# FCC 47 CFR PART 15 SUBPART C

| | | |
|---|---|---|
| Product Type | : | Media Gateway |
| Applicant | : | MobiRoam Pty Ltd |
| Address | : | 5 Learoyd Street, Mt Lawley, Perth, Australia |
| Trade Name | : | SmartBox |
| Model Number | : | PMG-005 |
| Test Specification | : | FCC 47 CFR PART 15 SUBPART C: Oct., 2013<br>ANSI C63.4:2009 |
| Receive Date | : | December 09, 2014 |
| Test Period | : | December 15,2014 ~January 19, 2015 |
| Issue Date | : | January 27, 2015 |

**Issue by**

A Test Lab Techno Corp.
No. 140-1, Changan Street, Bade City,
Taoyuan County 334, Taiwan R.O.C.
Tel：+886-3-2710188 / Fax：+886-3-2710190

Taiwan Accreditation Foundation accreditation number: 1330

## Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| 00 | January 27, 2015 | Initial Issue | |
| | | | |
| | | | |
| | | | |

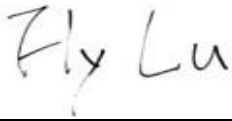
# Verification of Compliance

Issued Date: 01/27/2015

| | | |
|---|---|---|
| Product Type | : | Media Gateway |
| Applicant | : | MobiRoam Pty Ltd |
| Address | : | 5 Learoyd Street, Mt Lawley, Perth, Australia |
| Trade Name | : | SmartBox |
| Model Number | : | PMG-005 |
| FCC ID | : | 2ADXTPMG-005 |
| EUT Rated Voltage | : | DC 5V,2000mA from adapter, AC120V/60Hz from mains |
| Test Voltage | : | DC5V, AC 120 |
| Applicable Standard | : | FCC 47 CFR PART 15 SUBPART C: Oct., 2013<br>ANSI C63.4:2009 |
| Test Result | : | Complied |
| Performing Lab. | : | A Test Lab Techno Corp.<br>No. 140-1, Changan Street, Bade City,<br>Taoyuan County 334, Taiwan R.O.C.<br>Tel：+886-3-2710188 / Fax：+886-3-2710190<br>Taiwan Accreditation Foundation accreditation number: 1330<br>http://www.atl-lab.com.tw/e-index.htm |

The above equipment was tested by A Test Lab Techno Corp. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2009 and the energy emitted by the sample tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247 .

The test results of this report relate only to the tested sample identified in this report.

| | | | | | |
|---|---|---|---|---|---|
| Approved By | : |  | Reviewed By | : |  |
| (Manager) | | (Murphy Wang) | (Testing Engineer) | | (Fly Lu) |

# TABLE OF CONTENTS

# 1 General Information

## 1.1 Summary of Test Result

| Standard | Item | Result | Remark |
|---|---|---|---|
| 15.207 | AC Power Conducted Emission | PASS | ----- |
| 15.209 & 15.247(d) | Radiated Emissions | PASS | ----- |
| 15.247(b)(3) | Max. Output Power | PASS | ----- |
| 15.247(a)(2) | 6dB RF Bandwidth | PASS | ----- |
| 15.247(e) | Power Spectral Density | PASS | ----- |
| 15.247(d) | Out of Band Conducted Spurious Emission | PASS | ----- |
| 15.247(d) | Band Edge Measurement | PASS | ----- |
| 15.203 | Antenna Requirement | PASS | ----- |

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

## 1.2 Measurement Uncertainty

| Test Item | Frequency Range | | Uncertainty (dB) |
|---|---|---|---|
| Conducted Emission | 9kHz ~ 30MHz | | ± 2.02 |
| Radiated Emission | 30MHz ~ 1000MHz | Horizontal | ± 3.98 |
| | | Vertical | ± 3.62 |
| | 1000MHz ~ 18000MHz | Horizontal | ± 3.11 |
| | | Vertical | ± 3.07 |
| | 18000MHz ~ 40000MHz | Horizontal | ± 3.66 |
| | | Vertical | ± 3.54 |

## 2 EUT Description

| | |
|---|---|
| Product Type | Media Gateway |
| Trade Name | SmartBox |
| Model No. | PMG-005 |
| Applicant | MobiRoam Pty Ltd<br>5 Learoyd Street, Mt Lawley, Perth, Australia |
| Manufacturer | NA |
| FCC ID | 2ADXTPMG-005 |
| Frequency Range | IEEE 802.11b / 802.11g / 802.11n 2.4GHz 20MHz: 2412 ~ 2462 MHz<br>IEEE 802.11n 2.4GHz 40MHz: 2422 ~ 2452 MHz |
| Modulation Type | IEEE 802.11b:DSSS<br>IEEE 802.11g:DSSS + OFDM<br>IEEE 802.11n 2.4GHz 20MHz: OFDM<br>IEEE 802.11n 2.4GHz 40MHz: OFDM |
| Antenna Type | Internal Antenna |
| Antenna Gain | 0dBi |
| Antenna Delivery | TX + RX |
| RF Output Power | IEEE 802.11b: 0.101W / 20.04dBm<br>IEEE 802.11g: 0.212W / 23.26dBm<br>IEEE 802.11n 2.4GHz 20MHz: 0.203W / 23.07 dBm<br>IEEE 802.11n 2.4GHz 40MHz: 0.153 W / 21.85 dBm |
| -6dB Bandwidth | IEEE 802.11b: 12.13 MHz<br>IEEE 802.11g: 16.31 MHz<br>IEEE 802.11n 2.4GHz 20MHz: 17.11MHz<br>IEEE 802.11n 2.4GHz 40MHz: 35.45 MHz |
| Adapter information | Model: ICP12-050-2000D<br>Input:100-240V~50/60Hz 0.3A<br>Output:5V,2000A |

# 3 Test Methodology

## 3.1. Mode of Operation

Decision of Test ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

| Test Mode |
|---|
| Mode 1: Normal Operation Mode |
| Mode 2: IEEE 802.11b Link Mode |
| Mode 3: IEEE 802.11g Link Mode |
| Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode |
| Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode |
| -- |

PC Software is used to control the EUT for staying in continuous transmitting mode with a 100% duty cycle.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

IEEE 802.11b mode:
Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 1Mbps data rate and cyclic delay diversity were chosen for full testing.

IEEE 802.11g mode:
Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6Mbps data rate and cyclic delay diversity were chosen for full testing.

IEEE 802.11n 2.4GHz 20MHz mode:
Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with MCS0 data rate were chosen for full testing.

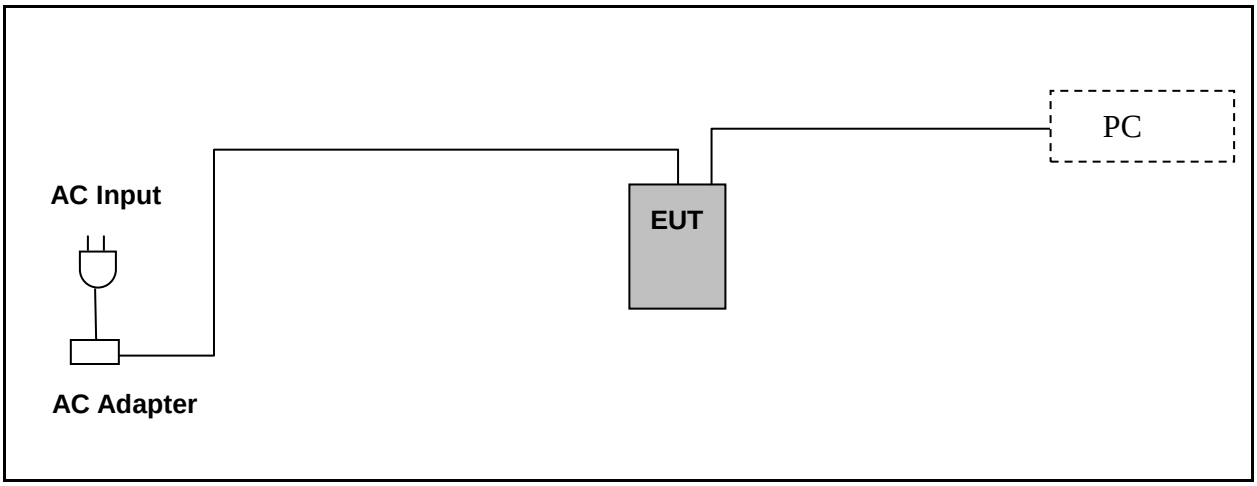
IEEE 802.11n 2.4GHz 40MHz mode:
Channel Low (2422MHz), Channel Mid (2437MHz) and Channel High (2452MHz) with 13.5Mbps data rate were chosen for full testing.

By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “X axis” position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

## 3.2. EUT Exercise Software

| |
|---|
| 1. Setup the EUT shown on 3.3, PC and EUT were linked with a network cable. |
| 2. Turn on the power of all equipment. |
| 3. PC run test program to make EUT in continue transmitting. |
| -- |

## 3.3. Configuration of Test System Details




## 3.4. Test Site Environment

| Items | Required (IEC 60068-1) | Actual |
|---|---|---|
| Temperature (°C) | 15-35 | 26 |
| Humidity (%RH) | 25-75 | 60 |
| Barometric pressure (mbar) | 860-1060 | 950 |

# 4 Conducted Emission Measurement

## 4.1. Limit

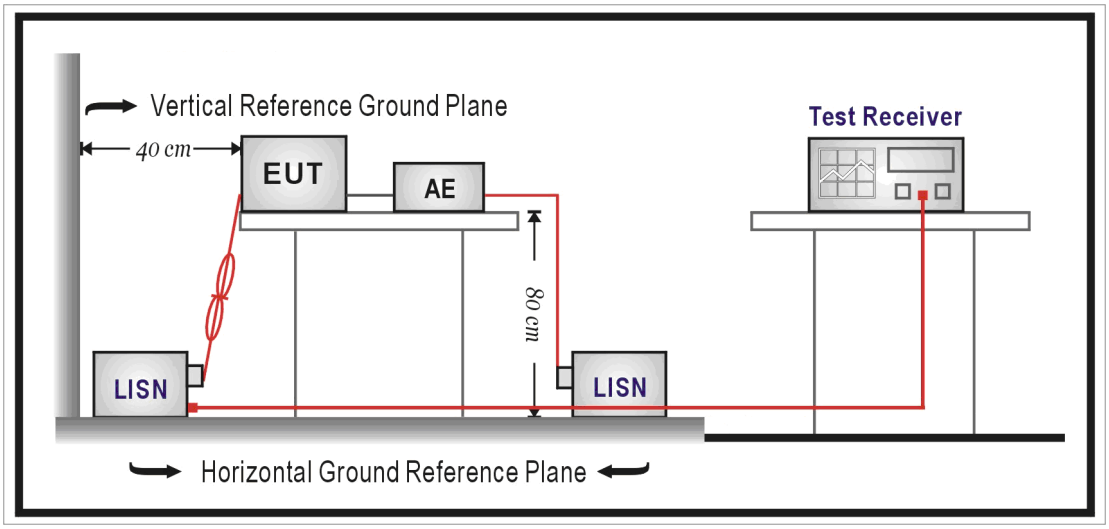
| Frequency (MHz) | Quasi-peak | Average |
|---|---|---|
| 0.15 - 0.5 | 66 to 56 | 56 to 46 |
| 0.50 - 5.0 | 56 | 46 |
| 5.0 - 30.0 | 60 | 50 |

## 4.2. Test Instruments

| Describe | Manufacturer | Model Number | Serial Number | Cal. Date | Remark |
|---|---|---|---|---|---|
| Test Receiver | R&S | ESCI | 100367 | 06/12/2014 | (1) |
| LISN | R&S | ENV216 | 101040 | 03/07/2014 | (1) |
| LISN | R&S | ENV216 | 101041 | 03/07/2014 | (1) |
| Cable | -- | -- | CB2452-2 | | |
| Test Site | ATL | TE02 | TE02 | N.C.R. | ----- |

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.
Note: N.C.R. = No Calibration Request.

