



ISO/IEC17025 Accredited Lab.

Report No:

FCC 1411058

File reference No:

2014-11-07

Applicant:

Dalian Cheering Technology Co., Ltd.

Product:

Case Remote

Model No:

CR11, CR110, CR119

Trademark:

**CASE**  
Remote

REMOTE  
**CASE**

Test Standards:

FCC Part 15.247

Test result:

It is herewith confirmed and found to comply with the requirements set up by ANSI C63.4, FCC Part 15 Subpart C, Paragraph 15.247 regulations for the evaluation of electromagnetic compatibility

Approved By

*Jack Chung*

Jack Chung

Manager

Dated:

November 07, 2014

**Results appearing herein relate only to the sample tested**

**The technical reports is issued errors and omissions exempt and is subject to withdrawal at**

**SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO., LTD**

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### **Special Statement:**

The testing quality ability of our laboratory meet with “Quality Law of People’s Republic of China” Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAL. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

#### **CNAL-LAB Code: L2292**

The EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

#### **FCC-Registration No.: 899988**

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 899988.

#### **IC- Registration No.: IC5205A-02**

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration IC No.: 5205A-02.

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## Test Report Conclusion

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## 1.0 General Details

### 1.1 Test Lab Details

Name : SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO., LTD  
Address: 5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District, Shenzhen,CHINA.  
Telephone: (755) 83448688  
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Site on File with the Federal Communications Commission – United States  
Registration Number: 899988  
For 3m & 10 m OATS  
Site Listed with Industry Canada of Ottawa, Canada  
Registration Number: IC: 5205A-02  
For 3m & 10 m OATS

### 1.2 Applicant Details

Applicant: Dalian Cheering Technology Co., Ltd.  
Address: 321-1 Tuqiang Street RM308, DDA Dalian, Liaoning, China 116023  
Telephone: +86-411-39022576  
Fax: +86-411-39022576

### 1.3 Description of EUT

Product: Case Remote  
Manufacturer: Dalian Cheering Technology Co., Ltd.  
Address: 321-1 Tuqiang Street RM308, DDA Dalian, Liaoning, China 116023  
Brand Name:



Model Number: CR11  
Additional Model Number: CR110, CR119  
Type of Modulation IEEE 802.11b : DSSS (CCK, QPSK, DBPSK)  
IEEE 802.11g/n (HT20, HT40) : OFDM(64QAM, 16QAM, QPSK, BPSK)  
Frequency range IEEE 802.11b/g/n (HT20) : 2412-2462MHz; 802.11n(HT40): 2422-2452MHz  
Channel Spacing 5MHz for IEEE 802.11b/g/n(HT20, HT40)  
Air Data Rate IEEE 802.11b : 11, 5.5, 2, 1 Mbps  
IEEE 802.11g : 54, 48,36, 24, 18, 12, 9, 6 Mbps  
IEEE 802.11n HT20/40 :150, 135, 117 ,104, 78, 65, 58.5, 52, 39, 26, 19.5, 13, 6.5 Mbps  
Frequency Selection By software  
Channel Number IEEE 802.11b/g/n (HT20) : 11 Channels  
IEEE 802.11n HT40 : 7 Channels

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Antenna: PCB Antenna with maximum gain 1.5 dBi

1.4 Submitted Sample: 2 Samples

1.5 Test Duration

2014-11-06 to 2014-11-07

1.6 Test Uncertainty

Conducted Emissions Uncertainty =3.6dB

Radiated Emissions Uncertainty =4.7dB

1.7 Test Engineer

*Terry Tang*

The sample tested by \_\_\_\_\_

Print Name: Terry Tang

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| 2.0                    | Test Equipments |            |                       |              |            |
|------------------------|-----------------|------------|-----------------------|--------------|------------|
| Instrument Type        | Manufacturer    | Model      | Serial No.            | Date of Cal. | Due Date   |
| ESPI Test Receiver     | R&S             | ESPI 3     | 100379                | 2014-08-22   | 2015-08-21 |
| TWO<br>Line-V-NETW     | R&S             | EZH3-Z5    | 100294                | 2014-08-22   | 2015-08-21 |
| TWO<br>Line-V-NETW     | R&S             | EZH3-Z5    | 100253                | 2014-08-22   | 2015-08-21 |
| Ultra Broadband<br>ANT | R&S             | HL562      | 100157                | 2014-08-22   | 2015-08-21 |
| ESDV Test Receiver     | R&S             | ESDV       | 100008                | 2014-08-22   | 2015-08-21 |
| Impuls-Begrenzer       | R&S             | ESH3-Z2    | 100281                | 2014-08-22   | 2015-08-21 |
| System Controller      | CT              | SC100      | -                     | --           | --         |
| Printer                | EPSON           | PHOTO EX3  | CFNH234850            | --           | --         |
| Computer               | IBM             | 8434       | 1S8434KCE99BLX<br>LO* | -            | -          |
| Loop Antenna           | EMCO            | 6502       | 00042960              | 2014-08-22   | 2015-08-21 |
| ESPI Test Receiver     | R&S             | ESI26      | 838786/013            | 2014-08-22   | 2015-08-21 |
| 3m OATS                | --              | --         | N/A                   | 2014-08-22   | 2015-08-21 |
| Horn Antenna           | SCHWARZBECK     | BBHA 9170  | BBHA9170265           | 2014-08-22   | 2015-08-21 |
| Horn Antenna           | SCHWARZBECK     | BBHA 9120D | 9120D-631             | 2014-08-22   | 2015-08-21 |
| Power meter            | Anritsu         | ML2487A    | 6K00003613            | 2014-08-22   | 2015-08-21 |
| Power sensor           | Anritsu         | MA2491A    | 32263                 | 2014-08-22   | 2015-08-21 |
| Bilog Antenna          | Schwarebeck     | VULB9163   | 9163/340              | 2014-08-22   | 2015-08-21 |
| LISN                   | AFJ             | LS16C      | 10010947251           | 2014-08-22   | 2015-08-21 |
| LISN (Three Phase)     | Schwarebeck     | NSLK 8126  | 8126453               | 2014-08-22   | 2015-08-21 |
| 9*6*6 Anechoic         | --              | --         | N/A                   | 2014-08-22   | 2015-08-21 |
| EMI Test Receiver      | RS              | ESCS30     | 100139                | 2014-08-22   | 2015-08-21 |

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### 3. DESCRIPTION OF TEST MODES

#### IEEE 802.11b, 802.11g, 802.11n (HT20) mode

The EUT had been tested under operating condition. There are three channels have been tested as following:

| Channel | Frequency (MHz) |
|---------|-----------------|
| Low     | 2412            |
| Middle  | 2437            |
| High    | 2462            |

IEEE 802.11b mode: 1Mbps data rate (worst case) was chosen for full testing. IEEE 802.11g mode: 6Mbps data rate (worst case) was chosen for full testing. IEEE 802.11n (HT20) mode 6.5Mbps data rate (worst case) were chosen for full testing

The worst-case data rates are determined according to the description above, based on the investigations by measuring the PSD and average power across all the data rates, bandwidths, modulations and spatial stream modes.

#### IEEE 802.11n HT40

The EUT had been tested under operating condition. There are three channels have been tested as following:

| Channel | Frequency (MHz) |
|---------|-----------------|
| Low     | 2422            |
| Mid     | 2437            |
| High    | 2452            |

IEEE 802.11n HT40 mode: 6.5Mbps data rate (worst case) was chosen for full testing.

The worst-case data rates are determined according to the description above, based on the investigations by measuring the PSD and average power across all the data rates, bandwidths, modulations and spatial stream modes.

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### 3.0 Technical Details

#### 3.1 Summary of test results

| The EUT has been tested according to the following specifications: |                                                                                                                                                        |        |          |
|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------|
| Standard                                                           | Test Type                                                                                                                                              | Result | Notes    |
| FCC Part 15, Paragraph 15.107 & 15.207                             | Conducted Emission Test                                                                                                                                | PASS   | Complies |
| FCC Part 15 Subpart C Paragraph 15.247(a)(2) Limit                 | Spectrum bandwidth of a Orthogonal Frequency Division Multiplex System<br>Limit: 6dB<br>bandwidth>500kHz                                               | PASS   | Complies |
| FCC Part 15, Paragraph 15.247(b)                                   | Maximum peak output power<br>Limit: max. 30dBm                                                                                                         | PASS   | Complies |
| FCC Part 15, Paragraph 15.109,15.205 & 15.209                      | Transmitter Radiated Emission<br>Limit: Table 15.209                                                                                                   | PASS   | Complies |
| FCC Part 15, Paragraph 15.247(e)                                   | Power Spectral Density<br>Limit: max. 8dBm                                                                                                             | PASS   | Complies |
| FCC Part 15, Paragraph 15.247(d)                                   | Out of Band Emission and Restricted Band Radiation<br>Limit: 20dB less than peak value of fundamental frequency<br>Restricted band limit: Table 15.209 | PASS   | Complies |

#### 3.2 Test Standards

FCC Part 15 Subpart & Subpart C, Paragraph 15.247

#### 4.0 EUT Modification

No modification by Shenzhen Timeway Technology Consulting Co., Ltd

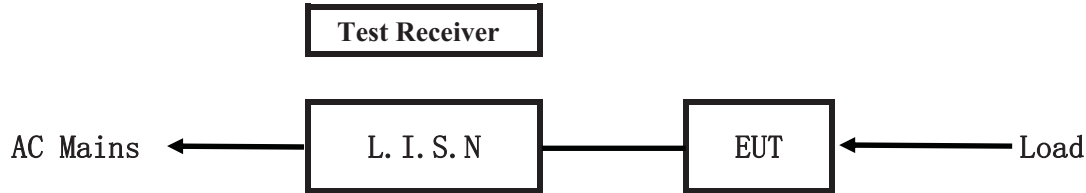
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## 5. Power Line Conducted Emission Test

### 5.1 Schematics of the test



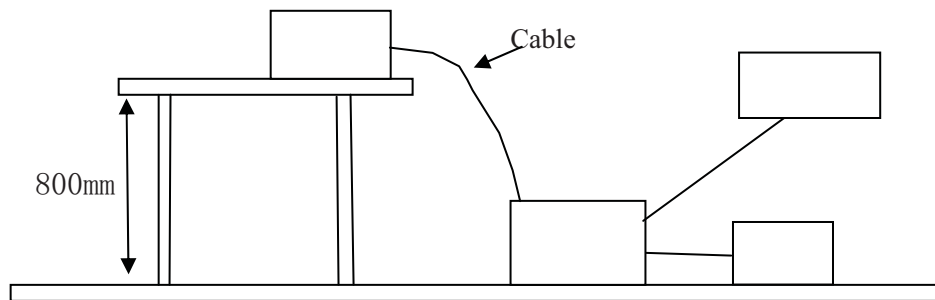
EUT: Equipment Under Test

### 5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2003. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2003.

Test Voltage: 120V~, 60Hz

Block diagram of Test setup



### 5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

#### A. EUT

| Device      | Manufacturer                         | Model              | FCC ID    |
|-------------|--------------------------------------|--------------------|-----------|
| Case Remote | Dalian Cheering Technology Co., Ltd. | CR11, CR110, CR119 | 2ADHGCR11 |

#### B. Internal Device

| Device | Manufacturer | Model | FCC ID/DOC |
|--------|--------------|-------|------------|
| N/A    |              |       |            |

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C. Peripherals

| Device       | Manufacturer | Model        | FCC ID/DOC | Rating                                                |
|--------------|--------------|--------------|------------|-------------------------------------------------------|
| Power Supply | THX          | THX-050200KE | VOC        | Input: 100-240V~, 50/60Hz, 0.65A;<br>Output: DC5V, 2A |

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2003.

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207 and 15.107

| Frequency<br>(MHz) | Class A Limits (dB $\mu$ V) |               | Class B Limits (dB $\mu$ V) |               |
|--------------------|-----------------------------|---------------|-----------------------------|---------------|
|                    | Quasi-peak Level            | Average Level | Quasi-peak Level            | Average Level |
| 0.15 ~ 0.50        | 79.0                        | 66.0          | 66.0~56.0*                  | 56.0~46.0*    |
| 0.50 ~ 5.00        | 73.0                        | 60.0          | 56.0                        | 46.0          |
| 5.00 ~ 30.00       | 73.0                        | 60.0          | 60.0                        | 50.0          |

- Notes:
1. \*Decreasing linearly with logarithm of frequency.
  2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

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**A: Conducted Emission on Live Terminal (150kHz to 30MHz)**

**EUT Operating Environment**

Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

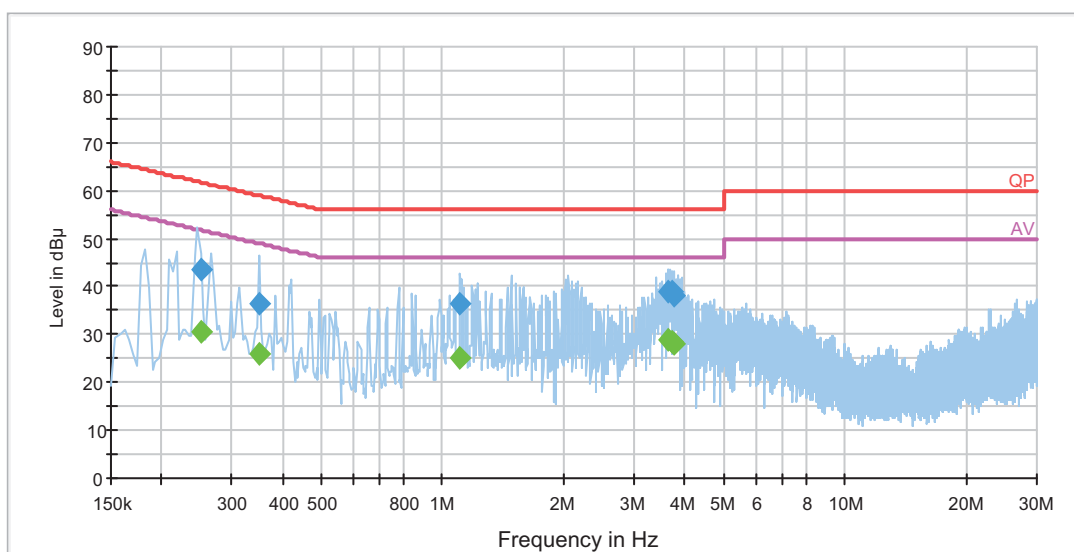
**EUT set Condition: Charging and Keep WIFI Transmitting**

**Equipment Level: Class B**

**Results: PASS**

Please refer to following diagram for individual

EMI Auto Test L



| Frequency | Reading | Correct    | Result | Limit  | Margin | Remark |
|-----------|---------|------------|--------|--------|--------|--------|
| (MHz)     | (dBμV)  | Factor(dB) | (dBμV) | (dBμV) | (dB)   |        |
| 0.250501  | 33.2    | 10.5       | 43.7   | 61.7   | -18.0  | QP     |
| 0.250501  | 19.9    | 10.5       | 30.4   | 51.7   | -21.3  | AV     |
| 0.348750  | 26.0    | 10.5       | 36.5   | 59.0   | -22.5  | QP     |
| 0.348750  | 15.4    | 10.5       | 25.9   | 49.0   | -23.1  | AV     |
| 1.109410  | 25.9    | 10.5       | 36.4   | 56.0   | -19.6  | QP     |
| 1.109410  | 14.5    | 10.5       | 25.0   | 46.0   | -21.0  | AV     |
| 3.640030  | 28.1    | 10.7       | 38.8   | 56.0   | -17.2  | QP     |
| 3.640030  | 18.1    | 10.7       | 28.8   | 46.0   | -17.2  | AV     |
| 3.726530  | 28.2    | 10.7       | 38.9   | 56.0   | -17.1  | QP     |
| 3.726530  | 17.7    | 10.7       | 28.4   | 46.0   | -17.6  | AV     |
| 3.765450  | 27.5    | 10.7       | 38.2   | 56.0   | -17.8  | QP     |
| 3.765450  | 17.4    | 10.7       | 28.1   | 46.0   | -17.9  | AV     |

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**B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)**

**EUT Operating Environment**

Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

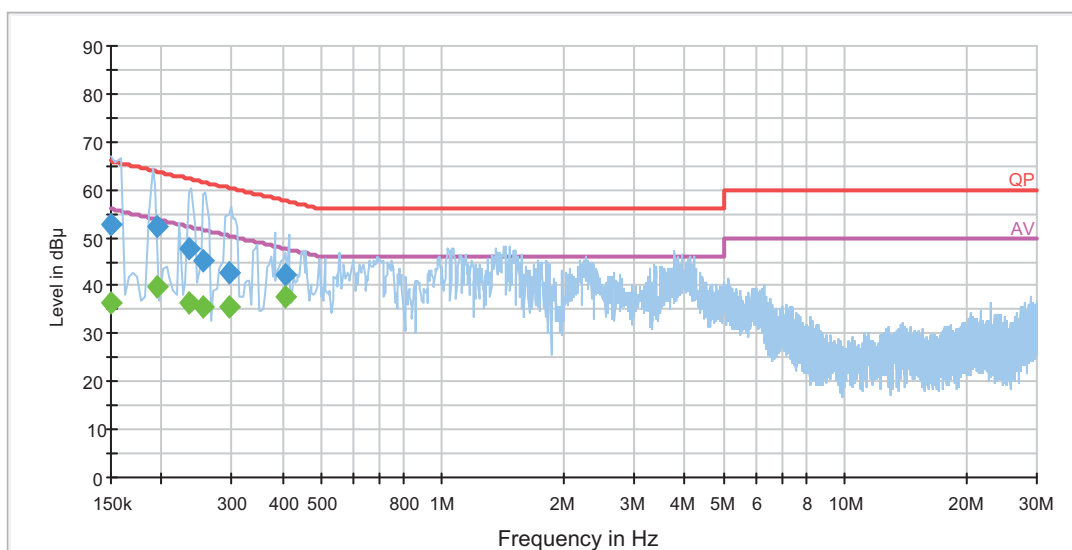
**EUT set Condition: Charging and Keep WIFI Transmitting**

**Equipment Level: Class B**

**Results: Pass**

Please refer to following diagram for individual

EMI Auto Test N



| Frequency | Reading | Correct    | Result | Limit  | Margin | Remark |
|-----------|---------|------------|--------|--------|--------|--------|
| (MHz)     | (dBμV)  | Factor(dB) | (dBμV) | (dBμV) | (dB)   |        |
| 0.150000  | 42.1    | 10.6       | 52.7   | 66.0   | -13.3  | QP     |
| 0.150000  | 25.7    | 10.6       | 36.3   | 56.0   | -19.7  | AV     |
| 0.194500  | 41.8    | 10.6       | 52.4   | 63.8   | -11.4  | QP     |
| 0.194500  | 29.2    | 10.6       | 39.8   | 53.8   | -14.0  | AV     |
| 0.233500  | 37.3    | 10.5       | 47.8   | 62.3   | -14.5  | QP     |
| 0.233500  | 26.0    | 10.5       | 36.5   | 52.3   | -15.8  | AV     |
| 0.253500  | 34.9    | 10.5       | 45.4   | 61.6   | -16.2  | QP     |
| 0.253500  | 25.1    | 10.5       | 35.6   | 51.6   | -16.0  | AV     |
| 0.293500  | 32.4    | 10.5       | 42.9   | 60.4   | -17.5  | QP     |
| 0.293500  | 25.3    | 10.5       | 35.8   | 50.4   | -14.6  | AV     |
| 0.407790  | 31.6    | 10.6       | 42.2   | 57.7   | -15.5  | QP     |
| 0.407790  | 27.0    | 10.6       | 37.6   | 47.7   | -10.1  | AV     |

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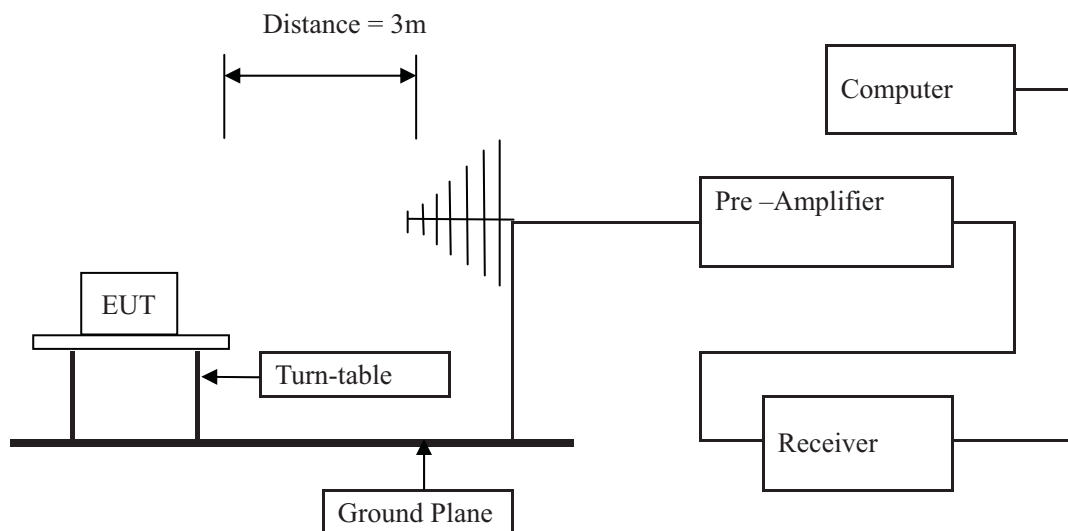
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## 6 Radiated Emission Test

### 6.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.
- (3) The frequency spectrum from 30 MHz to 25 GHz was investigated. All readings from 30 MHz to 1 GHz are Quasi-peak values with a resolution bandwidth of 120 kHz. For measurement above 1GHz, peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=3MHz and RMS detector. Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a “QP” in the data table.
- (6) The antenna polarization : Vertical polarization and Horizontal polarization.

