



ISO/IEC17025 Accredited Lab.

Report No: FCC 1504054-01  
File reference No: 2015-06-15

Applicant: Bird Home Automation GmbH

Product: DoorBird

Model No: DoorBird 1.0

Trademark: DoorBird

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: June 15, 2015

**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 TESTING LABORATORIES**

Room 512-519, 5/F., East Tower, Building 4, Anhua Industrial Zone, Futian District, Shenzhen, Guangdong, China

Tel (755) 83448688, Fax (755) 83442996, E-Mail: info@timewaytech.com



### **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 TESTING LABORATORIES.  
Address: Room 512-519,5/F., East Tower,Building 4, Anhua Industrial Zone, Futian District,Shenzhen, Guangdong China  
Telephone: (755) 83448688  
Fax: (755) 83442996  
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: Bird Home Automation GmbH  
Address: Joachimsthaler Strasse 12,10719,Berlin,Berlin,Germany  
Telephone: --  
Fax: --

### 1.3 Description of EUT

Product: DoorBird  
Manufacturer: Bird Home Automation GmbH  
Address: Joachimsthaler Strasse 12,10719,Berlin,Berlin,Germany  
Brand Name: DoorBird  
Model Number: DoorBird 1.0  
Additional Model Number: N/A  
Type of Modulation IEEE 802.11b : DSSS (CCK, QPSK, DBPSK)  
IEEE 802.11g/n (HT20/40) : OFDM(64QAM, 16QAM, QPSK, BPSK)  
Frequency range IEEE 802.11b/g/n (HT20) : 2412-2462MHz; IEEE 802.11n (HT40) : 2422-2452MHz  
Channel Spacing 5MHz for IEEE 802.11b/g/n(HT20/40)  
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,  
Antenna: PIFA antenna with Gain 2.0dBi

### 1.4 Submitted Sample: 2 Samples

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1.5 Test Duration

2015-04-10 to 2015-06-15

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            | 2014-08-21   | 2015-08-20 |
| 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            | 2014-08-23   | 2015-08-22 |
| ESDV Test Receiver     | R&S          | ESDV       | 100008            | 2014-08-22   | 2015-08-21 |
| Impuls-Begrenzer       | R&S          | ESH3-Z2    | 100281            | 2014-08-21   | 2015-08-20 |
| System Controller      | CT           | SC100      | -                 | --           | --         |
| Printer                | EPSON        | PHOTO EX3  | CFNH234850        | --           | --         |
| Computer               | IBM          | 8434       | 1S8434KCE99BLXLO* | -            | -          |
| 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               | 2014-08-21   | 2015-08-20 |
| Horn Antenna           | R&S          | BBHA 9170  | BBHA9170265       | 2014-08-23   | 2015-08-22 |
| Horn Antenna           | R&S          | BBHA 9120D | 9120D-631         | 2014-08-23   | 2015-08-22 |
| 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          | 2014-08-23   | 2015-08-22 |
| LISN                   | AFJ          | LS16C      | 10010947251       | 2014-08-21   | 2015-08-20 |
| LISN (Three Phase)     | Schwarebeck  | NSLK 8126  | 8126453           | 2014-08-22   | 2015-08-21 |
| 9*6*6 Anechoic         | --           | --         | N/A               | 2014-08-21   | 2015-08-20 |
| 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: 11Mbps data rate (worst case) was chosen for full testing. IEEE 802.11g mode: 54Mbps 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

#### IEEE 802.11n (HT40) mode

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

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

IEEE 802.11n (HT40) 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.

**Note: EUT with 100% Duty Cycle.**

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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 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 |

**Remark:** test are according to ANSI C63.4:2014, ANSI C63.10:2009

#### 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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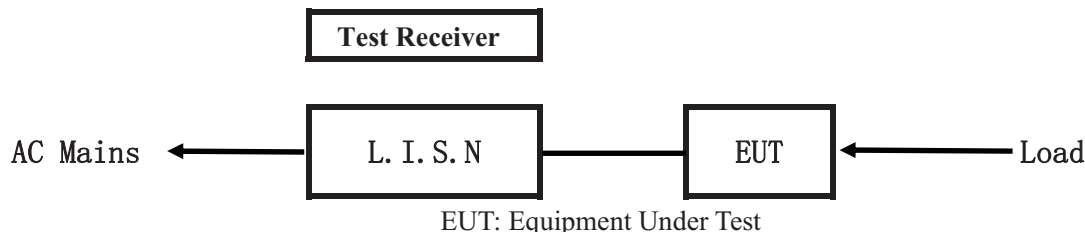
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## 5.0 Power Line Conducted Emission Test

### 5.1 Schematics of the test

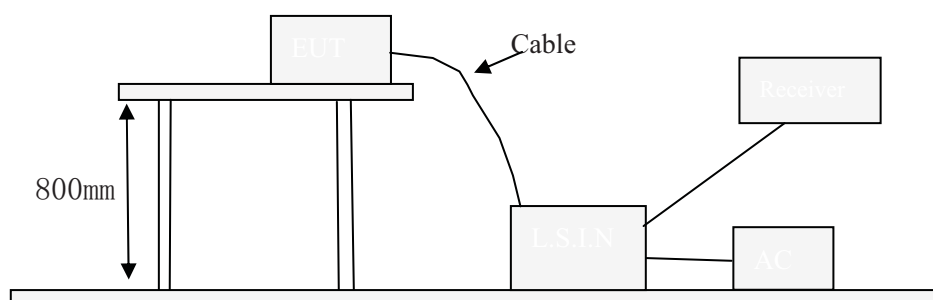


### 5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.10-2009. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.10-2009.

Test Voltage: 120V~, 60Hz

Block diagram of Test setup



### 5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.10-2013. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

#### A. EUT

| Device   | Manufacturer              | Model        | FCC ID/IC  |
|----------|---------------------------|--------------|------------|
| DoorBird | Bird Home Automation GmbH | DoorBird 1.0 | 2AD99DBRDA |

#### B. Internal Device

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

#### C. Peripherals

| Device       | Manufacturer | Model            | Rating                                                |
|--------------|--------------|------------------|-------------------------------------------------------|
| Power Supply | LEADER       | MU12-G1200100-C5 | Input: 100-240V~, 50/60Hz, 0.5A;<br>Output: DC12V, 1A |

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#### 5.4 EUT Operating Condition

Operating condition is according to ANSI C63.10 -2009.

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: Keep WIFI Transmitting**

**Equipment Level: Class B**

**Results: PASS**

Please refer to following diagram for individual



| No. | Mk. | Freq.  | Reading Level | Correct Factor | Measurement | Limit | Over   | Detector | Comment |
|-----|-----|--------|---------------|----------------|-------------|-------|--------|----------|---------|
|     |     | MHz    | dBuV          | dB             | dBuV        | dBuV  | dB     |          |         |
| 1   | *   | 0.1621 | 41.30         | 11.01          | 52.31       | 65.36 | -13.05 | QP       |         |
| 2   |     | 0.1621 | 6.80          | 11.01          | 17.81       | 55.36 | -37.55 | AVG      |         |
| 3   |     | 0.3710 | 30.00         | 11.23          | 41.23       | 58.48 | -17.25 | QP       |         |
| 4   |     | 0.3710 | 2.60          | 11.23          | 13.83       | 48.48 | -34.65 | AVG      |         |
| 5   |     | 1.1763 | 22.90         | 11.97          | 34.87       | 56.00 | -21.13 | QP       |         |
| 6   |     | 1.1763 | 0.30          | 11.97          | 12.27       | 46.00 | -33.73 | AVG      |         |
| 7   |     | 2.4434 | 20.50         | 12.48          | 32.98       | 56.00 | -23.02 | QP       |         |
| 8   |     | 2.4434 | -5.50         | 12.48          | 6.98        | 46.00 | -39.02 | AVG      |         |

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

**EUT Operating Environment**

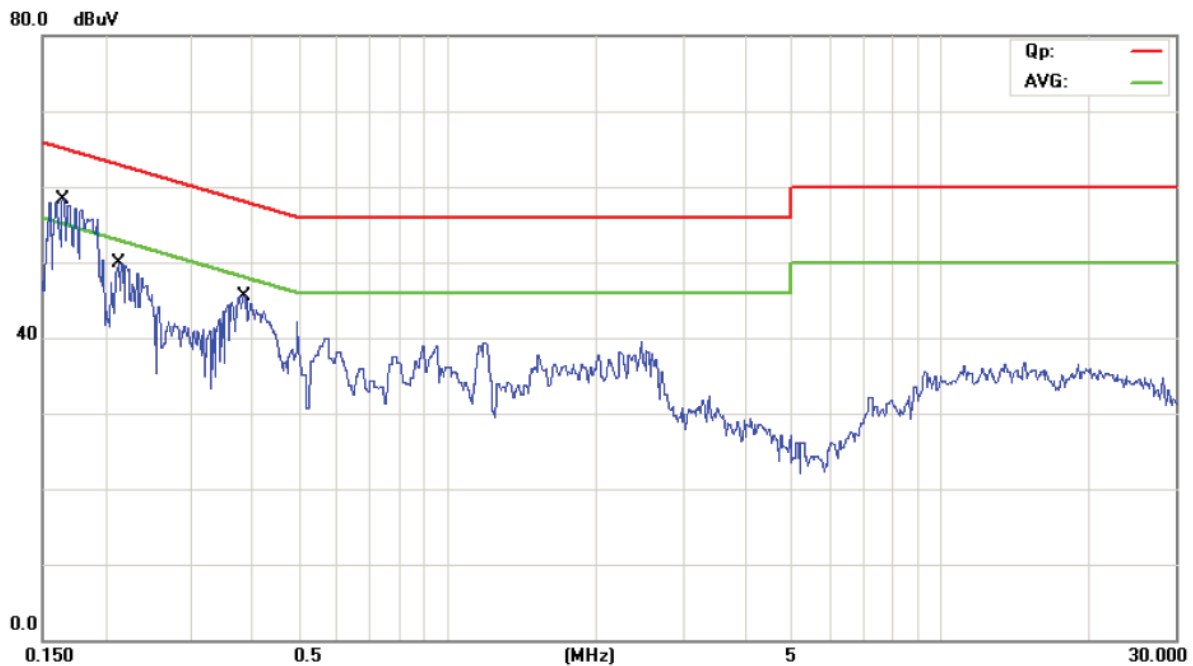
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

**EUT set Condition: Keep WIFI Transmitting**

**Equipment Level: Class B**

**Results: Pass**

Please refer to following diagram for individual



| No. | Mk. | Freq.  | Reading Level | Correct Factor | Measurement | Limit | Over   | Detector | Comment |
|-----|-----|--------|---------------|----------------|-------------|-------|--------|----------|---------|
|     |     | MHz    | dBuV          | dB             | dBuV        | dBuV  | dB     |          |         |
| 1   | *   | 0.1652 | 43.40         | 11.02          | 54.42       | 65.20 | -10.78 | QP       |         |
| 2   |     | 0.1652 | 11.50         | 11.02          | 22.52       | 55.20 | -32.68 | AVG      |         |
| 3   |     | 0.2138 | 32.80         | 11.07          | 43.87       | 63.06 | -19.19 | QP       |         |
| 4   |     | 0.2138 | -4.70         | 11.07          | 6.37        | 53.06 | -46.69 | AVG      |         |
| 5   |     | 0.3805 | 30.60         | 11.24          | 41.84       | 58.27 | -16.43 | QP       |         |
| 6   |     | 0.3805 | 2.90          | 11.24          | 14.14       | 48.27 | -34.13 | AVG      |         |

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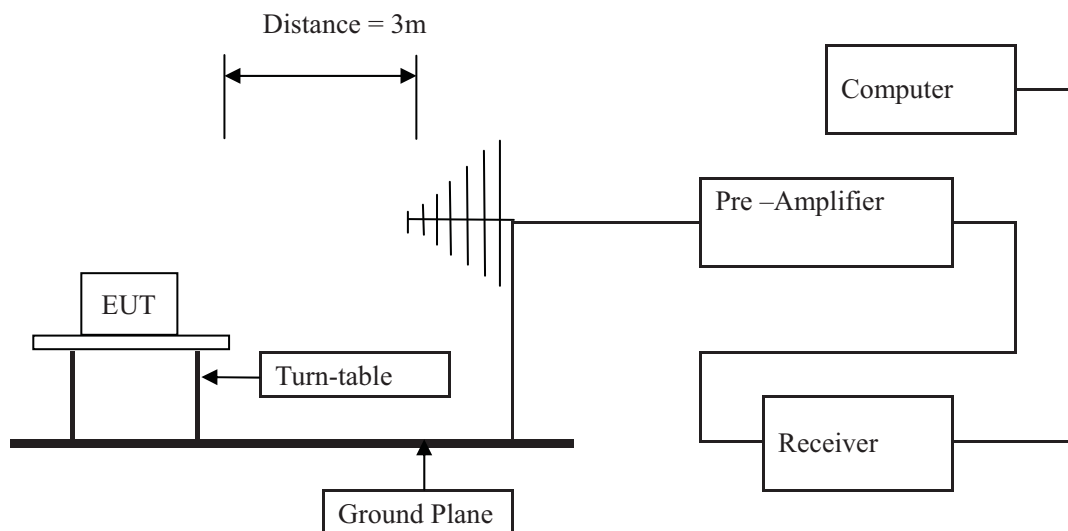
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## 6 Radiated Emission Test

### 6.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.10 –2009. 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 C63.10-2009.
- (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=1MHz VBW=3MHz 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

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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: **Keep Transmitting**

**Results: Pass**

| Frequency (MHz) | Level@3m (dB $\mu$ V/m) | Antenna Polarity | Limit@3m (dB $\mu$ V/m) |
|-----------------|-------------------------|------------------|-------------------------|
| 264.000         | 39.65                   | H                | 46.00                   |
| 151.480         | 34.82                   | H                | 43.50                   |
| 168.000         | 35.98                   | H                | 43.50                   |
| 202.960         | 35.25                   | H                | 43.50                   |
|                 |                         |                  |                         |
| 282.280         | 36.41                   | V                | 46.00                   |
| 156.520         | 35.97                   | V                | 43.50                   |
| 167.000         | 37.49                   | V                | 43.50                   |
| 34.760          | 37.63                   | V                | 40.00                   |

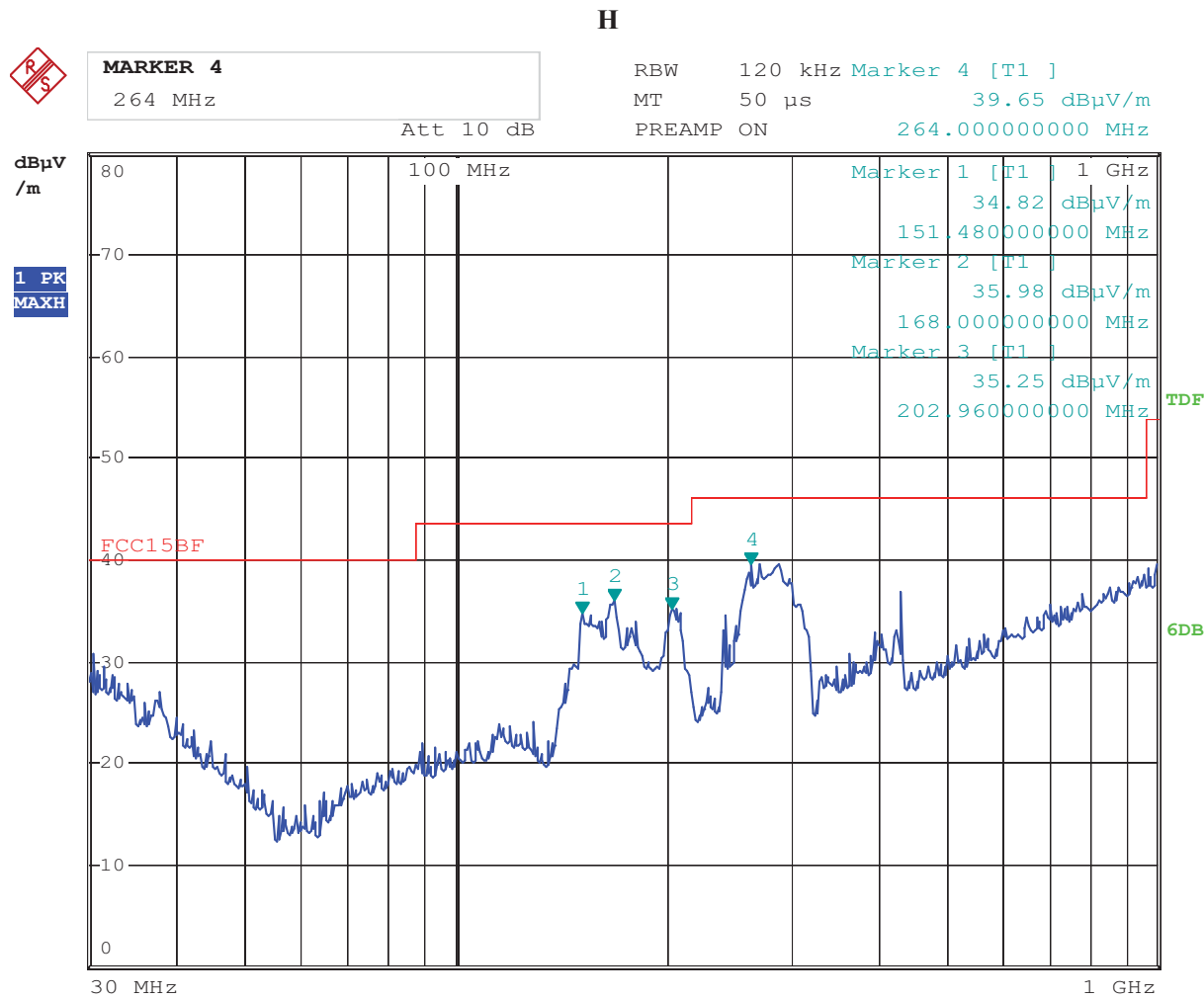
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Test Figure:



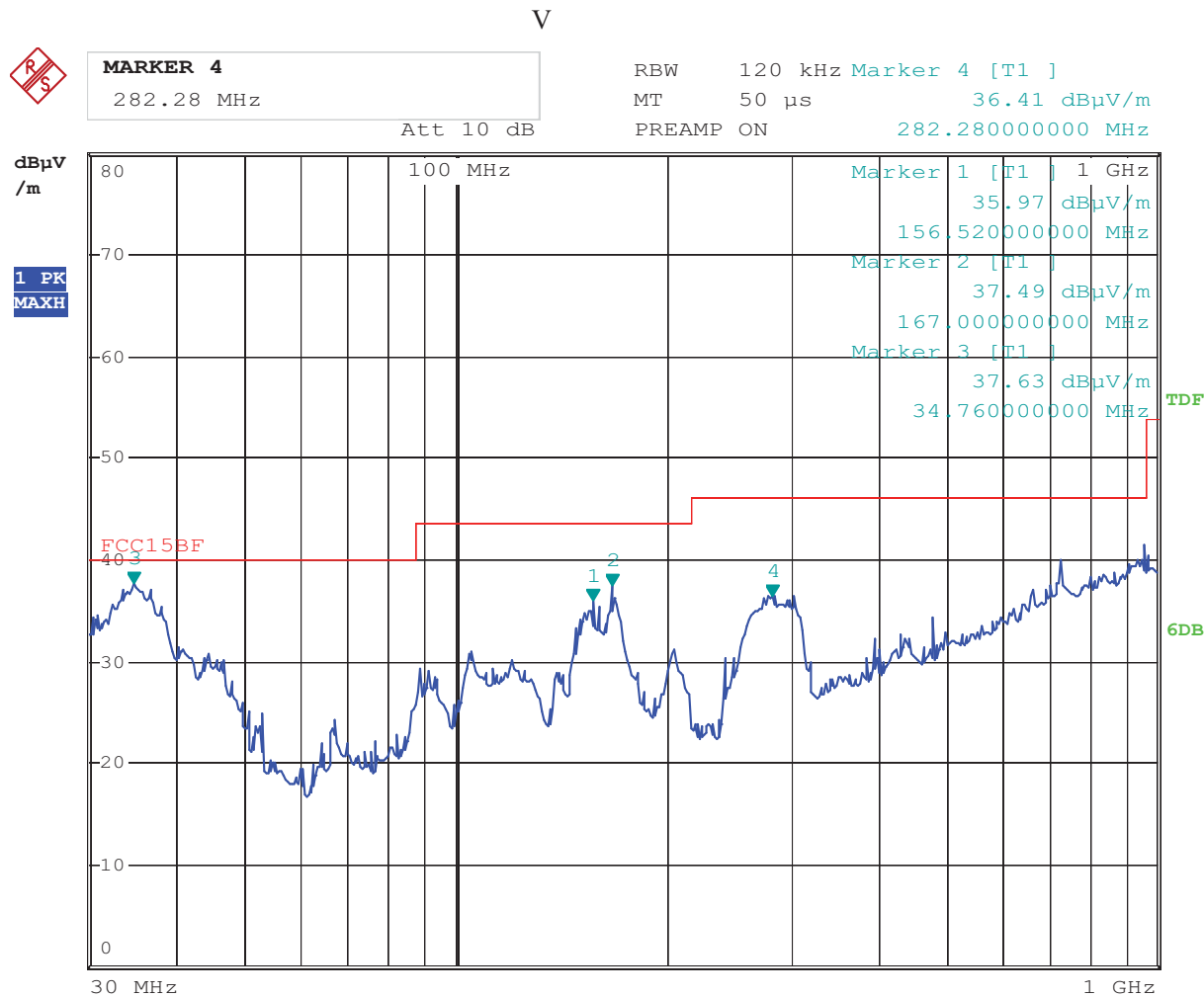
Date: 21.APR.2015 09:33:08

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Test Figure:



Date: 21.APR.2015 09:28:37

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**Operation Mode: Transmitting under CH01 for 11g at 54Mbps**

| Frequency (MHz) | Level@3m (dB $\mu$ V/m) | Antenna Polarity | Limit@3m (dB $\mu$ V/m) |
|-----------------|-------------------------|------------------|-------------------------|
| 4824.00         | 51.28 (PK)              | H                | 74(Peak)/ 54(AV)        |
| 4824.00         | 51.32 (PK)              | V                | 74(Peak)/ 54(AV)        |
| 7236.00         | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 9648.00         | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 12060           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 14472           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 16884           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 19296           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 21708           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 24120           | --                      | H/V              | 74(Peak)/ 54(AV)        |

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit  
 2. Remark "---" means that the emissions level is too low to be measured  
 3. For 802.11g mode 54Mbps

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**Operation Mode: Transmitting under CH06 for 11g at 54Mbps**

| Frequency (MHz) | Level@3m (dB $\mu$ V/m) | Antenna Polarity | Limit@3m (dB $\mu$ V/m) |
|-----------------|-------------------------|------------------|-------------------------|
| 4874.00         | 52.65 (PK)              | V                | 74(Peak)/ 54(AV)        |
| 4874.00         | 52.20 (PK)              | H                | 74(Peak)/ 54(AV)        |
| 7311.00         | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 9748.00         | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 12185           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 14622           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 17059           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 19496           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 21933           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 24370           | --                      | H/V              | 74(Peak)/ 54(AV)        |

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit  
2. Remark "---" means that the emissions level is too low to be measured  
3. For 802.11g mode 54 Mbps

**Operation Mode: Transmitting under CH11 for 11g at 54Mbps**

| Frequency (MHz) | Level@3m (dB $\mu$ V/m) | Antenna Polarity | Limit@3m (dB $\mu$ V/m) |
|-----------------|-------------------------|------------------|-------------------------|
| 4924            | 51.08 (PK)              | H                | 74(Peak)/ 54(AV)        |
| 4924            | 51.14 (PK)              | V                | 74(Peak)/ 54(AV)        |
| 7368            | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 9848            | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 12310           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 14772           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 17234           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 19696           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 22158           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 24620           | --                      | H/V              | 74(Peak)/ 54(AV)        |

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit  
2. Remark "---" means that the emissions level is too low to be measured  
3. For 802.11g mode at 54 Mbps

The report refers only to the sample tested and does not apply to the bulk.

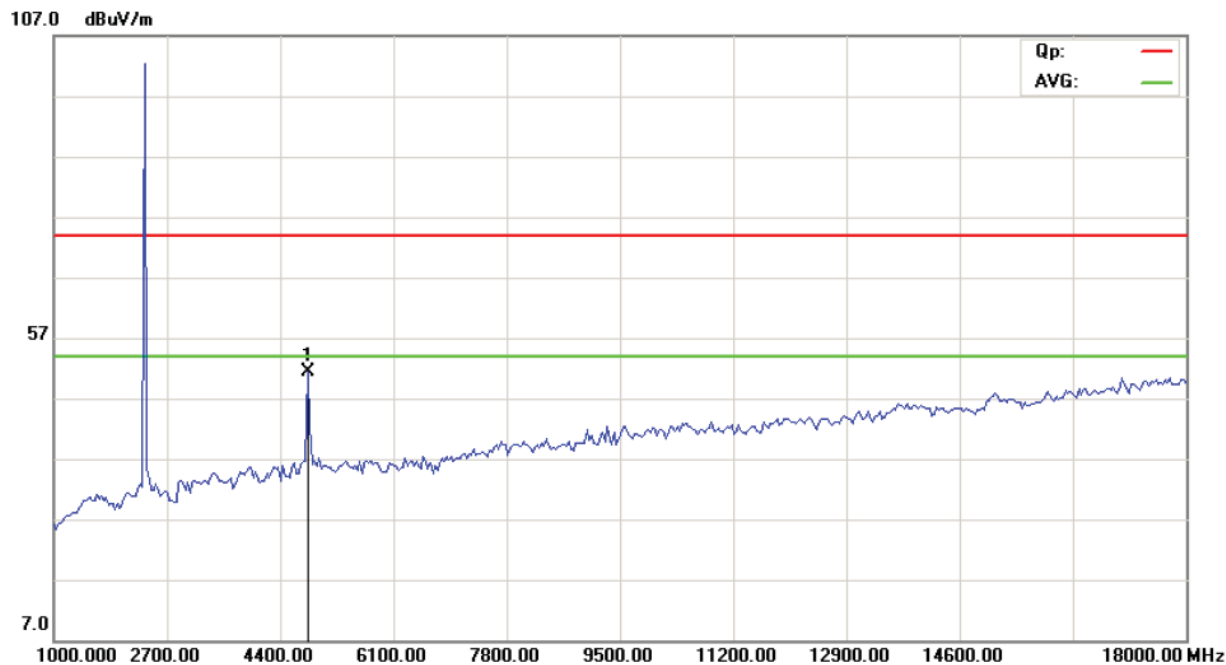
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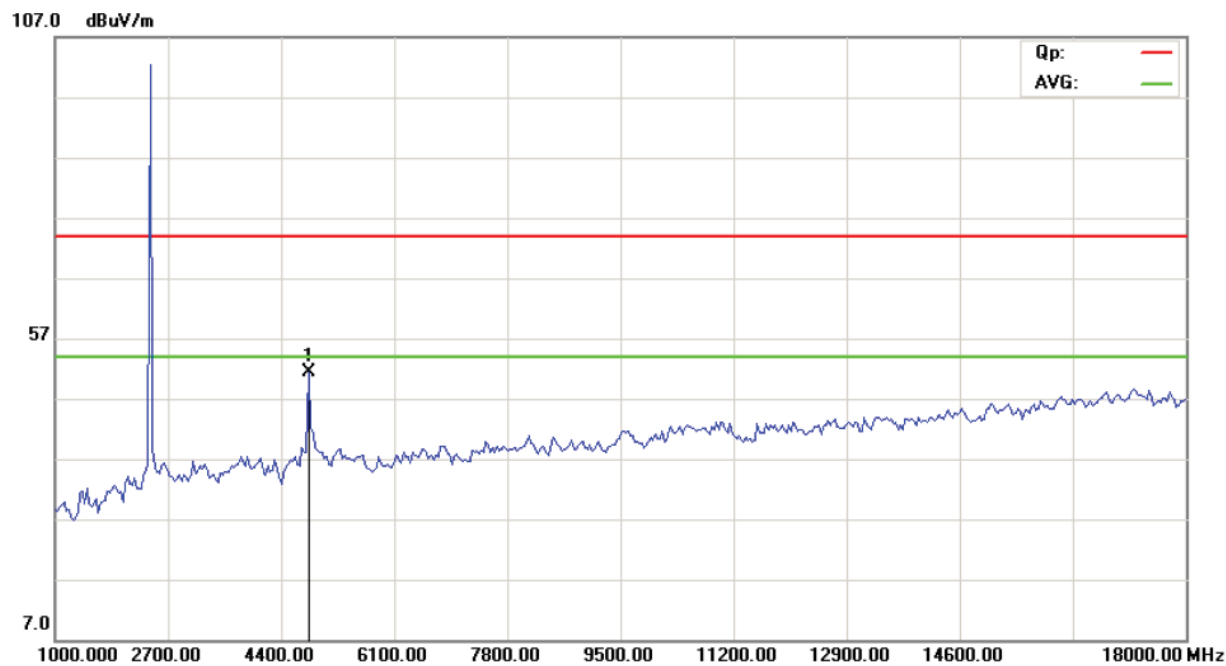


Please refer to the following test plots for details:

**CH01 for 11g at 54Mbps: Horizontal**



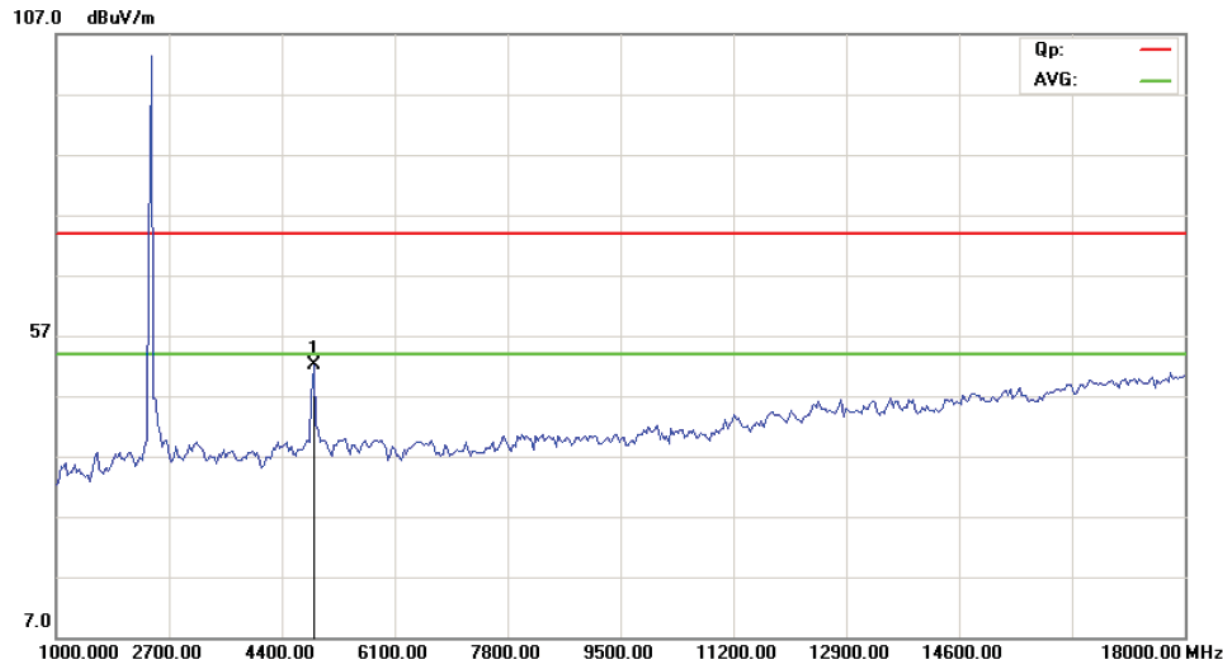
**CH01 for 11g at 54Mbps: Vertical**



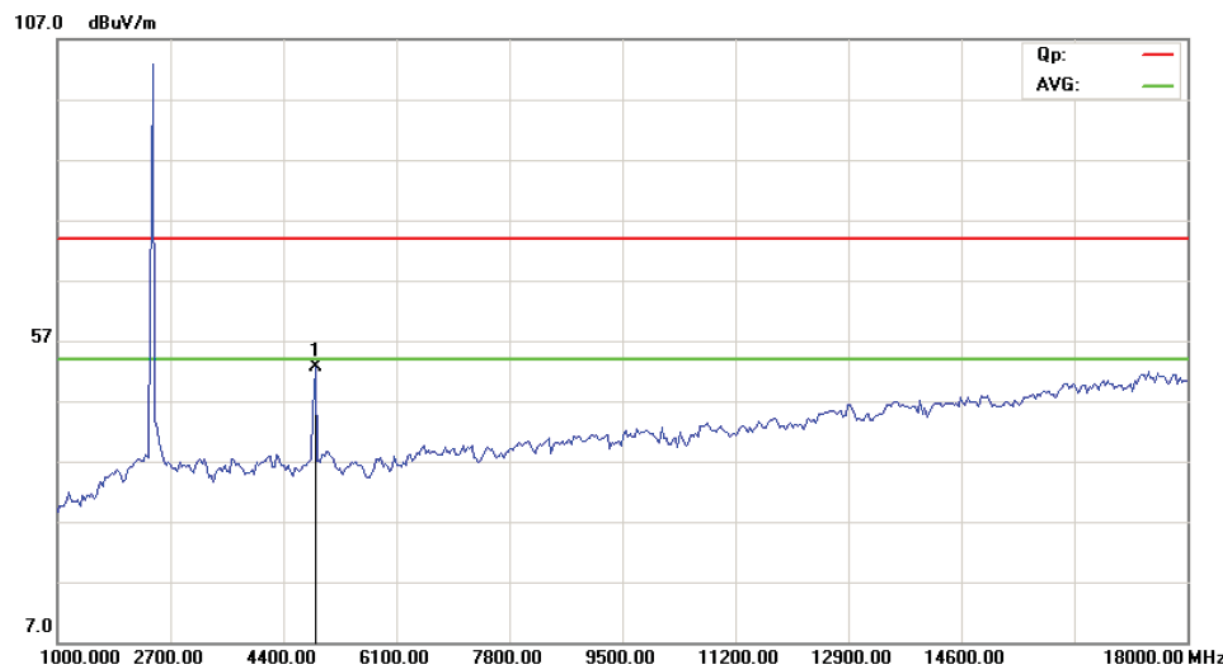
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CH06 for 11g at 54Mbps: Vertical

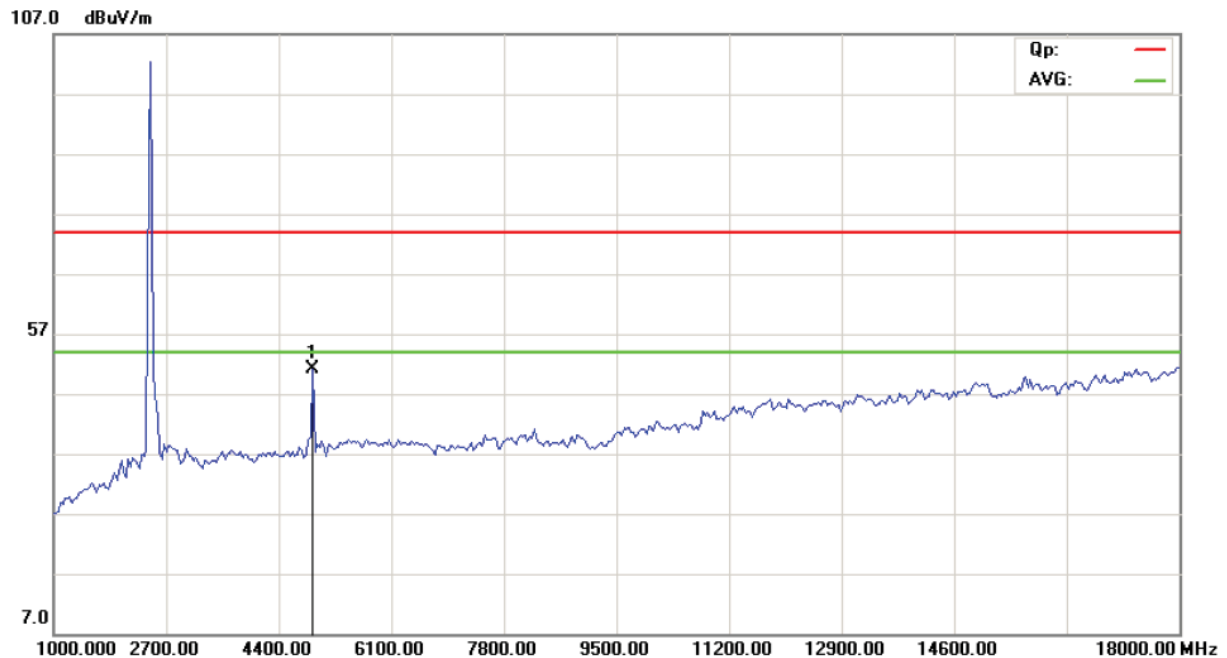


CH06 for 11g at 54Mbps: Horizontal

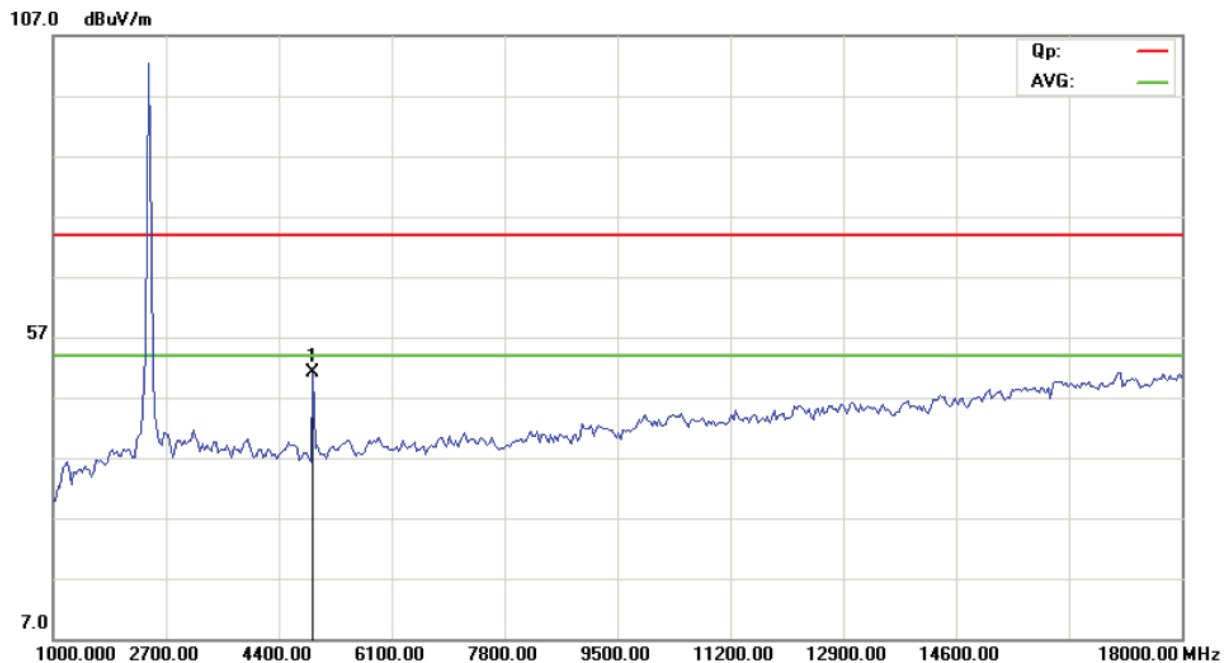


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### CH11 for 11g at 54Mbps: Vertical



### CH11 for 11g at 54Mbps: Horizontal



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.