## 4.3. Test Setup



## 4.4. Test Procedure

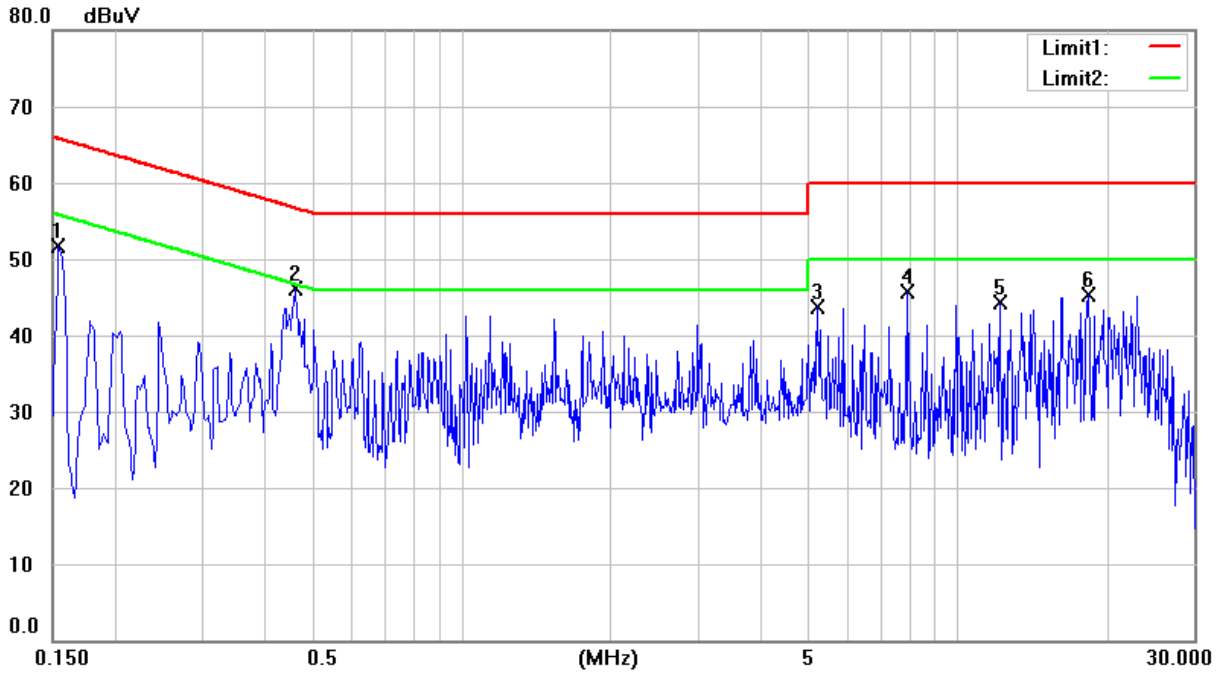
The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3162/2 SH Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 4.1.

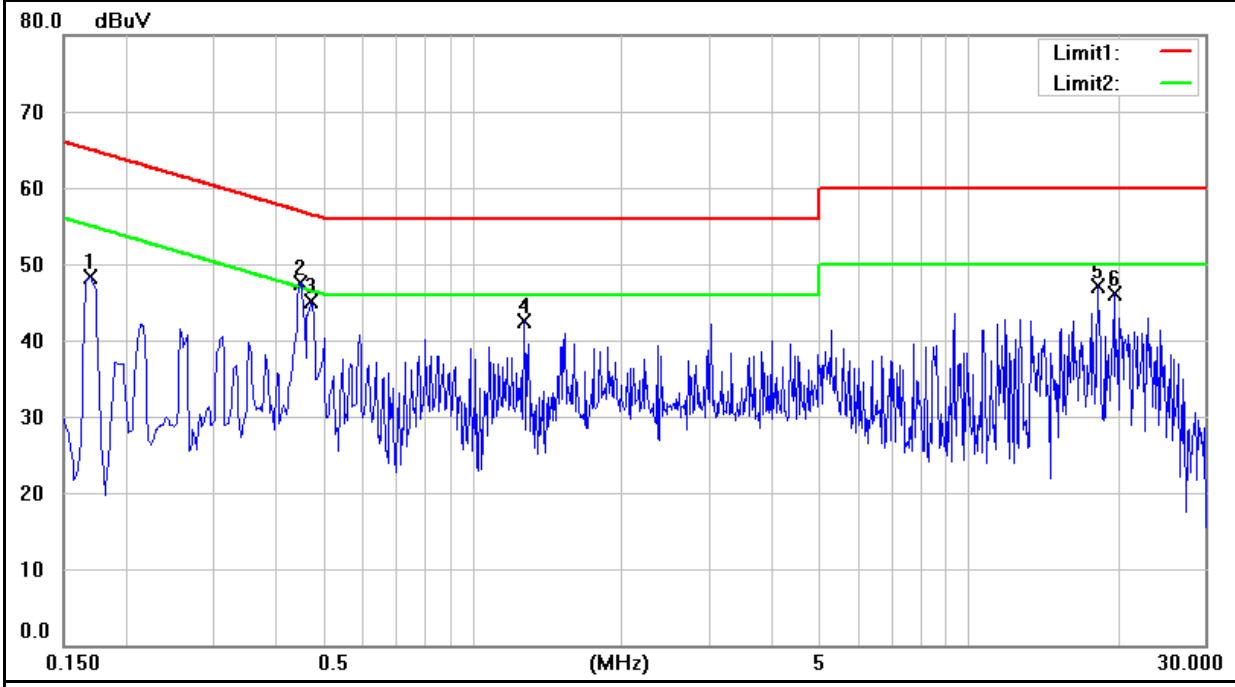
## 4.5. Test Result

| | | | |
|---|---|---|---|
| Standard: | FCC Part 15C | Line: | L1 |
| Test item: | Conducted Emission | Power: | AC 120V/60Hz |
| Model Number: | PMG-005 | Temp.(℃)/Hum.(%RH): | 25(℃)/59%RH |
| Mode: | 1 | Date: | 2014-12-17 |
| | | Test By: | Fly |
| Description: | | | |




| No. | Frequency | QP reading | AVG reading | Correction factor | QP result | AVG result | QP limit | AVG limit | QP margin | AVG margin | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | (dBuV) | (dB) | (dBuV) | (dBuV) | (dBuV) | (dBuV) | (dB) | (dB) | |
| 1 | 0.1540 | 33.82 | 13.27 | 9.60 | 43.42 | 22.87 | 65.78 | 55.78 | -22.36 | -32.91 | Pass |
| 2 | 0.4620 | 35.03 | 26.08 | 9.62 | 44.65 | 35.70 | 56.66 | 46.66 | -12.01 | -10.96 | Pass |
| 3 | 5.2340 | 32.76 | 22.30 | 9.80 | 42.56 | 32.10 | 60.00 | 50.00 | -17.44 | -17.90 | Pass |
| 4 | 7.9260 | 32.63 | 22.59 | 9.88 | 42.51 | 32.47 | 60.00 | 50.00 | -17.49 | -17.53 | Pass |
| 5 | 12.1980 | 32.59 | 24.48 | 10.02 | 42.61 | 34.50 | 60.00 | 50.00 | -17.39 | -15.50 | Pass |
| 6 | 18.3660 | 32.03 | 27.29 | 10.20 | 42.23 | 37.49 | 60.00 | 50.00 | -17.77 | -12.51 | Pass |

| | | | |
|---|---|---|---|
| Standard: | FCC Part 15C | Line: | N |
| Test item: | Conducted Emission | Power: | AC 120V/60Hz |
| Model Number: | PMG-005 | Temp.(℃)/Hum.(%RH): | 25(℃)/59%RH |
| Mode: | 1 | Date: | 2014-12-17 |
| | | Test By: | Fly |
| Description: | | | |




| No. | Frequency | QP reading | AVG reading | Correction factor | QP result | AVG result | QP limit | AVG limit | QP margin | AVG margin | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | (dBuV) | (dB) | (dBuV) | (dBuV) | (dBuV) | (dBuV) | (dB) | (dB) | |
| 1 | 0.1700 | 32.81 | 17.10 | 9.60 | 42.41 | 26.70 | 64.96 | 54.96 | -22.55 | -28.26 | Pass |
| 2 | 0.4500 | 33.70 | 25.28 | 9.62 | 43.32 | 34.90 | 56.88 | 46.88 | -13.56 | -11.98 | Pass |
| 3 | 0.4740 | 33.14 | 25.32 | 9.62 | 42.76 | 34.94 | 56.44 | 46.44 | -13.68 | -11.50 | Pass |
| 4 | 1.2700 | 30.49 | 18.47 | 9.66 | 40.15 | 28.13 | 56.00 | 46.00 | -15.85 | -17.87 | Pass |
| 5 | 18.2420 | 33.85 | 29.41 | 10.20 | 44.05 | 39.61 | 60.00 | 50.00 | -15.95 | -10.39 | Pass |
| 6 | 19.7100 | 33.47 | 28.43 | 10.24 | 43.71 | 38.67 | 60.00 | 50.00 | -16.29 | -11.33 | Pass |

# 5 Radiated Emission Measurement

## 5.1. Limit

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

| Frequency (MHz) | Field Strength (μV/m at meter) | Measurement Distance (meters) |
|---|---|---|
| 0.009 – 0.490 | 2400 / F (kHz) | 300 |
| 0.490 – 1.705 | 24000 / F (kHz) | 30 |
| 1.705 – 30.0 | 30 | 30 |
| 30 - 88 | 100** | 3 |
| 88-216 | 150** | 3 |
| 216-960 | 200** | 3 |
| Above 960 | 500 | 3 |

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

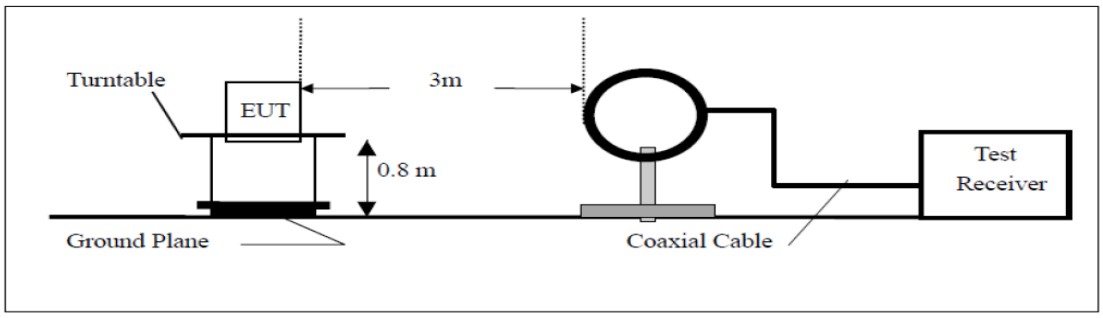
## 5.2. Test Instruments

| 3 Meter Chamber | | | | | |
|---|---|---|---|---|---|
| Equipment | Manufacturer | Model Number | Serial Number | Cal. Date | Remark |
| RF Pre-selector | Agilent | N9039A | MY46520256 | 01/10/2014 | (1) |
| Spectrum Analyzer | Agilent | E4446A | MY46180578 | 01/10/2014 | (1) |
| Pre Amplifier | Agilent | 8449B | 3008A02237 | 02/21/2014 | (1) |
| Pre Amplifier | Agilent | 8447D | 2944A10961 | 02/21/2014 | (1) |
| Broadband Antenna (30MHz~1GHz) | SCHWARZBECK MESS-ELEKTRONIK | VULB9163 | 9163-270 | 07/22/2014 | (1) |
| Horn Antenna (1~18GHz) | SCHWARZBECK MESS-ELEKTRONIK | BBHA9120D | 9120D-550 | 06/11/2014 | (1) |
| Horn Antenna (18~40GHz) | SCHWARZBECK MESS-ELEKTRONIK | BBHA9170 | 9170-320 | 07/02/2014 | (1) |
| Loop Antenna | COM-POWER CORPORATION | AL-130 | 121014 | 08/14/2014 | (3) |
| RF cable | WOKEN | -- | S02-140409-026 | 07/14/2014 | (1) |
| RF cable | WOKEN | -- | S02-140409-027 | 07/14/2014 | (1) |
| RF cable | WOKEN | -- | S02-140409-028 | 07/14/2014 | (1) |
| RF cable | WOKEN | -- | S02-140409-052 | 07/14/2014 | (1) |
| Test Site | ATL | TE01 | 888001 | 08/28/2014 | (1) |

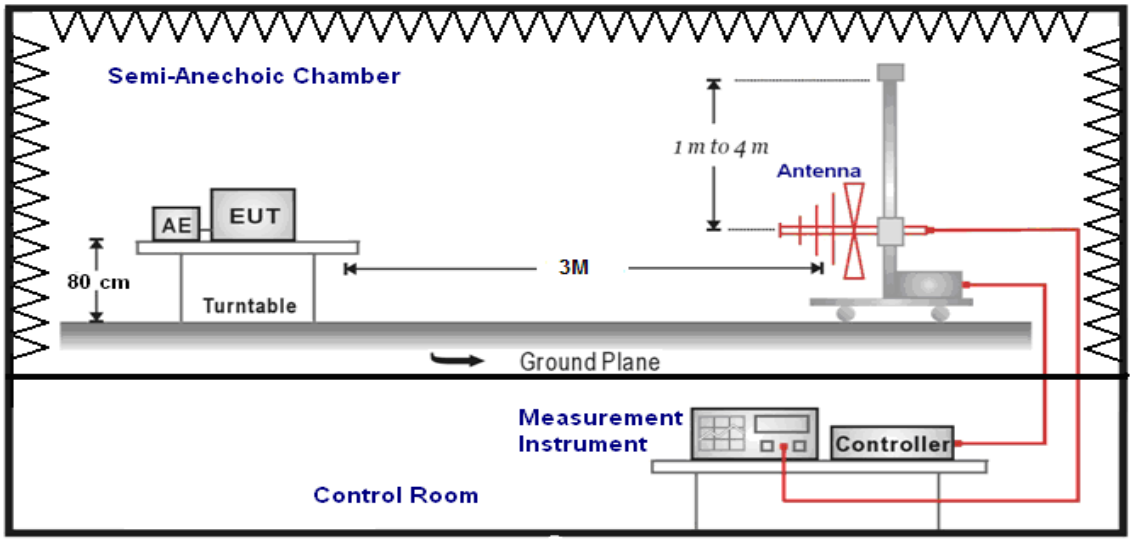
Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