#### Block diagram of Test setup



### 6.2 Configuration of The EUT

Same as section 5.3 of this report

### 6.3 EUT Operating Condition

Same as section 5.4 of this report.

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#### 6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

**Frequencies in restricted band are complied to limit on Paragraph 15.209 and 15.109 and RSS-210**

| Frequency Range (MHz) | Distance (m) | Field strength (dB $\mu$ V/m) |
|-----------------------|--------------|-------------------------------|
| 30-88                 | 3            | 40.0                          |
| 88-216                | 3            | 43.5                          |
| 216-960               | 3            | 46.0                          |
| Above 960             | 3            | 54.0                          |

- Note:
1. RF Voltage (dBuV) = 20 log RF Voltage ( $\mu$ V)
  2. In the Above Table, the higher limit applies at the band edges.
  3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT
  4. This is a handheld device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.

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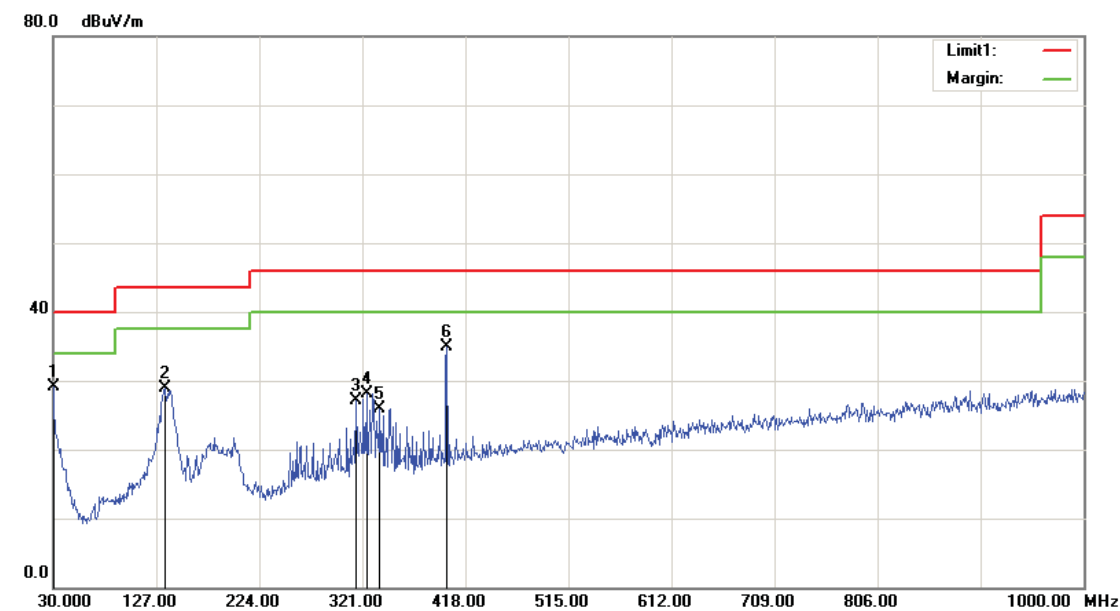
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Test result  
General Radiated Emission Data and Harmonics Radiated Emission Data  
Radiated Emission In Horizontal/Vertical (30MHz----1000MHz)  
EUT set Condition: Charging and Keep WIFI Transmitting  
Results: Pass  
Test Figure:

H



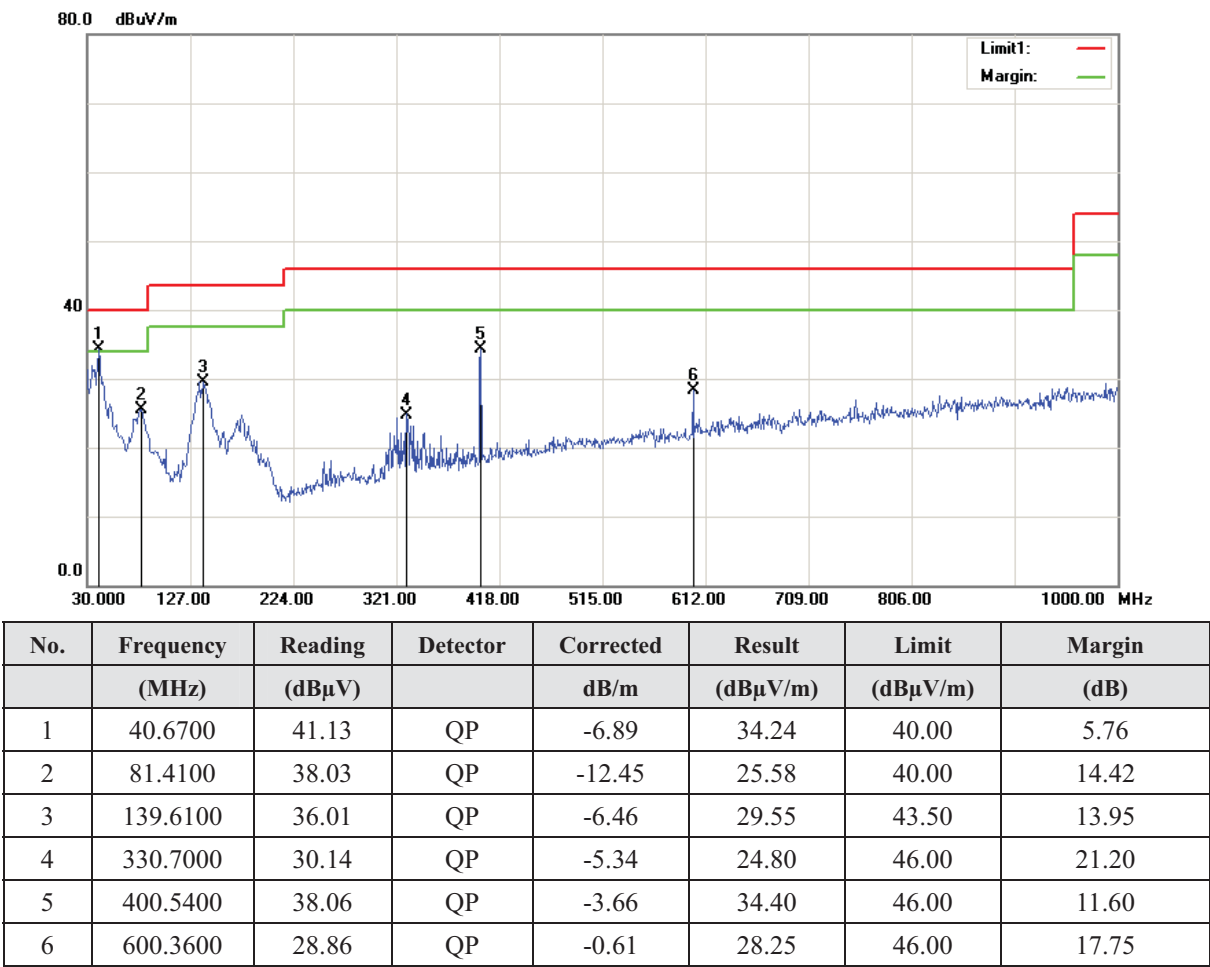
| No. | Frequency<br>(MHz) | Reading<br>(dBμV) | Detector | Corrected<br>dB/m | Result<br>(dBμV/m) | Limit<br>(dBμV/m) | Margin<br>(dB) |
|-----|--------------------|-------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 30.0000            | 25.76             | QP       | 3.38              | 29.14              | 40.00             | 10.86          |
| 2   | 134.7600           | 35.06             | QP       | -6.11             | 28.95              | 43.50             | 14.55          |
| 3   | 315.1800           | 32.63             | QP       | -5.57             | 27.06              | 46.00             | 18.94          |
| 4   | 324.8800           | 33.67             | QP       | -5.47             | 28.20              | 46.00             | 17.80          |
| 5   | 337.4900           | 31.33             | QP       | -5.36             | 25.97              | 46.00             | 20.03          |
| 6   | 400.5400           | 38.50             | QP       | -3.66             | 34.84              | 46.00             | 11.16          |

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Test Figure:

V



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**Above 1 GHz:**

**802.11b Mode:**

| Indicated                 |                           | Detector<br>(PK/QP/Ave.) | Antenna        | Correction Factor<br>(dB) | FCC Part 15.247/15.209/15.205 |                   |            |
|---------------------------|---------------------------|--------------------------|----------------|---------------------------|-------------------------------|-------------------|------------|
| Frequency<br>(MHz)        | S.A.<br>Reading<br>(dBμV) |                          | Polar<br>(H/V) |                           | Cord.<br>Amp.<br>(dBμV/m)     | Limit<br>(dBμV/m) | Margin(dB) |
| Low Channel (2412 MHz)    |                           |                          |                |                           |                               |                   |            |
| 2412                      | 92.38                     | PK                       | H              | 6.13                      | 98.51                         | /                 | /          |
| 2412                      | 87.87                     | AV                       | H              | 6.13                      | 94.00                         | /                 | /          |
| 2412                      | 90.75                     | PK                       | H              | 6.13                      | 96.88                         | /                 | /          |
| 2412                      | 86.87                     | AV                       | V              | 6.13                      | 93.00                         | /                 | /          |
| 2372                      | 39.84                     | PK                       | V              | 5.48                      | 45.32                         | 74                | 28.68      |
| 2372                      | 27.03                     | AV                       | H              | 5.48                      | 32.51                         | 54                | 21.49      |
| 2389.8                    | 46.19                     | PK                       | H              | 5.48                      | 51.67                         | 74                | 22.33      |
| 2389.8                    | 30.16                     | AV                       | V              | 5.48                      | 35.64                         | 54                | 18.36      |
| 2486.4                    | 39.16                     | PK                       | V              | 7.21                      | 46.37                         | 74                | 27.63      |
| 2486.4                    | 24.37                     | AV                       | V              | 7.21                      | 31.58                         | 54                | 22.42      |
| 4824                      | 40.14                     | PK                       | V              | 12.44                     | 52.58                         | 74                | 21.42      |
| 4824                      | 25.54                     | AV                       | H              | 12.44                     | 37.98                         | 54                | 16.02      |
| 7236                      | 35.64                     | PK                       | H              | 17.06                     | 52.70                         | 74                | 21.30      |
| 7236                      | 22.78                     | AV                       | V              | 17.06                     | 39.84                         | 54                | 14.16      |
| 9648                      | 36.83                     | PK                       | V              | 19.28                     | 56.11                         | 74                | 17.89      |
| 9648                      | 22.79                     | AV                       | V              | 19.28                     | 42.07                         | 54                | 11.93      |
| Middle Channel (2437 MHz) |                           |                          |                |                           |                               |                   |            |
| 2437                      | 92.70                     | PK                       | H              | 6.13                      | 98.83                         | /                 | /          |
| 2437                      | 88.53                     | AV                       | H              | 6.13                      | 94.66                         | /                 | /          |
| 2437                      | 92.36                     | PK                       | V              | 6.13                      | 98.49                         | /                 | /          |
| 2437                      | 87.77                     | AV                       | V              | 6.13                      | 93.90                         | /                 | /          |
| 2368.6                    | 37.40                     | PK                       | V              | 5.48                      | 42.88                         | 74                | 31.12      |
| 2368.6                    | 23.74                     | AV                       | V              | 5.48                      | 29.22                         | 54                | 24.78      |
| 2390                      | 37.51                     | PK                       | H              | 5.48                      | 42.99                         | 74                | 31.01      |
| 2390                      | 23.82                     | AV                       | H              | 5.48                      | 29.30                         | 54                | 24.70      |
| 2484.6                    | 37.10                     | PK                       | V              | 7.21                      | 44.31                         | 74                | 29.69      |
| 2484.6                    | 23.92                     | AV                       | V              | 7.21                      | 31.13                         | 54                | 22.87      |
| 4874                      | 38.64                     | PK                       | V              | 12.40                     | 51.04                         | 74                | 22.96      |
| 4874                      | 24.78                     | AV                       | V              | 12.40                     | 37.18                         | 54                | 16.82      |
| 7311                      | 36.16                     | PK                       | H              | 16.62                     | 52.78                         | 74                | 21.22      |

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|      |       |    |   |       |       |    |       |
|------|-------|----|---|-------|-------|----|-------|
| 7311 | 22.68 | AV | H | 16.62 | 39.30 | 54 | 14.70 |
| 9748 | 37.14 | PK | H | 19.40 | 56.54 | 74 | 17.46 |
| 9748 | 22.62 | AV | H | 19.40 | 42.02 | 54 | 11.98 |

| Indicated               |                           | Detector<br>(PK/QP/Ave.) | Antenna        | Correction Factor<br>(dB) | FCC Part 15.247/15.209/15.205 |                   |            |
|-------------------------|---------------------------|--------------------------|----------------|---------------------------|-------------------------------|-------------------|------------|
| Frequency<br>(MHz)      | S.A.<br>Reading<br>(dBμV) |                          | Polar<br>(H/V) |                           | Cord.<br>Amp.<br>(dBμV/m)     | Limit<br>(dBμV/m) | Margin(dB) |
| High Channel (2462 MHz) |                           |                          |                |                           |                               |                   |            |
| 2462                    | 93.01                     | PK                       | H              | 6.13                      | 99.14                         | /                 | /          |
| 2462                    | 88.7                      | AV                       | H              | 6.13                      | 94.83                         | /                 | /          |
| 2462                    | 92.08                     | PK                       | V              | 6.13                      | 98.21                         | /                 | /          |
| 2462                    | 87.82                     | AV                       | V              | 6.13                      | 93.95                         | /                 | /          |
| 2378.8                  | 37.05                     | PK                       | H              | 5.48                      | 42.53                         | 74                | 31.47      |
| 2378.8                  | 23.75                     | AV                       | H              | 5.48                      | 29.23                         | 54                | 24.77      |
| 2485.4                  | 47.03                     | PK                       | V              | 7.21                      | 54.24                         | 74                | 19.76      |
| 2485.4                  | 28.86                     | AV                       | V              | 7.21                      | 36.07                         | 54                | 17.93      |
| 2487.2                  | 45.78                     | PK                       | V              | 7.21                      | 52.99                         | 74                | 21.01      |
| 2487.2                  | 25.91                     | AV                       | V              | 7.21                      | 33.12                         | 54                | 20.88      |
| 4924                    | 36.79                     | PK                       | H              | 12.46                     | 49.25                         | 74                | 24.75      |
| 4924                    | 23.81                     | AV                       | H              | 12.46                     | 36.27                         | 54                | 17.73      |
| 7386                    | 36.98                     | PK                       | H              | 15.91                     | 52.89                         | 74                | 21.11      |
| 7386                    | 23.26                     | AV                       | H              | 15.91                     | 39.17                         | 54                | 14.83      |
| 9848                    | 36.75                     | PK                       | H              | 19.29                     | 56.04                         | 74                | 17.96      |
| 9848                    | 23.07                     | AV                       | H              | 19.29                     | 42.36                         | 54                | 11.64      |

**Note:**

*Frequency = Emission frequency in MHz*

*Correction Factor (dB) = Ant Factor + cable loss - Pre-Amp .Gain*

*Corrected Amplitude (dBμV/m) = S.A. Reading + Correction Factor (dB)*

*Limit (dBμV/m) = Limit stated in standard*

*PK = Peak QP = Quasi-peak Ave = Average*

**Calculation Formula**

*Margin (dB) = Limit – Corrected Amplitude*

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**802.11g Mode:**

| Indicated                 |                           | Detector<br>(PK/QP/Ave.) | Antenna        | Correction Factor<br>(dB) | FCC Part 15.247/15.209/15.205 |                   |            |
|---------------------------|---------------------------|--------------------------|----------------|---------------------------|-------------------------------|-------------------|------------|
| Frequency<br>(MHz)        | S.A.<br>Reading<br>(dBμV) |                          | Polar<br>(H/V) |                           | Cord.<br>Amp.<br>(dBμV/m)     | Limit<br>(dBμV/m) | Margin(dB) |
| Low Channel (2412 MHz)    |                           |                          |                |                           |                               |                   |            |
| 2412                      | 92.74                     | PK                       | H              | 6.13                      | 98.87                         | /                 | /          |
| 2412                      | 82.28                     | AV                       | H              | 6.13                      | 88.41                         | /                 | /          |
| 2412                      | 92.41                     | PK                       | V              | 6.13                      | 98.54                         | /                 | /          |
| 2412                      | 81.39                     | AV                       | V              | 6.13                      | 87.52                         | /                 | /          |
| 2388.2                    | 51.96                     | PK                       | H              | 5.48                      | 57.44                         | 74                | 16.56      |
| 2388.2                    | 33.51                     | AV                       | H              | 5.48                      | 38.99                         | 54                | 15.01      |
| 2490.4                    | 35.57                     | PK                       | H              | 7.21                      | 42.78                         | 74                | 31.22      |
| 2490.4                    | 23.20                     | AV                       | H              | 7.21                      | 30.41                         | 54                | 23.59      |
| 4824                      | 36.44                     | PK                       | H              | 12.44                     | 48.88                         | 74                | 25.12      |
| 4824                      | 23.22                     | AV                       | H              | 12.44                     | 35.66                         | 54                | 18.34      |
| 7236                      | 35.64                     | PK                       | V              | 17.06                     | 52.70                         | 74                | 21.30      |
| 7236                      | 22.81                     | AV                       | V              | 17.06                     | 39.87                         | 54                | 14.13      |
| 9648                      | 35.69                     | PK                       | H              | 19.28                     | 54.97                         | 74                | 19.03      |
| 9648                      | 23.72                     | AV                       | H              | 19.28                     | 43.00                         | 54                | 11.00      |
| Middle Channel (2437 MHz) |                           |                          |                |                           |                               |                   |            |
| 2437                      | 93.12                     | PK                       | H              | 6.13                      | 99.25                         | /                 | /          |
| 2437                      | 81.73                     | AV                       | H              | 6.13                      | 87.86                         | /                 | /          |
| 2437                      | 92.26                     | PK                       | V              | 6.13                      | 98.39                         | /                 | /          |
| 2437                      | 81.01                     | AV                       | V              | 6.13                      | 87.14                         | /                 | /          |
| 2389.5                    | 36.88                     | PK                       | V              | 5.48                      | 42.36                         | 74                | 31.64      |
| 2389.5                    | 22.71                     | AV                       | V              | 5.48                      | 28.19                         | 54                | 25.81      |
| 2485.8                    | 36.71                     | PK                       | H              | 7.21                      | 43.92                         | 74                | 30.08      |
| 2485.8                    | 23.60                     | AV                       | H              | 7.21                      | 30.81                         | 54                | 23.19      |
| 4874                      | 37.32                     | PK                       | V              | 12.4                      | 49.72                         | 74                | 24.28      |
| 4874                      | 23.85                     | AV                       | V              | 12.4                      | 36.25                         | 54                | 17.75      |
| 7311                      | 35.97                     | PK                       | V              | 16.62                     | 52.59                         | 74                | 21.41      |
| 7311                      | 23.76                     | AV                       | V              | 16.62                     | 40.38                         | 54                | 13.62      |
| 9748                      | 36.25                     | PK                       | H              | 19.4                      | 55.65                         | 74                | 18.35      |
| 9748                      | 23.15                     | AV                       | H              | 19.4                      | 42.55                         | 54                | 11.45      |