The report refers only to the sample tested and does not apply to the bulk.

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**Operation Mode: Transmitting under CH01 for 11b at 11Mbps**

| Frequency (MHz) | Level@3m (dB $\mu$ V/m) | Antenna Polarity | Limit@3m (dB $\mu$ V/m) |
|-----------------|-------------------------|------------------|-------------------------|
| 4824.00         | 51.32 (PK)              | H                | 74(Peak)/ 54(AV)        |
| 4824.00         | 51.09 (PK)              | V                | 74(Peak)/ 54(AV)        |
| 7236.00         | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 9648.00         | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 12060           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 14472           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 16684           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 19296           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 21708           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 24120           | --                      | H/V              | 74(Peak)/ 54(AV)        |

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit  
2. Remark "---" means that the emissions level is too low to be measured  
3. For 802.11b mode 11Mbps

**Operation Mode: Transmitting under CH06 for 11b at 11Mbps**

| Frequency (MHz) | Level@3m (dB $\mu$ V/m) | Antenna Polarity | Limit@3m (dB $\mu$ V/m) |
|-----------------|-------------------------|------------------|-------------------------|
| 4874.00         | 50.51 (PK)              | H                | 74(Peak)/ 54(AV)        |
| 4874.00         | 50.58 (PK)              | V                | 74(Peak)/ 54(AV)        |
| 7311.00         | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 9748.00         | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 12185           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 14622           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 17059           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 19496           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 21933           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 24370           | --                      | H/V              | 74(Peak)/ 54(AV)        |

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit  
2. Remark "---" means that the emissions level is too low to be measured  
3. For 802.11b mode 11Mbps

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**Operation Mode: Transmitting under CH11 for 11b at 11Mbps**

| Frequency (MHz) | Level@3m (dB $\mu$ V/m) | Antenna Polarity | Limit@3m (dB $\mu$ V/m) |
|-----------------|-------------------------|------------------|-------------------------|
| 4924            | 49.79 (PK)              | H                | 74(Peak)/ 54(AV)        |
| 4924            | 49.63 (PK)              | V                | 74(Peak)/ 54(AV)        |
| 7368            | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 9848            | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 12310           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 14772           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 17234           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 19696           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 22158           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 24620           | --                      | H/V              | 74(Peak)/ 54(AV)        |

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit  
2. Remark "---" means that the emissions level is too low to be measured  
3. For 802.11b mode at 11Mbps

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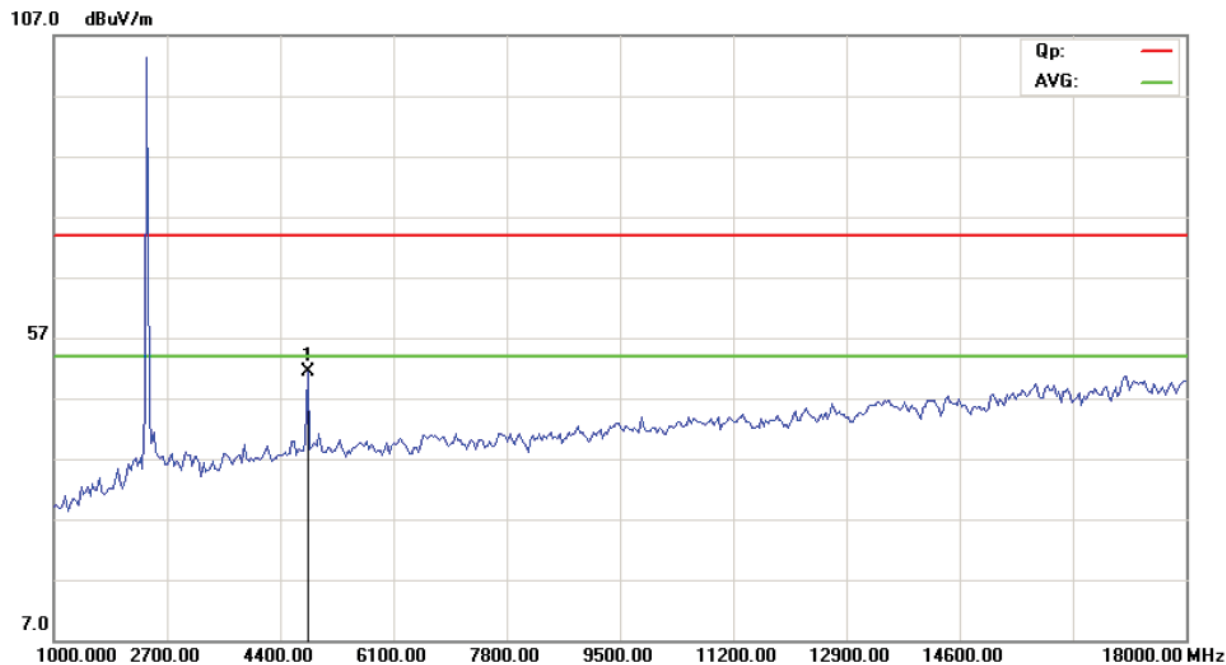
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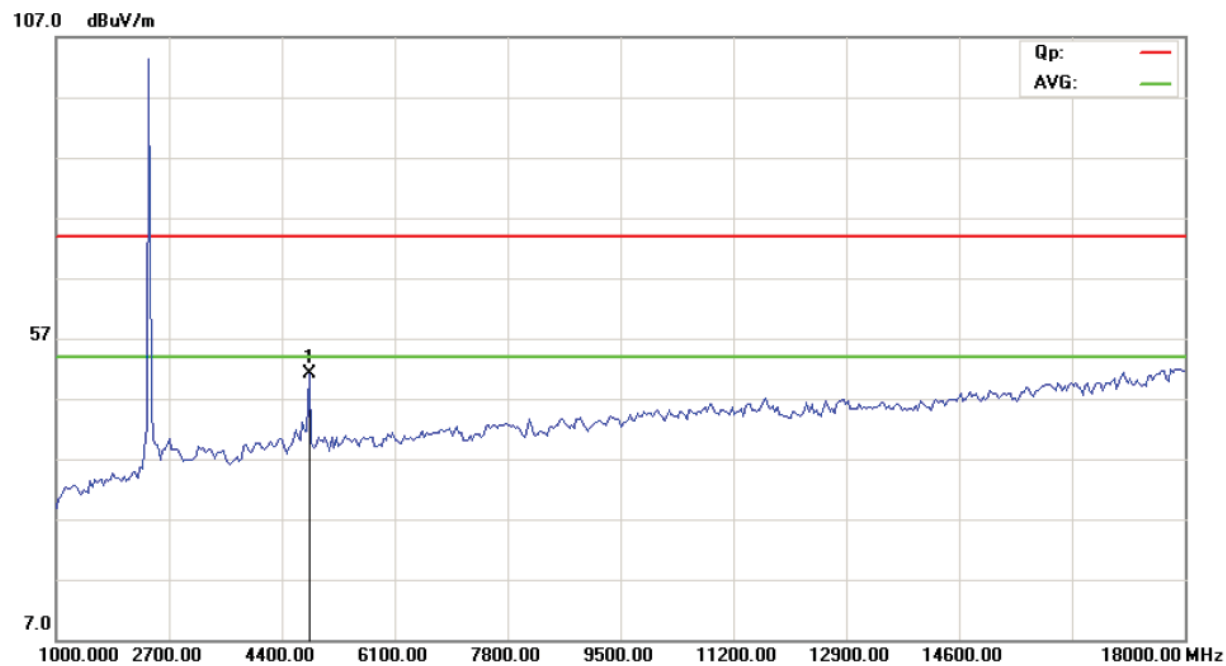


Please refer to the following test plots for details:

**CH01 for 11b at 11Mbps: Horizontal**



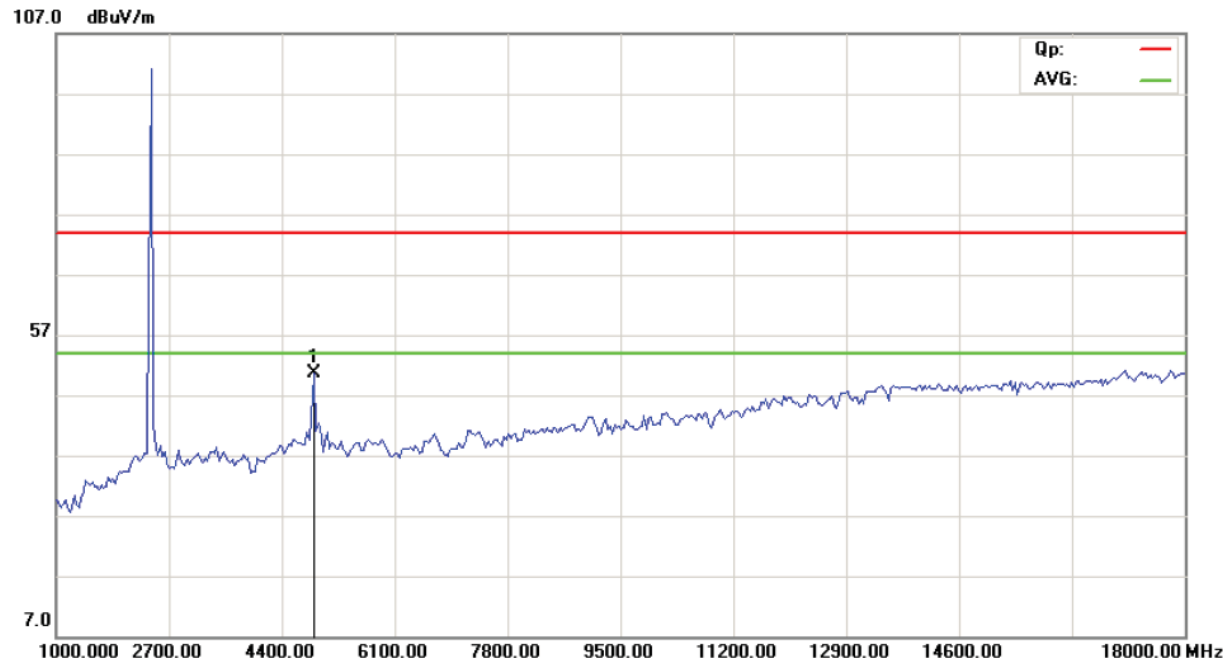
**CH01 for 11b at 11Mbps: Vertical**



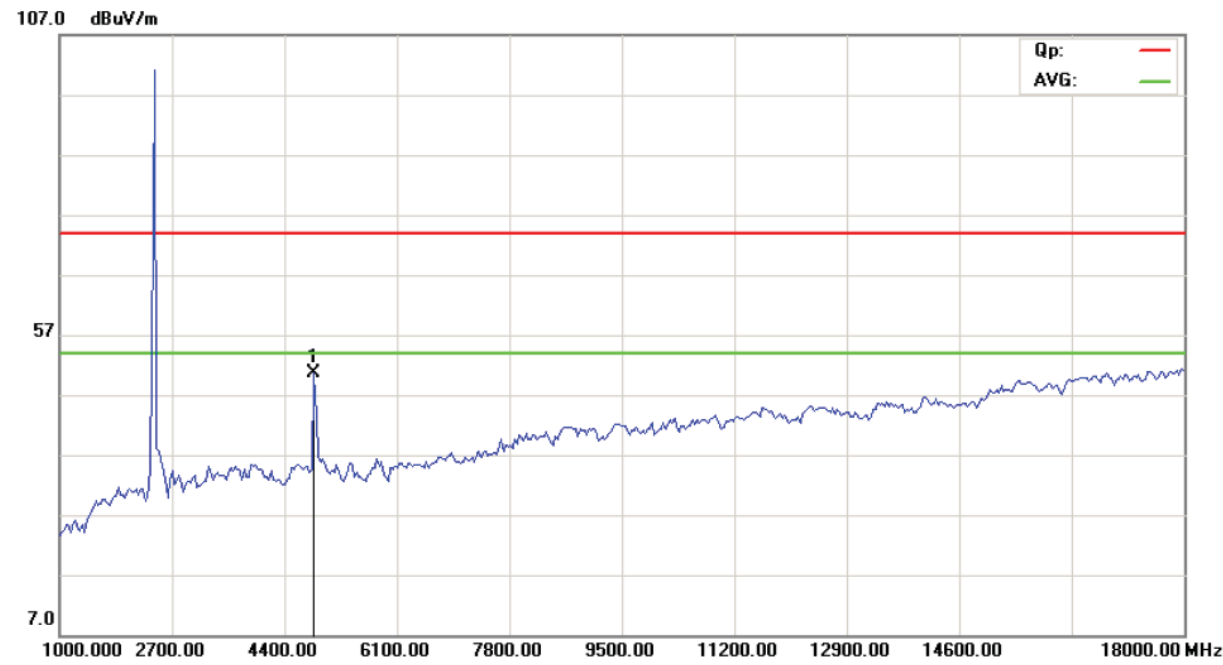
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CH06 for 11b at 11Mbps: Vertical

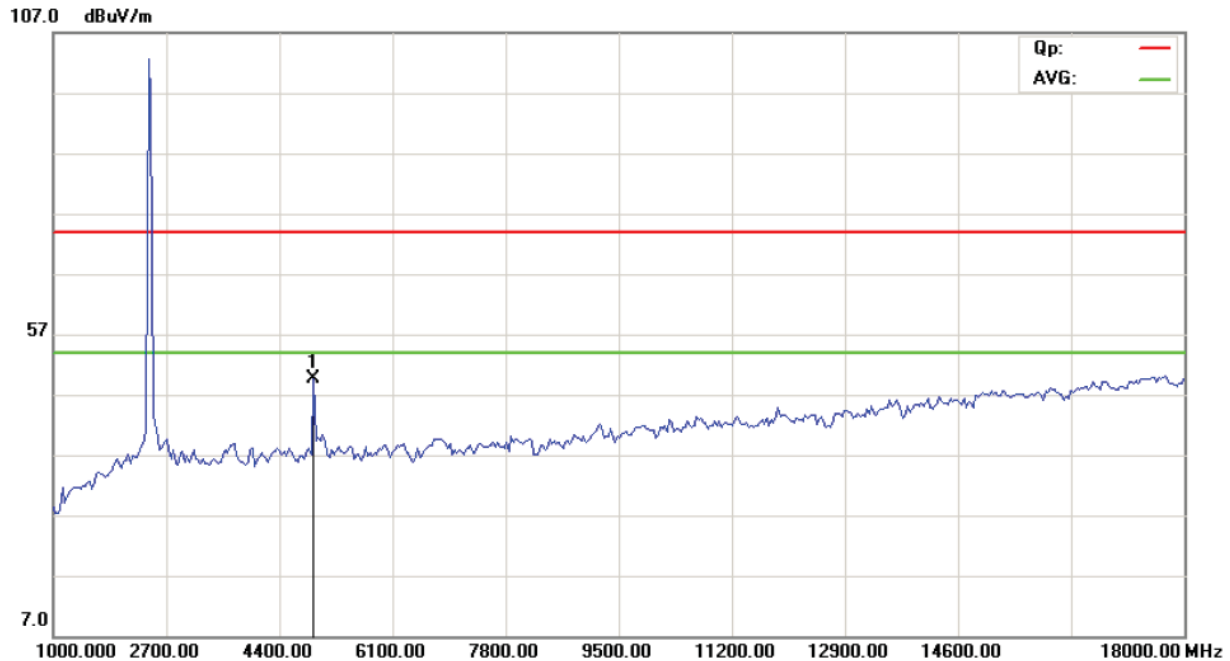


CH06 for 11b at 11Mbps: Horizontal

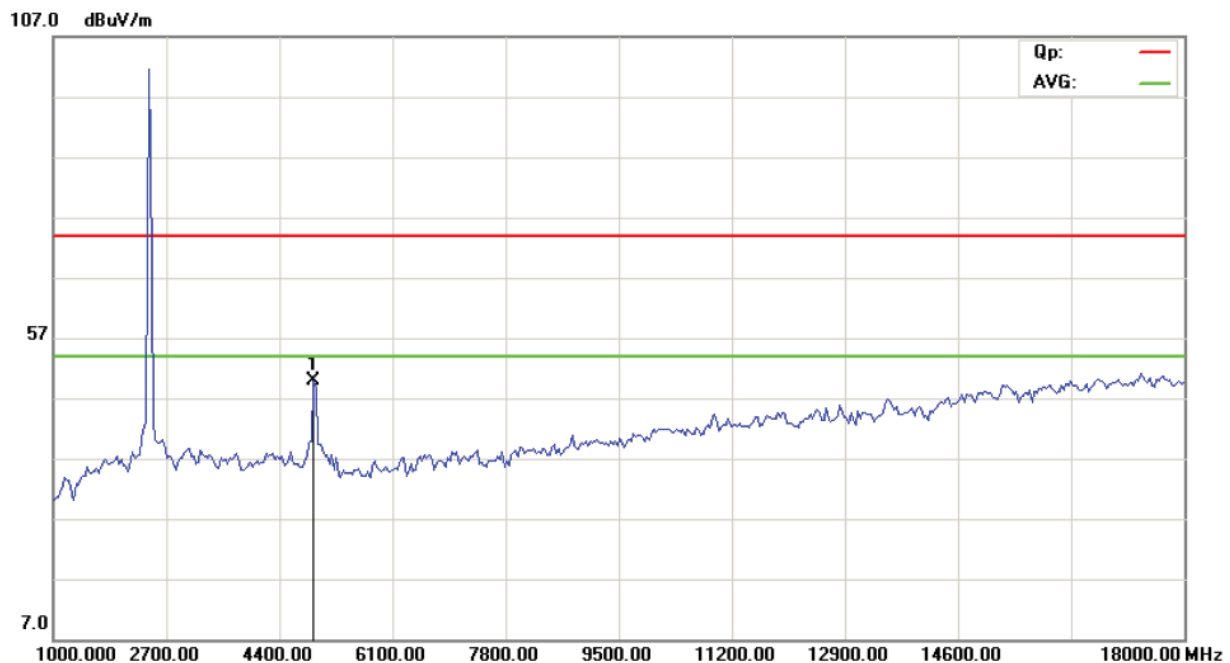


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### CH11 for 11b at 11Mbps: Vertical



### CH11 for 11b at 11Mbps: Horizontal



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.

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**Operation Mode: Transmitting under CH01 for 11n HT20 at 6.5Mbps**

| Frequency (MHz) | Level@3m (dB $\mu$ V/m) | Antenna Polarity | Limit@3m (dB $\mu$ V/m) |
|-----------------|-------------------------|------------------|-------------------------|
| 4824.00         | 49.35 (PK)              | H                | 74(Peak)/ 54(AV)        |
| 4824.00         | 49.59 (PK)              | V                | 74(Peak)/ 54(AV)        |
| 7236.00         | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 9648.00         | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 12060           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 14472           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 16684           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 19296           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 21708           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 24120           | --                      | H/V              | 74(Peak)/ 54(AV)        |

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit  
2. Remark "---" means that the emissions level is too low to be measured  
3. For 802.11n (HT20) mode 6.5Mbps

**Operation Mode: Transmitting under CH06 for 11n HT20 at 6.5Mbps**

| Frequency (MHz) | Level@3m (dB $\mu$ V/m) | Antenna Polarity | Limit@3m (dB $\mu$ V/m) |
|-----------------|-------------------------|------------------|-------------------------|
| 4874.00         | 50.54 (PK)              | H                | 74(Peak)/ 54(AV)        |
| 4874.00         | 50.69 (PK)              | V                | 74(Peak)/ 54(AV)        |
| 7311.00         | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 9748.00         | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 12185           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 14622           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 17059           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 19496           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 21933           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 24370           | --                      | H/V              | 74(Peak)/ 54(AV)        |

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit  
2. Remark "---" means that the emissions level is too low to be measured  
3. For 802.11n (HT20) mode 6.5Mbps

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**Operation Mode: Transmitting under CH11 for 11n HT20 at 6.5Mbps**

| Frequency (MHz) | Level@3m (dB $\mu$ V/m) | Antenna Polarity | Limit@3m (dB $\mu$ V/m) |
|-----------------|-------------------------|------------------|-------------------------|
| 4924            | 52.19 (PK)              | H                | 74(Peak)/ 54(AV)        |
| 4924            | 52.14 (PK)              | V                | 74(Peak)/ 54(AV)        |
| 7368            | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 9848            | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 12310           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 14772           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 17234           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 19696           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 22158           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 24620           | --                      | H/V              | 74(Peak)/ 54(AV)        |

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit  
2. Remark "---" means that the emissions level is too low to be measured  
3. For 802.11n (HT20) mode 6.5Mbps

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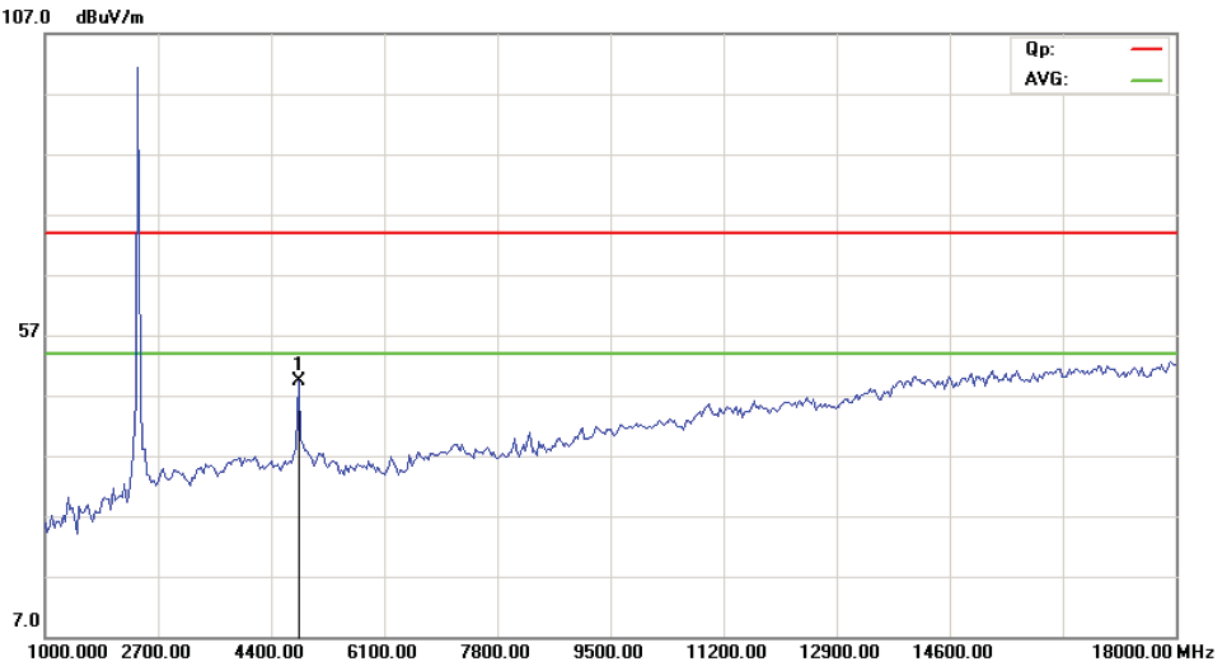
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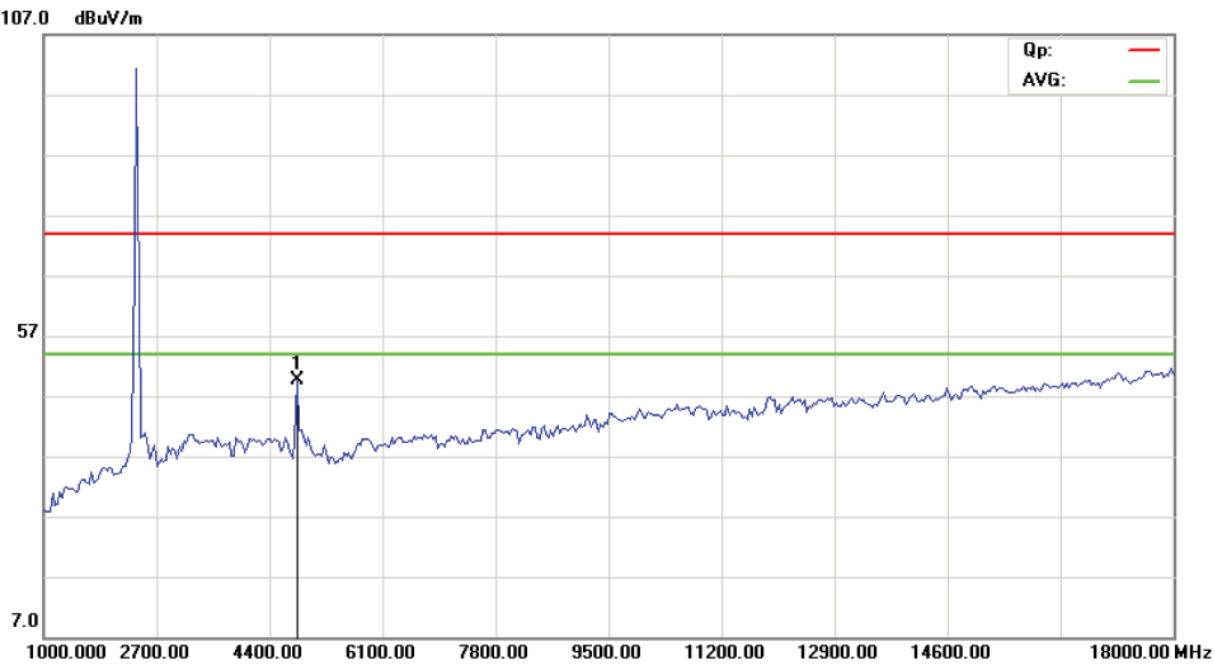


Please refer to the following test plots for details:

**CH01 for 11n HT20 at 6.5Mbps: Horizontal**



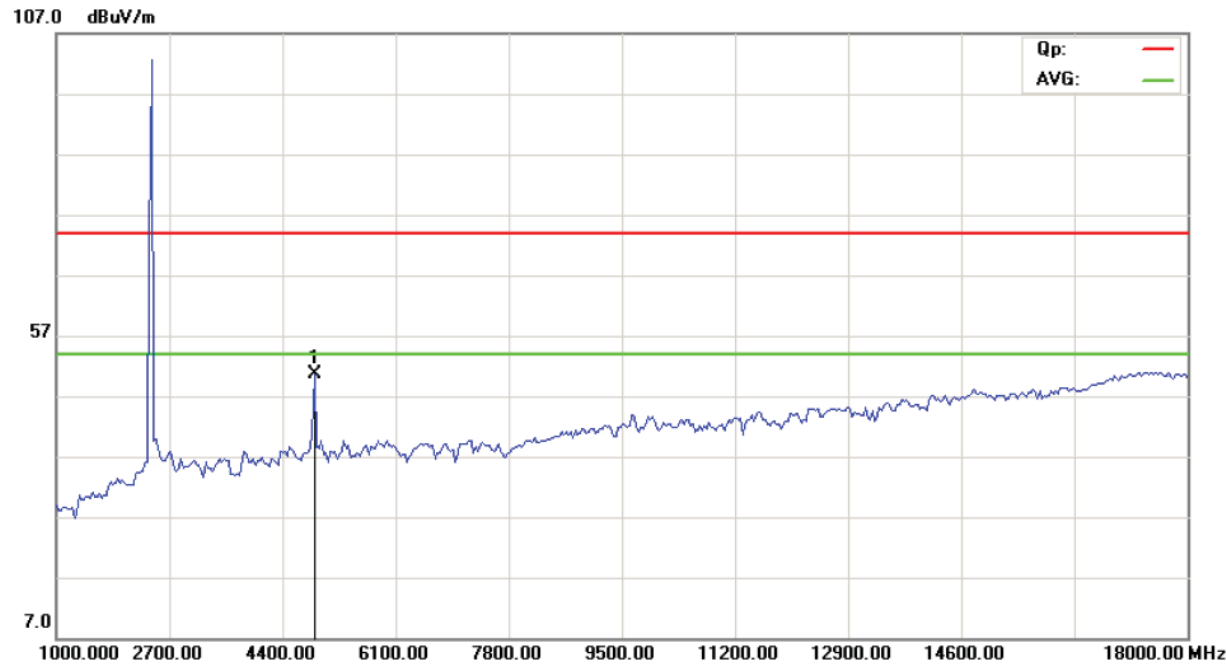
**CH01 for 11n HT20 at 6.5Mbps: Vertical**



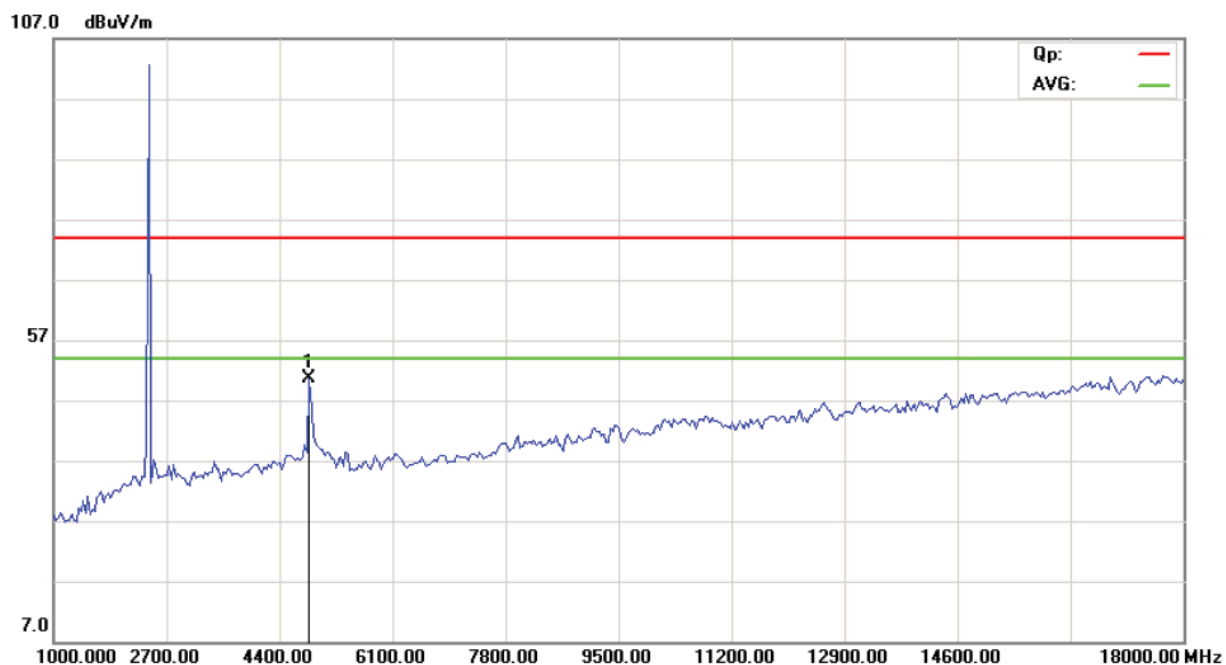
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CH06 for 11n HT20 at 6.5Mbps: Vertical

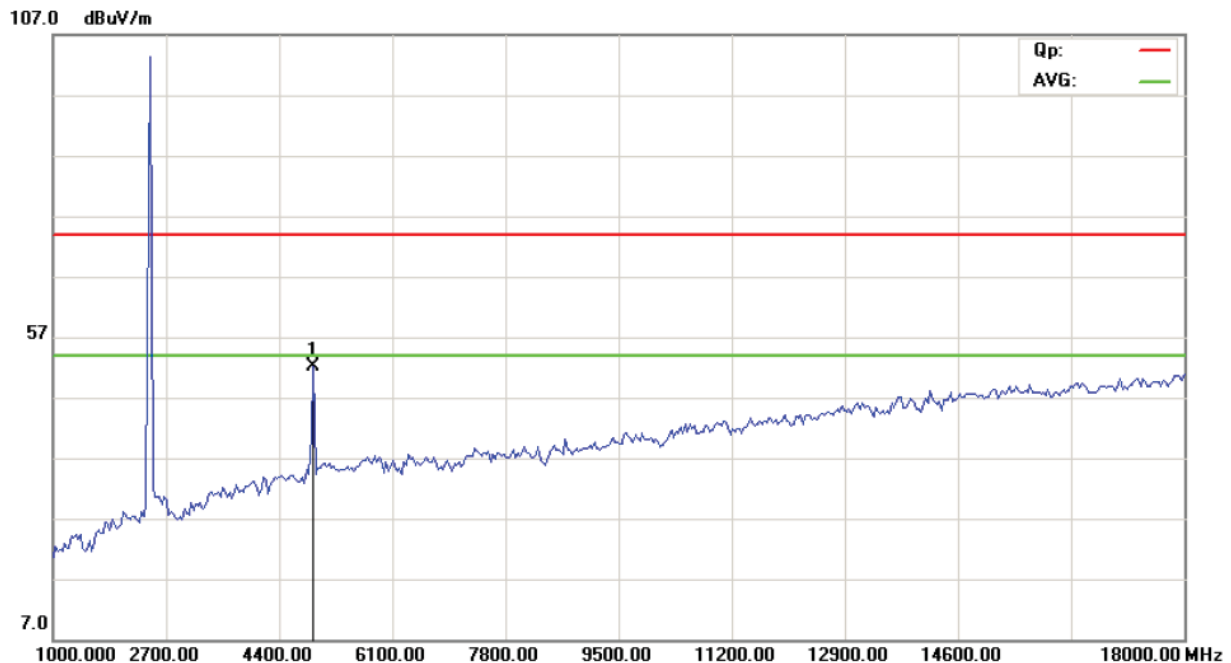


CH06 for 11n HT20 at 6.5Mbps: Horizontal

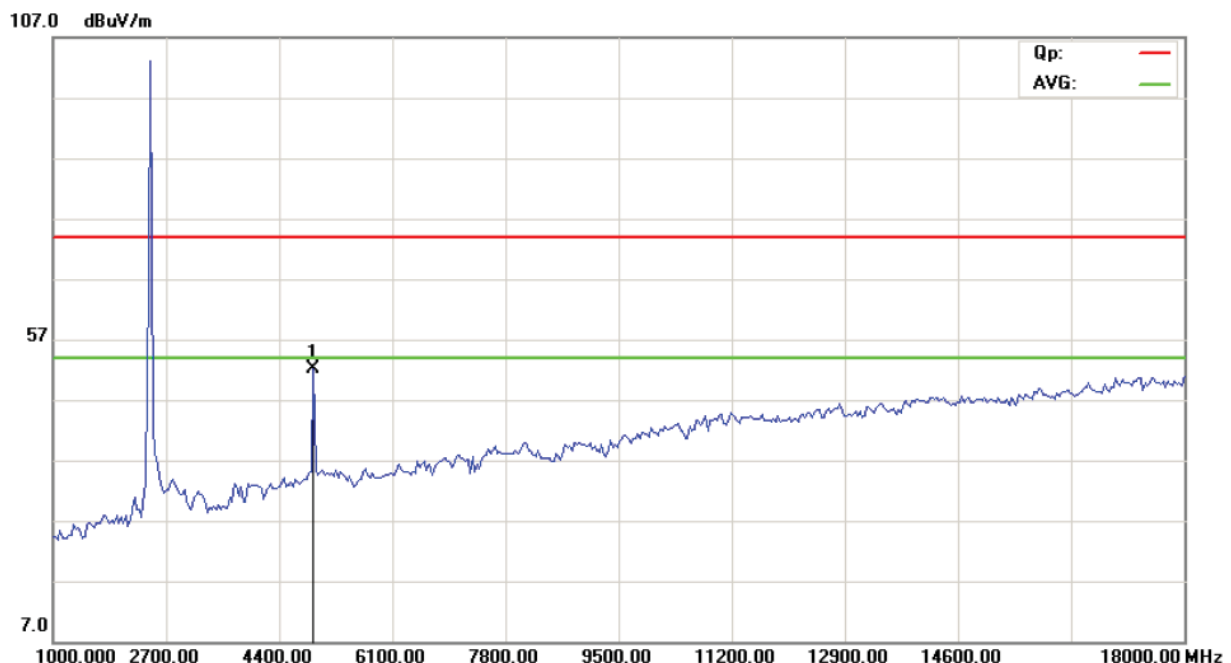


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**CH11 for 11n HT20 at 6.5Mbps: Vertical**



**CH11 for 11n HT20 at 6.5Mbps: Horizontal**



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.

