| | | | | |
|---|---|---|---|---|
| **Prüfbericht-Nr.:** *Test Report No.*: | **50108650 001** | **Auftrags-Nr.:** *Order No.*: | 114070293 | **Seite 1 von 52** *Page 1 of 52* |
| **Kunden-Referenz-Nr.:** *Client Reference No.*: | N/A | **Auftragsdatum:** *Order date*: | 17-Oct-2017 | |
| **Auftraggeber:** *Client*: | Hon Hai Precision Industry Co., Ltd<br>No.151, Sec. 1, Nankan Rd., Lujhu Township, Taoyuan County, 33859, Taiwan | | | |
| **Prüfgegenstand:** *Test item*: | WLAN 802.11 b/g/n 1x1 AIOT Module | | | |
| **Bezeichnung / Typ-Nr.:** *Identification / Type No.*: | CPWB-B*****KZ, FPWB-B*****KZ, CPWB-B450JBKZ, FPWB-B434DRKZ<br>(* = 0-9 or blank or A-Z) | | | |
| **Auftrags-Inhalt:** *Order content*: | FCC/IC test report | | | |
| **Prüfgrundlage:** *Test specification*: | FCC 47CFR Part 15: Subpart C Section 15.247<br>RSS-247 (02-2017) | | | |

| | |
|---|---|
| **Wareneingangsdatum:** *Date of receipt*: | 20-Oct-2017 |
| **Prüfmuster-Nr.:** *Test sample No.*: | A000636893-001,002<br>A000636951-001,002 |
| **Prüfzeitraum:** *Testing period*: | 24-Oct-2017 - 31-Oct-2017 |
| **Ort der Prüfung:** *Place of testing*: | EMC Laboratory Taipei |
| **Prüflaboratorium:** *Testing laboratory*: | TUV Rheinland Taiwan Ltd. |
| **Prüfergebnis*:** *Test result**: | Pass |

| **Report date** / *tested by*: | | | **kontrolliert von** / *reviewed by*: | | |
|---|---|---|---|---|---|
| 2017-11-20 | SamC.J. Kuo/Engineer | Sam | 2017-11-20 | Arvin Ho/Vice General Manager | |
| **Datum** *Date* | **Name / Stellung** *Name / Position* | **Unterschrift** *Signature* | **Datum** *Date* | **Name / Stellung** *Name / Position* | **Unterschrift** *Signature* |

**Sonstiges** / *Other*:
CPWB-B*****KZ, FPWB-B*****KZ (* = 0-9 or blank or A-Z, indication difference of US market purpose.)
CPWB-B450JBKZ, FPWB-B434DRKZ (For Canada and other countries.)
There are two models of the WiFi module, the difference is power supply circuit. All other RF circuit is same.
Please refer to the Block Diagram for detailed information.

**Zustand des Prüfgegenstandes bei Anlieferung:** Prüfmuster vollständig und unbeschädigt
*Condition of the test item at delivery*: *Test item complete and undamaged*

| | | | | | |
|---|---|---|---|---|---|
| * Legende: | 1 = sehr gut | 2 = gut | 3 = befriedigend | 4 = ausreichend | 5 = mangelhaft |
| | P(ass) = entspricht o.g. Prüfgrundlage(n) | | F(ail) = entspricht nicht o.g. Prüfgrundlage(n) | N/A = nicht anwendbar | N/T = nicht getestet |
| *Legend:* | *1 = very good* | *2 = good* | *3 = satisfactory* | *4 = sufficient* | *5 = poor* |
| | *P(ass) = passed a.m. test specification(s)* | | *F(ail) = failed a.m. test specification(s)* | *N/A = not applicable* | *N/T = not tested* |

**Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.**
*This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.*

# TEST SUMMARY

**5.1.1 ANTENNA REQUIREMENT**
*RESULT: Passed*

**5.1.2 PEAK OUTPUT POWER**
*RESULT: Passed*

**5.1.3 6DB BANDWIDTH AND 99% BANDWIDTH**
*RESULT: Passed*

**5.1.4 POWER DENSITY**
*RESULT: Passed*

**5.1.5 CONDUCTED SPURIOUS EMISSIONS AND FREQUENCY BAND EDGE MEASURED IN 100KHZ BANDWIDTH**
*RESULT: Passed*

**5.1.6 SPURIOUS EMISSION**
*RESULT: Passed*

**5.2.1 MAINS CONDUCTED EMISSIONS**
*RESULT: Passed*

**6.1.1 ELECTROMAGNETIC FIELDS**
*RESULT: Passed*

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# 1. General Remarks

## 1.1 Complementary Materials

The following attachments are integral parts of this test report:

**Appendix P: Photo Documentation**
**(File Name: 50108650APPENDIXP)**
**Appendix D: Test Result of Radiated Emissions**
**(File Name: 50108650APPENDIXD)**

Test Specifications

The following standards were applied (in bold: product standards, otherwise: basic standards).

### Table 1: Applied Standard and Test Levels

| **Radio** |
|---|
| FCC CFR47 Part 15: Subpart C Section 15.247<br>47 C.F.R. §§ 1.1310<br>KDB 447498 D01<br>RSS-247 Issue 2 (Feb 2017)<br>RSS-Gen, Issue 4, November 2014<br>ANSI C63.10:2013, KDB558074 D01 DTS Meas Guidance v02 |

# 2. Test Sites

## 2.1 Test Facilities

TUV Rheinland Taiwan Ltd.
Taipei Office

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

FCC RegistrationNo.: 340738
IC Canada Registration No.: 9465A-1
TAF Accredited NCC Test Lab. No.:0759
TAF ISO17025 Certification effective periods: 2016-Jul-1st to 2019-Jun-30th

Testing Laboratory
0759

## 2.2 List of Test and Measurement Instruments

### Table 2: List of Test and Measurement Equipment

| Kind of Equipment | Manu-facturer | Type | S/N | Last Calibration | Next Calibration |
|---|---|---|---|---|---|
| Test Software | Farad | EZ_EMC | Ver. TUV3A1 | N/A | N/A |
| EMI Test Receiver | R&S | ESCI 7 | 100797 | 2016/12/30 | 2017/12/30 |
| Spectrum Analyzer | R&S | FSV 40 | 100921 | 2017/05/02 | 2018/05/01 |
| Spectrum Analyzer | Agilent | N9010A | MY53470241 | 2017/05/23 | 2018/05/22 |
| Preamplifier (30MHz -1GHz) | HP | 8447D | 2944A06641 | 2016/12/28 | 2017/12/28 |
| Preamplifier (18 GHz -40 GHz) | COM-POWER | PAM-840 | 461257 | 2016/12/01 | 2017/12/01 |
| Pre-Amplifier (1GHz~18GHz) | EM Electronics | EM01G18G | 060558 | 2016/11/17 | 2017/11/17 |
| Bilog Antenna | TESEQ | CBL6111D | 29804 | 2017/08/18 | 2018/08/18 |
| Horn Antenna | ETS-Lindgren | 3117 | 201918 | 2017/08/18 | 2018/08/18 |
| Horn Antenna (18GHz~40GHz) | COM-POWER | AH-840 | 101031 | 2016/11/22 | 2017/11/22 |
| Loop Antenna | Schwarzbeck | FMZB 1513 | 1513-076 | 2017/06/14 | 2018/06/14 |
| EMI Test Receiver | R&S | ESCI7 | 100797 | 2016/12/30 | 2017/12/30 |
| Temp. & Humid. Chamber | Giant Force | GCT-099-40-S | MAF0103-007 | 2017/03/09 | 2019/03/09 |
| LISN (1 phase) | R&S | ENV216 | 101243 | 2017/06/18 | 2018/06/18 |
| LISN | R&S | ENV216 | 101262 | 2017/06/22 | 2018/06/21 |

## 2.3 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

## 2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basics using in house standards or comparisons.

## 2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements are ±3dB.

### Table 3: Emission Measurement Uncertainty

| Parameter | Uncertainty |
|---|---|
| RF power, conducted | ± 1.5 dB |
| Adjacent channel power | ± 3 dB |
| Radiated emission of transmitter, valid up to 26 GHz | ± 6 dB |
| Radiated emission of receiver, valid up to 26 GHz | ± 6 dB |
| Temperature | ± 2 ºC |
| Humidity | ± 10 % |

# 3. General Product Information

## 3.1 Product Function and Intended Use

The EUT is a 802.11b/g/n 1T1R WLAN Module which is designed to work mount on other device.
For details refer to the User Guide, Data Sheet and Circuit Diagram.

## 3.2 System Details and Ratings

### Table 4: Basic Information of EUT

| Item | EUT information |
|---|---|
| Kind of Equipment | WLAN 802.11 b/g/n 1x1 AIOT Module |
| Type Designation | CPWB-B450JBKZ, FPWB-B434DRKZ |
| FCC ID | RX3-B01 |
| IC | 2878F-B01 |
| HVIN | CPWB-B450JBKZ, FPWB-B434DRKZ |

### Table 5: Technical Specification of EUT

| Technical Specification | Value |
|---|---|
| Operating Frequencies | 2412~2462 MHz |
| Channel Spacing | 5 MHz |
| Channel number | 802.11b/g/n: 11 (2412 MHz ~ 2462 MHz) |
| Operation Voltage | 5Vdc for CPWB-B450JBKZ, 3.3Vdc for FPWB-B434DRKZ |
| Modulation | CCK, DQPSK, DBPSK for DSSS; QAM, QPSK, BPSK for OFDM |
| Antenna gain | 2dBi |

## 3.3 Independent Operation Modes

Basic operation modes are:

A. Transmitting
    1. Low channel
    2. Middle channel
    3. High channel
B. Receiving
C. Standby
D. Off

## 3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

## 3.5 Submitted Documents

- Block Diagram
- PCB Layout
- Photo Document
- Technical Description
- Circuit Diagram
- Instruction Manual
- Rating Label

# 4. Test Set-up and Operation Modes

## 4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use.

## 4.2 Test Operation and Test Software

Setup for testing: Test samples are provided with a UART interface which makes it possible to control them through a test software installed on a notebook computer.

This software was running on the laptop computer connected to the EUT. It was used to enable the operation modes listed in section 3.3 as appropriate.

Full test was applied on all test modes, but only worst case was shown

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

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

IEEE 802.11n HT 20 mode:
Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 13Mbps data rate were chosen for full testing.

### 4.3 cial Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

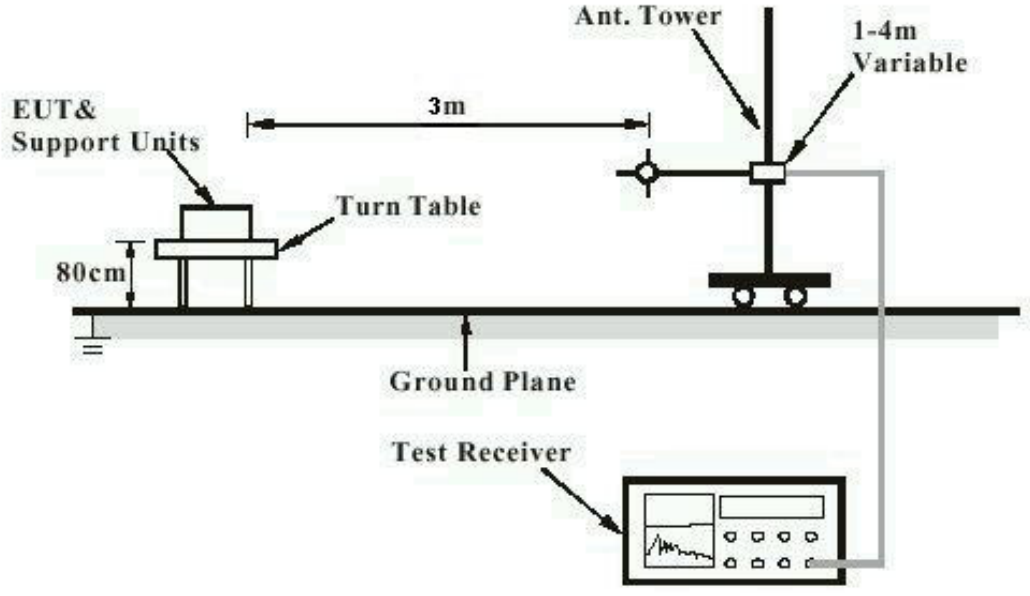
| Description | Manufacturer | Model No. | Serial No. |
|---|---|---|---|
| Notebook(EMC-06) | Lenovo | TP00048A | PB-0F8B2 |