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| Indicated               |                           | Detector<br>(PK/QP/Ave.) | Antenna        | Correction Factor<br>(dB) | FCC Part 15.247/15.209/15.205 |                   |            |
|-------------------------|---------------------------|--------------------------|----------------|---------------------------|-------------------------------|-------------------|------------|
| Frequency<br>(MHz)      | S.A.<br>Reading<br>(dBμV) |                          | Polar<br>(H/V) |                           | Cord.<br>Amp.<br>(dBμV/m)     | Limit<br>(dBμV/m) | Margin(dB) |
| High Channel (2462 MHz) |                           |                          |                |                           |                               |                   |            |
| 2462                    | 91.12                     | PK                       | H              | 6.13                      | 97.25                         | /                 | /          |
| 2462                    | 80.73                     | AV                       | H              | 6.13                      | 86.86                         | /                 | /          |
| 2462                    | 91.78                     | PK                       | V              | 6.13                      | 97.91                         | /                 | /          |
| 2462                    | 81.61                     | AV                       | V              | 6.13                      | 87.74                         | /                 | /          |
| 2387.5                  | 36.24                     | PK                       | H              | 5.48                      | 41.72                         | 74                | 32.28      |
| 2387.5                  | 24.03                     | AV                       | H              | 5.48                      | 29.51                         | 54                | 24.49      |
| 2487.8                  | 36.50                     | PK                       | V              | 7.21                      | 43.71                         | 74                | 30.29      |
| 2487.8                  | 22.93                     | AV                       | V              | 7.21                      | 30.14                         | 54                | 23.86      |
| 4924                    | 37.23                     | PK                       | H              | 12.46                     | 49.69                         | 74                | 24.31      |
| 4924                    | 23.76                     | AV                       | H              | 12.46                     | 36.22                         | 54                | 17.78      |
| 7386                    | 35.78                     | PK                       | V              | 15.91                     | 51.69                         | 74                | 22.31      |
| 7386                    | 22.98                     | AV                       | V              | 15.91                     | 38.89                         | 54                | 15.11      |
| 9848                    | 35.96                     | PK                       | V              | 19.29                     | 55.25                         | 74                | 18.75      |
| 9848                    | 22.69                     | AV                       | V              | 19.29                     | 41.98                         | 54                | 12.02      |

**Note:**

*Frequency = Emission frequency in MHz*

*Correction Factor (dB) = Ant Factor + cable loss - Pre-Amp .Gain*

*Corrected Amplitude (dBμV/m) = S.A. Reading + Correction Factor (dB)*

*Limit (dBμV/m) = Limit stated in standard*

*PK = Peak QP = Quasi-peak Ave = Average*

**Calculation Formula**

*Margin (dB) = Limit – Corrected Amplitude*

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**802.11n-HT20 Mode**

| Indicated                 |                           | Detector<br>(PK/QP/Ave.) | Antenna        | Correction Factor<br>(dB) | FCC Part 15.247/15.209/15.205 |                   |            |
|---------------------------|---------------------------|--------------------------|----------------|---------------------------|-------------------------------|-------------------|------------|
| Frequency<br>(MHz)        | S.A.<br>Reading<br>(dBμV) |                          | Polar<br>(H/V) |                           | Cord.<br>Amp.<br>(dBμV/m)     | Limit<br>(dBμV/m) | Margin(dB) |
| Low Channel (2412 MHz)    |                           |                          |                |                           |                               |                   |            |
| 2412                      | 92.17                     | PK                       | H              | 6.13                      | 98.30                         | /                 | /          |
| 2412                      | 82.9                      | AV                       | H              | 6.13                      | 89.03                         | /                 | /          |
| 2412                      | 91.78                     | PK                       | V              | 6.13                      | 97.91                         | /                 | /          |
| 2412                      | 82.65                     | AV                       | V              | 6.13                      | 88.78                         | /                 | /          |
| 2375                      | 39.07                     | PK                       | H              | 5.48                      | 44.55                         | 74                | 29.45      |
| 2375                      | 23.74                     | AV                       | H              | 5.48                      | 29.22                         | 54                | 24.78      |
| 2488.9                    | 35.79                     | PK                       | H              | 7.21                      | 43.00                         | 74                | 31.00      |
| 2488.9                    | 23.65                     | AV                       | H              | 7.21                      | 30.86                         | 54                | 23.14      |
| 4824                      | 36.06                     | PK                       | V              | 12.44                     | 48.50                         | 74                | 25.50      |
| 4824                      | 23.27                     | AV                       | V              | 12.44                     | 35.71                         | 54                | 18.29      |
| 7236                      | 36.93                     | PK                       | V              | 17.06                     | 53.99                         | 74                | 20.01      |
| 7236                      | 23.69                     | AV                       | V              | 17.06                     | 40.75                         | 54                | 13.25      |
| 9648                      | 35.33                     | PK                       | H              | 19.28                     | 54.61                         | 74                | 19.39      |
| 9648                      | 23.64                     | AV                       | H              | 19.28                     | 42.92                         | 54                | 11.08      |
| Middle Channel (2437 MHz) |                           |                          |                |                           |                               |                   |            |
| 2437                      | 92.73                     | PK                       | H              | 6.13                      | 98.86                         | /                 | /          |
| 2437                      | 83.94                     | AV                       | H              | 6.13                      | 90.07                         | /                 | /          |
| 2437                      | 92.09                     | PK                       | V              | 6.13                      | 98.22                         | /                 | /          |
| 2437                      | 83.74                     | AV                       | V              | 6.13                      | 89.87                         | /                 | /          |
| 2385                      | 40.55                     | PK                       | V              | 5.48                      | 46.03                         | 74                | 27.97      |
| 2385                      | 27.77                     | AV                       | V              | 5.48                      | 33.25                         | 54                | 20.75      |
| 2488.2                    | 36.65                     | PK                       | H              | 7.21                      | 43.86                         | 74                | 30.14      |
| 2488.2                    | 23.70                     | AV                       | H              | 7.21                      | 30.91                         | 54                | 23.09      |
| 4874                      | 35.87                     | PK                       | V              | 12.40                     | 48.27                         | 74                | 25.73      |
| 4874                      | 23.55                     | AV                       | V              | 12.40                     | 35.95                         | 54                | 18.05      |
| 7311                      | 36.24                     | PK                       | V              | 16.62                     | 52.86                         | 74                | 21.14      |
| 7311                      | 23.36                     | AV                       | V              | 16.62                     | 39.98                         | 54                | 14.02      |
| 9748                      | 36.54                     | PK                       | V              | 19.40                     | 55.94                         | 74                | 18.06      |
| 9748                      | 23.50                     | AV                       | V              | 19.40                     | 42.90                         | 54                | 11.10      |

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| Indicated               |                           | Detector<br>(PK/QP/Ave.) | Antenna        | Correction Factor<br>(dB) | FCC Part 15.247/15.209/15.205 |                   |            |
|-------------------------|---------------------------|--------------------------|----------------|---------------------------|-------------------------------|-------------------|------------|
| Frequency<br>(MHz)      | S.A.<br>Reading<br>(dBμV) |                          | Polar<br>(H/V) |                           | Cord.<br>Amp.<br>(dBμV/m)     | Limit<br>(dBμV/m) | Margin(dB) |
| High Channel (2462 MHz) |                           |                          |                |                           |                               |                   |            |
| 2462                    | 92.13                     | PK                       | H              | 6.13                      | 98.26                         | /                 | /          |
| 2462                    | 82.87                     | AV                       | H              | 6.13                      | 89.00                         | /                 | /          |
| 2462                    | 91.25                     | PK                       | V              | 6.13                      | 97.38                         | /                 | /          |
| 2462                    | 84.09                     | AV                       | V              | 6.13                      | 90.22                         | /                 | /          |
| 2376.4                  | 35.78                     | PK                       | H              | 5.48                      | 41.26                         | 74                | 32.74      |
| 2376.4                  | 23.73                     | AV                       | H              | 5.48                      | 29.21                         | 54                | 24.79      |
| 2484                    | 43.74                     | PK                       | V              | 7.21                      | 50.95                         | 74                | 23.05      |
| 2484                    | 28.84                     | AV                       | V              | 7.21                      | 36.05                         | 54                | 17.95      |
| 4924                    | 36.77                     | PK                       | V              | 12.46                     | 49.23                         | 74                | 24.77      |
| 4924                    | 24.42                     | AV                       | V              | 12.46                     | 36.88                         | 54                | 17.12      |
| 7386                    | 36.07                     | PK                       | H              | 15.91                     | 51.98                         | 74                | 22.02      |
| 7386                    | 23.93                     | AV                       | H              | 15.91                     | 39.84                         | 54                | 14.16      |
| 9848                    | 36.15                     | PK                       | V              | 19.29                     | 55.44                         | 74                | 18.56      |
| 9848                    | 23.1                      | AV                       | V              | 19.29                     | 42.39                         | 54                | 11.61      |

### Note:

*Frequency = Emission frequency in MHz*

*Correction Factor (dB) = Ant Factor + cable loss - Pre-Amp .Gain*

*Corrected Amplitude (dBμV/m) = S.A. Reading + Correction Factor (dB)*

*Limit (dBμV/m) = Limit stated in standard*

*PK = Peak QP = Quasi-peak Ave = Average*

### Calculation Formula

*Margin (dB) = Limit – Corrected Amplitude*

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**802.11n-HT40 Mode**

| Indicated                 |                           | Detector<br>(PK/QP/Ave.) | Antenna        | Correction Factor<br>(dB) | FCC Part 15.247/15.209/15.205 |                   |            |
|---------------------------|---------------------------|--------------------------|----------------|---------------------------|-------------------------------|-------------------|------------|
| Frequency<br>(MHz)        | S.A.<br>Reading<br>(dBμV) |                          | Polar<br>(H/V) |                           | Cord.<br>Amp.<br>(dBμV/m)     | Limit<br>(dBμV/m) | Margin(dB) |
| Low Channel (2422 MHz)    |                           |                          |                |                           |                               |                   |            |
| 2422                      | 92.78                     | PK                       | H              | 6.13                      | 98.91                         | /                 | /          |
| 2422                      | 83.07                     | AV                       | H              | 6.13                      | 89.20                         | /                 | /          |
| 2422                      | 91.89                     | PK                       | V              | 6.13                      | 98.02                         | /                 | /          |
| 2422                      | 82.47                     | AV                       | V              | 6.13                      | 88.60                         | /                 | /          |
| 2378.4                    | 43.86                     | PK                       | H              | 5.48                      | 49.34                         | 74                | 24.66      |
| 2378.4                    | 30.34                     | AV                       | H              | 5.48                      | 35.82                         | 54                | 18.18      |
| 2497.1                    | 36.00                     | PK                       | V              | 7.21                      | 43.21                         | 74                | 30.79      |
| 2497.1                    | 23.31                     | AV                       | V              | 7.21                      | 30.52                         | 54                | 23.48      |
| 4844                      | 36.80                     | PK                       | H              | 12.40                     | 49.20                         | 74                | 24.80      |
| 4844                      | 23.66                     | AV                       | H              | 12.40                     | 36.06                         | 54                | 17.94      |
| 7266                      | 36.18                     | PK                       | V              | 16.62                     | 52.80                         | 74                | 21.20      |
| 7266                      | 22.96                     | AV                       | V              | 16.62                     | 39.58                         | 54                | 14.42      |
| 9688                      | 34.85                     | PK                       | V              | 19.29                     | 54.14                         | 74                | 19.86      |
| 9688                      | 22.71                     | AV                       | V              | 19.29                     | 42.00                         | 54                | 12.00      |
| Middle Channel (2437 MHz) |                           |                          |                |                           |                               |                   |            |
| 2437                      | 91.93                     | PK                       | H              | 6.13                      | 98.06                         | /                 | /          |
| 2437                      | 82.67                     | AV                       | H              | 6.13                      | 88.80                         | /                 | /          |
| 2437                      | 91.71                     | PK                       | V              | 6.13                      | 97.84                         | /                 | /          |
| 2437                      | 82.81                     | AV                       | V              | 6.13                      | 88.94                         | /                 | /          |
| 2386.2                    | 37.20                     | PK                       | V              | 5.48                      | 42.68                         | 74                | 31.32      |
| 2386.2                    | 23.68                     | AV                       | V              | 5.48                      | 29.16                         | 54                | 24.84      |
| 2486.7                    | 37.16                     | PK                       | H              | 7.21                      | 44.37                         | 74                | 29.63      |
| 2486.7                    | 23.78                     | AV                       | H              | 7.21                      | 30.99                         | 54                | 23.01      |
| 4874                      | 36.88                     | PK                       | V              | 12.4                      | 49.28                         | 74                | 24.72      |
| 4874                      | 23.19                     | AV                       | V              | 12.4                      | 35.59                         | 54                | 18.41      |
| 7311                      | 36.56                     | PK                       | V              | 16.62                     | 53.18                         | 74                | 20.82      |
| 7311                      | 23.86                     | AV                       | V              | 16.62                     | 40.48                         | 54                | 13.52      |
| 9748                      | 36.03                     | PK                       | H              | 19.4                      | 55.43                         | 74                | 18.57      |
| 9748                      | 23.69                     | AV                       | H              | 19.4                      | 43.09                         | 54                | 10.91      |

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| Indicated               |                           | Detector<br>(PK/QP/Ave.) | Antenna        | Correction Factor<br>(dB) | FCC Part 15.247/15.209/15.205 |                   |            |
|-------------------------|---------------------------|--------------------------|----------------|---------------------------|-------------------------------|-------------------|------------|
| Frequency<br>(MHz)      | S.A.<br>Reading<br>(dBμV) |                          | Polar<br>(H/V) |                           | Cord.<br>Amp.<br>(dBμV/m)     | Limit<br>(dBμV/m) | Margin(dB) |
| High Channel (2452 MHz) |                           |                          |                |                           |                               |                   |            |
| 2452                    | 91.71                     | PK                       | H              | 6.13                      | 97.84                         | /                 | /          |
| 2452                    | 81.8                      | AV                       | H              | 6.13                      | 87.93                         | /                 | /          |
| 2452                    | 90.98                     | PK                       | V              | 6.13                      | 97.11                         | /                 | /          |
| 2452                    | 81.56                     | AV                       | V              | 6.13                      | 87.69                         | /                 | /          |
| 2385.2                  | 36.85                     | PK                       | H              | 5.48                      | 42.33                         | 74                | 31.67      |
| 2385.2                  | 23.82                     | AV                       | H              | 5.48                      | 29.30                         | 54                | 24.70      |
| 2484.8                  | 42.68                     | PK                       | V              | 7.21                      | 49.89                         | 74                | 24.11      |
| 2484.8                  | 30.03                     | AV                       | V              | 7.21                      | 37.24                         | 54                | 16.76      |
| 4904                    | 37.45                     | PK                       | H              | 12.46                     | 49.91                         | 74                | 24.09      |
| 4904                    | 24.53                     | AV                       | H              | 12.46                     | 36.99                         | 54                | 17.01      |
| 7356                    | 37.25                     | PK                       | H              | 16.49                     | 53.74                         | 74                | 20.26      |
| 7356                    | 23.68                     | AV                       | H              | 16.49                     | 40.17                         | 54                | 13.83      |
| 9808                    | 35.63                     | PK                       | V              | 19.29                     | 54.92                         | 74                | 19.08      |
| 9808                    | 22.86                     | AV                       | V              | 19.29                     | 42.15                         | 54                | 11.85      |

### Note:

*Frequency = Emission frequency in MHz*

*Correction Factor (dB) = Ant Factor + cable loss - Pre-Amp .Gain*

*Corrected Amplitude (dBμV/m) = S.A. Reading + Correction Factor (dB)*

*Limit (dBμV/m) = Limit stated in standard*

*PK = Peak QP = Quasi-peak Ave = Average*

### Calculation Formula

*Margin (dB) = Limit – Corrected Amplitude*

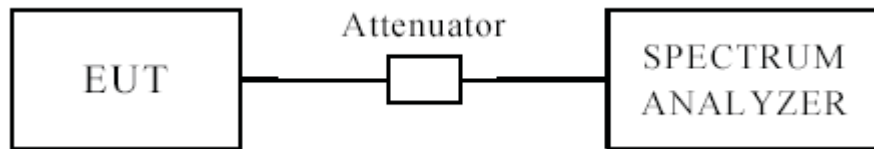
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## 7.0 6dB Bandwidth Measurement

### 7.1 Test Setup



### 7.2 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is >500 kHz

### 7.3 Test Procedure

1. Set resolution bandwidth (RBW) = 100 kHz
2. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

### 7.4 Test Result

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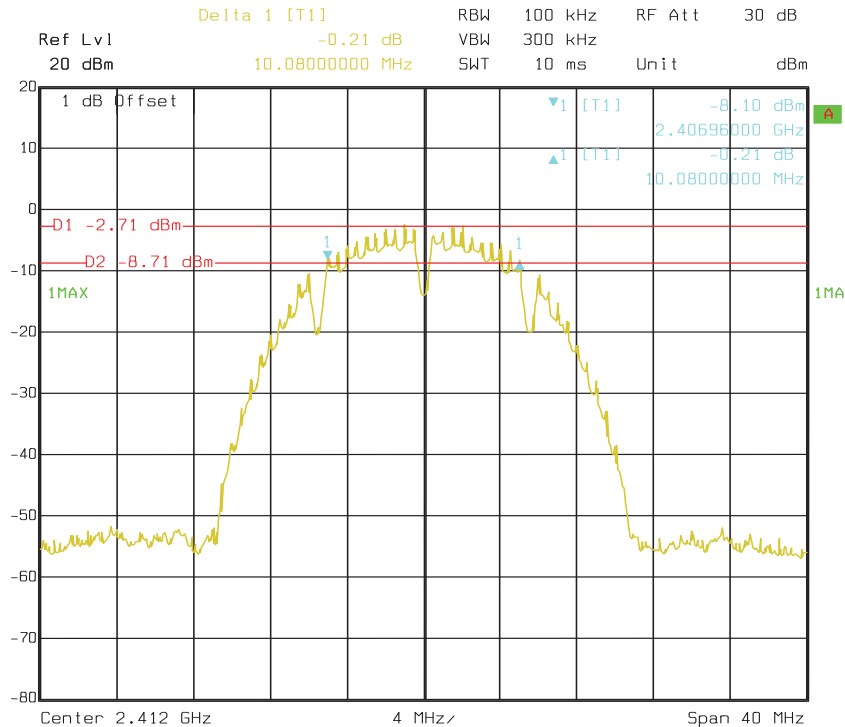
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## 6dB Occupied Bandwidth

| EUT         | Case Remote             |                           | Model                | CR11, CR110, CR119  |            |
|-------------|-------------------------|---------------------------|----------------------|---------------------|------------|
| Mode        | 802.11b                 |                           | Input Voltage        | AC120V              |            |
| Temperature | 24 deg. C,              |                           | Humidity             | 56% RH              |            |
| Channel     | Channel Frequency (MHz) | Data Transfer Rate (Mbps) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) | Pass/ Fail |
| 1           | 2412                    | 1                         | 10.08                | 0.5                 | Pass       |
| 6           | 2437                    | 1                         | 10.08                | 0.5                 | Pass       |
| 11          | 2462                    | 1                         | 10.00                | 0.5                 | Pass       |