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**Operation Mode: Transmitting under CH01 for 11n HT40 at 6.5Mbps**

| Frequency (MHz) | Level@3m (dB $\mu$ V/m) | Antenna Polarity | Limit@3m (dB $\mu$ V/m) |
|-----------------|-------------------------|------------------|-------------------------|
| 4844.00         | 48.01 (PK)              | H                | 74(Peak)/ 54(AV)        |
| 4844.00         | 48.77 (PK)              | V                | 74(Peak)/ 54(AV)        |
| 7266.00         | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 9688.00         | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 12110           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 14532           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 16954           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 19376           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 21798           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 24220           | --                      | H/V              | 74(Peak)/ 54(AV)        |

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit  
2. Remark "---" means that the emissions level is too low to be measured  
3. For 802.11n (HT40) mode 6.5Mbps

**Operation Mode: Transmitting under CH04 for 11n HT40 at 6.5Mbps**

| Frequency (MHz) | Level@3m (dB $\mu$ V/m) | Antenna Polarity | Limit@3m (dB $\mu$ V/m) |
|-----------------|-------------------------|------------------|-------------------------|
| 4874.00         | 49.66 (PK)              | H                | 74(Peak)/ 54(AV)        |
| 4874.00         | 49.53 (PK)              | V                | 74(Peak)/ 54(AV)        |
| 7311.00         | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 9748.00         | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 12185           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 14622           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 17059           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 19496           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 21933           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 24370           | --                      | H/V              | 74(Peak)/ 54(AV)        |

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit  
2. Remark "---" means that the emissions level is too low to be measured  
3. For 802.11n (HT40) mode 6.5Mbps

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**Operation Mode: Transmitting under CH07 for 11n HT40 at 6.5Mbps**

| Frequency (MHz) | Level@3m (dB $\mu$ V/m) | Antenna Polarity | Limit@3m (dB $\mu$ V/m) |
|-----------------|-------------------------|------------------|-------------------------|
| 4904            | 50.82 (PK)              | H                | 74(Peak)/ 54(AV)        |
| 4904            | 50.58 (PK)              | V                | 74(Peak)/ 54(AV)        |
| 7356            | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 9808            | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 12260           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 14712           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 17164           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 19616           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 22068           | --                      | H/V              | 74(Peak)/ 54(AV)        |
| 24520           | --                      | H/V              | 74(Peak)/ 54(AV)        |

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit  
2. Remark "---" means that the emissions level is too low to be measured  
3. For 802.11n (HT40) mode 6.5Mbps

The report refers only to the sample tested and does not apply to the bulk.

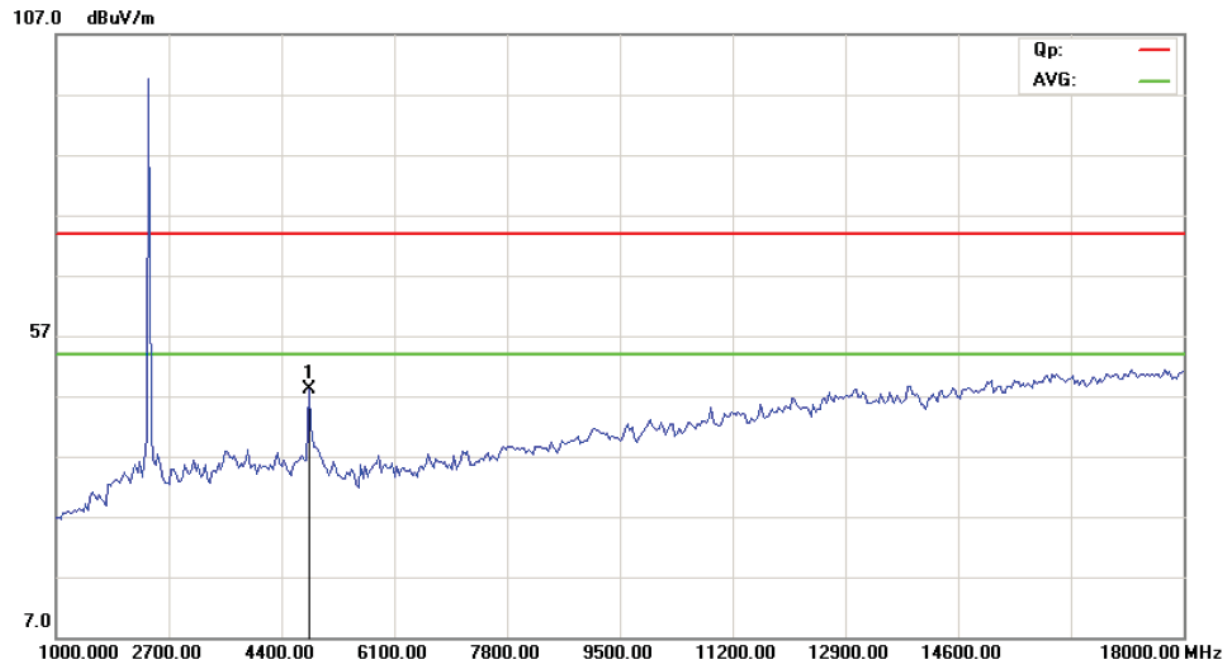
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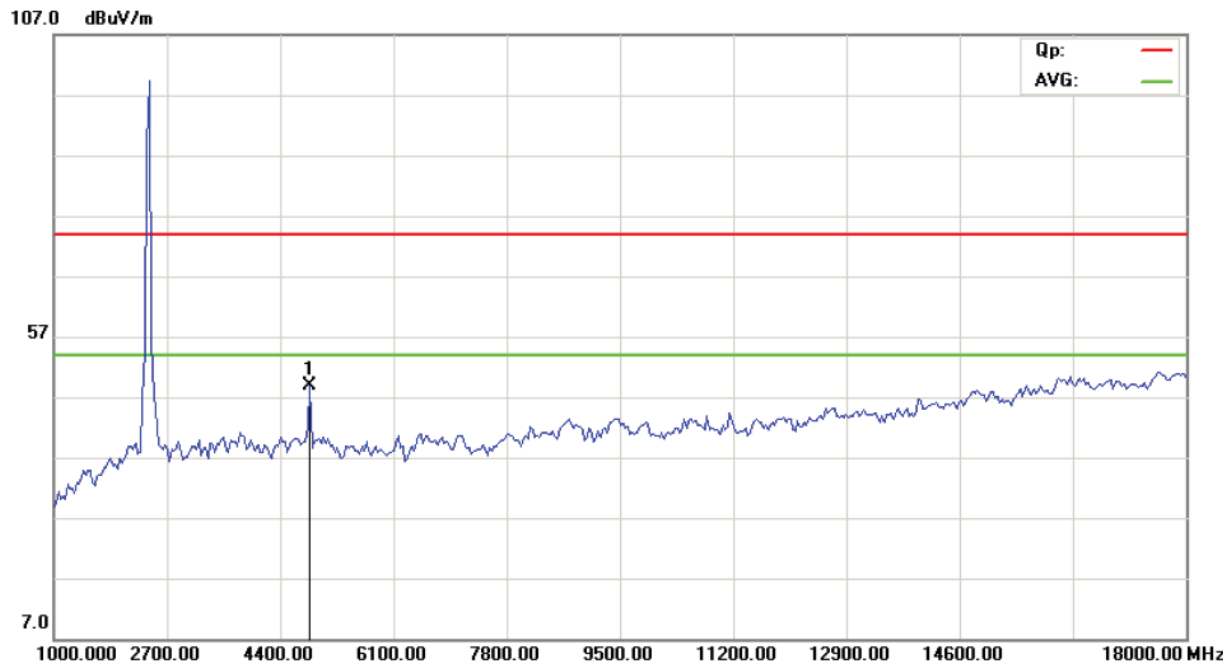


Please refer to the following test plots for details:

**CH01 for 11n HT40 at 6.5Mbps: Horizontal**



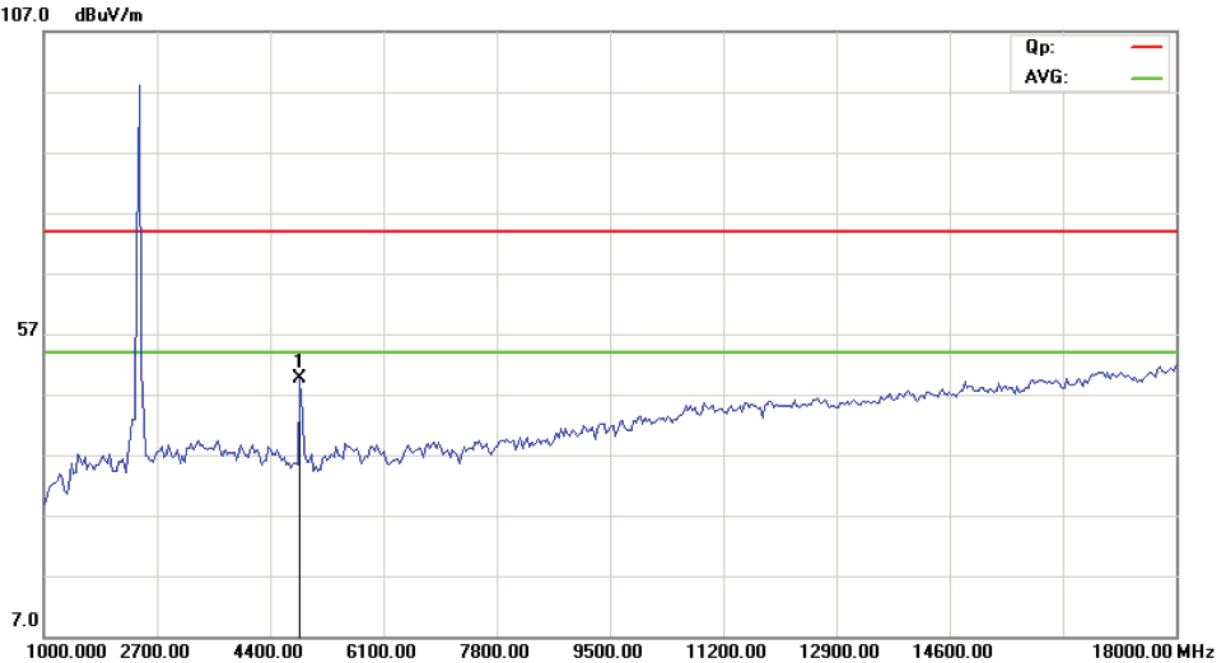
**CH01 for 11n HT40 at 6.5Mbps: Vertical**



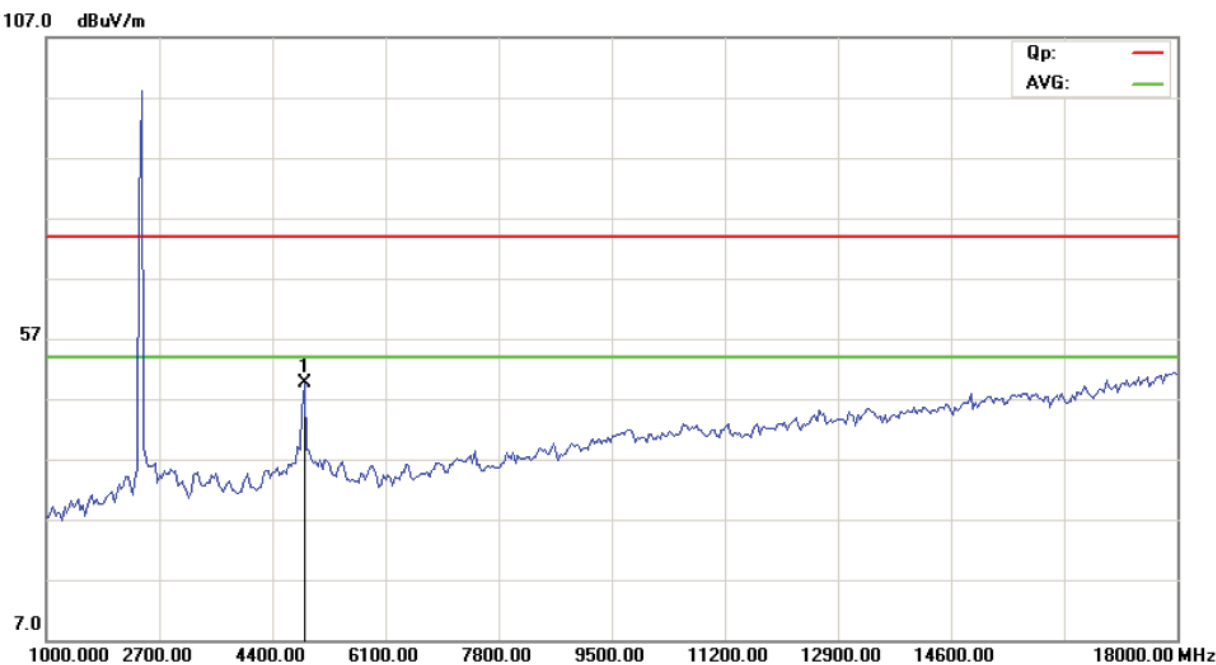
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CH04 for 11n HT40 at 6.5Mbps: Vertical

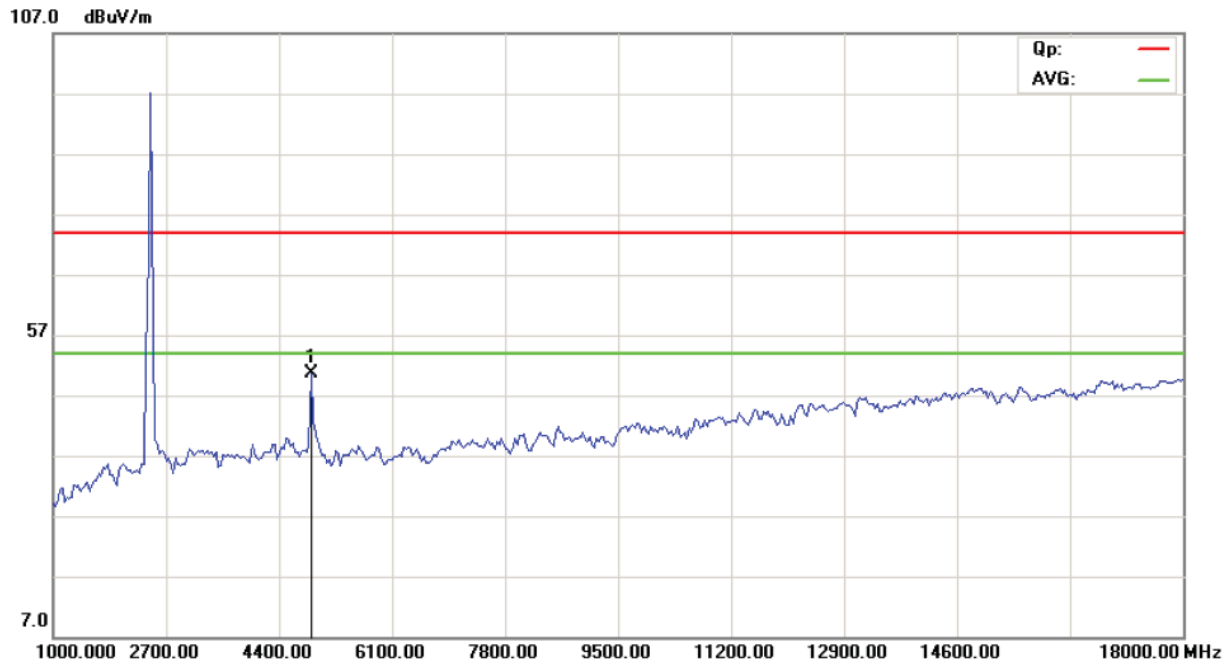


CH04 for 11n HT40 at 6.5Mbps: Horizontal

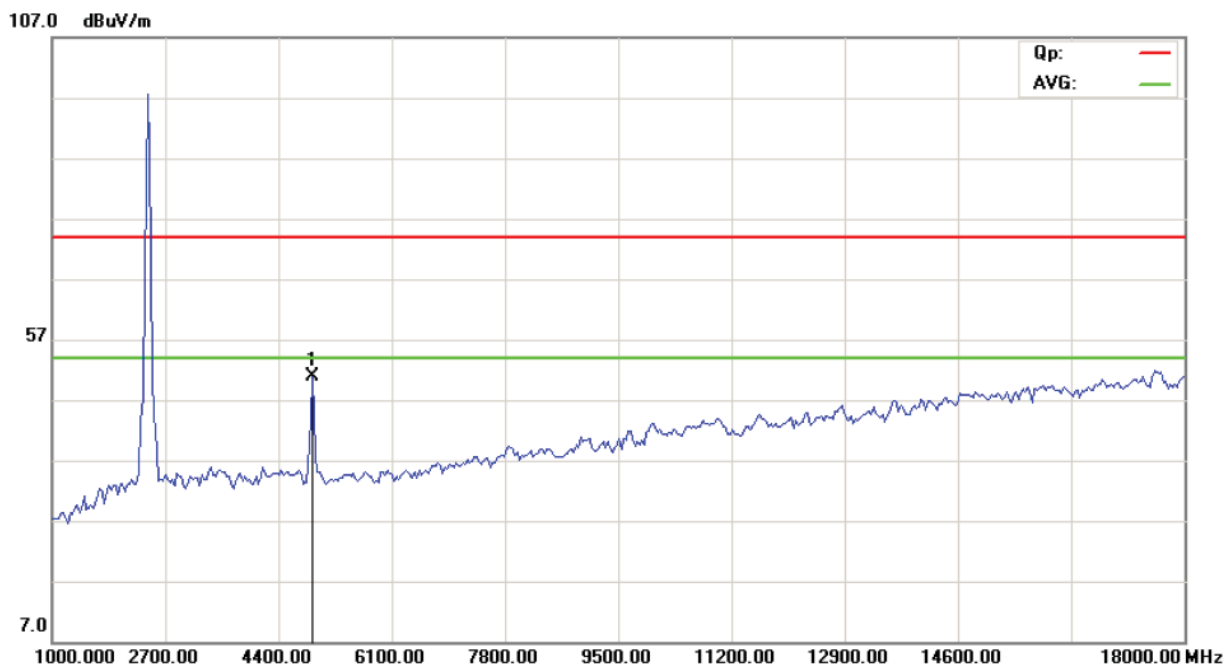


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**CH07 for 11n HT40 at 6.5Mbps: Vertical**



**CH07 for 11n HT40 at 6.5Mbps: Horizontal**



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.

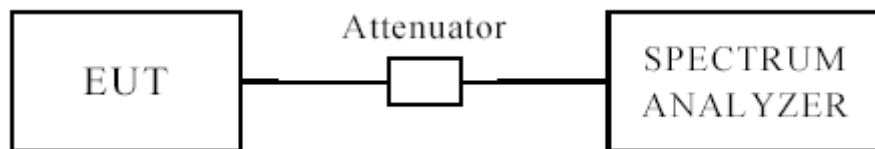
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## 7.0 6dB Bandwidth Measurement

### 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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### 6dB Occupied Bandwidth

| EUT         | DoorBird                |                           | Model                | DoorBird 1.0        |            |
|-------------|-------------------------|---------------------------|----------------------|---------------------|------------|
| 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                         | 10.04                | 0.5                 | Pass       |
| 6           | 2437                    | 1                         | 10.04                | 0.5                 | Pass       |
| 11          | 2462                    | 1                         | 10.04                | 0.5                 | Pass       |
| 1           | 2412                    | 11                        | 9.32                 | 0.5                 | Pass       |
| 6           | 2437                    | 11                        | 9.32                 | 0.5                 | Pass       |
| 11          | 2462                    | 11                        | 9.32                 | 0.5                 | Pass       |

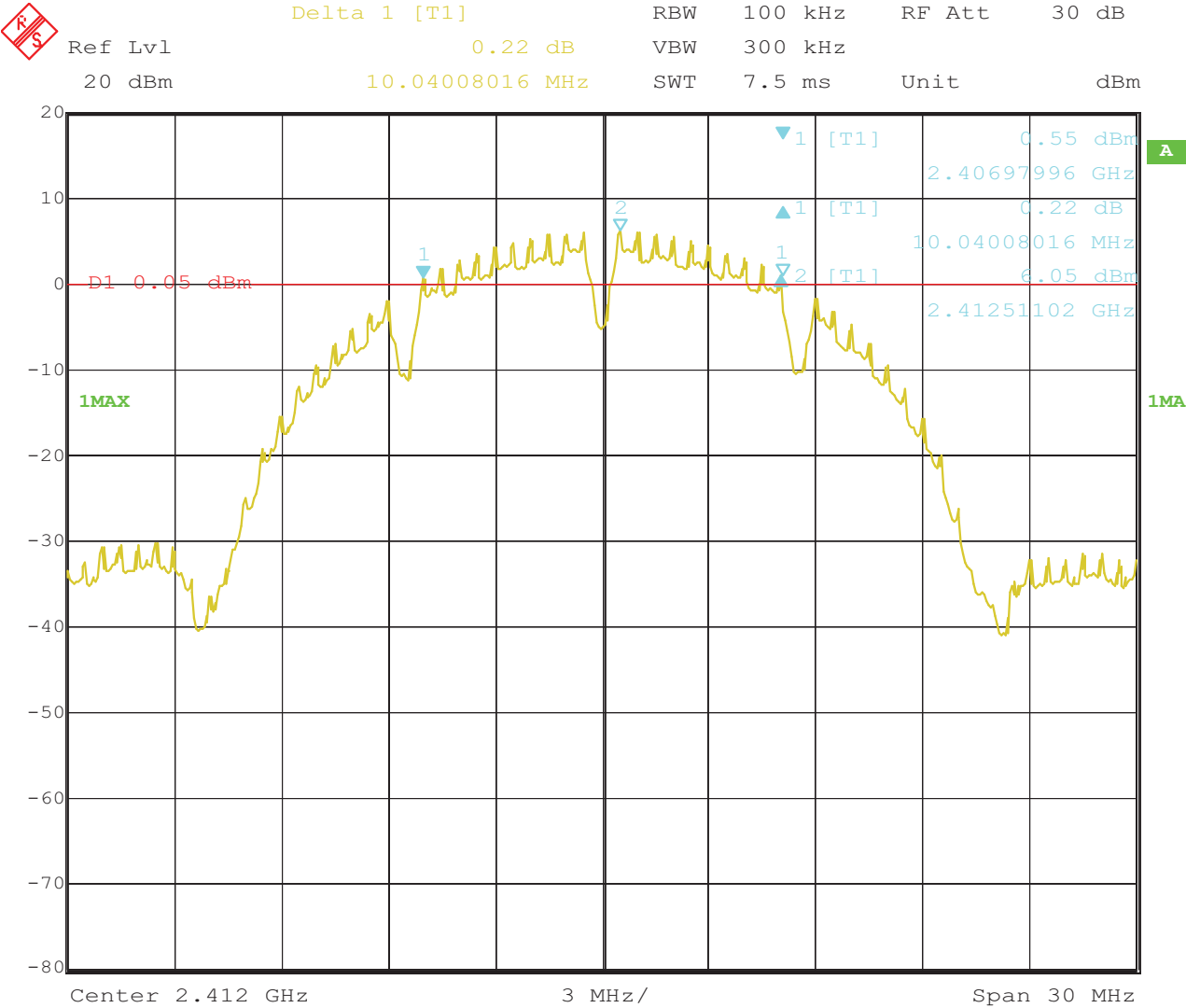
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1. 802.11b at 1Mbps of CH01



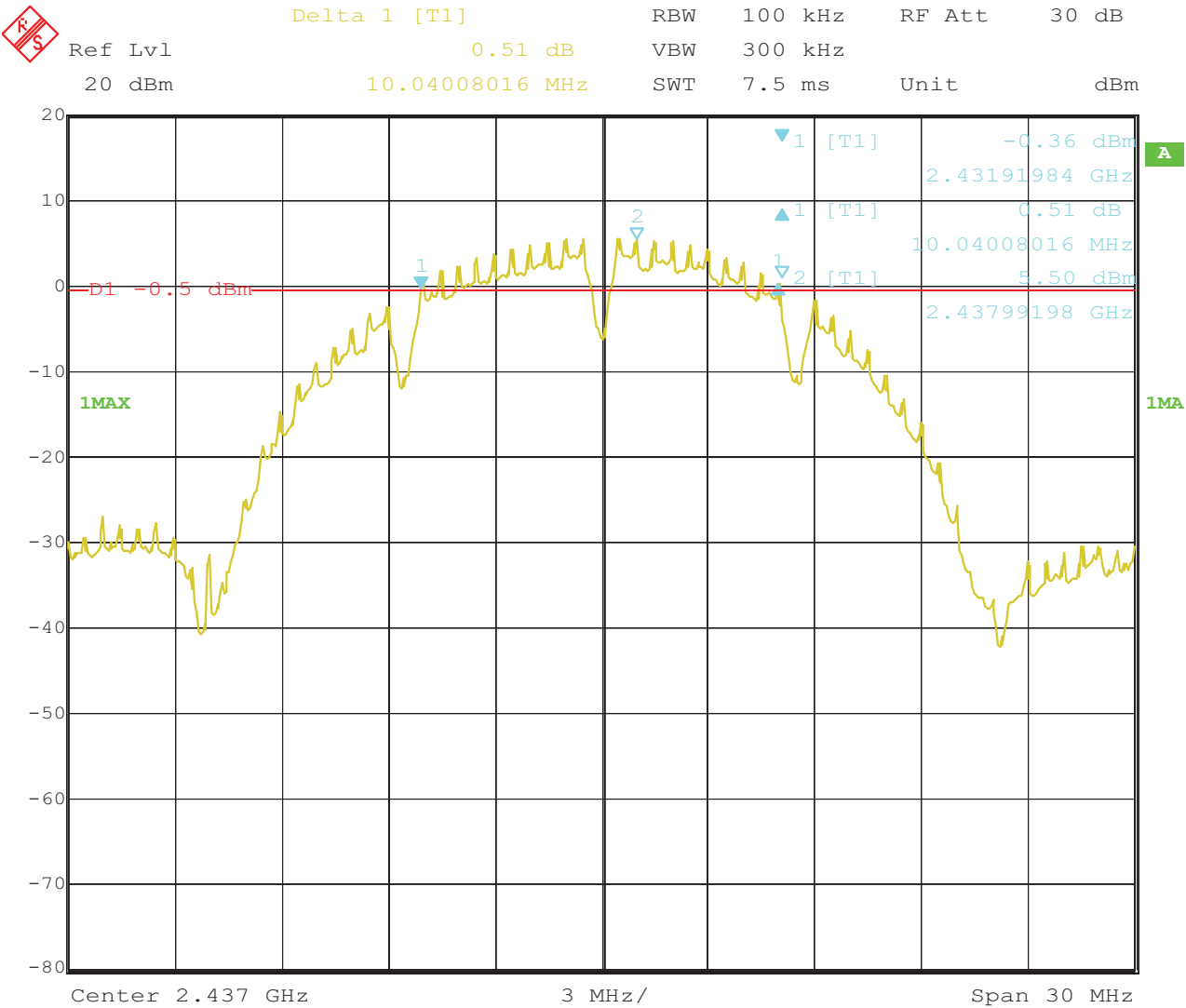
Date: 29.APR.2015 09:42:18

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2. 802.11b at 1Mbps of CH06

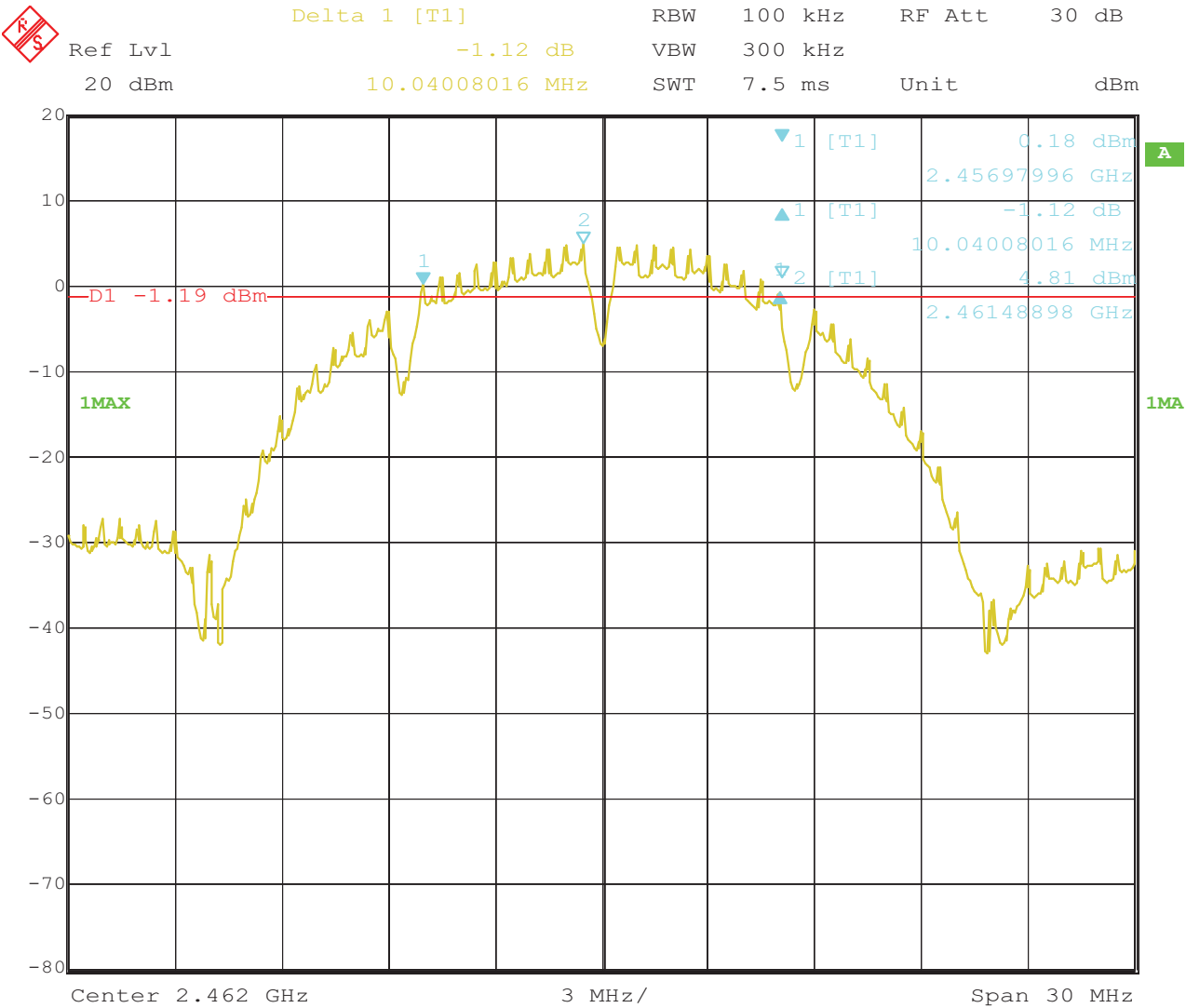


Date: 29.APR.2015 09:58:39

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3. 802.11b at 1Mbps of CH11

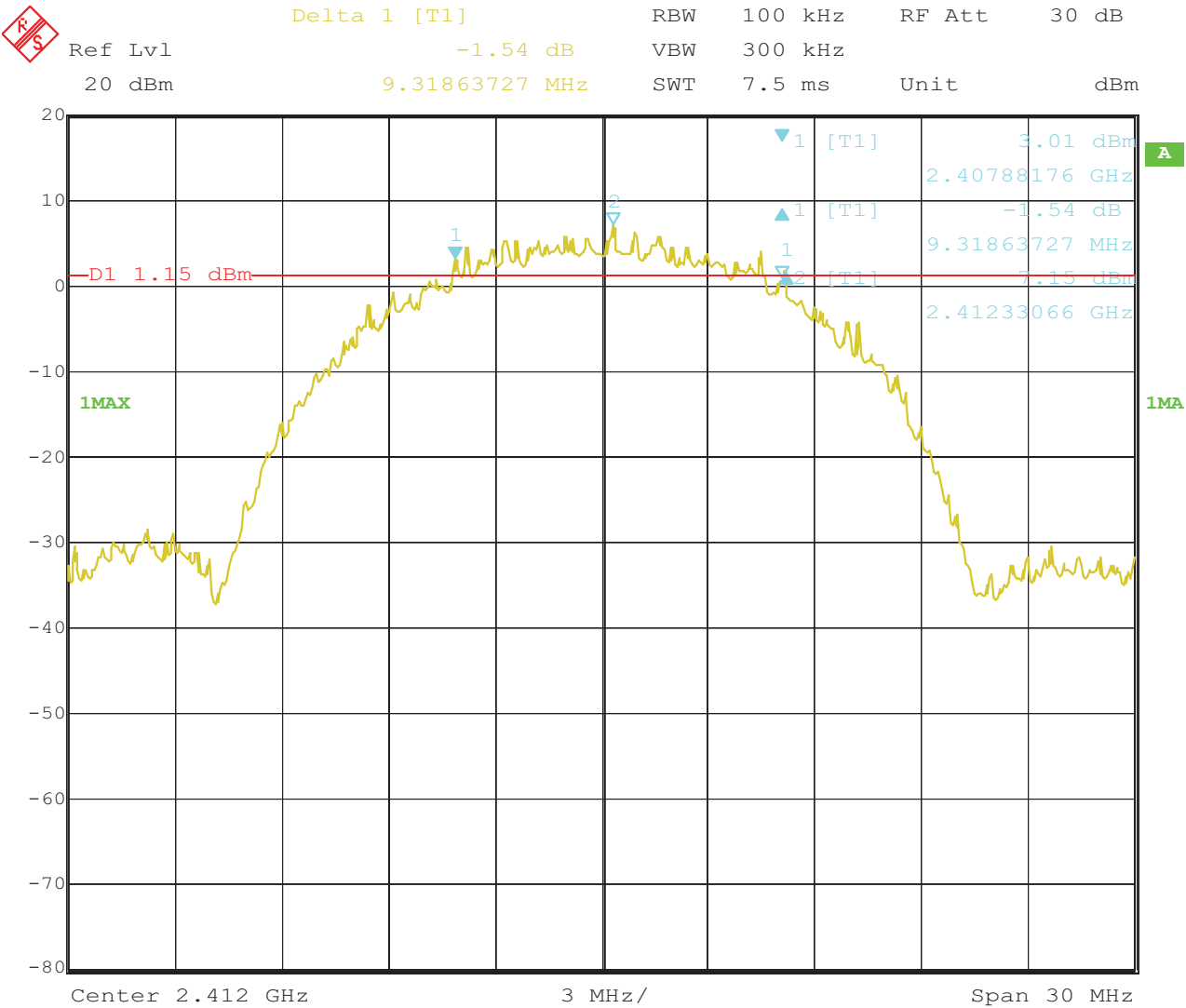


Date: 29.APR.2015 10:03:01

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4. 802.11b at 11Mbps of CH01