## 4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

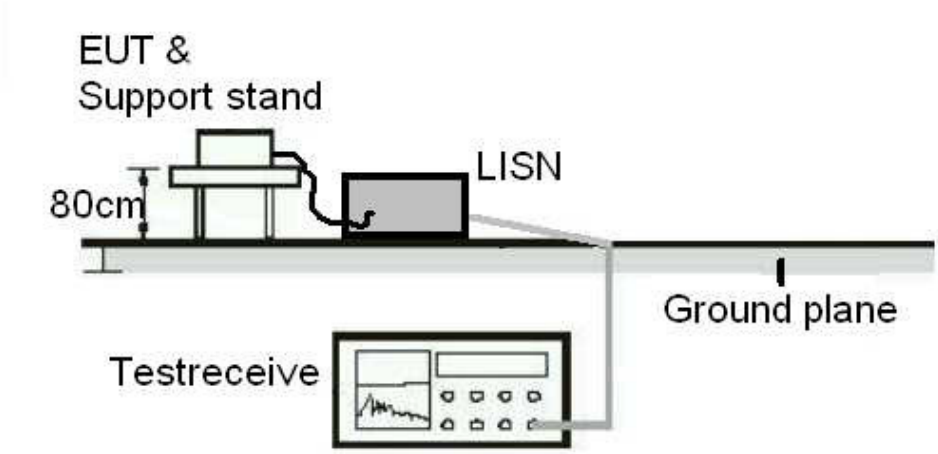
## 4.5 Test Setup Diagram

**Diagram of Measurement Configuration for Radiation Test**

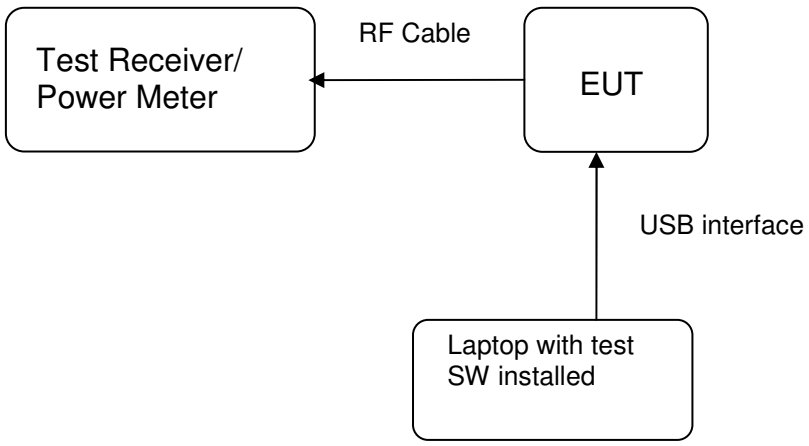



Note: Measurements above 1 GHz are done with a table height of 1.5m.

## Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)




## Diagram of Measurement Equipment Configuration for Conducted Transmitter Measurement



# 5. Test Results

## 5.1 Transmitter Requirement & Test Suites

### 5.1.1 Antenna Requirement

**RESULT:** **Passed**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(b)(4), Part 15.203 and RSS-Gen 8.3 |
| Limit | : | the use of antennas with directional gains that do not exceed 6 dBi |

According to the manufacturer declaration, the EUT has an antenna with a directional gain of 2dBi .The antenna is a printed PCB trace with no possibility of replacement with a non-approved antenna by the end-user. Therefore, the EUT is considered to comply with this provision.

Refer to EUT photo for details.

## 5.1.2 Peak Output Power

**RESULT:** **Passed**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(b)(3), RSS-247 5.4(4) |
| Basic standard | : | ANSI C63.10:2013, KDB558074 |
| Limit | : | 1 Watt |
| Kind of test site | : | Shielded room |

**Test setup**

| | | |
|---|---|---|
| Test Channel | : | Low/ Middle/ High |
| Operation Mode | : | A |
| Ambient temperature | : | 22-26 °C |
| Relative humidity | : | 50-65 % |
| Atmospheric pressure | : | 100-103 kPa |

**Table 6: Test result of Peak Output Power (802.11b)**

| Channel | Channel Frequency (MHz) | Output Power | | Limit |
|---|---|---|---|---|
| | | (dBm) | (W) | (W) |
| Low Channel | 2412 | 17.93 | 0.06209 | 1 |
| Middle Channel | 2437 | 17.84 | 0.06081 | 1 |
| High Channel | 2462 | 17.76 | 0.05970 | 1 |

**Table 7: Test result of Peak Output Power (802.11g)**

| Channel | Channel Frequency (MHz) | Output Power | | Limit |
|---|---|---|---|---|
| | | (dBm) | (W) | (W) |
| Low Channel | 2412 | 15.98 | 0.03963 | 1 |
| Middle Channel | 2437 | 15.87 | 0.03864 | 1 |
| High Channel | 2462 | 15.89 | 0.03882 | 1 |

## Table 8: Test result of Peak Output Power (802.11n HT20)

| Channel | Channel Frequency (MHz) | Output Power | | Limit |
|---|---|---|---|---|
| | | (dBm) | (W) | (W) |
| Low Channel | 2412 | 14.98 | 0.03148 | 1 |
| Middle Channel | 2437 | 14.81 | 0.03027 | 1 |
| High Channel | 2462 | 14.93 | 0.03112 | 1 |

b Max Value: 62.09 mW
g Max Value: 39.63 mW
n20 Max Value: 31.48 mW

## 5.1.3 6dB Bandwidth and 99% Bandwidth

**RESULT:** **Passed**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(a)(2), RSS-247 5.2(1) |
| Basic standard | : | ANSI C63.10:2013, KDB558074 |
| Kind of test site | : | Shielded room |

**Test setup**

| | | |
|---|---|---|
| Test Channel | : | Low/ Middle/ High |
| Operation Mode | : | A |

| | | |
|---|---|---|
| Ambient temperature | : | 22-26°C |
| Relative humidity | : | 50-65% |
| Atmospheric pressure | : | 100-103 kPa |

### Table 9: Test result of 6dB Bandwidth (802.11b)

| Channel | Channel Frequency (MHz) | 6dB Bandwidth (MHz) | Limit (MHz) | Result |
|---|---|---|---|---|
| Low Channel | 2412 | 9.091 | 0.5 | Pass |
| Mid Channel | 2437 | 9.082 | 0.5 | Pass |
| High Channel | 2462 | 9.082 | 0.5 | Pass |

### Table 10: Test result of 6dB Bandwidth (802.11g)

| Channel | Channel Frequency (MHz) | 6dB Bandwidth (MHz) | Limit (MHz) | Result |
|---|---|---|---|---|
| Low Channel | 2412 | 16.59 | 0.5 | Pass |
| Mid Channel | 2437 | 16.59 | 0.5 | Pass |
| High Channel | 2462 | 16.59 | 0.5 | Pass |

### Table 11: Test result of 6dB Bandwidth (802.11n HT20)

| Channel | Channel Frequency (MHz) | 6dB Bandwidth (MHz) | Limit (MHz) | Result |
|---|---|---|---|---|
| Low Channel | 2412 | 17.79 | 0.5 | Pass |
| Mid Channel | 2437 | 17.78 | 0.5 | Pass |
| High Channel | 2462 | 17.74 | 0.5 | Pass |

### Table 12: Test result of 99% Bandwidth (802.11b)

| Channel | Channel Frequency (MHz) | 99% Bandwidth (MHz) |
|---|---|---|
| Low Channel | 2412 | 13.335 |
| Mid Channel | 2437 | 13.28 |
| High Channel | 2462 | 13.366 |

### Table 13: Test result of 99% Bandwidth (802.11g)

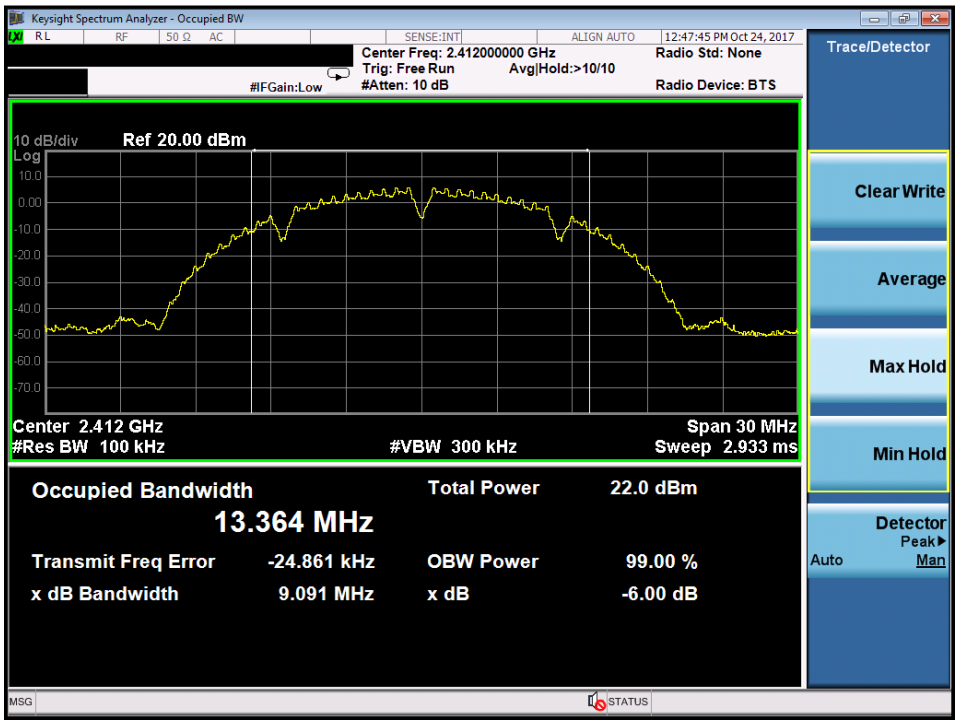
| Channel | Channel Frequency (MHz) | 99% Bandwidth (MHz) |
|---|---|---|
| Low Channel | 2412 | 16.81 |
| Mid Channel | 2437 | 16.798 |
| High Channel | 2462 | 16.823 |

### Table 14: Test result of 99% Bandwidth (802.11n HT20)

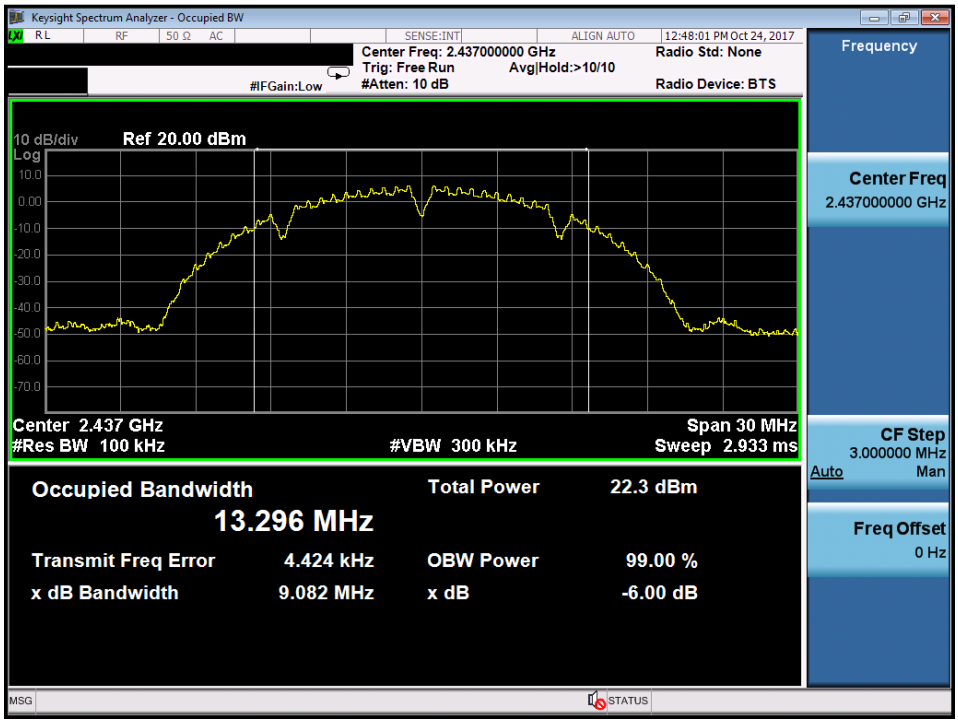
| Channel | Channel Frequency (MHz) | 99% Bandwidth (MHz) |
|---|---|---|
| Low Channel | 2412 | 17.828 |
| Mid Channel | 2437 | 17.825 |
| High Channel | 2462 | 17.836 |