### 1. 802.11b at 1Mbps of CH01



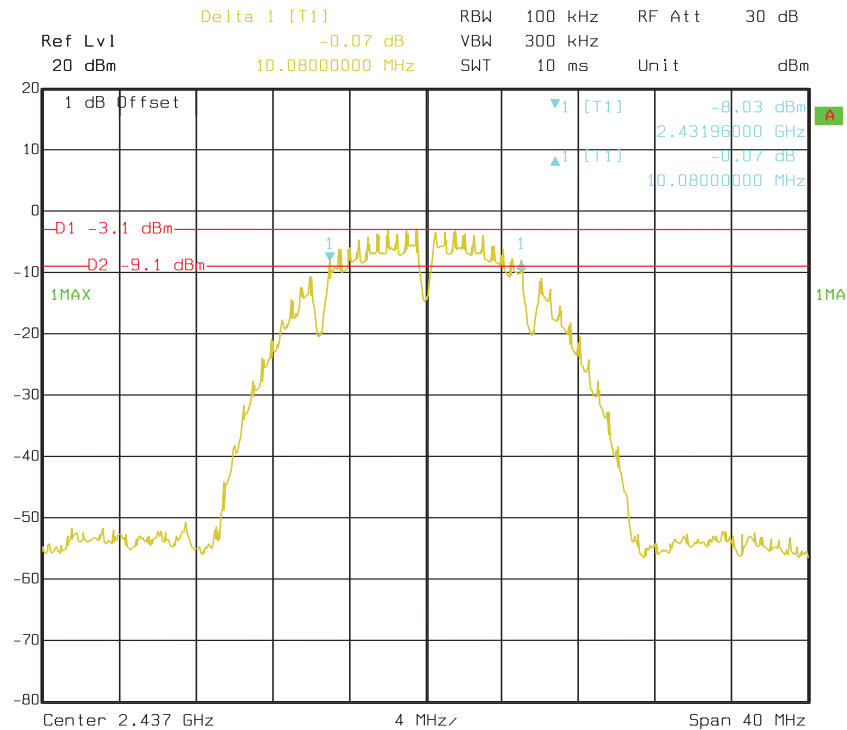
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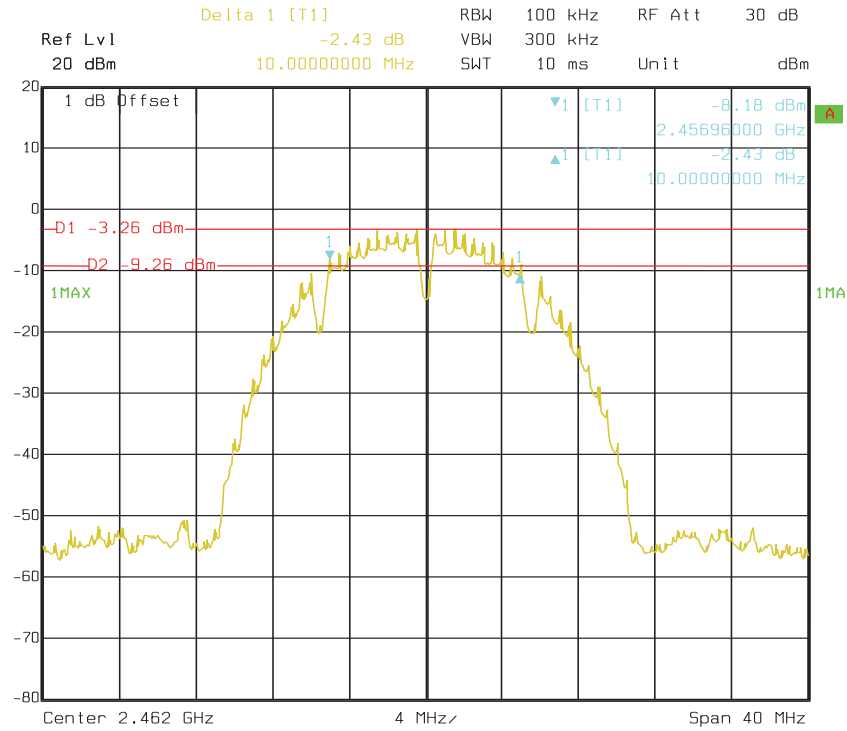
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2. 802.11b at 1Mbps of CH06



3. 802.11b at 1Mbps of CH11



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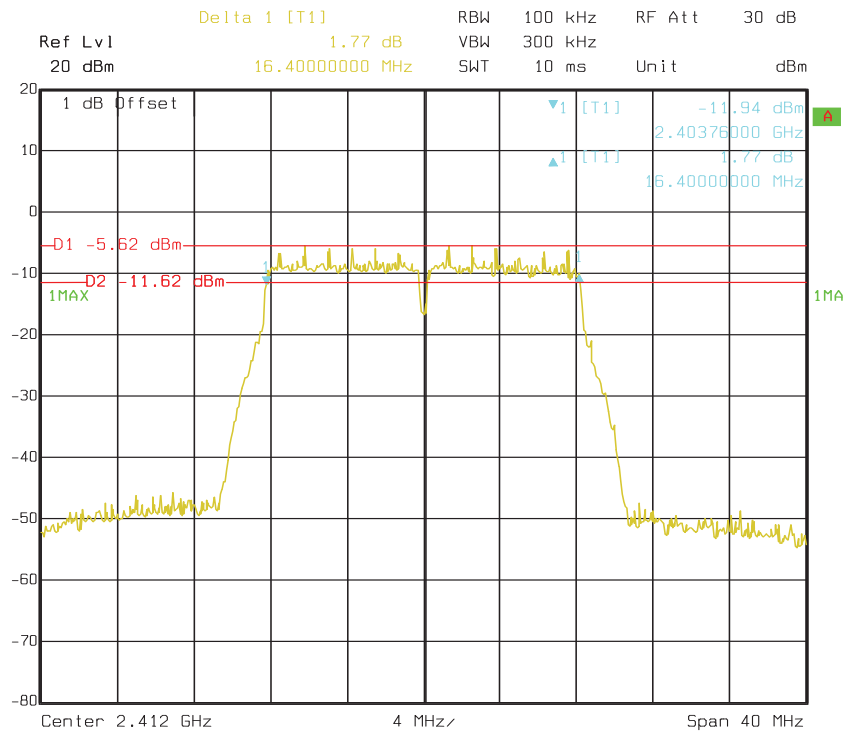


## 6dB Occupied Bandwidth

| EUT         | Case Remote             |                           | Model                | CR11, CR110, CR119  |            |
|-------------|-------------------------|---------------------------|----------------------|---------------------|------------|
| Mode        | 802.11g                 |                           | Input Voltage        | AC120V              |            |
| Temperature | 24 deg. C,              |                           | Humidity             | 56% RH              |            |
| Channel     | Channel Frequency (MHz) | Data Transfer Rate (Mbps) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) | Pass/ Fail |
| 1           | 2412                    | 6                         | 16.40                | 0.5                 | Pass       |
| 6           | 2437                    | 6                         | 16.40                | 0.5                 | Pass       |
| 11          | 2462                    | 6                         | 16.40                | 0.5                 | Pass       |

## Test Plots:

### 1. 802.11g at 6Mbps of CH01



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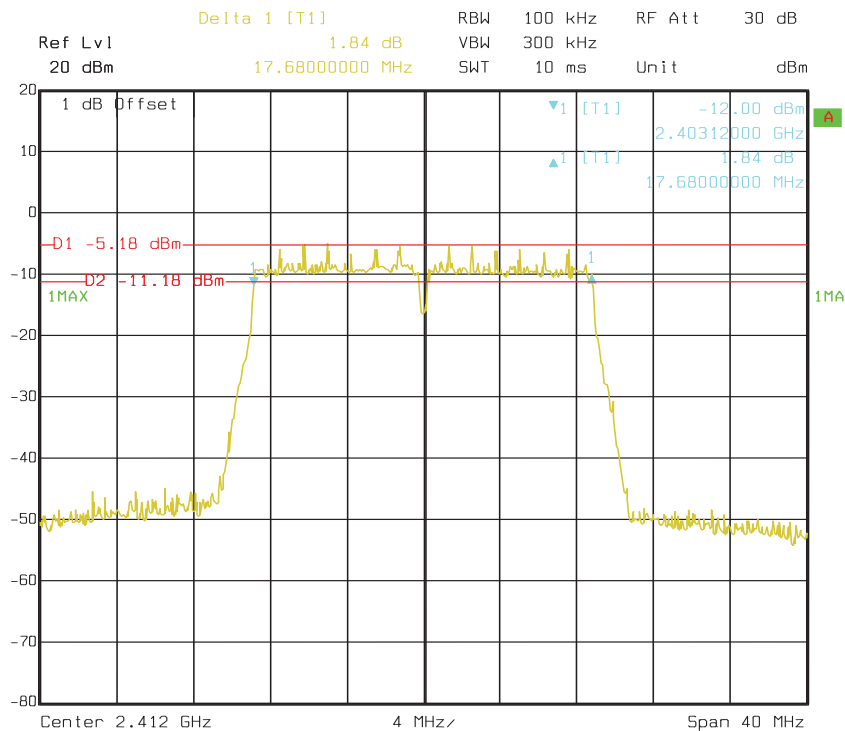


### 6dB Occupied Bandwidth

| EUT         | Case Remote             |                           | Model                | CR11, CR110, CR119  |            |
|-------------|-------------------------|---------------------------|----------------------|---------------------|------------|
| Mode        | 802.11n HT20            |                           | Input Voltage        | AC120V              |            |
| Temperature | 24 deg. C,              |                           | Humidity             | 56% RH              |            |
| Channel     | Channel Frequency (MHz) | Data Transfer Rate (Mbps) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) | Pass/ Fail |
| 1           | 2412                    | 6.5M                      | 17.68                | 0.5                 | Pass       |
| 6           | 2437                    | 6.5M                      | 17.68                | 0.5                 | Pass       |
| 11          | 2462                    | 6.5M                      | 17.60                | 0.5                 | Pass       |

### Test Plots:

#### 1. 802.11n at HT20 of CH01



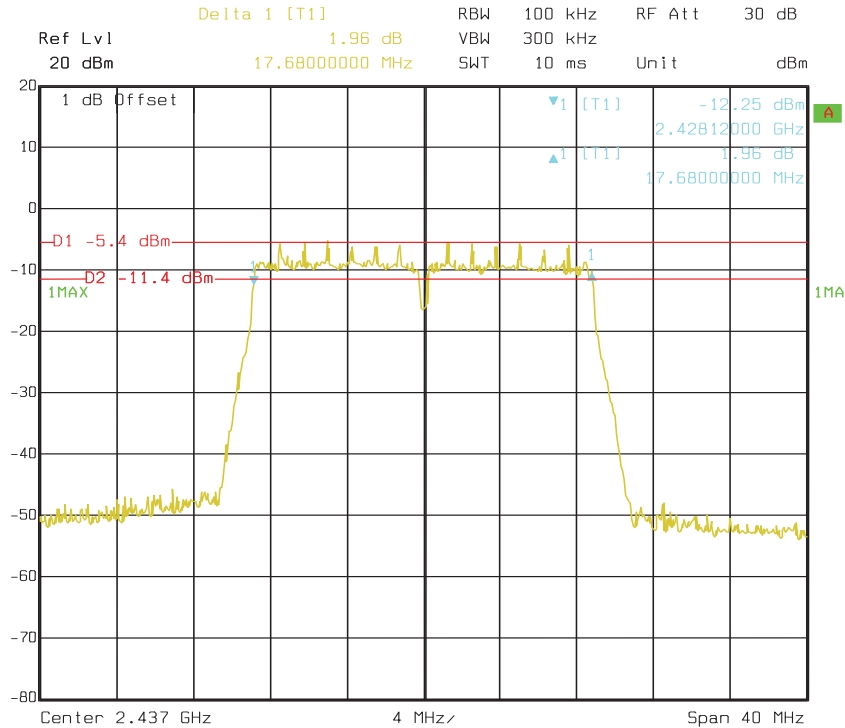
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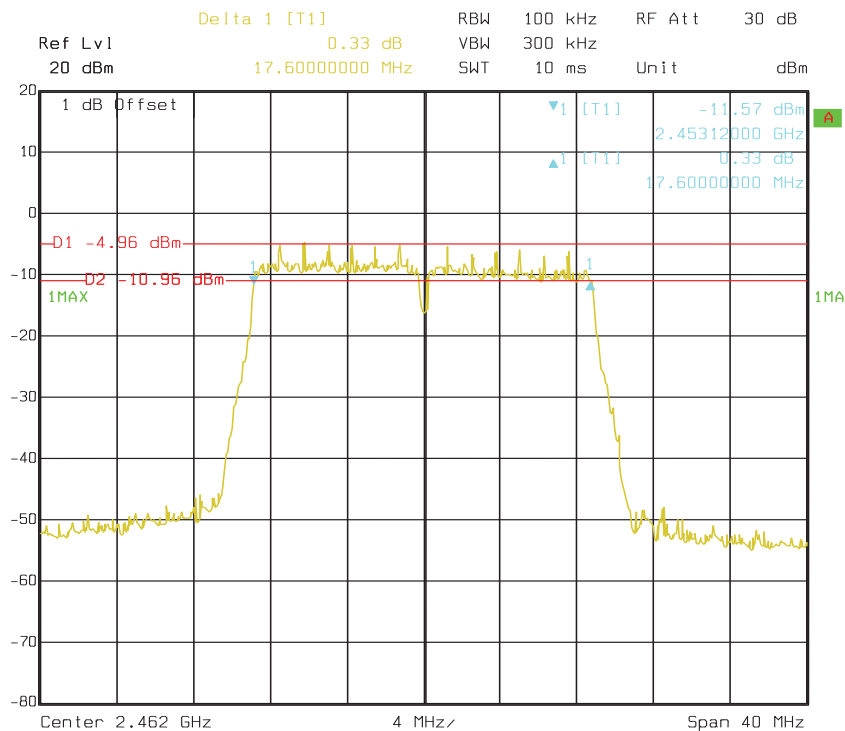
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## 2. 802.11n at HT20 of CH06



## 3. 802.11n at HT20 of CH11



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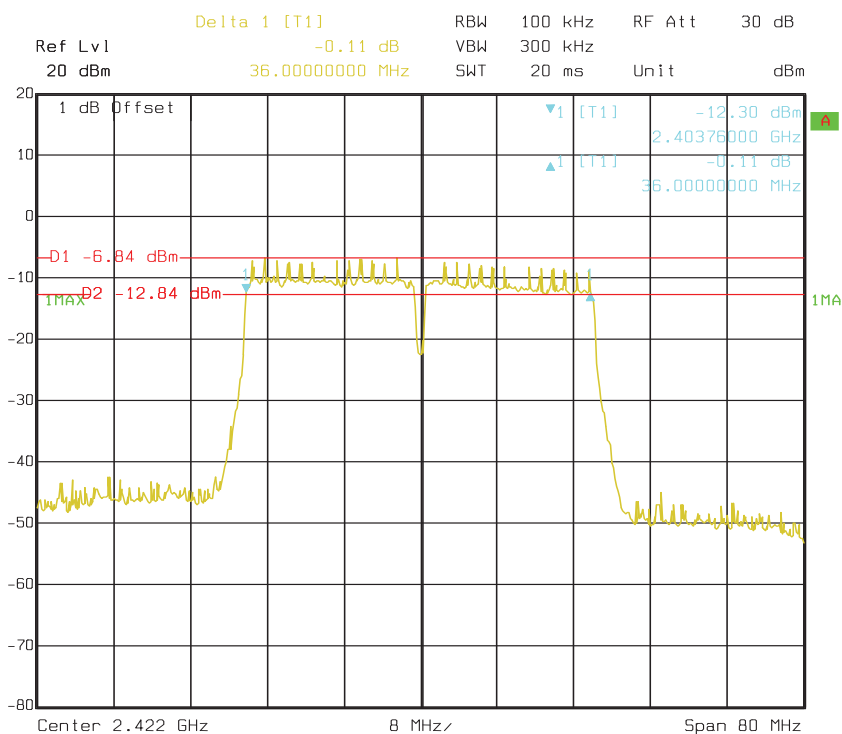
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## 6dB Occupied Bandwidth

| EUT         | Case Remote             |                           | Model                | CR11, CR110, CR119  |            |
|-------------|-------------------------|---------------------------|----------------------|---------------------|------------|
| Mode        | 802.11n HT40            |                           | Input Voltage        | AC120V              |            |
| Temperature | 24 deg. C,              |                           | Humidity             | 56% RH              |            |
| Channel     | Channel Frequency (MHz) | Data Transfer Rate (Mbps) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) | Pass/ Fail |
| 1           | 2422                    | 6.5M                      | 36.00                | 0.5                 | Pass       |
| 4           | 2437                    | 6.5M                      | 36.16                | 0.5                 | Pass       |
| 7           | 2452                    | 6.5M                      | 35.84                | 0.5                 | Pass       |

## Test Plots:

### 1. 802.11n at HT40 of CH01



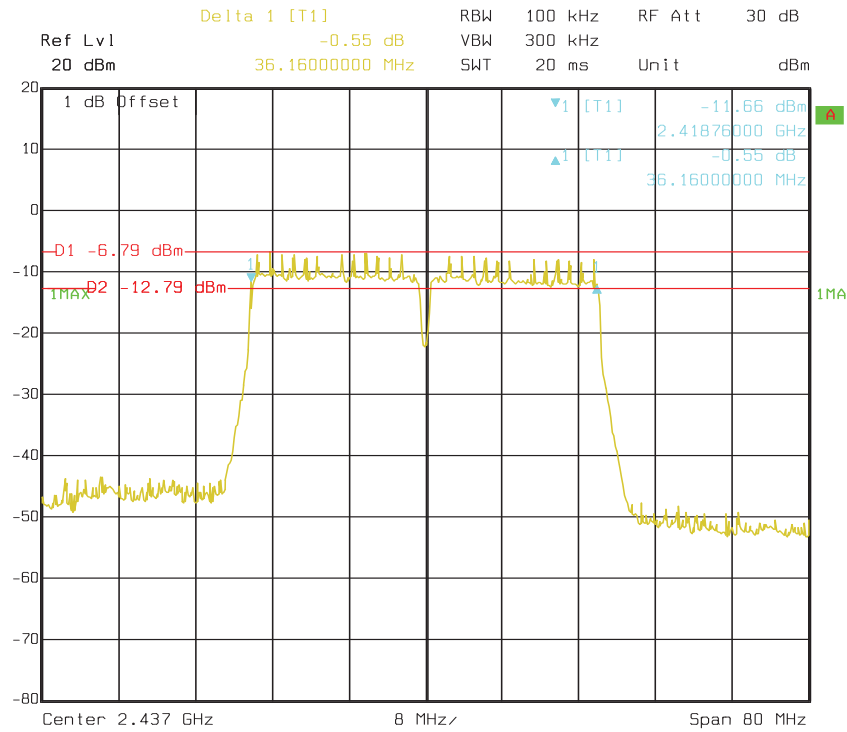
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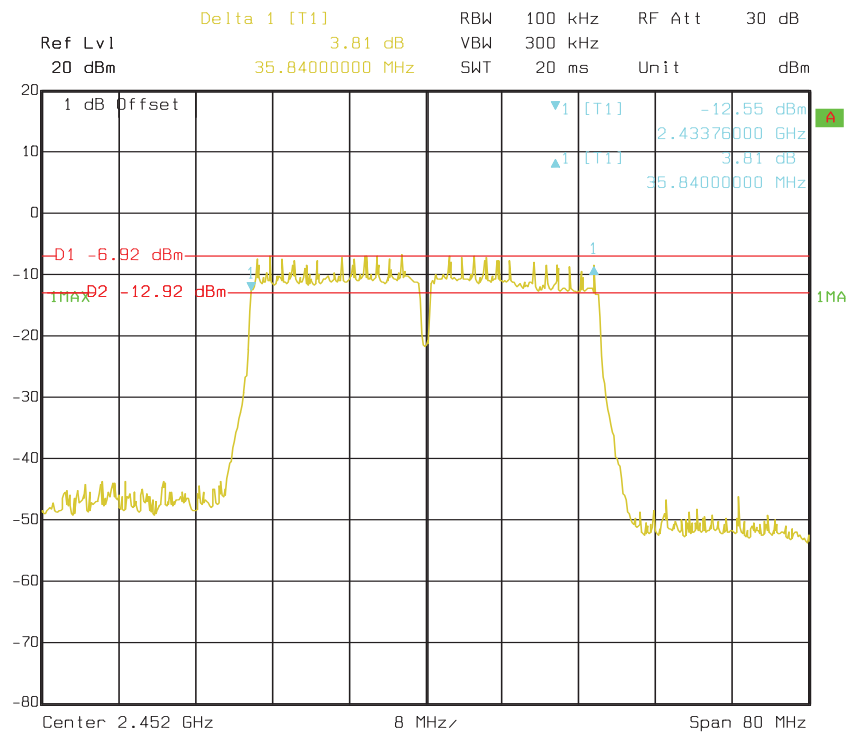
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2. 802.11n at HT40 of CH04



3. 802.11n at HT40 of CH07

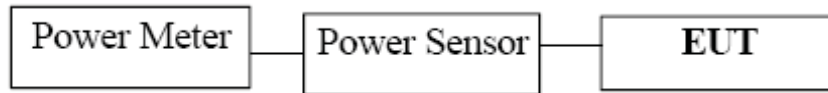


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## 8. Maximum Peak Output Power

### 8.1 Test Setup



### 8.2 Limits of Maximum Peak Output Power

The Maximum Peak Output Power Measurement is 30dBm.