Note: N.C.R. = No Calibration Request.etup

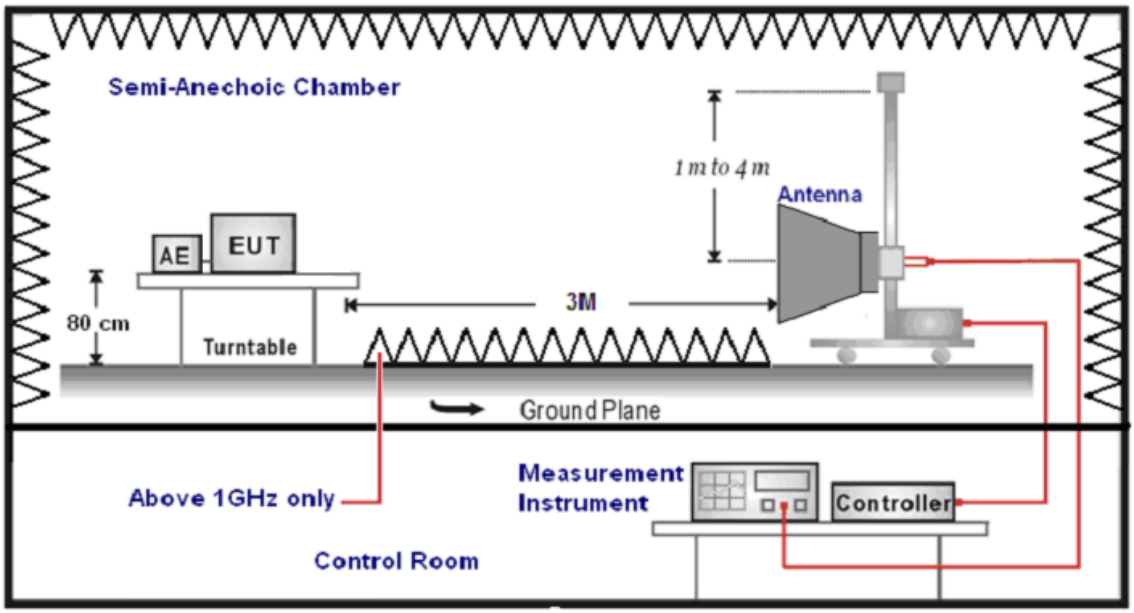
9kHz-30MHz




Below 1GHz




Above 1GHz



## 5.3. Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 9 kHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on tree orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna (mode VULB9163) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts pre meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro colts per meter (dBuV/m).

The actual field is intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

(1) Amplitude (dBuV/m) = FI (dBuV) +AF (dBuV) +CL (dBuV)-Gain (dB)
FI= Reading of the field intensity.
AF= Antenna factor.
CL= Cable loss.
P.S Amplitude is auto calculate in spectrum analyzer.

(2) Actual Amplitude (dBuV/m) = Amplitude (dBuV)-Dis(dB)
The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:
(a) For fundamental frequency : Transmitter Output < +30dBm
(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

Data of measurement within this frequency range without mark in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

## 5.4. Test Result

**Below 1GHz**

| | | | |
|---|---|---|---|
| Standard: | FCC Part 15C | Test Distance: | 3m |
| Test item: | Radiated Emission | Power: | AC 120V/60Hz |
| Model Number: | PMG-005 | Temp.(℃)/Hum.(%RH): | 26(℃)/60%RH |
| Mode: | 1 | Date: | 2014-12-17 |
| | | Test By: | |

Description:

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|---|---|---|---|---|---|---|---|
| 30.00 | 63.0 | -35.9 | 27.1 | 40.0 | 12.9 | QP | H |
| 72.77 | 61.0 | -38.7 | 22.3 | 40.0 | 17.7 | QP | H |
| 175.79 | 62.9 | -38.4 | 24.5 | 43.5 | 19.0 | QP | H |
| 249.66 | 60.8 | -34.4 | 26.4 | 46.0 | 19.6 | QP | H |
| 397.40 | 60.2 | -30.8 | 29.4 | 46.0 | 16.6 | QP | H |
| 961.12 | 56.4 | -21.8 | 34.6 | 54.0 | 19.4 | QP | H |
| 30.00 | 70.3 | -37.3 | 33.0 | 40.0 | 7.0 | QP | V |
| 72.77 | 64.7 | -39.4 | 25.3 | 40.0 | 14.7 | QP | V |
| 175.79 | 65.3 | -38.2 | 27.1 | 43.5 | 16.4 | QP | V |
| 249.66 | 62.7 | -34.5 | 28.2 | 46.0 | 17.8 | QP | V |
| 397.40 | 57.8 | -31.2 | 26.6 | 46.0 | 19.4 | QP | V |
| 961.12 | 55.4 | -22.6 | 32.8 | 54.0 | 21.2 | QP | V |

Note: No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

**Above 1GHz**

| | | | |
|---|---|---|---|
| Standard: | FCC Part 15C | Test Distance: | 3m |
| Test item: | Radiated Emission | Power: | AC 120V/60Hz |
| Model Number: | PMG-005 | Temp.(℃)/Hum.(%RH): | 26(℃)/60%RH |
| Mode: | 2 | Date: | 2014-12-17 |
| Frequency: | 2412MHz | Test By: | Fly |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|---|---|---|---|---|---|---|---|
| 4824 | 47.4 | 5.8 | 53.2 | 74.0 | 20.8 | peak | H |
| 4824 | 41.3 | 5.8 | 47.1 | 54.0 | 6.9 | Average | H |
| 4824 | 50.1 | 5.8 | 55.9 | 74.0 | 18.1 | peak | V |
| 4824 | 43.8 | 5.8 | 49.6 | 54.0 | 4.4 | Average | V |

| | | | |
|---|---|---|---|
| Standard: | FCC Part 15C | Test Distance: | 3m |
| Test item: | Radiated Emission | Power: | AC 120V/60Hz |
| Model Number: | PMG-005 | Temp.(℃)/Hum.(%RH): | 26(℃)/60%RH |
| Mode: | 2 | Date: | 2014-12-17 |
| Frequency: | 2437MHz | Test By: | Fly |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|---|---|---|---|---|---|---|---|
| 4874 | 45.7 | 5.9 | 51.6 | 74.0 | 22.4 | peak | H |
| 4874 | 39.8 | 5.9 | 45.7 | 54.0 | 8.3 | Average | H |
| 4874 | 48.0 | 5.9 | 53.9 | 74.0 | 20.1 | peak | V |
| 4874 | 41.3 | 5.9 | 47.2 | 54.0 | 6.8 | Average | V |

19191919

| | | | |
|---|---|---|---|
| Standard: | FCC Part 15C | Test Distance: | 3m |
| Test item: | Radiated Emission | Power: | AC 120V/60Hz |
| Model Number: | PMG-005 | Temp.(℃)/Hum.(%RH): | 26(℃)/60%RH |
| Mode: | 2 | Date: | 2014-12-17 |
| Frequency: | 2462MHz | Test By: | Fly |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|---|---|---|---|---|---|---|---|
| 4924 | 46.5 | 5.9 | 52.4 | 74.0 | 21.6 | peak | H |
| 4924 | 40.9 | 5.9 | 46.8 | 54.0 | 7.2 | Average | H |
| 4924 | 49.6 | 5.9 | 55.5 | 74.0 | 18.5 | peak | V |
| 4924 | 43.4 | 5.9 | 49.3 | 54.0 | 4.7 | Average | V |

1919191919191919

2020

| | | | |
|---|---|---|---|
| Standard: | FCC Part 15C | Test Distance: | 3m |
| Test item: | Radiated Emission | Power: | AC 120V/60Hz |
| Model Number: | PMG-005 | Temp.(℃)/Hum.(%RH): | 26(℃)/60%RH |
| Mode: | 3 | Date: | 2014-12-17 |
| Frequency: | 2412MHz | Test By: | Fly |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|---|---|---|---|---|---|---|---|
| 4824 | 46.0 | 5.8 | 51.8 | 74.0 | 22.2 | peak | H |
| 4824 | 42.6 | 5.8 | 48.4 | 54.0 | 5.6 | Average | H |
| 4824 | 49.1 | 5.8 | 54.9 | 74.0 | 19.1 | peak | V |
| 4824 | 42.5 | 5.8 | 48.3 | 54.0 | 5.7 | Average | V |

| | | | |
|---|---|---|---|
| Standard: | FCC Part 15C | Test Distance: | 3m |
| Test item: | Radiated Emission | Power: | AC 120V/60Hz |
| Model Number: | PMG-005 | Temp.(℃)/Hum.(%RH): | 26(℃)/60%RH |
| Mode: | 3 | Date: | 2014-12-17 |
| Frequency: | 2437MHz | Test By: | Fly |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|---|---|---|---|---|---|---|---|
| 4874 | 47.4 | 5.9 | 53.3 | 74.0 | 20.7 | peak | H |
| 4874 | 40.5 | 5.9 | 46.4 | 54.0 | 7.6 | Average | H |
| 4874 | 49.2 | 5.9 | 55.1 | 74.0 | 18.9 | peak | V |
| 4824 | 40.8 | 5.9 | 46.7 | 54.0 | 7.3 | Average | V |

20202020

| | | | |
|---|---|---|---|
| Standard: | FCC Part 15C | Test Distance: | 3m |
| Test item: | Radiated Emission | Power: | AC 120V/60Hz |
| Model Number: | PMG-005 | Temp.(℃)/Hum.(%RH): | 26(℃)/60%RH |
| Mode: | 3 | Date: | 2014-12-17 |
| Frequency: | 2462MHz | Test By: | Fly |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|---|---|---|---|---|---|---|---|
| 4924 | 44.4 | 5.9 | 50.3 | 74.0 | 23.7 | peak | H |
| 4924 | 39.5 | 5.9 | 45.4 | 54.0 | 8.6 | Average | H |
| 4924 | 46.7 | 5.9 | 52.6 | 74.0 | 21.4 | peak | V |
| 4924 | 40.2 | 5.9 | 46.1 | 54.0 | 7.9 | Average | V |

| | | | |
|---|---|---|---|
| Standard: | FCC Part 15C | Test Distance: | 3m |
| Test item: | Radiated Emission | Power: | AC 120V/60Hz |
| Model Number: | PMG-005 | Temp.(℃)/Hum.(%RH): | 26(℃)/60%RH |
| Mode: | 4 | Date: | 2014-12-17 |
| Frequency: | 2412MHz | Test By: | Fly |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|---|---|---|---|---|---|---|---|
| 4824 | 44.3 | 5.8 | 50.1 | 74.0 | 23.9 | peak | H |
| 4824 | 37.8 | 5.8 | 43.6 | 54.0 | 10.4 | Average | H |
| 4824 | 46.8 | 5.8 | 52.6 | 74.0 | 21.4 | peak | V |
| 4824 | 36.9 | 5.8 | 42.7 | 54.0 | 11.3 | Average | V |

| | | | |
|---|---|---|---|
| Standard: | FCC Part 15C | Test Distance: | 3m |
| Test item: | Radiated Emission | Power: | AC 120V/60Hz |
| Model Number: | PMG-005 | Temp.(℃)/Hum.(%RH): | 26(℃)/60%RH |
| Mode: | 4 | Date: | 2014-12-17 |
| Frequency: | 2437MHz | Test By: | Fly |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|---|---|---|---|---|---|---|---|
| 4874 | 45.4 | 5.9 | 51.3 | 74.0 | 22.7 | peak | H |
| 4874 | 38.6 | 5.9 | 44.5 | 54.0 | 9.5 | Average | H |
| 4874 | 47.5 | 5.9 | 53.4 | 74.0 | 20.6 | peak | V |
| 4824 | 36.9 | 5.9 | 42.8 | 54.0 | 11.2 | Average | V |