# Test Plot of 6dB Bandwidth (802.11b)

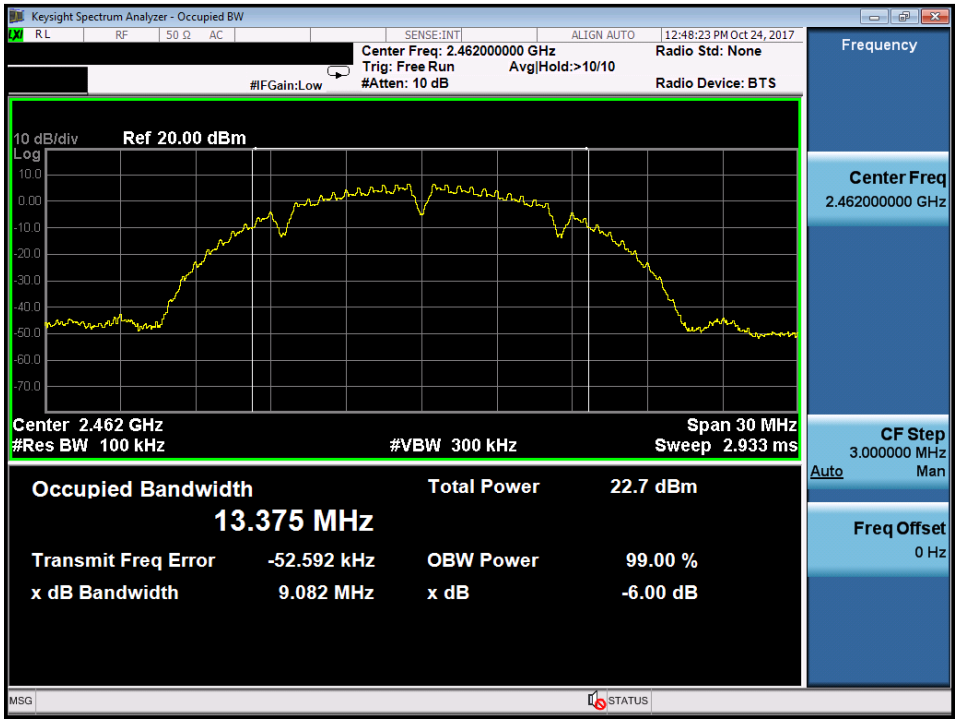
## Low Channel




## Middle Channel



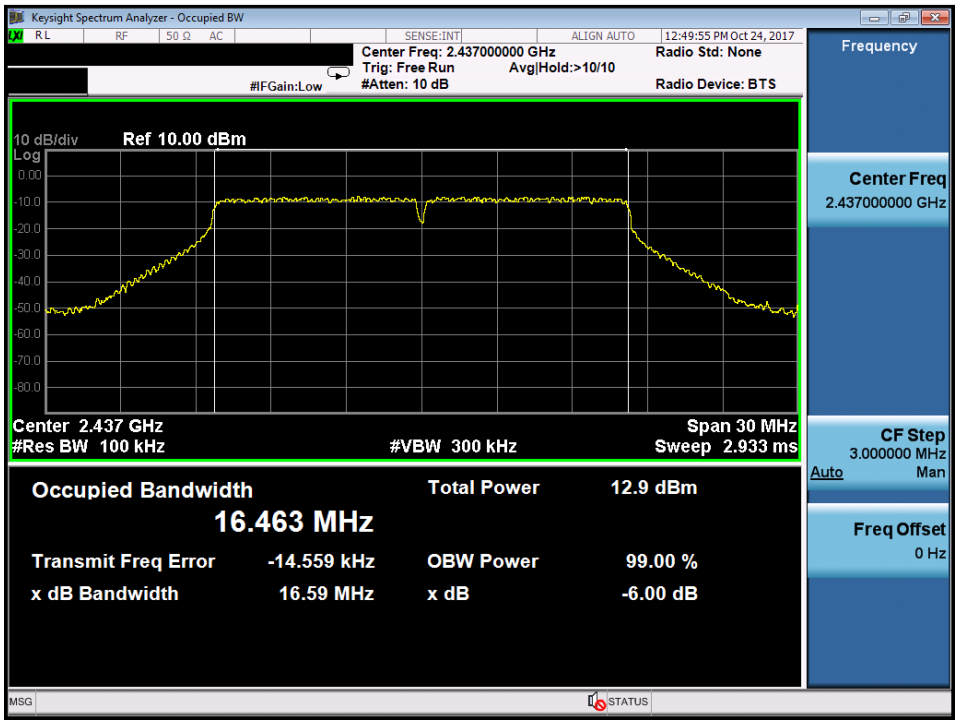
### High Channel




## Test Plot of 6dB Bandwidth (802.11g)

### Low Channel

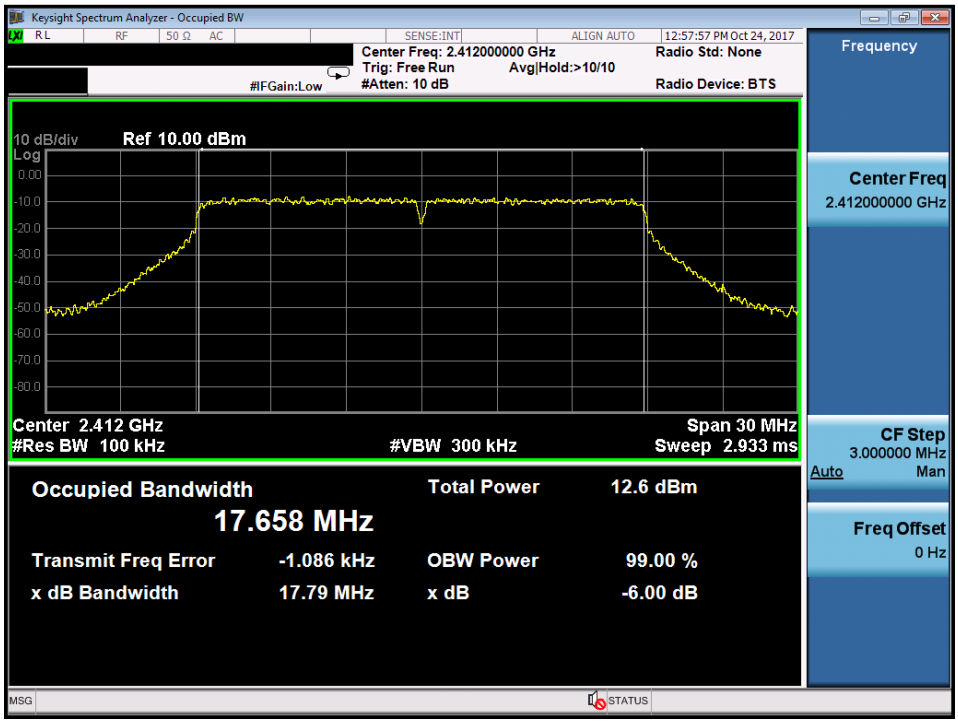
### Middle Channel



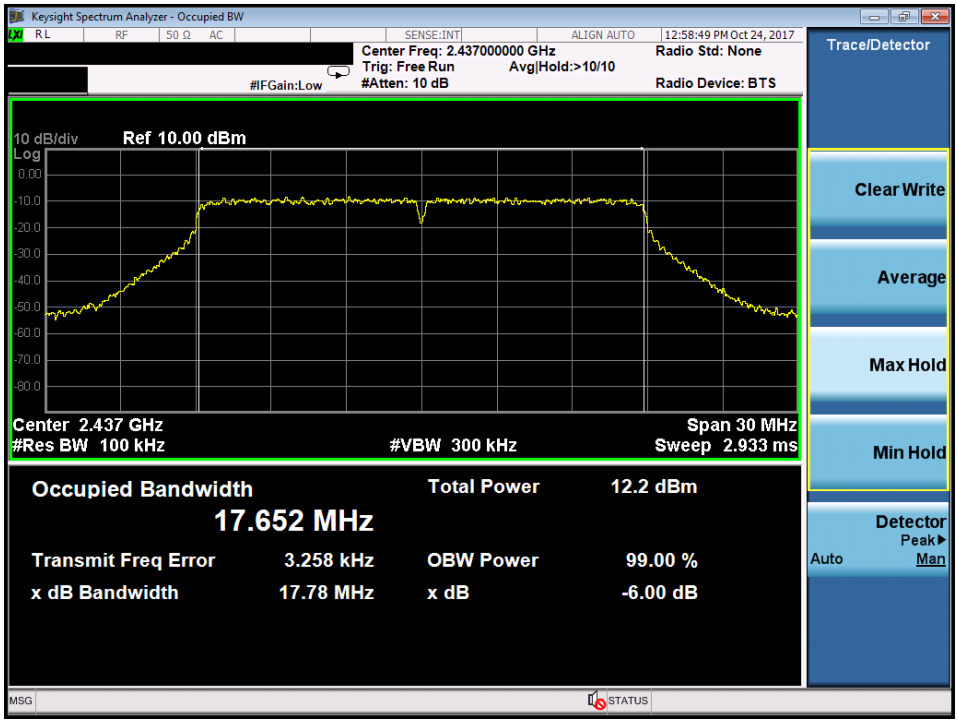

### High Channel

# Test Plot of 6dB Bandwidth (802.11n HT20)

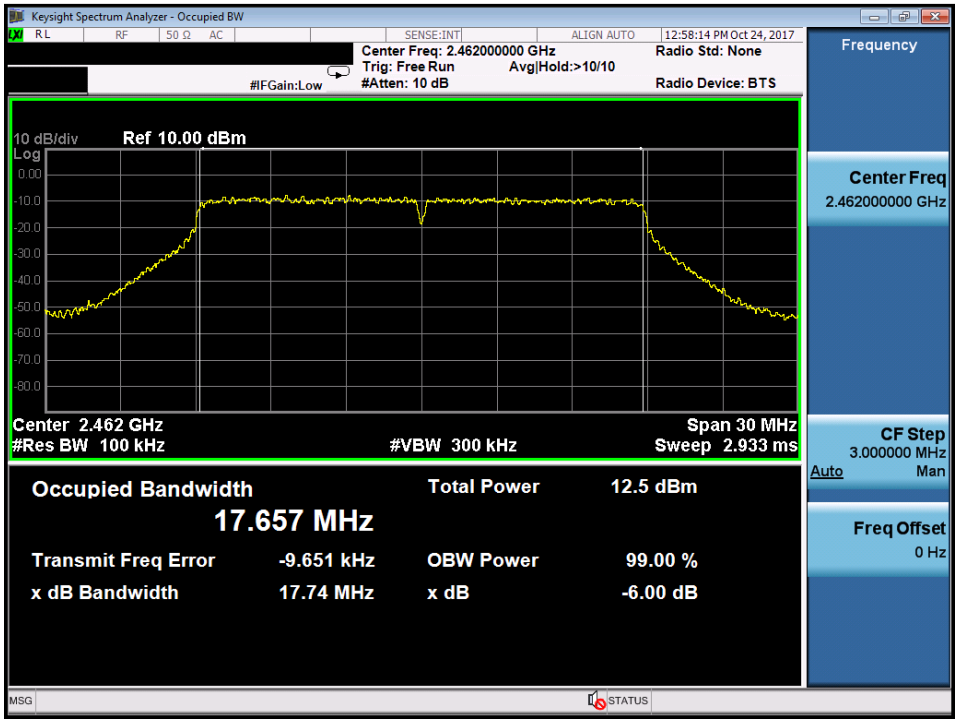
## Low Channel




## Middle Channel

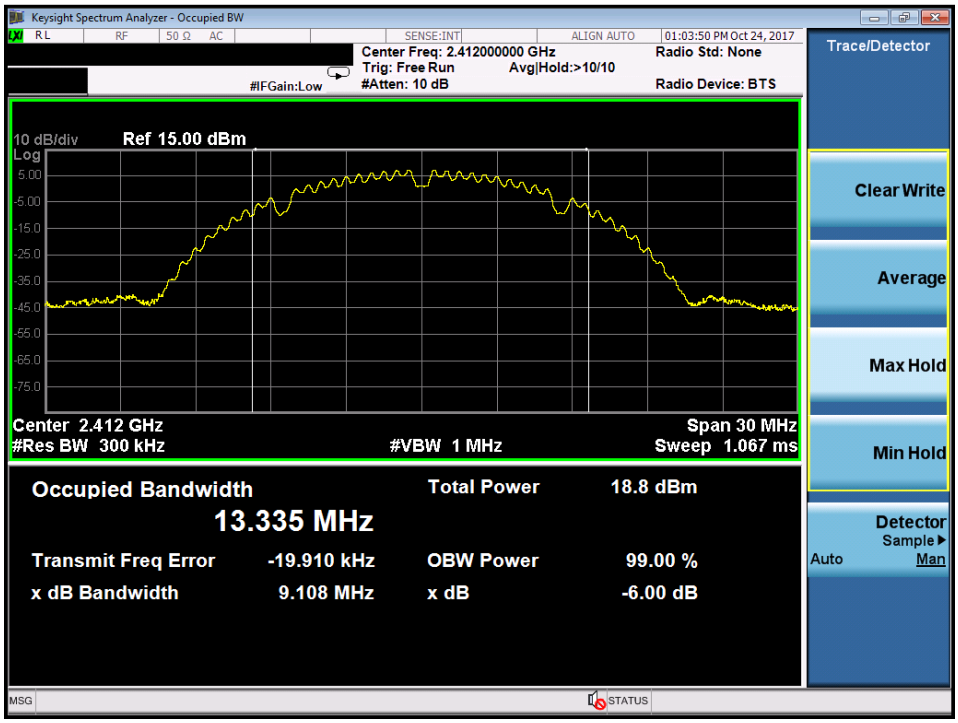


### High Channel

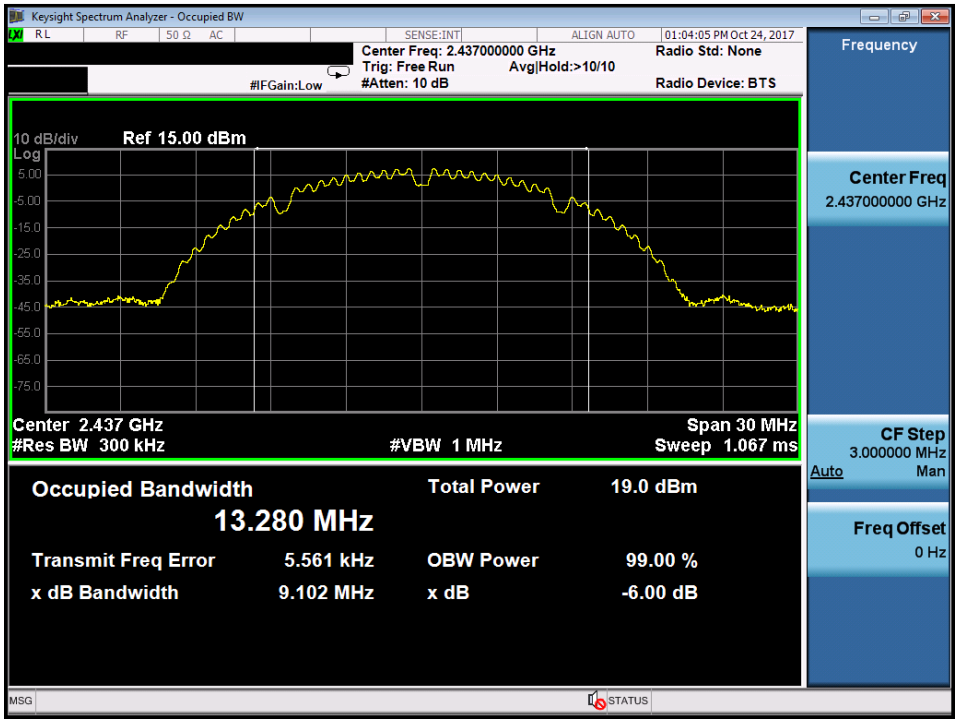


# Test Plot of Occupied Bandwidth (802.11b)

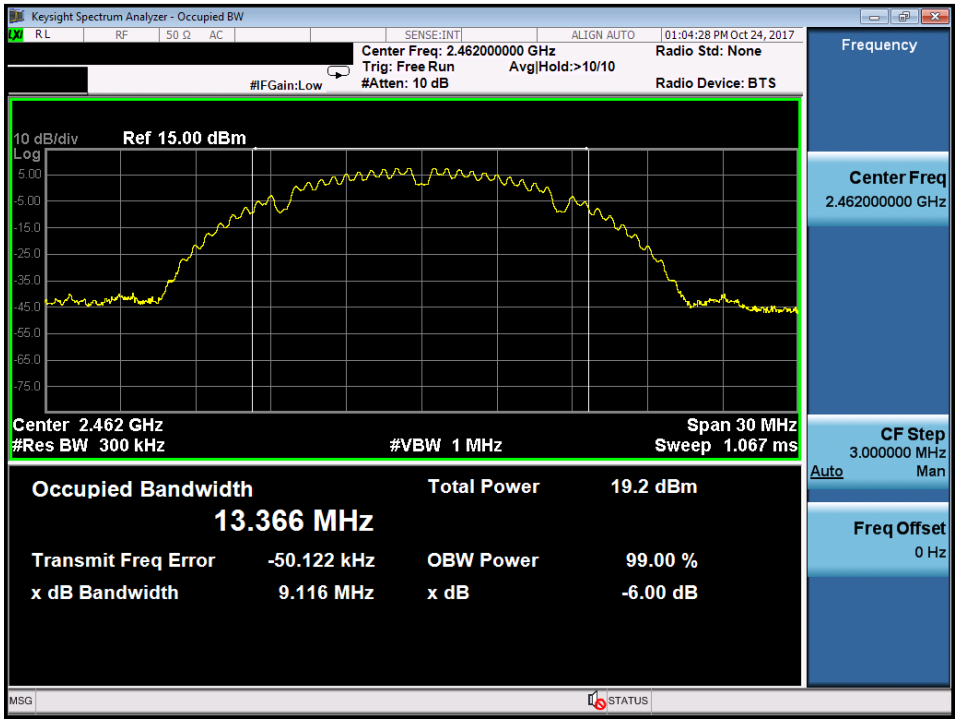
## Low Channel




## Middle Channel

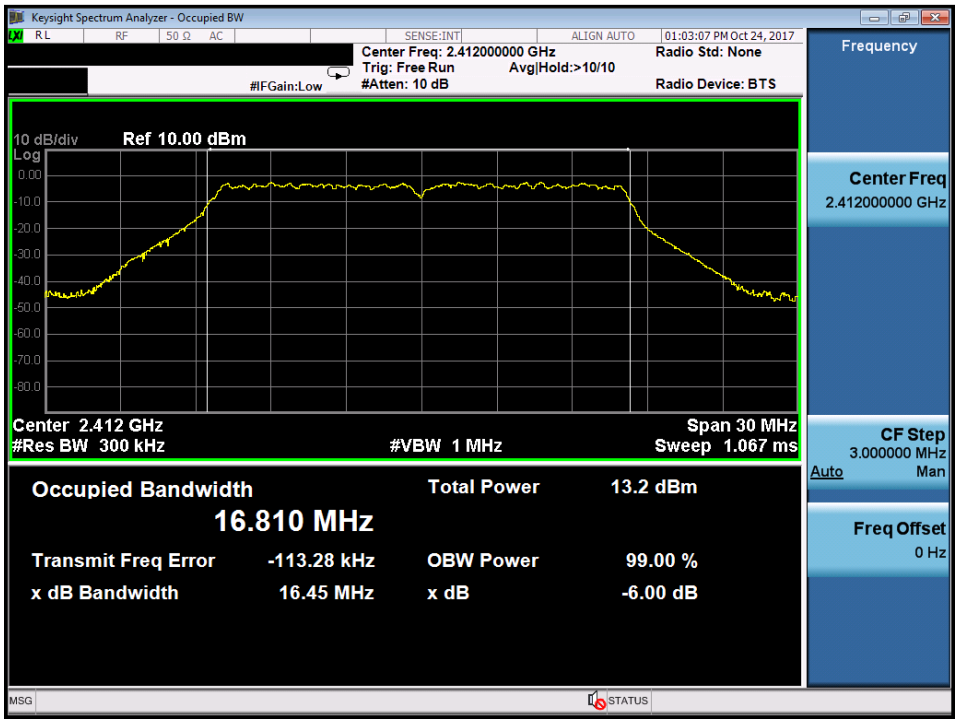