### 8.3 Test Procedure

The RF power output was measured with a Power meter connected to the RF Antenna connector ( conducted measurement ) while EUT was operating in transmit mode at the appropriate centre frequency.

**Note: the peak power was measured**

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#### 8.4 Test Results

| EUT         | Case Remote             |                         | Model                  | CR11, CR110, CR119 |
|-------------|-------------------------|-------------------------|------------------------|--------------------|
| Mode        | 802.11b                 |                         | Input Voltage          | AC120V             |
| Temperature | 24 deg. C,              |                         | Humidity               | 56% RH             |
| Channel     | Channel Frequency (MHz) | Peak Power Output (dBm) | Peak Power Limit (dBm) | Pass/ Fail         |
| 1           | 2412                    | 9.04                    | 30                     | Pass               |
| 6           | 2437                    | 8.73                    | 30                     | Pass               |
| 11          | 2462                    | 8.57                    | 30                     | Pass               |

Note: 1. At final test to get the worst-case emission at 1Mbps for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

$$\text{Peak Power Output} = \text{Peak Power Reading} + \text{Cable loss} + \text{Attenuator}$$

3. The worse case was recorded

| EUT         | Case Remote             |                         | Model                  | CR11, CR110, CR119 |
|-------------|-------------------------|-------------------------|------------------------|--------------------|
| Mode        | 802.11g                 |                         | Input Voltage          | AC120V             |
| Temperature | 24 deg. C,              |                         | Humidity               | 56% RH             |
| Channel     | Channel Frequency (MHz) | Peak Power Output (dBm) | Peak Power Limit (dBm) | Pass/ Fail         |
| 1           | 2412                    | 8.85                    | 30                     | Pass               |
| 6           | 2437                    | 8.74                    | 30                     | Pass               |
| 11          | 2462                    | 8.93                    | 30                     | Pass               |

Note: 1. At final test to get the worst-case emission at 6Mbps for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

$$\text{Peak Power Output} = \text{Peak Power Reading} + \text{Cable loss} + \text{Attenuator}$$

3. The worse case was recorded

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| EUT         | Case Remote             |                         | Model                  | CR11, CR110, CR119 |
|-------------|-------------------------|-------------------------|------------------------|--------------------|
| Mode        | 802.11n (HT20)          |                         | Input Voltage          | AC120V             |
| Temperature | 24 deg. C,              |                         | Humidity               | 56% RH             |
| Channel     | Channel Frequency (MHz) | Peak Power Output (dBm) | Peak Power Limit (dBm) | Pass/ Fail         |
| 1           | 2412                    | 8.98                    | 30                     | Pass               |
| 6           | 2437                    | 8.66                    | 30                     | Pass               |
| 11          | 2462                    | 8.96                    | 30                     | Pass               |

Note: 1. At final test to get the worst-case emission at 6.5Mbps of 11n HT20 for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

Peak Power Output = Peak Power Reading + Cable loss + Attenuator

3. The worse case was recorded

| EUT         | Case Remote             |                         | Model                  | CR11, CR110, CR119 |
|-------------|-------------------------|-------------------------|------------------------|--------------------|
| Mode        | 802.11n (HT40)          |                         | Input Voltage          | AC120V             |
| Temperature | 24 deg. C,              |                         | Humidity               | 56% RH             |
| Channel     | Channel Frequency (MHz) | Peak Power Output (dBm) | Peak Power Limit (dBm) | Pass/ Fail         |
| 1           | 2422                    | 7.99                    | 30                     | Pass               |
| 4           | 2437                    | 8.04                    | 30                     | Pass               |
| 7           | 2452                    | 8.21                    | 30                     | Pass               |

Note: 1. At final test to get the worst-case emission at 6.5Mbps of 11n HT40 for CH01, CH04 and CH7

2. The result basic equation calculation as follow:

Peak Power Output = Peak Power Reading + Cable loss + Attenuator

3. The worse case was recorded

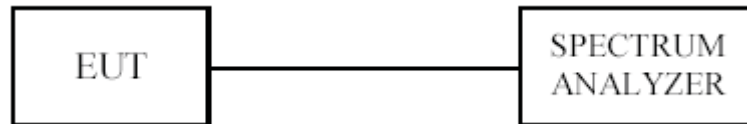
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## 9. Power Spectral Density Measurement

### 9.1 Test Setup



### 9.2 Limits of Power Spectral Density Measurement

The Maximum Power Spectral Density Measurement is 8dBm.

### 9.3 Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW = 3 kHz.
3. Set the VBW  $\geq$  10 kHz.
4. Set the span to 1.5 times the DTS channel bandwidth.
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.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
11. The resulting peak PSD level must be  $\leq$  8 dBm.

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#### 9.4 Test Result

|             |                         |               |                            |               |                     |                    |            |
|-------------|-------------------------|---------------|----------------------------|---------------|---------------------|--------------------|------------|
| EUT         |                         | Case Remote   |                            | Model         |                     | CR11, CR110, CR119 |            |
| Mode        |                         | 802.11b 1Mbps |                            | Input Voltage |                     | AC120V             |            |
| Temperature |                         | 24 deg. C,    |                            | Humidity      |                     | 56% RH             |            |
| Channel     | Channel Frequency (MHz) |               | Final RF Power Level (dBm) |               | Maximum Limit (dBm) |                    | Pass/ Fail |
|             |                         |               |                            |               |                     |                    |            |
| 1Mbps       |                         |               |                            |               |                     |                    |            |
| 1           | 2412                    |               | -17.10                     |               | 8                   |                    | Pass       |
| 6           | 2437                    |               | -17.19                     |               | 8                   |                    | Pass       |
| 11          | 2462                    |               | -16.73                     |               | 8                   |                    | Pass       |

|             |                         |               |                               |               |                     |                    |            |
|-------------|-------------------------|---------------|-------------------------------|---------------|---------------------|--------------------|------------|
| EUT         |                         | Case Remote   |                               | Model         |                     | CR11, CR110, CR119 |            |
| Mode        |                         | 802.11g 6Mbps |                               | Input Voltage |                     | AC120V             |            |
| Temperature |                         | 24 deg. C,    |                               | Humidity      |                     | 56% RH             |            |
| Channel     | Channel Frequency (MHz) |               | Final RF Power Level in (dBm) |               | Maximum Limit (dBm) |                    | Pass/ Fail |
| 6Mbps       |                         |               |                               |               |                     |                    |            |
| 1           | 2412                    |               | -19.05                        |               | 8                   |                    | Pass       |
| 6           | 2437                    |               | -19.42                        |               | 8                   |                    | Pass       |
| 11          | 2462                    |               | -18.75                        |               | 8                   |                    | Pass       |

|             |                         |                      |                            |               |                     |                    |            |
|-------------|-------------------------|----------------------|----------------------------|---------------|---------------------|--------------------|------------|
| EUT         |                         | Case Remote          |                            | Model         |                     | CR11, CR110, CR119 |            |
| Mode        |                         | 802.11n HT20 6.5Mbps |                            | Input Voltage |                     | AC120V             |            |
| Temperature |                         | 24 deg. C,           |                            | Humidity      |                     | 56% RH             |            |
| Channel     | Channel Frequency (MHz) |                      | Final RF Power Level (dBm) |               | Maximum Limit (dBm) |                    | Pass/ Fail |
| HT20        |                         |                      |                            |               |                     |                    |            |
| 1           | 2412                    |                      | -19.19                     |               | 8                   |                    | Pass       |
| 6           | 2437                    |                      | -19.76                     |               | 8                   |                    | Pass       |
| 11          | 2462                    |                      | -19.53                     |               | 8                   |                    | Pass       |

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|-------------|-------------------------|----------------------|----------------------------|---------------|---------------------|--------------------|------------|
| EUT         |                         | Case Remote          |                            | Model         |                     | CR11, CR110, CR119 |            |
| Mode        |                         | 802.11n HT40 6.5Mbps |                            | Input Voltage |                     | AC120V             |            |
| Temperature |                         | 24 deg. C,           |                            | Humidity      |                     | 56% RH             |            |
| Channel     | Channel Frequency (MHz) |                      | Final RF Power Level (dBm) |               | Maximum Limit (dBm) |                    | Pass/ Fail |
| HT40        |                         |                      |                            |               |                     |                    |            |
| 1           | 2422                    |                      | -21.01                     |               | 8                   |                    | Pass       |
| 4           | 2437                    |                      | -20.05                     |               | 8                   |                    | Pass       |
| 7           | 2452                    |                      | -21.05                     |               | 8                   |                    | Pass       |

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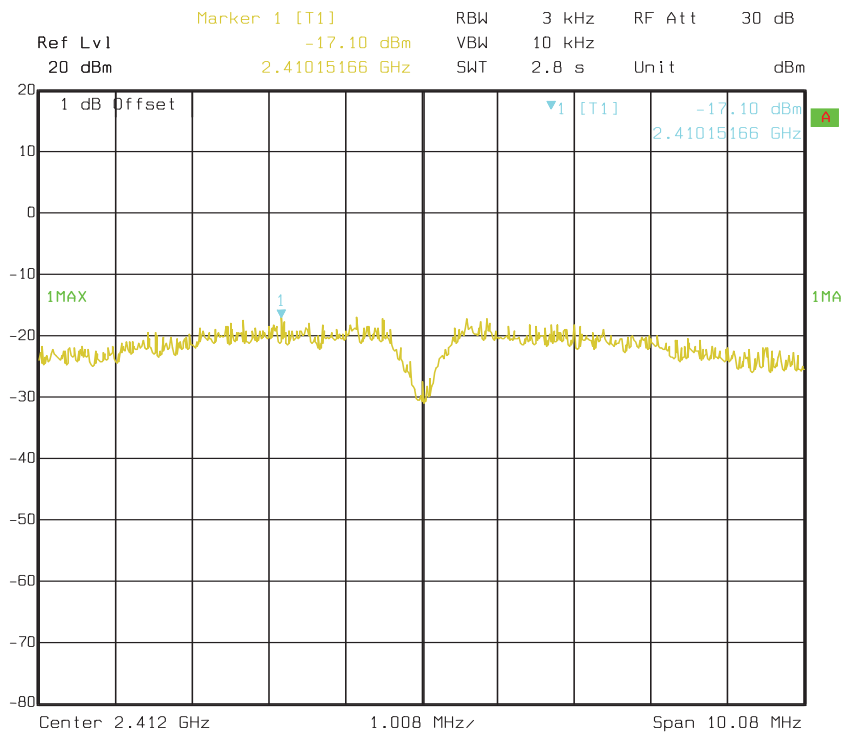
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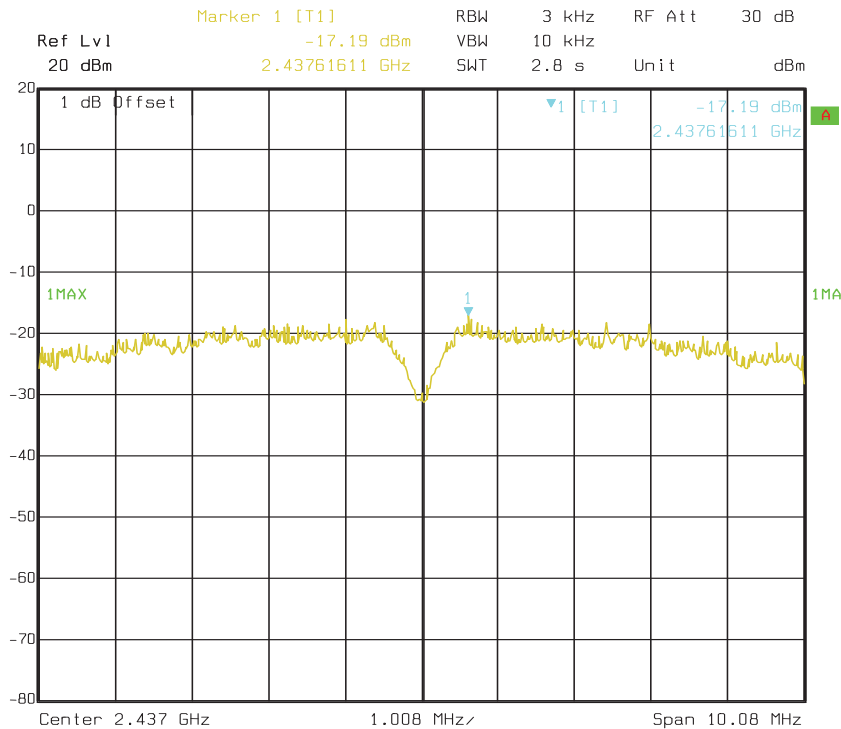


9.5 Photo of Power Spectral Density Measurement

1. 802.11b at 1Mbps of CH1



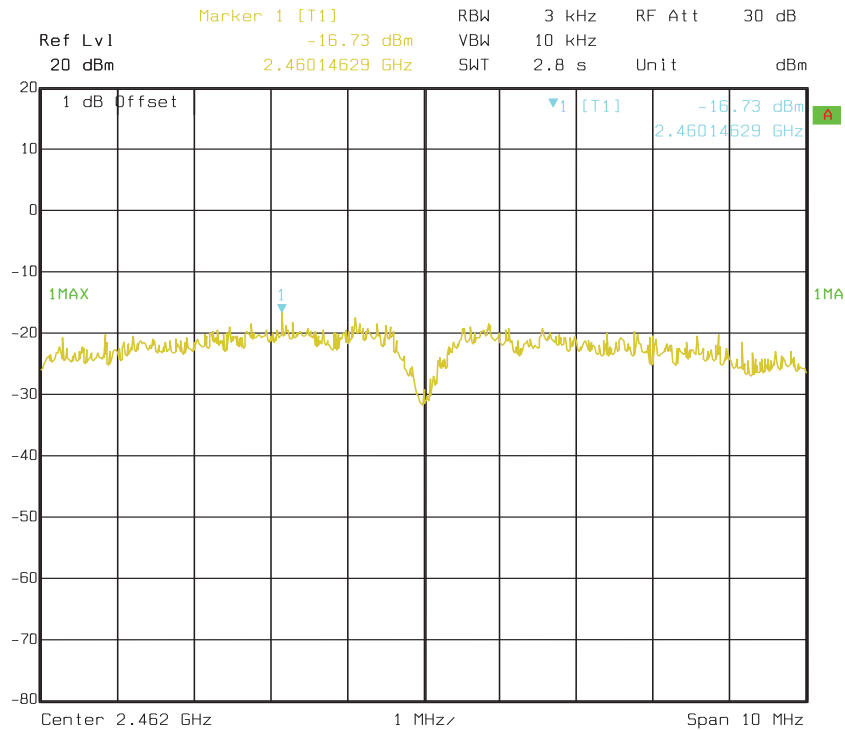
2. 802.11b at 1Mbps of CH6



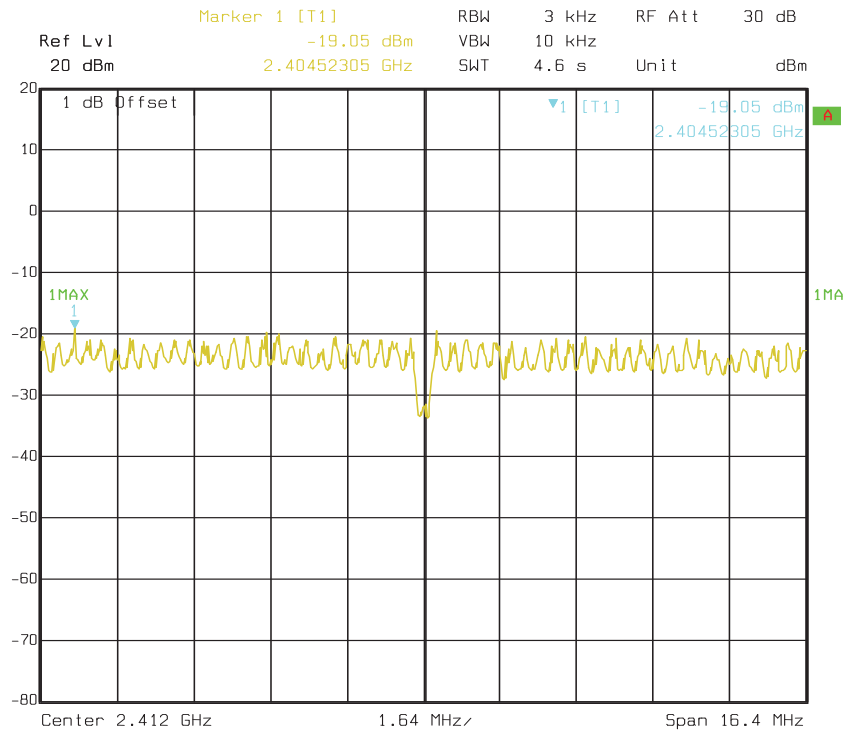
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3. 802.11b at 1Mbps of CH11



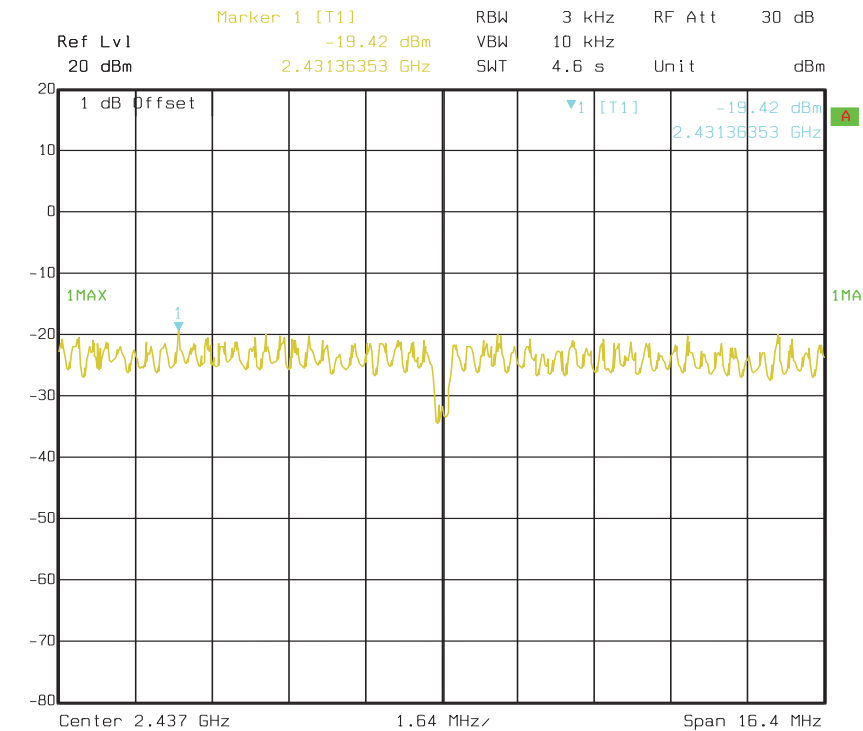
4. 802.11g at 6Mbps of CH1



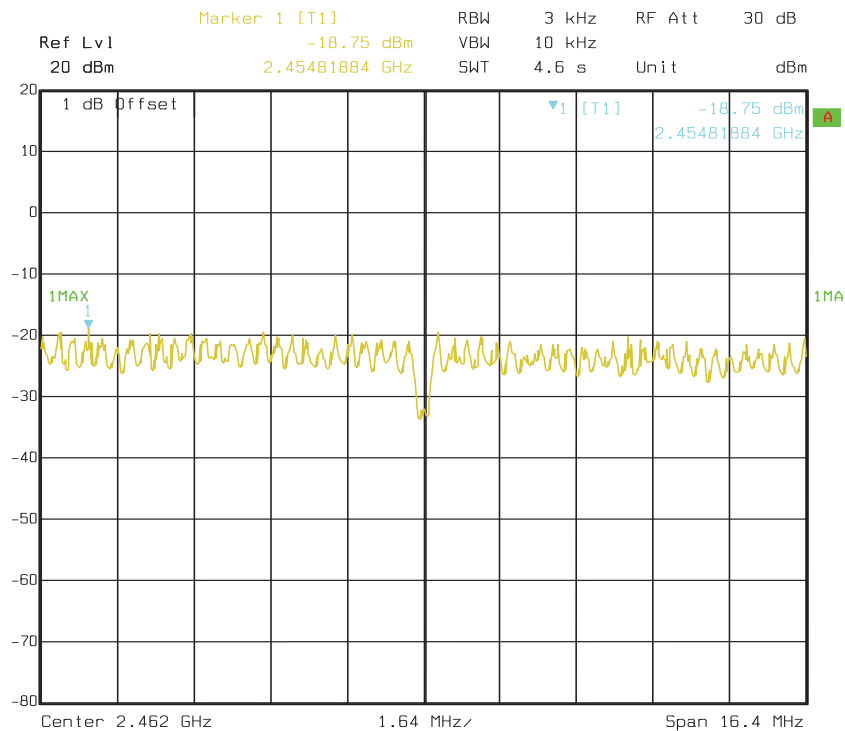
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5. 802.11g at 6Mbps of CH6