21212121

| | | | |
|---|---|---|---|
| Standard: | FCC Part 15C | Test Distance: | 3m |
| Test item: | Radiated Emission | Power: | AC 120V/60Hz |
| Model Number: | PMG-005 | Temp.(℃)/Hum.(%RH): | 26(℃)/60%RH |
| Mode: | 4 | Date: | 2014-12-17 |
| Frequency: | 2462MHz | Test By: | Fly |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|---|---|---|---|---|---|---|---|
| 4924 | 44.6 | 5.9 | 50.5 | 74.0 | 23.5 | peak | H |
| 4924 | 37.8 | 5.9 | 43.7 | 54.0 | 10.3 | Average | H |
| 4924 | 45.7 | 5.9 | 51.6 | 74.0 | 22.4 | peak | V |
| 4924 | 38.2 | 5.9 | 44.1 | 54.0 | 9.9 | Average | V |

| | | | |
|---|---|---|---|
| Standard: | FCC Part 15C | Test Distance: | 3m |
| Test item: | Radiated Emission | Power: | AC 120V/60Hz |
| Model Number: | PMG-005 | Temp.(℃)/Hum.(%RH): | 26(℃)/60%RH |
| Mode: | 5 | Date: | 2014-12-17 |
| Frequency: | 2422MHz | Test By: | Fly |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|---|---|---|---|---|---|---|---|
| 4844 | 44.6 | 5.8 | 50.4 | 74.0 | 23.6 | peak | H |
| 4844 | 35.9 | 5.8 | 41.7 | 54.0 | 12.3 | Average | H |
| 4844 | 43.8 | 5.8 | 49.6 | 74.0 | 24.4 | peak | V |
| 4844 | 34.4 | 5.8 | 40.2 | 54.0 | 13.8 | Average | V |

| | | | |
|---|---|---|---|
| Standard: | FCC Part 15C | Test Distance: | 3m |
| Test item: | Radiated Emission | Power: | AC 120V/60Hz |
| Model Number: | PMG-005 | Temp.(℃)/Hum.(%RH): | 26(℃)/60%RH |
| Mode: | 5 | Date: | 2014-12-17 |
| Frequency: | 2437MHz | Test By: | Fly |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|---|---|---|---|---|---|---|---|
| 4874 | 43.7 | 5.8 | 49.5 | 74.0 | 24.5 | peak | H |
| 4874 | 35.4 | 5.8 | 41.2 | 54.0 | 12.8 | Average | H |
| 4874 | 45.6 | 5.8 | 51.4 | 74.0 | 22.6 | peak | V |
| 4874 | 37.0 | 5.8 | 42.8 | 54.0 | 11.2 | Average | V |

22222222

| | | | |
|---|---|---|---|
| Standard: | FCC Part 15C | Test Distance: | 3m |
| Test item: | Radiated Emission | Power: | AC 120V/60Hz |
| Model Number: | PMG-005 | Temp.(℃)/Hum.(%RH): | 26(℃)/60%RH |
| Mode: | 5 | Date: | 2014-12-17 |
| Frequency: | 2452MHz | Test By: | Fly |

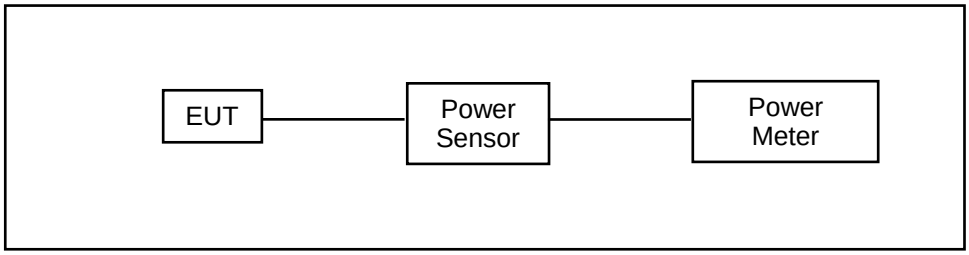
| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|---|---|---|---|---|---|---|---|
| 4904 | 44.7 | 5.9 | 50.6 | 74.0 | 23.4 | peak | H |
| 4904 | 36.9 | 5.9 | 42.8 | 54.0 | 11.2 | Average | H |
| 4904 | 43.8 | 5.9 | 49.7 | 74.0 | 24.3 | peak | V |
| 4904 | 35.4 | 5.9 | 41.3 | 54.0 | 12.7 | Average | V |

# 6 Maximum Conducted Output Power Measurement

## 6.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm.

## 6.2. Test Setup




## 6.3. Test Instruments

| Equipment | Manufacturer | Model Number | Serial Number | Cal. Date | Remark |
|---|---|---|---|---|---|
| Power Sensor | Anritsu | MA2411B | 1126022 | 08/21/2014 | (1) |
| Power Meter | Anritsu | ML2495A | 1135009 | 08/21/2014 | (1) |
| RF cable | WOKEN | -- | S02-140428-049 | 07/14/2014 | (1) |
| RF cable | WOKEN | -- | S02-140428-041 | 07/14/2014 | (1) |
| Test Site | ATL | TE05 | TE05 | N.C.R. | ----- |

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.
Note: N.C.R. = No Calibration Request.

## 6.4. Test Procedure

The tests below are run with the EUT's transmitter set at high power in TX mode. The EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to power sensor. The maximum peak output power shall not exceed 1 watt.

Use a direct connection between the antenna port of transmitter and the power sensor, for prevent the power sensor input attenuation 40-50 dB. Set the RBW Bandwidth of the emission or use a channel power meter mode.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm). For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to (GAIN - 6)/3 dBm.

The antenna port of the EUT was connected to the input of a power sensor. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

## 6.5. Test Result

| Model Number | PMG-005 | | |
|---|---|---|---|
| Test Item | Maximum Conducted Output Power | | |
| Test Mode | Mode 2: IEEE 802.11b Link Mode | | |
| Date of Test | 2014-12-15 | Test Site | TE05 |
| Frequency (MHz) | Peak Power (dBm) | | Limit (dBm) |
| 2412 | 20.04 | | < 30 |
| 2437 | 19.63 | | < 30 |
| 2462 | 19.02 | | < 30 |

| Model Number | PMG-005 | | |
|---|---|---|---|
| Test Item | Maximum Conducted Output Power | | |
| Test Mode | Mode 3: IEEE 802.11g Link Mode | | |
| Date of Test | 2014-12-15 | Test Site | TE05 |
| Frequency (MHz) | Peak Power (dBm) | | Limit (dBm) |
| 2412 | 23.22 | | < 30 |
| 2437 | 23.26 | | < 30 |
| 2462 | 23.21 | | < 30 |

| Model Number | PMG-005 | | |
|---|---|---|---|
| Test Item | Maximum Conducted Output Power | | |
| Test Mode | Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode | | |
| Date of Test | 2014-12-15 | Test Site | TE05 |
| Frequency (MHz) | Peak Power (dBm) | | Limit (dBm) |
| 2412 | 22.88 | | < 30 |
| 2437 | 23.03 | | < 30 |
| 2462 | 23.07 | | < 30 |

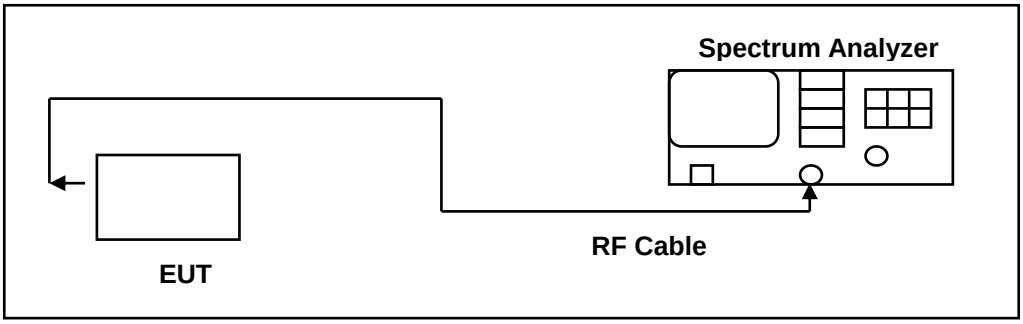
| Model Number | PMG-005 | | |
|---|---|---|---|
| Test Item | Maximum Conducted Output Power | | |
| Test Mode | Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode | | |
| Date of Test | 2014-12-15 | Test Site | TE05 |
| Frequency (MHz) | Peak Power (dBm) | | Limit (dBm) |
| 2422 | 21.85 | | < 30 |
| 2437 | 21.65 | | < 30 |
| 2452 | 21.81 | | < 30 |

# 7 6dB RF Bandwidth and 99 % Occupied Bandwidth Measurement

## 7.1. Limit

6dB RF Bandwidth: Systems using digital modulation techniques may operate in the 2400–2483.5 MHz bands. The minimum 6 dB band-width shall be at least 500 kHz.
99 % Occupied Bandwidth: N/A

## 7.2. Test Setup




## 7.3. Test Instruments

| Equipment | Manufacturer | Model Number | Serial Number | Cal. Date | Remark |
|---|---|---|---|---|---|
| Spectrum Analyzer | Agilent | N9020A | MY53420615 | 05/13/2014 | (1) |
| RF cable | WOKEN | -- | S02-140428-041 | 07/14/2014 | (1) |
| RF cable | WOKEN | -- | S02-140428-041 | 07/14/2014 | (1) |
| Test Site | ATL | TE05 | TE05 | N.C.R. | ----- |

dRemark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.
Note: N.C.R. = No Calibration Request.

## 7.4. Test Procedure

The EUT was setup to ANSI C63.4, 2009; tested to DTS test procedure of KDB558074D01 for compliance to FCC 47CFR 15.247 requirements.
6dB RF Bandwidth: The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A peak output reading was taken, a DISPLAY line was drawn 6 dB lower than peak level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line.
The test was performed at 3 channels (Channel low, middle, high)
99 % Occupied Bandwidth: The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.
The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.

## 7.5. Test Result

| Model Number | PMG-005 | | | |
|---|---|---|---|---|
| Test Item | 6dB RF Bandwidth and 99 % Occupied Bandwidth | | | |
| Test Mode | Mode 2: IEEE 802.11b Link Mode | | | |
| Date of Test | 2014-12-15 | | Test Site | TE05 |
| Frequency (MHz) | 6dB RF Bandwidth (MHz) | 99 % Occupied Bandwidth (MHz) | 6dB RF Bandwidth Limit (MHz) | |
| 2412 | 11.12 | 15.17 | > 0.500 | |
| 2437 | 12.09 | 15.08 | > 0.500 | |
| 2462 | 12.13 | 15.06 | > 0.500 | |

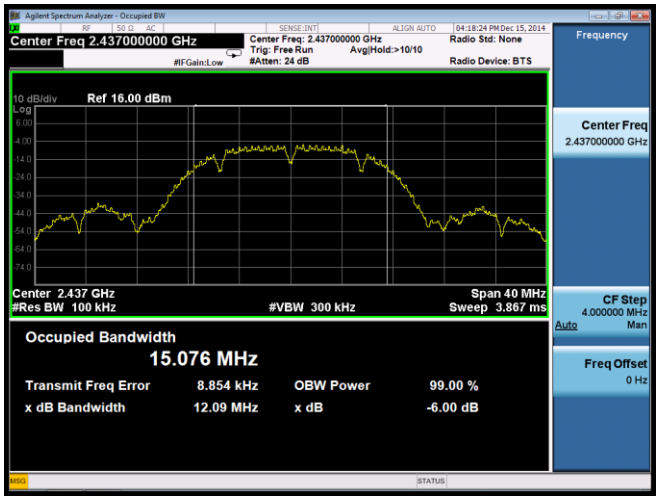
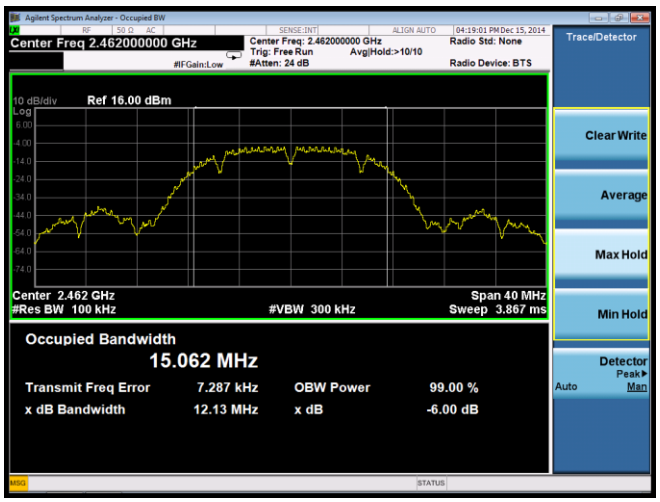
| Model Number | PMG-005 | | | |
|---|---|---|---|---|
| Test Item | 6dB RF Bandwidth and 99 % Occupied Bandwidth | | | |
| Test Mode | Mode 3: IEEE 802.11g Link Mode | | | |
| Date of Test | 2014-12-15 | | Test Site | TE05 |
| Frequency (MHz) | 6dB RF Bandwidth (MHz) | 99 % Occupied Bandwidth (MHz) | 6dB RF Bandwidth Limit (MHz) | |
| 2412 | 16.35 | 16.51 | > 0.500 | |
| 2437 | 16.36 | 16.48 | > 0.500 | |
| 2462 | 16.37 | 16.48 | > 0.500 | |