### High Channel



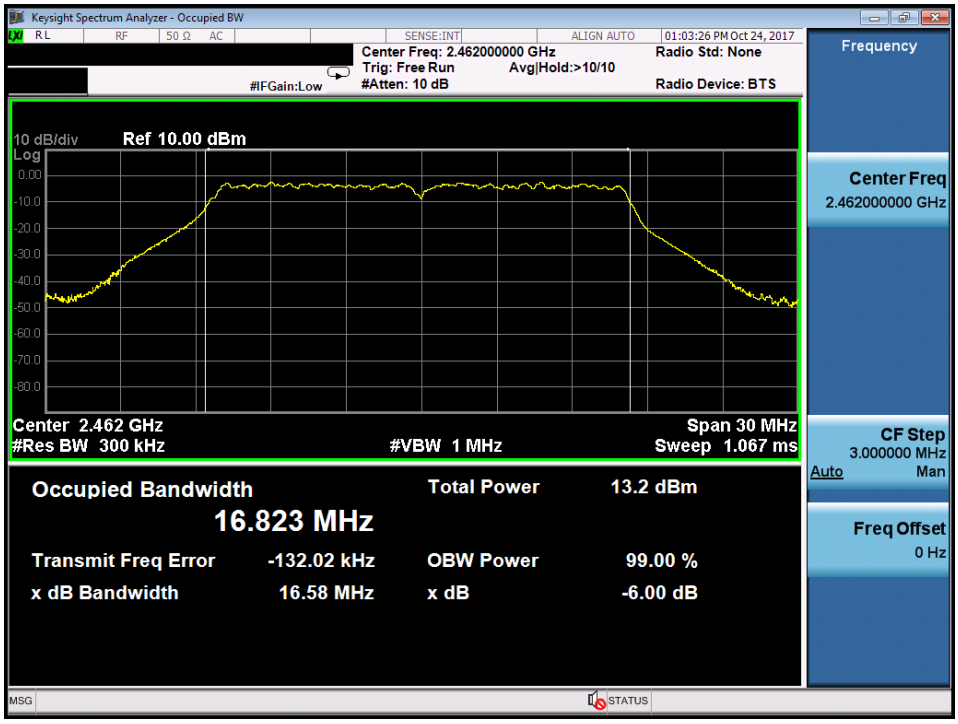

## Test Plot of Occupied Bandwidth (802.11g)

### Low Channel



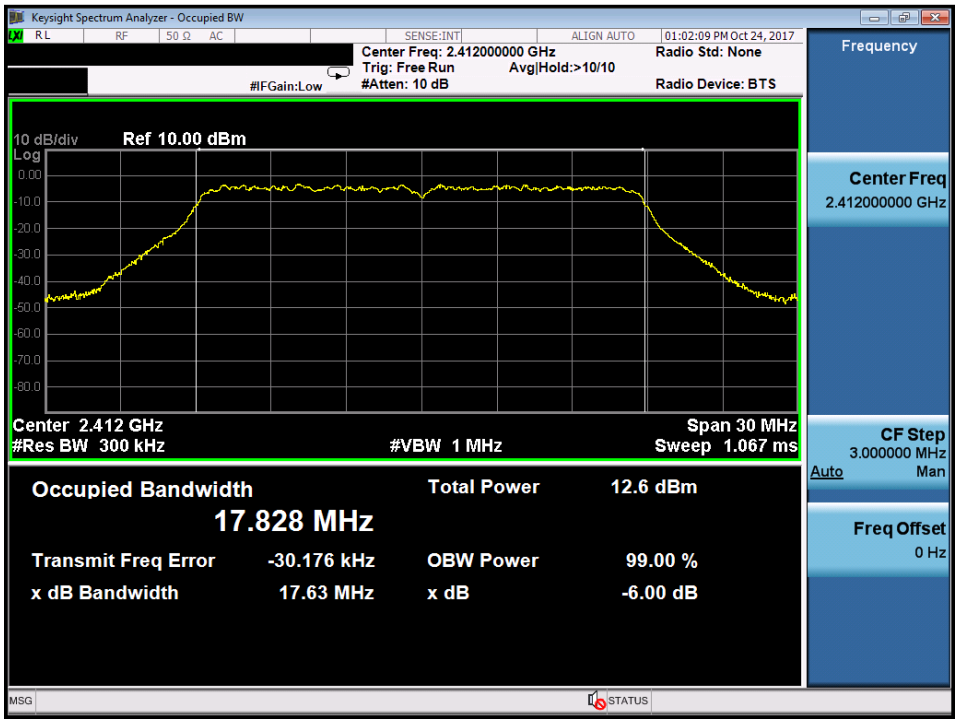
### Middle Channel


### High Channel

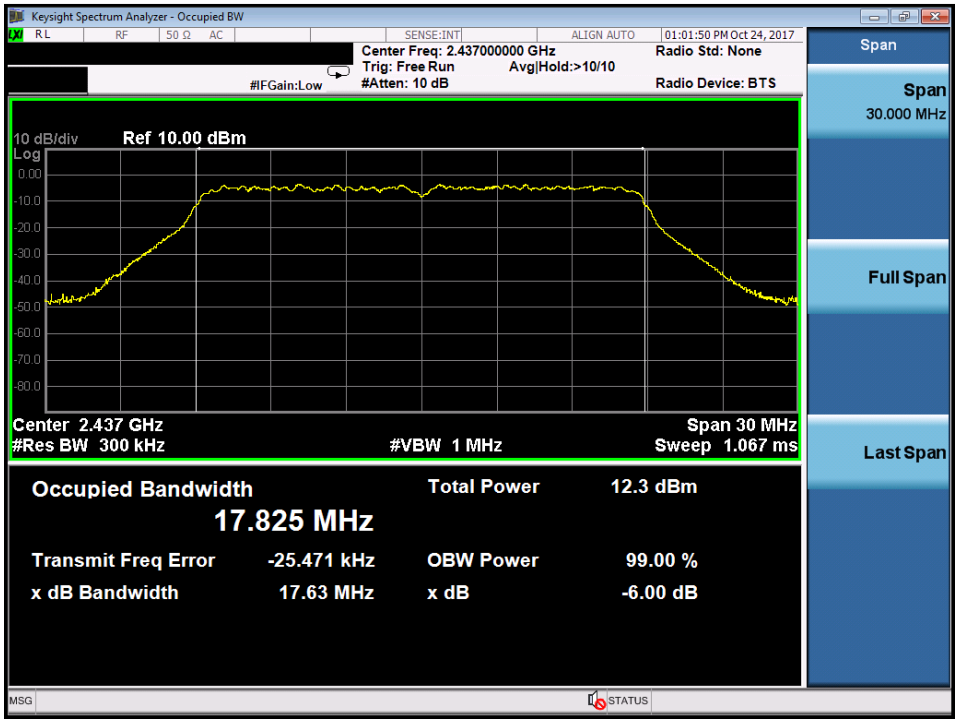


# Test Plot of Occupied Bandwidth (802.11n HT20)

## Low Channel




## Middle Channel



## High Channel

## 5.1.4 Power Density

**RESULT:** **Passed**

Test standard : FCC Part 15.247(e) , RSS-247 5.2(2)
Basic standard : ANSI C63.10:2013, KDB558074
Kind of test site : Shielded room

**Test setup**

Test Channel : Low/ Middle/ High
Operation Mode : A
Ambient temperature : 22-26°C
Relative humidity : 50-65%
Atmospheric pressure : 100-103 kPa

### Table 15: Test result of Power Density (802.11b)

| Channel | Channel Frequency (MHz) | Power Density | Limit |