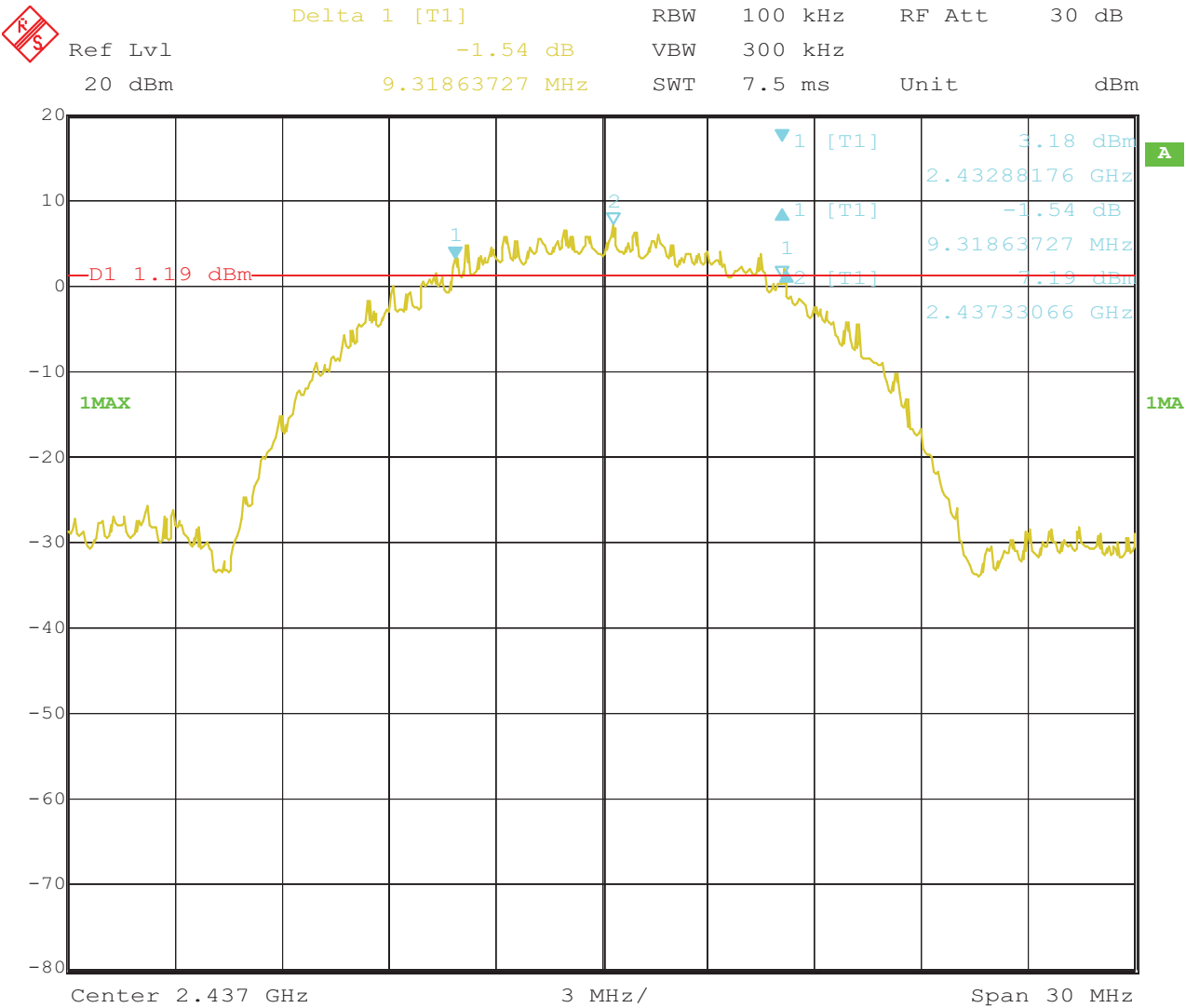


Date: 29.APR.2015 09:49:03

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5. 802.11b at 11Mbps of CH06

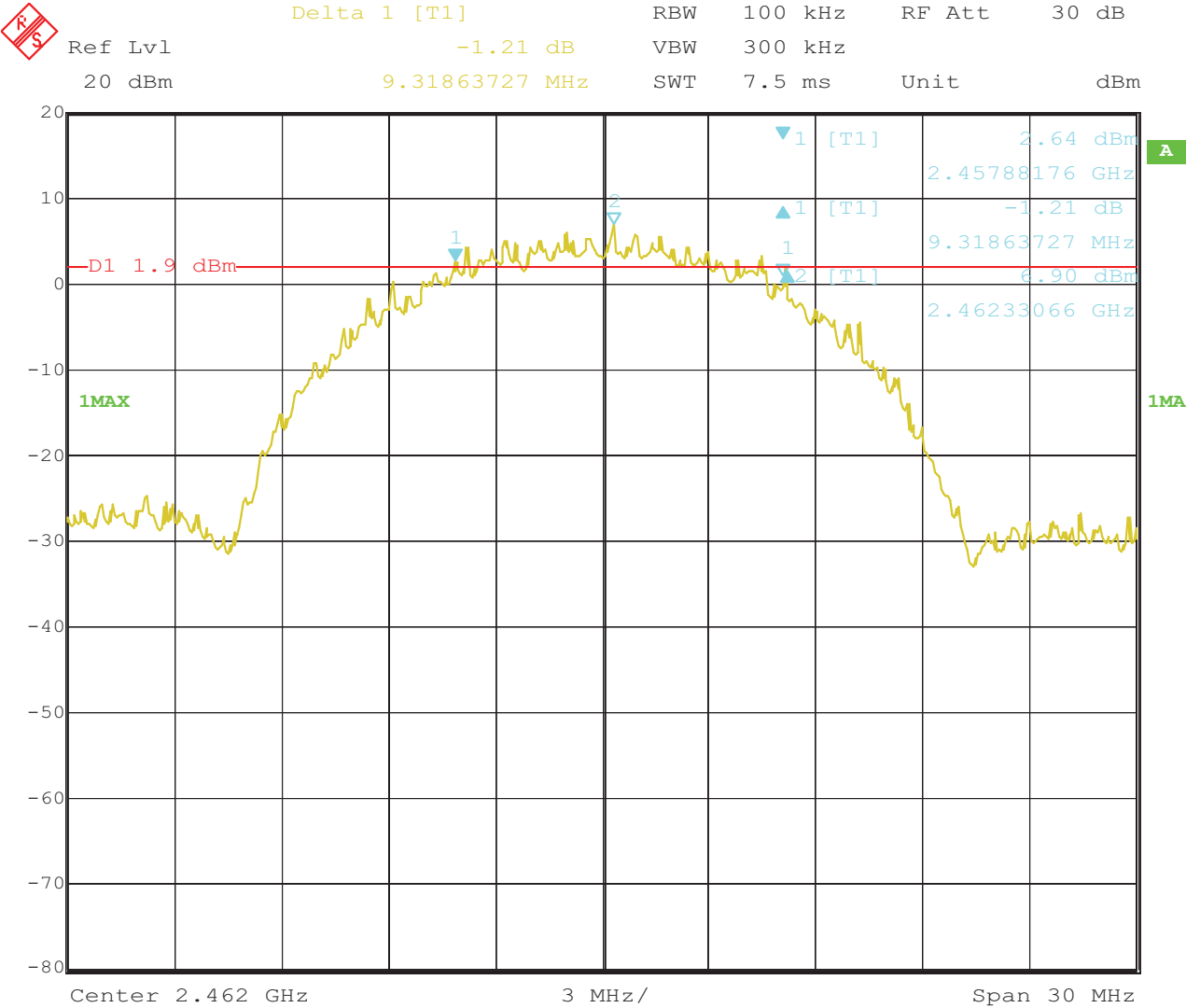


Date: 29.APR.2015 09:53:55

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6. 802.11b at 11Mbps of CH11



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### 6dB Occupied Bandwidth

| EUT         |                         | DoorBird                  |                      | Model               | DoorBird 1.0 |
|-------------|-------------------------|---------------------------|----------------------|---------------------|--------------|
| 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                    | 54                        | 16.41                | 0.5                 | Pass         |
| 6           | 2437                    | 54                        | 16.41                | 0.5                 | Pass         |
| 11          | 2462                    | 54                        | 16.41                | 0.5                 | Pass         |

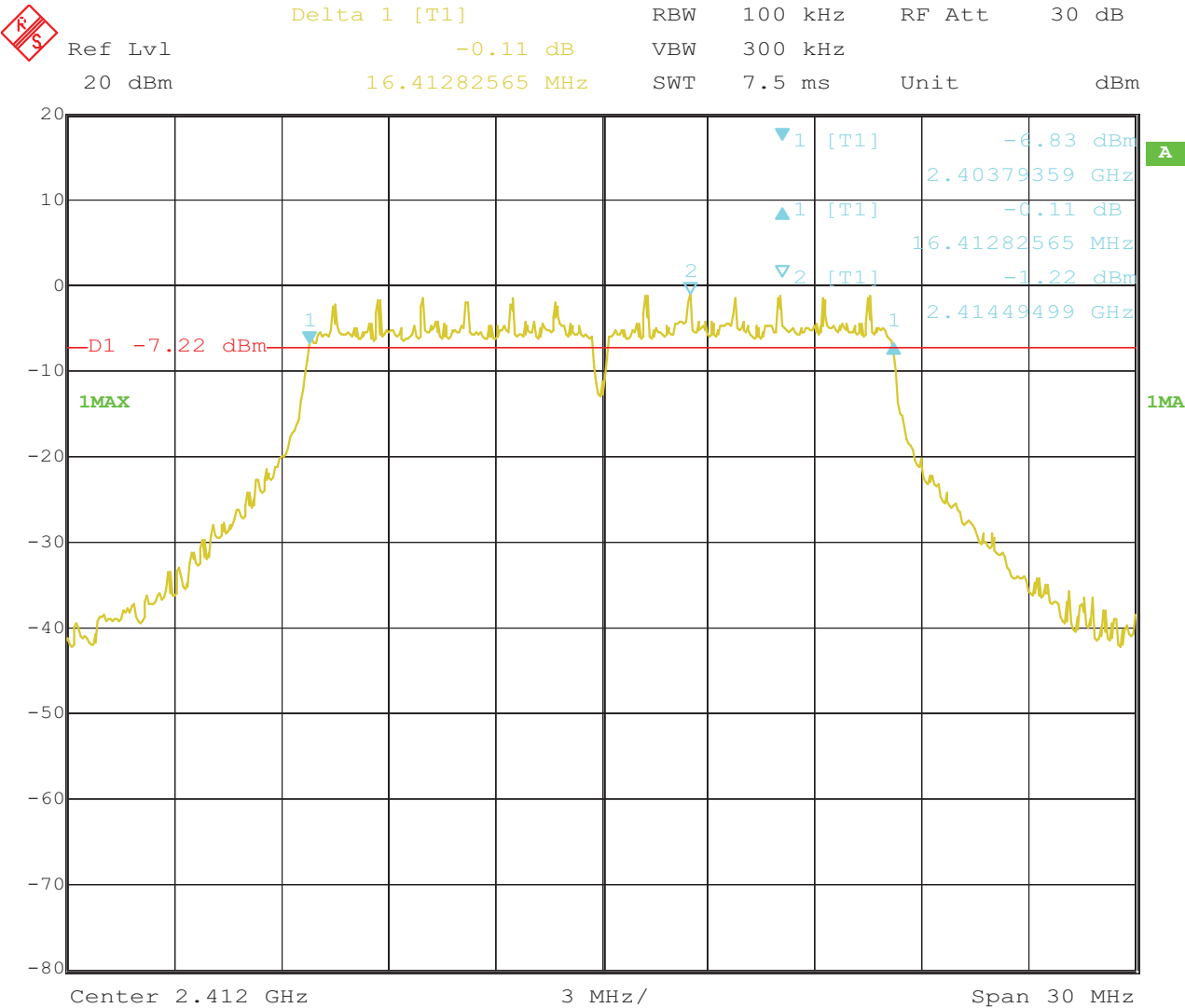
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Test Plots:  
1. 802.11g at 54Mbps of CH01

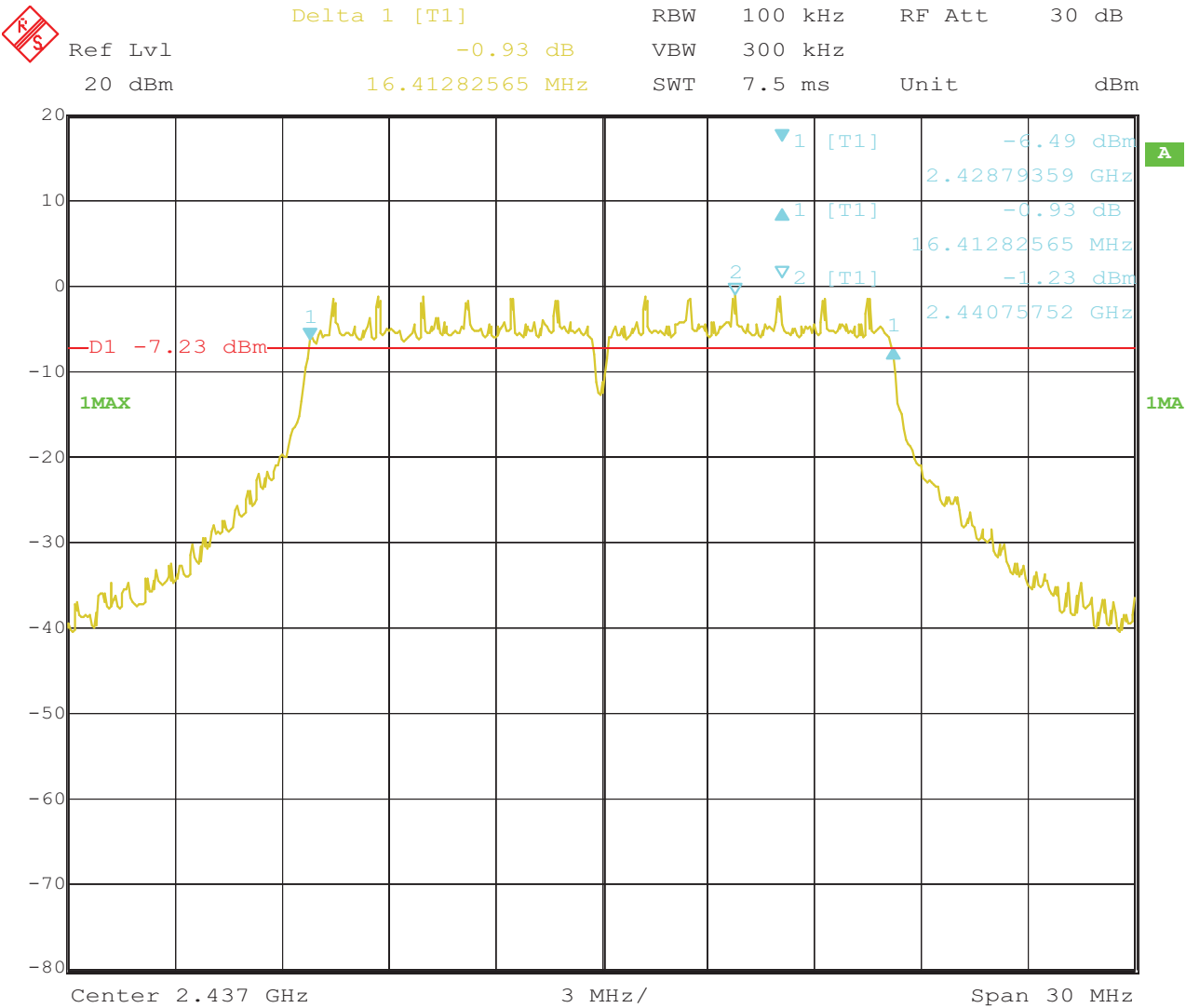


Date: 29.APR.2015 09:44:41

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2. 802.11g at 54Mbps of CH06



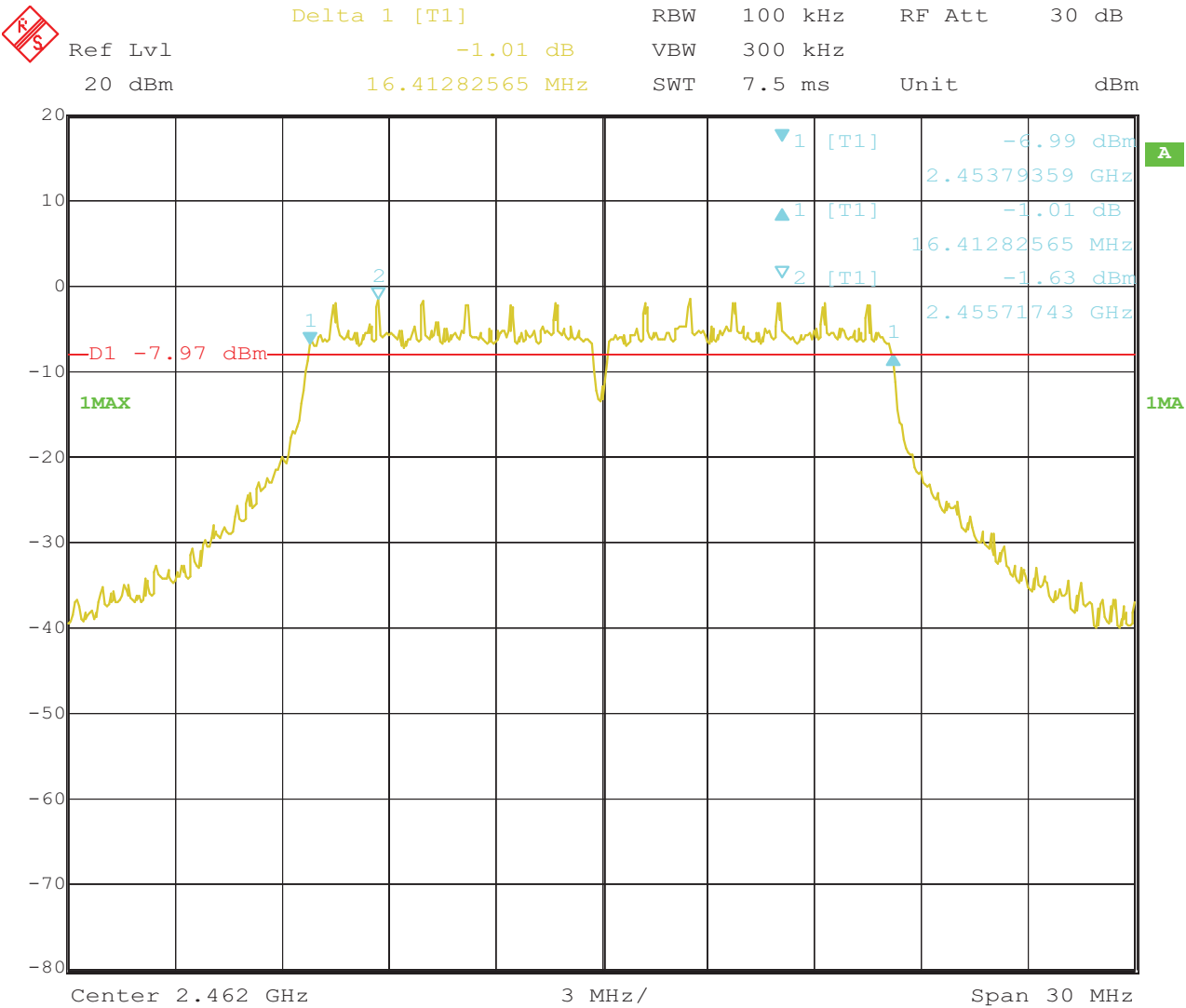
Date: 29.APR.2015 09:55:48

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3. 802.11g at 54Mbps of CH11



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### 6dB Occupied Bandwidth

| EUT         | DoorBird                |                           | Model                | DoorBird 1.0        |            |
|-------------|-------------------------|---------------------------|----------------------|---------------------|------------|
| 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                      | 17.56                | 0.5                 | Pass       |
| 6           | 2437                    | 6.5M                      | 17.56                | 0.5                 | Pass       |
| 11          | 2462                    | 6.5M                      | 17.56                | 0.5                 | Pass       |

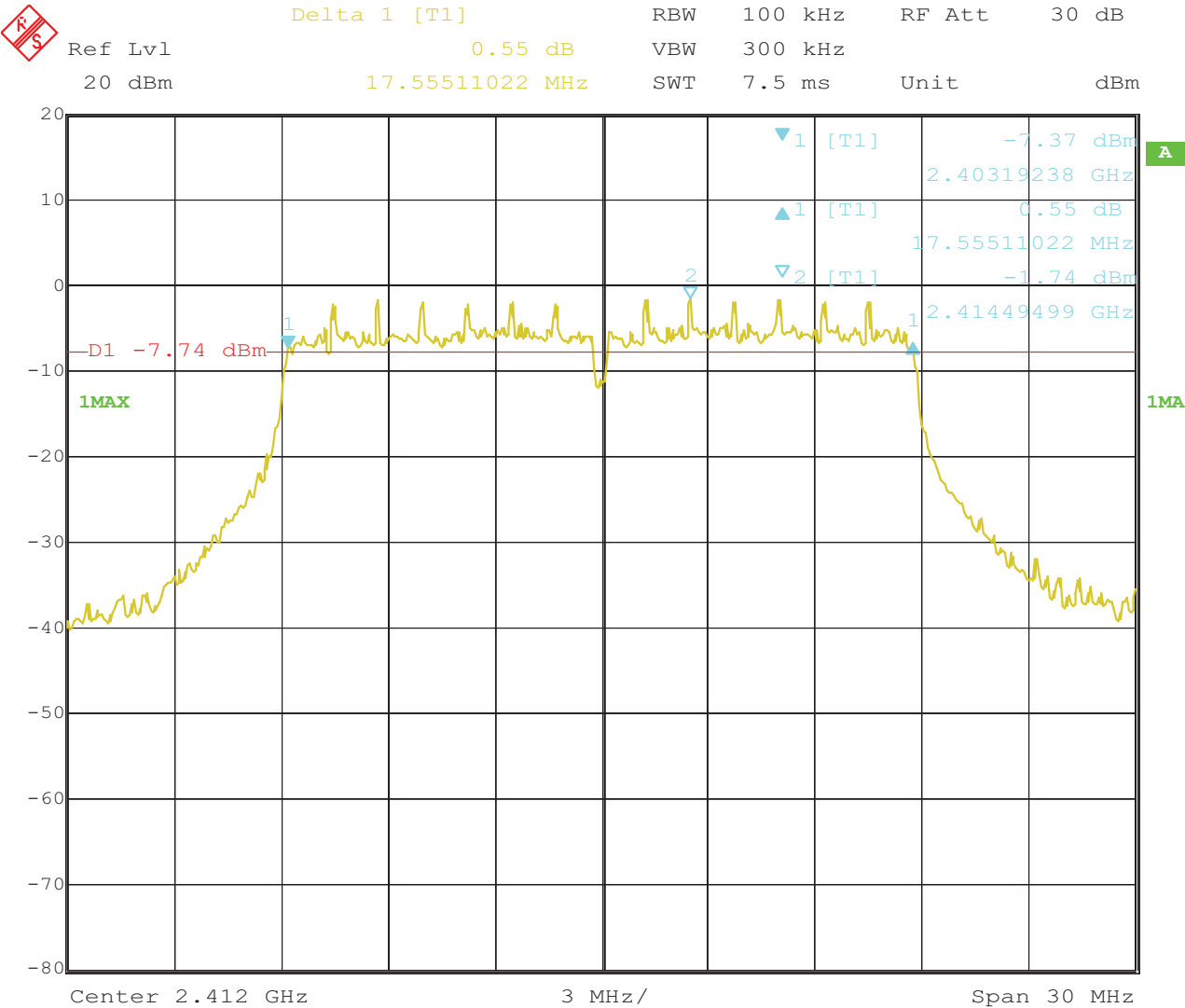
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Test Plots:  
1. 802.11n at HT20 of CH01

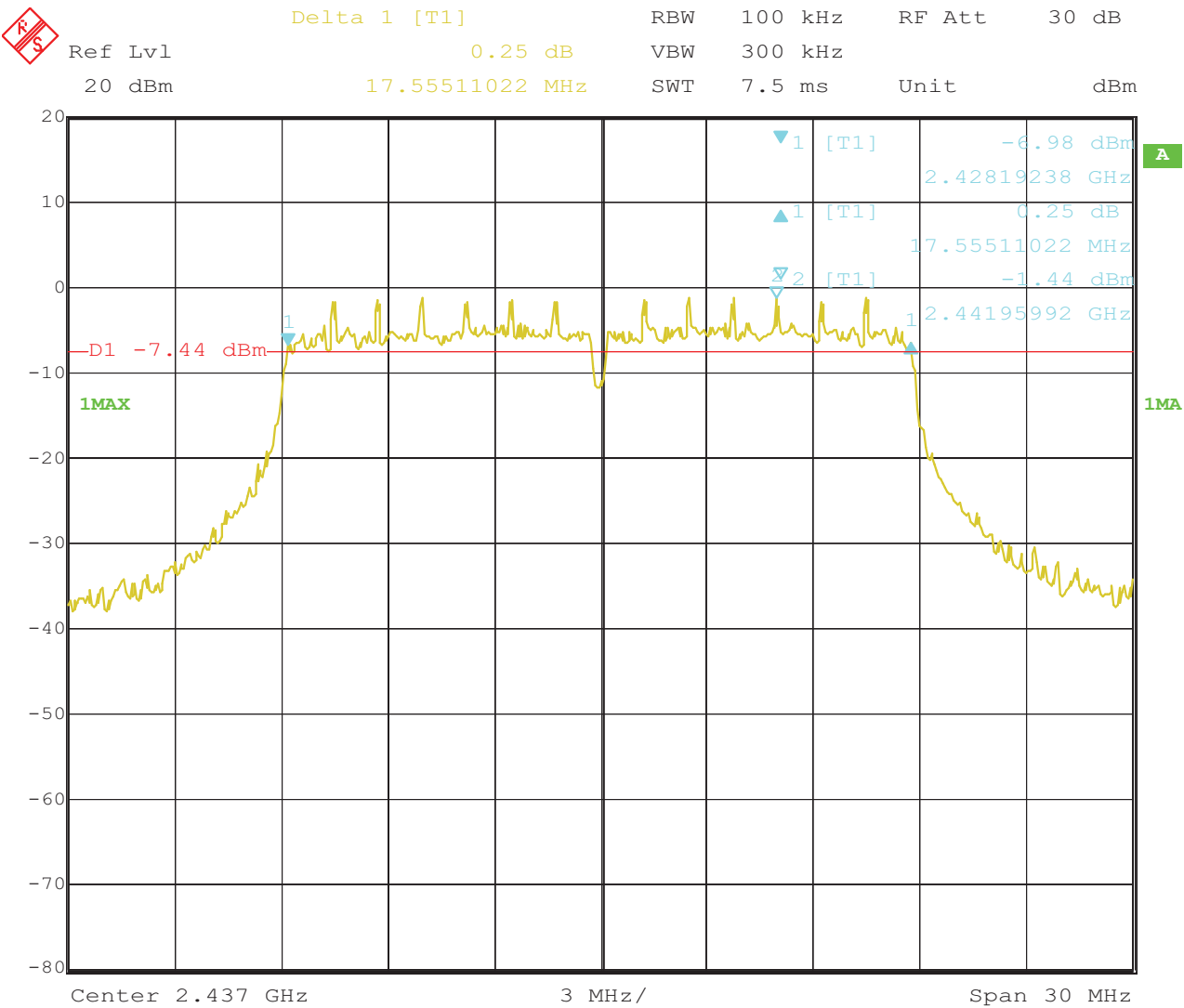


Date: 29.APR.2015 10:14:33

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2. 802.11n at HT20 of CH06

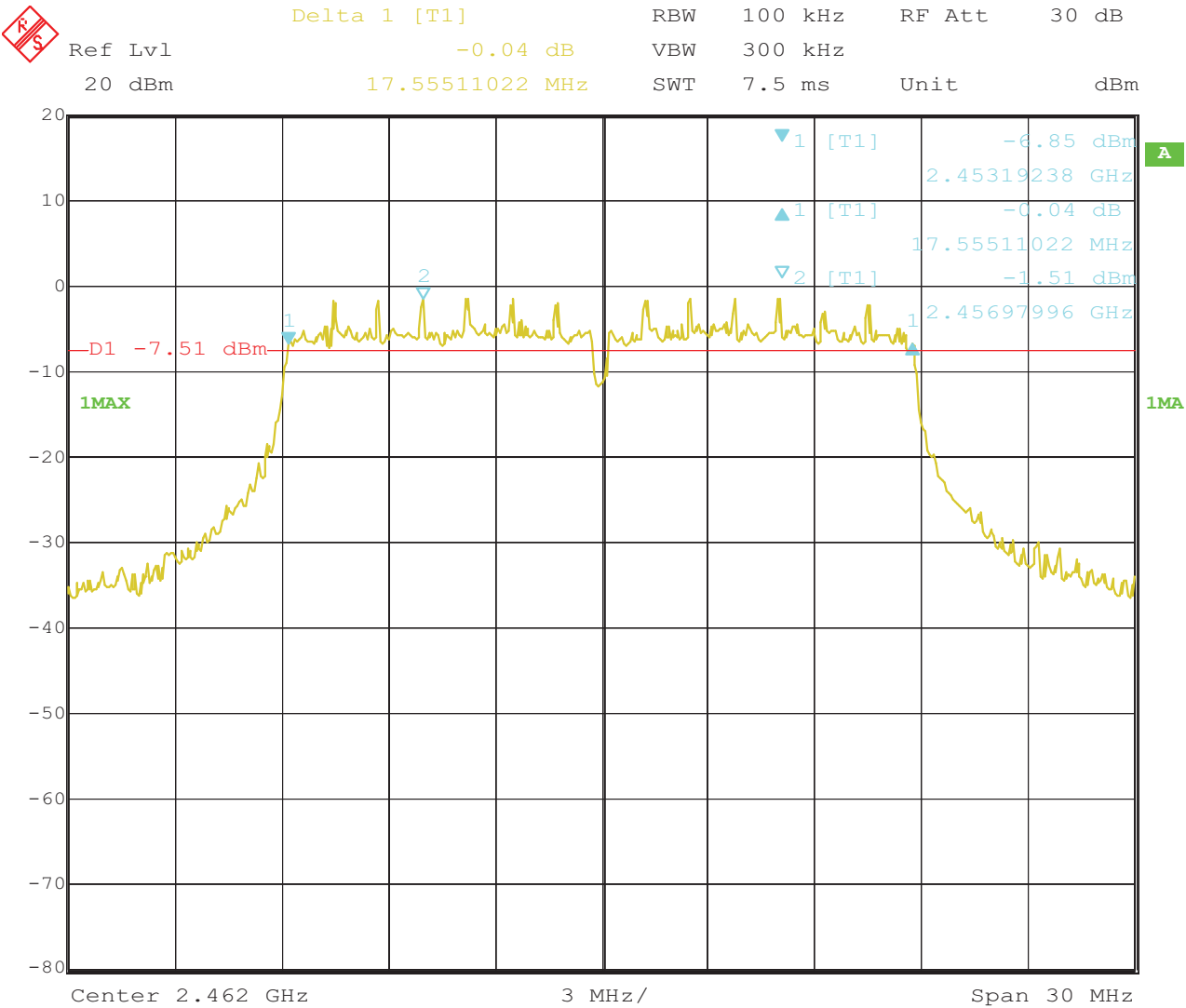


Date: 29.APR.2015 10:09:41

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3. 802.11n at HT20 of CH11



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### 6dB Occupied Bandwidth

| EUT         | DoorBird                |                           | Model                | DoorBird 1.0        |            |
|-------------|-------------------------|---------------------------|----------------------|---------------------|------------|
| 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                      | 35.39                | 0.5                 | Pass       |
| 4           | 2437                    | 6.5M                      | 35.39                | 0.5                 | Pass       |
| 7           | 2452                    | 6.5M                      | 35.39                | 0.5                 | Pass       |

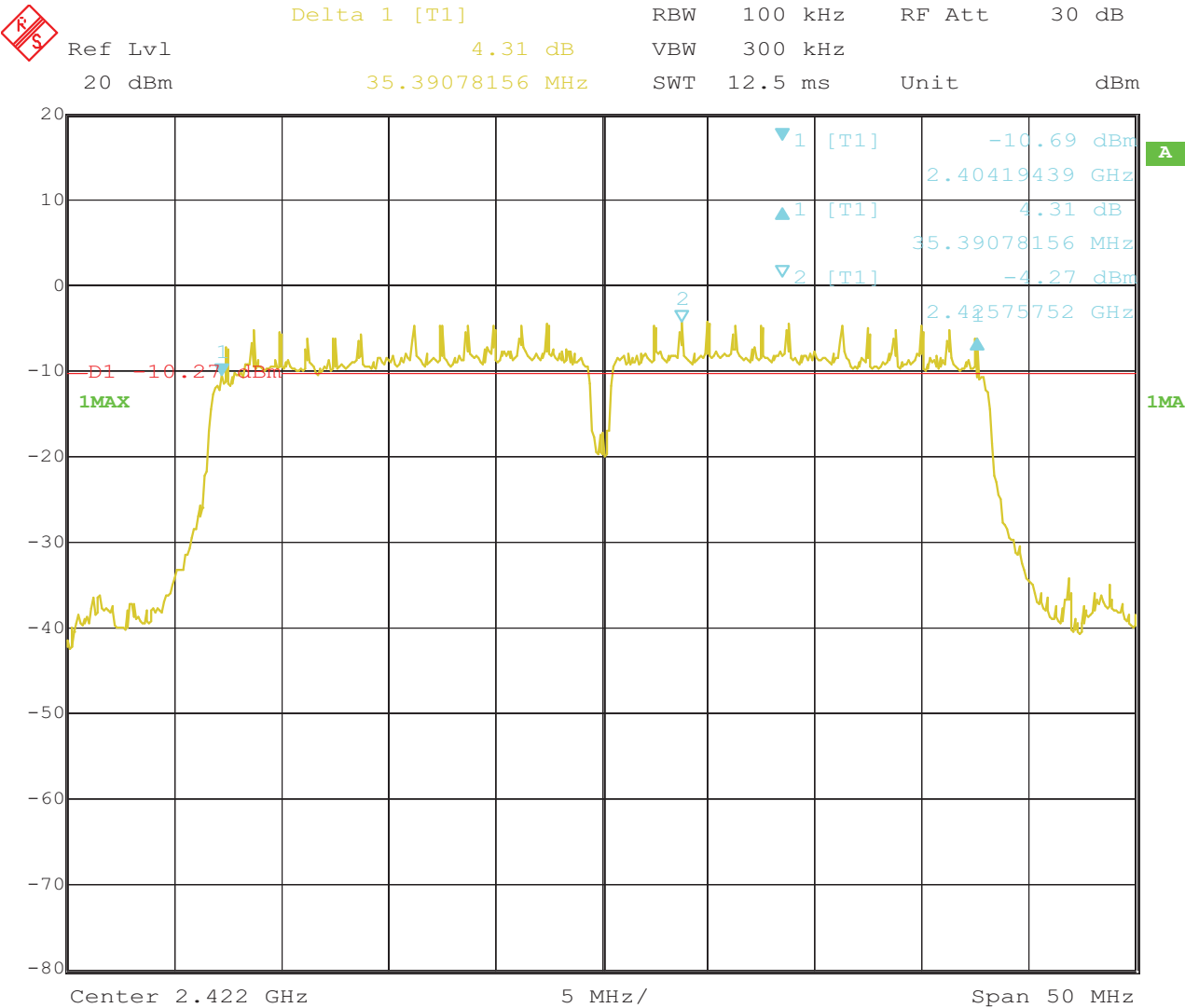
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Test Plots:  
1. 802.11n at HT40 of CH01