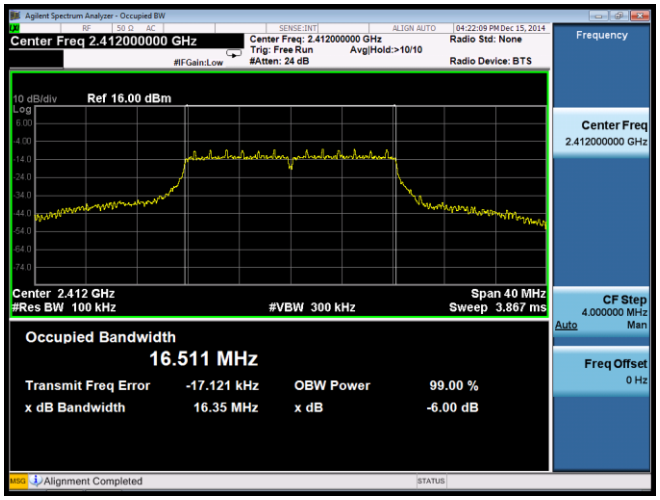
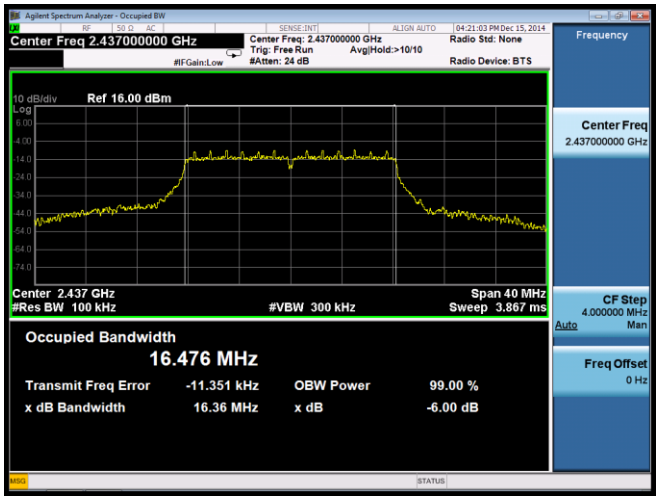
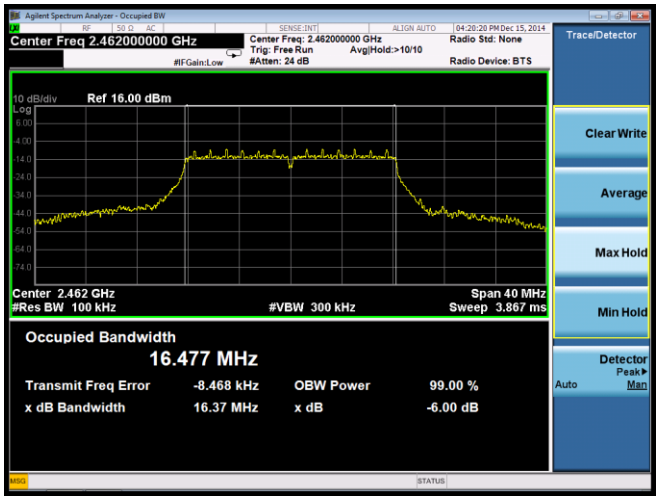
| Model Number | PMG-005 | | | |
|---|---|---|---|---|
| Test Item | 6dB RF Bandwidth and 99 % Occupied Bandwidth | | | |
| Test Mode | Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode | | | |
| Date of Test | 2014-12-15 | | Test Site | TE05 |
| Frequency (MHz) | 6dB RF Bandwidth (MHz) | 99 % Occupied Bandwidth (MHz) | 6dB RF Bandwidth Limit (MHz) | |
| 2412 | 17.10 | 17.61 | > 0.500 | |
| 2437 | 17.11 | 17.59 | > 0.500 | |
| 2462 | 17.11 | 17.59 | > 0.500 | |

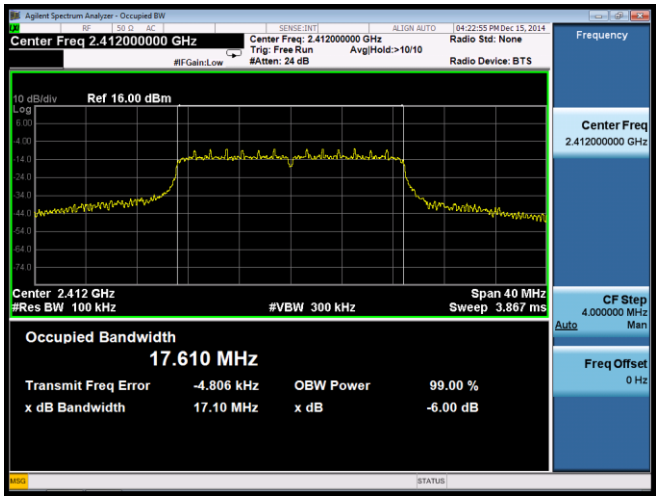
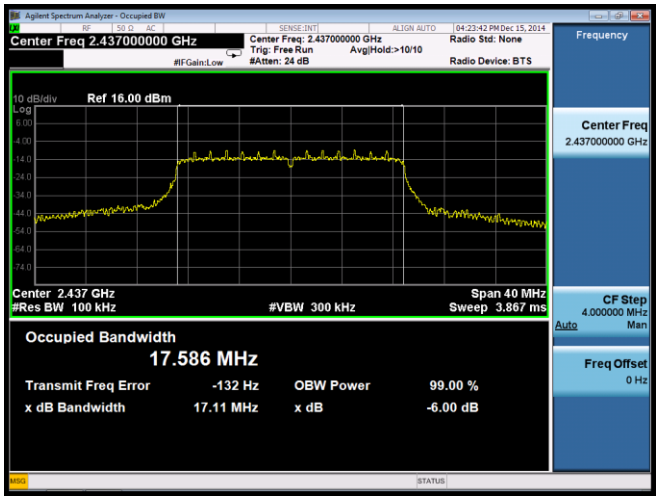
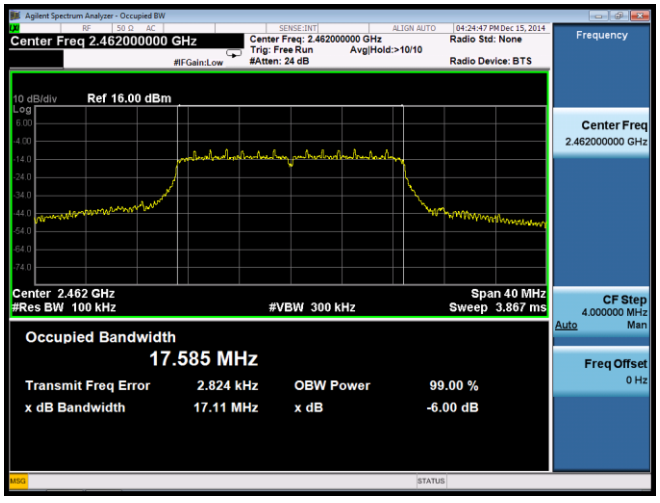
| Model Number | PMG-005 | | | |
|---|---|---|---|---|
| Test Item | 6dB RF Bandwidth and 99 % Occupied Bandwidth | | | |
| Test Mode | Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode | | | |
| Date of Test | 2014-12-15 | | Test Site | TE05 |
| Frequency (MHz) | 6dB RF Bandwidth (MHz) | 99 % Occupied Bandwidth (MHz) | 6dB RF Bandwidth Limit (MHz) | |
| 2422 | 35.39 | 36.02 | > 0.500 | |
| 2437 | 35.41 | 35.98 | > 0.500 | |
| 2452 | 35.40 | 35.99 | > 0.500 | |

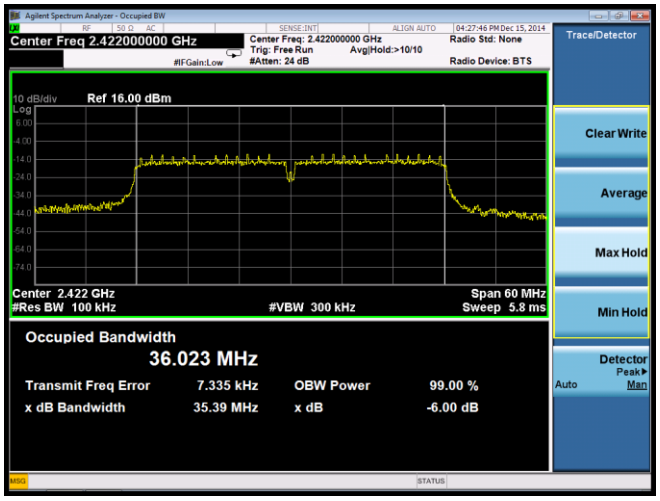
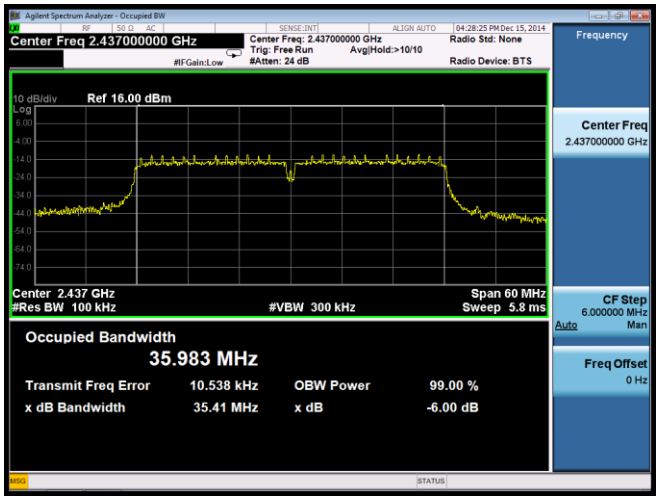
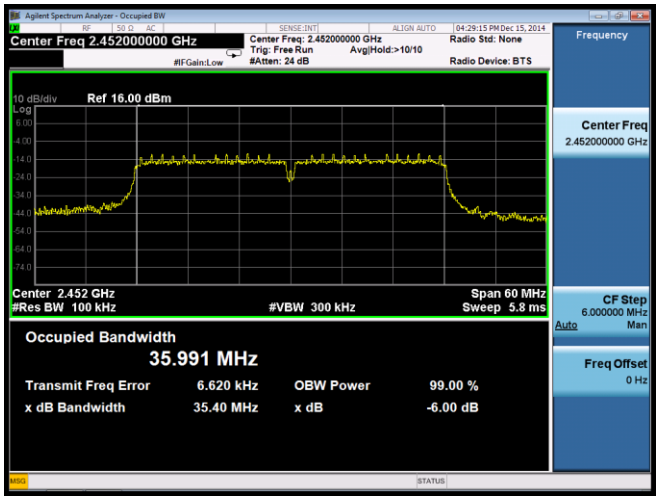
## 7.6. Test Graphs

6dB RF Bandwidth & 99 % Occupied Bandwidth

| Mode 2: IEEE 802.11b Link Mode | |
|---|---|
| 2412 |  |
| 2437 |  |
| 2462 |  |

| Mode 3: IEEE 802.11g Link Mode | |
|---|---|
| 2412 |  |
| 2437 |  |
| 2462 |  |

| Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode | |
|---|---|
| 2412 |  |
| 2437 |  |
| 2462 |  |

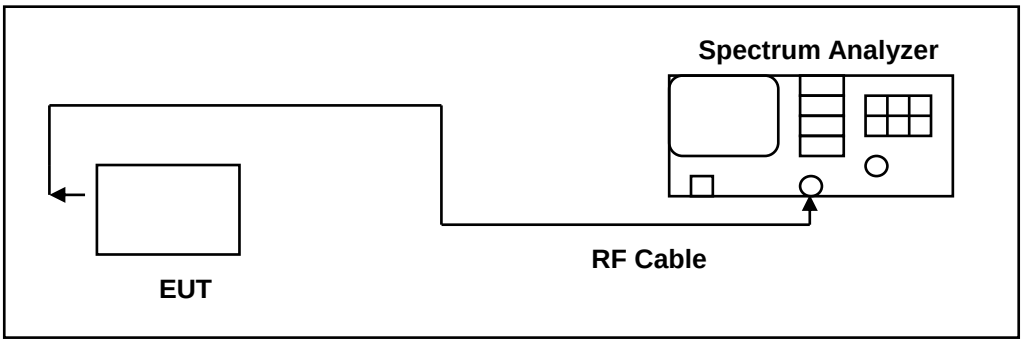
| Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode | |
|---|---|
| 2422 |  |
| 2437 |  |
| 2452 |  |

# 8 Maximum Power Density Measurement

## 8.1. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

## 8.2. Test Setup




## 8.3. Test Instruments

| Equipment | Manufacturer | Model Number | Serial Number | Cal. Date | Remark |
|---|---|---|---|---|---|
| Spectrum Analyzer | Agilent | N9020A | MY53420615 | 05/13/2014 | (1) |
| RF cable | WOKEN | -- | S02-140428-041 | 07/14/2014 | (1) |
| Test Site | ATL | TE05 | TE05 | N.C.R. | ----- |

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.
Note: N.C.R. = No Calibration Request.