|---|---|---|---|
| | | (dBm) | (dBm) |
| Low Channel | 2412 | 5.78 | 8 |
| Middle Channel | 2437 | 6.05 | 8 |
| High Channel | 2462 | 6.16 | 8 |

### Table 16: Test result of Power Density (802.11g)

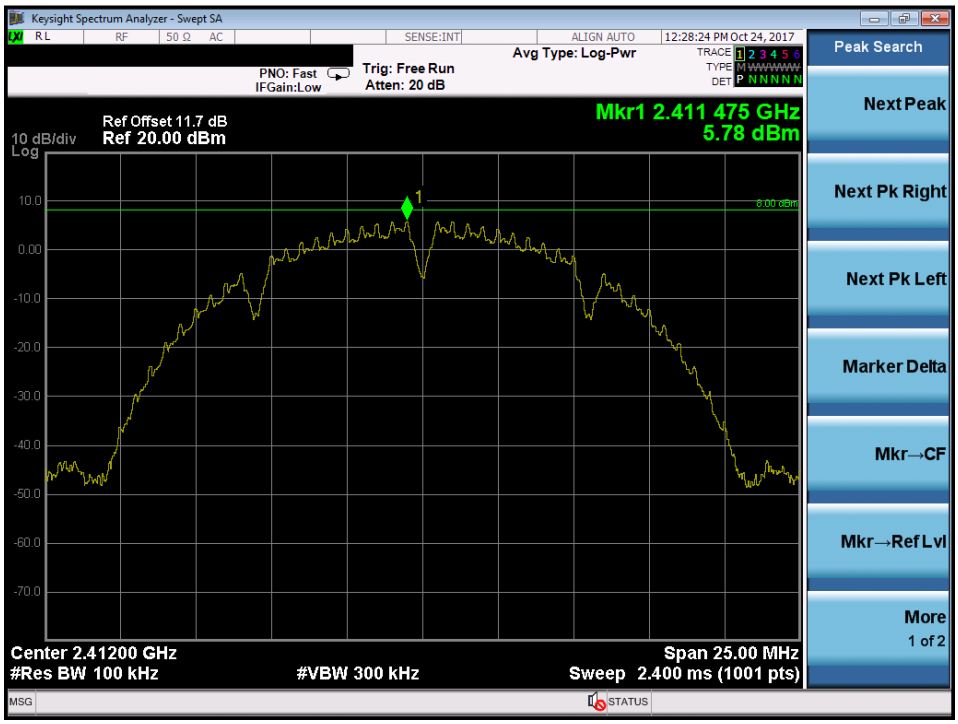
| Channel | Channel Frequency (MHz) | Power Density | Limit |
|---|---|---|---|
| | | (dBm) | (dBm) |
| Low Channel | 2412 | -7.76 | 8 |
| Middle Channel | 2437 | -8.12 | 8 |
| High Channel | 2462 | -7.75 | 8 |

### Table 17: Test result of Power Density (802.11n HT20)

| Channel | Channel Frequency (MHz) | Power Density | Limit |
|---|---|---|---|
| | | (dBm) | (dBm) |
| Low Channel | 2412 | -8.1 | 8 |
| Middle Channel | 2437 | -8.51 | 8 |
| High Channel | 2462 | -7.96 | 8 |