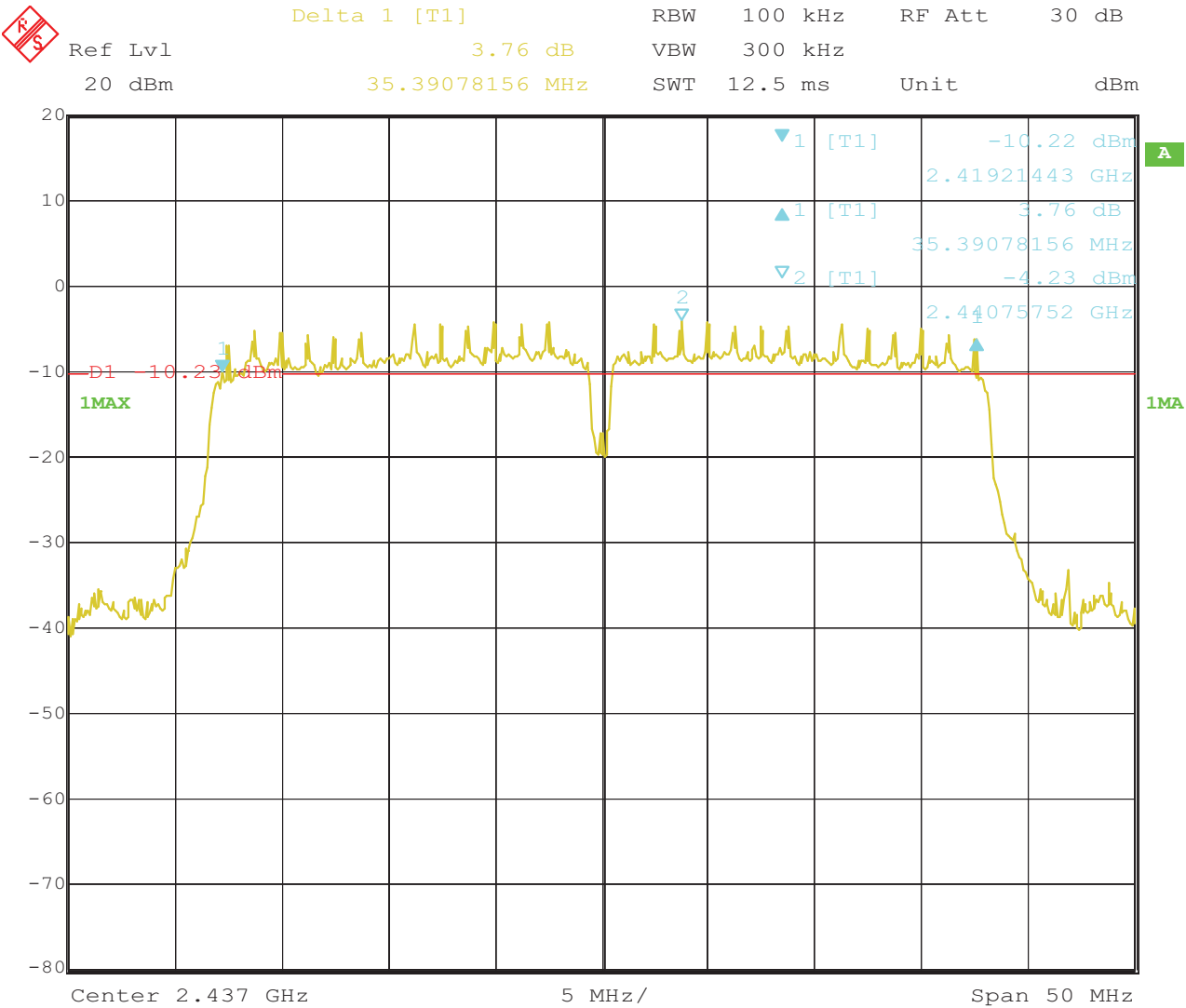


Date: 29.APR.2015 10:17:52

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2. 802.11n at HT40 of CH04



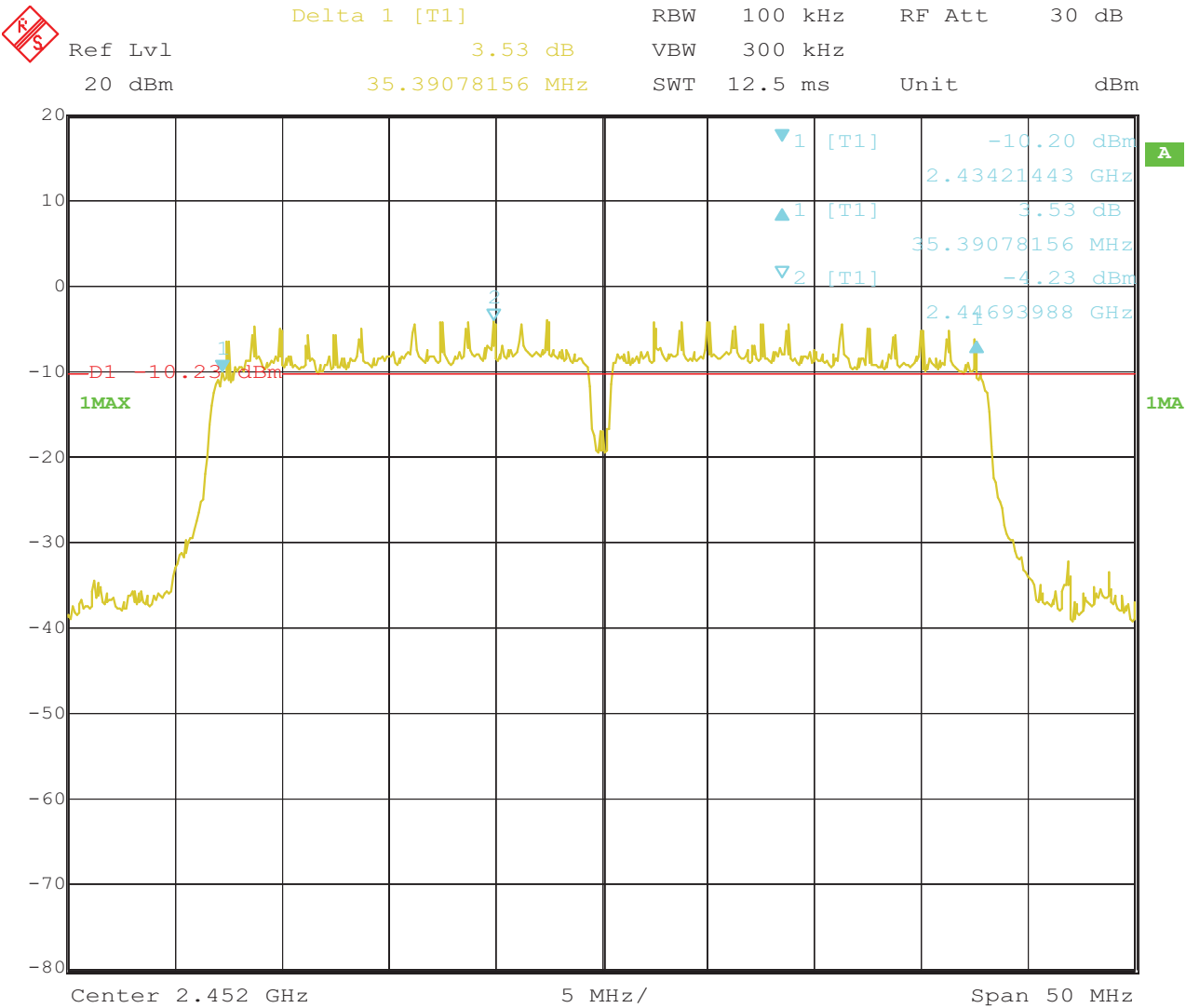
Date: 29.APR.2015 10:19:57

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3. 802.11n at HT40 of CH07



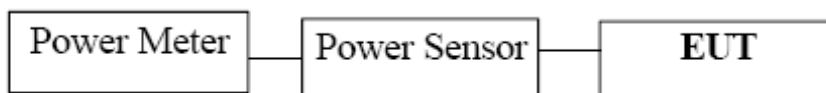
Date: 29.APR.2015 10:21:59

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## 8. Maximum Output Power

### 8.1 Test Setup



### 8.2 Limits of Maximum Output Power

The Maximum 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         | DoorBird                |                         | Model             | DoorBird 1.0 |  |
|-------------|-------------------------|-------------------------|-------------------|--------------|--|
| Mode        | 802.11b                 |                         | Input Voltage     | AC120V       |  |
| Temperature | 24 deg. C,              |                         | Humidity          | 56% RH       |  |
| Channel     | Channel Frequency (MHz) | Max. Power Output (dBm) | Power Limit (dBm) | Pass/ Fail   |  |
| 1           | 2412                    | 19.88                   | 30                | Pass         |  |
| 6           | 2437                    | 20.26                   | 30                | Pass         |  |
| 11          | 2462                    | 20.05                   | 30                | Pass         |  |

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

2. The result basic equation calculation as follow:

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

3. The worse case was recorded

| EUT         | DoorBird                |                         | Model             | DoorBird 1.0 |  |
|-------------|-------------------------|-------------------------|-------------------|--------------|--|
| Mode        | 802.11g                 |                         | Input Voltage     | AC120V       |  |
| Temperature | 24 deg. C,              |                         | Humidity          | 56% RH       |  |
| Channel     | Channel Frequency (MHz) | Max. Power Output (dBm) | Power Limit (dBm) | Pass/ Fail   |  |
| 1           | 2412                    | 16.54                   | 30                | Pass         |  |
| 6           | 2437                    | 17.10                   | 30                | Pass         |  |
| 11          | 2462                    | 17.02                   | 30                | Pass         |  |

Note: 1. At final test to get the worst-case emission at 54Mbps for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

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

3. The worse case was recorded

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| EUT         | DoorBird                |                         | Model             | DoorBird 1.0 |  |
|-------------|-------------------------|-------------------------|-------------------|--------------|--|
| Mode        | 802.11n (HT20)          |                         | Input Voltage     | AC120V       |  |
| Temperature | 24 deg. C,              |                         | Humidity          | 56% RH       |  |
| Channel     | Channel Frequency (MHz) | Max. Power Output (dBm) | Power Limit (dBm) | Pass/ Fail   |  |
| 1           | 2412                    | 16.97                   | 30                | Pass         |  |
| 6           | 2437                    | 17.42                   | 30                | Pass         |  |
| 11          | 2462                    | 17.25                   | 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:  
Max. Power Output = Power Reading + Cable loss + Attenuator  
3. The worse case was recorded

| EUT         | DoorBird                |                         | Model             | DoorBird 1.0 |  |
|-------------|-------------------------|-------------------------|-------------------|--------------|--|
| Mode        | 802.11n (HT40)          |                         | Input Voltage     | AC120V       |  |
| Temperature | 24 deg. C,              |                         | Humidity          | 56% RH       |  |
| Channel     | Channel Frequency (MHz) | Max. Power Output (dBm) | Power Limit (dBm) | Pass/ Fail   |  |
| 1           | 2422                    | 17.07                   | 30                | Pass         |  |
| 4           | 2437                    | 17.37                   | 30                | Pass         |  |
| 7           | 2452                    | 17.47                   | 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:  
Max. Power Output = Power Reading + Cable loss + Attenuator  
3. The worse case was recorded

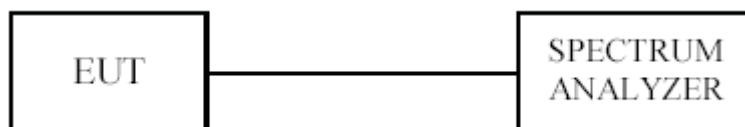
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## 9. Power Spectral Density Measurement

### 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 = 10 kHz.
3. Set the VBW  $\geq$  30 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         |                         | DoorBird       |                            | Model         |                     | DoorBird 1.0 |            |
| Mode        |                         | 802.11b 11Mbps |                            | Input Voltage |                     | AC120V       |            |
| Temperature |                         | 24 deg. C,     |                            | Humidity      |                     | 56% RH       |            |
| Channel     | Channel Frequency (MHz) |                | Final RF Power Level (dBm) |               | Maximum Limit (dBm) |              | Pass/ Fail |
|             |                         |                |                            |               |                     |              |            |
| 11Mbps      |                         |                |                            |               |                     |              |            |
| 1           | 2412                    |                | -4.42                      |               | 8                   |              | Pass       |
| 6           | 2437                    |                | -3.76                      |               | 8                   |              | Pass       |
| 11          | 2462                    |                | -5.56                      |               | 8                   |              | Pass       |

|             |                         |               |                               |               |                     |              |            |
|-------------|-------------------------|---------------|-------------------------------|---------------|---------------------|--------------|------------|
| EUT         |                         | DoorBird      |                               | Model         |                     | DoorBird 1.0 |            |
| Mode        |                         | 802.11b 1Mbps |                               | 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 |
|             |                         |               |                               |               |                     |              |            |
| 1Mbps       |                         |               |                               |               |                     |              |            |
| 1           | 2412                    |               | -5.15                         |               | 8                   |              | Pass       |
| 6           | 2437                    |               | -5.05                         |               | 8                   |              | Pass       |
| 11          | 2462                    |               | -5.47                         |               | 8                   |              | Pass       |

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|             |                         |                |                               |               |                     |              |            |
|-------------|-------------------------|----------------|-------------------------------|---------------|---------------------|--------------|------------|
| EUT         |                         | DoorBird       |                               | Model         |                     | DoorBird 1.0 |            |
| Mode        |                         | 802.11g 54Mbps |                               | 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 |
| 54Mbps      |                         |                |                               |               |                     |              |            |
| 1           | 2412                    |                | -12.23                        |               | 8                   |              | Pass       |
| 6           | 2437                    |                | -11.13                        |               | 8                   |              | Pass       |
| 11          | 2462                    |                | -12.67                        |               | 8                   |              | Pass       |

|             |                         |                      |                            |               |                     |              |            |
|-------------|-------------------------|----------------------|----------------------------|---------------|---------------------|--------------|------------|
| EUT         |                         | DoorBird             |                            | Model         |                     | DoorBird 1.0 |            |
| 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                    |                      | -11.27                     |               | 8                   |              | Pass       |
| 6           | 2437                    |                      | -11.47                     |               | 8                   |              | Pass       |
| 11          | 2462                    |                      | -11.66                     |               | 8                   |              | Pass       |

|             |                         |                      |                            |               |                     |              |            |
|-------------|-------------------------|----------------------|----------------------------|---------------|---------------------|--------------|------------|
| EUT         |                         | DoorBird             |                            | Model         |                     | DoorBird 1.0 |            |
| 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                    |                      | -13.85                     |               | 8                   |              | Pass       |
| 4           | 2437                    |                      | -13.83                     |               | 8                   |              | Pass       |
| 7           | 2452                    |                      | -14.22                     |               | 8                   |              | Pass       |

The report refers only to the sample tested and does not apply to the bulk.

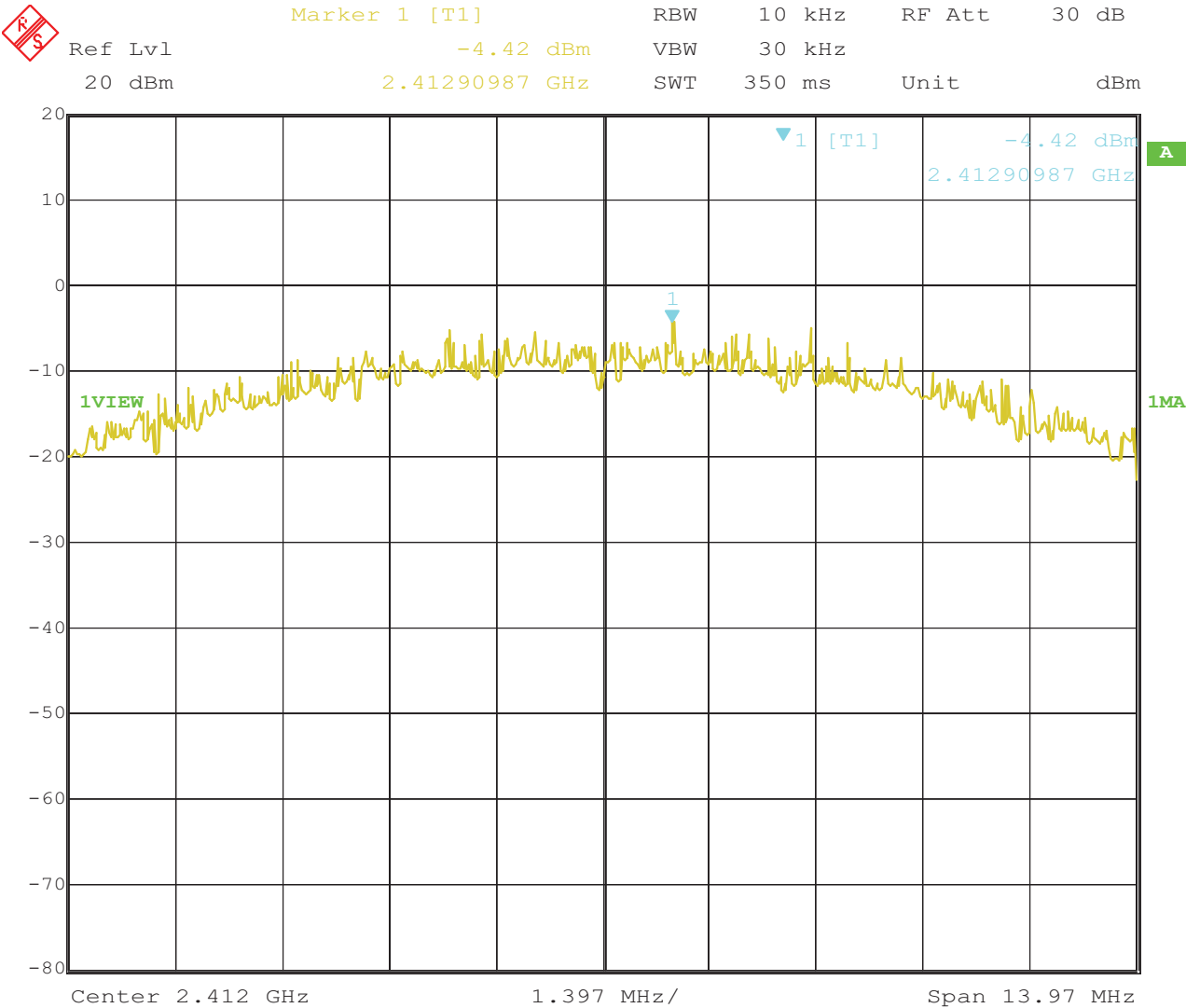
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9.5 Photo of Power Spectral Density Measurement

1.802.11b at 11Mbps of CH01



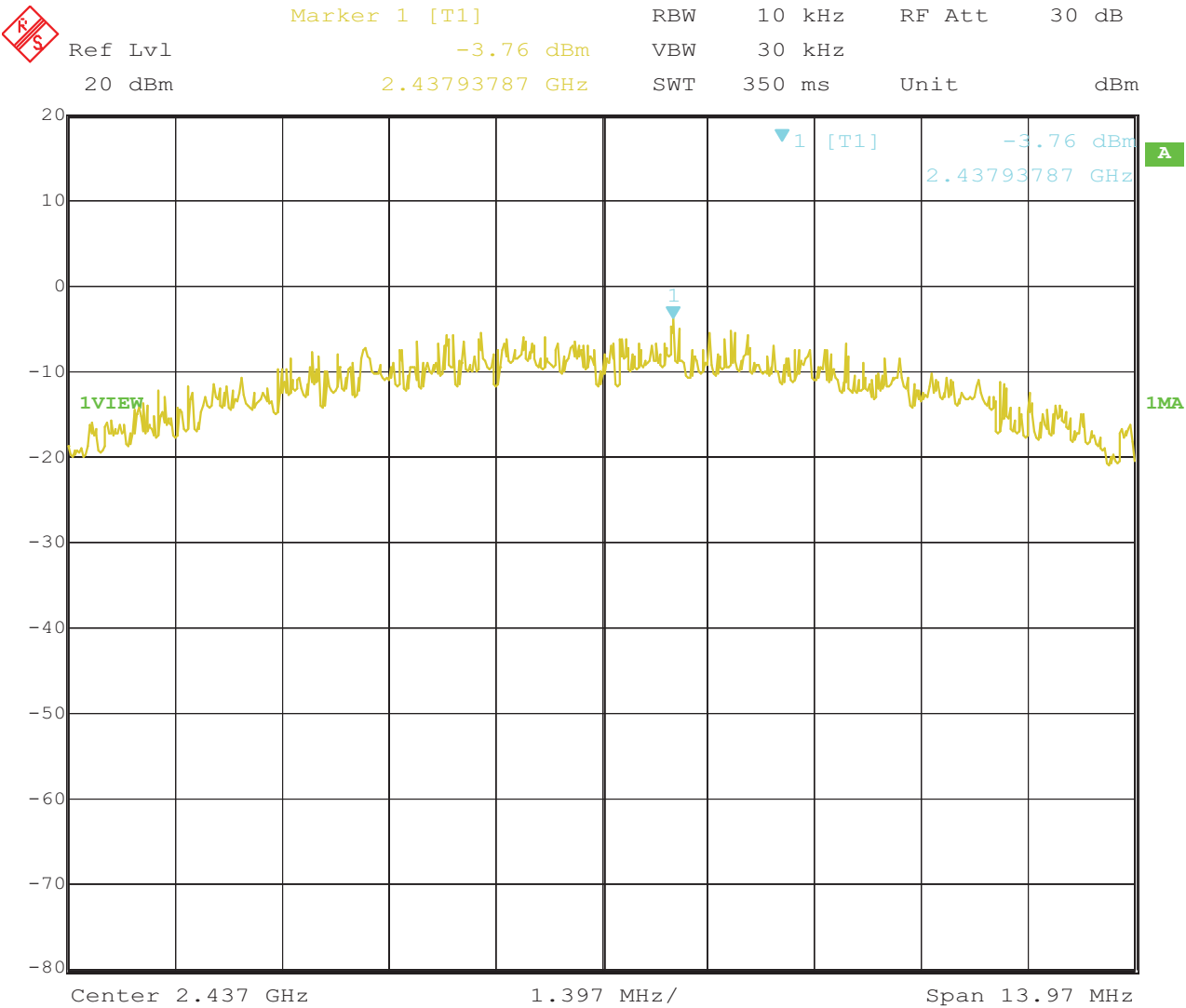
Date: 29.APR.2015 11:15:56

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2. 802.11b at 11Mbps at CH06

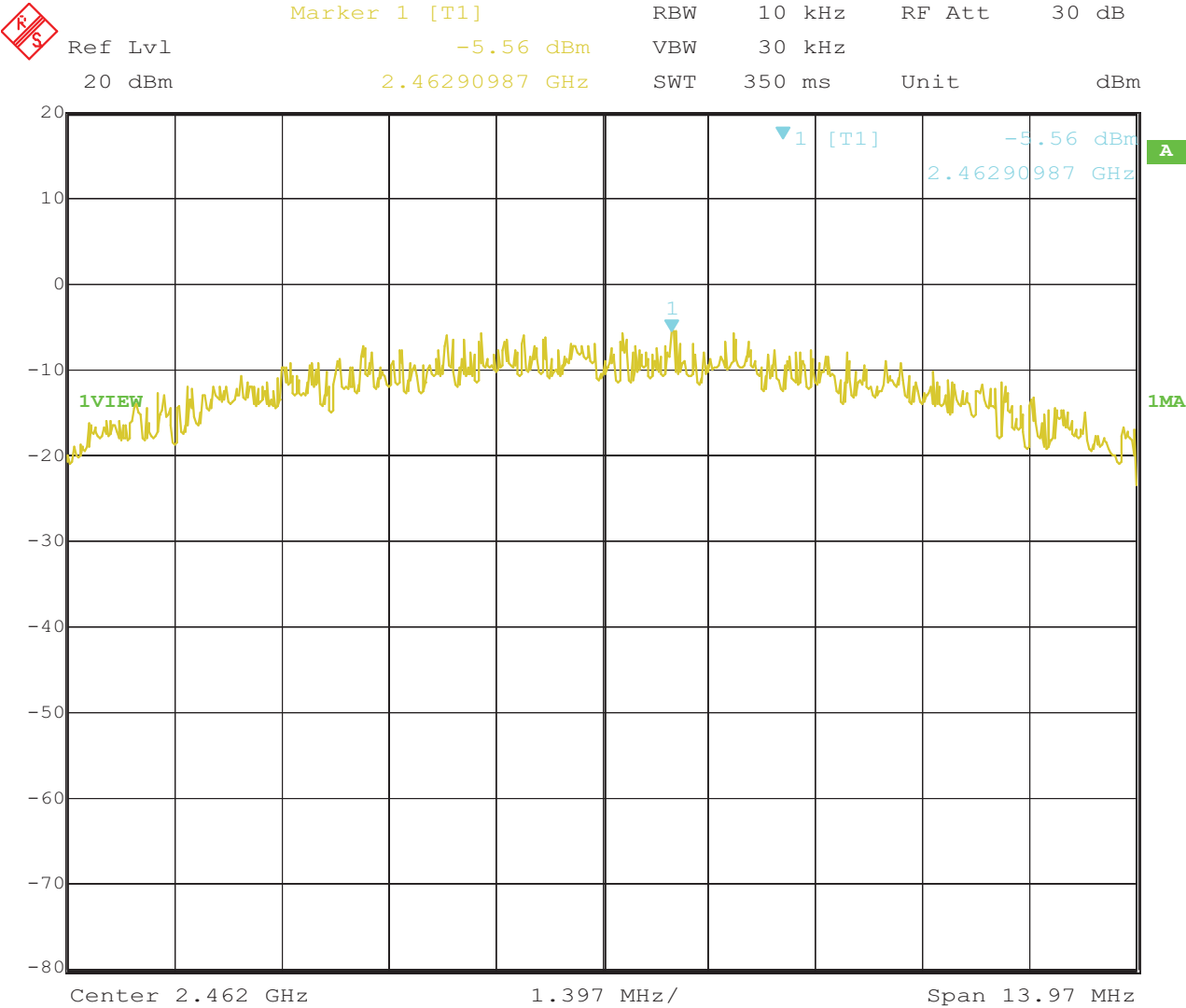


Date: 29.APR.2015 11:17:06

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3. 802.11b at 11Mbps of CH11