## 8.4. Test Procedure

The EUT was setup to ANSI C63.4, 2009; tested to DTS test procedure of KDB558074D01 for compliance to FCC 47CFR 15.247 requirements.

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
4. Set the VBW ≥ 3 × RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

## 8.5. Test Result

| Model Number | PMG-005 | | |
|---|---|---|---|
| Test Item | Maximum Power Density | | |
| Test Mode | Mode 2: IEEE 802.11b Link Mode | | |
| Date of Test | 2014-12-15 | Test Site | TE05 |
| Frequency(MHz) | Reading (dBm/100kHz) | | Limit(dBm/3kHz) |
| 2412 | 7.403 | | < 8 |
| 2437 | 6.463 | | < 8 |
| 2462 | 6.650 | | < 8 |

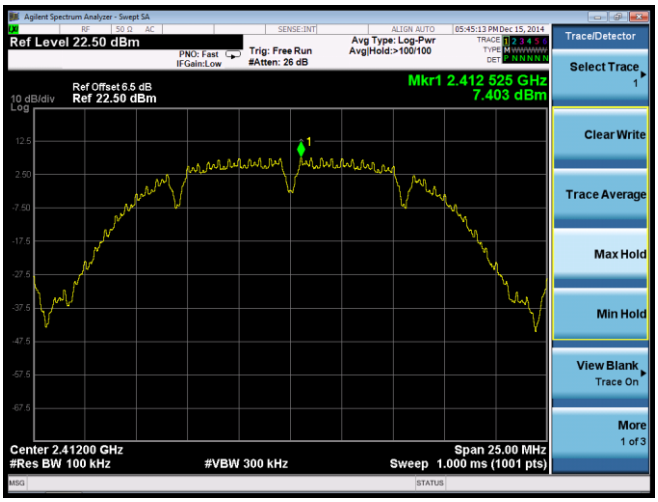
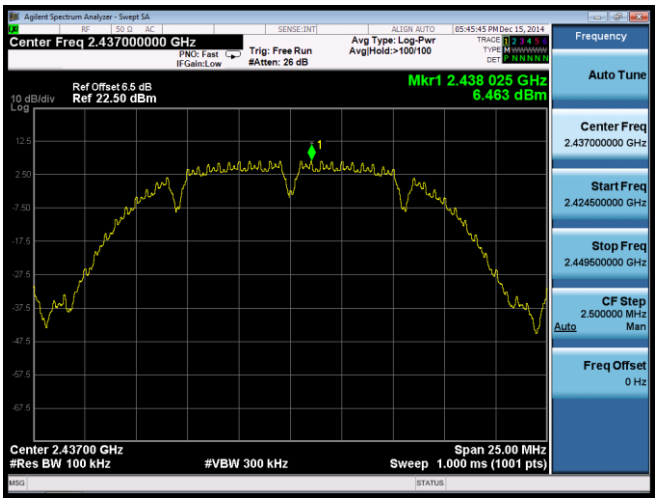
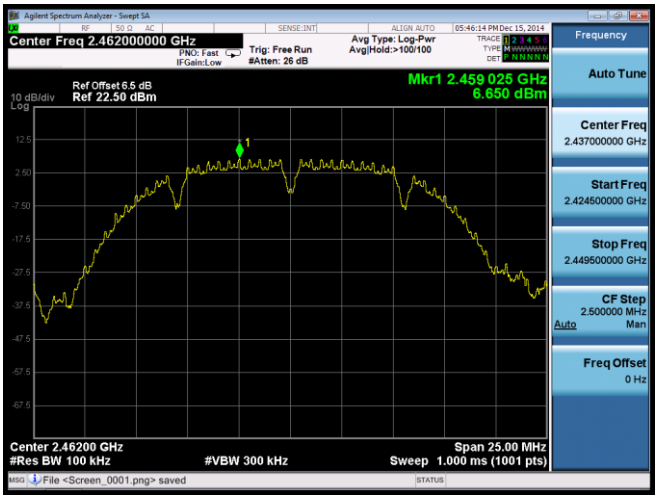
| Model Number | PMG-005 | | |
|---|---|---|---|
| Test Item | Maximum Power Density | | |
| Test Mode | Mode 3: IEEE 802.11g Link Mode | | |
| Date of Test | 2014-12-15 | Test Site | TE05 |
| Frequency(MHz) | Reading (dBm/100kHz) | | Limit(dBm/3kHz) |
| 2412 | 4.554 | | < 8 |
| 2437 | 3.785 | | < 8 |
| 2462 | 3.791 | | < 8 |

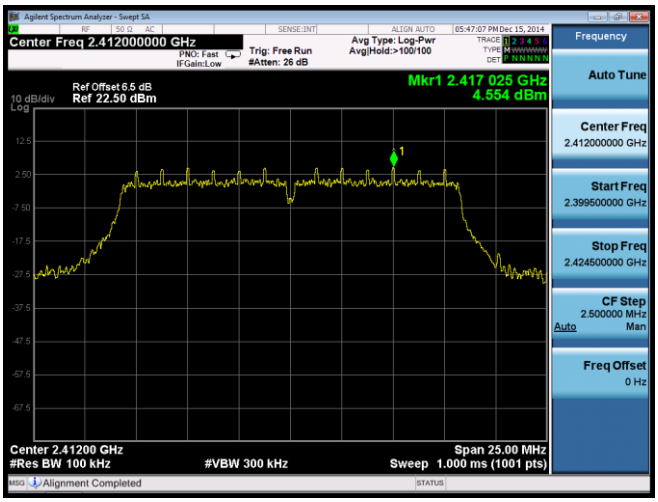
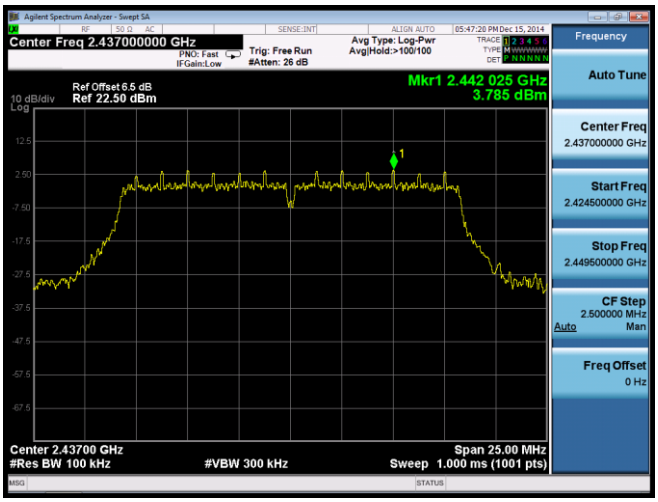
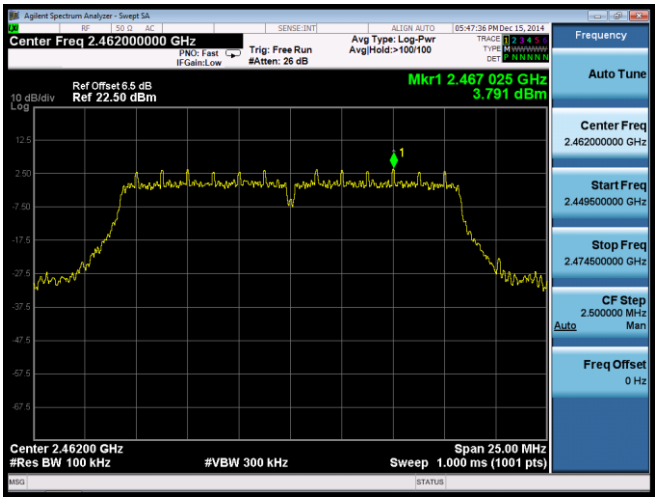
| Model Number | PMG-005 | | |
|---|---|---|---|
| Test Item | Maximum Power Density | | |
| Test Mode | Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode | | |
| Date of Test | 2014-12-15 | Test Site | TE05 |
| Frequency(MHz) | Reading (dBm/100kHz) | | Limit(dBm/3kHz) |
| 2412 | 4.574 | | < 8 |
| 2437 | 3.817 | | < 8 |
| 2462 | 3.926 | | < 8 |

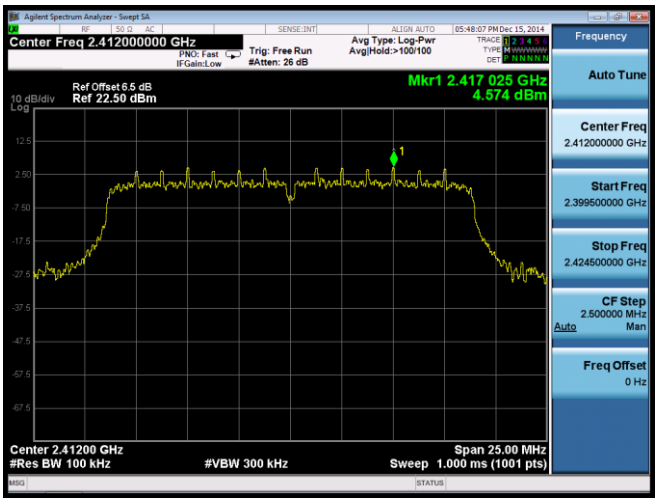
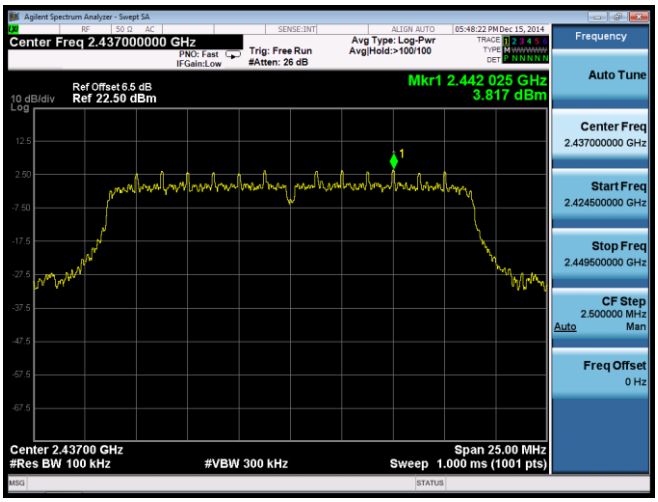
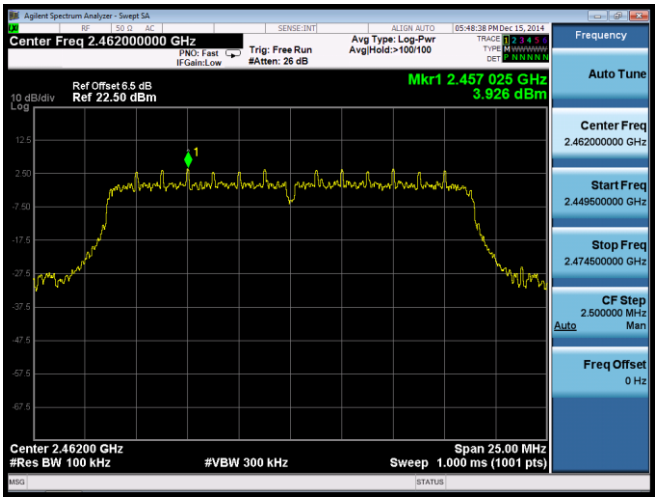
| Model Number | PMG-005 | | |
|---|---|---|---|
| Test Item | Maximum Power Density | | |
| Test Mode | Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode | | |
| Date of Test | 2014-12-15 | Test Site | TE05 |
| Frequency(MHz) | Reading (dBm/100kHz) | | Limit(dBm/3kHz) |
| 2422 | 1.744 | | < 8 |
| 2437 | 1.180 | | < 8 |
| 2452 | 1.469 | | < 8 |

