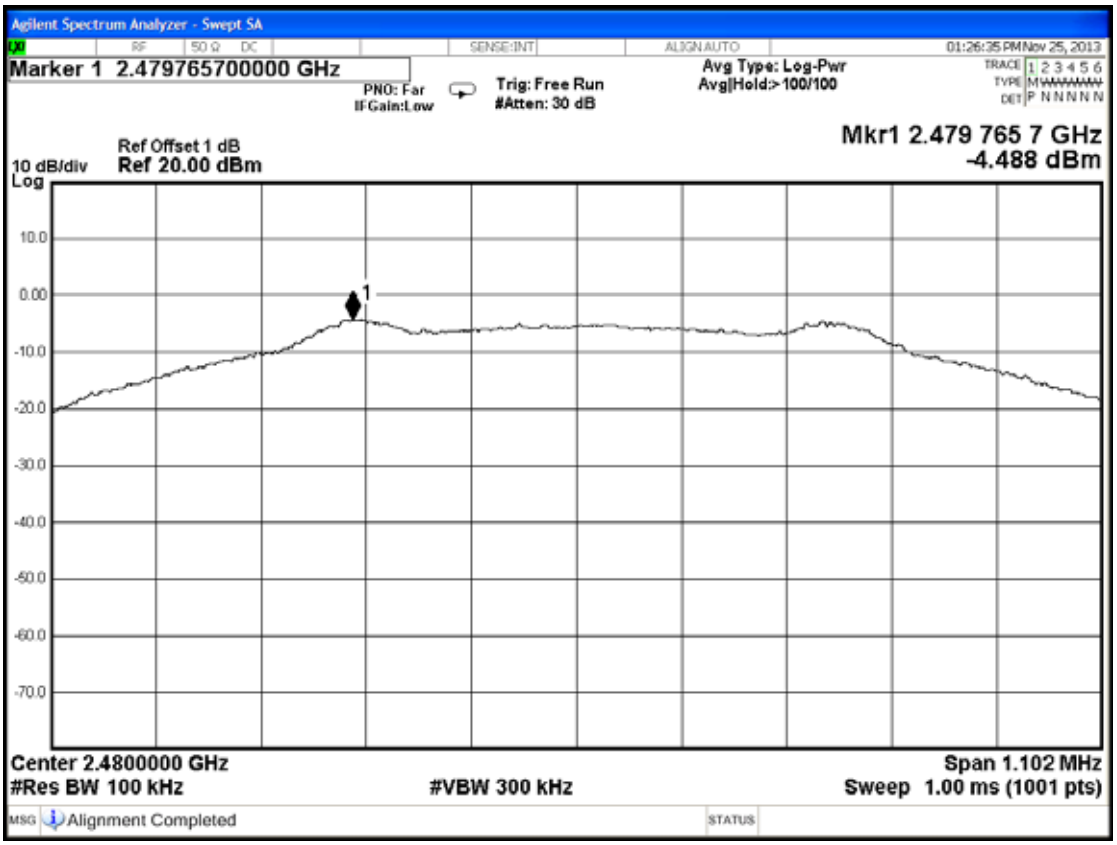
**Frequency: 2402MHz**




**Frequency: 2440MHz**



**Frequency: 2480MHz**



# 9. DEVIATION TO TEST SPECIFICATIONS

【NONE】

# 10. PHOTOGRAPHS

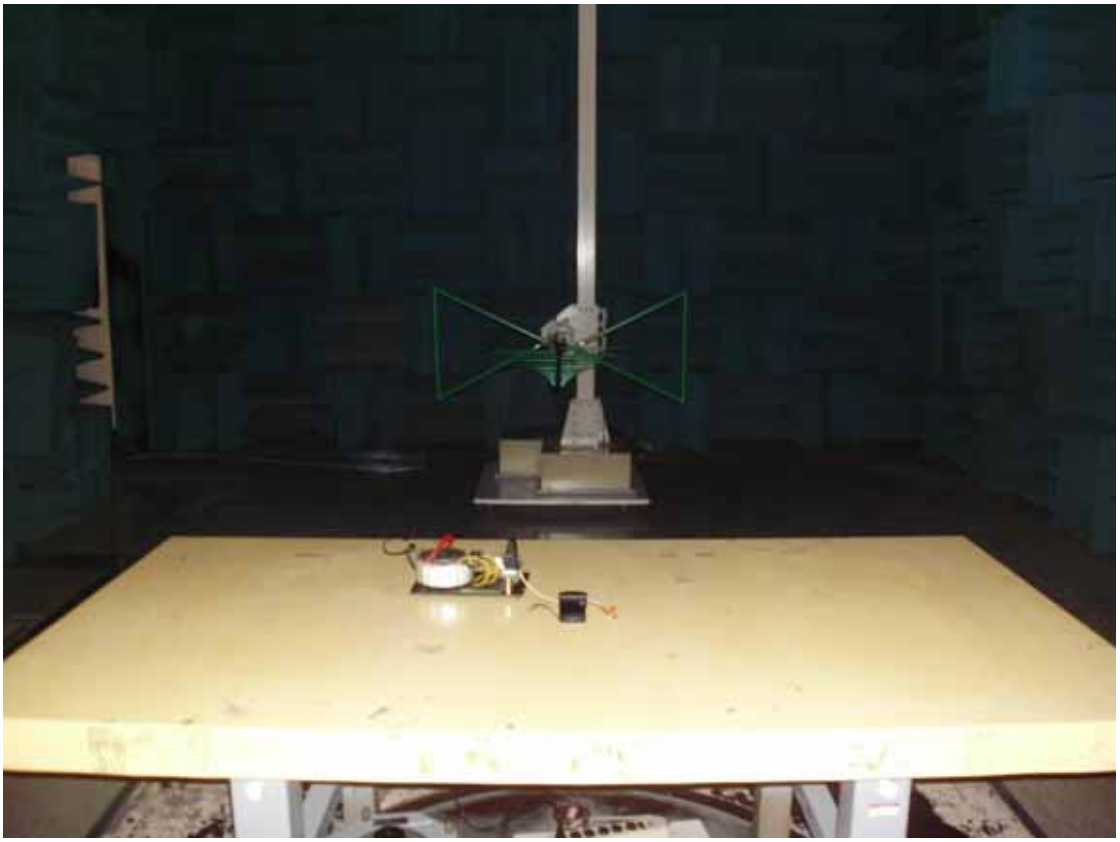
## 10.1. Photos of Conducted Emission Measurement

FRONT VIEW OF CONDUCTED MEASUREMENT

BACK VIEW OF CONDUCTED MEASUREMENT

## 10.2.Photos of Radiated Measurement at Semi-Anechoic Chamber

### 10.2.1.Frequency Below 1GHz



### 10.2.2. Frequency Above 1GHz

## 10.3.Photo of Section RF Conducted Measurement