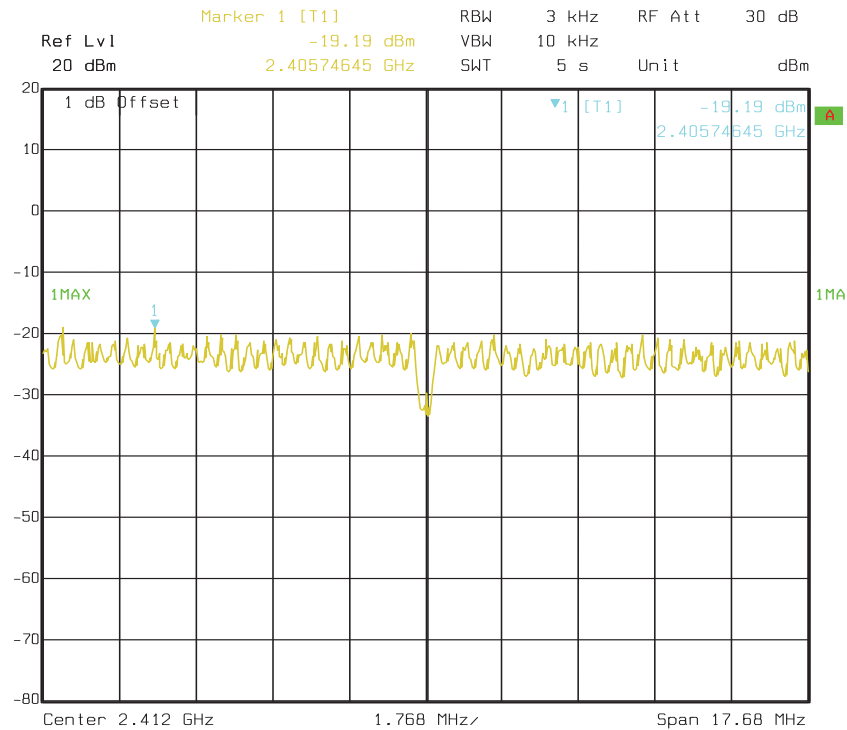
6. 802.11g at 6Mbps of CH11



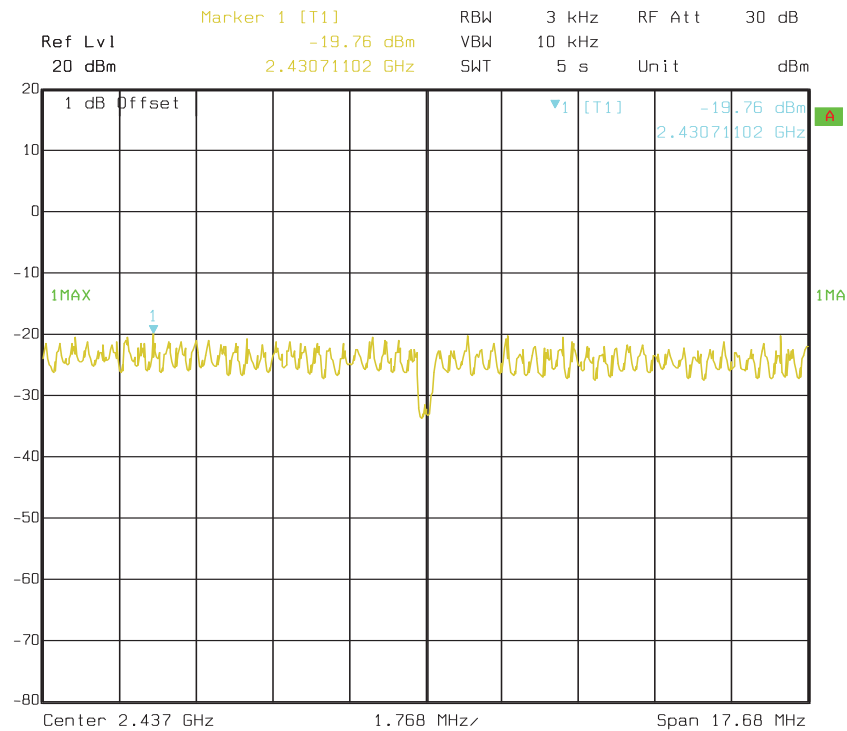
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7. 802.11n at HT20 of CH01



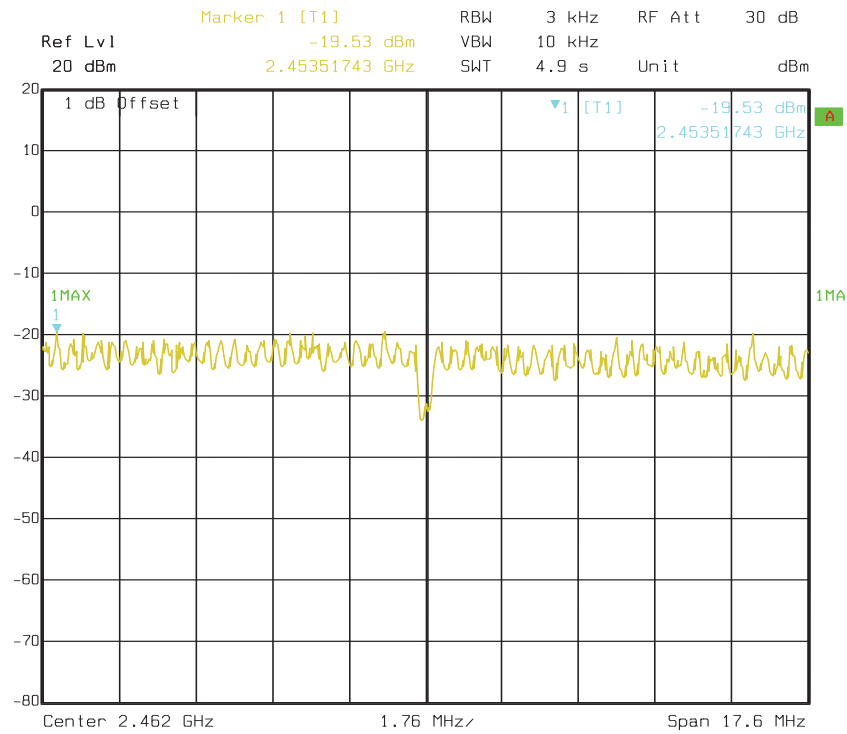
8. 802.11n at HT20 of CH06



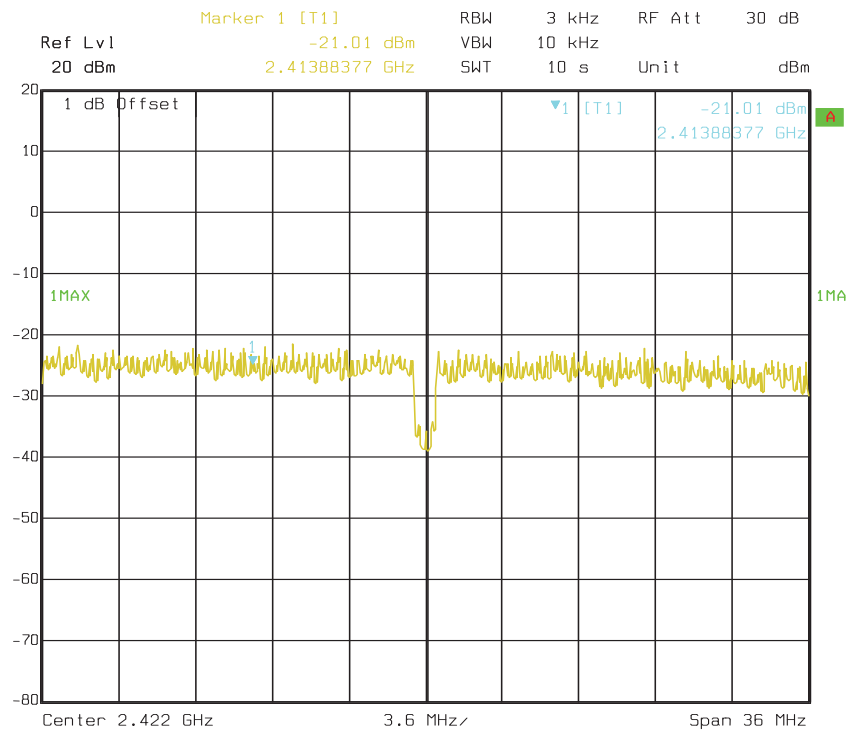
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9. 802.11n at HT20 of CH11



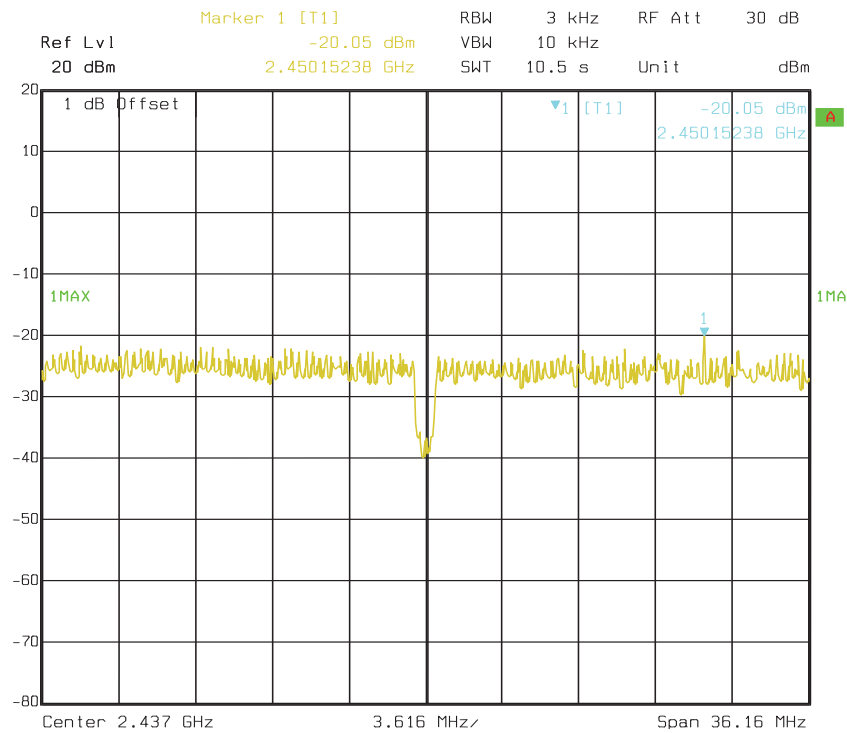
10. 802.11n at HT40 of CH01



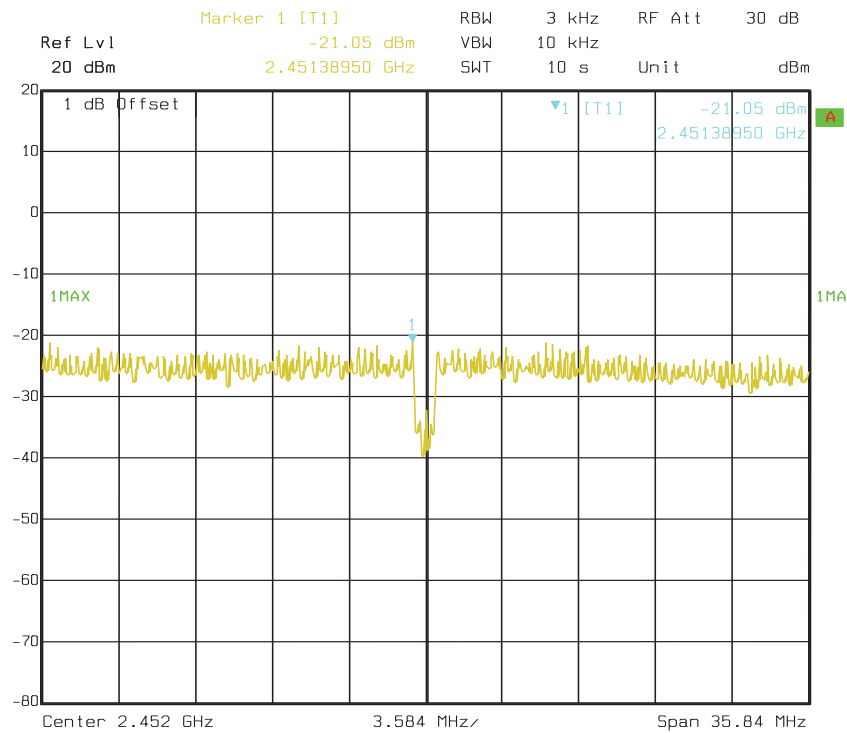
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11. 802.11n at HT40 of CH04



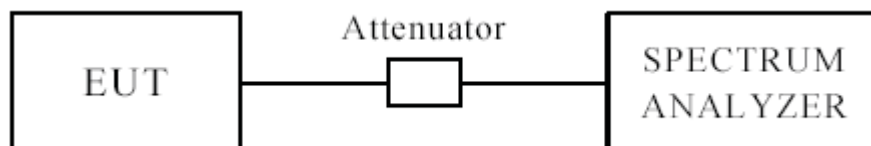
12. 802.11n at HT40 of CH07



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## 10 Out of Band Measurement

### 10.1 Test Setup for band edge



The restricted band requirement based on radiated emission test; please see the clause 6 for the test setup

### 10.2 Limits of Out of Band Emissions Measurement

1. Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

### 10.3 Test Procedure

For signals in the restricted bands above and below the 2.4-2.483GHz allocated band a measurement was made of radiated emission test.( Peak values with RBW=1MHz, VBW=3MHz and PK detector. AV value with RBW=1MHz, VBW=3MHz and RMS detector)

For bandage test, the spectrum set as follows: RBW=100, VBW=300 kHz. A conducted measurement used

### 10.4 Test Result

Please see next pages

Note: 1. this is a handheld device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), after pre-test. It was found that the worse radiated emission was get at the lying position. the worse case was recorded

2. For band-edge measurement, the frequency from 30MHz-25GHz was tested. And It met the FCC rule.

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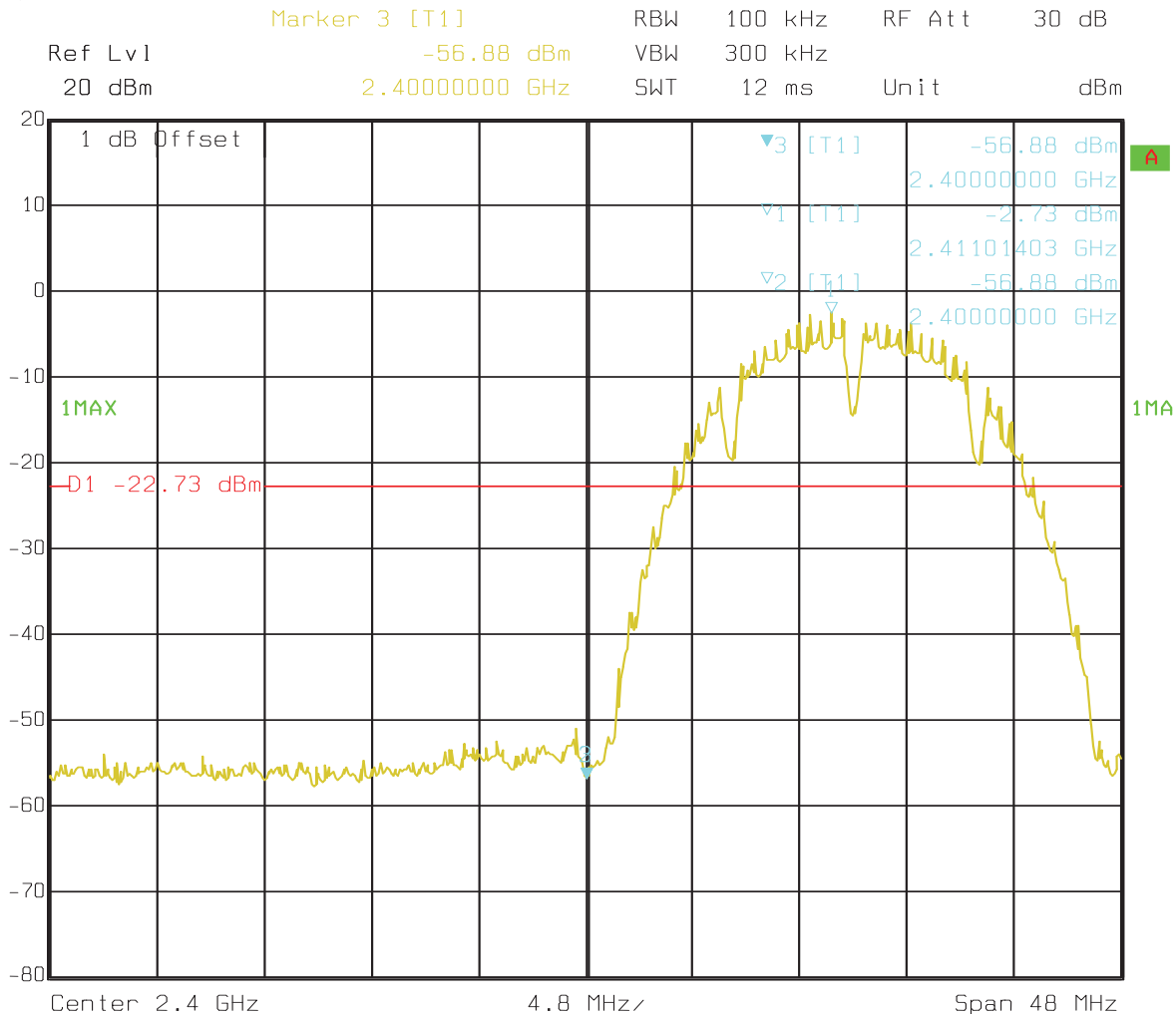
For 802.11b mode

CH01 at 1Mbps

10.4 Band-edge and Restricted band Measurement

|              |                      |       |               |                    |
|--------------|----------------------|-------|---------------|--------------------|
| EUT          | Case Remote          |       | Model         | CR11, CR110, CR119 |
| Mode         | Keeping Transmitting |       | Input Voltage | AC120V             |
| Temperature  | 24 deg. C,           |       | Humidity      | 56% RH             |
| Test Result: | Pass                 |       | Detector      | PK                 |
| 2400         | PK (dBμV/m)          | 46.13 | Limit         | 74(dBμV/m)         |
|              | AV (dBμV/m)          | --    |               | 54(dBμV/m)         |
| 2390         | PK (dBμV/m)          | 38.81 | Limit         | 74(dBμV/m)         |
|              | AV (dBμV/m)          | --    |               | 54(dBμV/m)         |

Test Figure:



Note: The Max. FS in Restrict Band are measured in conventional method.