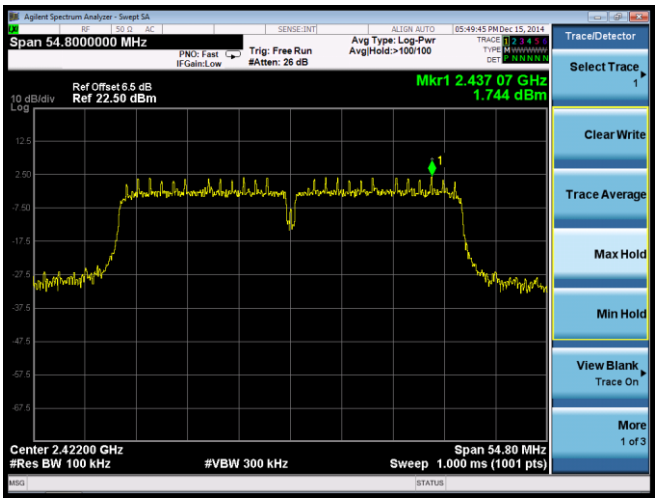
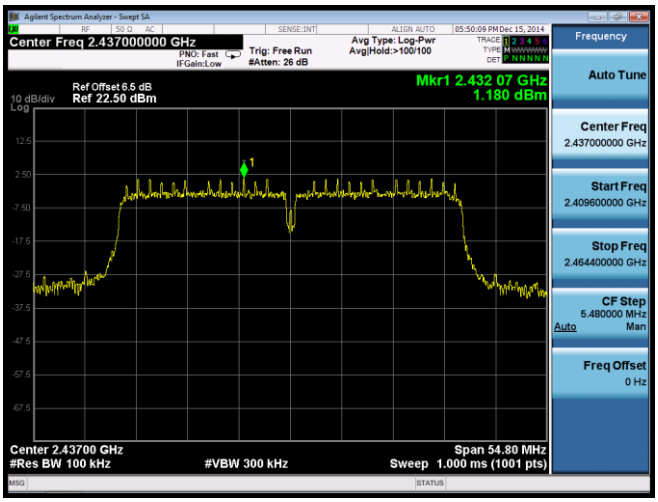
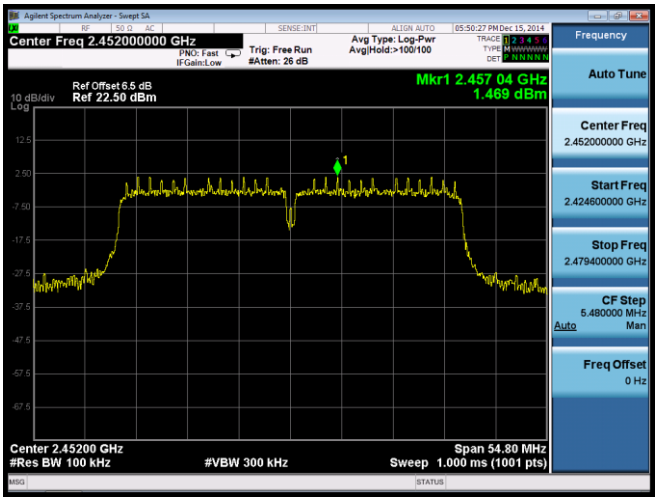
Note: A 100 kHz RBW is used during test, if the result compliance with 8dBm/3kHz, it must also compliance with 8dBm/3kHz when a 3kHz RBW is used.

## 8.6. Test Graphs

| Mode 2: IEEE 802.11b Link Mode | |
|---|---|
| 2412 |  |
| 2437 |  |
| 2462 |  |

| Mode 3: IEEE 802.11g Link Mode | |
|---|---|
| 2412 |  |
| 2437 |  |
| 2462 |  |

| Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode | |
|---|---|
| 2412 |  |
| 2437 |  |
| 2462 |  |

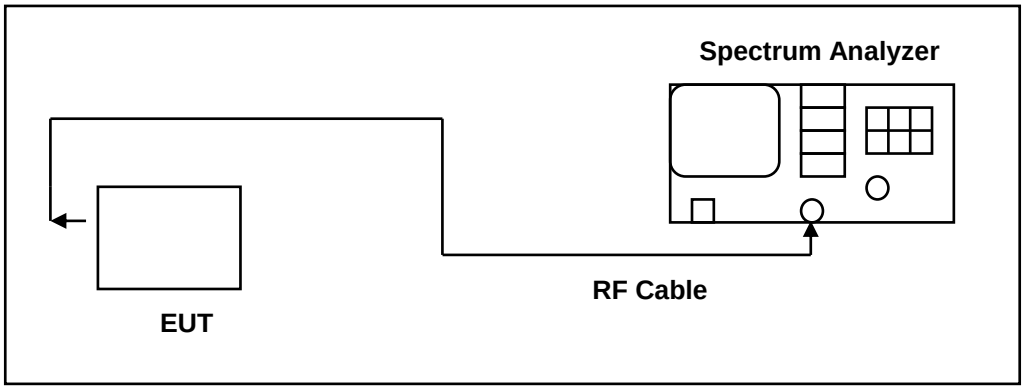
| Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode | |
|---|---|
| 2422 |  |
| 2437 |  |
| 2452 |  |

# 9 Out of Band Conducted Emissions Measurement

## 9.1. Limit

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

## 9.2. Test Setup




## 9.3. Test Instruments

| Equipment | Manufacturer | Model Number | Serial Number | Cal. Date | Remark |
|---|---|---|---|---|---|
| Spectrum Analyzer | Agilent | N9020A | MY53420615 | 05/13/2014 | (1) |
| Spectrum Analyzer | Agilent | E4408B | MY45107753 | 07/24/2014 | (1) |
| RF cable | WOKEN | -- | S02-140428-041 | 07/14/2014 | (1) |
| Test Site | ATL | TE05 | TE05 | N.C.R. | ----- |

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.
Note: N.C.R. = No Calibration Request.

## 9.4. Test Procedure

In any 100 kHz bandwidth outside the EUT pass band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.
All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass band.
The test was performed at 3 channels.

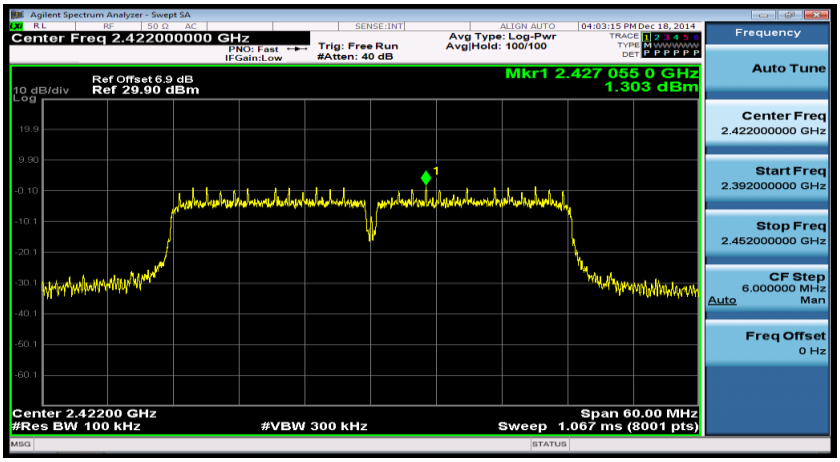
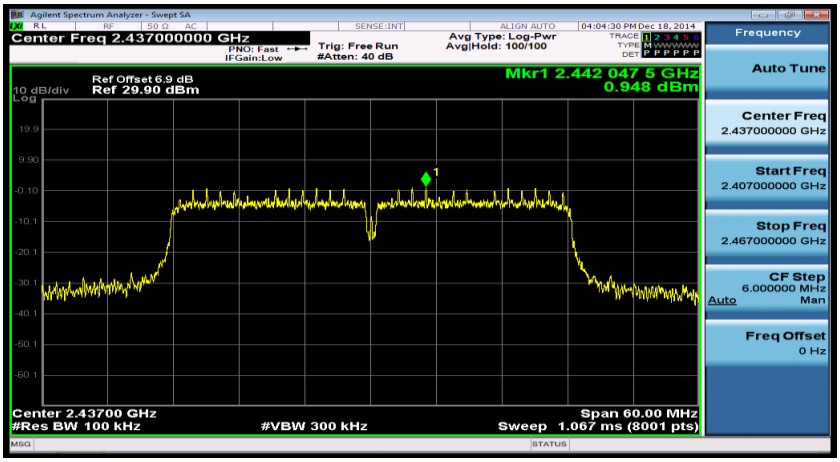
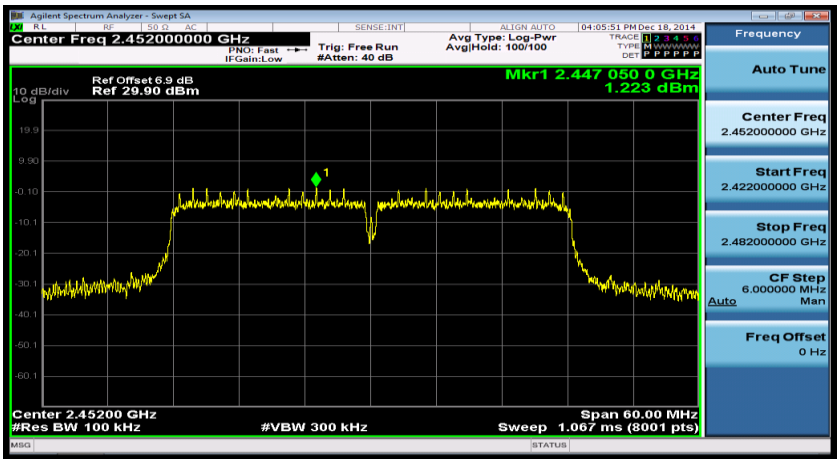
## 9.5. Test Graphs

### Reference level

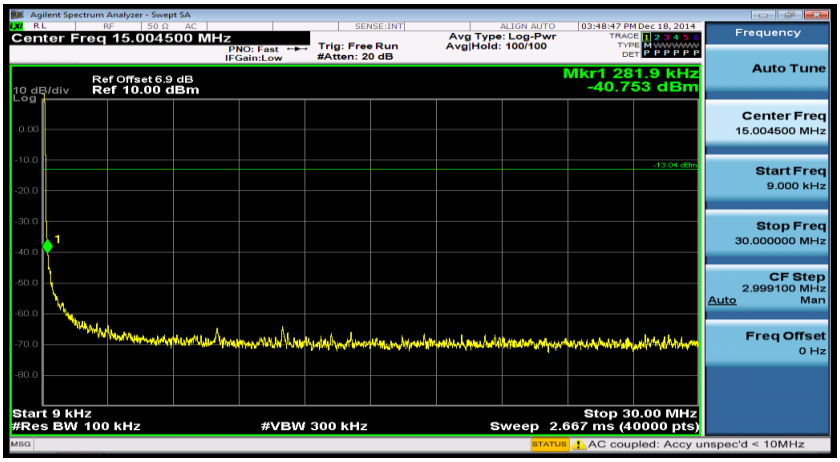
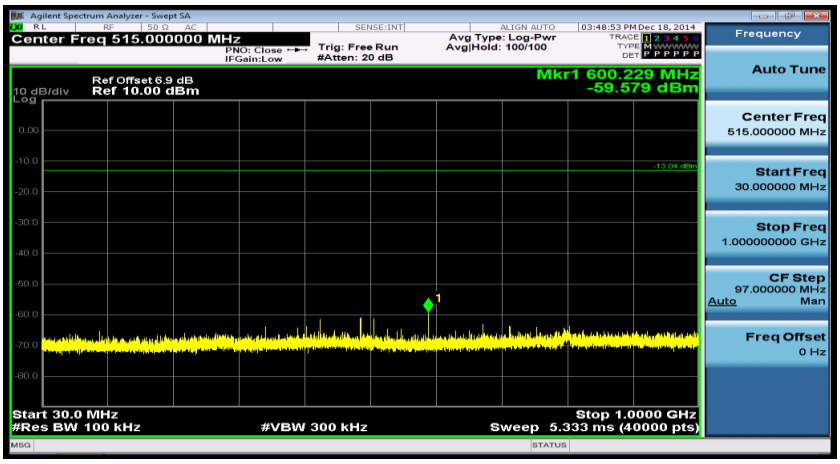
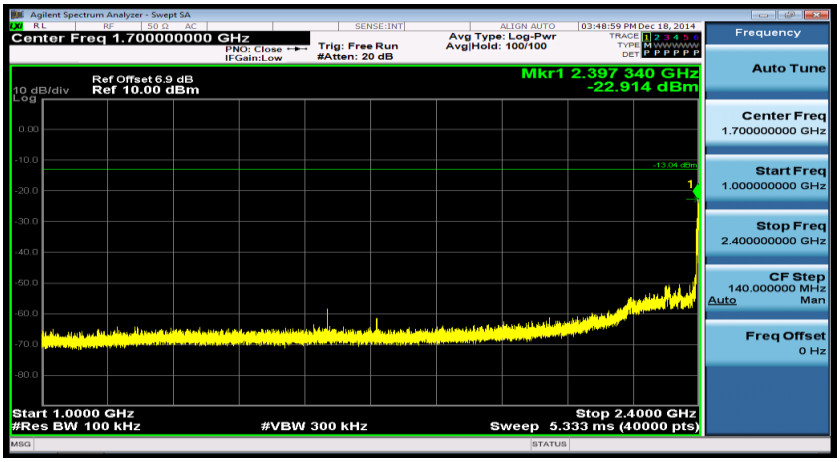
| Mode 2: IEEE 802.11b Link Mode | |
|---|---|
| 2412 |  |
| 2437 |  |
| 2462 |  |