# Test Plot of Power Density (802.11b)

## Low Channel

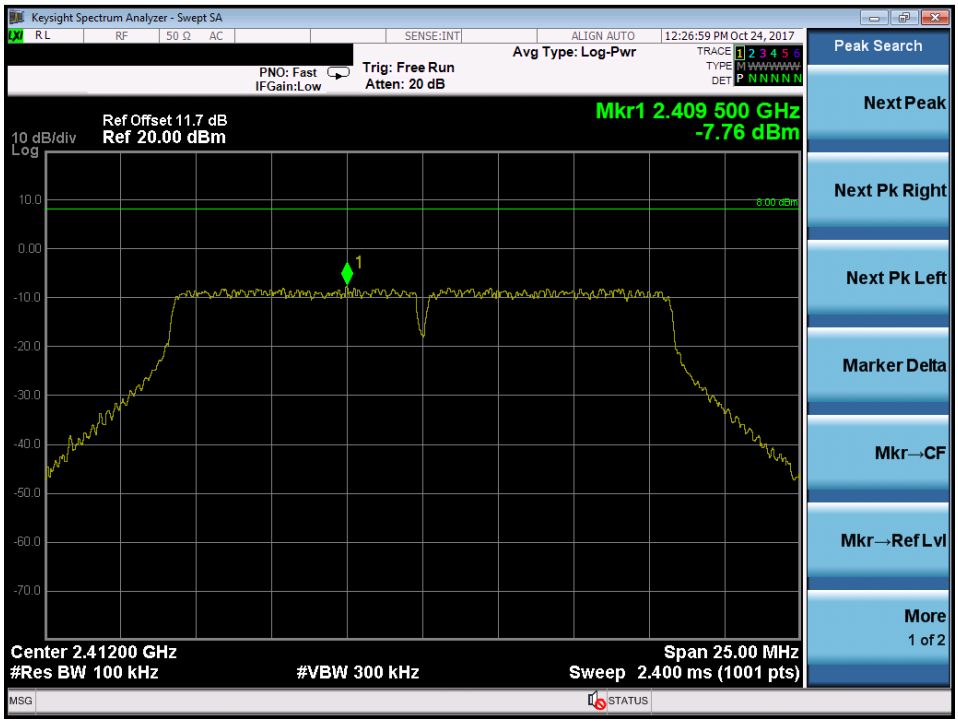



## Middle Channel

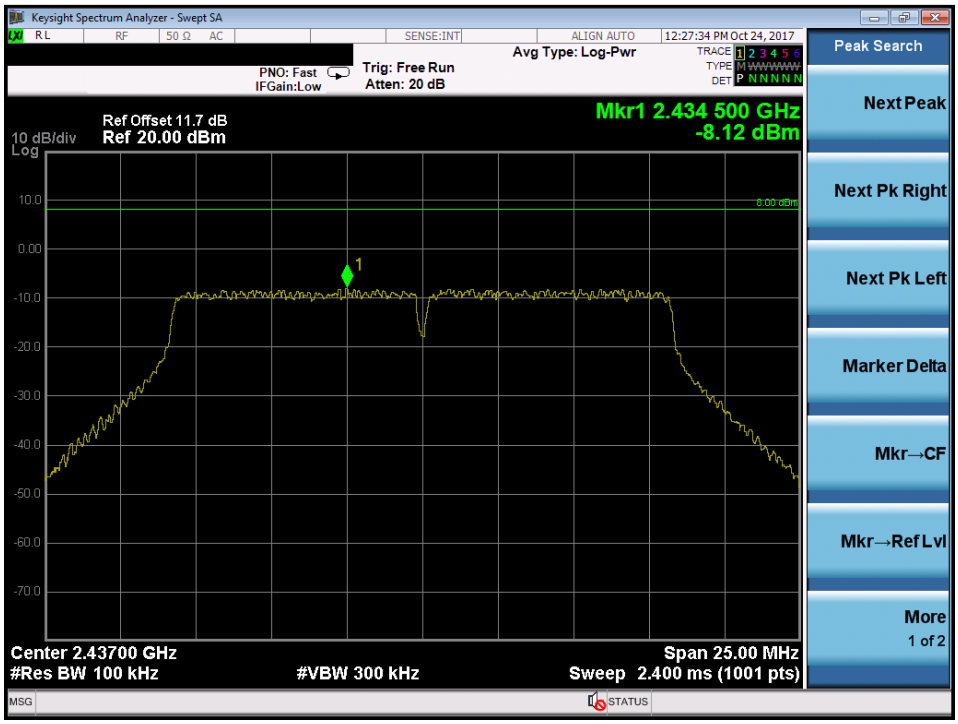
### High Channel


## Test Plot of Power Density (802.11g)

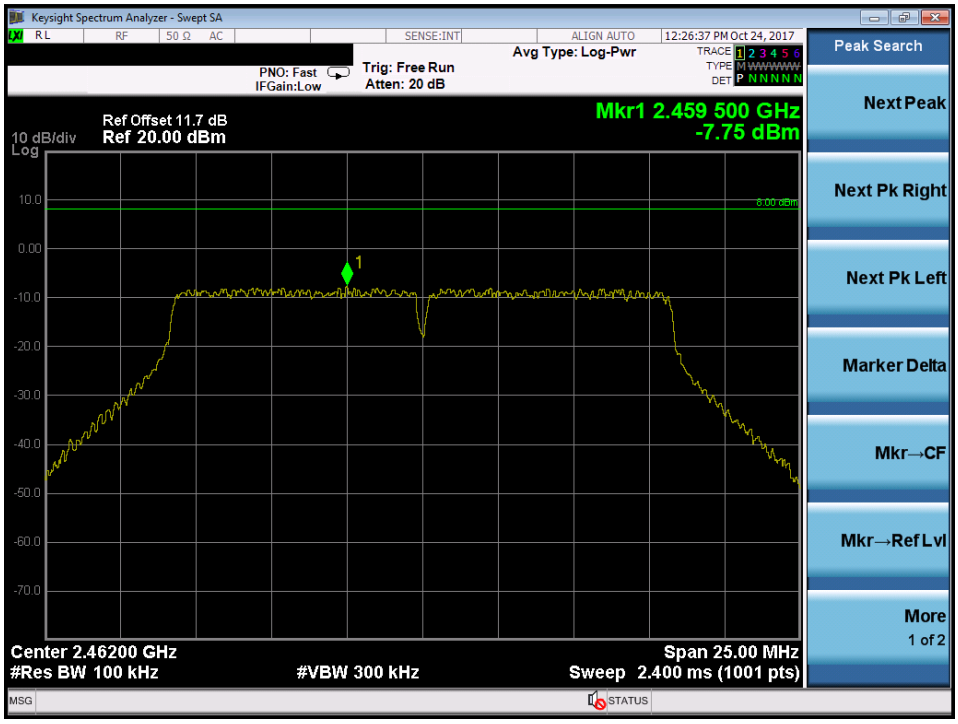
### Low Channel



### Middle Channel



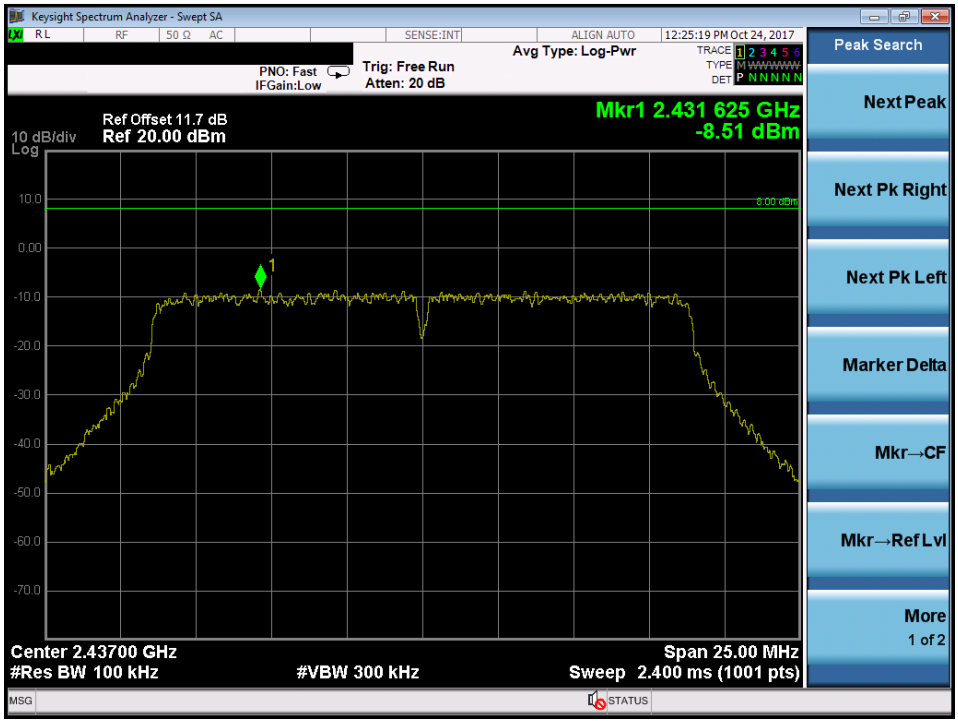

### High Channel



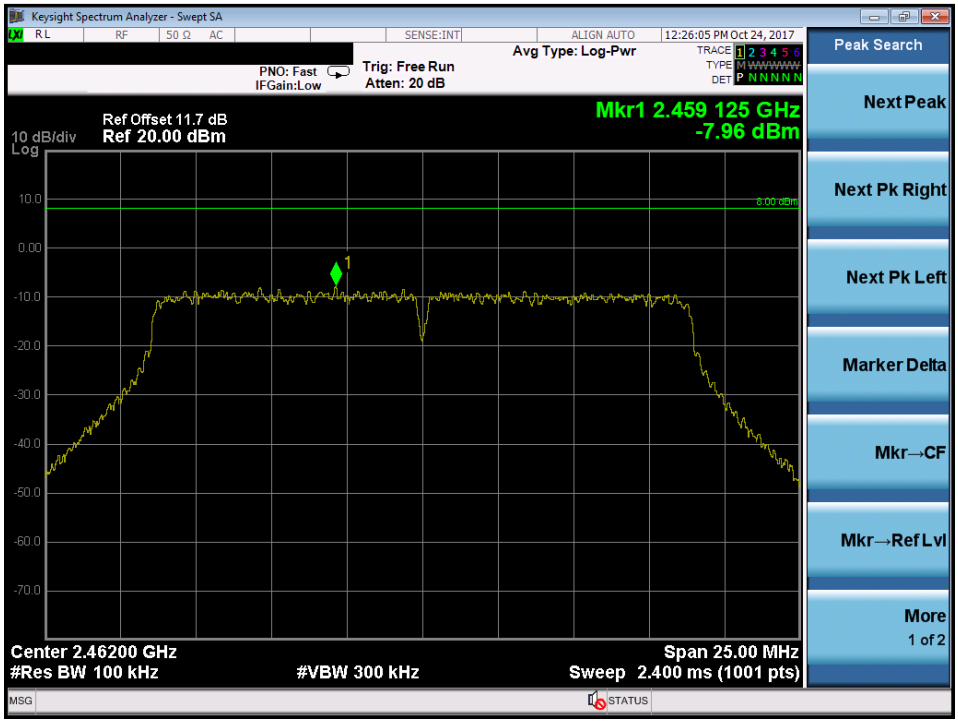
# Test Plot of Power Density (802.11n HT20)

## Low Channel


## Middle Channel



**High Channel**



## 5.1.5 Conducted spurious emissions and Frequency Band Edge measured in 100kHz Bandwidth

**RESULT:** **Passed**

| | | |
|---|---|---|
| Test standard | : | FCC part 15.247(d), RSS-247 5.5 |
| Basic standard | : | ANSI C63.10:2013, KDB558074 |
| Limit | : | 20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power) |
| Kind of test site | : | Shielded room |

**Test setup**

| | | |
|---|---|---|
| Test Channel | : | Low/ High |
| Operation mode | : | A |
| Ambient temperature | : | 22-26°C |
| Relative humidity | : | 50-65% |
| Atmospheric pressure | : | 100-103 kPa |

All emissions are more than 20dB below fundamental, details refer to following test plot, and compliance is achived as well.
Due to the small size of the product and that there are no inductive components of significant size, 9kHz to 30MHz frequency range is not tested based on technical judgment.