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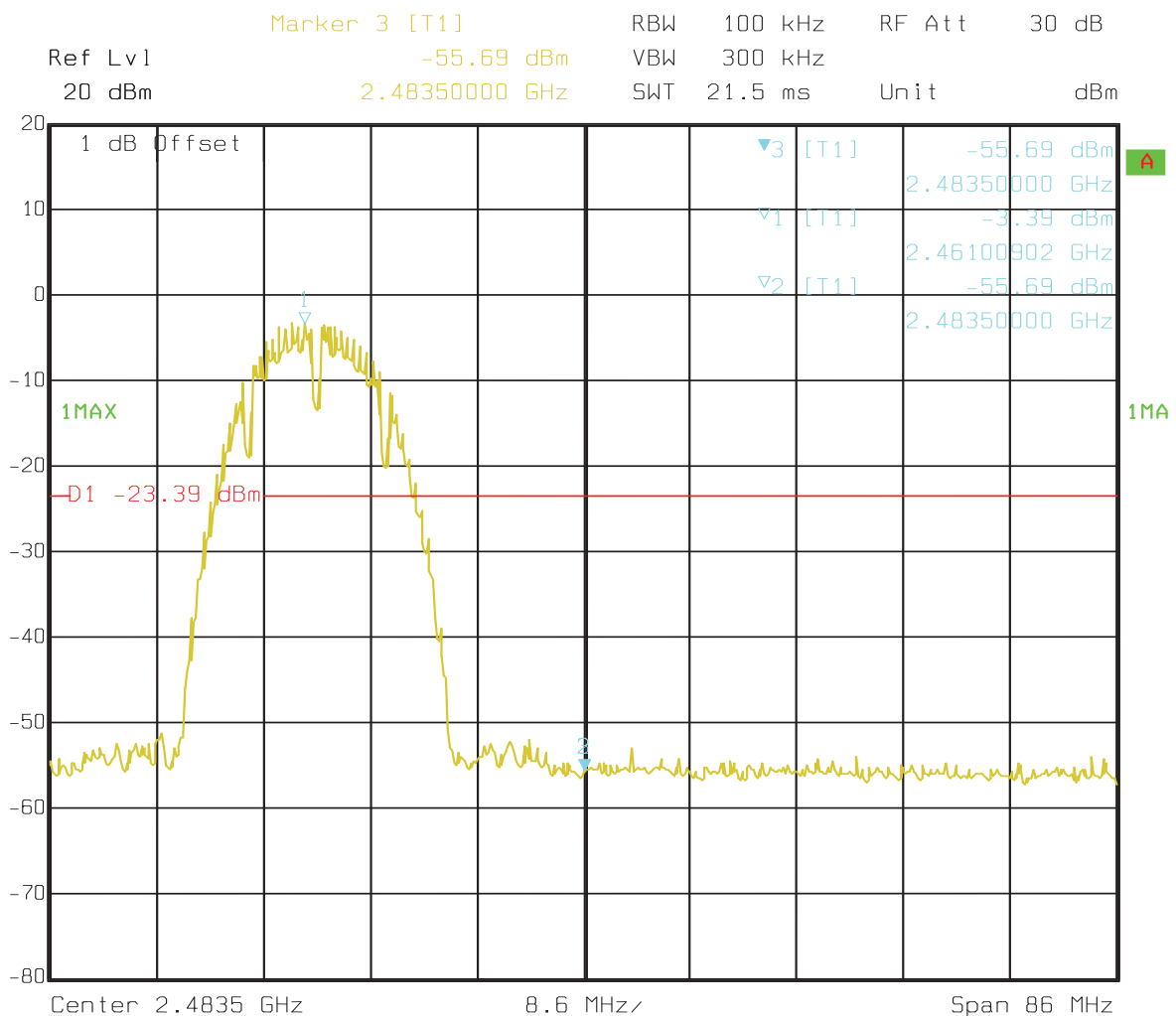


CH11 at 1Mbps

#### 10.4 Band-edge and Restricted band Measurement

|              |                      |       |               |                    |
|--------------|----------------------|-------|---------------|--------------------|
| EUT          | Case Remote          |       | Model         | CR11, CR110, CR119 |
| Mode         | Keeping Transmitting |       | Input Voltage | AC120V             |
| Temperature  | 24 deg. C,           |       | Humidity      | 56% RH             |
| Test Result: | Pass                 |       | Detector      | PK                 |
| 2483.5       | PK (dBμV/m)          | 42.89 | Limit         | 74(dBμV/m)         |
|              | AV (dBμV/m)          | --    |               | 54(dBμV/m)         |

**Test Figure:**



Note: The Max. FS in Restrict Band are measured in conventional method.

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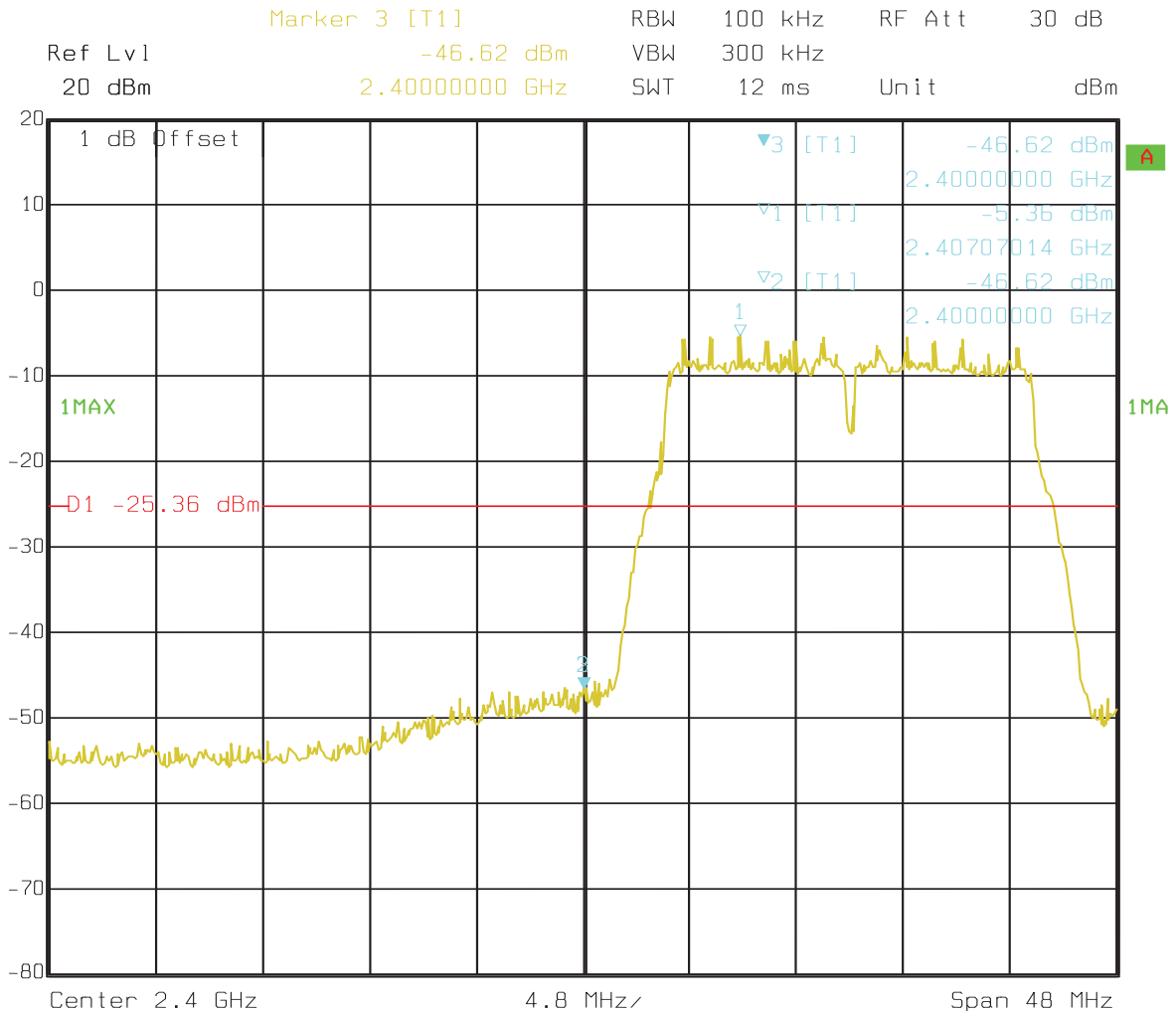
For 802.11g mode

CH01 at 6Mbps

#### 10.4 Band-edge and Restricted band Measurement

|              |                      |       |               |                    |
|--------------|----------------------|-------|---------------|--------------------|
| EUT          | Case Remote          |       | Model         | CR11, CR110, CR119 |
| Mode         | Keeping Transmitting |       | Input Voltage | AC120V             |
| Temperature  | 24 deg. C,           |       | Humidity      | 56% RH             |
| Test Result: | Pass                 |       | Detector      | PK                 |
| 2400         | PK (dBμV/m)          | 48.82 | Limit         | 74(dBμV/m)         |
|              | AV (dBμV/m)          | --    |               | 54(dBμV/m)         |
| 2390         | PK (dBμV/m)          | 38.79 | Limit         | 74(dBμV/m)         |
|              | AV (dBμV/m)          | --    |               | 54(dBμV/m)         |

Test Figure:



Note: The Max. FS in Restrict Band are measured in conventional method.

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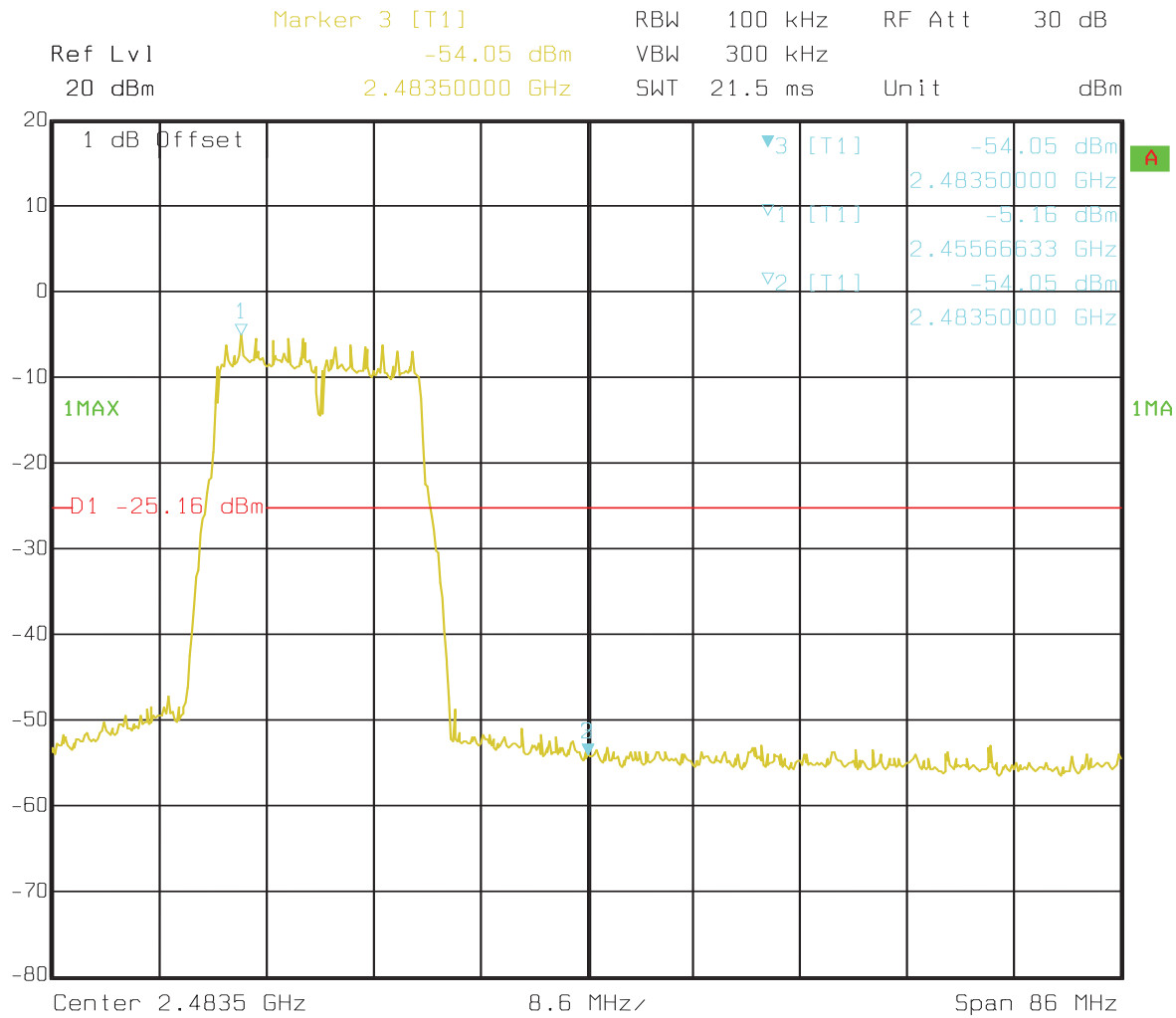


CH11 at 6Mbps

10.4 Band-edge and Restricted band Measurement

|              |                      |       |               |                    |  |
|--------------|----------------------|-------|---------------|--------------------|--|
| EUT          | Case Remote          |       | Model         | CR11, CR110, CR119 |  |
| Mode         | Keeping Transmitting |       | Input Voltage | AC120V             |  |
| Temperature  | 24 deg. C,           |       | Humidity      | 56% RH             |  |
| Test Result: | Pass                 |       | Detector      | PK                 |  |
| 2483.5       | PK (dBμV/m)          | 45.12 | Limit         | 74(dBμV/m)         |  |
|              | AV (dBμV/m)          | --    |               | 54(dBμV/m)         |  |

Test Figure:



Note: The Max. FS in Restrict Band are measured in conventional method.

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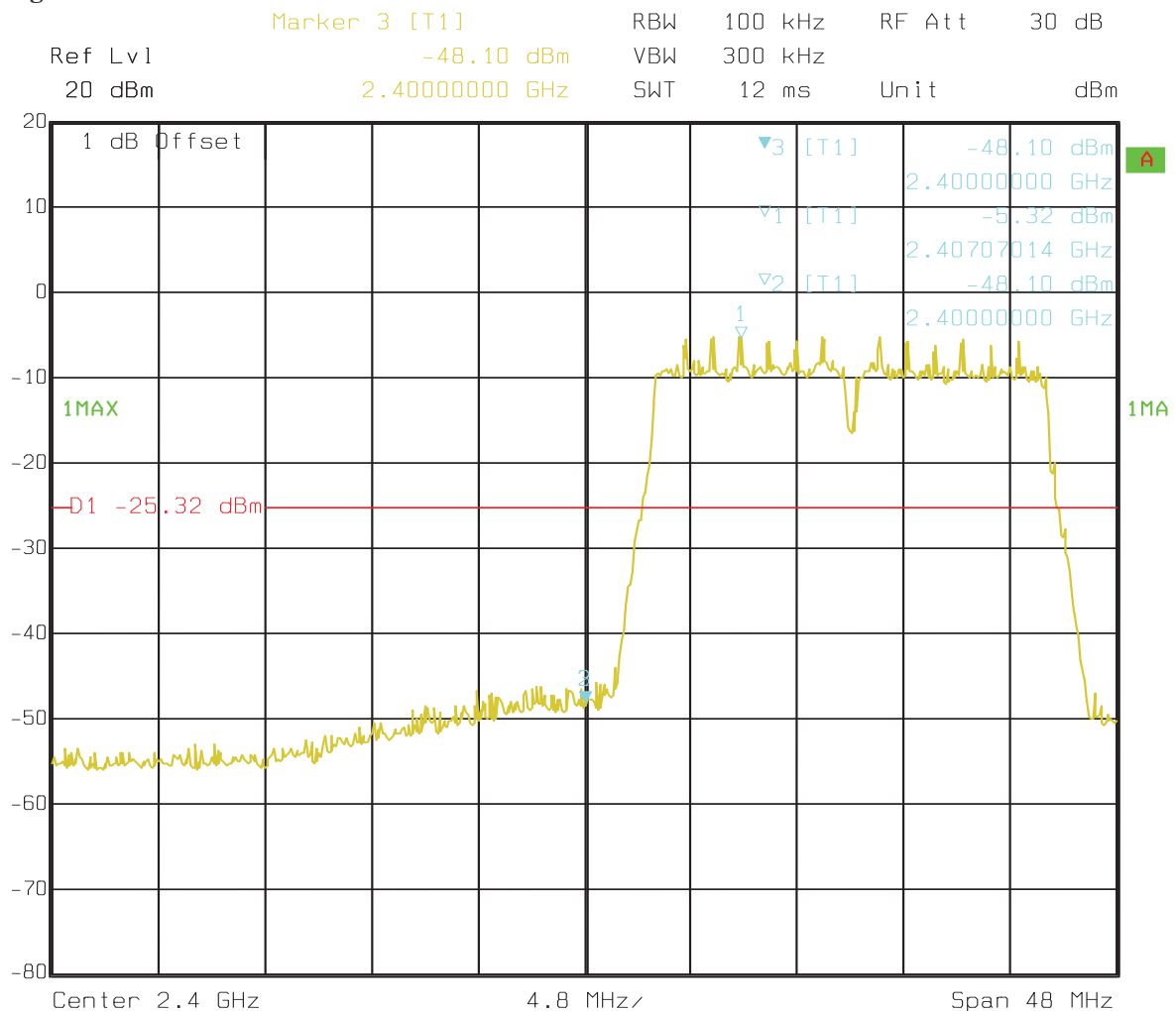
For 802.11n (HT20) mode

CH01 at 6.5Mbps

**10.4 Band-edge and Restricted band Measurement**

|              |                      |       |               |                    |
|--------------|----------------------|-------|---------------|--------------------|
| EUT          | Case Remote          |       | Model         | CR11, CR110, CR119 |
| Mode         | Keeping Transmitting |       | Input Voltage | AC120V             |
| Temperature  | 24 deg. C,           |       | Humidity      | 56% RH             |
| Test Result: | Pass                 |       | Detector      | PK                 |
| 2400         | PK (dBμV/m)          | 49.82 | Limit         | 74(dBμV/m)         |
|              | AV (dBμV/m)          | --    |               | 54(dBμV/m)         |
| 2390         | PK (dBμV/m)          | 37.29 | Limit         | 74(dBμV/m)         |
|              | AV (dBμV/m)          | --    |               | 54(dBμV/m)         |

**Test Figure:**



Note: The Max. FS in Restrict Band are measured in conventional method.

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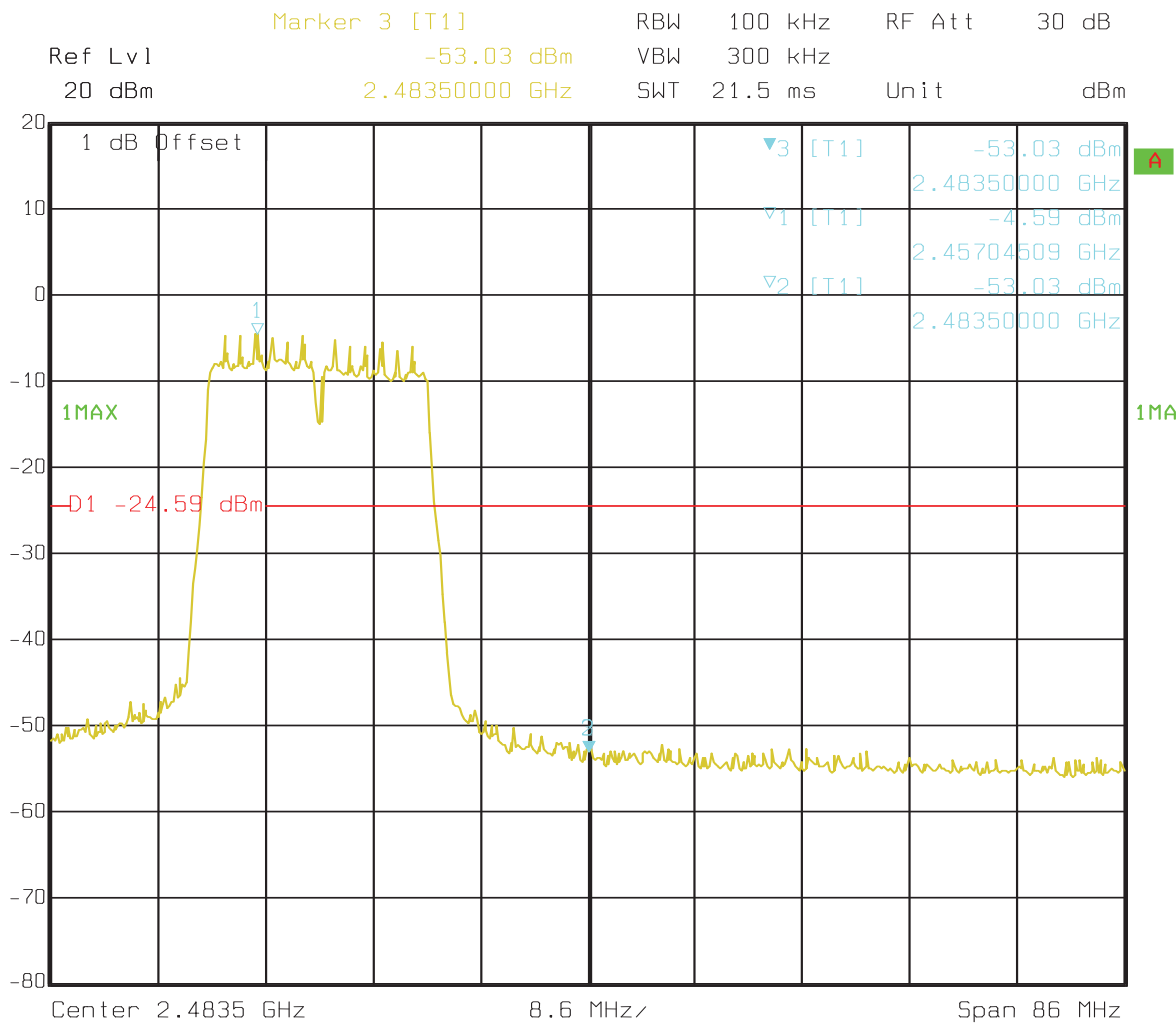


CH11 at 6.5Mbps

10.4 Band-edge and Restricted band Measurement

|              |                      |       |               |                    |
|--------------|----------------------|-------|---------------|--------------------|
| EUT          | Case Remote          |       | Model         | CR11, CR110, CR119 |
| Mode         | Keeping Transmitting |       | Input Voltage | AC120V             |
| Temperature  | 24 deg. C,           |       | Humidity      | 56% RH             |
| Test Result: | Pass                 |       | Detector      | PK                 |
| 2483.5       | PK (dBμV/m)          | 46.11 | Limit         | 74(dBμV/m)         |
|              | AV (dBμV/m)          | --    |               | 54(dBμV/m)         |

Test Figure:



Note: The Max. FS in Restrict Band are measured in conventional method.