Center 2.462 GHz

1.397 MHz/

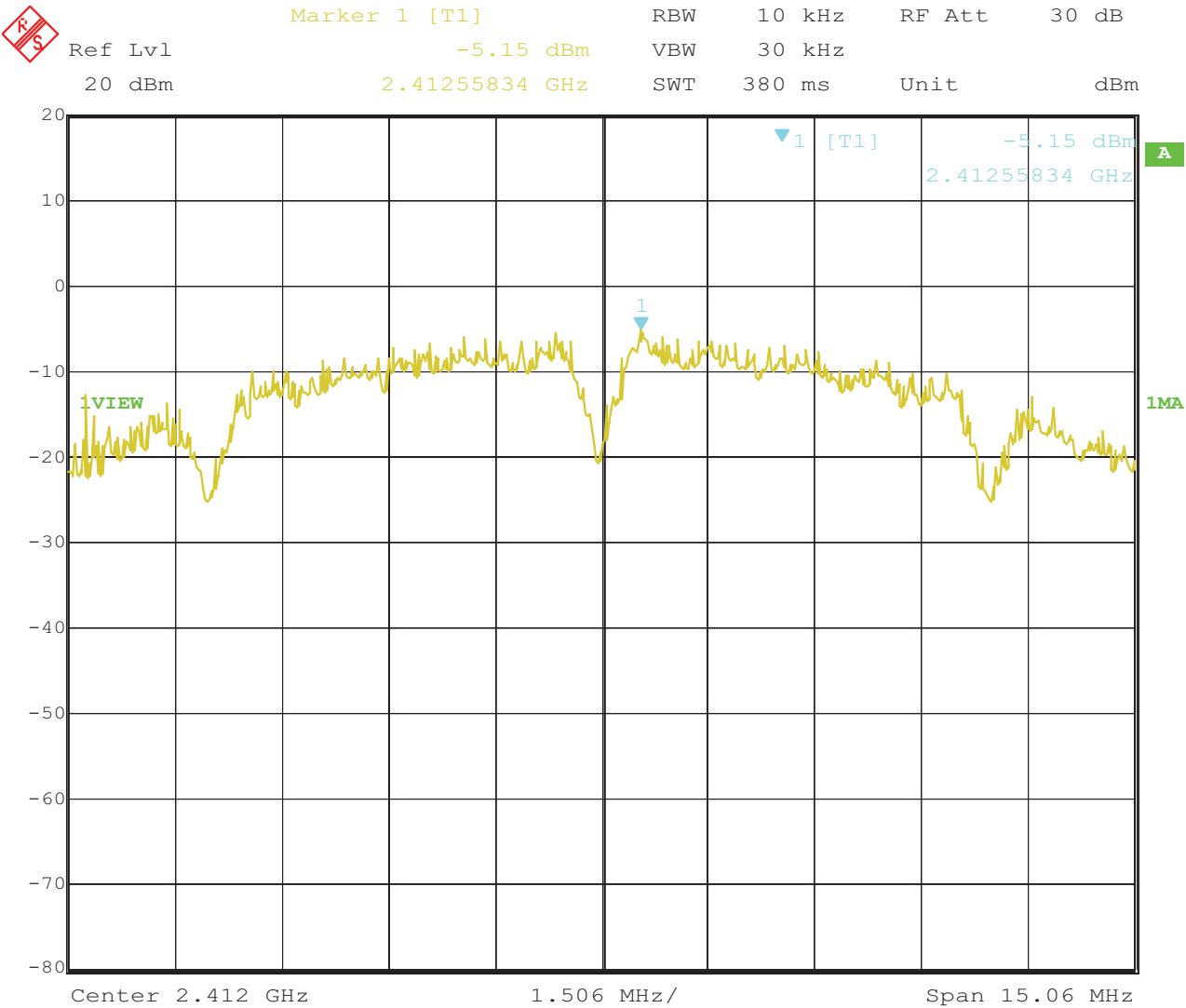
Span 13.97 MHz

Date: 29.APR.2015 11:17:34

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4. 802.11b at 1Mbps of CH1

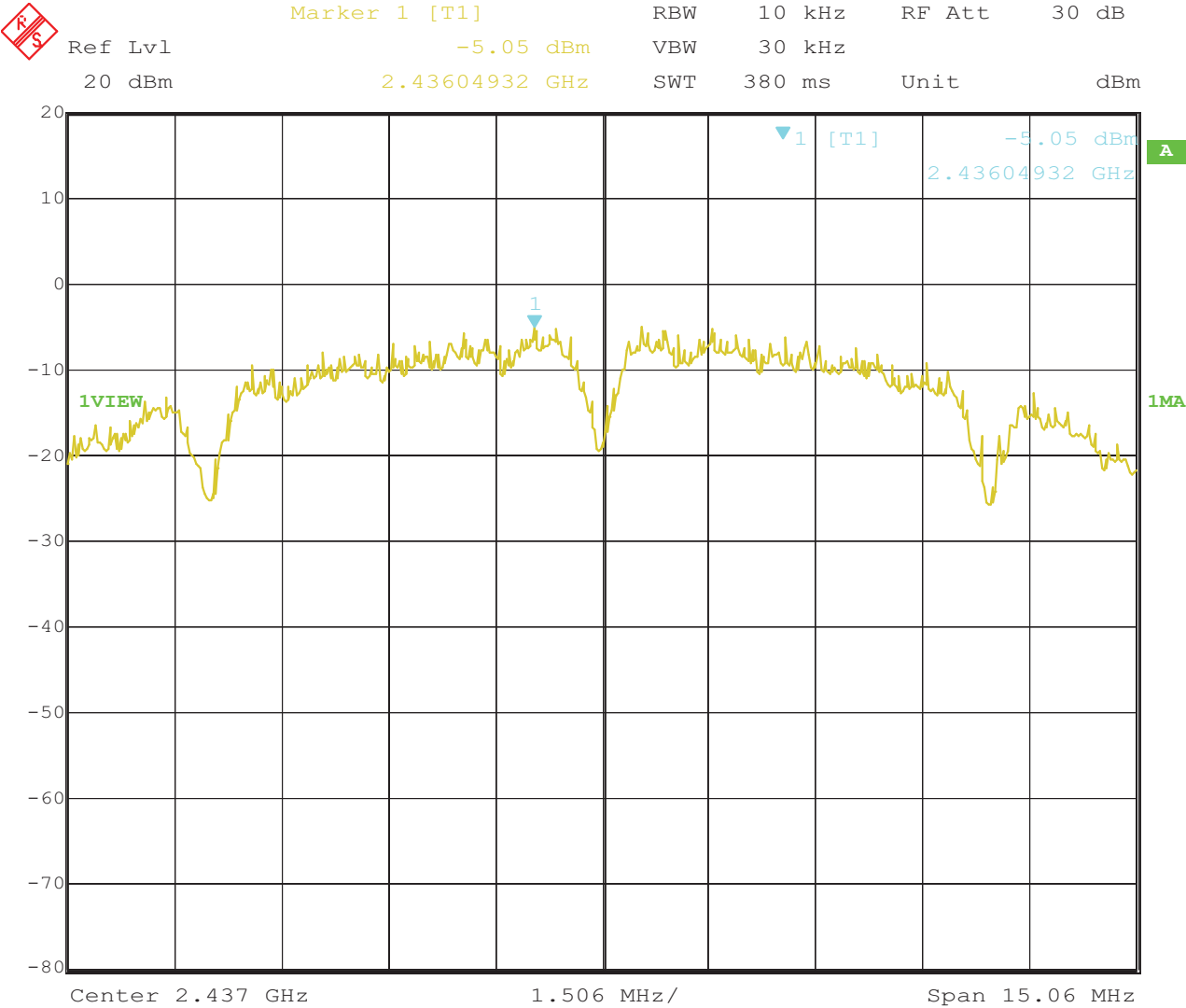


Date: 29.APR.2015 11:20:52

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5. 802.11b at 1Mbps of CH6

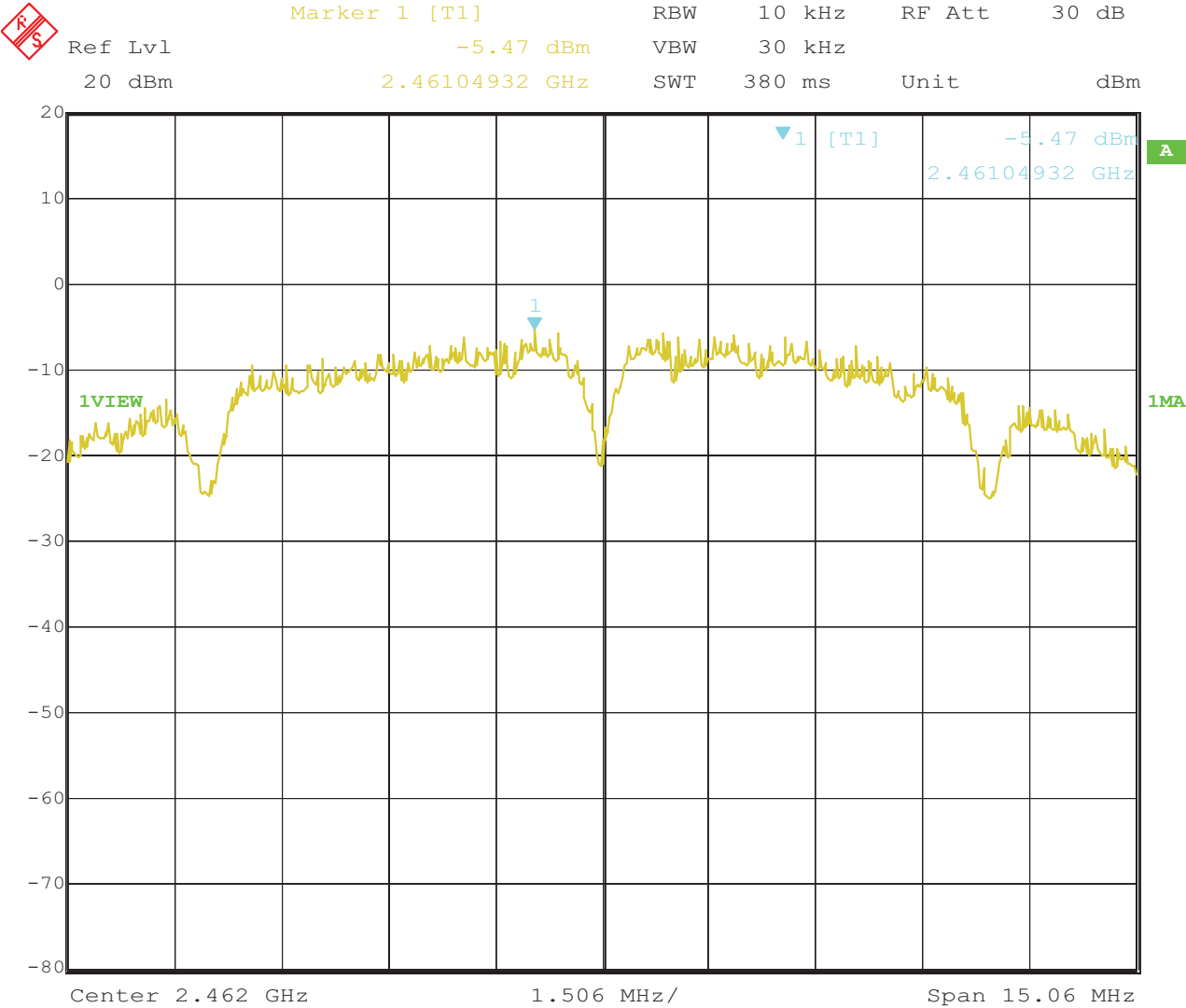


Date: 29.APR.2015 11:21:30

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6. 802.11b at 1Mbps of CH11



Center 2.462 GHz

1.506 MHz/

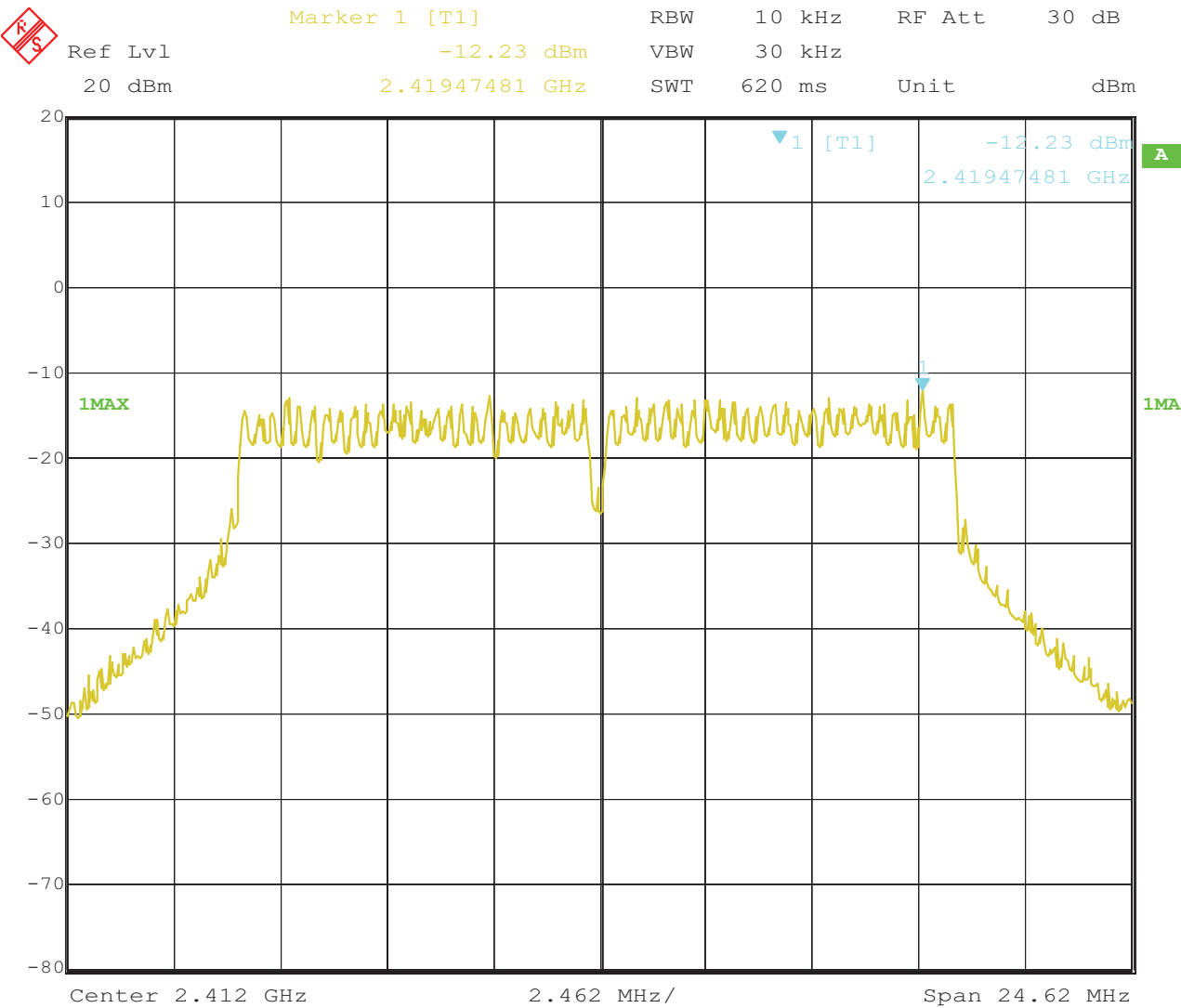
Span 15.06 MHz

Date: 29.APR.2015 11:22:10

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7. 802.11g at 54Mbps of CH1

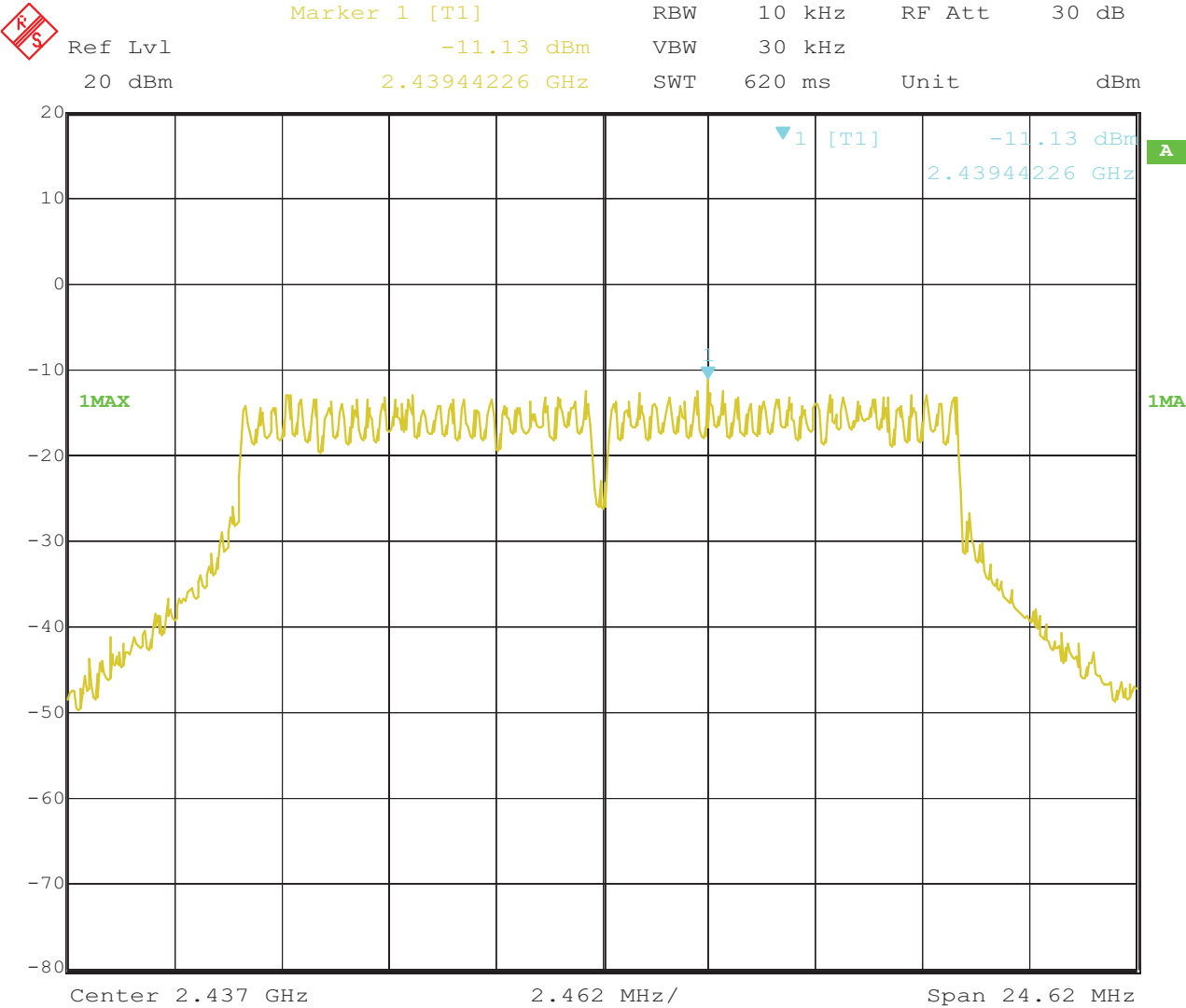


Date: 29.APR.2015 11:19:15

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8. 802.11g at 54Mbps of CH6

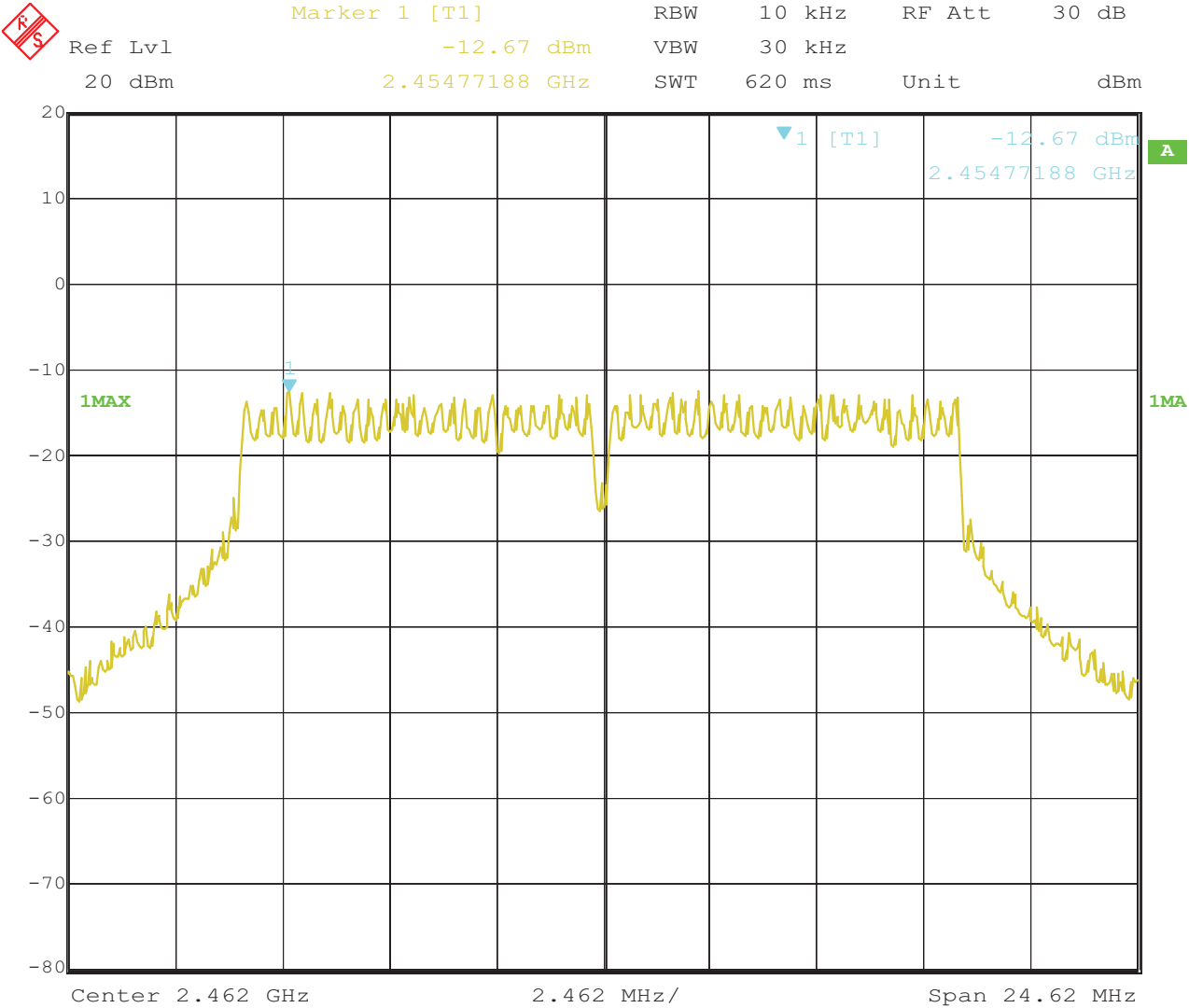


Date: 29.APR.2015 11:18:40

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9. 802.11g at 54Mbps of CH11



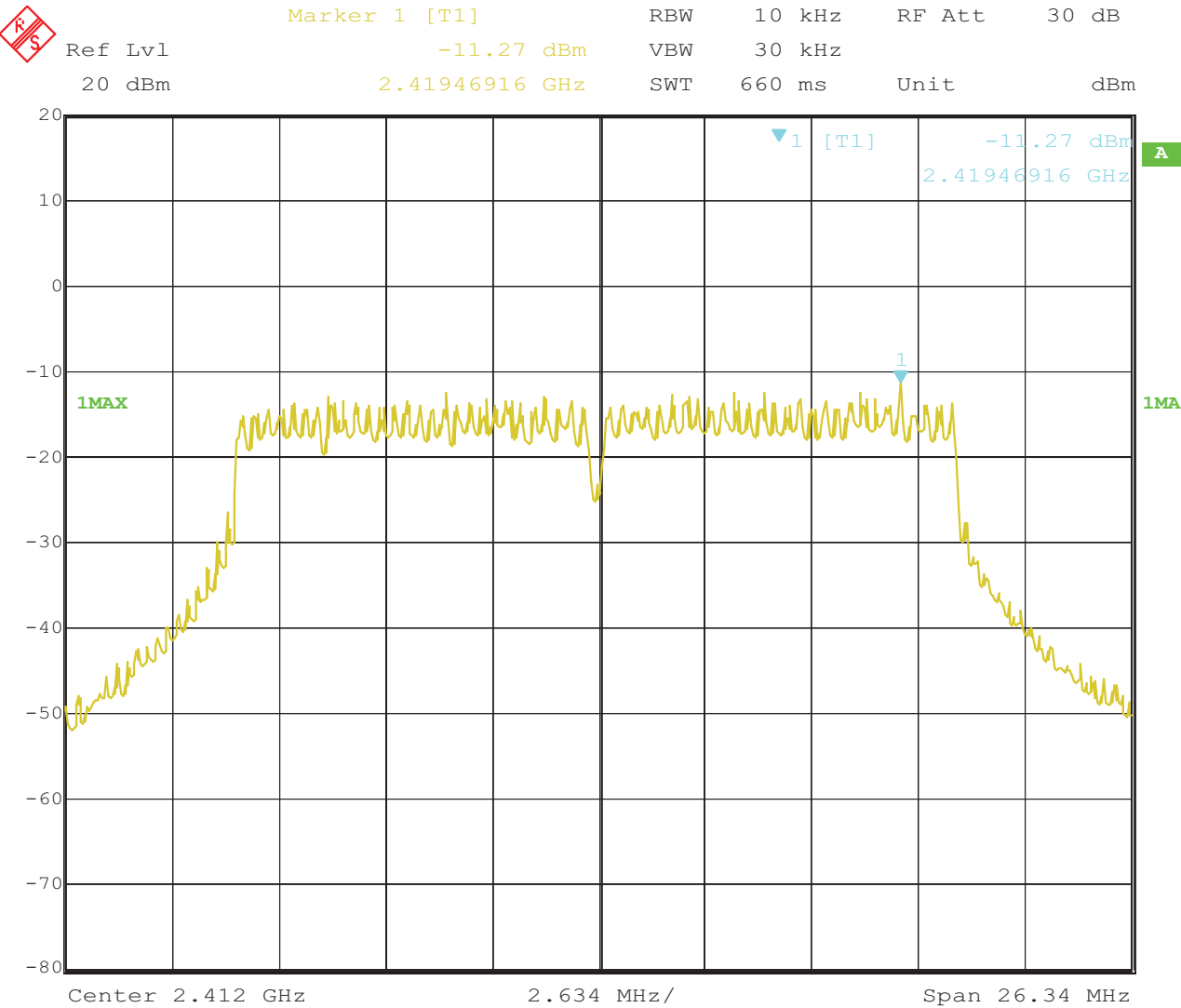
Date: 29.APR.2015 11:18:12

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10. 802.11n at HT20 of CH01

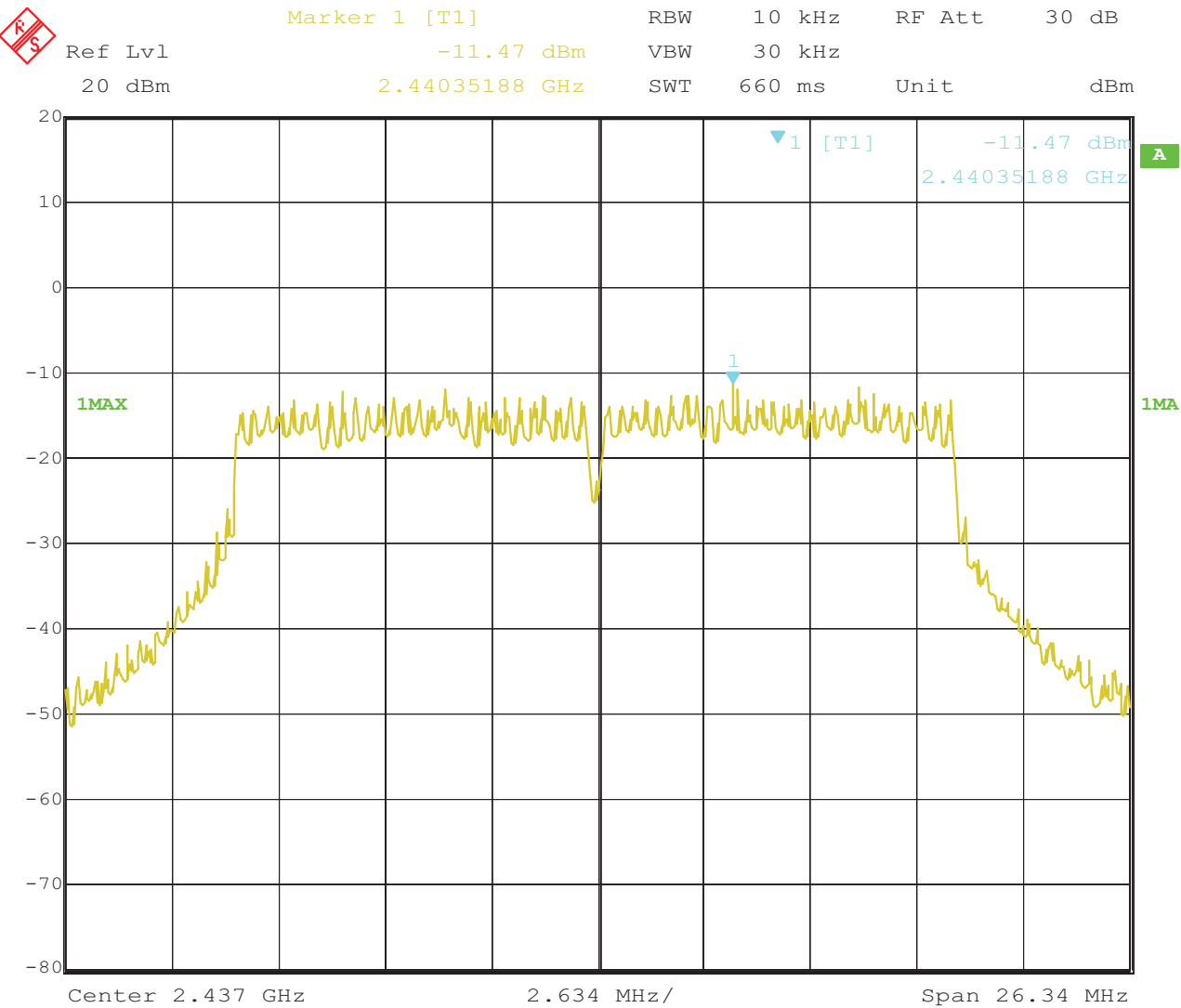


Date:            29.APR.2015    11:24:00

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11. 802.11n at HT20 of CH06

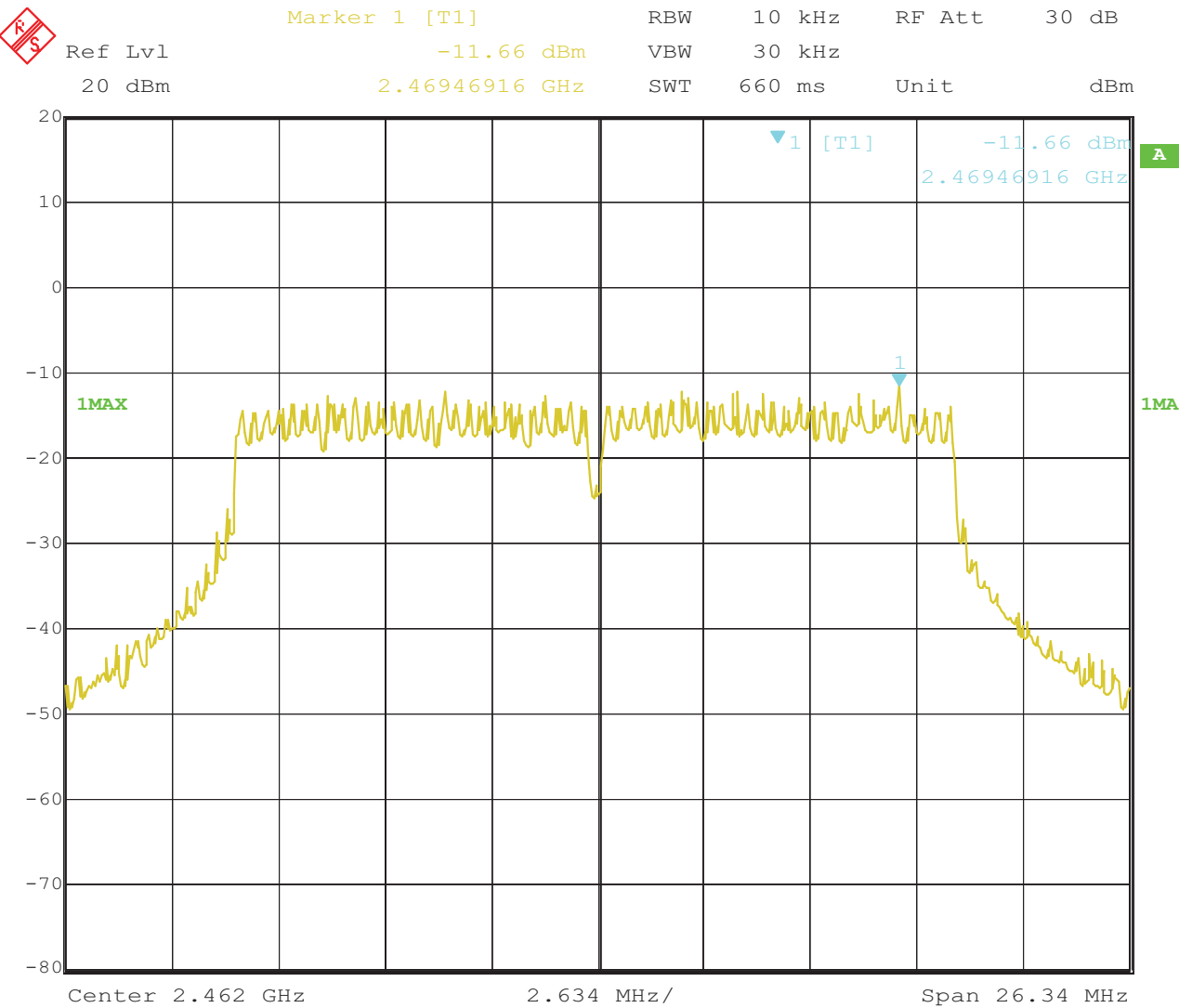


Date: 29.APR.2015 11:23:20

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12. 802.11n at HT20 of CH11

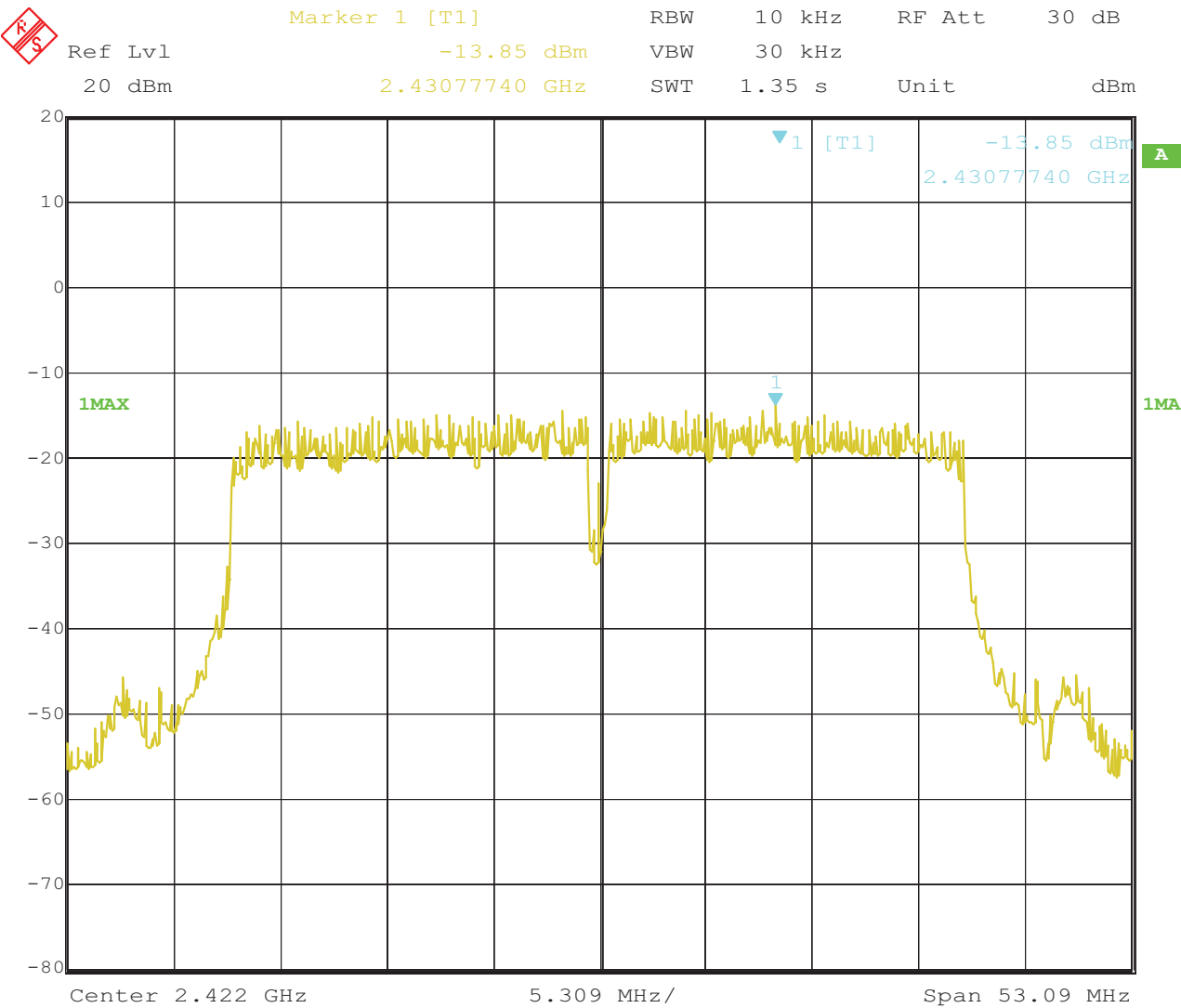


Date: 29.APR.2015 11:22:54

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13. 802.11n at HT40 of CH01



Center 2.422 GHz

5.309 MHz/

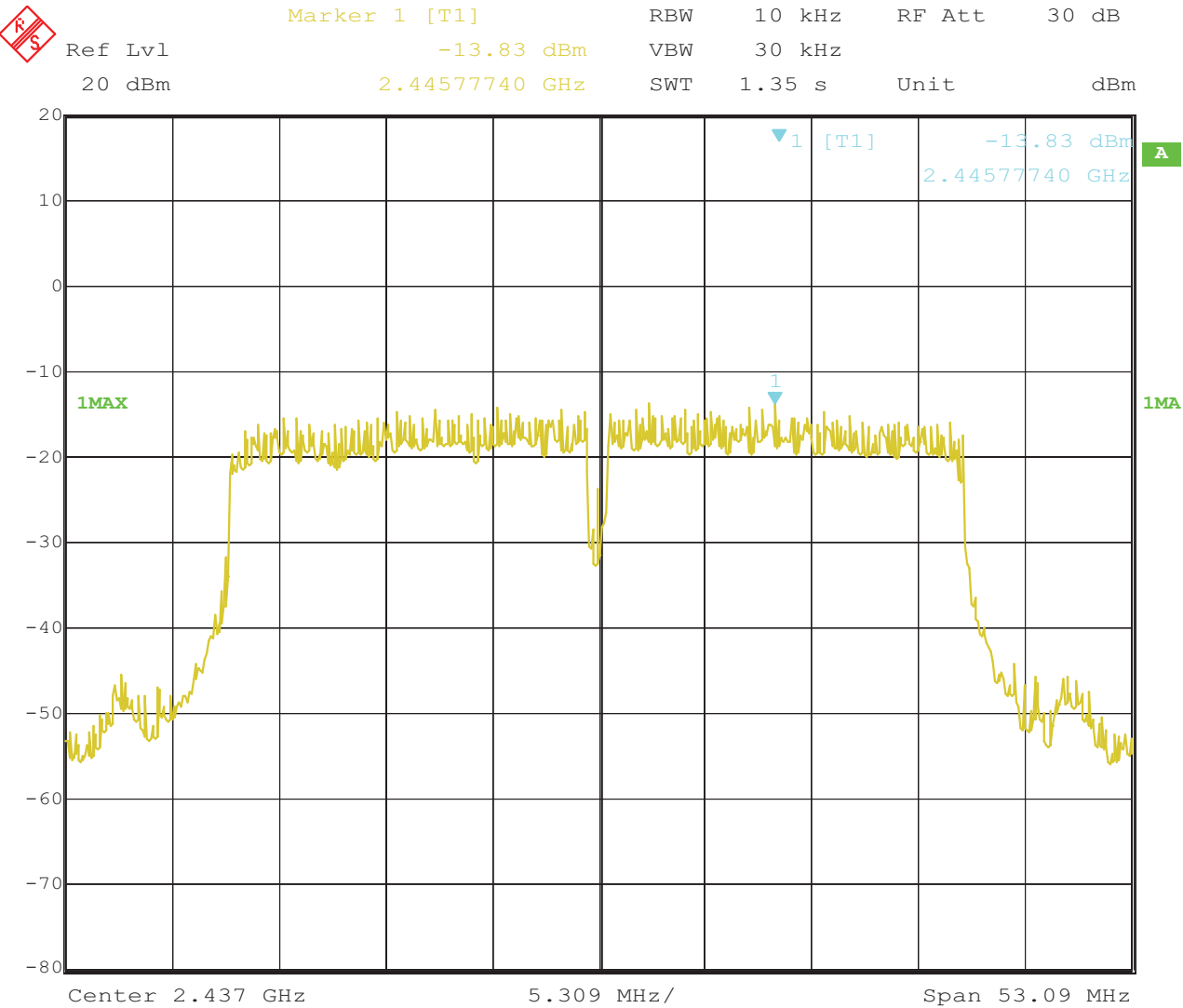
Span 53.09 MHz

Date: 29.APR.2015 11:25:06

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14. 802.11n at HT40 of CH04



Center 2.437 GHz

5.309 MHz/

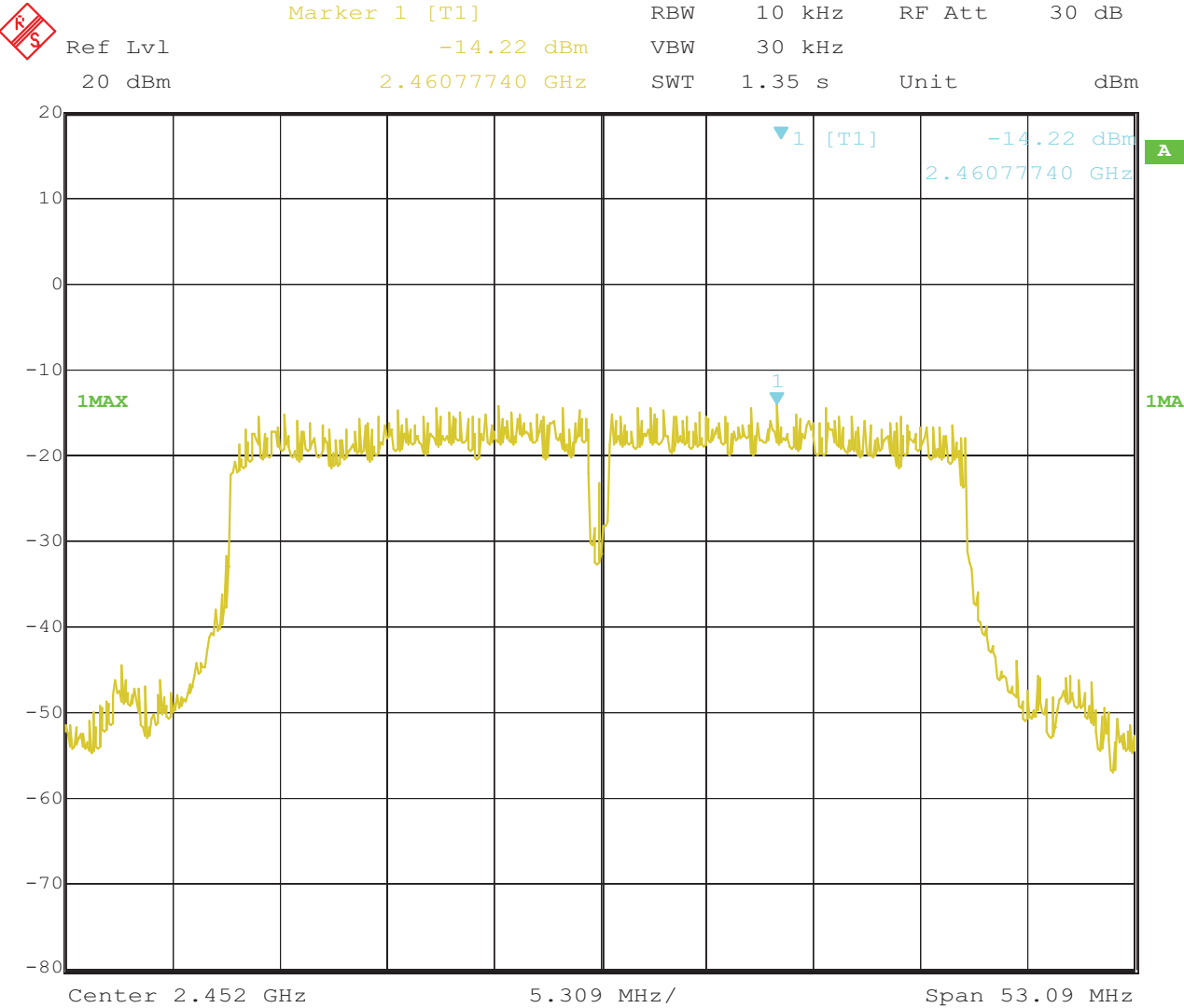
Span 53.09 MHz

Date: 29.APR.2015 11:26:15

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15. 802.11n at HT40 of CH07

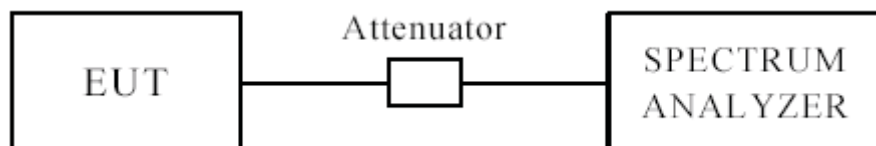


Date: 29.APR.2015 11:26:53

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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  $-20\text{dB}$  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=VBW=1MHz 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: For band-edge measurement, the frequency from 30MHz-25GHz was tested. And It met the FCC rule.