# Test Plot 100kHz Conducted Emissions (802.11b)

## Low Channel


## Middle Channel

### High Channel


## Test Plot 100kHz Conducted Emissions (802.11g)

### Low Channel

### Middle Channel


### High Channel

# Test Plot 100kHz Conducted Emissions (802.11n HT20)

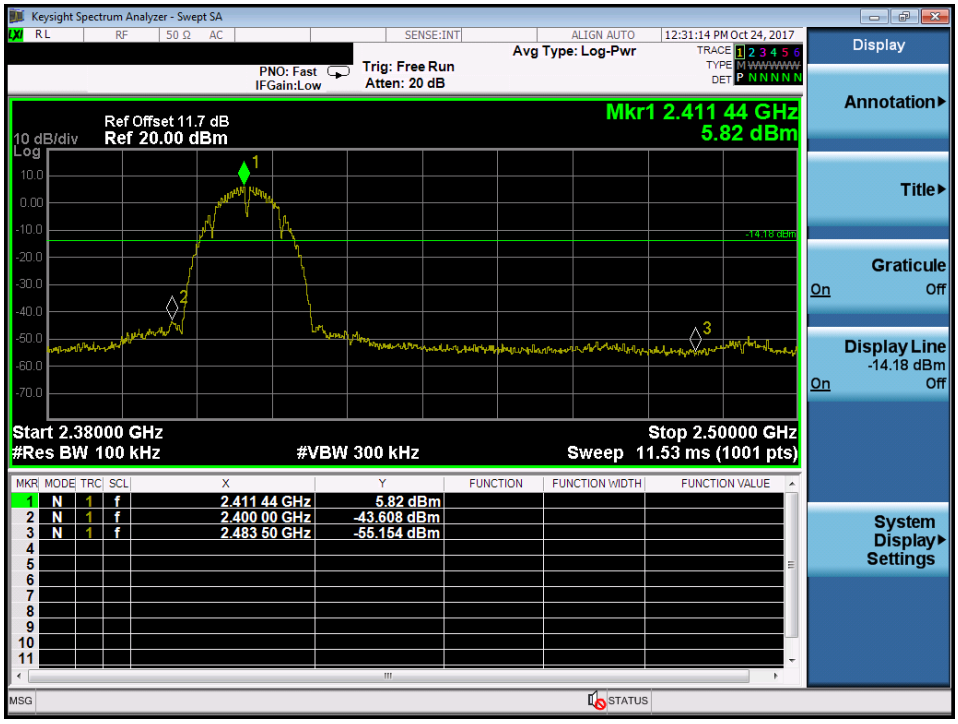
## Low Channel


## Middle Channel

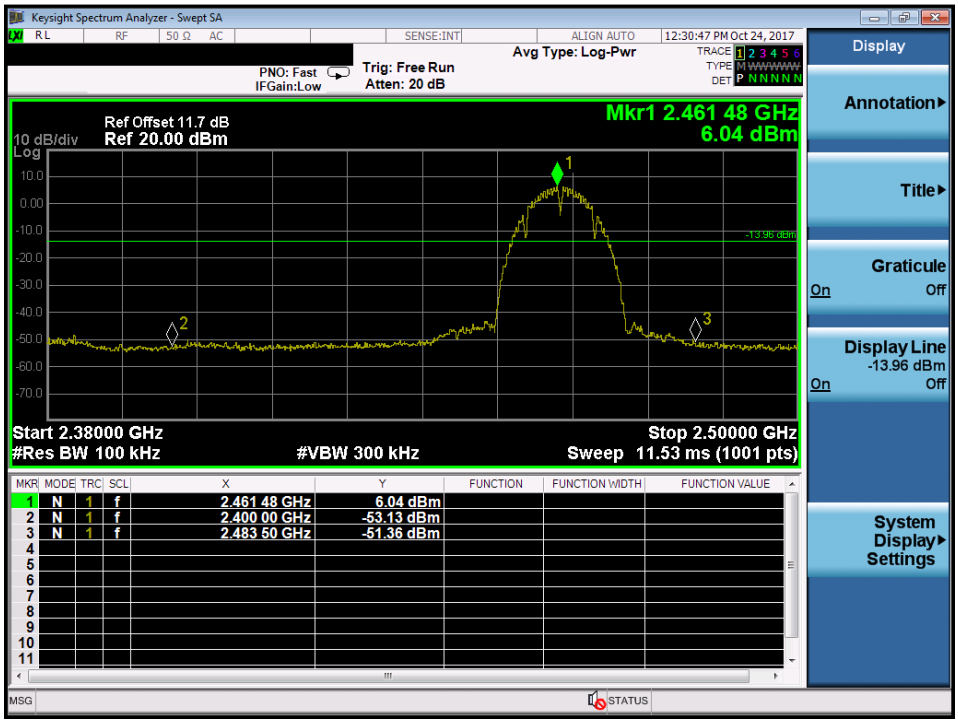
**High Channel**

# Test Plot 100kHz RBW of Band Edge (802.11b)

## Low Channel

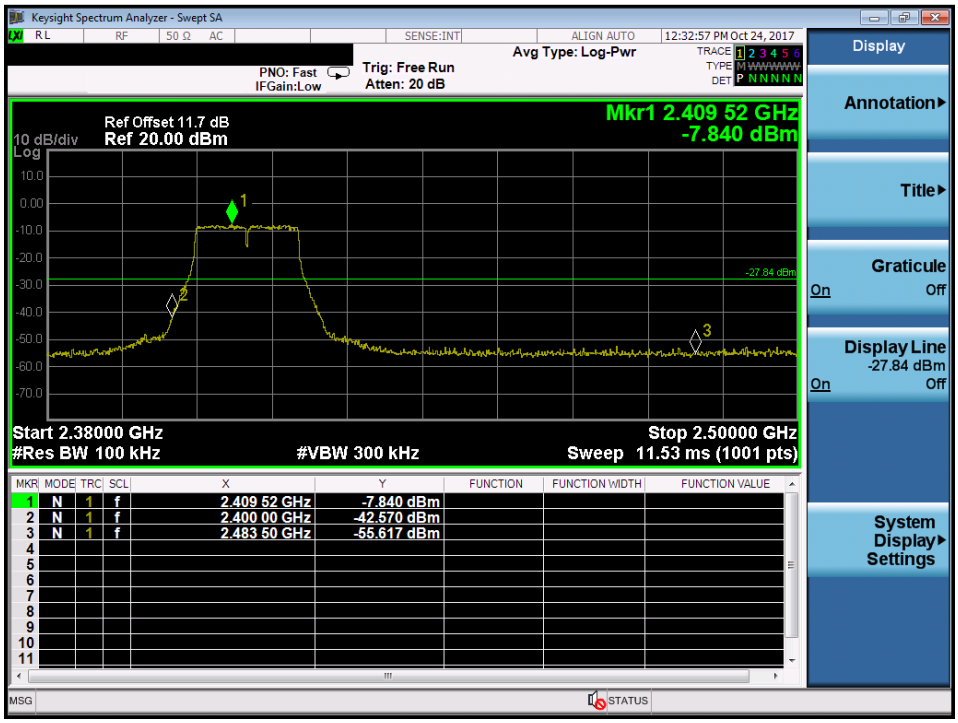



## High Channel

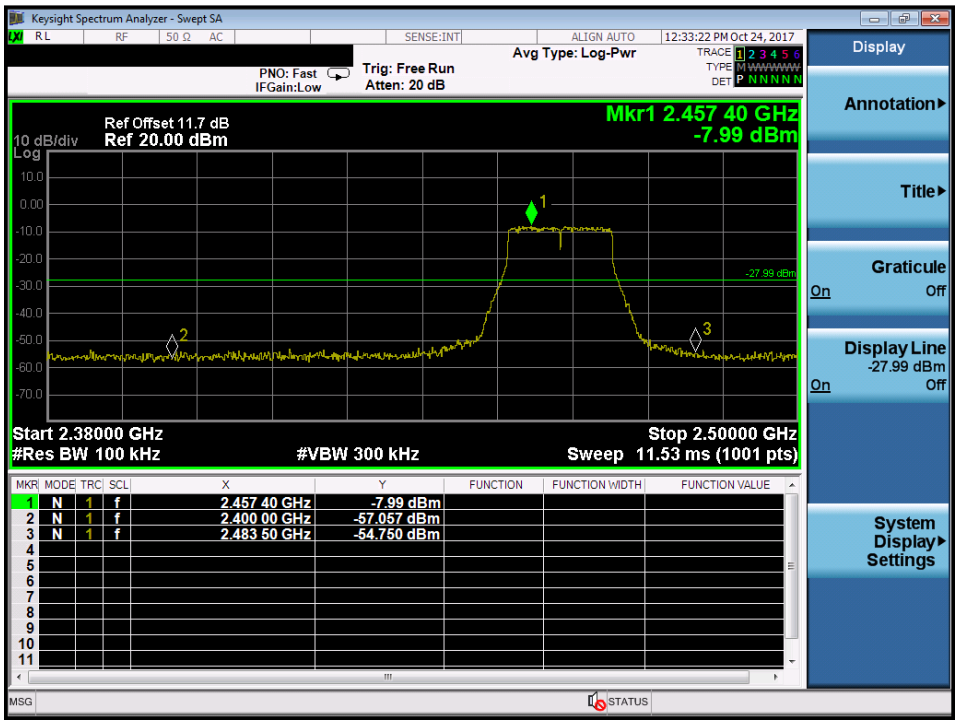


# Test Plot 100kHz RBW of Band Edge (802.11g)

## Low Channel

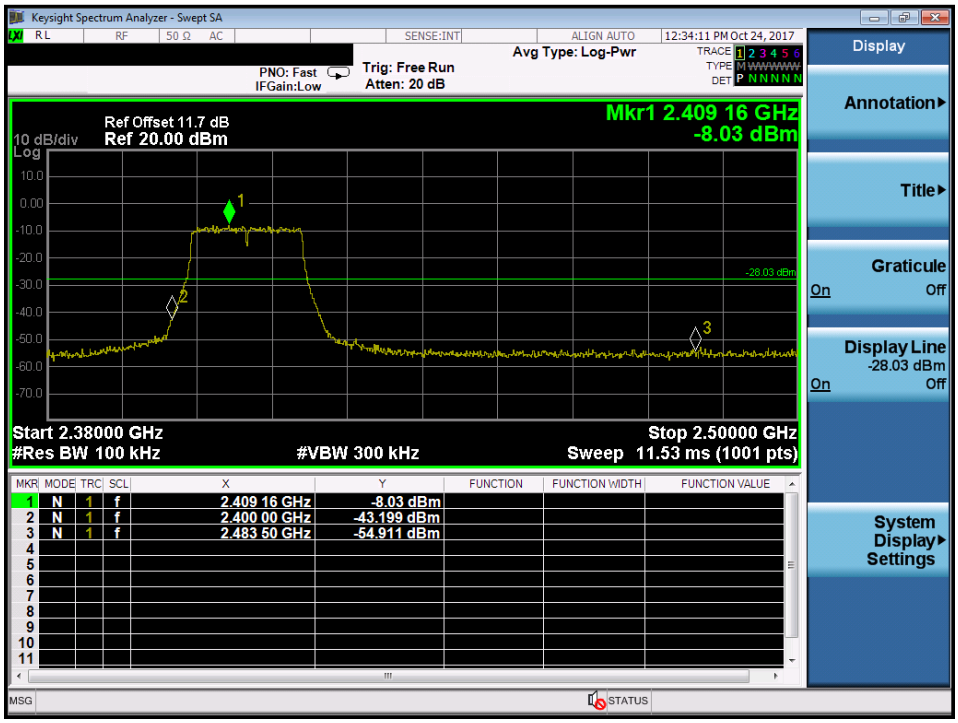



## High Channel

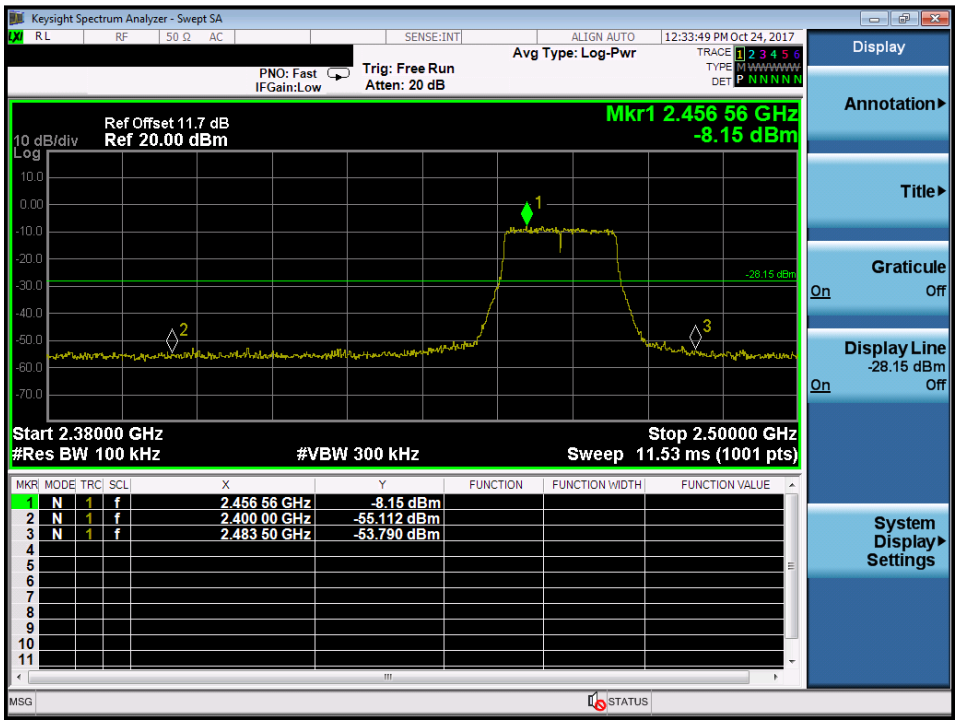


# Test Plot 100kHz RBW of Band Edge (802.11n HT20)

## Low Channel




## High Channel



## 5.1.6 Spurious Emission

**RESULT:** **Passed**

| | | |
|---|---|---|
| Test standard | : | FCC part 15.247(d), FCC 15.205, FCC 15.209, RSS-210 2.2, RSS-247 5.5 and RSS-Gen 8.9 |
| Basic standard | : | ANSI C63.10:2013 |
| Limits | : | Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a) and RSS-Gen i4, 8.9 (Table 6), must comply with the radiated emission limits specified in FCC 15.209(a) and RSS-Gen i4, 8.9 (Table 4 and 5).<br>Emission radiated outside the specified frequency bands must comply with the radiated emission limits specified in FCC 15.209(a) and FCC 15.249(a), RSS-Gen i4, 8.9 (Table 4 and 5) and RSS-210 A2.9(a). |
| Kind of test site | : | 3m Semi-Anechoic Chamber |

**Test setup**

| | | |
|---|---|---|
| Test Channel | : | Low/ Middle/ High |
| Operation mode | : | A, B |

Remark: Testing was carried out within frequency range 30MHz to the tenth harmonic.

For details refer to Appendix D.

The Radiated Emissions testing was performed in the X, Y and Z axis orientation. The X Axis orientation is the worst-case and recorded in this test report. Due to the small size of the product and that there are no inductive components of significant size, 9kHz to 30MHz frequency range is not tested based on technical judgment.

# 5.2 Mains Emissions

## 5.2.1 Mains Conducted Emissions

**RESULT:** **Passed**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.207<br>FCC Part 15.107<br>RSS-Gen 8.8 |
| Limits | : | Mains Conducted emissions as defined in above standards |
| Kind of test site | : | Shielded Room |

**Test setup**

| | | |
|---|---|---|
| Test Channel | : | Middle |
| Operation mode | : | A |

Remark: For details refer to Appendix D.

# 6. Safety Human exposure

## 6.1 Radio Frequency Exposure Compliance

### 6.1.1 Electromagnetic Fields

**RESULT:** **Passed**

Test standard : FCC KDB Publication 447498 D01 v06
47 C.F.R. §§ 1.1310
RSS--102

Separation distance is more than 20 cm, thus mobile device exposure limits can be applied

**Maximum Exposure:**

| | |
|---|---|
| Power to Antenna (mW) | 62.09 mW |
| Power to Antenna (dBm) | 17.9 dBm |
| Antenna Gain | 2 dBi |
| Power+Ant Gain | 98.4 mW |
| Distance | 20 cm |
| S= | 0.020 mW/cm^2 |

Limit FCC:

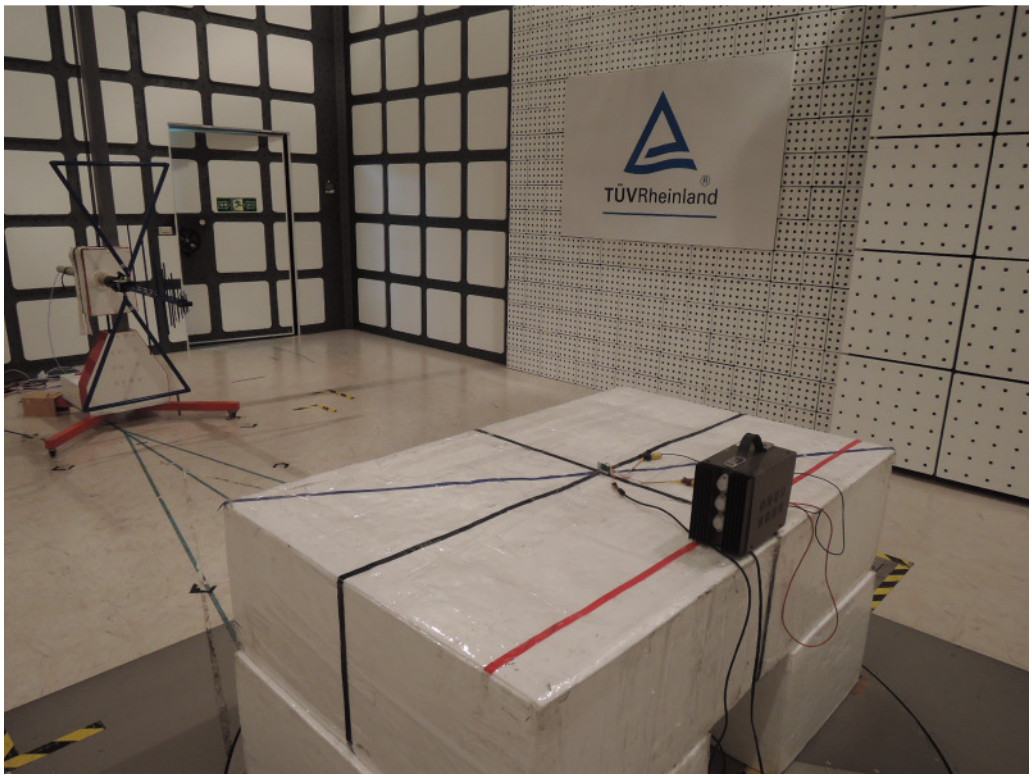
| | |
|---|---|
| 0.3-1.34 MHz | (100) $mW/cm^2$ |
| 1.34-30 MHz | (180/f2) $mW/cm^2$ |
| 30-300 MHz | 0.2 $mW/cm^2$ |
| 300-1500 MHz | f/1500 $mW/cm^2$ |
| **1500-100,000 MHz** | **1.0 $mW/cm^2$** |

**Limit Canada:** $0.02619 f^{0.6834}$

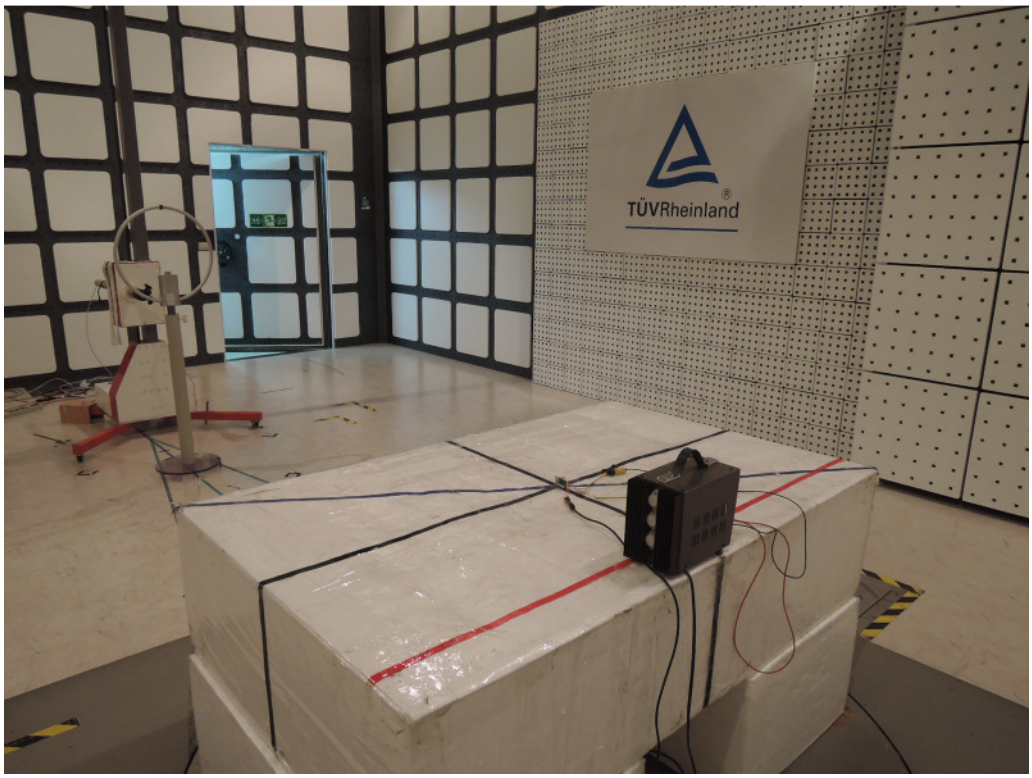
**---End---**

# Photographs of the Test Set-Up

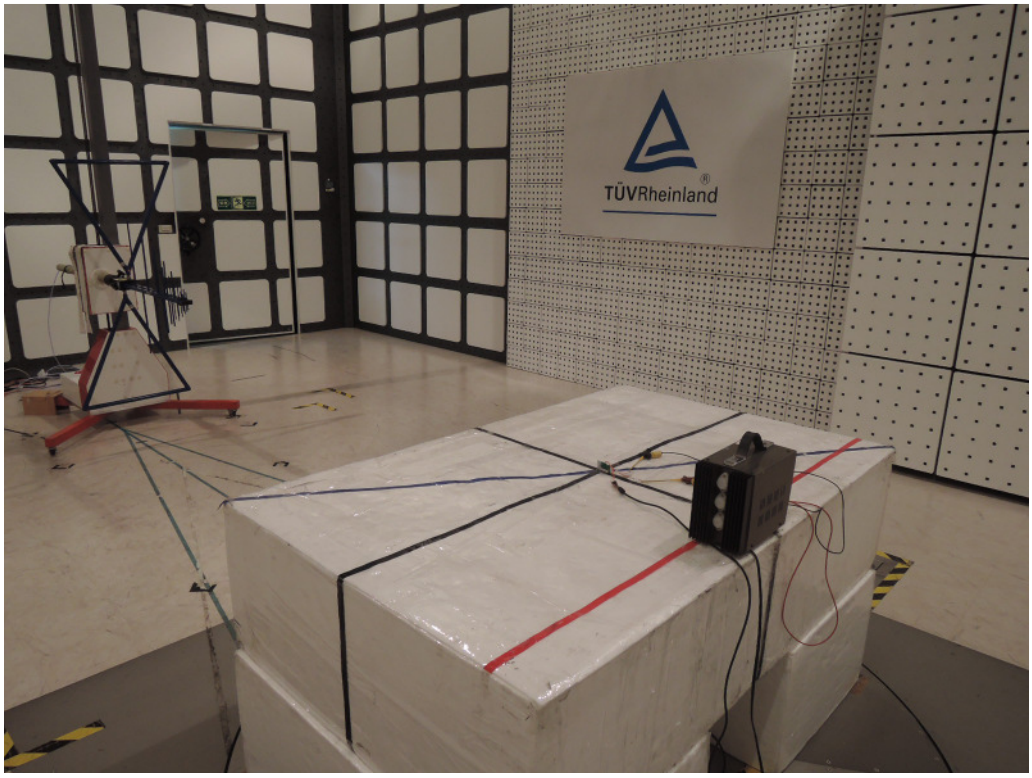
## Photograph 1: Set-up for Spurious Emissions (Front View)



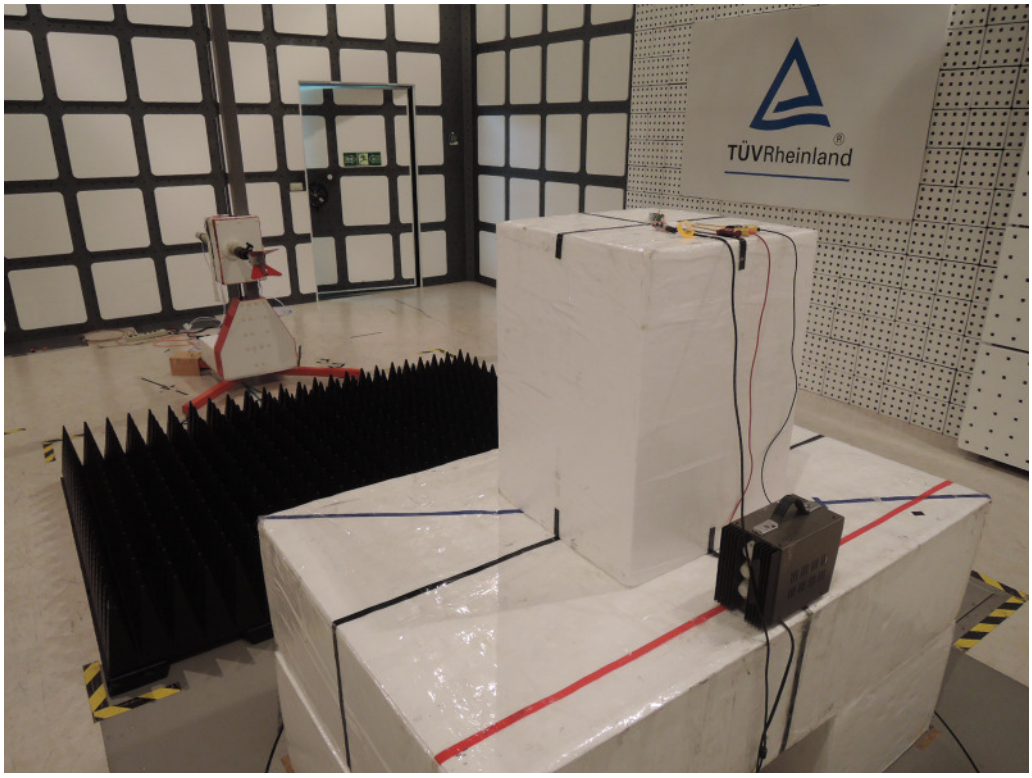

## Photograph 2: Set-up for Spurious Emissions (Back View 1)



## Photograph 3: Set-up for Spurious Emissions (Back View 2)

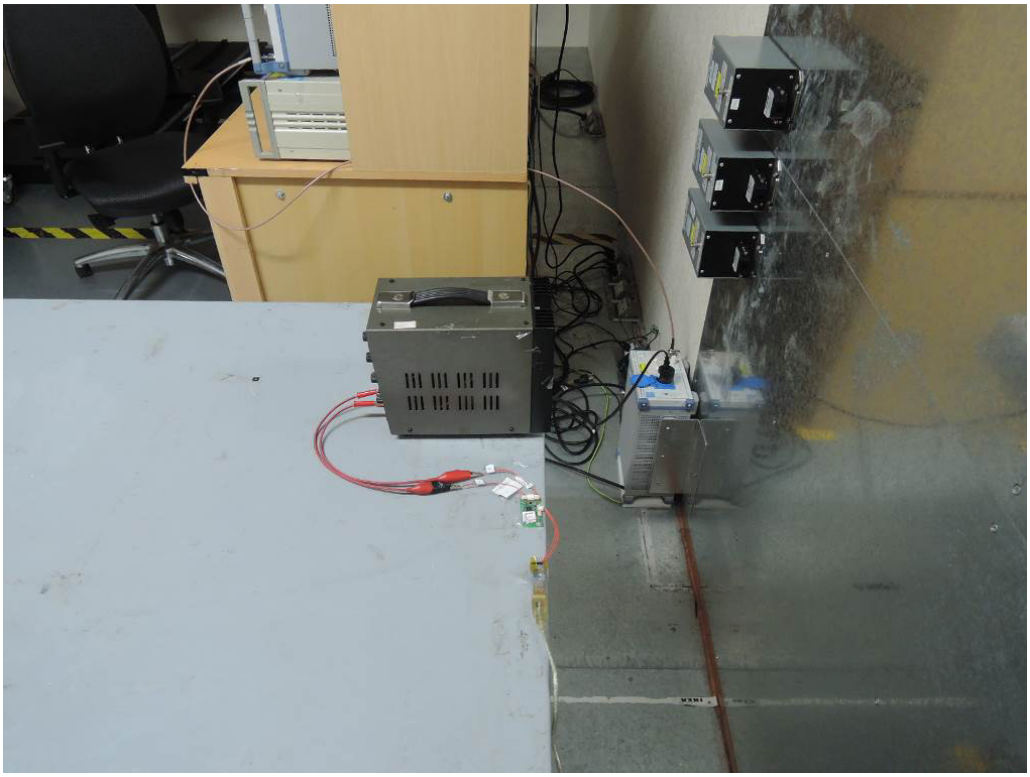



## Photograph 4: Set-up for Spurious Emissions (Back View 3)



## Photograph 5: Set-up for Conducted testing


## Photograph 6: Set-up for Mains Conducted testing (Back View)



## Photograph 7: Set-up for Mains Conducted testing (Front View)

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