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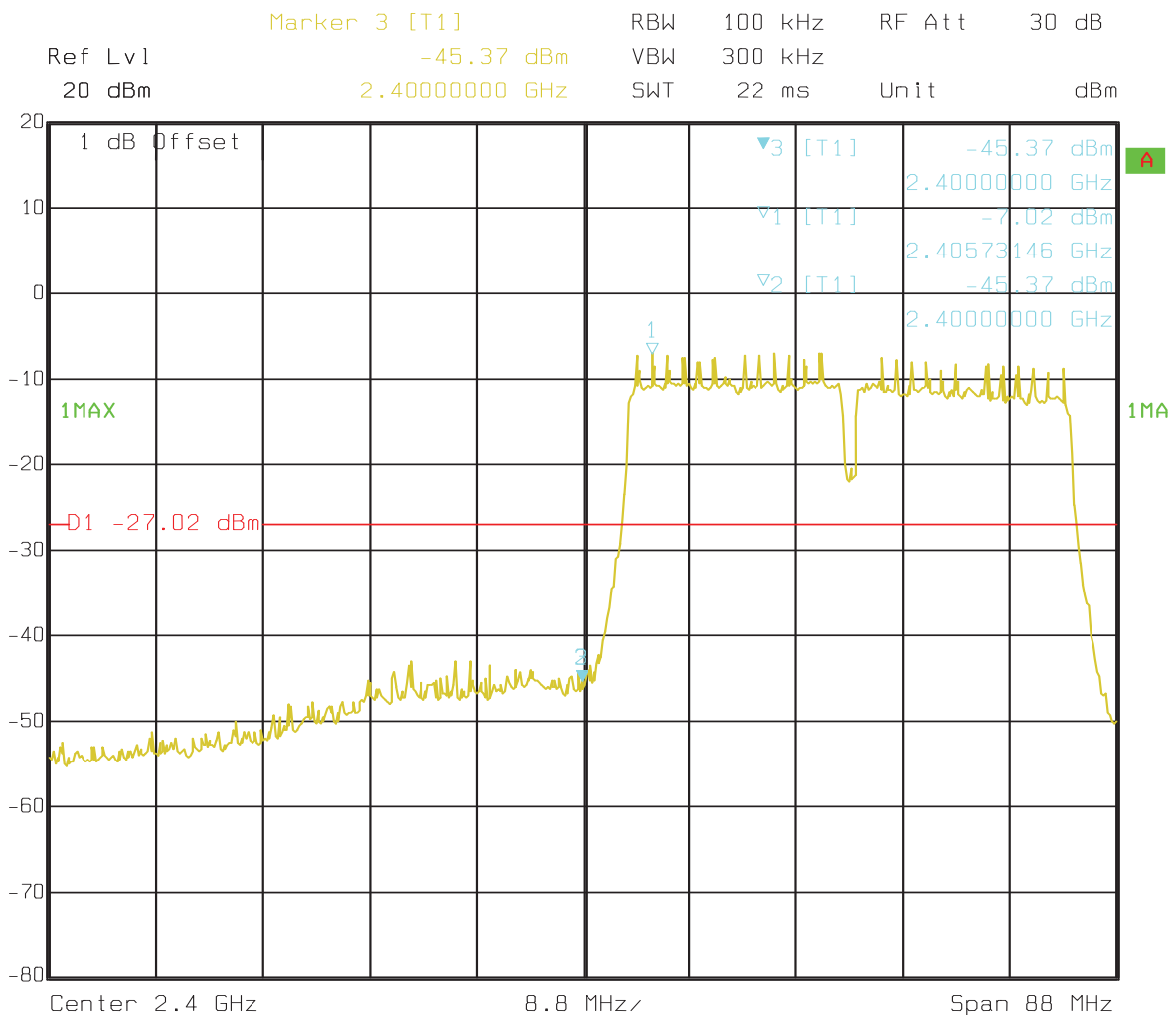
For 802.11n (HT40) mode

CH01 at 6.5Mbps

**10.4 Band-edge and Restricted band Measurement**

|              |                      |       |               |                    |
|--------------|----------------------|-------|---------------|--------------------|
| EUT          | Case Remote          |       | Model         | CR11, CR110, CR119 |
| Mode         | Keeping Transmitting |       | Input Voltage | AC120V             |
| Temperature  | 24 deg. C,           |       | Humidity      | 56% RH             |
| Test Result: | Pass                 |       | Detector      | PK                 |
| 2400         | PK (dBμV/m)          | 46.56 | Limit         | 74(dBμV/m)         |
|              | AV (dBμV/m)          | --    |               | 54(dBμV/m)         |
| 2390         | PK (dBμV/m)          | 40.67 | Limit         | 74(dBμV/m)         |
|              | AV (dBμV/m)          | --    |               | 54(dBμV/m)         |

**Test Figure:**



Note: The Max. FS in Restrict Band are measured in conventional method.

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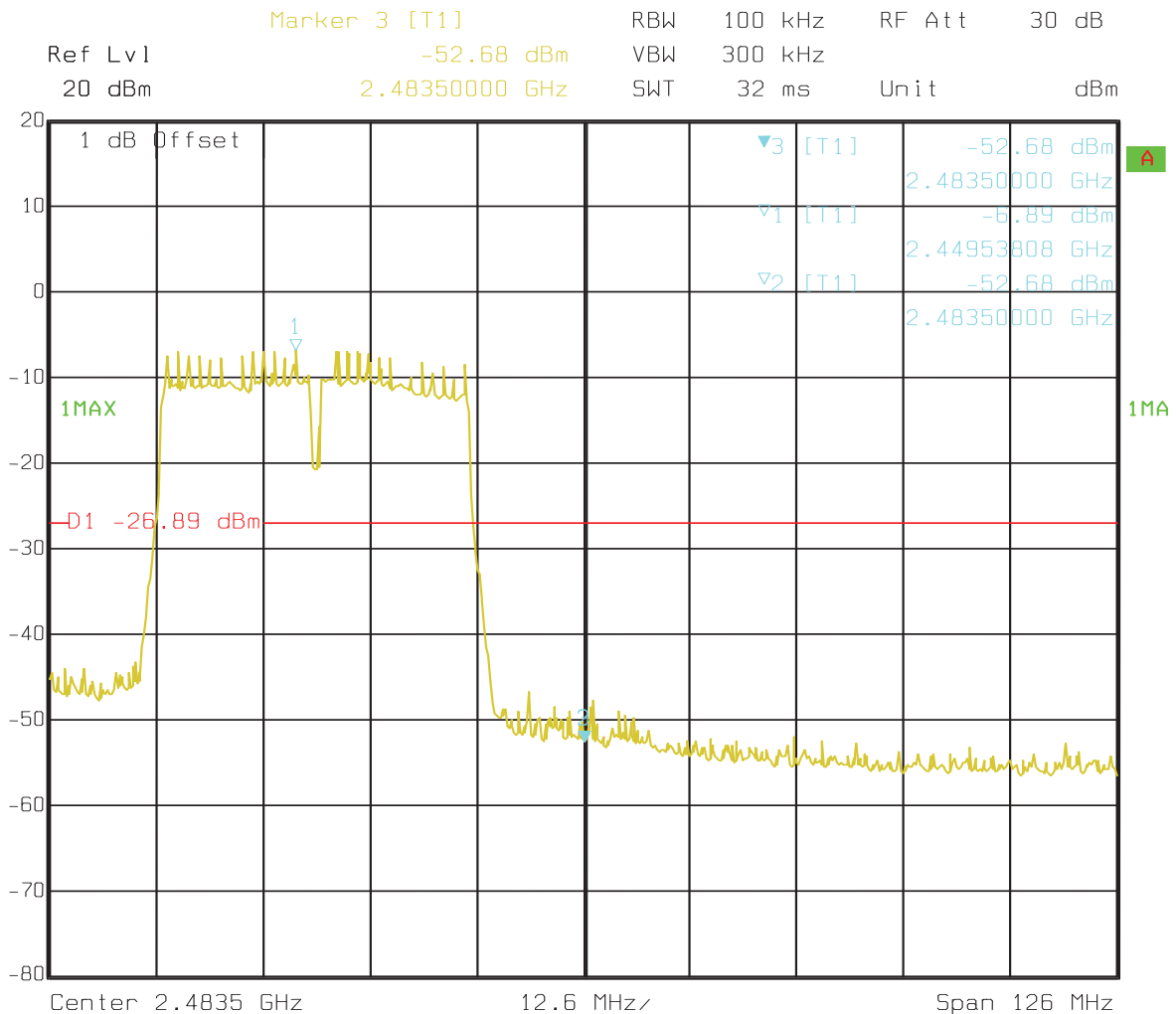
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CH7 at 6.5Mbps

#### 10.4 Band-edge and Restricted band Measurement

|              |                      |       |               |                    |
|--------------|----------------------|-------|---------------|--------------------|
| EUT          | Case Remote          |       | Model         | CR11, CR110, CR119 |
| Mode         | Keeping Transmitting |       | Input Voltage | AC120V             |
| Temperature  | 24 deg. C,           |       | Humidity      | 56% RH             |
| Test Result: | Pass                 |       | Detector      | PK                 |
| 2483.5       | PK (dBμV/m)          | 49.38 | Limit         | 74(dBμV/m)         |
|              | AV (dBμV/m)          | --    |               | 54(dBμV/m)         |

#### Test Figure:



Note: The Max. FS in Restrict Band are measured in conventional method.

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## **11.0 Antenna Requirement**

### **11.1 Standard Applicable**

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### **11.2 Antenna Connected construction**

PCB antenna used. The maximum Gain of the antennas is 1.5 dBi.

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## 12.0 FCC ID Label

### FCC ID:2ADHGCR11

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

#### Mark Location:



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### 13.0 Photo of testing

Conducted Emission Test Setup:

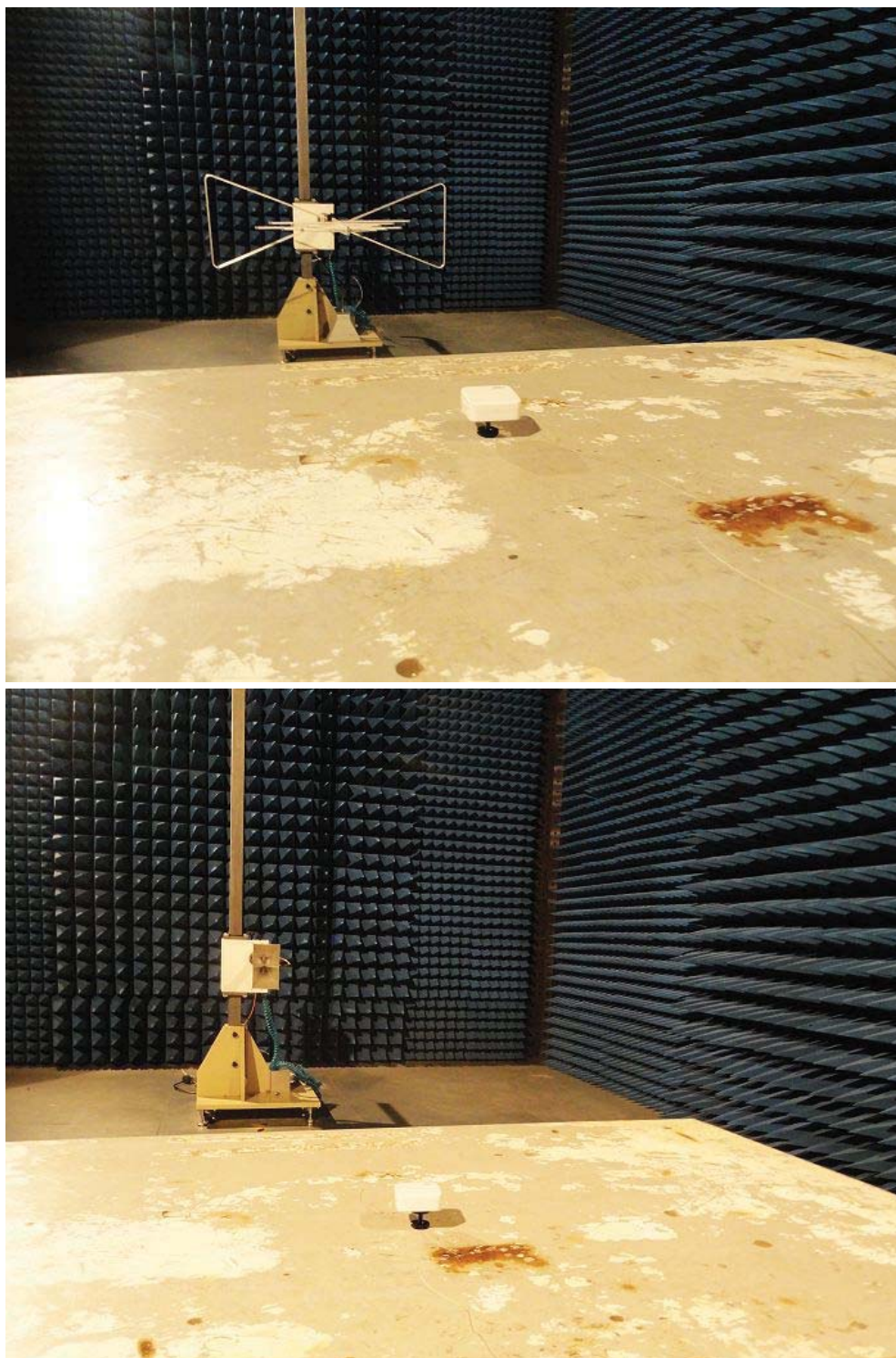


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Radiated Emission Test Setup:



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## Photographs – EUT

Outside view



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Outside view



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Outside view



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Inside view

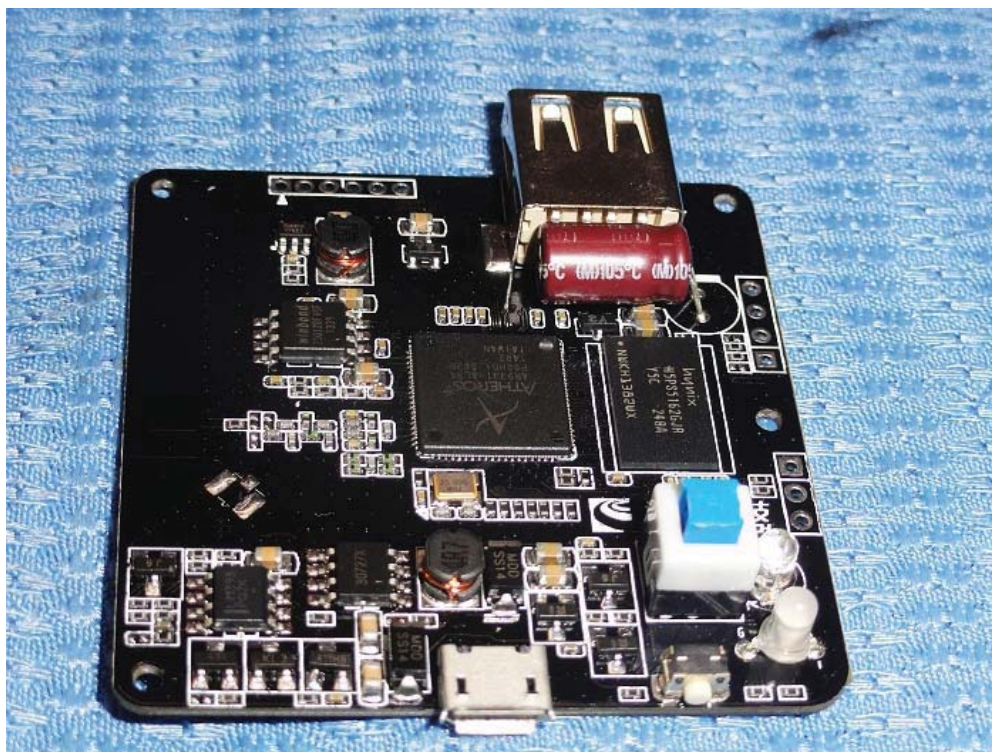
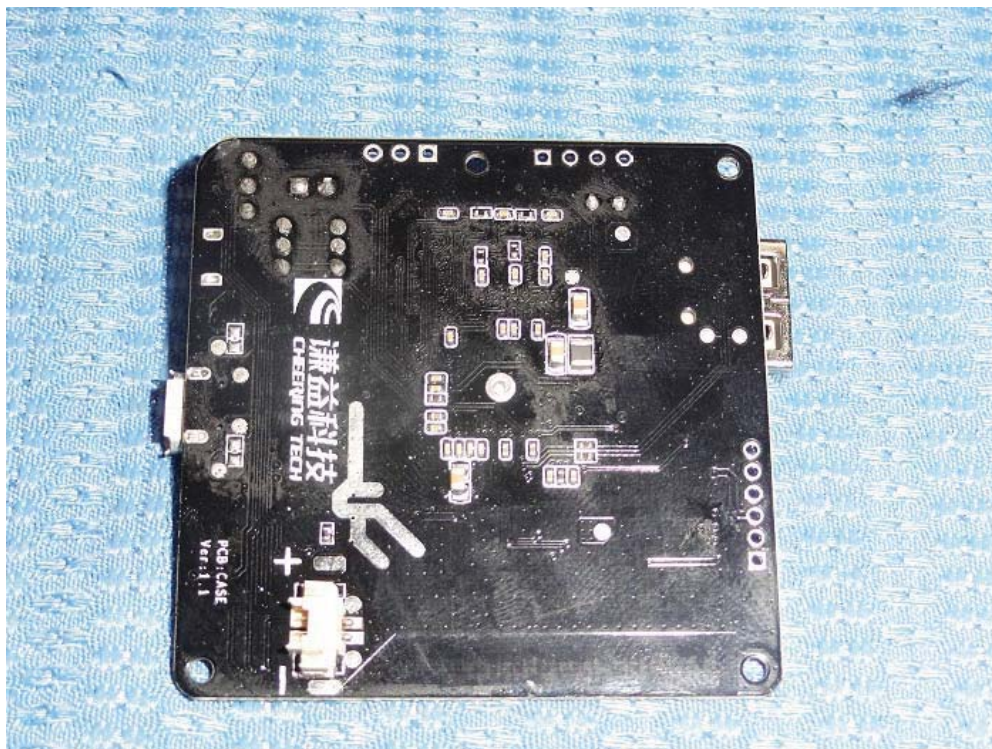


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Inside view



### -End of the report

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