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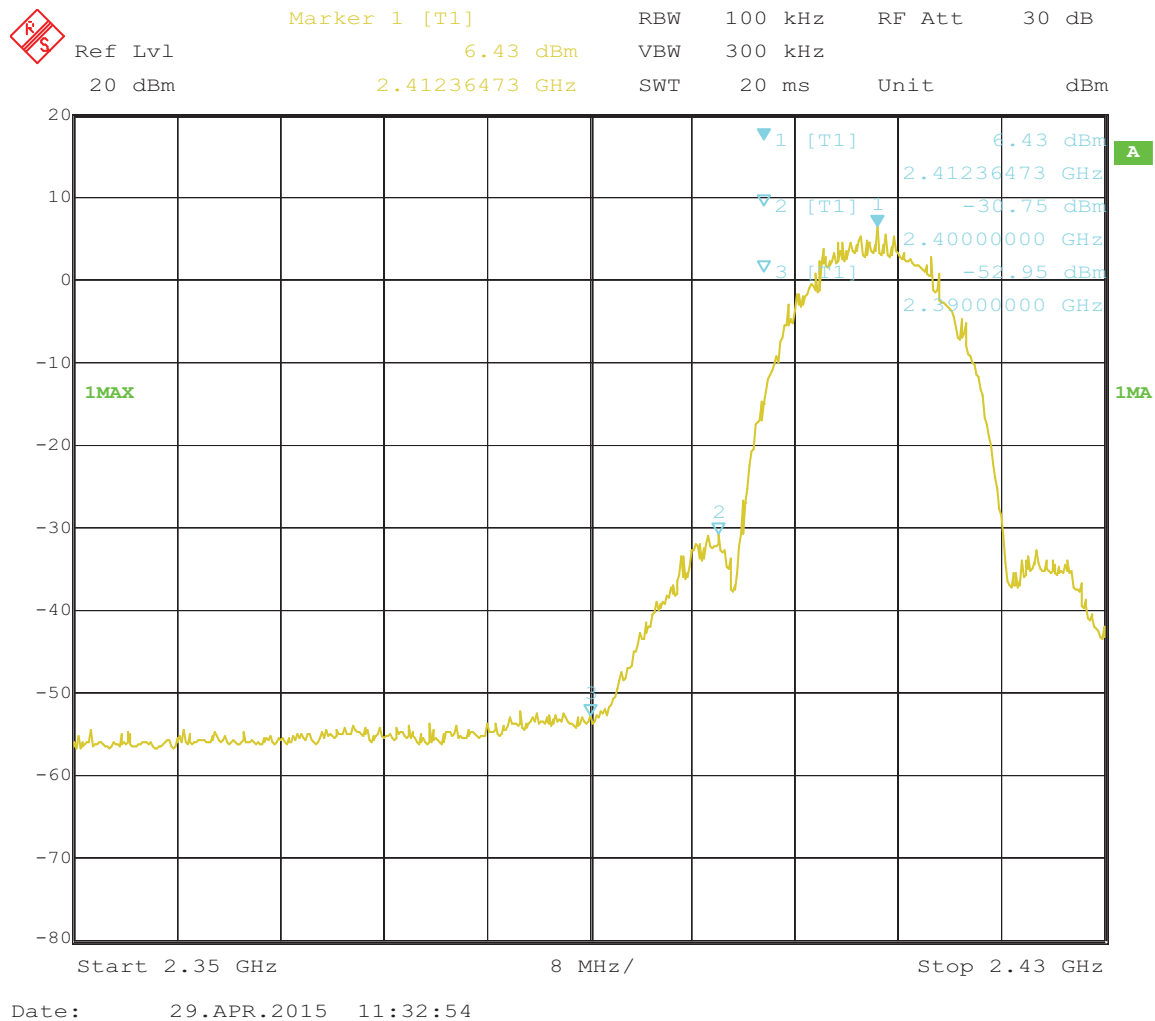
For 802.11b mode

CH01 at 11Mbps

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

|              |                      |      |               |              |
|--------------|----------------------|------|---------------|--------------|
| EUT          | DoorBird             |      | Model         | DoorBird 1.0 |
| Mode         | Keeping Transmitting |      | Input Voltage | AC120V       |
| Temperature  | 24 deg. C,           |      | Humidity      | 56% RH       |
| Test Result: | Pass                 |      | Detector      | PK           |
| 2400         | PK (dBμV/m)          | 66.5 | Limit         | 74(dBμV/m)   |
|              | AV (dBμV/m)          | 46.1 |               | 54(dBμV/m)   |
| 2390         | PK (dBμV/m)          | 47.1 | 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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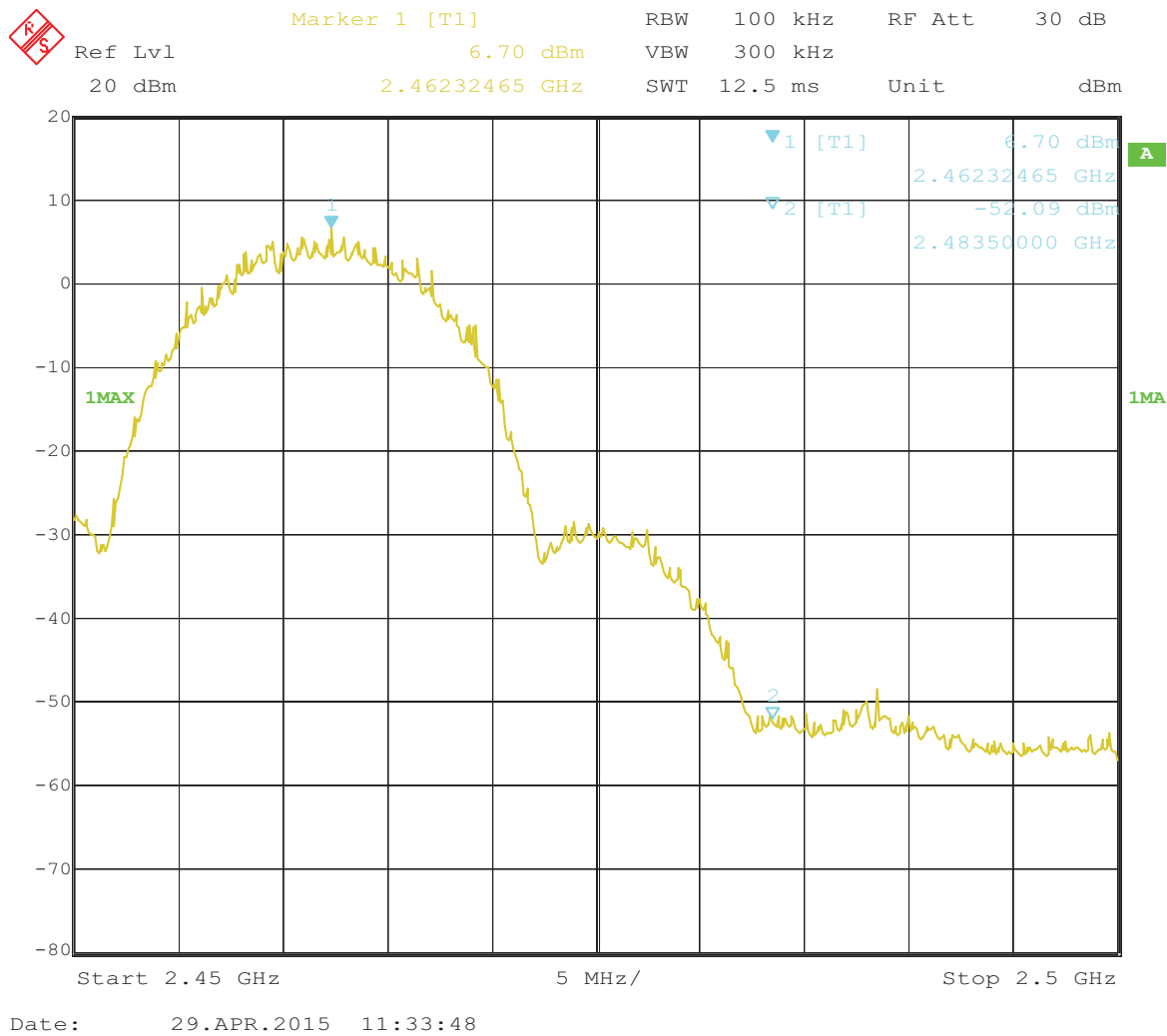


CH11 at 11Mbps

10.4 Band-edge and Restricted band Measurement

|              |                      |      |               |              |
|--------------|----------------------|------|---------------|--------------|
| EUT          | DoorBird             |      | Model         | DoorBird 1.0 |
| Mode         | Keeping Transmitting |      | Input Voltage | AC120V       |
| Temperature  | 24 deg. C,           |      | Humidity      | 56% RH       |
| Test Result: | Pass                 |      | Detector      | PK           |
| 2483.5       | PK (dBμV/m)          | 47.7 | 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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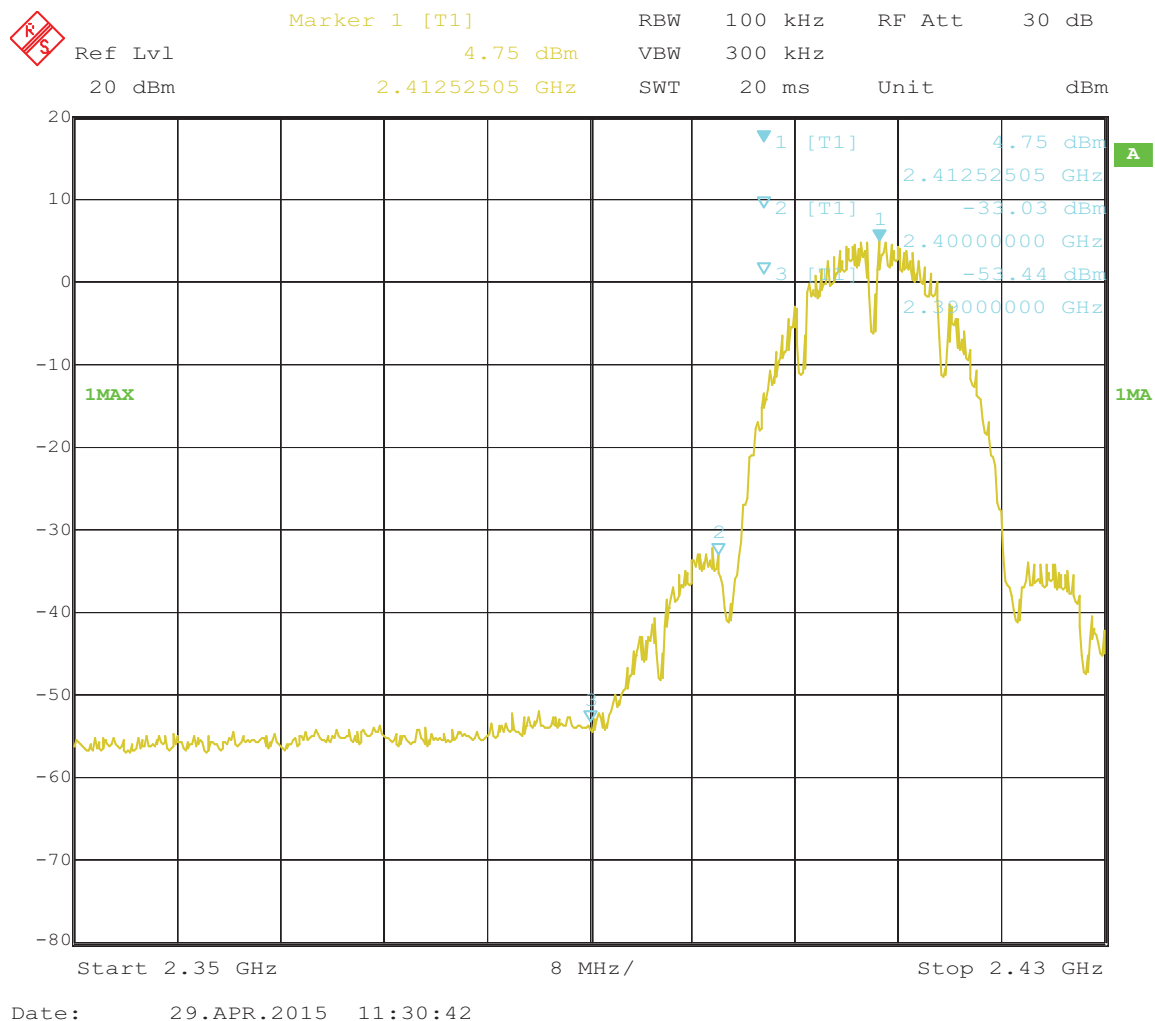
For 802.11b mode

CH01 at 1Mbps

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

|              |                      |      |               |              |
|--------------|----------------------|------|---------------|--------------|
| EUT          | DoorBird             |      | Model         | DoorBird 1.0 |
| Mode         | Keeping Transmitting |      | Input Voltage | AC120V       |
| Temperature  | 24 deg. C,           |      | Humidity      | 56% RH       |
| Test Result: | Pass                 |      | Detector      | PK           |
| 2400         | PK (dBμV/m)          | 67.4 | Limit         | 74(dBμV/m)   |
|              | AV (dBμV/m)          | 46.8 |               | 54(dBμV/m)   |
| 2390         | PK (dBμV/m)          | 48.6 | Limit         | 74(dBμV/m)   |
|              | AV (dBμV/m)          | --   |               | 54(dBμV/m)   |

Test Figure:



Date: 29.APR.2015 11:30:42

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

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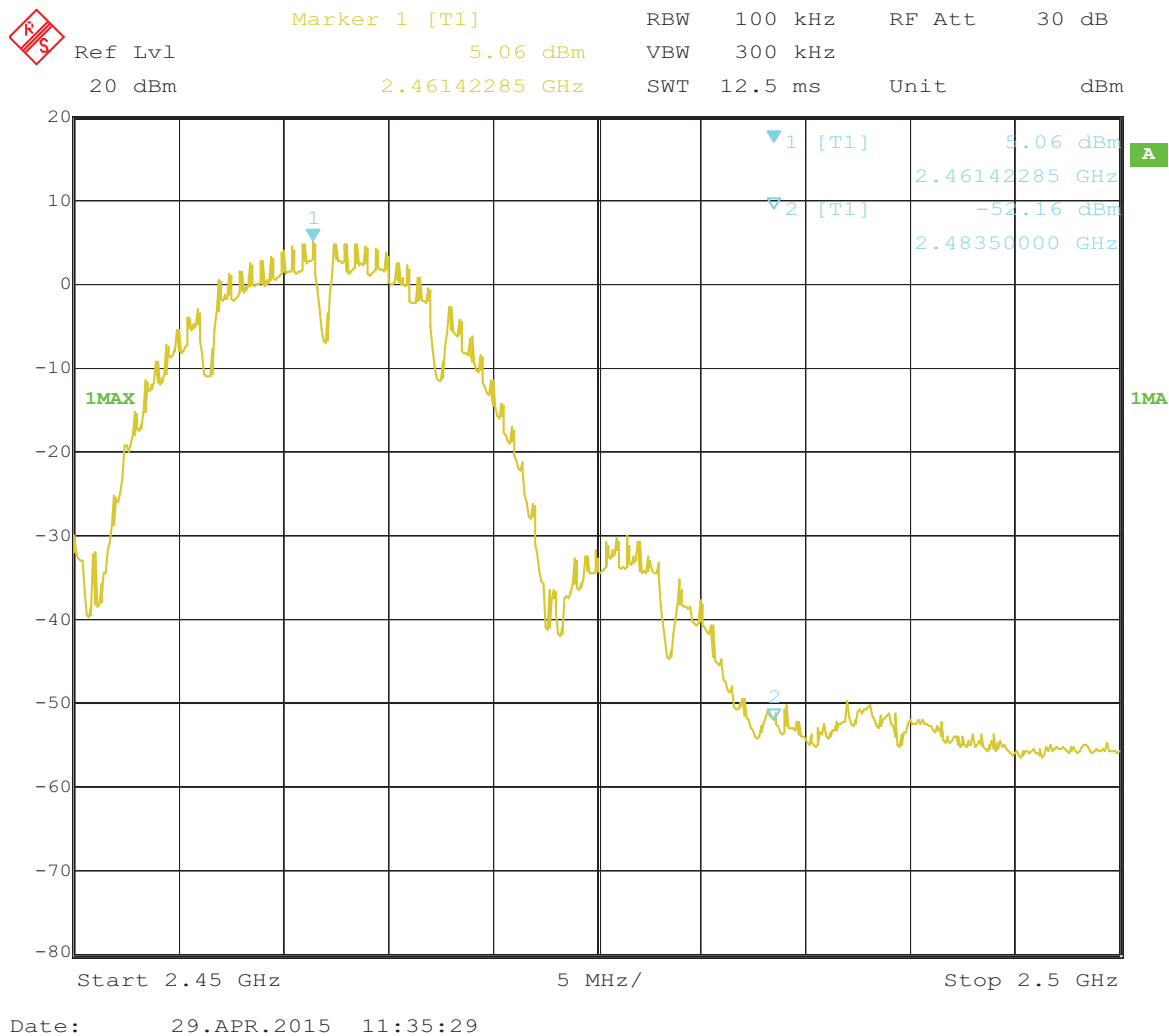


CH11 at 1Mbps

10.4 Band-edge and Restricted band Measurement

|              |                      |      |               |              |
|--------------|----------------------|------|---------------|--------------|
| EUT          | DoorBird             |      | Model         | DoorBird 1.0 |
| Mode         | Keeping Transmitting |      | Input Voltage | AC120V       |
| Temperature  | 24 deg. C,           |      | Humidity      | 56% RH       |
| Test Result: | Pass                 |      | Detector      | PK           |
| 2483.5       | PK (dBμV/m)          | 48.3 | 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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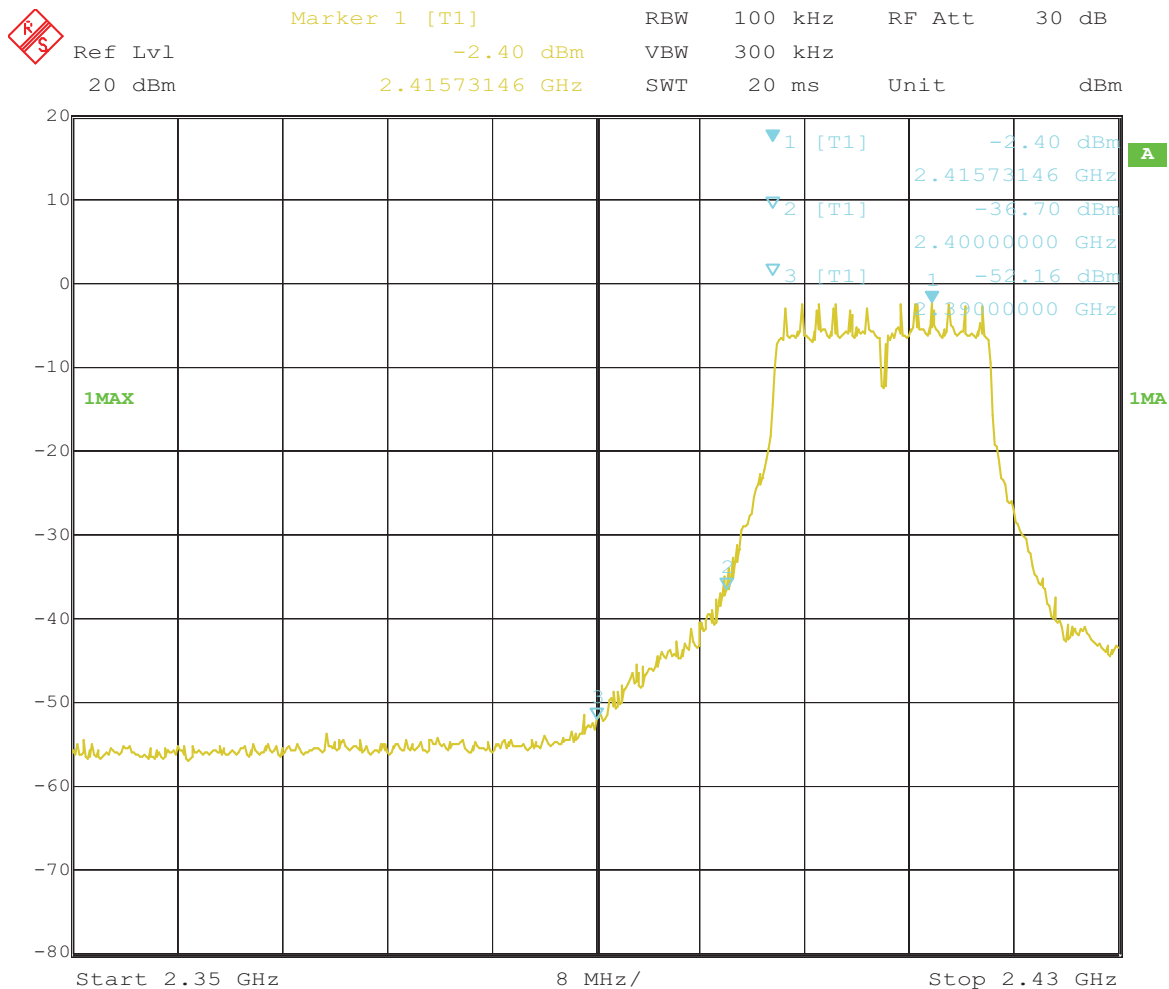


For 802.11g mode  
CH01 at 54Mbps

10.4 Band-edge and Restricted band Measurement

|              |                      |      |               |              |
|--------------|----------------------|------|---------------|--------------|
| EUT          | DoorBird             |      | Model         | DoorBird 1.0 |
| Mode         | Keeping Transmitting |      | Input Voltage | AC120V       |
| Temperature  | 24 deg. C,           |      | Humidity      | 56% RH       |
| Test Result: | Pass                 |      | Detector      | PK           |
| 2400         | PK (dBμV/m)          | 68.7 | Limit         | 74(dBμV/m)   |
|              | AV (dBμV/m)          | 49.4 |               | 54(dBμV/m)   |
| 2390         | PK (dBμV/m)          | 50.2 | Limit         | 74(dBμV/m)   |
|              | AV (dBμV/m)          | --   |               | 54(dBμV/m)   |

Test Figure:



Date: 29.APR.2015 11:31:50

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

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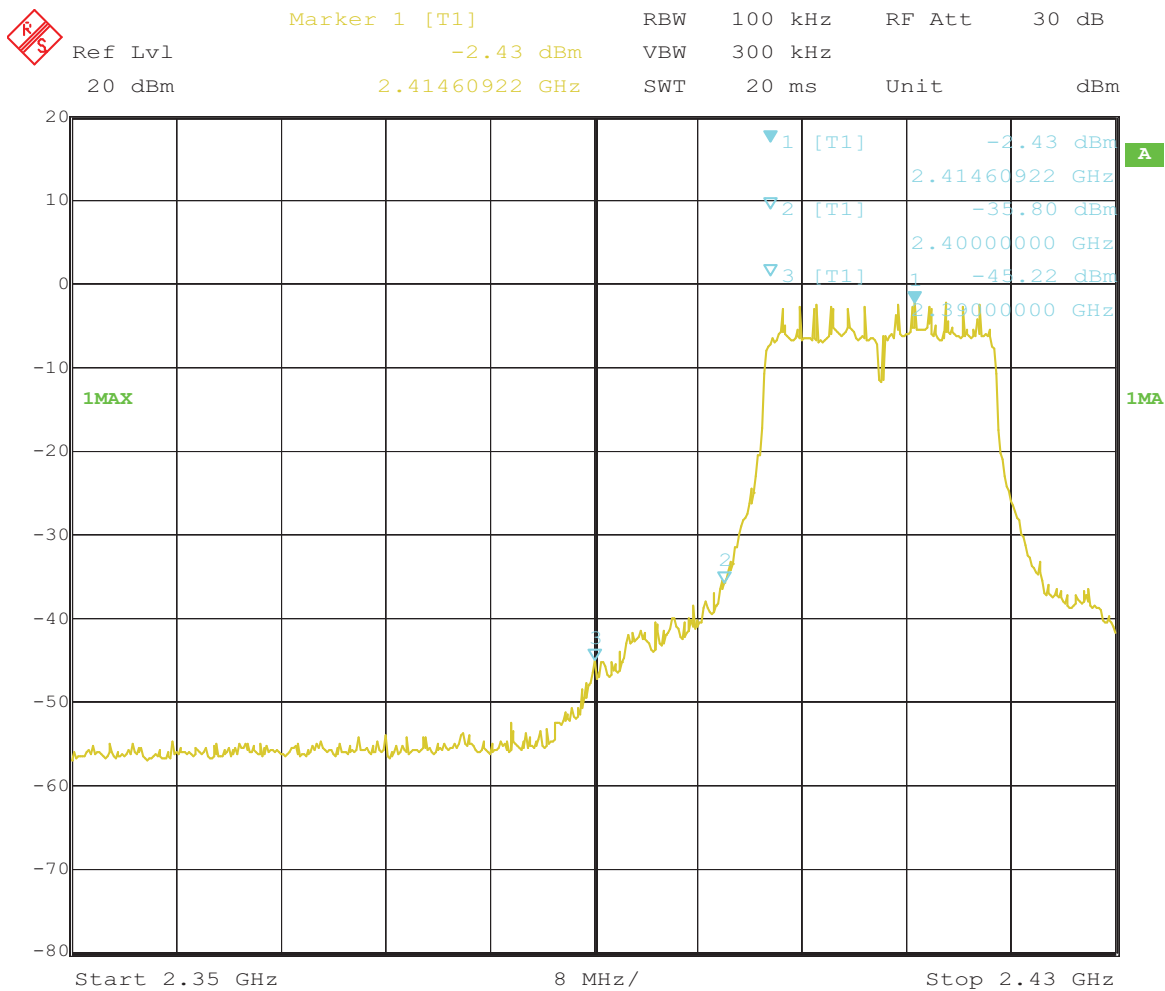
For 802.11n (HT20) mode

CH01 at 6.5Mbps

10.4 Band-edge and Restricted band Measurement

|              |                      |      |               |              |
|--------------|----------------------|------|---------------|--------------|
| EUT          | DoorBird             |      | Model         | DoorBird 1.0 |
| Mode         | Keeping Transmitting |      | Input Voltage | AC120V       |
| Temperature  | 24 deg. C,           |      | Humidity      | 56% RH       |
| Test Result: | Pass                 |      | Detector      | PK           |
| 2400         | PK (dBμV/m)          | 69.6 | Limit         | 74(dBμV/m)   |
|              | AV (dBμV/m)          | 49.3 |               | 54(dBμV/m)   |
| 2390         | PK (dBμV/m)          | 50.6 | Limit         | 74(dBμV/m)   |
|              | AV (dBμV/m)          | --   |               | 54(dBμV/m)   |

Test Figure:



Date: 29.APR.2015 11:29:46

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

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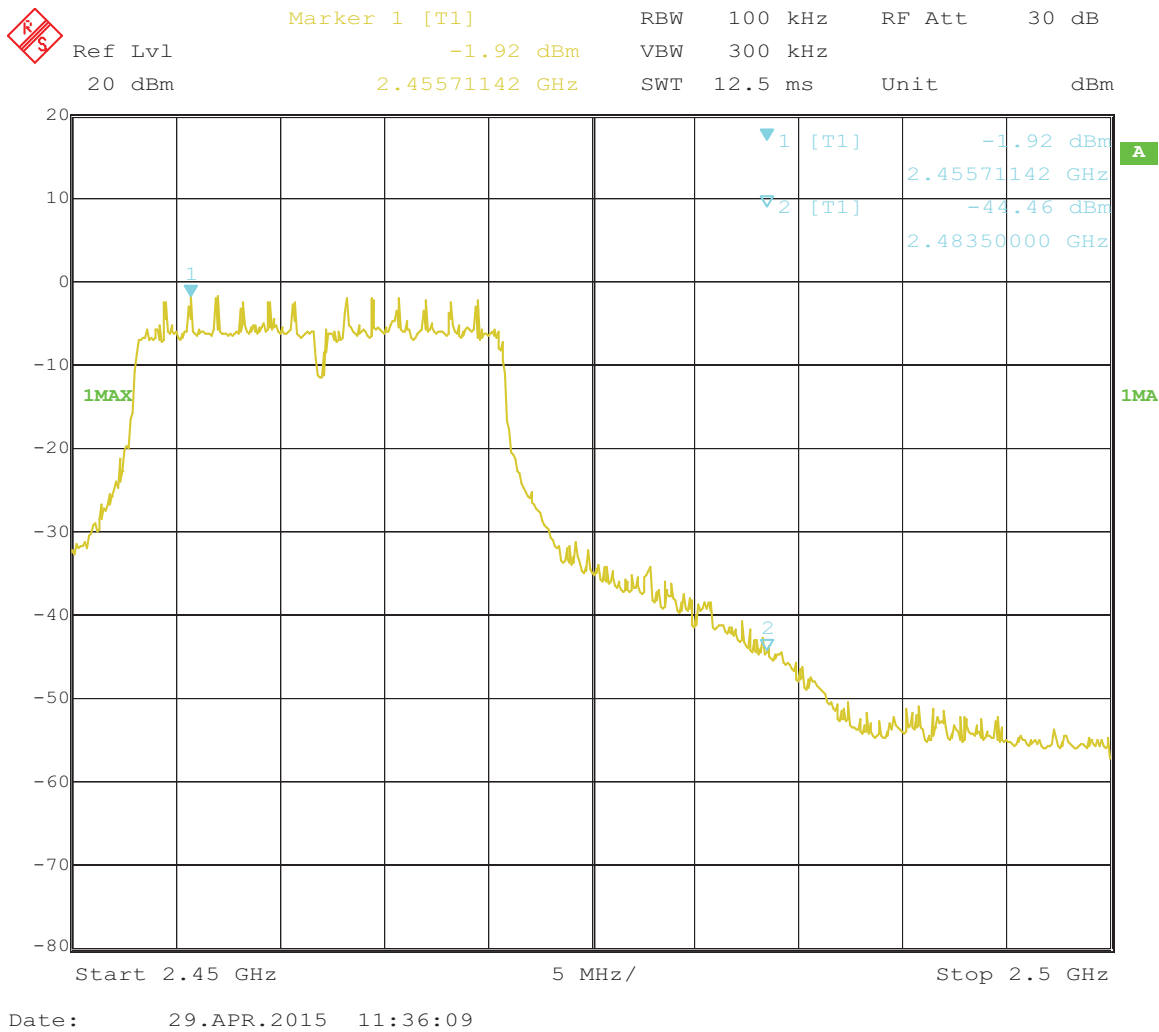


CH11 at 6.5Mbps

10.4 Band-edge and Restricted band Measurement

|              |                      |      |               |              |
|--------------|----------------------|------|---------------|--------------|
| EUT          | DoorBird             |      | Model         | DoorBird 1.0 |
| Mode         | Keeping Transmitting |      | Input Voltage | AC120V       |
| Temperature  | 24 deg. C,           |      | Humidity      | 56% RH       |
| Test Result: | Pass                 |      | Detector      | PK           |
| 2483.5       | PK (dBμV/m)          | 56.5 | Limit         | 74(dBμV/m)   |
|              | AV (dBμV/m)          | 37.2 |               | 54(dBμV/m)   |

Test Figure:



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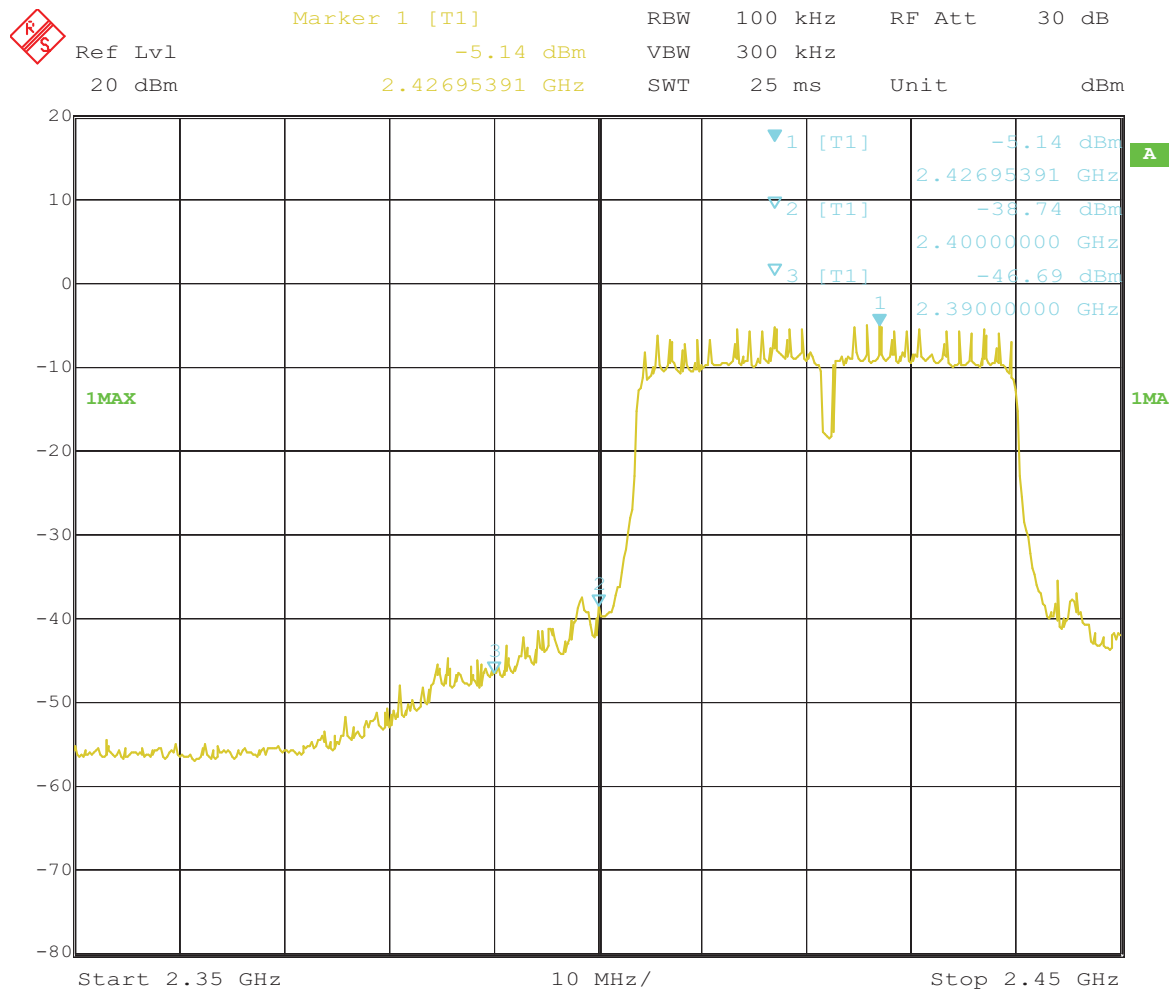
For 802.11n (HT40) mode

CH01 at 6.5Mbps

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

|              |                      |      |               |              |
|--------------|----------------------|------|---------------|--------------|
| EUT          | DoorBird             |      | Model         | DoorBird 1.0 |
| Mode         | Keeping Transmitting |      | Input Voltage | AC120V       |
| Temperature  | 24 deg. C,           |      | Humidity      | 56% RH       |
| Test Result: | Pass                 |      | Detector      | PK           |
| 2400         | PK (dBμV/m)          | 68.5 | Limit         | 74(dBμV/m)   |
|              | AV (dBμV/m)          | 47.8 |               | 54(dBμV/m)   |
| 2390         | PK (dBμV/m)          | 54.6 | Limit         | 74(dBμV/m)   |
|              | AV (dBμV/m)          | 35.3 |               | 54(dBμV/m)   |

**Test Figure:**



Date: 29.APR.2015 11:28:39

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

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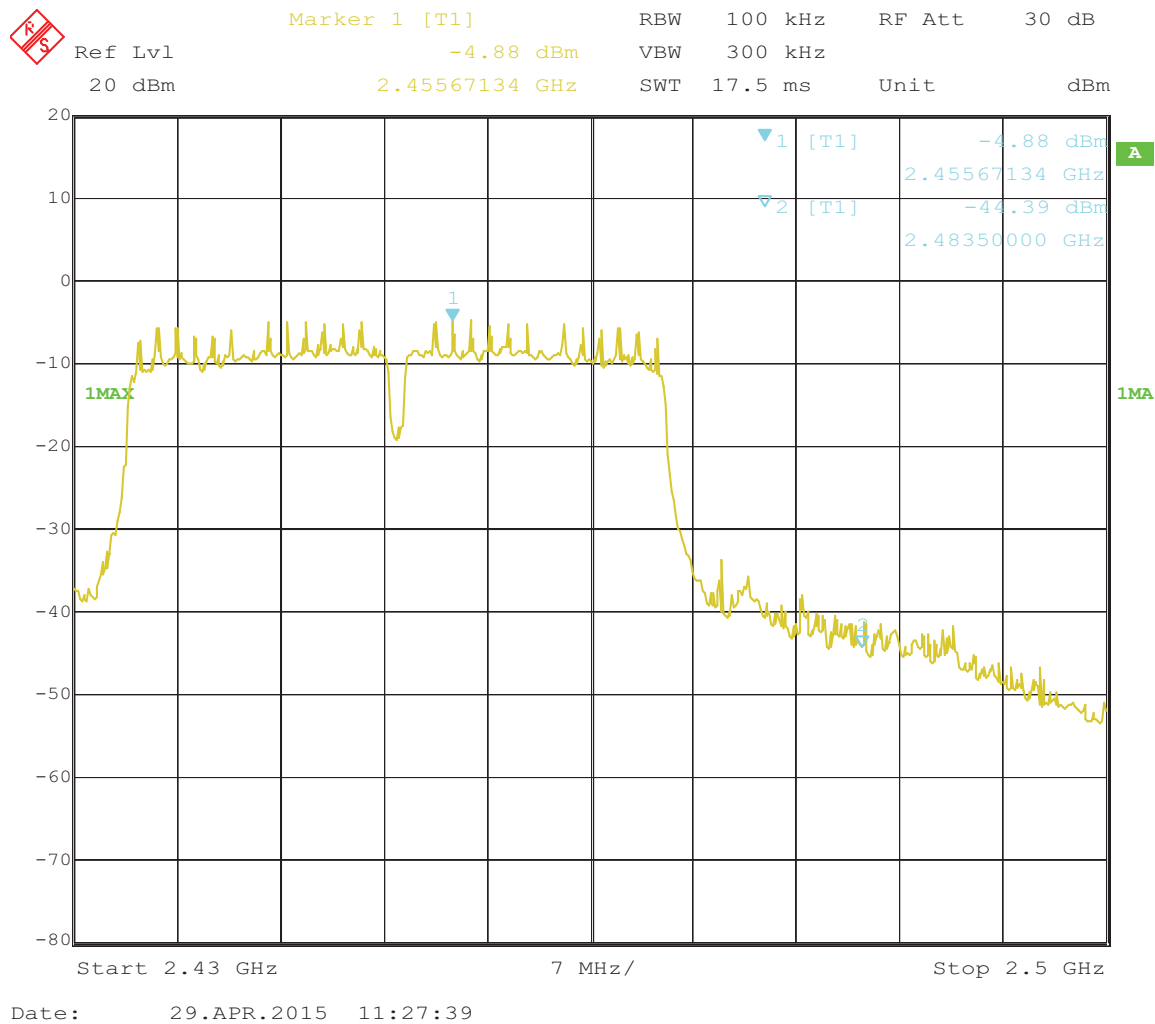


CH7 at 6.5Mbps

10.4 Band-edge and Restricted band Measurement

|              |                      |      |               |              |
|--------------|----------------------|------|---------------|--------------|
| EUT          | DoorBird             |      | Model         | DoorBird 1.0 |
| Mode         | Keeping Transmitting |      | Input Voltage | AC120V       |
| Temperature  | 24 deg. C,           |      | Humidity      | 56% RH       |
| Test Result: | Pass                 |      | Detector      | PK           |
| 2483.5       | PK (dBμV/m)          | 58.2 | Limit         | 74(dBμV/m)   |
|              | AV (dBμV/m)          | 38.8 |               | 54(dBμV/m)   |

Test Figure:



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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**