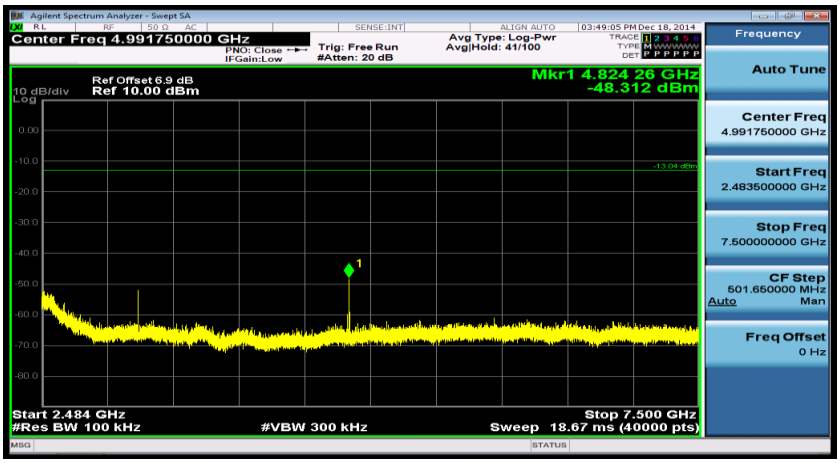
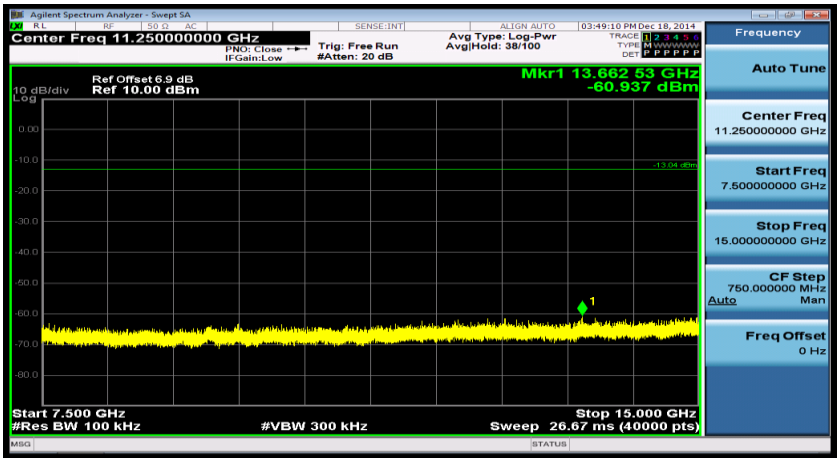
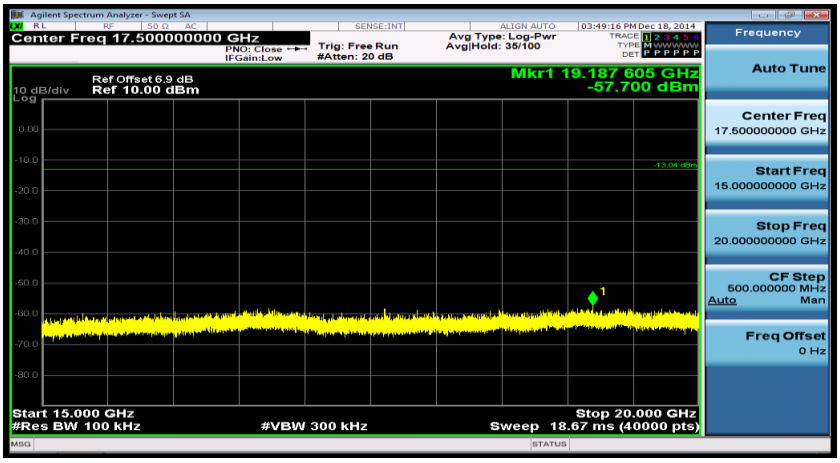
| Mode 3: IEEE 802.11g Link Mode | |
|---|---|
| 2412 |  |
| 2437 |  |
| 2462 |  |

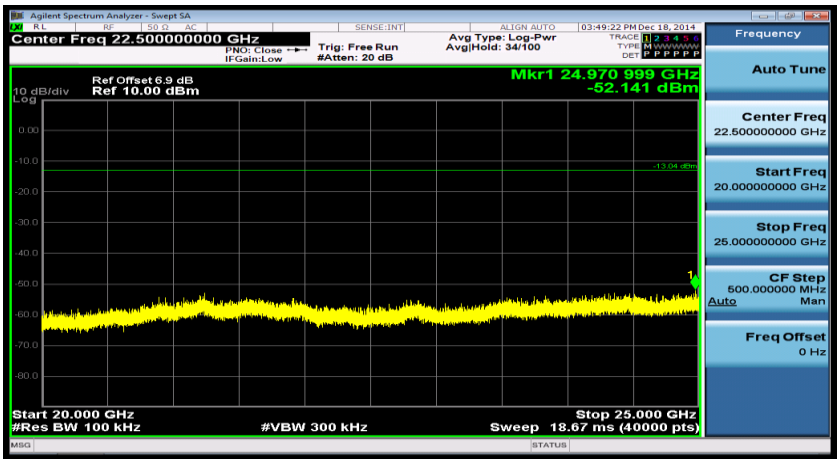
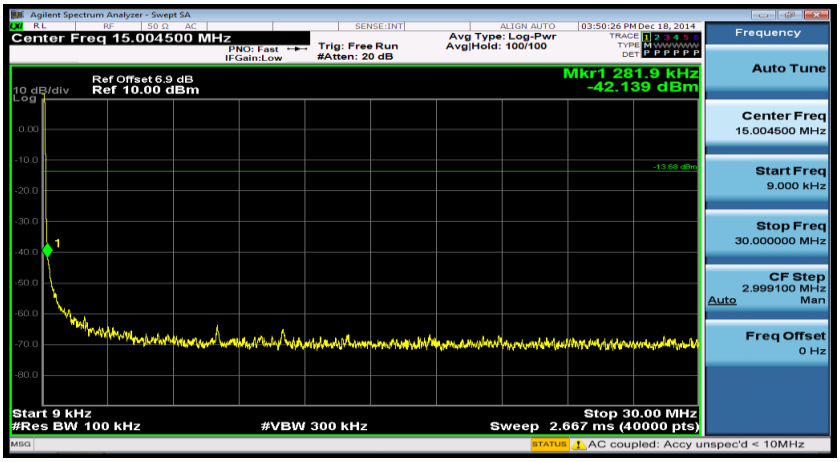
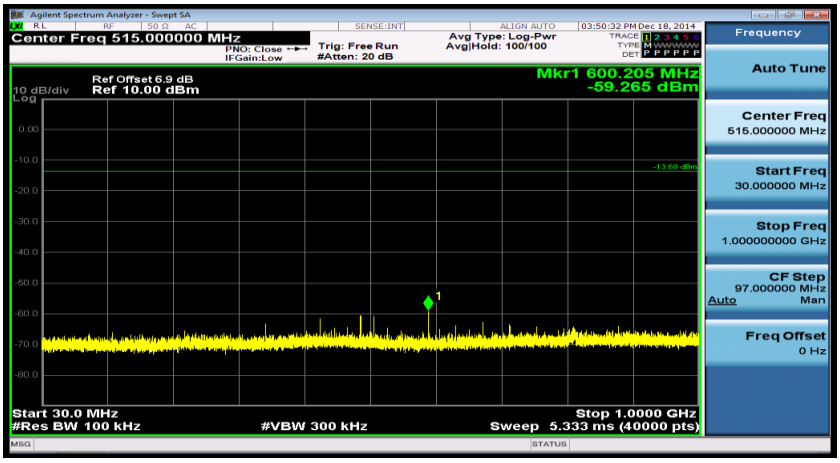
| Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode | |
|---|---|
| 2412 |   |
| 2437 |   |
| 2462 |   |

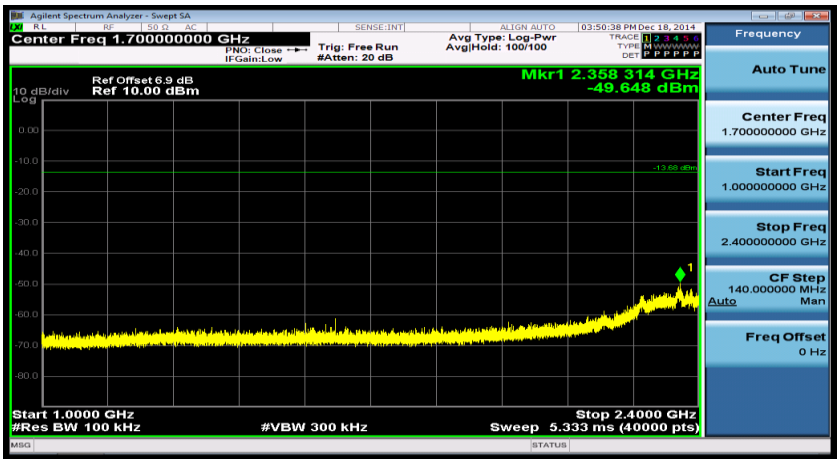
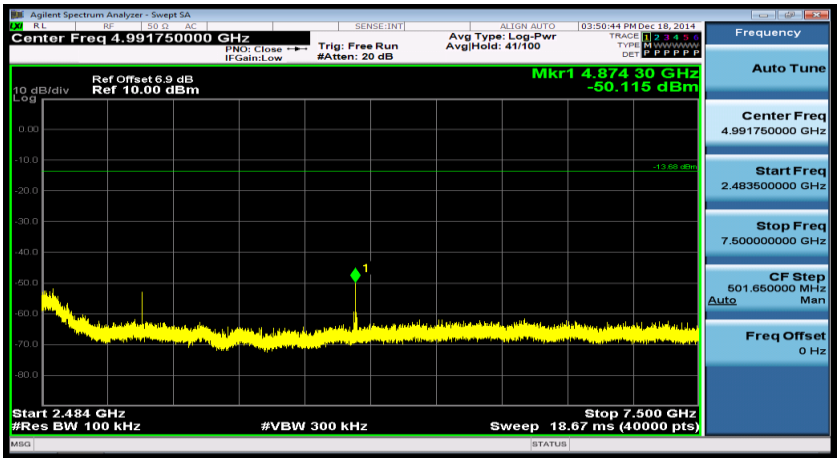
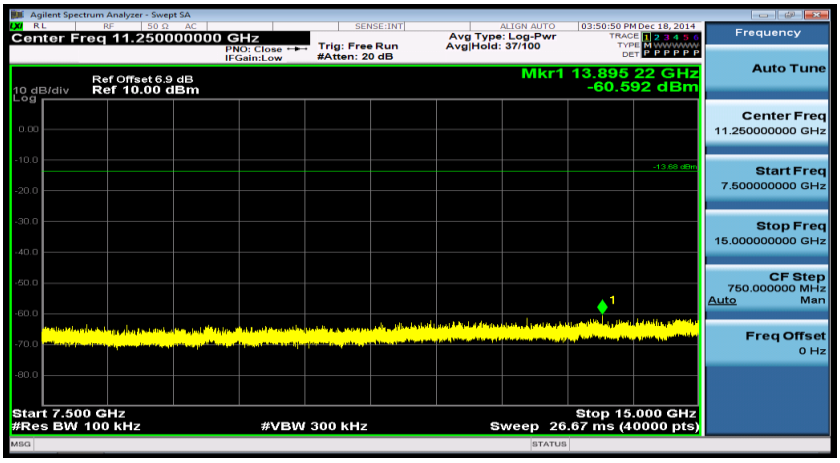
| Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode | |
|---|---|
| 2422 |  |
| 2437 |  |
| 2452 |  |

**Out of Band Conducted Emissions**

| Mode 2: IEEE 802.11b Link Mode-2412 | |
|---|---|
| 9kHz-30MHz |  |
| 30MHz-1GHz |  |
| 1GHz-2.4GHz |  |

| | |
|---|---|
| 2.4835GHz-7.5GHz |  |
| 7.5GHz-15GHz |  |
| 15GHz-20GHz |  |

| | |
|---|---|
| 20GHz-25GHz |  |
| Mode 2: IEEE 802.11b Link Mode-2437 | |
| 9kHz-30MHz |  |
| 30MHz-1GHz |  |

| | |
|---|---|
| 1GHz-2.4GHz |  |
| 2.4835GHz-7.5GHz |  |
| 7.5GHz-15GHz |  |