PIFA antenna with Gain 2.0dBi

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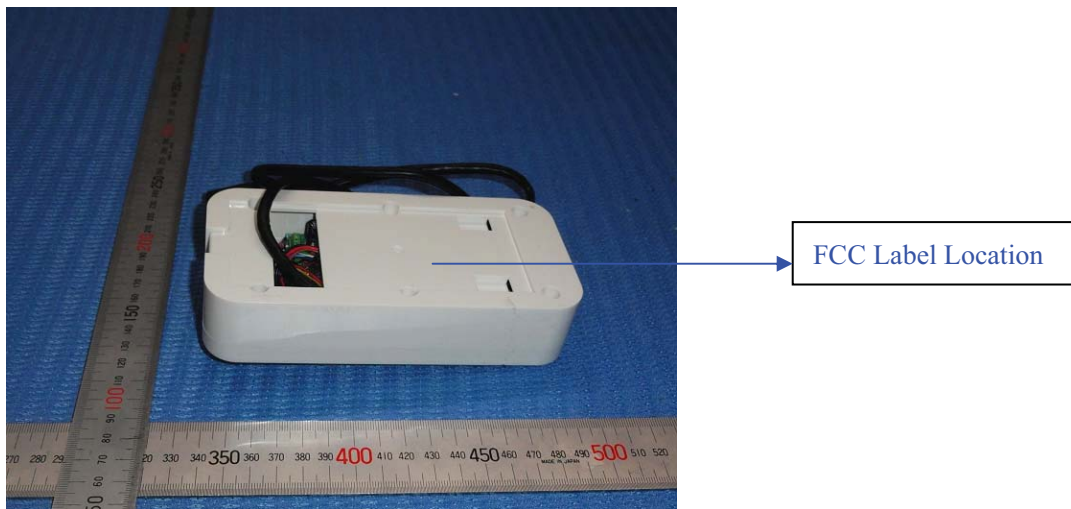
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## 12.0 FCC ID/ IC Label

**FCC ID: 2AD99DBRDA**

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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Inside view



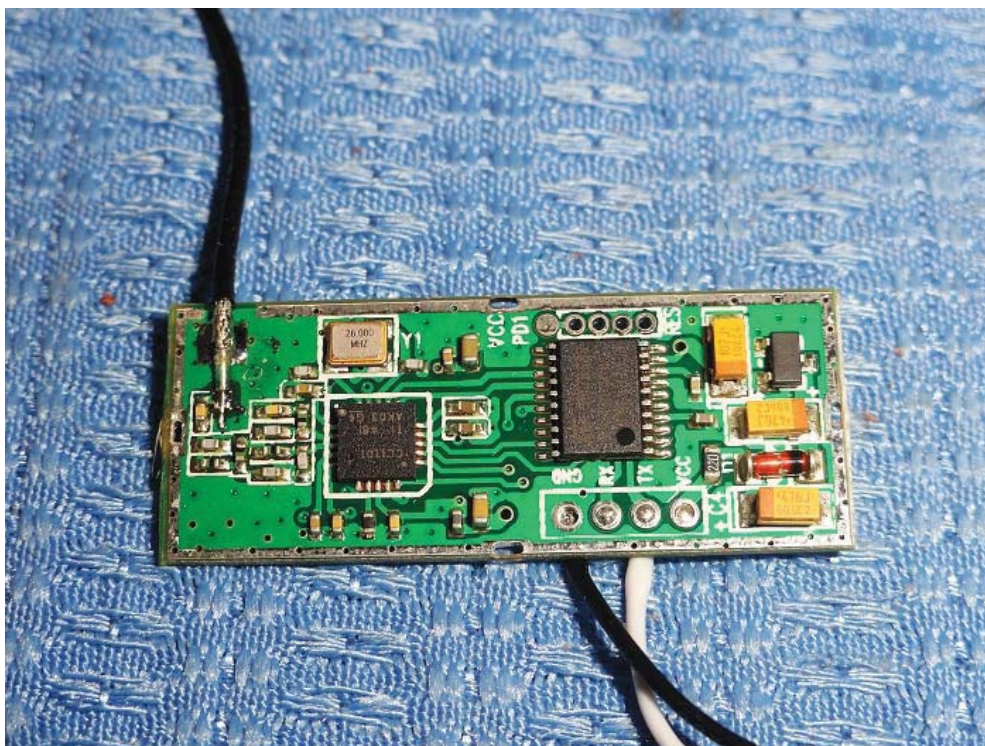
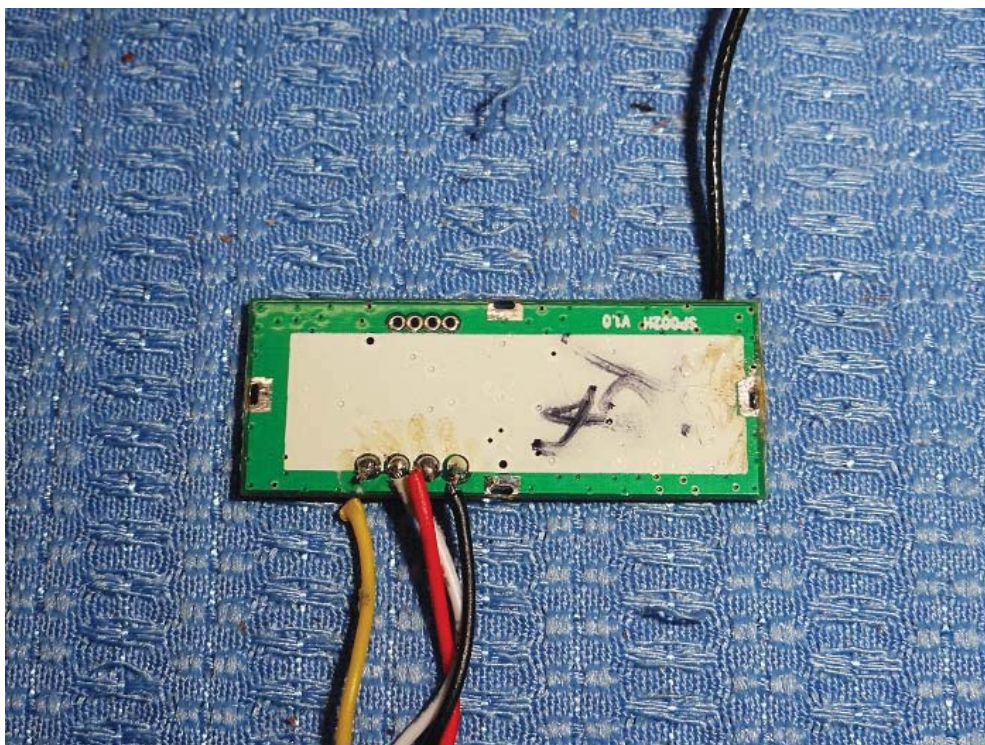
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Inside view



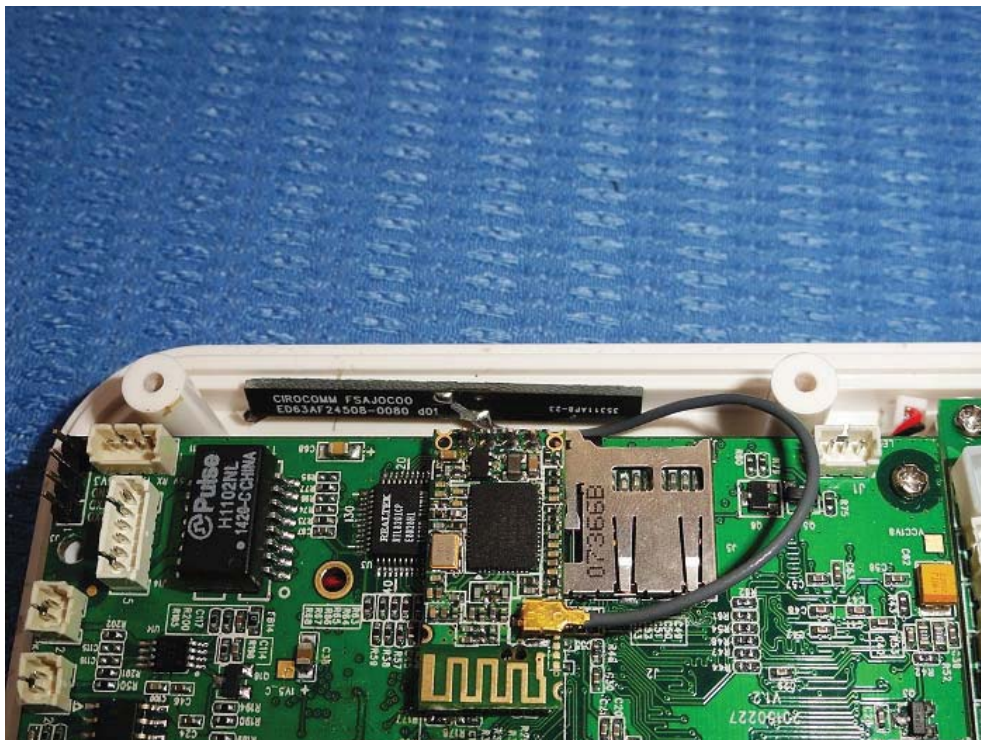
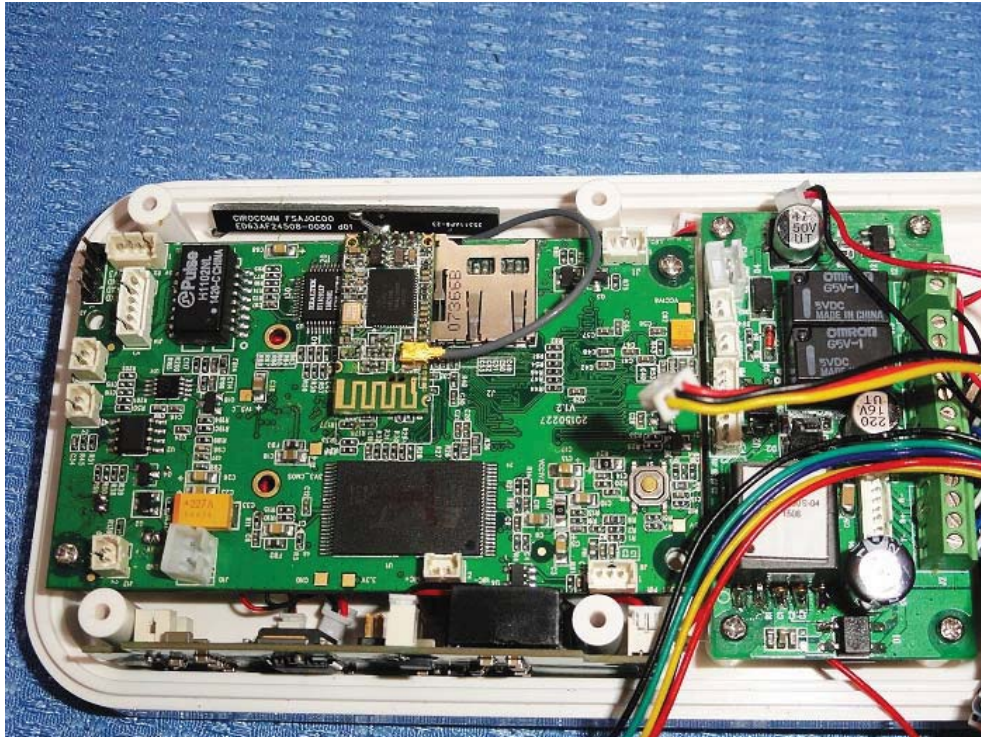
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Inside view



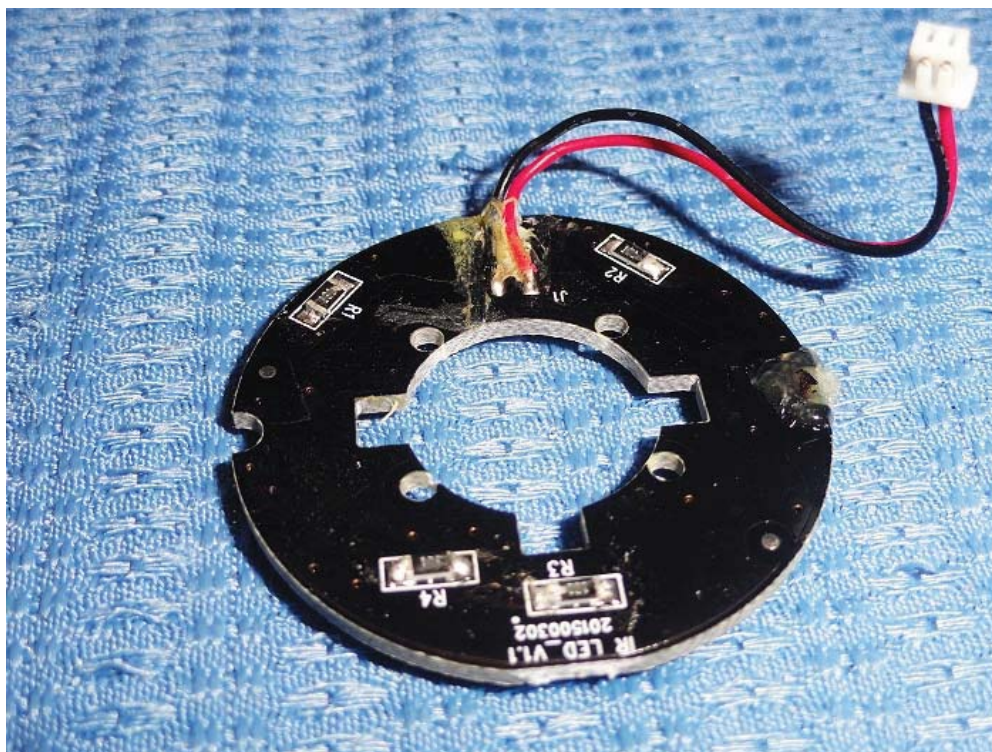
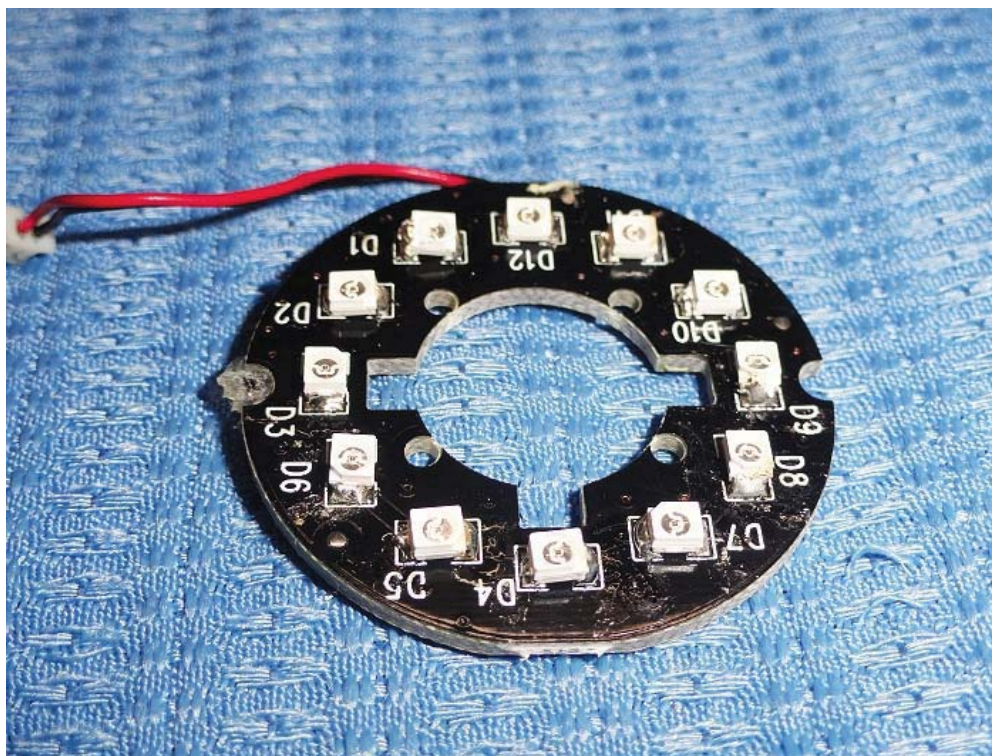
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Inside view



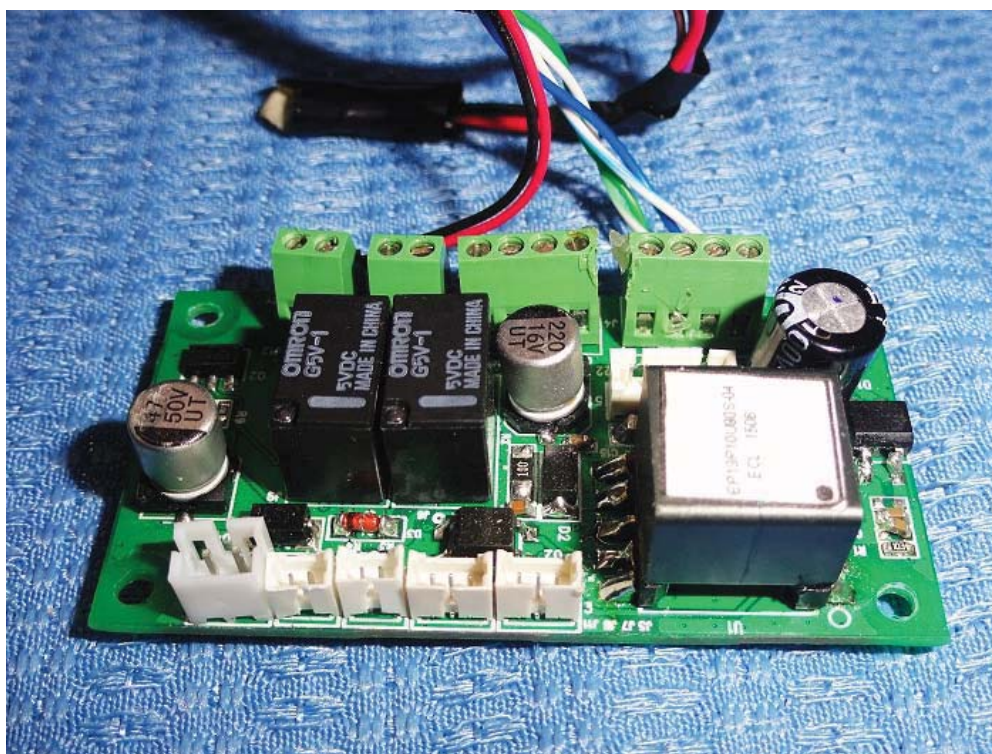
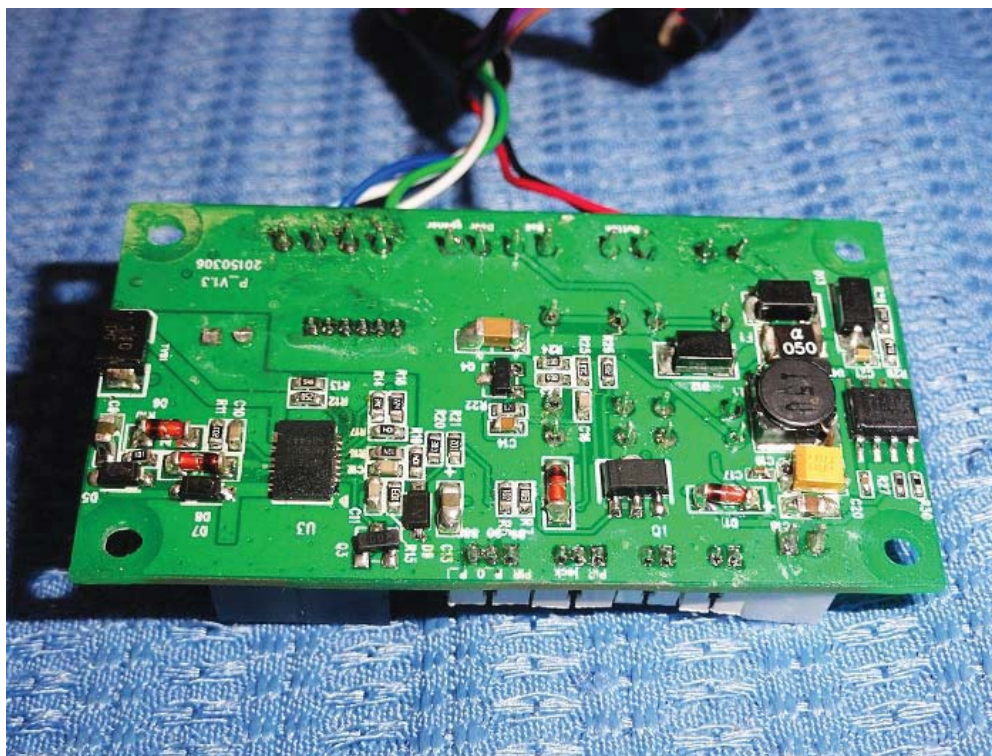
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Inside view



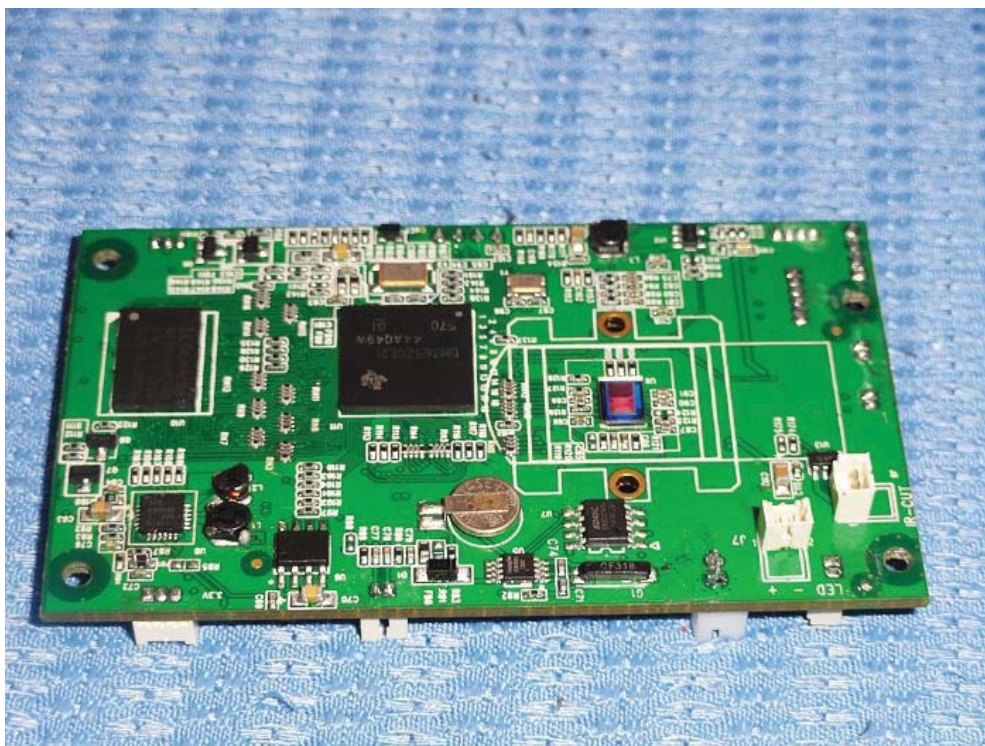
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Inside view



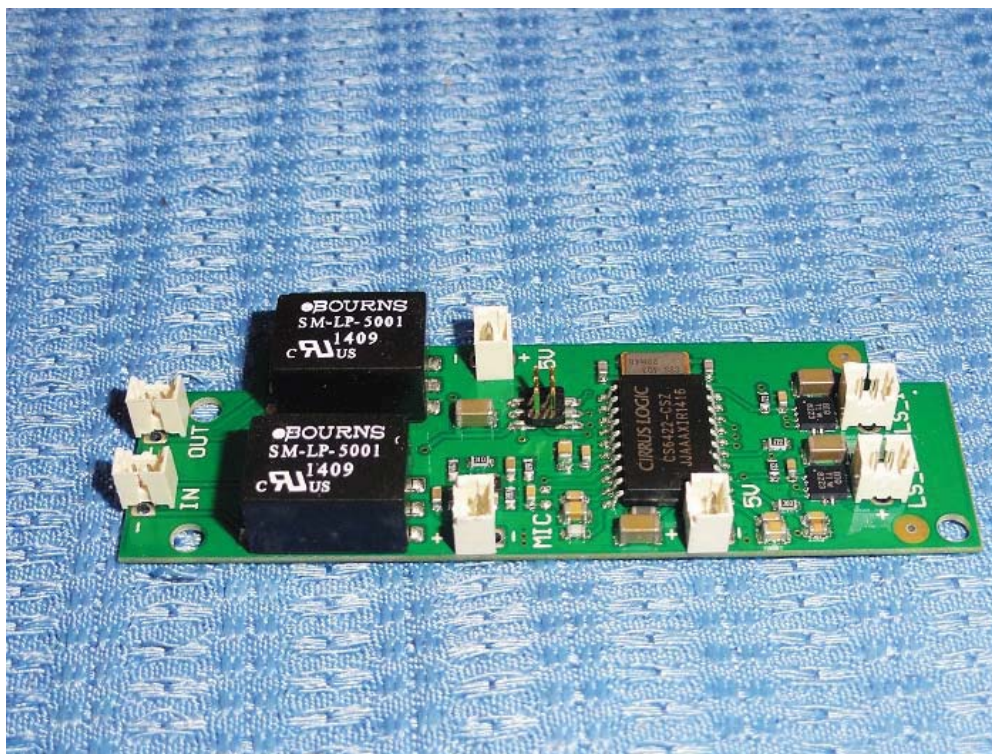
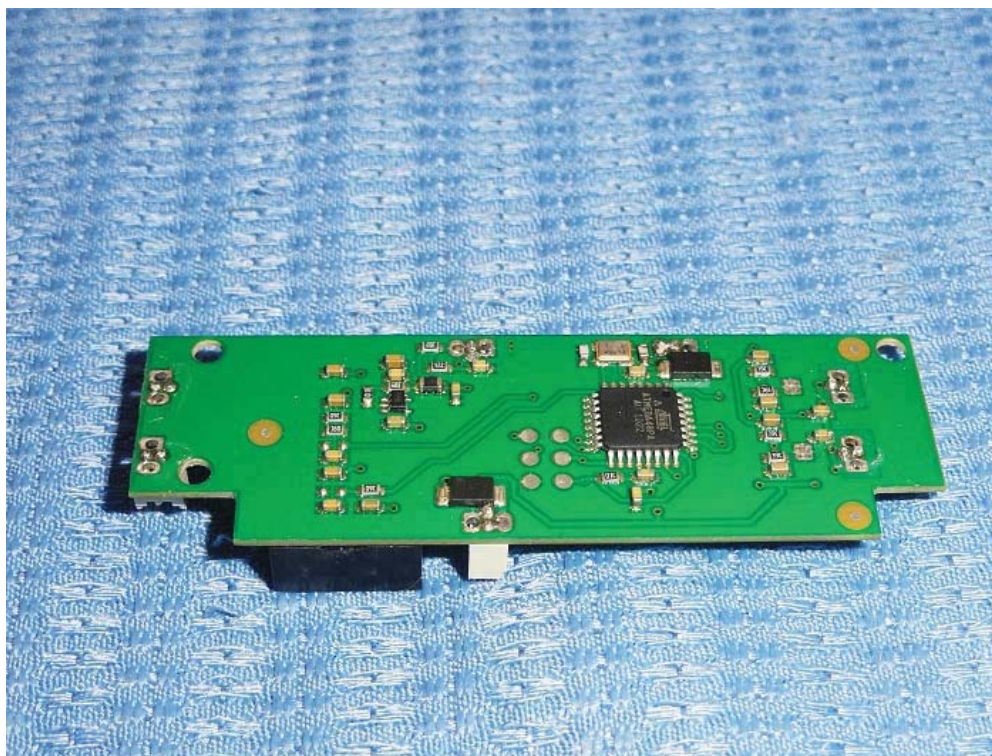
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Inside view



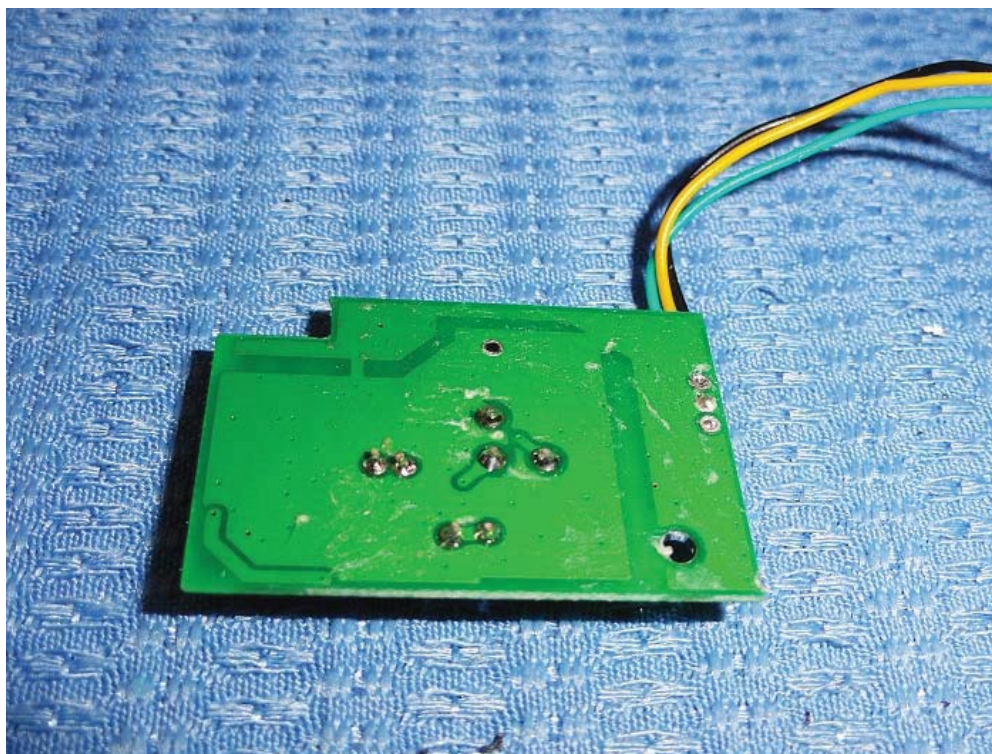
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Inside view



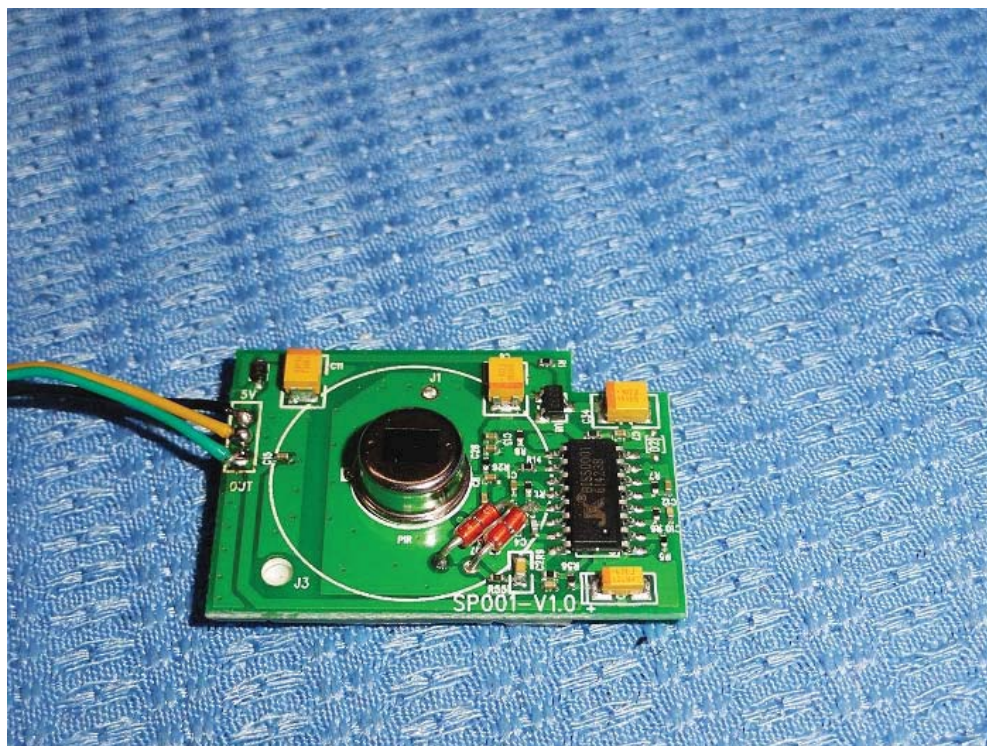
The report refers only to the sample tested and does not apply to the bulk.

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Inside view



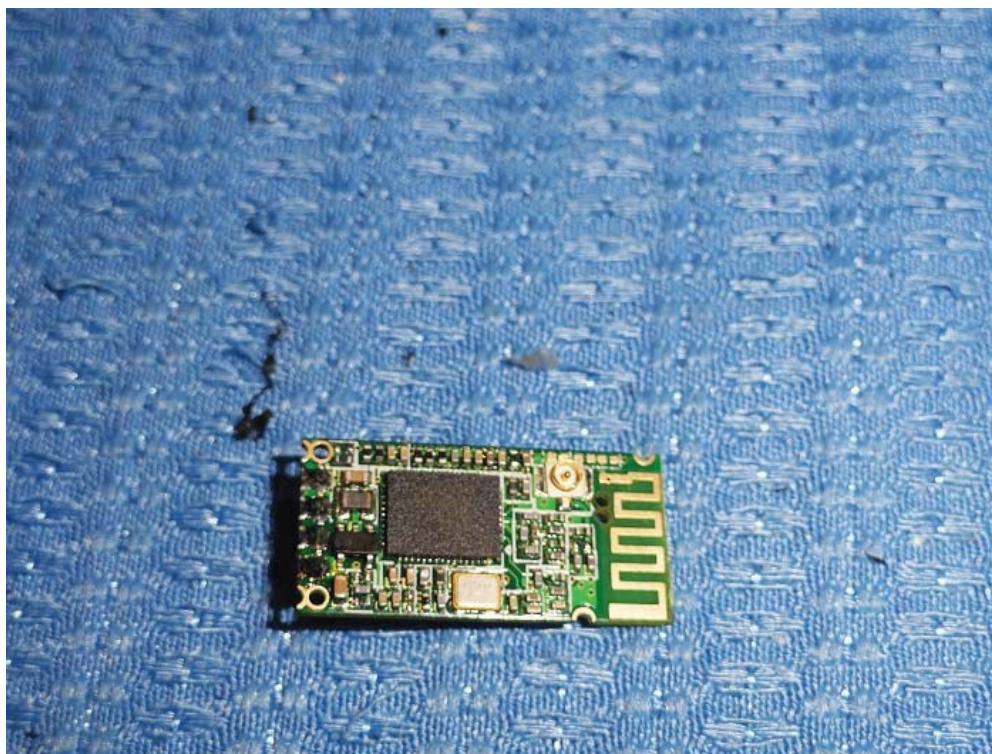
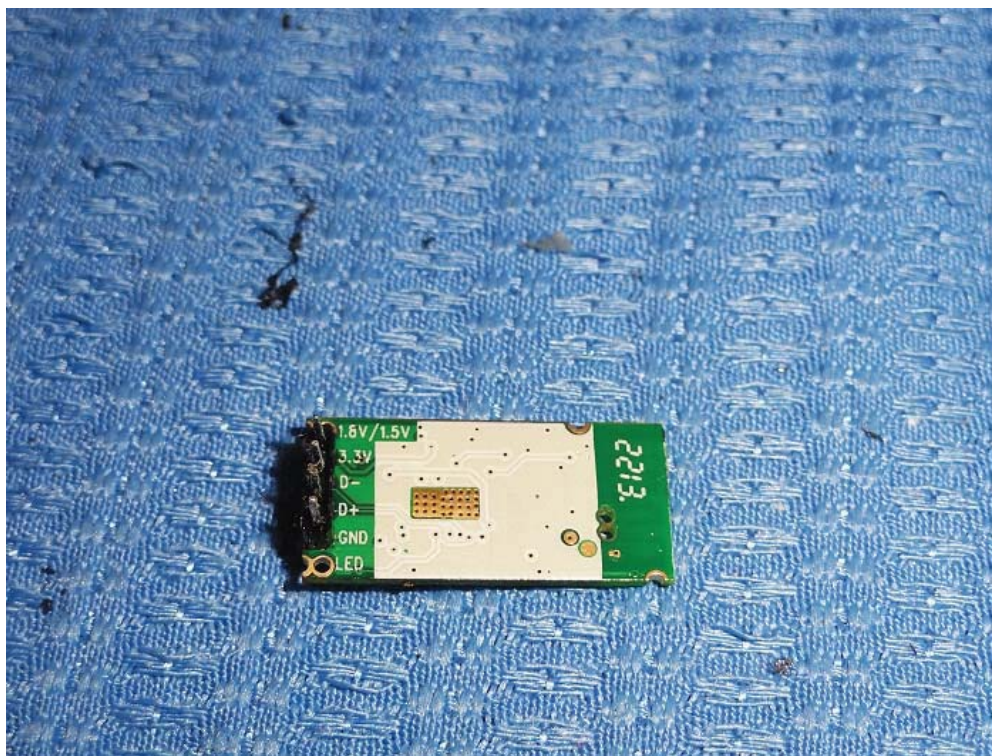
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WIFI Modular



**End of the report**

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